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PREFACE

Undergraduate Research Conference (URC) in a conference held annually since 2017, which provides an exciting platform for final year students to showcase their completed research as part of their undergraduate coursework. URC2021 provides an excellent platform these young researchers to demonstrate their communication skills, enhance their work readiness, meet students from other disciplines and learn how other disciplines approach research problems. Additionally, URC2021 will be the juncture for the students to share their thoughts and exchange ideas on how to chart their journey forward to reach new heights.

Due to the COVID-19 pandemic, URC2021 was held fully online, but it still provides undergraduate researchers a unique opportunity to present their research and enjoy a research conference environment.

To put a conference during this pandemic time is not a small task. To that end, I would like to thank the organizing committee for their invaluable support in organizing the conference. Also, the technical support team, keynote speaker, panels, the authors, and presenters for participating and making URC2021 a great venue for final year students to showcase their research. I hope that the compilation of URC2021 Proceedings will deliver the impact required for engineering students to evolve and mature as prolific researchers and life-ready graduates for the career world, thus benefiting the nation in the future when they serve our country as successful engineers or researchers.

Stay safe and healthy.

Prof. Madya Dr. Norhisham bin Bakhary
General Chair of URC 2021

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HOW PINTEREST ENGAGE WITH CONSUMER FOR TRAVEL

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ABSTRACT

The tourism sector relay on the digital platform nowadays to reach consumers. Pinterest application is one of the platforms has been choose by the tourism destination. This study is focusing on how tourism destinations adopt and implement Pinterest to engage with local tourism to help them in deciding travel destination. The use of Pinterest is not widespread in Malaysia for now. That is the reason why certain tourism destinations faced problems to get the reach of viewers on this platform. Besides that, they did not aware of the specific elements that can increase engagement in this platform. This study is aiming at local tourists that use Pinterest in their daily life as well as in helping them to decide on traveling. There are four variables that will be investigate in this research which are perceived ease of use, perceived usefulness, perceived trust and social capital. Those four variables are influencing the consumer intention to use Pinterest page in past research and minimum 100 respondent needed to succeed this research.

Keywords: Pinterest, Tourism, Local tourist

1.0 INTRODUCTION

According to Mohammad Ari Je Ulfy, (2016), the Malaysian Association of Hotels (MAH) has estimated a loss of RM560.72 million revenues for the movement control order (MCO) period. So, for now, they rely on the digital platform to keep on promoting and make a special offer like open for a certain period according to the government rules. The success of tourism destinations in any digital platform can be a benchmark for them to prove that their marketing strategy excellent in attract and help consumers to make decisions, especially on travel issues.

1.1 BACKGROUND OF THE COMPANY

Tiarasa Escape is located at Janda Baik and just 45 minutes from Kuala Lumpur city. Tiarasa Escape is own by Puan Sri Tiara Jacquelina. Tiarasa Escape itself is her idea in trying to bring the luxury tented accommodation experience to Malaysia based on what had she experienced in a Berber tent at Sir Richard Branson's Kasbah Tamadot in Morocco. As mentioned in one of the lifestyle news, Tiarasa Escapes is lauded as Malaysia's first premium glamping resort. The reason is the destination environment, Nestled in the cool foothills of Genting Highlands, Tiarasa Escapes offers guests the option of stylish designed luxury safari-styled tented villas or breezy treetop villas with spacious wraparound verandahs, sprawled over 7 acres of the beautiful landscape that's the perfect symbiosis of natural rainforest and clever design.

1.2 BACKGROUND OF THE PROBLEM

Tiarasa Escape has different social media to attract its target audience like Instagram, website, Pinterest, and more. Tiarasa Escape could achieved great performance and successfully attract the thousands of followers on its website or Instagram but it have a problem in getting followers in Pinterest, where Tiarasa Escape Pinterest page just get 5 followers on Pinterest. The board that provides in that Pinterest account is the main focus for the majority of users. The way the management of this destination implementing the Pinterest account to reach the customers and attract them to help on deciding for travel be as one of the aims of this research. The exact factor that needs to precise in generate any board is the main focus for them. This destination's management wonder about the element that needs to use by them to create perceive ease of use, perceive trust, and more. The factor that push the travellers when searching in the Pinterest account will be focused on.

1.3 RESEARCH OBJECTIVES

The objective of this study is to investigate the influence of perceive ease of use, perceive usefulness, perceive trust and social capital on local travelers' destination selection?

1.4 RESEARCH QUESTIONS

In order to meet the purpose and objectives of study, the following research questions will be used to frame this study. The study listed 4 main research questions as mentioned below:

i. To what extend the perceive ease of use influence user to use Tiarasa Escape's Pinterest Page
ii. To what extend the perceive usefulness influence user to use Tiarasa Escape's Pinterest Page
iii. To what extend the perceive trust influence user to use Tiarasa Escape's Pinterest Page
iv. To what extend the social capital influence user to use Tiarasa Escape's Pinterest Page

2.0 LITERATURE REVIEW

2.1 CONSUMER INTENTION

Intention can be defined as the idea that a person plan or intend to carry out. Consumer intention in making any decision can be influence by several factors which are situational factors, personal factor, psychological factor and social factors (Lumen, 2016). If discussion the consumer intention for travel, this will be deeper explained. First factor influence consumer intention is knowledge that consumer gain. Second, trust and attitude are the other factors. Any platform that could maintain in providing online trust and develop platform that easy to use and perceived usefulness (Agag, et.al, 2016) can highly influence consumer intention to choose this platform in planning for travel. Third, appropriate community policy that provide by the travel application or travel destination itself can influence consumer intention in travelling. Lastly, factor is focus about the advertisement which is consider any compatible issues like convenience, low price and time saving, can influence consumer intention (Agag, et.al, 2016).

2.2 PERCEIVE EASE OF USE

Perceived ease of use is also clarified as the degree to which a person believe that using a particular system would be free of effort (O.Gibreel et al, 2018). Platform which is easy to use that make consumers' lives easier can lead to positive sentiments about the platform and businesses as well (Suki et al, 2012). To add on, perceived ease of use is referring to the ease of use that can operate in the Pinterest sites such as look on board or used the Pinterest account to straight search for the certain website of tourism destination. Simply said that either this can make some extra engagement with the Pinterest account or not. As revealed by Singh and Srivastave (2019), for those that have high level of perceived ease of use will display high intention to use that social sites or social media. The researchers revealed that perceived ease of use effect intention to use Pinterest. Based on this discussion, the following hypothesis were proposed.

H1: There is positive significant relationship between perceived ease of use and intention to use Pinterest for travel purpose

2.3 PERCEIVE USEFULNESS

Perceived usefulness is defined as the degree to which a person believes that using a particular system would enhance his or her job performance. Researchers (Singh and Srivastava, 2019) mentioned that the percentage of travellers who feel that utilising social media (Pinterest) would improve their vacation experience is represented by perceived usefulness. About 80 percent of the travelers used social media to research the destination before actually leaving and because of the limited time for a holiday so they did a lot of research (online) before leaving. (Singh & Srivastava, 2019).

H 2: There is positive significant relationship between perceived usefulness and intention to use Pinterest for travel purpose.

2.4 PERCEIVE TRUST

Perceived trust (PT) is the belief on the information that the user finds on social media or Pinterest for his or her travel needs is objective, reliable, and relevant (Singh and Srivastava, 2019). Before travel, the tourist will check on the review for a viral place or any interesting activities that can plan to do at the tourism destination. All of this just by using any social media such as Pinterest to be a trusted platform that they can rely on. According to the study by Singh and Srivastava (2019), perceived trust is important for destination decision and information search. During the trip, perceived trust was shown through the usage of social media to research restaurant reviews and activities to do at the destination (Singh and Srivastava, 2019).

H3: There is positive significant relationship between perceived trust and intention to use Pinterest for travel purpose.

2.5 SOCIAL CAPITAL

Social capital can be defined as the networks of relationships among people who live and work in a particular society, enabling that society to function effectively. Social media affect the users' social capital by maintaining the existing relationships and creating new connections with those who are geographically dispersed on a large scale in a virtual location (Vitak *et al*., 2011). Some researchers said that internet-based interactions are regarded as positive factors of offline interaction, involvement, and even social capital (Hampton and Wellman, 2003; Ellison *et al*., 2007). During travel, generally, social capital was exhibited by the use of social media to stay connected with friends or to share pictures (Singh and Srivastava, 2019).

H 4: There is positive significant relationship between social capital and intention to use Pinterest for travel purpose

2.6 RESEARCH FRAMEWORK MODEL

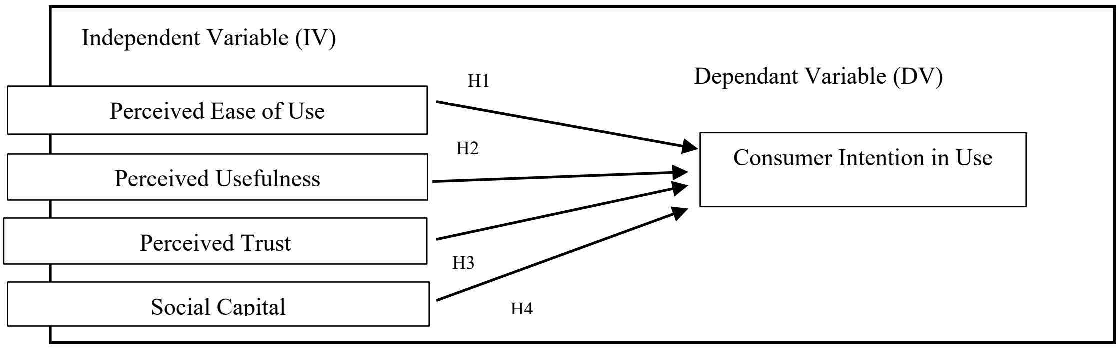

Fig. 1: Figure 1 shows the relationships between the independent variable and dependent variable. The framework of the variables in Figure 1 was adopted from Singh and Srivastava (2019).

3.0 RESEARCH METHADOLOGY

3.1 RESEARCH DESIGN

The research design of this study is a descriptive quantitative research design. This study use survey method in collecting data from local tourist that have Pinterest account. The target respondents is among local tourist that aged 20 to 30 who are young adult consumers that use Pinterest in their daily life.

3.2 POPULATION AND SAMPLING

According to Simon Kemp (2021), there are 32.57 million people in Malaysia for first quarter in 2021 and 28 million of them are active social media users. Plus, 6.72 million of them who are 16 years old until 64 years old used Pinterest in their life. This study will aim for young adult users that already have Pinterest account because the dependant variables of this study is intention of consumer to use Pinterest for travel and young adult consumer is the most category of consumer that active using social media as well as using internet. According to Hair et al. (2010), a recommended sample size of 100 for survey is minimum in survey study. Therefore, the number of samples is at least 100. Then, 100 sets of questionnaires will be distributed among the 100 respondents from the population of consumers that use Pinterest through any digital platform like Facebook, Instagram, Whatsapp and Pinterest by online Google Form.

3.3 SAMPLING SIZE TECHNIQUE

The sampling technique that used in this research is one of the non-probability sampling technique which is judgemental or purposive sampling. Homogeneous sampling applied to make the form. The respondents share the similar traits, which are the respondents that aged 20 to 30 years old that use Pinterest. The idea is on how this type of respondents relates to the topic or variables that indicate in this survey. In the survey, the first question that will be ask: "Are you Pinterest's user, currently 20 to 30 years of age?" The next questions will indicate that if the answer is no, the respondent will be terminated from the survey.

3.4 DATA COLLECTION METHOD

Primary data and secondary data used in this research. This research will collect primary data from the survey that spread to the target respondents who are young adult Pinterest' users which located in Malaysia. The secondary data that referring for this study are like book, previous research article and statistical data from any report (i.e., MCMC Report, previous research on social media or Pinterest) that related to the topic discuss in this research.

3.5 RESEARCH INSTRUMENT

Questionnaire separated to two section which are Section A and Section B, to make it easier to understand. The question, 'Are you Pinterest's user and currently 20 to 30 years of age?' will ask first to make sure that only respondents in this category allow to participate in the survey. Section A developed consists of demographic questions while section B has four part consist of four independent variables and one dependent variable.

4.0 DATA ANALYSIS AND FINDINGS

4.1 DEMOGRAPHIC ANALYSIS

Table 1: The two dependent variables that has analysed by the researcher which are gender and state.

Demographic Factors		Frequency (f)	Percentage (%)
Gender	Male	25	24.5
	Female	77	75.5
State	Johor	37	36.3
	Kelantan	29	28.4
	Pulau Pinang	4	3.9
	Melaka	1	1.0
	Pahang	2	2.0
	Kedah	2	2.0
	Perak	3	2.9
	Perlis	1	1.0
	Negeri Sembilan	3	2.9
	Terengganu	5	4.9
	Wilayah Persekutuan	3	2.9
	Selangor	5	4.9
	Sabah	2	2.0
	Sarawak	5	4.9

4.2 NORMALITY TEST

TABLE 2: shows the normality test result for all the variables. The table visualize that all the variables is normal distribution because the value of skewness and kurtosis is between -2 to 2 (George & Mallery, 2010).

Variables	Items	Skewness	kurtosis	Conclusion

Consumer Intention	4	-.557	1.127	Normal distribution
Perceive ease of use	4	-1.127	1.689	Normal distribution
Perceive Usefulness	4	-.853	.481	Normal distribution
Perceive Trust	5	-1.036	1.691	Normal distribution
Social Capital	3	-.789	.991	Normal distribution

4.3 RELIABILITY TEST

TABLE 3: The general rule is that reliability greater than 0.8 are considered as high (Downing, 2004). The value of Cronbach's Alpha for perceive ease of use is excellent because the value was more than 0.9. For the perceive usefulness, perceive trust and social capital the value is very good but the value for consumer intention was moderate as shown as 0.694.

Variables	Statement	Scale item	Cronbach's Alpha
Perceive Ease of Use	It is easy for me to use this Tiarasa Escape Pinterest page.	4	.905
	It is easy to find the information I want on Tiarasa Escape's Pinterest page.		
	I feel confident about using Tiarasa Escape's Pinterest page.		
	I find it easy to do what I want to do during my travel on Tiarasa Escape's Pinterest page.		
Perceive Usefulness	This Tiarasa Escape Pinterest page provides speedy answers to my questions.	4	.846
	This Tiarasa Escape Pinterest page is effective in helping me find the most relevant information		
	Overall I find this Pinterest page useful.		
	This Tiarasa Escape Pinterest page improves my ability to get knowledge about this destination.		
Perceive Trust	This Tiarasa Escape Pinterest page is genuinely committed to my satisfaction.	5	.873
	I have trust in ths Pinterest page.		
	This Tiarasa Escape Pinterest page appears to be more trustworthy than other resorts' social networking sites.		
	This Pinterest page is secure.		
	I feel safe when I use this Tiarasa Escape Pinterest page to choose the destination for travel.		
Social Capital	Uisng Pinterest, I can understand what happens in society and help myself to travel in peace.	3	.834
	I can learn about other cultures through Pinterest before travel.		
	Using Pinterest I can get specialized knowledge and information.		
Consumer Intention	I believe that using Pinterest to travel would be fascinating.	4	.694
	I willingly use Pinterest social networking sites.		
	I am not opposed to use Pinterest for travel purposes.		
	I intend to continue using Pinterest.		

4.4 MULTIPLE REGRESSION ANALYSIS

Table 4: Coefficient

Model	Unstandardized Coefficient		Standardized Coefficient	t	Sig.	R Square
	B	Std. Error	Beta			
Constant	1.660	.300		5.526	.000	.439
Perceived ease of use	-.070	.099	-.104	-.711	.479	
Perceive Usefulness	.175	.133	.220	1.323	.189	
Perceive Trust	-.075	.105	-.099	.714	.477	
Social Capital	.423	.077	-.512	5.498	.000	

5.0 DISCUSSION AND CONSCLUSION

5.1 DISCUSSION AND FINDINGS

The result for the normality test showed all the data collected by the respondents is normal distribution with value of skewness and kurtosis is between -2 to +2. The result form the reliability test shows that all the variable were reliable with the value of Cronbach's alpha is more than 0.6. The result from the Multiple Regression analysis shows that social capital is the only independent variable that making a significant contribution to the dependent variable which is consumer intention.

5.2 RECOMMENDATION AND IMPLICATION

The respondents not look into the link of Pinterest page given before proceed to answer the questions about that Pinterest page. The respondents randomly pick the choice given in the questionnaire and this effected the result of findings. Next limitation is lack of time in collecting data from the respondents and this effect the data collection. The first recommendation is the future researchers may use qualitative method in getting data from the respondents. By doing this, the respondents will answer all the questions genuinely and data collected will be more accurate. Other than that, the researcher could use larger scale of target respondents for example targeting consumers that age 16 to 50 to easily increase the amount of respondents and help in create more accurate result.

5.3 CONCLUSION

The researcher study on how Pinterest engage with consumer for travel purpose. Consumer's social capital impact on how they select the travel destination page. Most of the consumers strive to get the social media page that consist of complete information about the destinations and really demand for Pinterest page that may make them feel secure. The amount of respondents for this study is about 102 respondents who use Pinterest in their daily life and aged 20 to 30 years old. After run the multi regression analysis, the researcher get result that shows that 3 variables are not supported the dependent variable.

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THE RELATIONSHIP BETWEEN EMPLOYEE EMPOWERMENT AND INNOVATIVE WORK BEHAVIOUR AT FOREST INTERACTIVE

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ABSTRACT

The purpose of this study is to identify the relationship between employee empowerment and innovative work behaviour because modern organisations need to enhance their competitiveness so management nowadays is aware of the necessity and significance of empowering their employees. This study also examines the influence of employees' length of tenure in empowerment and innovative work behaviour. The quantitative approach is used as a research strategy by adapting the questionnaires technique with a sample of 69 employees. The respondents are the subordinates and managerial employees from the Technology department, Creative department and Operation department of Forest Interactive as they need to meet the high standards of innovation to perform their daily tasks. Data collected are analysed using SPSS version 26.0 and the findings depicted that employees who worked 6 to 10 years for the company have a very high perception level of employee empowerment and innovative work behaviour. The results indicated that there is a significant correlation between employee empowerment (Goal internalisation, Perceived control, Perceived competence) and innovative work behaviour (Idea generation, Idea promotion, Idea realisation).

Keywords: Employee Empowerment, Innovative Work Behaviour, ICT Industry

1.0 INTRODUCTION

For a business to sustain itself in the long run, organisations require to be innovative especially in this uncertain and challenging business environment [1]. It is crucial for organisations to adopt a work environment with open to creativity and innovation by applying less rigid company regulations so Uzunbacak [2] suggested the first move that should be taken by organisations is highlighting employee empowerment within the daily operations. According to Sahoo, Behera and Tripathy [3], empowerment is reducing the centralized decision-making process by boosting employees' self-confidence and thus offering workers more autonomy, discretion and responsibility. Empowerment is a powerful management tool that can be used to exchange the shared vision of the organisation and expect to materialise into common goals [4]. Malaysian government showed initiatives to reduce bureaucracy within public sectors revealed that Malaysia is slowly embracing empowerment practices from Western countries [4].

An organisational culture that gives authority to employees for decision making in their daily tasks and to involve in management practices can encourage employees to behave innovatively since employees feel emphasised and empowered [2]. Empowered subordinates see themselves as innovative, not afraid to try new things and tend to generate more innovative ways of doing things [5]. Indeed, Spreitzer [6] believed innovative behaviour is one of the consequences of empowerment. This is due to the reason that empowered individuals think they have less restraint and greater autonomy, so they are likely to be creative and innovative [7]. Innovative work behaviour (IWB) refers to searching new technologies, proposing feasible strategies, making use of new methods in the workplace as well as seeking support and resources to realise novelty ideas [8].

However, Ahmad and Oranye [9] proved that empowerment practices on nurses in Malaysia and England contributed to different results indicates that empowerment does not generate identical outcomes in all countries. Empowerment may not work well due to the high power distance nature of the society in Malaysia as mentioned by Aryee and Chen [10] that employees may not exercise discretionary power granted. According to Chen and Fahr [11], a high power distance culture implies that employees prefer their boss to make decisions for themselves as they tend to hesitate in taking initiatives when without consulting their supervisors in which will then minimise the innovation ability of employees.

In response to this matter, this study intended to study the relationship between employee empowerment and innovative work behaviour among Malaysian employees of a private organisation named Forest Interactive in the Information and Communications Technology (ICT) industry. In the Malaysian context, there are 3 research studies conducted regarding employee empowerment and innovative work behaviour but only limited to the education sector [12][13][14]. This research would like to extend the application of theory by exploring the links between the two research variables with the samples collected from a telecommunications service provider which is a different sector in Malaysia. Focusing on different research settings is of paramount importance for expanding the practicality of the theory.

1.1 Research Objectives

The following are the objectives of this study:

a) To examine the perception level of employee empowerment based on the length of tenure of the employees at Forest Interactive.

b) To determine the perception level of innovative work behaviour based on the length of tenure of the employees at Forest Interactive.

c) To identify the relationship between employee empowerment and innovative work behaviour at Forest Interactive.

2.0 LITERATURE REVIEW

2.1 Employee Empowerment

In reviewing past literature, it is hard to determine a consensus definition of empowerment from different authors [15]. This research study will adapt the empowerment scale from Menon [16] as his empowerment measures can represent the construct holistically. Menon's [16] research is based on the premise that the psychological experience of power is the basis of the feeling of empowerment and extends existing perspectives on empowerment by integrating the empowering effect of goals, such as those provided by transformational leadership. Mathieu et al. [17] agreed with Menon and called his approach a 'unifying view of empowerment'.

Menon [16] proposed the definition of a psychologically empowered state as a cognitive state characterised by a sense of perceived control, perceived competence and goal internalisation. Perceived control refers to beliefs about autonomy in the scheduling, availability of resources, decision-making latitude and authority [16]. Menon [16] mentioned that perceived control roughly corresponds to the task assessments of choice, impact and self-determination in the Thomas and Velthouse [18] and Spreitzer [19] models. Perceived competence indicates self-efficacy and confidence with regard to role demands: the individual believes that he or she can successfully meet daily task demands and any unconventional challenges that might arise in the work process [16]. Lastly, the dimension of goal internalisation denotes the energising aspect of empowerment, which in turn is the main driving force of the leadership approach to empowerment [16].

2.2 Innovative Work Behaviour

Innovative work behaviour refers to the intention of an individual to initiate, create, and realise novel ideas, processes, products and procedures that can bring ultimate benefits to work roles, groups, or organisations [20][21]. Samma et al. [22] denoted that these behaviours usually start with the identification of work-related issues, then the introduction of better ideas, and end with the implementation of those ideas. This study adopts a definition from Janssen [21] where innovative work behaviour encompasses three behavioural tasks namely idea generation, idea promotion and idea realisation. Idea generation acts towards the development of new ideas for products or processes. Once the idea has been created, individuals will convince stakeholders to provide supports and assistance by marketing the ideas in order to encourage the implementation of an idea. This phase belongs to the idea promotion stage. During the idea realisation phase, the idea transforms into a procedure or prototype which can be utilised in organisation practices [21]. Innovative work behaviour is conceptualised as a multistage process that includes all behaviours mentioned by Janssen [21].

2.3 Conceptual Framework of the Study

Figure 1 below shows the conceptual framework for this study that focuses on employee empowerment and innovative work behaviour.

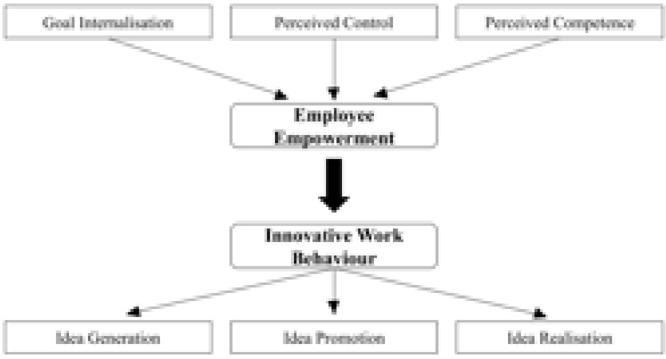

Fig. 1: Conceptual Framework

In this study, employee empowerment is the independent variable and innovative work behaviour is the dependent variable. Goal internalisation, perceived control and perceived competence are the three dimensions that will affect employee empowerment. Employees with innovative work behaviour will undergo three behaviour tasks namely idea generation, idea promotion and idea realisation.

3.0 RESEARCH METHODOLOGY

3.1 Population & Sampling

In this study, the total number of the population is the number of respondents allowed and agreed by Forest Interactive which was 86 people. A total of 86 questionnaires were distributed among the employees and 69 responses are identified as valid samples to carry further research. The purposive sampling method of non-probability sampling strategy is used because this study is small scale research and not every job position contains innovative characteristics. In this way, the sample of this study is only included those satisfied with the specific needs of the research purpose. The subordinates and managerial employees from the Technology department, Creative department and Operation department are chosen to be the sample of this study as they need to meet the high standards of innovation to perform their daily tasks.

3.2 Research Instrument & Reliability

Employee empowerment was measured using fifteen items from Menon [16] based on three dimensions, namely goal internalisation, perceived control and perceived competence. Innovative work behaviour of respondents was measured by adapting the instrument used by Janssen [21] which consists of nine items that are filled out by respondents. Three items each are designated to measure the idea generation, idea promotion and idea realisation. All the responses were made on a 5-point Likert scale that ranged from (1) strongly disagree to (5) strongly agree.

Cronbach's alpha is used to measure the reliability of internal consistency for the items. The Cronbach alpha for the employee empowerment variable is 0.867 while innovative work behaviour variables is 0.857 in the pilot study conducted by the researcher and all value of Cronbach's alpha is greater than 0.7 which is considered as a valid instrument.

4.0 RESEARCH FINDINGS

The normality test of skewness and kurtosis is conducted to check if the distributions of the data collected are normally distributed. The acceptable level of skewness and kurtosis for a distribution to be acceptably normal are close to zero or within the range of +1 to -1 [23]. Based on Table 1, the results indicate the skewness and kurtosis of dependent and independent variables fall in the acceptable range so the data collected is normally distributed.

TABLE 1: Skewness and Kurtosis for Normality Test

Variables	N	Skewness	Kurtosis

	Statistics	Statistics	Std. Error	Statistics	Std. Error
Employee Empowerment	69	0.236	0.289	-0.805	0.570
Innovative Work Behaviour	69	0.258	0.289	-0.490	0.570

4.1 Demographic Analysis

With a total of 69 respondents, there are 31 male respondents which represent 44.9% of the total respondents whereas 38 female respondents constitute a larger percentage which is 55.1%. The findings of the study also show that most of the employees in Forest Interactive are young people when 47 respondents (68.1%) are less than 29 years old. Subsequently, most of the respondents have a bachelor's degree, which is 49 people that accounting for 71.0%. 12 respondents (17.4%) have STPM or diploma level academic qualification while 7 of them (10.1%) have postgraduate education level. SPM education level has the lowest number of respondents which is only 1 (1.4%). Lastly, 32 respondents (46.4%) had been working for less than 1 year, and only 6 respondents (8.7%) had been with Forest Interactive for 6 to 10 years.

4.2 Objective 1: The Perception Level of Employee Empowerment Based on the Length of Tenure

TABLE 2: Perception level of employee empowerment based on the length of tenure among the respondents at Forest Interactive

Variable	Length of Tenure	Overall Mean	Level
Employee Empowerment	Below 1 year	4.20	**High**
	1 - 5 years	4.24	**Very High**
	6 - 10 years	4.49	**Very High**
	Overall	4.25	Very High

Based on the analysis, respondents who have worked for 1 to 5 years (mean=4.24) and 6 to 10 years (mean=4.49) have very high levels of employee empowerment. However, employees who have joined the organisation for less than 1 year have a slightly lower perception level of empowerment (mean=4.20) which can be observed from Table 2 but it still falls in the high-level category. Therefore, the mean score can conclude that respondents of Forest Interactive are highly empowered in the organisation but the level of employee empowerment will increase as employees work for the company longer.

4.3 Objective 2: The Perception Level of Innovative Work Behaviour Based on the Length of Tenure

TABLE 3: Perception level of innovative work behaviour based on the length of tenure among the respondents at Forest Interactive

Variable	Length of Tenure	Overall Mean	Level
Innovative Work Behaviour	Below 1 year	3.75	**High**
	1 - 5 years	3.84	**High**
	6 - 10 years	4.26	**Very High**
	Overall	3.84	High

Table 3 shows that the talents who worked for 6 to 10 years have a very high level of innovative work behaviour (mean=4.26) compared to the other categories. For employees who have serviced Forest Interactive for less than 1 year and 1 to 5 years, they also have a high level of innovative work behaviour with a mean of 3.75 and a mean of 3.84 respectively.

4.4 Objective 3: The Relationship Between Employee Empowerment and Innovative Work Behaviour

Results illustrate that the Pearson correlation coefficient between employee empowerment and innovative work behaviour is 0.634, indicating that there is a positive correlation between the two variables. This explains that when respondents believe that they are highly empowered by their employers, they tend to be more innovative at work. Findings show that there is a moderate correlation between employee empowerment and innovative work behaviour. The aforementioned variables are correlated significantly at the level 0.01 (2-tailed) because the p-value of the variables is less than 0.05.

5.0 DISCUSSION AND CONCLUSION

The results indicated that the employees of Forest Interactive have a very high level of employee empowerment with an overall mean score of 4.25. The very high level of employee empowerment is aligned with the findings of Ismail, Abdullah and Abdullah [14] which showed a mean score of 4.48 for psychological empowerment among the teachers in Penang, Malaysia. This revealed that employees in general, have a strong sense of ownership of their jobs; acquire the ability and skills to perform their duties and are granted freedom and trust to perform their tasks. The longer employees worked at the company, the higher the perceived level of employee empowerment, as senior employees perceive themselves have higher control over their works, department’s operation and strategic outputs in the workplace. This demonstrates that Malaysia is indeed a high power distance country as mentioned by Hofstede Insights [24] because employees do prefer paternalistic leadership so individuals are accustomed to centralized power among senior-level employees. But this does not imply that junior-level employees have no power to make a difference because the findings indicate that employees who join the company for less than 1 year still has a high perception level of perceived control over their tasks. The employees believe that their behaviour could have an impact and they have a feeling of being heard.

The employees of Forest Interactive do practice innovative work behaviour in their daily working life as the overall mean score is 3.84 which fall under the high-level category. Based on Swaroop and Dixit [25], this revealed that employees are not only creative, they also share their ideas and involve themselves to promote the ideas, persevere in the face of opposition and setbacks, and be dedicated, enthusiastic and motivated to see their own ideas come true. The findings signified that when employees have a longer length of tenure, they have a higher level of innovative work behaviour including idea generation, idea promotion and idea realisation. When subordinates serve the company longer, they are more likely to persuade others to embrace innovative ideas because they know exactly how and where to get support, approval, and resources from colleagues or sponsors surrounding an idea. It is believed that senior employees are more likely to become idea realisers because they are usually the ones who approve ideas so that new ideas can be implemented and put into practice. Therefore, this may explain why senior employees tend to have higher perceived levels of innovative work behaviours.

The results are a pointer to the argument that there is a significant (sig=0.00) moderate positive relationship between employee empowerment and innovative work behaviour with r=0.634. This finding concurs with the studies from Rahman, Panatik and Alias [12], Ghani, Hussin and Jusoff [13], Kanake and Kemboi [26] and Alkhodary [27]. Employees with a higher perceived level of empowerment are more likely to exhibit innovative work behaviour. Empowerment is really perceived by subordinates as providing greater autonomy and being innovation supportive. Empowered individuals will not passively wait for the work environment to provide direction; instead, they take proactive and innovative methods to shape and influence their work environment [14].

In a nutshell, this study had achieved all the three objectives that were intended to examine. The results imply that empowered employees are intrinsically inclined towards greater innovative behaviour at work. The results gained from this study provided additional empirical evidence and provided awareness to the upper-level management, human resources department or any related departments regarding the effect of employee empowerment on innovative work behaviour. This can assist the organisation to implement empowerment practices effectively and thus impose a greater positive effect on the innovative behaviour of employees in the workplace. With the support from findings, management can adjust and modify their empowerment practices to maximize the organisation innovation outputs.

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TOURIST VISITING INTENTION THROUGH FACEBOOK MARKETING

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ABSTRACT

New media is an interactive form of communication nowadays that are different from the old media such as newspaper, television and radio. New media is any media delivered digitally such as websites, blogs, email, social media networks and virtual or augmented reality. It has been one of recent marketing strategies for businesses. In tourism industry, social media marketing is a must for the organization to attract visitors using high quality and engaging contents. Facebook is one of the popular social media was put focus on by majority of tourism campaign or organization. The aim of this study is to examine the effectiveness of social media activities to influence consumer's intention towards the tourism campaign on Facebook. This study is conducted through descriptive survey by distributing questionnaire to Facebook travel interest users to examine the user interaction with the Facebook page activity and how it affects the perception of the brand and influence visitors' intention towards the product or service.

Keywords: New media, social media marketing, tourism, Facebook

1.0 INTRODUCTION

Tourism has been an important role in contributing to a country's economy since the early days. Malaysia is one of the ASEAN countries that are known for its unique diversity of cultures, festivals, traditions and customs which creates the desires for tourist to choose Malaysia as one of their destination selections. The statistic of Malaysia shares of economic sectors in the gross domestic product (GDP) from 2009 to 2019 by O'Neill (2021), illustrates the percentage of services contributed about 54.17 percent in 2019 meanwhile the share of industry contributed around 37.42 percent and agriculture in Malaysia's gross domestic product was around 7.28 percent. This statistic convinced that the contribution of service sector is a big influence to Malaysia's economy as well. Tourism and related travel is considered as one of the service sectors by Ministry of International Trade and Industry Malaysia (MITI). It is one of the most dynamic economic service that contributes 5.9 percent to Malaysia's GDP (Hirschmann,2021), employment and creating foreign exchange. The data and the results prove that how tourism is an important part of a Malaysia's growth.

67.5 percent visitors visit Malaysia for holiday purposes in 2019 (Hirschmann, 2021) and due to pandemic, this sector has been affected badly both to the economy and to the labors. In a study by (Mohd Noor et al., n.d.) shown five tourism industry sectors that stimulates development and increasing income per capita and local communities' living standards in Malaysia which are health tourism, sustainable tourism, cultural tourism, eco-tourism and Islamic tourism. Malaysia's government recently introduced a ten-year strategy to help the country's tourism industry revive. One of the primary initiatives for recovery mentioned in the National Tourism Policy 2020-2030 is to promote and enhance sustainable tourism. Among the travel experiences to promote are ecotourism, adventure, and sports tourism, including island and coastal tourism (Hirschmann, 2021).

According to Oz (2014) findings in his study, social media is being used both for in daily lives 96 percent and for travel-related activities 95 percent. Nowadays, consumers easily explore the internet and websites to select the best tourism destination for them to choose based on their preference and many other factors. Consumer use social media at any stage of their travel phases not just during pre-travel stage (Fotisetal, 2012) but also during and post-travel. Holt (2016) states that present companies use social media to form direct relationships with customers by connecting in real time and sharing great stories with them. Social media is a prominent strategy for most businesses not just in tourism industry, to be used for marketing and integrated communication channel with the target audience. As social media platform develops, tourism businesses will face more opportunities and challenges (Oz, 2014). To improve their brand on social media, businesses invested big amount of money for it. Despite this, only a few companies have sparked significant customer interest on the internet (Holt, 2016). In this study, one of Cooperatives Commission of Malaysia (SKM) Facebook page is being studied on the effectiveness of its advertising to be a destination selection for ecotourism and agrotourism lovers.

1.1 Research Objective

This study listed four main objectives:

i. To explore the effect of brand page commitment of Kongkong Ecotourism Facebook on traveler's visiting intention.

ii. To explore the effect of brand awareness of Kongkong Ecotourism Facebook on traveler's visiting intention.

iii. To explore the effect of word-of-mouth of Kongkong Ecotourism Facebook on traveler's visiting intention.

iv. To explore the effect of annoyance of Kongkong Ecotourism Facebook page on traveler's visiting intention.

2.0 LITERATURE REVIEW

2.1 Hypothesis Development

2.1.1 Brand Page Commitment and Purchasing Intention

Lim, Ching, & Weaver (2012), discover that social media sites have a significant influence to consumer depending on the individual had a positive or negative reaction to a company's social networks site. For individuals with positive experience, they will be pleased with the brand and on the contrary, when a consumer had negative site experience reported a negative reaction to the firm's brand. A customer's brand page commitment or customer involvement with the brand page refers to their participation motivated by their needs, values, or interests and brand familiarity (Huang, Chou, & Lin, 2010). Bosnjak et al. (2007) identified a significant indicator of online purchase intention is affective involvement.

H 1: *Brand page commitment will significantly affect traveler's visiting intention.*

2.1.2 Annoyance and Purchasing Intention

Intrusiveness or annoyance of consumers associated with irritation perceptions when advertisements disturbed their goal-oriented behaviors (Taylor, Lewin & Strutton, 2011). As an example, majority brand pages are not being used in a right way, where most of it is used for advertising purposes on product information rather than engaging directly with their consumers (Shareef, Mukerji, Dwivedi, Rana, Islam, 2019). Online platforms have possibilities of similar negative effects like traditional advertising due to intrusiveness which reduce the advertising effectiveness and makes consumers annoyed with the brand (McCoy, Everard, Polak & Galletta 2007).

H 2: *Annoyance will significantly affect traveler's visiting intention.*

2.1.3 Brand Awareness and Purchase Intention

Edelman (2010) believes that the relationships created in a social environment is a contributing factor in the purchase decision. When a product or service has an established brand, the probability of consumer purchasing intention will increase (Chi, Yeh, & Tsai, 2011). According to Shahid, Hussain & Zafar (2017), a customers' decision making on a product is affected by brand awareness. When a buyer decides to purchase something, he or she will think of a brand that could possibly fulfill their wants. If a customer is well-informed about the brand, the customer will have more purchasing possibilities and have better economic decisions.

H 3: *Brand awareness will significantly affect traveler's visiting intention.*

2.1.4 Word-Of-Mouth and Purchasing Intention

A customer's purchase intention usually hinges on various factors like customer's product interest, forced social pressure from others and general perception of what they will receive. In the current technology era, customers have more exposure and could share their purchase information with others which influence on a brand purchase decision (Vahdati, & Mousavi, 2016). Electronic word of mouth can be found in online consumer reviews and social networks which help to determine the purchase intention of the products or services mentioned has been acknowledged by consumers (Fan & Miao, 2012). According to Hutter, et.al. (2013), WOM includes both positive and negative information of the brand to others. Hence, businesses need to make sure that every customer have a positive experience in order to generate positive word-of-mouth that will eventually affect the purchasing intention of potential consumers. Therefore, following hypothesis was generated:

H 4: *Word-of-mouth activities will significantly affect traveler's visiting intention.*

2.2 Research Framework Model

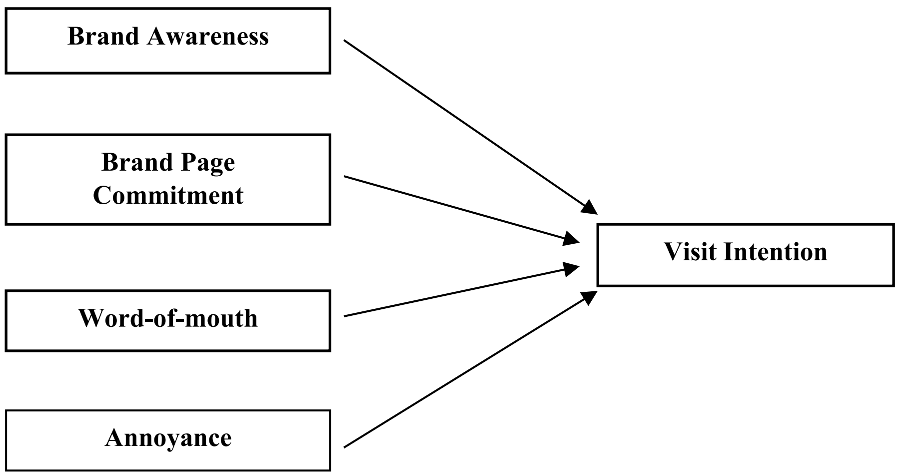

Fig. 1: Research framework for the traveler's visiting intention on Kongkong Tourism Facebook

3.0 RESEARCH METHODOLOGY

The sampling of this research uses one of non-probability sampling methods which is convenience sampling as the questionnaires can be answered by Facebook users who visits Kongkong Tourism Facebook page and evaluate their visiting intention through the provided questionnaire. The questionnaire distributed through social media using Google Form to the respondents. The reason convenience sampling is suitable for this survey as it needs the opinion or perception of consumer from the Facebook content in tourism aspects and how would it affect their visiting intention to the destination. This questionnaire asks general question to the respondents and not specified only for Kongkong Ecotourism followers or previous visitors. This research uses multivariate data analysis by Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018) where most of research will have 100 samples overall. The questionnaire distributed to 100 Facebook users that visits Kongkong Ecotourism Facebook page and evaluate it through answering the questionnaire consisting seven sections on demographic, Facebook usage frequency, brand page commitment, brand awareness, annoyance and visiting intention (purchasing intention).

4.0 DATA ANALYSIS AND FINDINGS

4.1 Normality Analysis

Garson (2012) states that a normally distributed data range is in a range of 2 and -2 for skewness and kurtosis. Table 4.2 indicates result of skewness and kurtosis for brand page commitment, brand awareness, word of mouth, annoyance and customers' visiting intention. The variables result shown in Table 4.2 are acceptable as it is in range between 2 and -2. Therefore, this research data is normally distributed.

TABLE 4.2: Normality Analysis

Variables	Items	N	Skewness	Kurtosis
Brand Page Commitment	BPC1	108	-0.372	-0.170
	BPC2	108	0.045	-0.723
	BPC3	108	-0.175	-0.798
Word of Mouth	WOM1	108	-0.661	0.115
	WOM2	108	-0.434	-0.488
	WOM3	108	-0.469	-0.203
Brand Awareness	BA1	108	-0.448	-0.037
	BA2	108	-0.451	0.320
	BA3	108	-0.545	0.244
Annoyance	A1	108	-0.329	-0.680
	A2	108	-0.473	-0.462
	A3	108	-0.276	-0.600
Visiting Intention	V1	108	-0.649	0.199
	V2	108	-0.526	-0.027
	V3	108	-0.696	0.272

4.2 Multiple Regression Analysis

Table 4.3 shows the multiple regression analysis. The dependent variable's percentage of variation indicated by R Square with the value of 0.803. Based on the value of r, 80.3% of the variation exists in traveler's visiting intention are well-explained by the independent variables mentioned in this study which are brand page commitment, brand awareness, annoyance and word of mouth. On the other hand, another 19.7% were influenced by other factors that are not in this research.

Table 4.4 which is ANOVA shows value of $F(4,108) = 104.729$ with a p-value of 0.000 less than $\alpha = 0.001$, which means at least one of the 4 independent has a significant influence on traveler's visiting intention.

Table 4.5 shows the coefficient result and only two out of four independent variables are significant to visiting intention which are word of mouth and brand awareness. However, brand page commitment and annoyance are not significant to visiting intention.

TABLE 4.4: ANOVA

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.896a	0.803	0.795	0.60615

TABLE 4.3: Model Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	153.917	4	38.479	104.729	.000
	Residual	37.844	103	0.367		
	Total	191.761	107			

TABLE 4.5: Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.569	0.279		2.039	0.044
	BrandPageCommitment	0.059	0.063	0.068	0.942	0.348
	WordOfMouth	0.582	0.068	0.625	8.618	0.000
	BrandAwareness	0.270	0.083	0.259	3.262	0.001
	Annoyance	0.010	0.040	0.011	0.242	0.809

4.3 Hypothesis Testing

The hypothesis collected from this study is shown in the hypothesis testing table below. This concludes that brand awareness and word of mouth has a significant influence on traveler's visiting intention through Kongkong Ecotourism Facebook page. Meanwhile brand page commitment and annoyance have insignificant influence on traveler's visiting intention through Kongkong Ecotourism Facebook page as it is not supported.

TABLE 4.6: Hypothesis Testing

Research Hypothesis	Results
To explore the effect of brand page commitment of Kongkong Ecotourism Facebook on traveler's visiting intention.	Not Supported
To explore the effect of brand awareness of Kongkong Ecotourism Facebook on traveler's visiting intention.	Supported
To explore the effect of word-of-mouth of Kongkong Ecotourism Facebook on traveler's visiting intention.	Supported

To explore the effect of annoyance of Kongkong Ecotourism Facebook page on traveler's visiting intention.	Not Supported

5.0 DISCUSSION AND CONCLUSION

The researcher has run few data analysis for this study which are descriptive analysis to know the respondents' demographic characteristics, normality test to examine the data distribution and accepted as it is normally distributed within range between 2 and -2. Lastly, multiple regression analysis conducted to identify the significant effect between variables which shows that two variables are supported while another two variables are not supported. This study examines Kongkong Ecotourism Facebook page's visitor travelling intention through the influence of brand page commitment, brand awareness, word of mouth and annoyance. The researcher discovered that brand awareness and word of mouth have positive influence on Kongkong Ecotourism visitors' travelling intention while annoyance and brand page commitment have negative influence to the visitor's travelling intention. In conclusion, Kongkong Ecotourism Facebook page may refer to this study for future improvement through clear data analysis collected.

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FACTORS INFLUENCING CUSTOMER SATISFACTION: CASE STUDY OF BAMBOO HUT ENTERPRISE

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ABSTRACT

In this era, customer satisfaction is essential to a company because this links to the company's profit and reputation, especially in a company that needs to interact with the customers, such as in the printing industry. Correspondingly, this research is conducted at Bamboo Hut Enterprise and examines whether customer satisfaction will be influenced by price, product quality, and service quality. The quantitative sampling method is used with a medium sample size of 108 respondents through purposive sampling. Sources of primary data that have been obtained from the questionnaire are administered to the customer of Bamboo Hut Enterprise. Data analysis is performed with multiple regression by using SPSS (Statistical Product and Service Solution) version 23. The result showed that price, product quality and service quality significantly influence the customers' overall satisfaction. Therefore, these variables are the company's need to improve customer satisfaction.

Keywords: Price, Product Quality, Service Quality and Customer Satisfaction

1.0 INTRODUCTION

It is easy to abandon the medium favouring social media and other online media in today's digital world. However, the fact is that the company plays a vital role in integrated communication, although in recent years, the printing industry has been fraught with the intensification of digital trends, while the typical printing company model has experienced a decline in workload, which has posed some challenges to the printing industry (Charoensopa, Mungaomklang, & Chotithamaporn, 2020).

Nevertheless, printing continues to be alive and well, perhaps more critical and influential than ever before. Consumers are now surrounded by advertising, email, and online content, so much so that it is hard to achieve the right audience. This can be why the printing industry has refused to disappear for many years. Dornan (2020) indicated that junk contains a 37% higher response rate than email marketing, and surprisingly children trust printed content over digital content. Research shows that everyone, including millennials, trusts print over other social media; they trust print materials over digital content. It is seen in printed newspapers, letters from banks, and printed advertising books. The study found that paper material was more credible than Facebook, Instagram, and WhatsApp. Nearly all 52.3% of female respondents and 47.7% of male respondents had received fake news on social media platforms, such as Facebook and Instagram (79.7%). These were followed by messaging apps such as WhatsApp (67%); 43% received fake news on video-sharing platforms such as YouTube, while 23.1% received fake news on mainstream media such as television and the newspapers. From this survey, we can see that paper materials receive a rock-bottom percentage of fake news. Therefore, the printing industry remains needed during this digital age because it is trustworthy (UCSI, 2019).

By 2020, the world commercial printing market will reach the US $411.99 billion. By the beginning of 2026, it is expected to be worth US $472.35 billion, with a CAGR of about 2.24% from 2021 to 2026. Within five years, the printing market is predicted to indicate significant growth. Advanced printing technology features a distant future and can commence a wave of innovative media and communication beyond imagination. While print employment is tiny, it is expected to expand because of privacy concerns and the over-saturation of digital platforms. The market is predicted to recover and grow at a CAGR of three from 2021 to succeed in $317 billion by 2023 (Wood, June 15, 2020). All this implies that the printing industry is predicted to grow; this can be because there is still a necessity for printing. Some people want to print books or read materials to focus on reading. Some may not have a printer reception; one might have to travel to a printing shop if needed to print a document. To some, visiting a workshop is less complicated and cheaper than buying printers and ink. Some people have a printer but do not have photocopying capability. Thus a visit to a printing shop is still warranted. The printing shop also provides binding and laminating services, which are difficult to attempt on one own due to the shortage of apparatus.

Besides that, in Malaysia, packaging and label printing is booming thanks to the high demand for medical products, especially face masks and rubber gloves. The 2019 coronavirus pandemic has created a replacement for what is considered a 'norm' lifestyle, with people preferring to order or remove food reception under a "Movement Control Order"; this has increased the demand for food packaging. Therefore, this creates a decent opportunity for ordering goods online, hence the opportunity for printing services (Chan, 2020). However, this also shows that there are more challenges. However, printing remains an industry that will grow; the printing industry has to change its traditional model of printing and photocopy into a digitalised or updated machine and photocopy machine. The printing industry can also provide delivery service, receive online orders, and add to their line by doing 3D printing, textual printing, or packaging and label printing.

1.1 Research Objective

This study listed three main objectives:

i. To examine the influence of price on customer satisfaction.
ii. To examine the influence of product quality on customer satisfaction.
iii. To examine the influence of service quality on customer satisfaction.

2.0 DATA ANALYSIS PLAN

The researcher checks the reliability and validity of the questionnaire through a pilot test. The pilot test was carried out before distributing the real questionnaire. 30 respondents had been chosen to fill up the questionnaire. Cronbach Alpha was calculated. As the scores were more between 0.7 to 0.832, the variables were considered reliable and consistent.

The results and analysis of 124 responses were collected for the study. This study discusses demography, normal test, preliminary test, multicollinearity analysis, and multiple regression analysis.

2.1 Profile of Respondents

Background information on respondents included gender, race, age, and income level. This study consists of 52 females (42%) and 72 males (58%). The race consists of 41 Malay (33%), 61 Chinese (49%), and 22 India (18%). The age has 50 people 10-20 years old (40%), 19 people 21-30 years old (15%), 33 people 31-40 years old (27%), 17 people 41-50 years old (14%) and 5 people are 51 year old and above (4%). The income level has 71 people are below RM4850 (57%), 48 people had RM4851 until RM10970 (39%) and 5 has above RM10971 (4%).

2.2 Preliminary Testing: Compliance with Regression Assumptions

In order to satisfy the assumptions of multiple regression analysis, preliminary tests are performed. These assumptions are normally distributed data without extreme values (contours) and multicollinearity problems (Steve, 2017).

2.2.1 Normality Test

Garson (2012) believes skewness and kurtosis must be between 2 and -2. Table 4.1 gives the skewness and kurtosis results. The acceptable range for all variables is 2 and -2. Since then, the data in this study are normally distributed.

TABLE 2.1: Results of Skewness and Kurtosis

Variables	Items	N	Skewness	Kurtosis
Price	p1	124	0.192	-0.941
	p2	124	-0.01	-1.154
	p3	124	-0.062	-1.333
	p4	124	-0.373	-0.843
	p5	124	0.266	-0.817
	p6	124	0.038	-0.78
Product Quality	Pq1	124	0.404	-0.95
	pq2	124	0.368	-1.134
	pq3	124	0.416	-0.641
	pq4	124	-0.136	-0.942
	pq5	124	0.101	-1.228
Service Quality	sq1	124	-0.028	-0.97
	sq2	124	0.441	-0.48
	sq3	124	0.99	0.632
	sq4	124	0.29	-1.039
	sq5	124	0.209	-0.562
	sq6	124	0.574	-0.705
	sq7	124	-0.062	0.668
Customer Satisfaction	cs1	124	0.55	-0.179
	cs2	124	-0.049	-1.157
	cs3	124	0.612	-0.847
	cs4	124	0.237	-0.443
	cs5	124	0.633	-0.498
	cs6	124	-0.216	-1.017

2.2.2 Univariable and Multivariable Analysis

After the normality test, the univariate outliner and Mahalanobis values were determined by the standardised Z-score to see the existence of the multivariable outliner and the intense value of the 2 tests (outliner). The results of standardising z-score values show that no value exceeds +4 to -4(no additional output because of size constraints). Therefore, these values do not have extreme values (Coakes & Steed, 2003). The utmost Mahalanobis of the three variables utilised in this study must not exceed 16.266 (Hair et al., 2007; Tabachnik & Fidell, 2007). Therefore, there is no outlier because the most value of Maanalobis is a smaller amount than 16.266 as in Table 2.2. Regardless of whether it is univariate or multivariate, conclusions are drawn without taking extreme values, and the isometric hypothesis is satisfied.

TABLE 2.2: Results of Mahalanobis, D^2

	Minimum	Maximum	Mean	Std. Deviation	N

Mahal. Distance	0.136	16.02	2.976	3.161	124

2.3 Preliminary Testing: Compliance with Regression Assumptions

2.3.1 Multicollinearity Analysis

The hypothetical model uses colinear analysis to check tolerance and variance inflation factor (VIF) values. If the worth of tolerance is larger than 0.2 (Grason,2012), where VIF is a smaller amount than 10 (Pallant,2015), significance is assumed. The subsequent results in Table 2.3 show that price, product quality, and repair quality contribute significantly to the variable quantity of customer satisfaction. So H1, H2, H3 are accepted. H1, H2, and H3 are statistically obsessed with customer satisfaction.

TABLE 2.3: Multicollinearity Analysis

Model		**Tolerance**	**VIF**
	Price		
	Product Quality	0.586	1.707
	Service Quality	0.541	1.849
		0.375	2.668
a. Dependent Variable: customer satisfaction			

2.3.2 Multiple Regression Analysis

As shown in Table 2.4, customer satisfaction after the adjustment is 0.671%, indicating that 61.7% of customer satisfaction will be significantly explained by price, product quality, and repair quality. The ANOVA table showed that F (3,124) =81.554, the many effect value was but 0.05 (P =0.000) and no over α (0.001). Therefore, it is concluded that a minimum of one in all the three variables features a significant impact on the variable customer satisfaction, as shown in Table 2.5.

In Table 2.6, the output of the coefficients shows that hypotheses 1, 2, and 3 show that price, product quality, and repair quality positively affect customer satisfaction of bamboo house enterprises. As seen from the table, price, product quality and repair quality have a big direct correlation with customer satisfaction, which are P =0 (P <0.01), P =0.022 (P <0.05) and P =0.112 (P <0.1), respectively. The standardised beta values of product quality and repair quality are positive (0.718,0.199), respectively, while the standardised beta values of price are negative (-0.11). Consistent with Cohen (1988), a positive beta value indicates that both variables positively impact customer satisfaction, while a negative beta value indicates that variable 'price' incorporates a negative impact on customer satisfaction. Therefore, H1, H2, and H3 are supported during this study.

TABLE 2.4: Model Summary of Multiple Regression Analysis

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.819a	0.671	0.663	0.43001
a. Predictors: (Constant), service, price, product				
b. Dependent Variable: Customer Satisfaction				

TABLE 2.5: ANOVA

Model	F	Sig
1	81.554	.000b
a. Predictors: (Constant), service, price, product		
b. Dependent Variable: Customer Satisfaction		

Table 2.6: Results of Multiple Regression Analysis

Model		Standardized Coefficients			
		Beta	t	Sig.	p-value
1	(Constant)		6.137	0	
	Price	-0.11	-1.602	0.112	<0.1*
	Product Quality	0.718	10.082	0	<0.01***
	Service Quality	0.199	2.326	0.022	<0.05**
a Dependent Variable: Customer Satisfaction					

2.4 Summary of Hypothesis

As shown in Table 2.7, three hypotheses are proposed in this study. This means that price, product quality, and service quality positively affect customer satisfaction.

TABLE 2.7 Summary of Hypothesis Testing

Hypothesis Testing	
H 1: Price has a negative and significant influence on customer satisfaction.	Supported
H 2: Product quality has a positive and significant influence on customer satisfaction.	Supported
H 3: Service quality has a positive and significant influence on customer satisfaction.	Supported

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FACTORS INFLUENCING CUSTOMER SATISFACTION AT DAILY HAPPY OTAK OTAK

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ABSTRACT

In the food industry, the relationship between four independent variables (quality of food, quality of service, quality of setting, price and value) and overall customer satisfaction is close. Overall, customers satisfaction is important for a company because of this link to customer loyalty towards the company and also the company's sales and reputation. Therefore, many companies pay attention to customer satisfaction and find ways to solve the problem of dissatisfaction and manage customer satisfaction for building reputation and positive world-of-mouth. The research objective is to examine the influence of independent variables on customers' overall satisfaction. Thus, Daily Happy Otak Otak can know customer satisfaction towards their company to improve their weakness and plan for the future. This study uses questionnaires by distributing questionnaires to Daily Happy Otak Otak. The sampling method used in this study was quantitative, and the sample size is 137 respondents based on purposive sampling. The result showed that food quality, service, price, and value significantly influence customers' overall satisfaction. Therefore, these variables are the company's need to focus and improve to increase customer satisfaction.

Keywords: Price and Value, Quality of Food, Quality of Service, Quality of Setting and Customer Satisfaction

1.0 INTRODUCTION

Food plays an important role in our lives, which is why the methods of growing, processing and transporting it are valued to us to understand it and try to improve it. The food industry consists of compound activities related to the availability, consumption, and catering of food and services worldwide.

Today's food industry has become highly competitive and quite growing rapidly. In the global market, Malagie et al., (1998) stated that world food exports totalled 290 billion U.S. dollars in 1989, 30% over 1981. Countries with industrialised market economies account for 67% of exports. There has been substantial growth because of increased demand for food and drinks. This also means that the world's food production will continue to increase. The rapid development of technology in the food industry is partly driven by population pressure, uneven distribution of agricultural resources, and the need to keep food fresh for better distribution. Rapid economic development and enormous marketing pressure allow the industry to continuously deliver new, different and attractive products. In order for the population's needs to be met, the industry not only needs to produce enough food to satisfy the huge population, but it also needs to adhere to strict hygiene controls, in this way to ensure and maintain the quality required for community health.

Because of the huge number of similar products and competitors in the food market, consumers' preferences and satisfaction significantly influence the food industry and food companies. Therefore, this study is aimed to research customer satisfaction towards the company so that it can help the company understand their customer satisfaction and give them a chance to improve it.

1.1 Research Objective

This study listed four main objectives:

i. To examine the influence of quality of food on customers' overall satisfaction.
ii. To examine the influence of quality of service on customers' overall satisfaction.
iii. To examine the influence of quality of setting on customers' overall satisfaction.
iv. To examine the influence of price and value on customers' overall satisfaction.

2.0 DATA ANALYSIS PLAN

This study has collected 137 respondents. It exceeds the number required of Cohen Table, 118 respondents. The result and analyses about demographic, normality test, univariable and multivariable analysis, multicollinearity analysis, and multiple regression analysis were stated in this chapter. Besides, the reliability test was used in a pilot study that collected 30 respondents and Cronbach's Alpha of all variables exceed 0.7 so that all variables accepted in this study.

2.1 Profile of Respondents

The information of respondents such as gender, race, age, the average number of visits to Daily Happy Otak Otak, and once average expenditure in Daily Happy Otak Otak are shown in Table 2.1.

TABLE 2.1: Demographic

Profile of Respondents	Frequency	Percent (%)
Gender		
Female	93	67.9
Male	44	32.1
Race		
Malay	3	2.2
Chinese	133	97.1
Indian	1	0.7
Age		
Under 20 years old	12	8.8
21 - 30 years old	47	34.3
31- 40 years old	23	16.8
41 - 50 years old	21	15.3
51 years old and above	34	24.8
Average Number of Visits to Daily Happy Otak Otak		
Once/three months	47	34.3
Once/month	66	48.2
Once/week	20	14.6
Twice/week	4	2.9
Once Average Expenditure in Daily Happy Otak Otak		
Less than RM20	22	16.1

RM21 - RM30	45	32.8
RM31 - RM40	31	22.6
RM41 - RM50	18	13.1
More than RM50	21	15.3

2.2 Normality Test

In the normality test, skewness and kurtosis were shown that all variables in this study were normally distributed. This is because the result of data is between 2 and -2 (Garson, 2012), that shown in Table 2.2.

TABLE 2.2: Normality Test

Variables	Items	N	Skewness	Kurtosis
Quality of Food	QF1	137	-0.929	1.897
	QF2	137	-0.324	-1.361
	QF3	137	-0.376	-1.346
	QF4	137	-0.665	-0.906
Quality of Service	QS1	137	0.201	-1.298
	QS2	137	-0.202	-1.101
	QS3	137	-0.311	-0.937
	QS4	137	-0.261	-1.227
Quality of Setting	QFS1	137	-0.531	-0.906
	QFS2	137	-0.445	-0.92
	QFS3	137	-0.203	-1.079
	QFS4	137	-0.52	-0.338
Price and Value	PV1	137	-0.976	0.551
	PV2	137	-0.896	1.023
	PV3	137	-1.052	1.164
Customers' Overall Satisfaction	OS1	137	-0.335	-0.848
	OS2	137	0.073	-1.311
	OS3	137	0.04	-1.416
	OS4	137	-0.649	-0.994
	OS5	137	-0.476	-1.204

2.3 Univariable and Multivariable Analysis

After doing the normality test, the univariate outlier and multivariate outlier were be tested in this study. The standardised z score value needs between 4 and -4 to prove there is no univariate outlier in this study (Coakes & Steed, 2003; Hair et al., 2010). In this study, there have been no values exceeding 4 and -4. After this, the multivariate outlier is tested to make sure the maximum value of Mahalanobis Distance (D2) that showed in

Table 4.4 is less than the 18.467 (four variables) (Hair et al., 2010). This result proves there was no extreme value in this study. Therefore, univariate outlier and multivariate outlier were tested, and the result showed no extreme values in this study.

TABLE 2.3: Mahalanobis Distance (D2)

Mahal. Distance	Minimum	Maximum	Mean	Std. Deviation	N
	0.321	13.326	3.971	2.814	137

2.4 Multicollinearity Analysis

In multicollinearity, two or more predictors of multiple regression models must be highly correlated. According to Garson (2012), the applicable rules of the tolerance value should be greater than 0.2 and based on the findings of Pallant (2015), the value of VIF should be less than 10. Thus, there are no multicollinearity problems in this study because Table 4.5 showed the value of tolerance of all variables exceeded 0.2, and the value of VIF is below 10.

TABLE 2.4: Multicollinearity Analysis

Collinearity Statistics			
Model		**Tolerance**	**VIF**
	Quality of Food	0.602	1.661
	Quality of Service	0.305	3.275
	Quality of Setting	0.333	3.005
	Price and Value	0.745	1.342
a Dependent Variable: Customers' Overall Satisfaction		>0.2	<10

2.5 Multiple Regression Analysis

Table 4.6 shows that the value of R2 square was 0.478 in the multiple regression analysis. This means 47.8% of the variation in customers' overall satisfaction can be explained by the quality of food, service, setting, price, and value. The ANOVA table implies value F (4, 137) = 30.255, the significant influence value was below 0.05 (ρ=0.000). Therefore, it is not greater than α (0.001). The result of Table 4.7 proves this study's variable has a significant effect on the dependent variable that named customers' overall satisfaction.

The output of coefficients that showed in Table 4.8 indicated H1, H2, and H4 resulted that quality of food, quality of service, price and value positively influence customers' overall satisfaction towards Daily Happy Otak Otak. At the same time, Hypothesis 3 stated that the quality of setting was not positively influenced customers' overall satisfaction towards Daily Happy Otak Otak. Based on the table, quality of food, quality of service, price and value were positively significant to customers' overall satisfaction towards Daily Happy Otak Otak, which were p=0 (p<0.001), p=0.007 (p<0.05), p=0.007 (p<0.05). The standardised beta values for the three variables were positive (β=0.429, β=0.314, β=2.735), supporting Hypothesis 1, Hypothesis 2, and Hypothesis 4. Furthermore, Hypothesis 3 predicts that quality of setting cannot significantly affect customers' overall satisfaction with Daily Happy Otak Otak, and the ρ values are bigger than 0.05, which were (ρ=0.255). The standardised betas for quality of setting (β= -0.125). The beta value of the quality of the setting (β=-0.125) was negative, indicating that the quality of the setting was high, the customers' overall satisfaction with Daily Happy Otak Otak was also low or not respond. This means that the quality of the setting cannot significantly affect overall customers' overall satisfaction. After that, H3 cannot be accepted in this study.

TABLE 2.5: Model Summary of Multiple Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.692a	0.478	0.462	0.60477
a Predictors: (Constant), PV_AVG, QS_AVG, QF_AVG, QFS_AVG				

TABLE 2.6: ANOVA

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.263	4	11.066	30.255	.000b
	Residual	48.279	132	0.366		
	Total	92.541	136			
a Dependent Variable: OS_AVG						
b Predictors: (Constant), PV_AVG, QS_AVG, QF_AVG, QFS_AVG						

TABLE 2.7: Results of Multiple Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.15	0.342		-0.437	0.663
	Quality of Food	0.49	0.093	0.429	5.291	0
	Quality of Service	0.298	0.108	0.314	2.756	0.007
	Quality of Setting	-0.123	0.108	0.125	-1.1	0.255

					4 4	
	Price and Value	0.227	0.0 83	0.199	2 . 7 3 5	0. 00 7

2.6 Summary of Hypothesis

As shown in Table 4.9, this study proposes four hypotheses. This means that quality of food, price and value, and quality of service were positively supported, while the quality of setting does not support this study to significantly influence customers' overall satisfaction with Daily Happy Otak Otak.

TABLE 2.8 Summary of Hypothesis Testing

Hypothesis Testing	
H1. Food quality has a significant positive influence on customers' overall satisfaction.	Supported
H2. Quality of service has a significant positive influence on customers' overall satisfaction.	Supported
H3. Quality of setting has a significant positive influence on customers' overall satisfaction.	Not supported
H4. Price and Value has a significant positive influence on customers' overall satisfaction.	Supported

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CONSUMER ENGAGEMENT BEHAVIOR TOWARDS SOCIAL MEDIA CONTENT FORMAT IN COSMETIC INDUSTRY

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ABSTRACT

The selection of social media content format and platform(s) is crucial parallel following the increasing usage of social media as a marketing tool for small business owners. Posts containing rich media format and are highly interactive were noted to enhance consumers' engagement behavior. Previous research relied heavily on the theoretical relationship between social media advertisement and consumers' engagement and thus has been unable to provide a rich explanation of content format that is viewed as fundamental characteristics in expecting active engagement behavior from consumers. This study assessed the effect of (i) social media platform and (ii) social media content format in terms of the vividness and interactivity towards users' corresponding engagement metrics including the number of likes, comments, shares, views, and retweets. This study employed descriptive content analysis to analyze the dataset collected within three months across Facebook, Instagram, and Twitter. This study's findings will contribute to a comprehensive understanding of social media content format and significantly benefit marketers or small business owners of skincare brands in selecting the most engaging social media platform and post format strategies.

Keywords: Beauty and wellness industry, Engagement behavior, Content format, Skincare, Social media

1.0 INTRODUCTION

Social media has been proliferating in the last few years. According to a survey conducted by Pew Research Center (2021) on 1,502 adults recently, it is reported that over 75 percent of U.S adults aged between 18 to 49 are using social media sites at least once, in which YouTube and Facebook appear as the most used online platforms widely followed by other social media namely Instagram, Pinterest, LinkedIn, Snapchat, Twitter, WhatsApp, and Reddit. According to the recent report, the increase in social media users in 2020 is its fastest rate during lockdown with 4.20 billion users (Kemp, 2021), more than half of the population. Meanwhile in Malaysia, approximately 86 percent of Malaysians were active social media users, unwaveringly increased from 62 percent in 2016, in which Facebook is the leading social media platform among all (Müller, 2021).

Considering social media massive growth among all age groups, brands have begun to adopt the use of social media in their organization to encourage consumers' engagement (Hallock et al., 2019) as according to Kumar and Pansari (2016), engagement is fundamental in maintaining the excellent relationship between organization and consumer. With the fear of failing to get the benefits that social media offers, Nick G (2021) stated that more than 50 million small businesses use social media to connect with consumers. Consequently, consumers' digital spending soared along with the rapid proliferation of social media content made to stimulate consumers' engagement behavior (Malthouse et al., 2016). Nonetheless, these marketing strategies will not be profitable unless brands comprehend how to deliver and distribute social media content to engage with their target audience efficiently across these platforms (Lee et al., 2018).

Pinpointing the beauty and wellness industry as a spotlight, Kopelman et al. (2021) state that social media have channeled a window of opportunity for aesthetic experts to excel in marketing through the actions of raising awareness on their products and services, identifying themselves and their practices, as well as building up their influence. Prior study has shown that social media usage enormously benefits the brand awareness and brand image of medical centers, consequently influencing consumers' trust (Ventola, 2014). For this reason, the format and direction of social media content carry to completion of consumer engagement as Vries et al. (2012) stated that posts with multisensory and interactive elements were more presumably to result in consumer's engagement. In the same manner, a previous study found that posts with photos tend to stimulate involvement from social media users (Kim et al., 2015).

That being the case, this study aims to gain a deeper understanding on the level of vividness and interactivity of social media content that contributes the most significant impact on consumers' social media engagement behavior as according to Shahbaznezhad et al. (2021), there is a limit in the apprehension of social media content for the reason that previous studies only stated the theoretical relationship between social media advertisement and consumer engagement, provided a limited explanation of social media engagement behavior, and only a few of them evaluated the relationship between the vividness of social media content and the social media platform in expecting consumers' engagement behavior. On top of that, Kaur and Kumar (2021) also noted that academic research on social media in the beauty and wellness industry is not as much as in other industries.

Health Sciences Authority (2020) defines cosmetic products as any natural or artificial ingredient or mixture intended to be applied on a human face, body, or teeth in order to clean, enhance, change, odorize or scent its users' appearances. It is categorized under several types; baby products, bath preparations, makeup preparations, fragrance preparations, hair coloring preparations, manicuring preparations, oral hygiene products, personal cleanliness, shaving preparations, skincare preparations, and suntan preparations (U.S Food and Drug Administration, 2020). Bring to a focus of skincare, it includes a large variety of products such as cleansers, moisturizers, face and neck creams or lotions, body and hand creams or lotions, as well as foot powders or sprays (Cosmetics Info, 2021). Today, people of all ages perceive physical beauty and wellbeing as a preponderance. The youth are not afraid to spend a massive amount of money in the beauty world with the aim to improve their appearances (Sai and Reddy, 2019). Consumers, particularly women, often pampered themselves with unique beauty products and services that boost their self-confidence in their appearances (Black, 2002; Kampani and Jhamb, 2021 as cited in Kaur & Kumar, 2021). Consequently, beauty and wellness services, which were perceived as tools to please individuals' satisfaction in yesteryears, have become essential in daily life (Tfaily, 2017).

Cosmetics industry is one of the outstanding industries in the global market. In the six categories under the global cosmetics industry, skincare arose among all equal to 36.4 percent of the global market in 2016 before it crumbled when the global cosmetics market declined by 8 percent compared to the year before (Sabanoglu, 2021). Nevertheless, the beauty and wellness industry has been growing steadily, and it has the potential to consistently flourish even through unconducive economic conditions (Lopaciuk and Loboda, 2013 as cited in Moslehpour et al., 2017). To give an instance throughout history, Moslehpour et al. (2017) stated that the beauty and wellness industry easily thrived again in 2011 even after being affected by the global economic crisis in 2008 up until 2009. A recent article reported that the beauty and wellness market has increased by 6.4 percent from \$3.7 trillion in 2017 to \$4.2 trillion, twice as fast compared to the growth of the global economy (Stasha, 2021). Meanwhile in Malaysia, skincare was the most significant sector under the cosmetics and toiletries industry, with sales of RM1.96 billion in 2019, and the industry is forecasted to hit a compounded annual growth rate (CAGR) of 2.8 percent from 2019 to 2024 (Global Data, 2020).

1.1 Background of Study

Malaysia's most favored skincare companies consist of Procter & Gamble, L'Oreal and Nu Skin with market shares of 12 percent, 10 percent, and 7 percent sequentially (Tan, 2021). Following an immense demand for skincare products, many local skincare brands instigate the initiative to compete with highly reviewed international skincare products. Among local skincare brands with a large customer base consist of Bougas Beauty, Kayman Beauty, JELITA.KL, Mimpikita, ZarZou Beauty, yello, SKINEATS, Alluskin, Daughters of Malaya, and Nature's Palette (Bakar, 2021). Addressing Nature's Palette as a foreground, Nature's Palette Resources is a local skincare brand founded in 2017 by Regina Chin and Alex Beh with cleanser and essence as their main products made up of four products in total. Intending to craft luxurious yet practical skincare products using the finest ingredients for their consumers, Nature's Palette currently has two partners and three part-time employees, with a consumer base of approximately 5000-6000 people and the age range between 18-35. Most of their customers are locals, but they do have international customers occasionally. The unique proposition value of Nature's Palette's products is its most refined ingredients, which are cruelty-free and fragrance-free.

Nature's Palette uses websites and social media platforms, including Facebook, Instagram, and Twitter to connect with their consumers and employ marketing activities generally since they do not have their bricks and mortar. With 310 followers on Nature's Palette's Facebook account, they keep their page simple with basic and essential information such as the link for their website page, frequently asked questions (i.e., products' price, business background, assistance, recommendation), and an empty box to type a question. Moving on to Instagram, Nature's Palette has 4,869 followers with 370 posts. Along with 3,147 followers and 6,070 tweets on Twitter, Nature's Palette is trying to build trust among its potential consumers by reposting 'stories' on Instagram and 'retweet' on Twitter regarding their consumers' positive reviews and feedback. Nature's Palette social media posts consist of informative rather than interactive content with a considerably balanced number of photos and videos. This situation eventually results in a lack of engagement on Nature's Palette's social media platforms as they scarcely execute push strategy. In other aspects, Nature's Palette also admits that they lack leads and conversions which can lead to purchase intention through their social media content.

1.2 Problem Statement

Social media platforms enable users to share media, update profiles, connect with people and join the community (Boyd and Ellison, 2007). In the context of business, social media provides brands with the advantages of advertising and forming positive connections with customers, which establishes brand communities and engages with customers (De Vries et al., 2012; Labrecque, 2014 as cited in Qin, 2020). Statista (2021) reported that the use of social media for marketing purposes could deliver the benefits of increased exposure, increased traffic, generated leads, developed loyal fans, improved sales, provided marketplace insights, and grew business partnerships. Previous studies by Juntunen et al. (2020) also cover the topics of social media content that stimulate engagement (i.e., in the forms of like, share, view, comment or retweet), whether social media content should be differentiated between business-to-business and business-to-consumer interactions, and what are the successful social media content strategies. Despite that, based on SWOT analysis, Nature's Palette's lack of interaction in social media causes the need for brand awareness among beauty and wellness markets.

In the context of Nature's Palette, considering its years in the industry and the numbers of its followers on social media accounts, their social media content has not brought positive outcomes from their consumer engagement behavior. It is because they practice informative content rather than keeping it interactive with their consumers as Eigenraam et al. (2021) stated that it is pivotal for stimulating consumers' online engagement and providing businesses with the importance of competitive, financial and positioning benefits. Consequently, it is crucial to consider interactive social engagement for social media advertisement since it could attract customers' responsiveness only if they are engaged in the media vehicle (Voorveld et al., 2018 as cited in Paramita et al., 2021). Not to mention, Nature's Palette also admits that they lack leads and conversion through their social media posts, unable to stimulate the consumer's purchase intention despite their consistent posting and luxurious image on social media.

Nowadays, the competition among local skincare brands is quite fierce. Research by Ishak et al. (2020) stated that the Malaysian local cosmetics and toiletries market's worth is now estimated at around RM3 billion, with a 13 percent annual growth rate on par with the blooming of home-grown beauty brands. Therefore, Nature's Palette needs to engage more with customers through their postings on social media, encouraging their followers to share content or feedback that can help spread word-of-mouth and build awareness (Lepkowska-White et al., 2019). User-generated content (UGC) also enables the collection of real-time data that deliver predictive and prescriptive models in order to help in faster and relevant decision making as well as forecast business outcomes (Sloan and Quan-Haase, 2017; Ho et al., 2020 as cited in Siti-Nabiha et al., 2021). These benefits mentioned above contribute to strengthening business competitiveness, though currently is not being practiced by Nature's Palette. Hence, this study will focus on the vividness and interactivity of social media content to see its effect on consumer engagement behavior by the number of likes, comments, shares, views and retweets.

1.3 Research Questions

This study lists three main research questions;
RQ1: How does the vividness of social media content affect consumers' social media engagement behavior?
RQ2: How does the interactivity of social media content affect consumers' social media engagement behavior?
RQ3: What type of social media platform most impacts consumers' social media engagement behavior?

1.4 Research Objectives

Based on the aforementioned statements, the following lists the specific objectives;
RO1: To determine the importance of social media vividness on consumer engagement behavior.
RO2: To investigate the importance of social media interactivity on consumer engagement behavior.
RO3: To examine the importance of social media platform selection on consumer engagement behavior.

1.5 Significance of Research

By analyzing the social media postings made by two local skincare brands in Malaysia, this research adds to the current understanding of the selection of social media platforms and content format in terms of vividness and interactivity. This study provides a clear comprehension of social media content format's role in encouraging customers' social media engagement behavior in the beauty and wellness industry. The findings of this study will directly benefit marketers or small business owners of skincare brands in selecting the most engaging social media platform and content strategies. Specifically, this study will help Nature's Palette in addressing their main problems referring to the (i) lack of consumers' engagement and (ii) lack of leads and conversions through their social media postings with the aim of developing consumers' social media engagement through the behavior of liking, commenting, sharing, viewing, and retweeting. Furthermore, a detailed presentation employing a descriptive content analysis method to evaluate social media postings involved in this research may guide further studies to employ an alternative methodology in the beauty and wellness industry. This study also helps future researchers comprehend critical areas in social media content that were insufficiently addressed by past researchers on the topic of social media vividness, social media interactivity, types of social media platforms, and consumer engagement behavior.

1.6 Scope of Study

With the increase in the number of social media users and its use in delivering beneficial insights, there has been a corresponding increase in the number of businesses using social media as a medium to connect with their customers. Whilst the contribution of social media in building up the engagement between businesses and customers have been well documented, the effect of social media content on customer engagement is mostly unknown (Shahbaznezhad et al., 2021). In view of these circumstances, this study examines the role of social media platforms and content format on consumers' social media engagement behavior. The scope of this study is limited to collecting the dataset from the postings made by the most followed Malaysian skincare brands and Nature's Palette on their social media platforms specifically Facebook, Instagram, and Twitter. The data collection period was three months, from August until October 2021. Nonetheless, this study will not cover social media content types (i.e., informational, entertainment, remuneration, and social) to provide consistent results focusing on social media content format specifically. Besides, this study also has limitations regarding the study period compared to prior research by Shahbaznezhad et al. (2021) and Aldous et al. (2019), which were done between 8-12 months. The scope of the study has placed a constraint on the time frame for data collection.

2.0 LITERATURE REVIEW

2.1 Social Media and Consumers' Engagement

Social media is explained by Kaur and Kumar (2021) as online technological tools which enable people on the internet to communicate and exchange information. The perks of social media have been immeasurable. Social media are interactive, which enliven casual and deep interaction (Saldanha et al., 2020), allowing communication between brands and consumers, encouraging consumers' involvement in content creation and value generation (Goh and Arenas, 2020), at which point enable brands to build long-term relational benefits. Consumers have grown accustomed to obtaining information through social media rather than visiting the brand's website or physical store (Li and Chang, 2016). Subsequently, this information has the potential to influence consumers' purchase decisions. (Wang et al., 2012). As social media has emerged with fast-paced growth, marketers, with its instinct to advance towards customers' choice, has made social media a channel to expand their business (Kaur and Kumar, 2021) as it acts as a low-cost platform to communicate, share the information, building up social networking and present brand portfolio (Genc and Oksuz, 2015). Given these numerous advantages, a large number of small business owners chose to begin their business journey on social media over broadcast, printing, and billboards (Ukpere et al., 2014).

In association with the benefits social media offers as a marketing channel, many studies stated that a positive behavioral intention is present (Akar and Mardikyan, 2014; Ramadari et al., 2014 as cited in Kaur and Kumar, 2021). Consumer engagement is different from consumer involvement or participation as it hones in on consumers' interactivity and experience with a brand (Brodie et al., 2013). Engagement between customers and brands on social media has gained explosive attention in the past few years due to its competence to influence customers' behavior (Schivinski et al., 2016). Based on the discussions of prior studies, engagement is important to create and maintain profound relationships between organizations and consumers (Kumar and Pansari, 2016; Hollebeek et al., 2014 as cited in Lima et al., 2019). In addition, a situation of the consumer becoming a follower of a brand's social media platform can escalate consumers' frequency of visit and profitability (Rishika et al., 2013) as well as it acts as a value-added to company be it directly through purchases or indirectly through social media which to be exact, through electronic word of mouth (eWOM) of a brand (Chevalier and Mayzlin, 2006; Dessart and Pitardi, 2019; Dessart et al., 2015 as cited in Schaefers et al., 2021).

Defined as customer's behavioral actions toward brand deriving from motivational drivers, beyond transactions (van Doorn et al., 2010 as cited in Munoz and Towner, 2021), customer engagement takes place through both transactional and nontransactional interactions with brands which results in emotional, cognitive, and behavioral states of activation (Kumar et al., 2010; Brodie et al., 2011 as cited in Vlachvei et al., 2021). Interactions made by brands that successfully pull off users' satisfaction and favorable emotions can develop further efforts toward engagement including the behavior of commenting, as a cognitive approach that results in a higher level of engagement (Vlachvei et al., 2021). Wang (2021) further explained that users comment to share their satisfaction, favorable emotions, passion, and wisdom for the community to see and be pleased by. Consumer engagement has been acknowledged as the variable of certain accomplishment outcomes (Xue et al., 2020). Munoz and Towner (2021) added that liking and commenting are critical key performance indicators for marketers since they signify if a post met particular marketing objectives and which content format actively engages with users.

2.2 Theoretical Background

Social media content format

The success of social media strategy is based on how the relationship between brands and customers was built (Sashi, 2012; Schaffer, 2013; Diffley and McCole, 2019 as cited in Kaur and Kumar, 2021), in which the selection of content plays a vital part (Lagrosen and Grunden, 2014; Voorveld et al., 2018 as cited in Kaur and Kumar, 2021). Delivering product information to consumers through social media content can increase brand awareness (Colicev et al., 2018). According to Deng et al. (2021), content as a post is what brands communicate meanwhile Juntunen et al. (2020) described the content as a distinctive form of elements presented on social media (i.e., text, voice recordings, photos or videos).

Post media is cited as the media channel that brands use to interact and is generally measured from the vividness and interactivity of brand posts in which vividness refers to the media richness of a brand post (Deng et al., 2021). The concept of media richness is established from an information processing theory that illustrates media usage and communication effectiveness (Cao et al., 2021). Hernández-Ortega et al. (2020) further explained vividness as the level to which a post encourages distinctive consumers' responses. According to Deng et al. (2021), vividness is categorized into four classes consisting of posts with pure text as no vividness, posts with photos or images as low vividness, posts with the event as medium vividness, and posts with videos as high vividness. Multiform types of media can create information and entertaining values and sensory for consumers in which the appearance or novelty from photos and video cannot be experienced from minimal phrases or textual information (Tan and Chen, 2021). Previous research noticed that vivid brand posts would likely lead to higher consumer engagement than non-vivid posts (Cvijikj and Michahelles, 2013; Khan et al., 2016; Kim et al., 2015 as cited in Deng et al., 2021).

Responsiveness is essential in communication between brands and consumers (Rafaeli, 1988 as cited in Kaye, 2021). That being the case, interactivity is defined as the degree to which more than one communication subjects engage with each other through the communication medium and information (Tan and Chen, 2021). Interactivity has been categorized into two-way interactive such as video call, two-way reactive such as liking another user's content, and one-way non-interactive such as merely browsing social media which conclude the types of communication in social media (Kaye, 2021). Prior scholars also categorize interactivity into four levels based on the type of interactive determinants consist of posts without interactive components as no interactivity, posts with a link to a website or voting options as low interactivity, posts with calls to acts or contests as medium interactivity, and posts with questions or quizzes as high interactivity even though the effects of post interactivity on consumer engagement were found to be inconsistent across several studies (Deng et al., 2021). Computer-mediated communication tools such as hyperlinks, chat rooms, or site maps provide more features to encourage a higher level of interactivity compared to any other mass media (Song and Zinkhan, 2008 as cited in Tan and Chen, 2021).

Social media platform

Kaur and Kumar (2021) stated that marketers need to choose the best social media to approach and engage with the target audience instead of excelling in every platform.

Facebook enables users to create a profile as an individual or organization and interact with other users by sharing their stories, interests, and desires. Hence, according to (Fuchs, 2014 as cited in Lima et al., 2019), this platform has transformed the way people communicate, socialize, learn and make decisions. Regarding this context, consumers' choice is influenced by recommendations and sharing of experiences in which business will have a novel approach to establish trust and credibility among consumers (Sabate et al., 2014). Another scholar stated that a business could publish specific marketing content on its fan page at which point, relationships with its consumer base can be formally established when consumers access the business' page and use the reaction button (i.e., like, love, laugh, amaze, sad or angry) to represent their emotions (Lima et al., 2019). However, studies report that only 1% of brand followers on Facebook engage with the brands, and the highest consumer engagement rate on an active Facebook brand page is merely 4.3% (eMarketer, 2015; Cambra-Fierro et al., 2019 as cited in Deng et al., 2021). Genc and Oksuz (2015) concluded that Facebook, which is known to be user-friendly and practical, seems to lose its ground to Instagram which is simpler to use and has Hashtags. Given its massive user community, more than 200 million small businesses have created their brand pages on Facebook and are using its tools (Facebook, 2021).

Instagram is one of the most popular social media platforms with roughly one billion active users, in which almost 33 percent of whom are between 25 and 34 years old, making it exceptionally attractive for marketers (Tankovska, 2021). Based on Statista (2021) statistics, Instagram was chosen as the second most important social media platform for marketers worldwide as of January 2021, with 22 percent following Facebook with 55 percent. Consumers, especially millennials, spend much time on Instagram and are more likely to be involved in purchasing activities directly through their phones (Nielsen Research, 2019 as cited in Argyris et al., 2020). Instagram allows users to express themselves through personal sharing and produce their content in photos and videos. Its several features help brands in reaching their target audience. The features consist of (1) bio section, which contains basic details regarding the brand, (2) linking the Instagram account with the other social media platform such as Facebook and Twitter to reach more audiences, (3) the usage of Hashtag to groups specific searches with its results in a short time, all together. Based on (Bahcecik et al., 2019), it is to ensure the brand's messages represent their identity and culture accurately and efficiently, apart from increasing their appeal through various campaigns.

Twitter was launched in 2006 and evolved to have an estimated more than 199 million active users as of the first quarter of 2021 (Tankovska, 2021). A tweet is any word with a maximum of 280 characteristics, and it may contain text, photos, GIFs, videos, or links. Hashtag functions to group tweets around particular topics and accelerates word searches (Swani et al., 2014). Users can engage with the content by liking, commenting, retweeting, or quoting retweets (Swani et al., 2013 as cited in Juntunen et al., 2020). According to Malhotra (2012), retweeting enables users to relay their own or another user's tweet, making that tweet reach more users while commenting engages users to have interpersonal communication with those who have initially tweeted. Juntunen et al. (2020) stated that these engagements are widely acknowledged to measure the prominence of social media content, and users could be influenced by the content of a tweet and how the other users have acted to it. Unlike other social networking services, Twitter is exceptional in its underlying forces, and users can follow any other user with a public profile, enabling them to interact with one another leading to the process of building relationships and creating influence (Arova et al., 2019 as cited in Watanabe et al., 2021).

2.3 Consumers' Social Media Engagement Behavior

According to Hallock et al. (2019), marketers need to create posts for engagement purposes ahead of evaluating the success of those posts among the steps to employ social media strategy. Acknowledgement of the content, page or brand can be recognized by the act of reacting to social media content (Swani and Labrecque, 2020). The effectiveness of engagement through social media can be measured by quantitative metrics such as the number of likes, comments, shares, views, or followers as indicators of audiences' engagement level (Voorveld et al., 2018). The crucial elements in engagement, as stated by Schaefers et al. (2021), are its repetitive manner, the incorporating resources (e.g., time and effort spent by consumers), and the interactivity happening among consumers within a particular channel (e.g., amount and range of activities acted out on a social media platform) as it is fundamental to focus on consumers' engagement occurring by use of social media platform in a brand-related context.

The 'liking' behaviour as engagement metrics implies consumers' acceptance or satisfaction toward social media content (Moran et al., 2020). Consumer comments when they have something to say in the social media community to deliver their feelings or opinions in which other users can access and see (Song et al., 2021). Meanwhile, users' sharing activity will result in the spreading of information that performs as electronic word-of-mouth (eWOM) (Fu et al., 2017). Moreover, nowadays, the features of 'repost' story on Instagram and 'retweet' another user's tweet on Twitter also represent the metric of sharing. According to Muñoz-Expósito et al. (2017) regarding a metric used to evaluate engagement in Twitter, the researcher noted that from a behavioral approach, users should be involved through interaction with the content to stimulate consumer engagement by following the approach provided by Kayser and Bierwisch (2016) of five main functionalities for users to interact on Twitter such as tweets, retweets, messages, hashtags, and follower relations.

Recognizing the significance of social media in stimulating consumers' engagement is essential since social media holds power to help brands evolve their users from passive consumers to active consumers by creating and sharing content with the other online users (Oh et al., 2016). The reason is that marketers need to recognize types of consumers that tend to actively engage with brands on social media platforms (Wallace et al., 2014) and their motivations to do so (Muntinga et al., as cited in Schivinski, 2021). For more profound understanding, consumers' social media engagement behavior can be distinguished with the category of 'active' or 'passive', as often stated in the previous studies in which the 'active' engagement consists of the behavior of liking, commenting, communicating with others, posting information and uploading photos in the meanwhile, 'passive' behavior was merely their time spent to browse and observe another user's content (Pagani et al., 2011; Shim et al., 2008; Wang et al., 2018; Yu, 2016 as cited in Kaye, 2021).

2.4 Conceptual Model

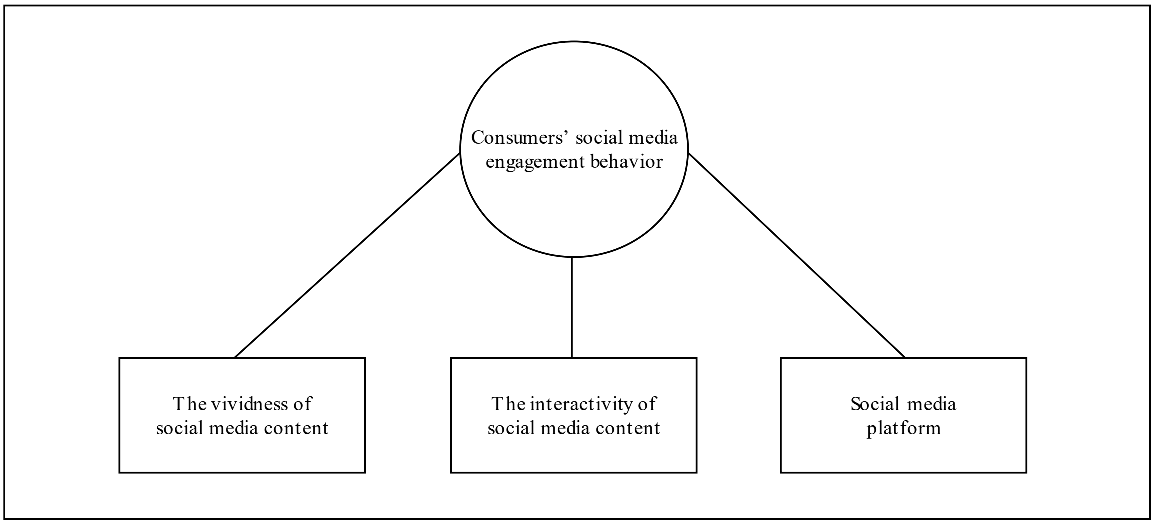

Fig. 1: Research conceptual model

Figure 1 shows the research model of this research. The model of the variables in Figure 1 was adopted from Shahbaznezhad et al. (2021), who highlighted the relationship between social media content format and social media platforms in impacting consumers’ social media engagement behavior.

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The research design of this study is a qualitative research design. Qualitative is defined as an act to analyze unstructured and non-numeric data (Thelwall and Nevill, 2021). For more profoundly, Aspers and Corte (2019) stated qualitative as an activity of getting more imminent to the case being studied in order to better understand the scientific community through significant heterogeneity, which results in a repetitive course of action. Based on Malhotra (2012), qualitative research is to understand the underlying motives and rationale. Developed from research objectives, the research questions require the researcher to comprehend the impact of social media content in the form of vividness and interactivity upon consumers’ social media engagement behavior which explains the grounds of employing qualitative research design, as Anaker et al. (2021) noted that qualitative studies provide a rich explanation of a specific phenomenon, particularly when not much is known about the topic. That being the case, this study used non-participant observation to understand the phenomenon of consumers' engagement without actively participating and staying separate from the activities being observed.

3.2 Population and Sample Selection

Population for this study includes all posts made by two local skincare brands; Nature's Palette as a brand subjected in this study, and a brand selected as a benchmark which is Bougas Beauty due to its total of 279 thousand followers on Instagram; 3,412 followers on Twitter; 41 thousand followers on Facebook, correspondingly. Sample for this study consists of posts collected from their social media platforms namely Facebook, Instagram and Twitter within three months, which are from the 1st of October 2021 until 31st of December 2021, including all posts made and the number of their corresponding engagement metrics of likes, comments, shares, views, and retweets.

The criterion of posts with any of these two elements will be excluded to ensure the accuracy of the result, assuming that the unrelated post is beyond the scope of this study. The two elements are as follows;

1. Post(s) unrelated to skincare products (i.e., makeup products, pouch, t-shirt).
2. Post(s) unrelated to the brand's marketing purposes (i.e., re-opening announcement, hiring announcement, top performer name list).

The unit of analysis in this study comprises the vividness and interactivity of the post's content. These objective measures were selected as a coding scheme in this study based on the discussion of social media content format that has been mentioned in a literature review.

3.3 Data Collection

To collect the data, all the posts that were made on the study period of three months will be analyzed and evaluated by the form of consumers' engagement behavior (i.e. likes, comments, shares, views, retweets) towards the level of vividness and interactivity on both Nature's Palette and Bougas Beauty social media platforms namely Facebook, Instagram and Twitter. This process generated six subsets of data (2 brands × 3 platforms), allowing a significant analysis of social media content and consumers' social media engagement behavior across several platforms.

The variables in this study will be subcategorized into (i) level of the vividness of social media content, (ii) level of the interactivity of social media content, and (iii) consumers' engagement behavior, based on the abovementioned illustration in the literature review. The data will be classified into numerous coding based on its feature(s) as follows;

TABLE 1: Level of the vividness of social media content

Level	Feature(s)	Coding
No vividness	Posts with pure text	1
Low vividness	Posts with photos or images	2
Medium vividness	Posts with the event	3
High vividness	Posts with videos	4

TABLE 2: Level of the interactivity of social media content

Level	Feature(s)	Coding
No interactivity	Posts without interactive components	1
Low interactivity	Posts with a link to a website or voting options	2
Medium interactivity	Posts with calls to acts or contests	3
High interactivity	Posts with questions or quizzes	4

Following aforementioned categories and subcategories, data will be collected from both Nature's Palette and Bougas Beauty social media platforms namely Facebook, Instagram and Twitter will be recorded as follows;

TABLE 3: Table for data collection

Post	Date	Vividness	Interactivity	Engagement behavior	
1				Number of like(s)	
				Number of comment(s)	
				Number of share(s)/view(s)/retweet(s)	
2				Number of like(s)	
				Number of comment(s)	
				Number of share(s)/view(s)/retweet(s)	
3				Number of like(s)	
				Number of comment(s)	
				Number of share(s)/view(s)/retweet(s)	

3.4 Data Analysis

Hence, this study will implement content analysis that best fits research questions. Referring to data analysis, content analysis is well-defined as "systematic coding of qualitative or quantitative data determined from specific themes or categories" (Cohen et al., 2007; Fraenkel et al., 2012 as cited in Dincer, 2018). Dincer (2018) further explained that content analysis could be employed in applied or theoretical studies, including coding and systematically classifying data obtained through observations. According to Krippendorff (2004), a content analysis should start by (1) making decisions on the research questions and objectives of the study; (2) selecting sample and population and determining selection criteria, as it plays a vital role in sample selection; (3) defining the categories of the content and variables before pre-testing ahead of checking the reliability and validity of the coding sheet and research design; (4) concluding report with the findings.

Based on research by Dincer (2018) that has grouped content analysis into three categories (i.e., meta-analysis, meta-synthesis, descriptive content analysis), this study will employ the approach of descriptive content analysis with the aims to understand the pattern(s) of a theme in frequencies or percentages to deliver an overall case, which invalidates detailed conclusions as it is most unlikely to decide the precise outcome. Descriptive content analysis is mainly used to determine tendencies that are carried out through descriptive statistics, specifically frequencies or percentages, at which point both qualitative and quantitative data may be used (Cohen et al., 2007; Dincer, 2018). To be more precise, descriptive content analysis is defined as the analysis through frequencies or percentages of prior studies or the collective narration of the researcher's findings regarding specific themes or criteria to determine tendencies (Sozbilir, 2014).

Adopting previous research by Al-Daihani and AlAwadhi (2015) in using descriptive statistical analysis and content analysis to collect data from Twitter, the procedures are as follow;

TABLE 4: Procedures of statistical analysis

Category	**Description**
Data collection	1. Collect data based on the features of the brand post in terms of the vividness and the interactivity of the content format that has been coded beforehand to be included in the sample. Data were collected from the brand's social media platforms including Facebook, Instagram, and Twitter.

Data analysis	2. Define categories of content format for data collection. Brand posts were reviewed based on the number of users' engagement metrics including likes, comments, shares, views and retweets. Certain posts were filtered and eliminated from the sample to ensure the accuracy of the result.
	3. The data collected were analyzed into frequencies and percentages to determine social media users' tendencies. The researcher then analyzed the brand posts with the highest users' engagement metrics, its features, and its contributing factors.

4.0 FINDINGS

4.1 Data Screening

This study presents an exploratory analysis of content format made by local skincare brands on Facebook, Instagram and Twitter. A total of 1,154 posts across three social media platforms from two skincare brands within three months were examined. The research methodologies adopted in this study are content analysis and descriptive statistical analysis.

To ensure the accuracy of this study's result, data screening is needed. After identifying the unrelated and irrelevant data to be excluded in the final sample, a total of 1,011 posts were gathered from the 1st of October 2021 until the 31st of December 2021. As mentioned previously, there were two types of posts; post(s) unrelated to skincare products and post(s) unrelated to the brand's marketing purposes to be discounted from the final sample. Table 3 below shows that 144 posts were excluded from the final sample as they failed to meet the study's criteria within the three months of data collection.

TABLE 5: Reason(s) and number of posts excluded

Social media platform	**Reason(s)**	**Amount of post(s) excluded**	
		Nature's Palette	Bougas Beauty
Facebook	Makeup products, re-opening announcement, evening event, top performer name list	0	132
Instagram	Re-opening announcement, evening event, top achiever name list	0	6
Twitter	No interactivity in its features of content	6	0
Total		144	

4.2 Content Analysis Result

The population of this study includes all posts made by Nature's Palette and Bougas Beauty on Facebook, Instagram and Twitter. Meanwhile, the sample of this study consists of posts made from the 1st of October 2021 until the 31st of December 2021, with a total of 1,011 posts included as the final sample for this study. Table 4.2 below shows the total number of posts collected within three months of data collection.

TABLE 6: Number of sample

Brand	**Social media platform**	**Number of posts posted by brand**	**Number of post(s) excluded**	**Number of post(s) selected**
Nature's Palette	Facebook	72	0	72
	Instagram	98	0	98
	Twitter	457	6	452
Bougas Beauty	Facebook	303	132	171
	Instagram	169	6	163

	Twitter	55	0	55
Total		1,154	144	1,011

Vividness of social media content on consumers' engagement behavior

To begin with, turning focus on the vividness of social media content that were coded on grounds of media richness theory that have been discussed in the literature review, posts with pure text were coded as '1' as no vividness in this study. Out of 1,011 posts, 14.44% (n=146) posts have been identified as having no vividness. This level of the vividness of social media content was found only on Twitter of both brands since the other social media platforms; Facebook and Instagram, commonly post their content with pictures or videos.

Posts with photos or images were coded as '2', representing a low level of the vividness of social media content. In this case, graphic interchange format (GIF), known as a type of image sequence, was also counted as photos or images instead of videos. GIFs were also mostly found on Twitter as a means for brands to convey emotions and feelings. This level of vividness took up 57.37% (n=580) from the final sample.

The coding '3' in vividness represents posts with the event held by brands. As examples taken from this study, the event that has been mentioned includes product launch, giveaway contest, sales promotion, and collaboration with other brands. In a case in which brands post photos or videos to promote the event, the researcher coded the post according to the highest level of vividness. For instance, a brand posts photos to promote the event, the researcher coded the post as '3'; posts with the event instead of '2'; posts with videos. The same goes when a brand posts videos to promote a certain event, the researcher coded the post as '4'; posts with videos instead of '3'; posts with the event to verify the accuracy and no discrepancies were identified. Hence, this explains why posts coded as medium vividness only made up 3.26% (n=33) of the final sample.

The highest level of vividness was coded as '4', which are posts with videos. On Facebook, there were several posts from the brand that consisted of Facebook live, which the researcher counted as videos. The same goes for reels and IGTV on Instagram that the researcher coded as videos as long as they were posted under the brand's Instagram feed. 24.93% (n=252) posts were coded as videos in this study. Figure 2 shows the percentage of the level of the vividness of social media content in this study.

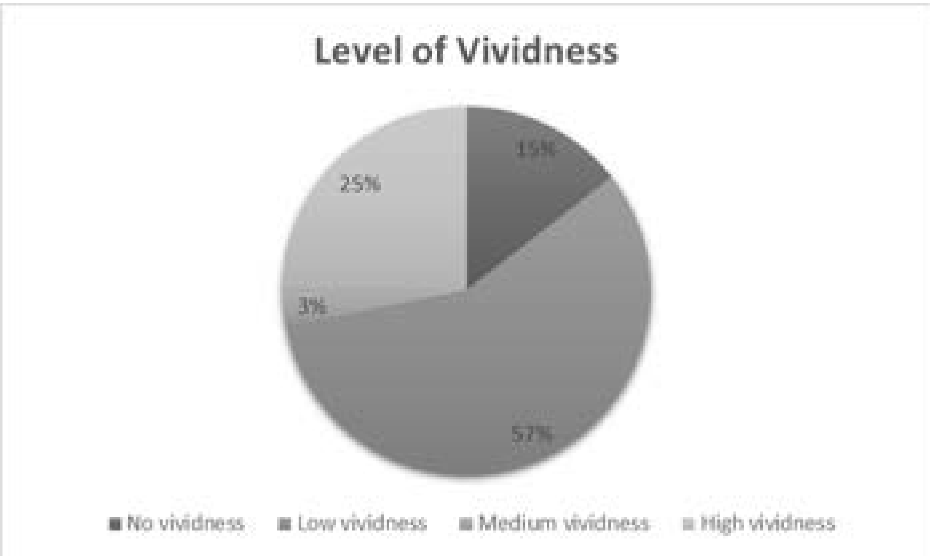

Fig. 2: Percentage of the level of vividness in this study

TABLE 7: Corresponding engagement metrics according to the level of vividness

Coding	Level of vividness	Corresponding engagement metrics		
			Frequency	Percentage (%)
1		Number of like(s)	401	0.51

	No vividness	Number of comment(s)	71	0.26
		Number of share(s)	0	0
		Number of view(s)	0	0
		Number of retweet(s)	419	22.39
2	Low vividness	Number of like(s)	36732	47.10
		Number of comment(s)	12068	44.87
		Number of share(s)	116	35.58
		Number of view(s)	0	0
		Number of retweet(s)	1202	64.24
3	Medium vividness	Number of like(s)	2071	2.66
		Number of comment(s)	871	3.24
		Number of share(s)	13	3.99
		Number of view(s)	0	0
		Number of retweet(s)	161	8.61
4	High vividness	Number of like(s)	18785	49.73
		Number of comment(s)	13887	51.63
		Number of share(s)	197	60.43
		Number of view(s)	690174	100.00
		Number of retweet(s)	89	4.76

In respect to RQ1 "How does the vividness of social media content affect consumers' social media engagement behavior?", posts with no vividness present 0.51% (n=401) of the total number of likes, 0.26% (n=71) of the total number of comments, 22.39% (n=419) of the total number of retweets, and no shares at all. Meanwhile, posts with low vividness were associated with 47.10% (n=36,732) of the total number of likes, 44.87% (n=12,068) of the total number of comments, 35.58% (n=116) of the total number of shares, and 64.24% (n=1,202) of the total number of retweets. On the other hand, posts with medium vividness, being the minority from the whole sample, still produce a slightly better result than posts with no vividness with 2.66% (n=2,071) of the total number of likes, 3.24% (n=871) of the total number of comments, 3.99% (n=13) of the total number of shares, and 8.61% (n=161) of the total number of retweets. Last of all, posts with high vividness are winning in every category of corresponding engagement metrics, except for the number of retweets with 49.73% (n=38,785) of the total number of likes, 51.63% (n=13,887) of the total number of comments, 60.43% (n= 197) of the total number of shares, a remarkably high number of views (n=690,174), and 4.76% (n=89) of the total number of retweets.

These results imply that the highest engagement metrics by its number of likes with 49.73% (n=18,785), number of comments with 51.63% (n=13,887), number of shares with 60.43% (n=197), and total views of 690,174 came from posts with a high vividness that was coded as '4' in this study. In the meantime, the highest number of retweets with 64.24% (n=1,202) were linked with posts with a low vividness that was coded as '2' in this study in which might be inclined to a relatively high gap between posts which were differentiated by the level of vividness that brands on Twitter posted.

According to the previous research by Moran et al. (2020), across all levels of media richness, brand posts that include rich media formats receive a higher level of interaction than brand posts that do not include rich media formats in which on this basis, according to media richness theory, scholars discover that rich media formats (e.g. video) that engage a greater number of senses are extremely effective at increasing consumer-brand engagement. Another study by Vazquez (2020) also noted that a moderate cognitive load positively influenced digital engagement in the context of high content vividness.

Interactivity of social media content on consumers' engagement behavior

Directing the focus on the context of interactivity of social media content, coding was categorized based on the types of interactive determinants that have been discussed in the literature review. Coding '1' was meant for posts without interactive components as no interactivity in this study. For this level of interactivity, the researcher identified the posts posted by the brand with pure text in which the characteristic of two-way communication was absent either in its content or caption as no interactivity at all. Out of 1,011 posts, 38.18% (n=386) were coded as having no interactivity in this study.

This study coded posts with a link to a website or voting options as '2'. In this circumstance, brands often attach a link to their website or an e-commerce platform (e.g., Shopee, Lazada, PG Mall) with the aim of generating clicking behavior (Moran et al., 2020). On Twitter, the 'mention' feature is a tweet containing another user's username using the '@' symbol, allowing users to connect effortlessly. This feature will direct users to another page that has been mentioned. The researcher included all posts with mention under the category of low interactivity with the coding of '2'. The researcher has found many voting options on the same social media platform that encourage users to interact with the brand. However, the posts described above are practically in the form of questions which made the researcher code these posts as '4'; posts with high interactivity instead. Thus, this level of interactivity took up 10.29% (n=104) from the final sample.

This study coded posts with calls to acts or contests as '3'. Calls to acts meant in which brand post content or caption that calls out user to prompt an immediate response including "Grab yours now!", "Do get yours!", "Go try now!" or "Message us for more information." Apart from these aforementioned statements, any contests held by the brand were also counted as medium interactivity in this study. 17.01% (n=172) posts were coded as medium interactivity in this study.

This study coded the highest level of interactivity as '4'. Elementally, posts with questions or quizzes are the best form to interact with social media users. In this context, questions such as "Have you applied your sunscreen today?", "What is your skincare routine?", "What is your favorite product made by us?" or "Can you guess our new ingredients formulated in your guys' favorite essence?". Despite that, having a question mark at the end of the caption does not necessarily signify a certain sentence as a question since the question should initiate users to give their honest answers and opinions instead of instilling a certain understanding or idea in users' minds. Therefore, posts coded as '4' were counted as much as 34.52% (n=349) in this study. Figure 3 shows the percentage of the level of the vividness of social media content in this study.

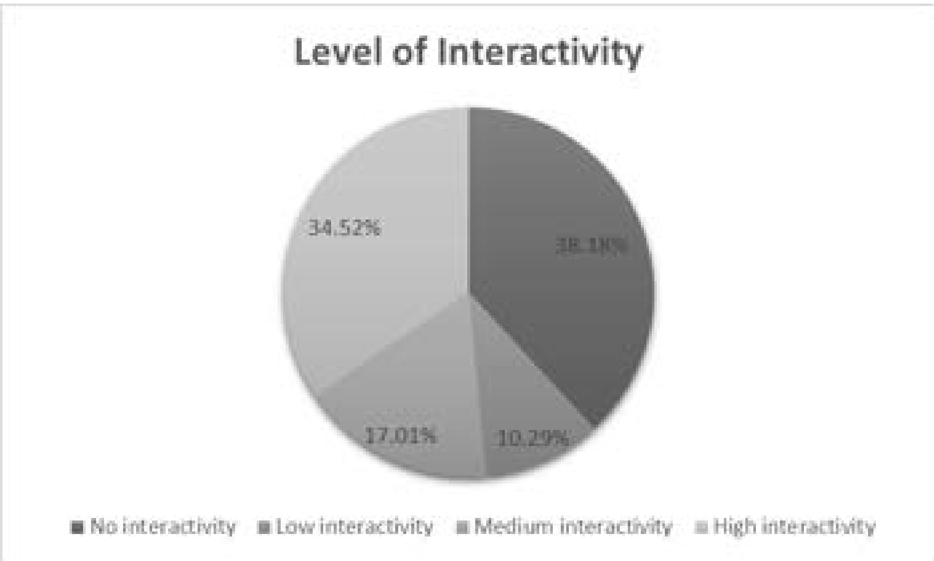

Fig. 3: Percentage of the level of interactivity in this study

TABLE 8: Corresponding engagement metrics according to the level of interactivity

Coding		Corresponding engagement metrics

	Level of interactivity		Frequency	Percentage (%)
1	No interactivity	Number of like(s)	21863	28.03
		Number of comment(s)	10045	37.35
		Number of share(s)	157	48.16
		Number of view(s)	157264	22.79
		Number of retweet(s)	656	35.06
2	Low interactivity	Number of like(s)	577	0.74
		Number of comment(s)	78	0.29
		Number of share(s)	0	0
		Number of view(s)	0	0
		Number of retweet(s)	441	23.57
3	Medium interactivity	Number of like(s)	17460	22.39
		Number of comment(s)	4502	16.74
		Number of share(s)	50	15.34
		Number of view(s)	51904	7.52
		Number of retweet(s)	379	20.26
4	High interactivity	Number of like(s)	38089	48.84
		Number of comment(s)	12272	45.63
		Number of share(s)	119	36.50
		Number of view(s)	481006	69.69
		Number of retweet(s)	395	21.11

In respect to RQ2 "How does the interactivity of social media content affects consumers' social media engagement behavior?", posts with no interactivity present 28.03% (n=21,863) of the total number of likes, 37.35% (n=10,045) of the total number of comments, 48.16% (n=157) of the total number of shares, 22.79% of the total number of views (n=157,264), and 35.06% (n=656) of the total number of retweets. Meanwhile, posts with low interactivity were associated with 0.74% (n=577) of the total number of likes, 0.29% (n=78) of the total number of comments, 23.57% (n=441) of the total number of retweets, and no share neither view at all. On the other hand, posts with medium interactivity were linked with 22.39% (n=17,460) of the total number of likes, 16.74% (n=4,502) of the total number of comments, 15.34% (n=50) of the total number of shares, 7.52% (n=51,904) of the total number of views, and 20.26% (n=379) of the total number of retweets. Last of all, posts with high interactivity are winning in several categories of corresponding engagement metrics such as number of likes, number of comments, and number of views with 48.84% (n=38,089) of the total number of likes, 45.63% (n=12,272) of the total number of comments, as well as 69.69% (n= 481,006) of the total number of views. The other two categories, number of shares and number of retweets from posts with high interactivity, took up 36.50% (n=119) and 21.11% (n=395) from the total number of its categories consecutively.

These results signify that the highest engagement metrics by its number of likes with 48.84% (n=38,089), number of comments with 45.63% (n=12,272), number of views with 69.69% (n=481,006) came from posts with high interactivity that were coded as '4' in this study. In the meantime, the highest number of shares with 48.16% (n=157) and the number of retweets with 35.06% (n=656) were linked with posts with no interactivity that were coded as '1' in this study, which might be because of the relatively highest frequency of posts with no interactivity with its percentage of 38.18% (n=386) from the final sample of this study.

This result is confirmed by Moran et al. (2020), who found that postings with interactive elements perform better in garnering more clicks, likes, comments, and shares than non-interactive content. Another study from Hamzah et al. (2021) mentioned that interactivity was found to positively influence consumer engagement with brands' posts in the form of liking, commenting, and sharing on social media platforms in which the data imply consumers respond by taking an action on the brand post and having the brand post respond to their actions as a result.

Selection of social media platform on consumers' engagement behavior

TABLE 9: Corresponding engagement metrics according to social media platforms

Social media platform	**Number of posts collected**	**Corresponding engagement metrics**		
			Frequency	**Percentage (%)**
Facebook	243	Number of like(s)	1908	2.46
		Number of comments(s)	2162	8.04
		Number of share(s)	326	100.00
Instagram	261	Number of like(s)	73839	94.68
		Number of comments(s)	24431	90.83
		Number of view(s)	690174	100.00
Twitter	507	Number of like(s)	2242	2.86
		Number of comments(s)	304	1.13
		Number of retweet(s)	1871	100.00

Concerning the RQ3 "What type of social media platform gives the most impact on consumers' social media engagement behavior?", Facebook contributed as many as 24.04% (n=243) posts to the final sample with its corresponding engagement metrics including 2.46% (n= 1,908) of the total number of likes, 8.04% (n=2,162) of the total number of comments, and a significant number of shares (n=326). On the other hand, the number of posts collected from Instagram are slightly higher than Facebook, which is 25.82% (n=261) from the final sample with exceptionally high corresponding engagement metrics inclusive of 94.68% (n=73,839) of the total number of likes, 90.83% (n=24,431) of the total number of comments, and an impressive number of views (n=690,174). As a final point, Twitter made up from the highest number of posts collected with 50.15% (n=507) from the final sample, which resulted in 2.86% (n=2,242) of the total number of likes, 1.13% (n=304) of the total number of comments, and an exceptional number of shares (n=1,871).

Derived from the data collected, it was evident that Instagram significantly gets more corresponding engagement metrics of likes with 94.68% (n=73,839) and comments with 90.83% (n=24,431) compared to any other social media platform being examined in this study which is Facebook and Twitter. In contrast, withdrawing Instagram as a basis for evaluation, Facebook users are more likely to leave comments than Twitter users, who prefer to like instead.

5.0 DISCUSSION AND CONCLUSION

5.1 Discussions

While brands have widely used social media platforms, this paper reports an exploratory study on the use of social media content format using a sample of 1,011 posts by two local skincare brands. Content analysis was used to analyze the brand's posts. A coding that consisted of two main categories and several subcategories was proposed to represent the content format. This paper contributes to social media and the cosmetic industry's growing literature, focusing on content analysis.

The analysis revealed that social media platforms, specifically Facebook, Instagram, and Twitter were used as tools to engage and interact with their consumers because the brand regularly posted at least one post every single day. Social media platforms were used by brands not only to promote their products but also to disseminate information considering brands also announce the re-opening of their physical store, employment opportunities, and lists of their top resellers through their social media postings.

Despite the fact that brands are for the most part, use photos or images along with their social media postings, the results still suggest that the utilization of videos which was identified as high vividness in this study, will undoubtedly generate higher engagement metrics from users. This might be why Instagram which facilitates a wide range of media richness features, including reels and IGTV, has received a great number of engagement metrics from social media users.

The findings indicate that even though the final sample is mostly made up of posts with no interactivity, the results appear to favor posts with high interactivity as these posts effectively generate high corresponding engagement metrics regarding the number of likes, comments, and views. However, on the contrary with results from the previous study from Moran et al. (2020) and Hamzah et al. (2021) that presents high interactivity will result in high engagement metrics, this study signifies that posts with no interactivity lead to a high number of shares and retweet by social media users. But then again, as mentioned earlier, it could be because of the sheer volume of posts with no interactivity that made it into the final sample of this study. Additionally, it is fascinating to see how Twitter users use the comment section to join in the conversation under other users' tweets and 'quoting' tweets to express their opinions. Hence, it is possible that the high number of retweets with a pure text is attributed to posts with no interactivity in this study.

In the final analysis, this research endeavored to acknowledge the importance of selecting the type of platform in facilitating consumers' engagement behavior. This study demonstrates that Instagram users appear to like and comment more frequently than those on Facebook and Twitter. In the aftermath of removing Instagram as a criterion for evaluation, Facebook users are more likely to leave comments than Twitter users who tend to demonstrate greater engagement behavior in the form of liking. This could be because Facebook is more frequently used on a desktop computer than on a mobile device, allowing users to type comments more conveniently than on the phone (Shahbaznezhad et al., 2021).

5.2 Research Limitations and Recommendations

This study examined the literature on social media content and consumer engagement behavior to construct a conceptual model proposing two main social media content formats; vividness and interactivity, and analyzes how the selection of social media platforms affects corresponding engagement metrics of a brand’s posts. Using a dataset of 1,011 social media posts with corresponding 77,989 total likes, 26,897 total comments, 326 total shares, 690,174 total views, and 1,871 total retweets based on two local skincare brands, researchers explain the significance of the findings in line with the research questions.

The dataset utilized in this study is, however, limited to the sample selection as this study only collect data from the three months as compared to previous research that employs at least eight months up until one year period of data collection (Aldous et al., 2019; Shen and Bissell, 2013; Shahbaznezhad et al., 2021). Due to the lack of workforce and the researcher’s limited time frame, a sample selection of three months seems the best fit for the researcher’s capabilities to collect the data. However, according to the aforementioned statement, the results might bias the posts with specific features collected as a final sample in this study. An example shown from this study would be that the corresponding engagement metrics appear to favor posts with no interactivity simply because these posts were the most prevalent in this sample. Future research could then limit the total of postings with particular features collected as a final sample, ensuring that the number of posts for each level of content format is consistent.

This research is limited to actions within social media platforms such as liking, commenting, sharing, viewing, and retweeting and does not include any other types of consumer engagement. In this study, additional research may be needed to examine various forms of engagement through social media (e.g., collaborations), as well as other dimensions of engagement including novelty, consistency, a cognitive and content type that might contribute significantly to the finding of the study regarding consumers' engagement behavior. Apart from that, consideration needs to be put into the other contributing factors that might affect users' engagement behavior such as celebrity endorsement, the prime time to post, or the corresponding elements of electronic word-of-mouth (eWOM).

Due to the secondary nature of this dataset, the researcher cannot consider and investigate the profiles of users (e.g., demographic factors) who engage with posts since the collection of data from survey research enables the researcher to take a variety of potential sources to bias into account. For instance, focusing the topic on age group as a subject, generation Y and Generation Z are found to engage similarly in interactive and informative social media marketing activities meanwhile millennials are social media users who enjoy communicating and seeking out information from the brands they prefer (Hazzam, 2021). Due to the unavailability of this data, consumers who use Facebook, Instagram, and Twitter are likely to have a self-selection bias. These elements contribute significantly to understanding the types of users who engage across platforms and their moderating role that must be included in future research to enable a more profound comprehension of engagement through several different social media platforms.

5.3 Conclusions

The purpose of this study was to determine the importance of social media format in terms of vividness and interactivity, as well as the selection of social media platforms in facilitating consumers' engagement behavior. The findings of this study discovered that posts with high vividness resulted in high engagement metrics of likes, comments, shares and views meanwhile on the other hand, posts with high interactivity produce remarkable social media engagement in terms of users' behavior of liking, commenting, and viewing. This study also noted that Instagram significantly gets more corresponding engagement metrics of likes and comments than Facebook and Twitter. The findings of this study will directly benefit marketers or small business owners of skincare brands in selecting the most engaging social media platform and content format strategies.

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FACTOR INFLUENCING CONSUMERS' INTENTION TOWARDS FRAUDULENT DIETARY SUPPLEMENTS AMONG JOHOR CONSUMERS: A CASE OF TDC HOLDINGS SDN BHD

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ABSTRACT

Dietary supplements consumption among people nowadays is increasing for the purpose of staying healthy and getting strong antibodies especially during this Covid-19 pandemic. Besides, the issue of fraudulent dietary supplements is also gaining attention among consumers. This is proven when many dietary supplement frauds are issued by irresponsible parties as it is also affecting other parties as well. The effects of such immoral activities cause adverse effects to consumers due to the uncertainty of the ingredients used by the irresponsible parties. However, the fraudulent intake of dietary supplements is also rooted in consumers' intentions itself. This study was conducted to examine the factor influencing consumers' intentions towards fraudulent dietary supplement which involved the variable of knowledge, attitude, subjective norms, perceived behavioural control, and awareness Purposive sampling method from 140 respondents has been conducted and results were generated using SPSS Software version 26. The findings shows two out of five hypotheses were accepted and some recommendations also has been provided to improve understanding among consumers regarding dietary supplements intake in future research.

Keywords: Dietary Supplement, Fraudulent, Consumer, Intentions

1.0 INTRODUCTION

The consumption of dietary supplements among Malaysians is increasing especially during this pandemic season due to fears of being easily infected due to the body's weak immunity. This can be further evidenced by a study found by the Institute for Public Health, (2017) which said that there are about 44.7% and 30.6% of Malaysian teenagers consume vitamins, minerals, and food supplements, respectively.

Lordan et al., (2021) also stated supplement consumption has increased between the first and second pandemic waves. In addition, there are also reports regarding a variety of reasons for supplement use by consumers which are boosting immunity (60%), improving overall health (57%), and filling nutrient gaps in their diets (53%), respectively. Thus, the consumption of dietary supplements is shoot up recently by all generations to ensure their health is more secure and this is becoming popular among Malaysians nowadays.

1.1 Background of Company

Tunas Duta Cemerlang (TDC) Holdings Sdn Bhd is one of the companies that produce dietary supplement which is C2Joy Colostrum Milk. In 2018, C2Joy was declared as 'High Calcium' milk. To add on, by the end of 2020, TDC's revenue has already exceeded 100 million. This clearly proves that the dietary supplement, C2Joy Colostrum Milk that being produced by TDC Holdings Sdn Bhd received a good response in the market due to the effectiveness of the product among consumers.

1.3 Problem Statement

Recently, TDC Holdings Sdn Bhd faced problems in terms of the fraudulent in copying of C2Joy Colostrum Milk product. This is due to irresponsible competitors that trying to manipulate the original product to tarnish the image of TDC Holdings Sdn Bhd. When there is an increase in dietary supplement consumption, there are also incidents related to increase of food safety as there are many counterfeit food supplements in the market by manufacturers who aim to gain additional profits by ignoring consumer safety concerns (Abdul Aziz & Kamarulzaman, 2020). This will cause adverse effects to consumers due to the uncertainty of the ingredients used by the irresponsible parties.

Fraudulent activity in copying of C2Joy Colostrum Milk product has been detected by TDC Holdings and appropriate action has been taken. However, there are still others who keep trying to do the same thing and try to tarnish the image of the company. This will cause consumers to be deceived by buying a fake product instead of the original. With the existence of this issue, researchers are concerned to study the factor influencing consumers' intentions towards fraudulent dietary supplements. Thus, next section will highlight the research variables and hypotheses.

2.0 LITERATURE REVIEW

2.1 Consumers' Intentions

Consumers' intention is referring to a person's commitment, plan, or decision to perform an action or achieve a target (Eagly and Chaiken, 1993). Empirically, human activity is depending on their intention, however, not all intentions are able to perform the relevant response by them (Ajzen, 1985; Abdul Aziz & Kamarulzaman, 2020). Hence, Ajzen (1985) in his findings said that intention may cause the human response and the relationship between intention and reaction can be seen with purpose and plans that drive to behaviours.

2.2 Fraudulent Dietary Supplements

Fraudulent dietary supplements are defined as the form of product fraud as well as food fraud and also known as economically motivated adulteration (EMA) (Wheatley and Spink, 2013). When there is an increasing in the use of dietary supplements, there is also an increasing between food and safety issues due to the higher availability of counterfeit food supplements in the market by manufacturers who deliberately want to gain additional profits but at the same time, they ignore safety towards consumer (Abdul Aziz & Kamarulzaman, 2020). Thus, Wheatley & Spink (2013) have described that such things cause consumers to be unable to distinguish between true or fraudulent dietary supplements.

2.3 Hypothesis Development

2.3.1 Knowledge

Knowledge is one of the keys to avoiding mistakes made by humans while education is the key to expand and gain our knowledge (Chireh, 2011). According to Axon et al., (2017), he stated that a consumer with a high level of education and knowledge of dietary supplements would be more careful in their consumption of dietary supplements compared to the general population. Hence, in order to avoid the misuse of dietary supplements, all consumers must have knowledge regarding the usage and efficacy in order to prevent receiving bad side effects. Therefore, the following hypothesis are presented:

H1: *There is positive significant relationship between knowledge and consumers' intentions towards fraudulent dietary supplements.*

2.3.2 Attitude

Attitude is defined as a willingness to respond towards the particular institution, people or things consistently that has been learned and has become a person's special means of response (Freeman, F., n.d). Attitude is strongly linked to the engagement of a person in a given of health behaviour accordingly (Armitage and Conner, 2001). In addition, positive attitude by people may lead to positive impacts on behaviour while negative attitudes will cause to negative impacts on behaviour (Abdul Aziz & Kamarulzaman, 2020). Thus, researcher hypothesize:

H2: *There is positive significant relationship between attitude and consumers' intentions towards fraudulent dietary supplements.*

2.3.3 Subjective norms

Ajzen (1991) revealed that subjective norms which also known as normative influences are defined as perceived social pressure by significant others with the social environment in order to involve in target behaviours. In order to assist customers in choosing the right dietary supplements, consumers who are unsure about their dietary supplement options can gain information from people who are more knowledgeable about health information such as health professionals, doctors, physicians, and family members, or close

acquaintances that can provide them with correct information (Park and Lessig, 1977). Therefore, the following hypothesis was generated:
H3: *There is positive significant relationship between subjective norms and consumers' intentions towards fraudulent dietary supplements.*

2.3.4 Perceived Behavioural Control

Perceived behavioural control is described as the perception of an individual related to the difficulty or ease of performing a target behaviour (Azjen, 1991; Abdul Aziz & Kamarulzaman, 2020). H, Frances. and Ricks, J. M. (2016) explained that behavioural performance determined by sufficient resources and competence in order to control barriers to behaviour. According to Abdul Aziz & Kamarulzaman (2020) perceived behavioural control is logical consideration to supplement intake as a controlling factor that may encourage or inhibit an intention of a person to take dietary supplements. Thus, Hence, the following hypothesis was generated:
H4: *There is positive significant relationship between perceived behavioural control and consumers' intentions towards fraudulent dietary supplements.*

2.3.5 Awareness

Consumer awareness whether in consciously or unconsciously, come before modification, elimination, control, change in behaviour and decision making by a human Chartrand (2005). Furthermore, Chincholkar (2016) described that consumer are aware of health and nutritional supplements as well as they believed that these products have a tendency to help them in sustaining their body health. Hence, the following hypothesis was generated:
H5: *There is positive significant relationship between awareness and consumers' intentions towards fraudulent dietary supplements.*

2.4 Conceptual Framework Model

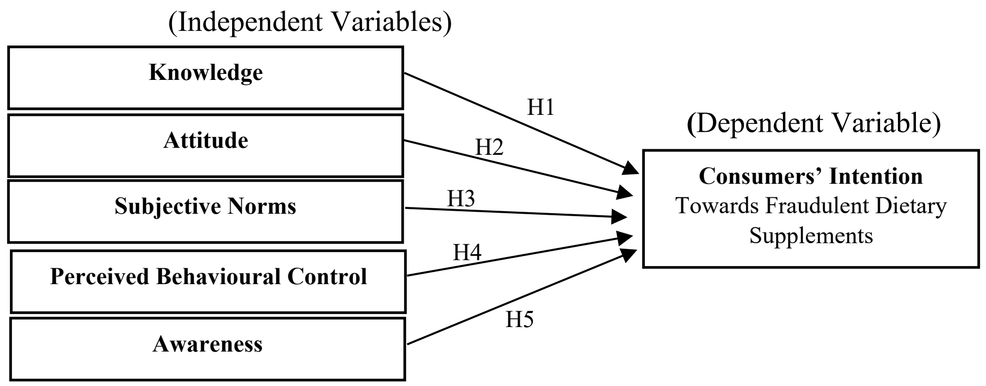

Fig. 1: Conceptual Framework of The Factor Influencing Consumers' Intentions Towards Fraudulent Dietary Supplements

Source: Adapted from Ajzen (1991); Chartrand (2005); Axon et al. (2017).

Figure 1 shows the conceptual framework of this research. The function is to test the relationships between independent variable and dependent variable for academic and business purposes. The framework of the variables in Figure 1 was adopted from Ajzen (1991); Chartrand (2005); Axon et al. (2017) who highlighted the factors of knowledge, attitude, subjective norms, perceived behavioural factor, and awareness that influencing consumers' intentions towards fraudulent dietary supplements.

3.0 RESEARCH METHODOLOGY

3.1 Population and Sample Size

The population of this research is focusing on Johor community that consume dietary supplements of C2Joy Colostrum Milk. Online Google form survey have been distributed among respondents by using purposive sampling form through social media. Referring to Hair et al. (2010), a minimum number of sample size required in research study should be at least 100 samples. Therefore, at least 100 sets of questionnaires have been distributed and collected the samples among the respondents from population in Johor. However, the total sample of 140 respondents were taken to carry out this study.

1.1 Research Instrument

The main instrument consists of close-ended questionnaires. The five Likert scale are used to determine the strength of the answer that consists of strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5) (Vagias and Wade (2006). The questionnaire was divided in to two sections which are demographic group profile and independents variables (IV) and dependent variable (DV) respectively.

3.3 Data Analysis Methods

Data collected in this research has been analyzed using Statistical Package for Social Science (SPSS) version 26. There are variety of method were used in the research as shown in table below.

TABLE 1: Variety of Methods

Statistical Measure	**Objective**
Descriptive Analysis	To describe the demographic profile, examine frequency and percentage of respondents such as age, gender, race, occupation status, educational level, monthly income.
Normality Analysis	To determine whether the sample data has been normally distributed.
Reliability Analysis	To test the reliability of measurement items and ensure the results is 0.7 and above.
Multicollinearity	To ensure there is no issue of collinearity among the variables based on the value of Tolerance (>0.2) and Variance Inflation Factor, VIF (<10).
Multiple Regression Analysis	To analyze strongest predictor that motivate dependent variable and most significant variable.

4.0 DATA ANALYSIS

4.1 Profile of Respondents

TABLE 2: Profile of Respondents

Demographic	**Variables**	**Frequency (F)**	**Percentage (%)**
Gender	Male	39	27.9
	Female	**101**	**72.1**
Age	Below 20 years old	3	2.1
	21 – 30 years old	**69**	**49.3**
	31 – 40 years old	14	10.0
	41 – 50 years old	34	24.3
	Over 50 years old	20	14.3
Race	Malay	**125**	**89.3**
	Indian	2	1.4
	Chinese	8	5.7
	Others	5	3.6

Educational level	SPM	36	25.7
	Matrics / STPM / Diploma	16	11.4
	Degree	**76**	**54.3**
	Master / Phd	8	5.7
	Others	4	2.9
Occupation status	Private sector	**42**	**30.0**
	Public sector	23	16.4
	Self-employed	27	19.3
	Retired	5	3.6
	Student	21	15.0
	Unemployed	18	12.9
	Others	4	2.9
Income per month	RM1000 & below	50	35.7
	RM1001 – RM3000	**55**	**39.3**
	RM3001 – RM6000	27	19.3
	RM6001 & above	8	5.7
Have you ever used dietary supplements; C2Joy Colostrum Milk produced by TDC Holdings Sdn Bhd?	Yes	**140**	**100.0**
	No	0	0.0

5.0 DISCUSSION & CONCLUSION

5.1 Conclusion

The current research analysed regarding the relationship between variables of knowledge, attitude, subjective norms, perceived behavioural control and awareness towards fraudulent dietary supplements among Johor consumers. There are five research objective and five hypotheses were proposed and a conceptual research framework also was developed for this research. Subsequently, the total of 140 sample of respondents were collected and examined by using SPSS Software Version 26 for data analysis part. Apart from that, the main findings indicate the positive significant relationship between knowledge and consumers' intentions towards fraudulent dietary supplements and it is followed by the variable of attitude which also have positive significant relationship towards consumers' intentions accordingly. However, the other variables which are subjective norms, perceived behavioural control and awareness have negative significant relationship on consumers' intentions towards fraudulent dietary supplements. Therefore, researchers or marketers should pay more attention to these three attributes in helping to solve the problems faced by TDC Holdings Sdn Bhd regarding the issue of fraudulent dietary supplements that cause adverse impacts to all parties. Future researchers could conduct further investigation on fraudulent dietary supplements by adding other possible factors into conceptual framework. As a conclusion, this research has fulfilled two out of five hypotheses and answered the research questions and objectives. Last but not least, recommendations for future research were stated to minimize the limitations and improve information as well as the understanding regarding dietary supplements intake among consumers.

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A CASE STUDY OF ZOO NEGARA'S WEBSITE AND CHESTER ZOO'S WEBSITE

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ABSTRACT

Website is playing a crucial role in an organization. The usage of the internet has increased among children. Their preferences are relevant in the choice of tourism destination. Zoo Negara is an attraction in Malaysia. The Zoo Negara organization is currently enduring a significant website gap. Hence, this paper identifies the deficient website features of the National Zoo compared to the Chester Zoo website among young visitors for the National Zoo can take action and improve their website in the future and determine the young visitors' experience while browsing the website. An observation checklist was used for data collection as a comparison with Chester Zoo due to its efficient website design, and 15 checklists were collected among young visitors from 8 to 12 years old. The finding shows that Zoo Negara has a flaw in terms of website design, information quality, and interactivity. The study discussed that young visitors do not have a great experience while browsing the website. This research may help Zoo Negara to improve its website in the future time.

Keywords: Website features, user experience, tourism website, young children

1.0 INTRODUCTION

Tourism has become a major economic activity in most regions of the world, in Malaysia, the number of tourist arrivals to Malaysia by 2020 was declined by up to 83.4 percent, or 4.33 million, compared with the previous year, which was 26.10 million (Tourism Malaysia, 2019). The study by Strategic Planning Division, Tourism Malaysia found that 71.3 percent of respondents preferred to travel domestically rather than abroad in a survey titled Domestic Travel in Malaysia after Movement Control Order (MCO) prepared by Tourism Malaysia an d 50.9 percent believe traveling within Malaysia is safe after MCO (Tourism Malaysia, 2020). This indicates the domestic sector is expected to grow in the post covid era. According to Fernández-Cavia et al. 2014, the internet has increased economically, mostly in tourism industries around the world in obtaining, interacting, and influencing the audience to purchase and use the online platform. Websites are now the most significant public communication portal for the majority of businesses (Garett et al., 2019). With a current rising global estimate of 7.8 billion, roughly 4.93 billion people have internet access. In other words, the internet is used by 63.2 percent of the world's population (Broadbandsearch, 2021). Correspondingly, according to the Department of Statistics Malaysia Official Portal, 2021, 89.6 percent of Malaysians use information and communication technology (ICT) services and equipment. Gathering information regarding products or services is among the most common online activities, which is equivalent to 85.4%, as stated in (Department of Statistics Malaysia Official Portal, 2021). According to Morris (2016), in 2015, 66% of children aged 3 to 14 used the internet and among children, aged 8 to 11, 41.5% of the children were found to use the internet as mentioned by eMarketer in 2014. Being born in the digital era, the current generation of youths residing in urban areas in Malaysia is reportedly exposed to the internet since the age of 5 years old (Nik et al., 2021). Internet Survey User, 2020 mentioned that the worldwide lockdown due to the pandemic had caused the number of time children spent online to skyrocket. 48.0% of children in the USA were spending more than six hours per day online, an increase of 500% from before the crisis (Parentstogether Foundation, 2020). The same thing occurs in Malaysia. Dr. Norazah, an expert stated that children spent most of their days with electronic devices, and rarely have outdoor activities which have been aggravated by the MCO (Mazlan, 2020). IUS 2020 also stated that children from 5 to 17 years old who use the internet have grown by 155% since 2016 (MCMC, 2020).

2.0 LITERATURE REVIEW

2.1 Website Features

Website features is an additional advantage for customer to be more accessible with the website, and more user-friendly (Ubaidur, 2015). According to Anubha et al. (2020), an organization can use a variety of unique features in a website to attract customers' attention and engagement. As mentioned by Soegaard (2019), if the website has been designed in such a way that helps the customers' ease of use, the website has the capability for engagement. Bilgihan & Bujisic (2015) describe that consumer purchasing decisions are usually based on the website features elements, including quality information, website interactivity, and design. According to Floh & Madlberger (2013), quality web features and convenient navigation foster shopping pleasure. If a company uses strategies such as animated or cartoon characters, or events (eg. Upin Ipin) it will indirectly attract the children to stay on the website longer (Gómez et al., 2021). According to Lööf et al. (2019), websites should have features that allow children to easily understand the content.

2.2 Information Quality

In a previous study, information quality is well-defined as the validity, precision, timeliness, effectiveness, and comprehension of the data provided on the website (Huang & Benboucef, 2013; Molinillo et al., 2020). In this regard, Molinillo et al. (2020), discovered that information quality is an essential factor for a website's success. Users think that the information on the internet is significant, precise, and helpful to their necessities. Information quality can also be defined as a customer's perception of the quality of information about a product or service displayed on an organization's website site (Bressolles, 2006; Le et al., 2020). Ou & Sia (2010), found that information quality refers to customers' perceptions of knowledge about products or services obtainable on a firm's website, and this understanding is formed only when consumers seek the information to be precise, useful, and updated regularly. Kim et al. (2009) also mentioned that providing useful and precise website information improves the chances of attracting and retaining customers. According to Garett et al. (2019), the quality of information given by a website, including current and accurate information, is significantly related to customers' behavioral intentions, such as the intent to use. As mentioned in Shim et al. (2018) findings, information quality has a significant relationship with customer satisfaction. It is considered a key factor in consumer evaluations of a website (Katerattanakul & Siau, 1999; Ou & Sia, 2010), especially for children as it is vital for them to get a piece of accurate information.

2.3 Website Interactivity

Ever since its beginnings, cyberspace has emerged as a powerful entertainment platform, allowing businesses to interact with customers on a one-to-one basis (Islam et al., 2020). According to Fernández-Cavia et al. (2014), interactivity is one of the most crucial aspects of a website. In respect, Fan et al. (2013) explained that interactivity on websites can help facilitate and control active two-way interactions. Besides this, Shim et al. (2018) classify interactivity as the degree to which customers can substantially modify the style and content of the media context. According to prior findings, companies who provide quality web interactivity to their visitors earn greater concentrations of website customer engagement (Mann & Shani, 2011; Islam et al., 2020). Pertinently in the tourism industry, a large percentage of them already have developed online sites to boost virtual interactivity with their clients, for instance, virtual, augmented reality uses for hotel rooms to enhance knowledge and create good relationships with customers. As mentioned by (Alhumaidan, 2004) children are easily attracted to visual illustrations and enjoy interacting with media. In a study of children's use and experience by Lööf et al. (2019), one of the children interviewed stated that he was stunned by color, sound, and movement within a website. Dattolo et al. (2018) stated that websites should provide enjoyment such as interactive materials to keep the child cheerful. As stated in Kim & Niehm (2009) findings of their study demonstrated that interactivity, one of five website quality dimensions, was positively related to consumers' perceived information quality. In another, interactivity has a positive influence on user 5 Syafiqah Aqilah (2022) Pembentangan Projek Sarjana Muda 2022, Sekolah Perniagaan Antarabangsa Azman Hashim UTM beta behaviors (Naqvi et al., 2020). This was supported by Peker et al. (2016), which agree when websites provide interactive features, the user experience is significantly improved. In this regard, website interactivity is an essential feature to be discussed in the National Zoo website, particularly for children who are the target market for the organization.

2.4 Website User Experience

Recently, academics and industry practitioners in various fields have paid close attention to user experience research. User experience is a new term in the field of human-machine interaction. It is now one of the important research topics because the user experience is a key factor that gives users a satisfying and pleasant experience when interacting with a product, system, or interface (Zahidi, 2016). Since the internet has become a norm, user experience channels have shifted from face-to-face to the virtual world via websites, social media, and augmented reality. Alshaheen, (2019) described user experience as “how a person feels when interfacing with a system”. While Pant (2015) defined user experience as the overall satisfaction a user gets from interacting with a product or digital tool. Vila et al. (2021), on the other hand, discussed that the content of a website, as well as its design and appearance, can improve the user's browsing experience. To put it more simply, usability, usefulness, as well as the appeal of the products or services are the major factors that influence the quality of user experience. As for the children’s experience, they are now regarded as the primary users of the software. Hence, the use of tech is no longer restricted to adults (Alrashed & Alhussayen, 2015). The website developers try to construct software that caters to children’s abilities, preferences, and development needs (Kaur et al., 2021). According to (Alrashed & Alhussayen, 2015), it is critical to measure children's experience of enjoyment with websites because it has a significant outcome on children's view of the website. For this reason, a website with a good user experience will have benefits and a strong business value. To the researcher’s knowledge, no studies have been conducted in Malaysia to investigate the user experience of tourism websites for children. To fill this research gap, we present preliminary findings from a study on Zoo Negara's website users' experiences.

3.0 RESEARCH METHODOLOGY

Qualitative research also involved a few methods and studies based on the interpretative and naturalistic to get the full picture regarding a phenomenon or the problem at hand (Othman, 2007). Cohen, Manion, and Morrison (2011) states that the advantages of qualitative research are from the accuracy of the information collected because the findings need to be triangulated. Based on the objectives of the study as discussed in the first chapter, the main question of the study requires the researcher to identify the deficient website features of the National Zoo compared to the Chester Zoo website among young visitors in order for the National Zoo can take action and improve their website in the future and to determine the experience of young visitors while browsing the website. The researcher created the observation checklist that was used to carry out this research. It was made up of items that the researcher thought represented some of the needs on the website from the perspective of children. The goal was to provide a vehicle for the researcher to record all observations made on each child during the study. It was designed solely for the researcher's comfort and convenience, not essentially for the use of other observers.

This study sample consisted of a total of 15 children. These children range in age from 7 to 12 years because as mentioned by Amirul Asyraf, the person in charge of the Education Department of Zoo Negara the most visitors coming from children. To protect the children’s anonymity, all information about them is kept hidden, including their names. This is also due to the request from the parents of the children themselves.

The data was collected using the observation method. This study adopted the research method by Lanik (2000) on the prediction of child maltreatment using the checklist. The checklists used in his research were made up of 45 “yes” and “no” that is divided into six categories. On the other hand, the instrument for this study is composed of 15 "yes" or "no" items divided into four categories. To make the process as simple as possible, all methods for this observation checklist will be performed on an iPad. To begin the observation checklist, children were approached and asked to browse the Zoo Negara website. They will then fill out the Google Forms form. After completing the first observation checklist in Google Form, they must proceed to the Chester Zoo's website for the next step. Finally, they will complete the observation checklist in the Google Form as given before, with the only difference being that at the end of the question, they will be asked is "I choose the Chester Zoo’s website than the Zoo Negara’s website”. To provide guidance, respondents completed a checklist of observations in a quiet area with their caregivers.

To analyze the collected data, descriptive analysis was used to identify the preferred website features and the children’s experience on the website with the application of three attributes; information quality, design, and interactivity including website user experience. This study adopted the Anyaoku & Akpojotor (2020) data analysis method in their research titled "Usability Evaluation of University Library Websites in South-South Nigeria." to analyze the data collected. Chester Zoo was chosen as a benchmark for Zoo Negara because it has one of the best website zoo designs (Silkalns, 2021). As mentioned by Silkalns (2021), Chester Zoo has one of the most impressive zoo websites. According to Johnston (2021), Forbes magazine described Chester Zoo as one of the top 15 zoos in the world. In 2015, several awards recognized Chester Zoo's reputation as a successful and well managed tourist attraction and conservation organization. As stated in Zoo (2015), Chester was named the best zoo in the United Kingdom by Trip Advisor's Travelers' Choice Attractions award. In this study, a comparison was made between Chester Zoo and Zoo Negara to identify the features of the website to be accessible and easily understood by the young visitors, to examine the preference for Zoo Negara and Chester Zoo websites, and lastly, to determine the young visitor's experience while browsing the website. As a result, Chester Zoo serves as an excellent model for Zoo Negara to follow to improve its business functions.

4.0 FINDINGS

This result indicates that ZNEG's website's design and color scheme need to be updated. Because ZCHE receives a higher percentage on both items, it demonstrates that young visitors enjoy the website's design and color scheme. However, nothing needs to be changed in terms of information such as videos, photos, and maps, as these are available on both websites. The same goes for the font and layout used because both of the websites receive more than 50% of the respondent who stated "yes" to the statement.

This finding suggests that the ZNEG website needs to add more animal information and the most recent information, such as annual reports. ZCHE, on the other hand, includes a lot of animal information on its websites, such as age, name, and habitat, and also up-to-date information such as the 2021 annual report. Though, nothing needs to be changed in terms of obtaining the information because it is readily available, and more than half of those polled agreed with the statement.

According to these findings, the ZNEG website lacks an inquiry form and a Frequently Asked Question (FAQ), whereas the ZCHE has both. In total, less than half of the respondents would like to revisit the ZNEG website, whereas 13 respondents would like to revisit the ZCHE website in the future. However, nothing needs to be modified in terms of interactivity elements such as animal videos, as ZNEG already presents them.

According to the observation checklist, in comparison to ZCHE, the ZNEG website has less information available. Furthermore, young visitors do not have a great experience browsing the website as they did on the ZCHE website. However, according to the young visitors, the ZNEG website does not have any problems with loading pages. As a conclusion made by young visitors, 80 percent of the young visitors prefer the ZCHE website to the ZNEG website.

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MEASURING CUSTOMER SATISFACTION FOR COURIER SERVICES USING SERVPERF: A CASE STUDY OF NINJA VAN SERVICES IN MALAYSIA

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ABSTRACT

Customer satisfaction is a metric that evaluates how satisfied customers are with a business's products, services, and capabilities. Information on customer satisfaction, such as surveys and ratings, can aid a firm in determining how to enhance or modify its products and services. The primary goal of any business should be to satisfy its customers. This remains true for business organizations, retail and wholesale businesses, government agencies, service enterprises, non-profit organizations, and every subgroup within a company. In order to increase the customer satisfaction, company should meet their expectation. The objective of this study is to look at the level of customer satisfaction towards the courier services in Malaysia. This study uses a SERVPERF method and quantitative sampling method. Statistical analysis with mean (average) and percentage tests is used to measure the level of customer satisfaction towards the courier services in Malaysia. Hence, this study explains that SERVPERF is actually can be used to measure the level of customer satisfaction.

Keywords: Service performance, Customer Satisfaction, Courier Services, Malaysia

1.0 INTRODUCTION

This study will conduct related to the customer satisfaction, service performance and logistic company. Logistics companies help companies in planning, implementing, and executing the movement and storage of goods, resources, and services from point of origin to point of consumption throughout the supply chain. Transportation, shipping, warehousing, packing, disposal, and security are all possible options.

In Malaysia we have several brands of company that implementing logistic business. Malaysia's logistics business has progressed in recent years. Companies are benefiting on the expansion of e-commerce in the country. Corporations are getting more interested in emerging areas such as cold chain logistics, last-mile delivery services, and so on, as a result of strong margins and increased demand. Why is it important to research this market from a marketing point of view is because people stayed at home since the covid-19 virus provoked nationwide lockdowns, preventing them from going shopping. However, throughout the epidemic, on-line sales and parcel delivery both increased. Customers have grown accustomed to purchasing on the internet. As a result of this shift in consumer behavior, the logistics industry is refocusing on last-mile delivery services. To keep up with the times, logistics companies will need to improve their last-mile capabilities.

2.0 LITERATURE AND METHODOLOGY

2.1 Theoretical Framework

The theoretical framework of the SERVPERF Model, which was used in the research, is demonstrated in Figure 1. The independent factors are tangible, assurance, reliability, responsiveness and empathy while the dependent variable is customers' satisfaction towards courier services.

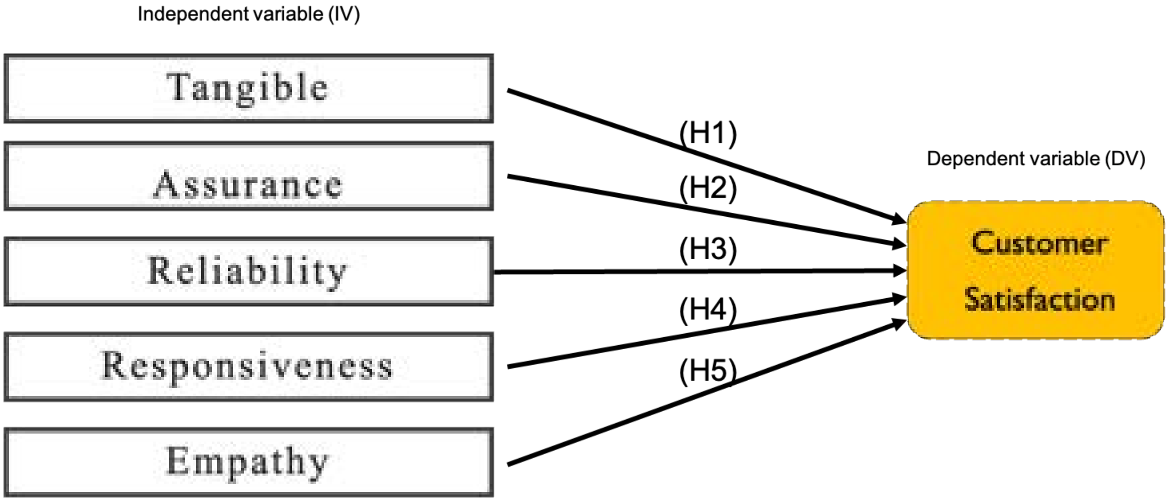

Fig. 1: Research framework for the customer satisfaction towards courier services using SERVPERF

Figure 1 shows the research framework of this research. The function is to test the relationships between independent variable and dependent variable for academic and business purposes.

2.2 Data Analysis Plan

Respondent's information

This study plan to collect the respondent demographics based on the gender, age, education and ethnicity. Table 1.0 is the demographic data to be collected in this study.

TABLE 2.2.1 Respondent's information

Demographics	**Category**
Age	• **17 years old and below** • **18 – 29 years** • **30 - 49 years** • **50 years old and above**
Gender	• **Male** • **Female**
Ethnicity	• **Malay** • **Indian** • **Chinese** • **Others**
Occupation	• **Student** • **employed** • **Job seeker/unemployed**
Income per month	• **Below RM1000** • **RM1000-RM3000** • **RM3000-RM5000** • **RM5000 above**
How long have been using Ninja Van services	• **Daily** • **Weekly** • **Monthly** • **yearly**

TABLE 2.2.2 General perspective on customer satisfaction towards ninja van services (dependent variable)

Customer satisfaction	Level of satisfaction
Overall satisfaction	**1. Very dissatisfied** **2. Dissatisfied** **3. Neutral** **4. Satisfied** **5. Very satisfied**
Satisfaction about price	**1. Very dissatisfied** **2. Dissatisfied** **3. Neutral** **4. Satisfied** **5. Very satisfied**
Satisfaction about service performance	**1. Very dissatisfied** **2. Dissatisfied** **3. Neutral** **4. Satisfied** **5. Very satisfied**

TABLE 2.2.3 Dimension and item statement of SERVPERF (independent variable)

Dimension	Item statements	Sources of literature
Tangible	**Q1: The service company's equipment is up to date.** **Q2: The physical facilities are pleasing to the eye.** **Q3: The personnel are tidy and well-dressed.** **Q4: The physical facilities' look is appropriate for the services offered.**	Dyah R. Rasyida, M. Mujiya Ulkhaq, Priska R. Setiowati and Nadia A. Setyorini, 2016
Assurance	**Q5: Customers can have faith in the workers.** **Q6: Customers can be confident in their interactions with personnel.** **Q7: The staff are courteous.** **Q8: In order to accomplish their duties properly, employees need receive enough support from the service firm's management.**	Dyah R. Rasyida, M. Mujiya Ulkhaq, Priska R. Setiowati and Nadia A. Setyorini, 2016
Reliability	**Q9: When employees agree to complete a task by a specified date, they do so.** **Q10: When consumers have problems, the staff are compassionate and reassuring.** **Q11: The personnel are trustworthy.** **Q12: The staff deliver on their promises when they say they will.** **Q13: The personnel keep meticulous records.**	Dyah R. Rasyida, M. Mujiya Ulkhaq, Priska R. Setiowati and Nadia A. Setyorini, 2016
Responsiveness	**Q14: Employees should advise customers when services will be completed.** **Q15: Customers should expect prompt service from employees.**	Dyah R. Rasyida, M. Mujiya Ulkhaq, Priska R. Setiowati and Nadia A. Setyorini, 2016

	Q16: Employees are expected to assist consumers at all times. **Q17: When personnel are too busy to reply to consumers' needs promptly, it is an issue.**	
Empathy	**Q18: Employees are expected provide the close attention to each customer individually.** **Q19: Employees are expected to provide personalized service to customers.** **Q20: It is expected that personnel are aware of their clients' needs. Employees are required to have operating hours that are convenient for all of their customers.** **Q21: Employees are required to have the best interests of their customers at heart.** **Q22: Employees are required to have operating hours that are convenient for all of their customers.**	Dyah R. Rasyida, M. Mujiya Ulkhaq, Priska R. Setiowati and Nadia A. Setyorini, 2016

Data analysis

TABLE 2.2.4 Variety of Method for This Study

	Analyze	**Threshold**
Demography	Frequency and percentage	
Normality	Skewness Kurtosis	-2 to +2 (Hair *et al.*, 2010) -7 to +7 (Hair *et al.*, 2010)
Reliability	Cronbach alpha	≥0.6 (Nunnally, 1978)
Validity	Factor analysis	≥ 0.5 (Kaiser and Rice, 1974)
Pearson's correlation		-1 to +1 (Hair *et al.*, 2006)

Data collected in this study has been analysed using Statistical Package for Social Science (SPSS) version 26 as listed in the Table 2.2.4 above.

CONCLUSION

To summarise what has been said thus far, this study intends to do this issue investigation. Measuring customer satisfaction for courier services using SERVPERF: A case study of Ninja Van in Malaysia. The questionnaire approaches are the major platform to distribute among respondents in this study in order to obtain accurate and useful data. In brief, once the data has been acquired, all of the data will be measured and all of the information will be gathered using SPSS.

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MARKETING MIX STRATEGIES TO INCREASE PURCHASE INTENTION OF PLUMBING AND MAINTENANCE SERVICE DURING COVID-19 PANDEMIC

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ABSTRACT

Now, all industries including service industry has impacted by the Covid-19 pandemic with low purchase intention and sales. Azman Bin Ahmad is sole proprietorship company that provides a service in all aspects of plumbing and installation of pipes. The sale of the company is affected due to low purchase intention from existing and potential customers. Therefore, the purpose of this study is to implement some marketing mix strategies with aims to increase the purchase intention of plumbing and maintenance service for Azman Bin Ahmad. Evidently, past research has shown that the marketing mix, which includes the 4Ps (product, price, place, and promotion) is useful to increases customer intention. This is a quantitative study, and the data is gathered using a survey approach. All the items were graded on a 5-point Likert scale. This survey used 150 sample data to study the impact of marketing mix on purchasing intention, and it is sent via Google form. From the findings, this study will propose a marketing plan for Azman Bin Ahmad to increase purchase intention of its services. Lastly, this study will provide insights to other service providers on the importance of marketing mix for increased purchase intention.

Keywords: Marketing mix, purchase intention, service industry

1.0 INTRODUCTION

Service industry focuses on providing services rather than actual goods. Service industries include banking, wholesale, retail commerce, plumbing, engineering and nonprofit economic activities. Small and medium companies (SMEs) account for the majority of the services industry, which plays a key role in economic development. Services (87.9%) have the biggest percentage of SMEs in Malaysia, followed by agriculture (7.1%) and manufacturing (5%) (Zulkifli et al., 2010). In Malaysia, the statistics performance of service sector falls 0.3 percent and recorded 123.4 point in the first quarter of 2021 as compared to 123.8 points in the previous quarter. The overall performance for total revenue of services industry in first quarter 2021 recorded RM428.5 billion, decreased -1.7 percent as compared to the final quarter 2020 (Department of Statistics Malaysia, 2021).

Now, the service industry has impacted by the Covid-19 pandemic. As a result of such unpleasant occurrences, material shortages and service postponement are noticeable in the downstream supply chain, which have caused a ripple effect and lower performance in terms of services, revenue, and productivity process (Kumar,2020). Since people are being confined to their homes, this means call volume has essentially increased for the services industry. Now, offering virtual diagnostic processes via video call and skype for easy-to-fix difficulties, as well as serving clients who want information or guidance, is the most viable option for the service industry to survive (Askar, 2020).

Marketing, on the other hand, is one of the techniques to increase purchase intention. Marketing allows individuals to be aware of the products, thus helps to drive purchase intention (Rosiani & Irena, 2017). The marketing 4Ps (product, price, place, and promotion) are designed so that businesses may successfully allocate and manage their marketing resources in order to meet long-term profit goals (Bakri et al., 2021). Product, price place and promotion are important to create an effective marketing strategy, with controllable variable that will assist to create intention of customer (Meera, 2012). In addition, Rust et al. (2004) found that the marketing strategy 4Ps and purchase intention could impact the both productivity and consumer decision.

2.0 LITERATURE REVIEW

2.1 Purchase Intention

Purchase intention is referring to the willingness, desire, and preference of a client in opting to buy a product or service (Nasirun et al., 2019). Before committing to buy a product, there are six steps to consider: awareness, knowledge, interest, preference, persuasion, and purchase (Kotler & Armstrong, 2010). When people have a favorable purchase intention, the services have a beneficial effect on the customers and could lead to actual buy action (Awan, 2011). Additionally, Kotler and Armstrong (2010) suggested that an individual's emotions and impulsive situation can also influence purchase intent. Individual feelings are influenced by personal preferences as well as impulsive situations that modify buying intentions.

2.2 Marketing Mix

Marketing is a set of actions that give value to customers and can help the company to build a relationship with customers (Kotler & Armstrong, 2011). The component of a marketing mix 4Ps (product, price, promotion, and place) are used to implement the operational phase of the marketing management process (Giuseppe, 2016).

According to Kotler and Armstrong (2014, p. 248), a product is anything that can be offered to a market for consideration, acquisition, use, or consumption in order to satisfy a desire or need. Kotler and Armstrong (2014, p.313) defined price as the amount of money a client pays for a product or service in exchange for the benefits of utilizing it. Additionaly, companies must now get across their value proposition to customers after planning and developing a good product or service, setup a reasonable service pricing, and making it available to customers (Kotler & Armstrong, 2014). The process of delivering products or services from producers to the intended users is referred to as location in the marketing mix (Martin, 2019).

The 4Ps can be used in services industry marketing in terms of methodology and versatility. Today's business environment presents difficulties in the narrow context of promoting or selling, which is too myopic and non-integrative to meet a potential customer's wants and needs (Aashish, 2021). In the context of the marketing mix, despite price is an essential consideration, other factors such as product, location, and promotion also play a role in a customer's purchasing decision (Jayaraman & Wong, 2008). Nevertheless, customers are targeted by mass media, which alters their thinking through emotions, needs, wants, and demands (Appel et al., 2020). Therefore, according to Keller (2013), a clear strategy that is based on a complete understanding of the factors that will encourage a consumer to purchase the company's services or brands is required.

2.3 Hypotheses Development

2.3.1 Product

A product is a good or service that can be supplied to clients in exchange for their attention, acquisition, or consumption, and that fulfils a want or need (Kotler et al., 2008). According to Vahidreza et al. (2015), when it comes to determining purchase intent, product quality is crucial. According to Kavitha et al. (2012), the quality of a product or service has been found to influence a consumer intention in making decision process. According to Lew and Sulaiman (2014), as compared to a lesser quality product or service, a higher quality product or service promotes a higher purchase intention. As a result, the following hypothesis is proposed in this study:

H1: Product element has a significant and positive relationship with purchase intention of plumbing and maintenance services.

2.3.2 Price

Price is the amount of money clients pay for a service or a product, or the value they receive (Kotler & Armstrong, 2010). Customers' perceptions of a product's or service's pricing, which has a significant impact on them (Kotler & Keller, 2016). Hence, customers' perceptions of product or service value and purchase intent have been found to be significantly influenced by price (Kotler & Amstrong, 2006). According to Haitham (2012), price refers to what is given up in order to obtain a product or service, as well as how much people are ready to pay in order to meet their various needs. Research by Komaladewi and Indika (2017) indicated that the majority of respondents believe that price has a significant impact on their purchasing intention. The following hypothesis is provided based on the above discussion:

H2: Price element has a significant and positive relationship with purchase intention of plumbing and maintenance services.

2.3.3 Place

Place is defined as any method whereby a customer can obtain a product or a service, and it is also referred to as distribution (Paulus et al., 2021). According to Goi (2011) and Muala and Qurneh (2012), to affect customer intention, the location strategy requires effective distribution of the firm's products through marketing channels such as wholesalers or shops. Kotler and Amstrong (2006) defined place as a collection of interconnected organizations that caters to the process of making a product or service available to consumers. According to Jeanne and Jamie (2015), a strategic location is an important factor in a business, companies must consider how accessible the venues are for customers and whether they are in a strategic position. As a result, the following hypothesis is proposed:

H3: Place element has a significant and positive relationship with purchase intention of plumbing and maintenance services.

2.3.4 Promotion

Promotion is explained as a company's efforts to market a product and encourage customers to buy it (Aristia & Angela, 2017). Consumers are frequently influenced by internal and external environment, therefore, businesses must utilize a variety of promotional activities to entice them to acquire a product or service right away (Kotler, 2000). Even if the product or service produced by the company is the right quality product, if people have never seen and heard this product or service, then they will not be confident of the product (Tjahjono & Rezza, 2016). Promotion serves not only to communicate with customers, but also to persuade them to utilize service items that are tailored to their needs and aspirations (Kevin, 2015). According to Dash (2012), promotional activities are ranked second among the seven marketing activities that can affect a customer's purchase intention. As a result, the following hypothesis predicts a positive relationship between promotion levels and purchase intent in the services industry:

H4: Promotion element has a significant and positive relationship with purchase intention of plumbing and maintenance services.

2.4 Research Framework

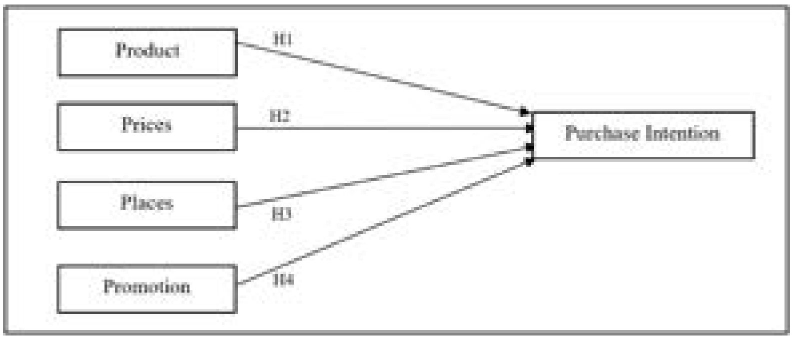

Fig. 1: Research Framework

The research framework for this study is shown in Figure 1. The framework in Figure 1 was adapted from studies of Ofosu et al. (2016) and Mbaye and Jose (2017). The framework is used to test the correlations product factor, prices factor, places factor, promotion factor and purchase intention.

3.0 RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

Research design is an inquiry that offers precise direction for a research project. It is an inquiry that connects conceptual research concerns to relevant and doable empirical research (Creswel, 2014). According to Syed (2018), a research design is a blueprint or strategy that was built specifically to answer the study question. As explained by Tesfaye (2018), the three types of research design are exploratory, descriptive, and explanatory.

The essence of research design is to transform research questions into data for analysis, and provide relevant answers to research questions with minimal cost (Asenahabi, 2019). According to Creswel (2014), the research design must include a strategy for interpreting the examined data in order to give adequate results and conclusions from the study, which allows the researchers to make suggestions or draw conclusions from the findings. According to Naresh (2010), a conclusive research design is one that is used to generate findings that may be used to reach conclusions or make decisions. In most cases, conclusive research entails the use of quantitative data collecting and analysis methodologies.

Moreover, conclusive research is more than likely to employ quantitative rather than qualitative methods (Nargundkar, 2008), and there are two types of research: descriptive research and causal research. According to Shona (2019), the goal of descriptive research is to explain the facts and characteristics of a certain population or area of interest in a systematic and precise manner. On the other hand, the descriptive research can be divided into two types: cross-sectional and longitudinal designs. According to Cherry (2019), a cross-sectional study collects data from a population at a single point in time, whereas longitudinal studies collect data over a longer period of time. Therefore, this study will investigate the relationships between product, price, location, promotion, and purchase intention of plumbing and maintenance services using a conclusive research design via descriptive research and cross-sectional design.

3.2 POPULATION AND SAMPLING

Population is understood as a group of people living the same specific life and mixing in a given territory (Tarsi, 2012). From research perspectives, the intervention's target population is the group of people with whom it plans to conduct research and develop conclusions (Barnsbee at al., 2018). Thus, the study's target population can be the retail stores, residential homes, restaurants and grocery, public and private institutions, warehouses, offices, and hotels. Delice (2010) suggested that a sample size of greater than 50 is recommended for survey research and is regarded an appropriate level while doing research. Based on (Mumtaz et al., 2020) a carefully selected small sample (150 and above) is more meaningful tan a blindly selected large sample (300 and aboove). Therefore, the study's sample size for this study is 150 people. Furthermore, the non-probability sampling methodology, also known as the purposive sample technique, will be used in this investigation because due to the criteria of selecting the respondents.

3.3 RESEARCH INSTRUMENT

This study adopts quantitative methods and uses a questionnaire survey tool to collect the main data of online respondents in a Google form format. The questionnaire includes 2 sections, specifically Section A (demographic profile), and Section B (marketing mix to increase purchase intention of plumbing and maintenance service. Section A ccontains six questions about the demographic characteristics of the respondents, such as gender, age, educational level, occupational status, income level, and type of property. Section B consist of 14 questions related to respondents' views of 4P of the marketing mix: product, price, location and promotion on purchase intention of plumbing and maintenance service.

These items are adapted from previous study (Saaty & Ansari, 2011). The objective of this measure is to investigate the impact of 4P marketing mix on consumers' purchasing intentions. The 5-point Likert scale is used in section B of the questionnaire, ranging from 1 (strongly disagree, 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree) using Statistical Package for the Social Science (SPPSS) for processing and analysis Information.

4.0 EXPECTED FINDINGS

The study is expected to confirm i) the relationship between product factor and purchase intention, ii) the relationship between pricing strategy and purchase intention, iii) the relationship between place and purchase intention, iv) the relationship between promotion and purchase intention. This study is important to services industry. This study provides services industry including Azman Bin Ahmad with a greater insights of marketing strategy towards the businesses. This means that the company can make the marketing strategies improvement of the services to achieve the customer expectation on the services industry which in turn can influence their intention to purchase the services. Besides, this study also provides a deeper insight to marketers about the customer needs and wants towards the services industry. So, the strategic marketing mix plan can fulfil customer expectation about the services. In addition, this research study can help the service industry in formulating and executing unique marketing plans and strategies to achieve the competitive advantages. Following the findings of this research study, marketers can focus on the key factors that motivate customers towards purchase intention.

5.0 CONCLUSION

This study contributes to the marketing plan development for service industry by providing key factors that increase consumers' willingness to purchase the services. Companies could focus on the target market to attract their customer attention using marketing mix and purchase intention. Besides, through the findings of the marketing mix and purchasing intention, the service company can design effective marketing plan to generate more new customers since the users of media social is increasing in this era. Lastly, this study can be helpful to other business professionals in the service industry and other industries through the use of marketing mix for increased purchase intention.

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FACTORS INFLUENCING CUSTOMER SATISFACTION: CASE STUDY OF ONE COSMETICS BRAND IN MALAYSIA

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ABSTRACT

The buying and selling process has shifted dramatically from conventional (physical) to online purchasing in the present technological environment. Furthermore, the traditional trading method has been rendered obsolete by the COVID-19 epidemic. Customer satisfaction has risen to the top of the priority list when it comes to online purchases. Therefore, this study was conducted to measure customers' satisfaction level of cosmetics brand XYZ based on four factors: shopping online experiences, external incentives, sellers' or customer service, security, and privacy. Multiple regression analysis was applied to identify the factors influencing customers' satisfaction levels. A total of 118 respondents participated based on the sample size determination from Cohen Table. Purposive sampling was employed in this study and the investigation was limited by the number of respondents who only purchased online from cosmetics brand XYZ. Statistical Package for Social Science and Multiple Regression Analysis showed that online shopping experiences seller or customer services, security, and privacy were significantly associated with customers' satisfaction towards cosmetics brand XYZ. Customers' satisfaction was not affected by external incentives.

Keywords: Online shopping experiences, seller or customer services, external incentive and security and privacy.

1.0 INTRODUCTION

In the era of globalization, all types of transactions can be completed online. Online transactions are now gaining a place in the hearts of consumers. Customers' changing busy lifestyles have led them to prefer internet purchasing to traditional buying [15]. Online shopping is an exceptional development in the field of electronic commerce, and it will undoubtedly become the next big thing.

Online or e-commerce businesses are gaining popularity and overwhelming response from the community in this era. The government and businesses are also developing the online business industry and providing numerous allocations to increase its usage. Among the popular online businesses for Malaysians include Lazada, Shopee, Zalora. According to [28], almost 47% of consumers in Malaysia are turning to the online method as the most frequently used channel to purchase goods.

1.1 Problem Statement

Internet shopping is increasingly gaining favour among society's members with the rise of digitisation. Consumers making online are unable to handle the object in their hands or inspect it, thereby leading to which may lead to a lack of trust in the item's condition [1]. Furthermore, some internet merchants employ images that differ from the actual appearance of the item being offered [22]. Customers who have been duped are unlikely to trust Internet vendors. Besides, internet users avoid online purchasing due to credit card theft, loss of privacy, non-delivery risk, and a lack of assurance of the quality of products and services. These events highlight the advantages and disadvantages of online purchasing [11].

2.0 LITERATURE REVIEW

2.1 Customer Satisfaction

Customer satisfaction, according to [14], is a person's emotional response upon comparing the performance of a purchased product with the customers' expectations. Consumer satisfaction results from a comparison of expectations and experience. In other words, consumers are satisfied when the delivery matches or surpasses their expectations [25]. According to [16], customer satisfaction is a crucial factor that can affect the company's sales. Meanwhile, [4] assumed that customer satisfaction affects future purchase intentions and behaviour, leading to increased sales and profitability.

2.2 Online Shopping Experiences

The expanding importance of digital environments in retail and customer behaviour necessitates a thorough grasp of online experiences. According to [20], online customers' experience is a psychological condition that consists of a cognitive and emotional sensory experience expressed as a subjective reaction to the website. Furthermore, customers who are happy with prior encounters have more self-efficacy [8]. [24] posited that the actual experience is more important than memories of previous encounters when customers purchase online.

2.3 External Incentives

According to [19], external incentives include price, promotion, product attributes, quality, brands, and source of opinion. Customers are motivated to acquire a product or service for a variety of reasons, one of which is the seller's intense or promotional offer. Customers prefer to buy from businesses that provide the product as soon as possible, rather than from stores that postpone their purchases [27]. Furthermore, an external incentive such as a price reduction could be used as a better marketing strategy, which may impact consumers' satisfaction. [26] argued that customers will be attracted to select a business with a more appealing marketing approach.

2.4 Seller or Customer Services

The services that accompany the purchase of a product might be of significant value to the customer. Services can be used by customers to assist them in determining which goods to buy. Factors relating to seller or customer service include ordering, payment method, delivery, guarantee, website design, and service. According to [2], customer service refers to the degree of service and return handling/return policies provided during and after the sale. Customer service is a set of actions that includes customer assistance systems, complaint processing, complaint speed, complaint convenience, and complaint friendliness [13].

2.5 Security and Privacy

Security and privacy can be described as the security of credit card payments from customer purchasing transactions [16]. Customers' confidence in security and privacy should be increased in situations when online firms conduct advertising and purchasing transactions through websites. Customers' perceptions of a seller's ability to protect a consumer's pre-purchase choice are referred to as "privacy" [12]. Security may be defined as a sort of security that assures customer safety while also preventing hackers from violating privacy [7].

2.6 Research Framework

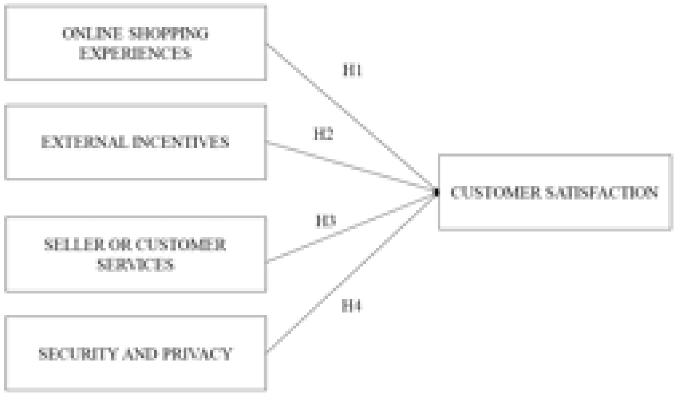

Fig. 2.1: Five-Construct Theoretical Model of Customer Satisfaction

3.0 METHODOLOGY

[5] described research design as a plan that includes data collection methodologies, research instruments, and data analysis in line with the research question. A descriptive and cross-sectional design was employed in this study. Based on the research objective, the quantitative research method was deemed appropriate for this investigation. Specifically, the research methodology assists the researcher to determine the association between online shopping experiences, external incentives, seller or customer service, security and privacy, and customer satisfaction.

4.0 RESULTS AND DISCUSSION

Table 4.1 shows the multiple regression analysis. R2 indicates the percentage of variation in the dependent variable. The results of multiple regression analysis revealed that the value of r was 0.686, meaning that 68.60% of the variation that exists in customer satisfaction can be explained by all the four variables, namely, online shopping experience, external incentives, seller or customer service, security and privacy. The remaining 31.40% were influenced by other factors that were not studied by the researcher. The ANOVA results present in Table 4.2 indicate a value of $F(4,126) = 66.241$ with a p-value of 0.000, which is less than $\alpha = 0.001$. These statistical parameters reveal that at least one of the four independent variables: online shopping experience, external incentives, vendor or customer service, security and tested privacy, has a significant influence on customer satisfaction. The coefficients result in Table 4.3 depicts that only three independent variables (online shopping experience, security and privacy) had a significant association ($P < 0.001$) with customer satisfaction. Besides that, seller or customer service and security/privacy (IV) tested has a significant influence on customer satisfaction (DV) with a p-value of 0.001 and 0.009, which is smaller than the $\alpha = 0.05$. For the standardised beta, online shopping experiences (0.340), seller or customer services (0.326), security and privacy (0.180) had a positive effect on customer satisfaction with a positive β value ($p < 0.001$ and $p < 0.05$). This shows that customers' satisfaction with cosmetics brand XYZ will be enhanced following a positive increase in online shopping experiences, seller or customer services, security and privacy. Online shopping experiences (0.340) were more dominant than external incentives (0.090).

TABLE 4.1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.829[a]	0.686	0.676	0.34561

TABLE 4.2: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31.650	4	7.912	66.241	.000b

	Residual	14.453	121	0.119		
	Total	46.103	125			

TABLE 4.3: Coefficients

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.310	0.271		1.145	0.254
	Online Shopping Experiences	0.349	0.094	0.340	3.706	0.000
	External Incentives	0.092	0.080	0.090	1.156	0.250
	Seller or Customer Services	0.331	0.097	0.326	3.396	0.001
	Security and Privacy	0.184	0.069	0.180	2.662	0.009

5.0 DISCUSSION AND CONCLUSION

Based on the research findings, online shopping experience has the highest influence for customer satisfaction for cosmetics brand XYZ. Hence, the cosmetics brands should improve among others based on the feedback by providing detailed and comprehensive product information. Products are intangible in an internet buying environment. Customers are unable to touch, taste, see, smell, or customarily hear the items. Hence their customers may only rely on the photographs and descriptions of the items on the websites to determine the quality and usefulness of a commodity. The cosmetics brand XYZ uses Shopee to sell their products. It is an advantage for the company because the Shopee platform is very customer-friendly. In order to enhance customer satisfaction, they should also provide more free shipping for customers who buy their products on Shopee. According to [3], free delivery is successful than a similar amount of discount in luring customers. Offering free delivery demonstrates a genuine concern for consumers' experience, even while they pay for their purchases [18]. It can attract more customers from different genders because everyone is more likely to buy more if the seller gives free shipping options.

According to [17], the most frequently used tool for attracting consumers and enhancing sales performance is price promotion. However, the current research does not support this. This implies that for cosmetics brand XYZ, external incentives in terms of promotion were not the major determination for customer satisfaction. Other incentives might be more relevant to the customers. According to [6], other benefits through email marketing or social media marketing might appeal more as opposed to incentives.

Furthermore, good customer service leads to repeat sales and loyal customers. In order to increase customer satisfaction through sales or customer service, they may need to consider a self-service system. Self-service refers to a customer's capacity to handle their difficulties and wants without having to contact customer care [23]. Customers of cosmetic brand XYZ can use the self-service to ask anything about skincare, cosmetics and skincare tips of the company’s products. Besides, online sellers should give customers more contact options to boost their pre-sale services [10]. Cosmetics brand XYZ need to have more contact on social networks, such as Facebook, Instagram, Tik Tok, and Twitter. Customers can stay in touch more easily if they provide their contact information, facilitated either by the drop shipper or the agent.

The protection given by an online vendor to an online customer is known as security. Examples include personal data protection or user authentication protection [9]. Without security, online shoppers will be hesitant to make purchases on that site. Meanwhile, consumers will feel safe and satisfied if there is enough security. Cosmetics brand XYZ need to maintain their sales platform, Shopee, to make customers more comfortable and satisfied using this platform. According to [21], consumer satisfaction with security will improve if they choose a platform that already has a more trustworthy security mechanism.

5.1 Limitation and Recommendations for Future Researcher

The researchers faced some limitations in executing this study. First, the researcher's difficulty in determining whether the respondent purchased cosmetics brand XYZ products online. Second, the respondent's behaviour as some of them thought answering this questionnaire was time-wasting. However, due to Covid-19, the face-to-face method is restricted. Additionally, a few participants did not answer the questions honestly, resulting in inaccurate data. Finally, the scope of this study is too small due to limited time and budget, but sufficient statistically.

Some recommendations are presented in this study to improve future research. First, the study only focused on Malaysia and could be considered as the foundation for future research that can be expanded to an international scale. For instance, neighbouring countries such as Indonesia can be included in future studies to elucidate the data pattern as cosmetics brand XYZ's product is available. Diverse demographics and socio-economic factors may influence the acceptance of the technology and outcomes in different countries. Second, only 118 respondents participated in this research, thus reducing the generalisability of the results. Therefore, researchers need to increase the number of respondents to improve the reliability and accuracy of the data. Finally, more qualifying questions need to be added to obtain more accurate data on customer satisfaction towards cosmetics brand XYZ

5.2 Conclusion of the Study

This study determined the influence of online shopping experiences, external incentives, seller or customer service, security and privacy on customers' satisfaction, utilizing cosmetics brand XYZ as the study site. The factors impacting significantly on customers' satisfaction included online shopping experiences, seller or customer service, security and privacy. The higher the aforementioned value, the higher the customer satisfaction.

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FACTORS INFLUENCING CUSTOMER LOYALTY OF MOBILE ELECTRONICS STORES: CASE STUDY OF ONLY U MOBILE ENTERPRISE

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ABSTRACT

Nowadays, mobile electronics store has experienced a tremendous expansion due to the rapid changing technology in recent year. The expansion of mobile electronics store will bring the tough competition in today's business and it is the basic requirement for companies to build and maintain strong relationship with the customers to achieve their loyalty to against customer shifting to other companies. That's why customer relationship marketing becomes more important nowadays. The aim of this study is to investigate the factors influencing customer loyalty of mobile electronics stores. This study adopted the quantitative research approach through google form questionnaire to gather data from the respondents. The target population for this study is a least 120 respondents. The sampling technique in this study used the non-probability sampling technique, which refers to purposive sampling. All the collected data will analyze using SPSS software. Expected findings for this research is to confirm the CRM strategies will improve the customer loyalty. In conclusion, the findings are expected to increase the level of customer loyalty in mobile electronics stores.

Keywords: customer loyalty, store environment, service quality, price

1.0INTRODUCTION

The telecommunications industry is made up of cable companies, internet service providers, satellite companies and telephone companies. Telecommunications is defined as communicating over a distance (Corporate Finance Institute, 2020). Communication is a process in which information is transferred from source to destination. Information can be in any form e.g Voice, Data, Video, Graphics etc. Voice communication is the simplest mode of communication. People also use facial expressions and body language to communicate with each other.

Only U Mobile Enterprise is a small and medium enterprises business. The enterprise operates in the mobile electronics stores industry. It was registered under the name of the owner, Tan Kai Chuan. Only U Mobile Enterprise was established in 2014 and it operating in Malaysia located at Pt 4953, Jalan Tampin, 73400 Gemas, Negeri Sembilan. Products that included under the company are smart phone, camcorders, and phone accessories for leading global brands. Besides from those products, Only U Mobile Enterprise also has offer some services such as top up services and repair services. Some of our well-known brands are: Samsung, Huawei, Oppo, Mi, Honor and others brands are available at Only U Mobile Enterprise.

Only U Mobile Enterprise is fully managed by Mr. Tan and his wife Mrs. Masuin only because it is a very small store layout. Mr.Tan and his wife live at Bahau, Negeri Sembilan which is probably around 40km distance or 41 minutes from his house to his business location, Gemas, Negeri Sembilan. The business operation time is from 3pm until 10pm every day including the public holiday as well. Mr.Tan operate his business on 3pm is because his child back from school at 1pm so he need to pick up his child from school before going to work.

Mr.Tan has set the vision of the Only U Mobile Enterprise which is to connecting people, businesses and communities to a better future through electronic product. While the mission of the company is to become the first choose mobile electronics stores for the Gemas villagers. The future goals of Only U Mobile Enterprise is to open a branch located at Bahau which is nearly with his house and also launch an online stores.

1.1 Problem Statement

In today's competitive market, customer loyalty has become a major concern of company. In the mobile electronics stores, customers are able to choose among multiple service providers and actively exercise their rights of switching from one service provider to another. Companies with more loyal customers consistently tend to report better results in terms of profitability. Loyal customers not only increase the value of the company but they also enable it to maintain costs lower than those associated with attracting new customers (Boora and Singh, 2011). In order to offer better services and gain competitive advantage, operators have to understand the customer satisfaction and customer loyalty so as to provide better services to customers.
When companies provider similar products, it's tough to build a strong consumer base. In this case, the only thing which is helpful in retaining and attracting customer is to develop strong relationship with customers. The purpose of this study is to determine the effect of customer relationship management strategies toward customer loyalty.

1.2 Research Questions

This study listed 3 main research questions:

i. What are the factors influencing customer loyalty of mobile electronics stores?
ii. What is the most important factor influencing customer loyalty of mobile electronics stores?
iii. Will CRM strategies improve the level of customer loyalty of mobile electronics stores?

1.3 Research Objectives

This study listed 3 main objectives:

i. To examine the factors influencing customer loyalty of mobile electronics stores.
ii. To investigate the most important factor influencing customer loyalty of mobile electronics stores.
iii. To explore whether CRM strategies improve the level of customer loyalty of mobile electronics stores.

2.0 LITERATURE REVIEW

2.1 Customer Loyalty

Nowadays, customer loyalty has received much consideration and attention in the business environment. The traditional role of the marketing has been to win customers. No emphasis was on retaining customers. Most of the companies lose their customers before or at the time of repurchase decision, mainly due to poor service. It proves that there are high number of customers who are not loyal to the company and searching for better options. Johnson and Gustafsson (2006) claimed that over the past two decades, many companies have moved sequentially from focusing on quality to focusing on customer satisfaction and then on customer loyalty as a panacea of the day. Mei-Lien and Green (2010) defined customer loyalty as a deep-held commitment to rebuy or re-patronize a preferred product in the future despite situational influence and marketing efforts having the potential to cause switching behaviour and recommending the product to friends and associates. Customer loyalty is a positive or negative attitude of the customer toward the company and its products and services. It is considered important because the loyal customer will contribute to company in long-range. Therefore, customer loyalty is basically related to provider's ability to retain customers and persuade them to recommend its products and services to potential customers.

2.2 Customer Relationship Management (CRM)

CRM is a technique that can help build long-term relationships with the customers and increase profits through efficient management systems and the application of customer-focused strategies. Customer relationship management is a customer oriented marketing effort which is responsible for accumulating and managing customer details in order to serve the customers in the present and future. CRM is a strategic marketing process whose purpose is to predict, understand and manage the demand of customers.

2.3 Store Environment

Store environment is a critical aspect of marketing and refers to the physical environment of a store, such as the music, lighting, store layout and arrangement of merchandise (Hu & Jasper 2006; Wang & Ha 2011). Baker (1986) believed that the layout of the store environment could generate exclusive emotional impact on customers which increase the chances to purchase more. According to him there are three categories which constitute environmental factors. These factors are; ambient cues, design cues and social cues. Ambient cues are the elements in the environment that influence customer's mood such as temperature, music and light etc. Design cues are visible elements that attract customers such as style, layout and architecture etc. Social cues are interaction related with customer and employee which have a significant effect of customer perceptions of the store. The researcher believe that consumers will look to the store environment such as music, temperature and lighting. Therefore, the researcher hypothesizes:

H1: There is significant relationship between store environment and customer loyalty on mobile electronics stores.

2.4 Service Quality

Kotler (2008) defines a service as any performance or action that either party can offer to the other party, which is essentially intangible and does not result in any ownership. Services can be attributed to physical products, but can also not associated with physical product. Quality can be defined as suitability of the product for use, or the degree to which a product effectively serve consumer needs (Beverly et al., 2002). Service quality mean a set of behaviors, characteristics, and techniques used to meet and satisfy customers' needs, desires, priorities, and preferences. Service quality refers to an overall impression of the judgement made by the customer concerning the service provided by a company (Hussain et al., 2015; Wang, 2010). Relying on explanation given above, researcher hypothesize:

H2: There is significant relationship between service quality and customer loyalty on mobile electronics stores.

2.5 Price

Among marketing mix elements, price is considered the most flexible element because it changes rapidly when the characteristics of product is changed (Dovaliene & Virvilaite, 2008). Price is an important component of a product, because it will affect company profit. Price is also a consideration of consumers to buy, so it needs special considerations for determining that price. According to Kotler and Keller (2006), price is the amount of money a buyer pays to a seller in exchange for a good or service. In addition, the price can be interpreted a number of money (plus a few items that may be) required to get the number of combinations of goods along with services (Swastha and Irawan, 2005). Prices are also defined amount of money charged or imposed on a product or service (Simamora, 2003). When customers want to choose mobile electronics stores, they basically will consider the price with other shop. Therefore, following hypothesis was generated:

H3: There is significant relationship between price and customer loyalty on mobile electronics stores.

Figure 1. Research Framework

3.0 RESEARCH METHODOLOGY

3.1 Research Design

Research design is an action plan or a blueprint to conduct a study that provides details of each step of obtaining the information required by the structure and resolves the management decision issue (Malhotra, 2012). Conclusive research is performed to provide better information that arrives at the conclusion or the decision-making process. The two categories in conclusive research are descriptive and casual studies. The descriptive research method was adopted in this study because the findings provide a systematic description that is almost accurate and represents the groups. A large number of representative sample were used to collect the study data. The gathered data were analysed using the statistical technique. With the adoption of cross-sectional design, the selected group of respondents answered the questionnaire only once, as it reflects one-time collection of information.

3.2 Population and Sampling

Population is known as a gathering of objects that own information that the researcher would like to seeks. The same common characteristic can be defined by choosing the target population related to the research problem. Sample is defined as the number of components that can be included in the research study. The following calculation was made to identify the most suitable sample size for the Malaysian population. According to Tabachnick and Fidell (2007), five-to-one ratio determines the minimum size from the number of variables to be tested. As such, 120 respondents was required for this study.

3.3 Sampling Technique

This study used the non-probability sampling technique, which refers to purposive sampling. Purposive sampling is a form of non-probability sampling where the selection of population elements relies on the researchers' personal judgment. With purposive sampling, samples are selectively chosen based on the characteristics of a population. Hence, the respondents in this study were users with experience at Only U Mobile Enterprise.

3.4 Research Instrument

The instrument was adapted from numerous constructs of literature as references from previous research were modified to suit this study, as well as to ensure the reliability and validity of items. The variables were assessed by using questionnaires that were disseminated via Google Form to first-hand sources (primary data). The questionnaire comprised of three sections; Sections A to C. Respondents are required to answer all questions in Section A, Section B and Section C. Section A, respondent need to fill the details on demographic question that comprising gender, age, ethnicity, monthly income level and frequency of visiting mobile electronics store in a month. While Section B indicates the three factors of independent variable (store environment, service quality, price) which Section C, the questions are related to dependent variable (customer loyalty). Section B and C measured by 5-point Likert Scale, Respondent will be answered by 1 to 5 where is “1” represents strongly disagree and “5” represents strongly agree. Respondent are obliged to complete all the questions. The questionnaire was adopted from prior studies to ensure reliability and validity.

4.0 EXPECTED FINDINGS

The study is expected to confirm i) the relationship between customer relationship management strategies of store environment and customer loyalty, ii) the relationship between customer relationship management strategies of service quality and customer loyalty and iii) the relationship between customer relationship management strategies of price and customer loyalty. This study is important to mobile electronics stores. This study provides Only U Mobile Enterprise with a better undersatnding in terms of key factors and can increase the level of customer loyalty. This mean that Only U Mobile Enterprise can adjust their customer relationship management strategies to increase the level of customer loyalty. Besides, this study also provides a deeper insight to Only U Mobile Enterprise about the effectiveness of implemented CRM strategies that can increase the level of customer loyalty. In this study, researcher will identify the factor that cause Only U Mobile Enterprise to have higher level of customer loyalty and provide a best solution to solve the problem that Only U Mobile Enterprise facing now.

5.0 CONCLUSION

This research had investigated the factors that influenced customer loyalty of mobile electronics stores. It highlights the methods and hypotheses that addressed the problem statement and fulfilled the study objectives. By understanding the factors that are influencing customer loyalty towards mobile electronics stores, companies may offer the right strategies of customer relationship management to their customers and gain competitive advantage over other mobile electronics stores. The results from this study encourage other researchers to look into the factors that influences the customer loyalty while they face the customer loyalty problem.

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SOCIAL MEDIA MARKETING STRATEGIES TO INCREASE PURCHASE INTENTION OF A KINDERGARTEN

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ABSTRACT

Businesses nowadays are facing competitive dynamics. Kindergarten is also facing the problem of decreasing purchase intention, especially during this Covid-19 pandemic. Thus, digitalization is an integral part to increase businesses' online presence. This study aims to explore what are the factors and social media marketing efforts that could be used to increase the purchase intention of a kindergarten. A research framework is developed to identify the relationship between the social media marketing element (entertainment and interaction), trust, perceived value and purchase intention. This study uses a quantitative sampling method with respondents of 200. A set of online questionnaires is distributed to parents of kids from 3 to 6 years old. This study is expected to discover the key determinants of purchase intention for a kindergarten. From the findings, this study proposes kindergartens to adopt social media marketing in their future marketing plan as entertaining content and interaction on social media are able to build trust and perceived value among the consumers. With trust and perceived value well developed, consumers' purchase intention will be enhanced.

Keywords: Social Media Marketing, Trust, Perceived Value, Purchase Intention

1.0 INTRODUCTION

On March 11, 2020, the World Health Organization (WHO) designated Covid-19 a pandemic and proclaimed it a current threat to mankind [1]. This declaration has directly led to forced lockdown enforcement in many countries. Many industries including preschool services were forced to close their business temporarily. Preschool is a formal education that serves as an early childhood education for children before they undergo compulsory education at primary school. The primary goal of preschools is to promote the acquisition of fundamental skills such as socialization and personality development. This is an important step for children in preparing for their primary schooling.

However, the temporary closure of kindergarten has brought some difficulties for parents while choosing a kindergarten. Parents will consider class size, quality of instruction and student-teacher relationship when choosing a kindergarten [2]. In addition, it was proved that parents will normally investigate the school environment before they choose a kindergarten for their children [3]. However, due to Covid-19, parents are restricted to visit the kindergarten as all movement is subject to strict compliance with standard operating procedures (SOP) [4]. The restriction had limited parents from the visiting. Hence, parents must find other alternatives to replace face-to-face visits.

Due to these critical situations, businesses need to pay attention to their social media communication to increase business competitiveness and consumers' purchase intention [5]. Social media provides a platform for two-way communication between firms and customers [6]. Nowadays, social media has become the current trend in creating new business opportunities and generating new business [7]. Hence, it is a great way to increase consumers' purchase intention [8]. It was highlighted by previous study that good content marketing on social media can create brand awareness [9]. Therefore, businesses should grab these opportunities to increase their online presence and attract more customers.

The number of preschools like kindergarten is growing and the competition among them to increase the number of students is increasing significantly. To increase trust and perceived value, social media marketing can be a powerful tool for kindergartens. With an effective social media marketing plan, a kindergarten could be able to deliver useful information to their potential customers. The entertaining and engaging content on social media enable trust building and increase the potential customers' perceived value towards their services, likewise their consumer's purchase intention.

1.1 Problem Statement

Kindergarten is a place that provides preschool services. It is normally providing quality education to children aged 4-6 years. The instruction medium of a kindergarten can range from Bahasa Malaysia, Chinese, Tamil to English. Nowadays, kindergartens are commonly facing a few problems. First, kindergarten has a limited business background available online. When searching the kindergarten on Google, there will be no, or limited information shown such as operating hours, courses available, kindergarten environment and surroundings, student and parent. The communication way had been shifted due to the rapid adoption of social media technologies [10]. Social media is a current trend in getting information. Without information online for people as a reference, the kindergarten might lose part of its potential customers.

Another issue of the kindergarten is limited social media appearance. Most kindergartens possess a social media page but with limited business information available. For example, no complete details on address, phone number, website or operating hours. This makes it hard for people who are interested in this kindergarten to contact them. Thus far, those social media pages are mostly with limited page reviews. Social network comments and reviews determine consumers' purchasing decisions [11]. Hence, the limited online rating on the social media page will decrease the consumers' purchase intention.

Due to the marketing issues faced by the kindergarten, firstly, this study examines the critical factors to drive the purchase intention of a preschool service. Secondly, the study proposes social media strategies for the kindergarten to use its Facebook page actively. According to previous study, social media provides users with entertaining content and enables interaction between consumers and businesses [12]. With the adaptation of social media, kindergarten can provide more useful business information online and hence increase the consumers' purchase intention. The use of social media is an important step for kindergarten, especially during the Covid-19 pandemics.

1.2 Research Framework Model

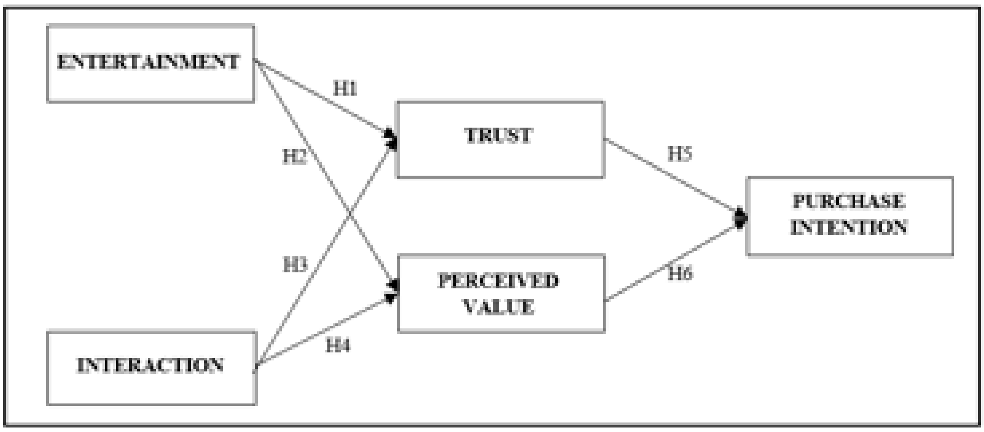

Fig. 1: Research Framework

The variables in the framework were adopted from Moslehpour et al. (2021) who highlighted the social media trust and perceived value in consumers and will lead to the purchase intention.

1.3 Research Objectives

The main objectives of this study are:
RO1: To examine the factors that could increase the purchase intention of a preschool service.
RO2: To implement the possible social media marketing efforts that could increase the purchase intention of the kindergarten.
RO3: To measure the effectiveness of the social media marketing efforts to increase the purchase intention of the kindergarten.

2.0 LITERATURE REVIEW

2.1 Purchase Intention

Purchase intention refers to the customers' willingness and desire in deciding to buy a product [13]. It is closely related to the consumers' interest to act on a product or brand [14]. Hence, purchase intention is related to a person's motive and the probability of purchasing a particular product [15]. According to [16] and [17], social media can mediate consumers' purchase intentions. It was proved that the increasing usage of social media worldwide is supporting a better consumer-brand engagement and hence led to the increment of consumers' purchase intention [19].

2.2 Trust

Trust is defined as the faith of a consumer that the seller will react according to their expectations [19]. Trust is closely related to an individual, team or organization's willingness to depend on others when they come across opportunities and risks [20]. Trust is crucial for the consumer to counter uncertain situations [21]. The research has also proved that trust is able to encourage future purchase intentions. Previous research proved that trust can be built by providing information and offering a communication platform to the target audience [22]. Hence, a business needs to provide sufficiently useful information and make it visible to the public.

Thus, trust plays a vital role in the online environment. The element of trust should be present on a kindergarten social media page. The researcher suggests that kindergarten should provide more useful information about the business on social media to increase consumers' trust toward the business. For example, they can deliver their website, contact number, address and their business background to their audience on social media. Moreover, the preschool curricular structure could also be informed on their social media page.

2.3 Perceived Value

Perceived value as consumers' preference and evaluation of brand features that help them in accomplishing their purposes [23]. Besides, perceived value is also defined as customers' overall evaluation of a product or service [24]. Perceived value results from the consumers' perceived benefits [12]. It was proved that consumers' perceived value is influenced by their perceived benefits and perceived risk towards a product or service [25]. Consumers tend to buy the products or services that increase their value perception hence it is important to increase consumers' perceived value.

A kindergarten needs to focus on delivering its business strength on social media. For example, they could deliver the benefits they can bring either in monetary or non-monetary aspects. With this, the potential customers can find out the value brought by their business and increase the level of satisfaction towards a kindergarten. This may further lead to a higher purchasing intention among them.

2.4 Entertainment

Entertainment is defined as the level of enjoyment that can be provided by stimuli [26]. Customers tend to pay more attention to social media advertisements that are creative and attractive [27]. It was found that advertising on social media is able to satisfy consumers' hedonic needs by offering pleasure, emotional release, diversion and enjoyment [28]. Entertainment content is able to make users feel more enjoyable and pleasure than other media content [29]. A study had found that entertainment is an important influencing criterion for users to continue social media browsing intention [30].

Entertaining content needs to be used by a kindergarten in order to grab their potential customers' attention. Therefore, advertising on a kindergarten social media site has to attract parents by posting more entertaining, interesting and enjoyable content. For example, they can post videos and photos regarding activities done online or offline with the children to boost the potential customer understanding towards the kindergarten.

2.5 Interaction

Interaction of social network sites refers to platforms that offer opportunities for two-way opinion exchange and information sharing [6]. Online social media platforms allow businesses to interact with their audience on specific product information [31]. Interaction on social media allows consumers to have a strong and positive brand knowledge [32]. With a deeper knowledge about a particular brand, consumers will have a stronger purchase intention. Previous study had mentioned that interaction enables the generation of useful information for a business to better promote their products or service and lead to a stronger purchase intention among the consumers [12]. A kindergarten should interact with its audience on social media frequently. Kindergarten can create more review platforms such as emoji voting to increase social media interaction. They could also encourage the existing parents to provide more feedback and comments on social media.

2.6 Hypotheses Development

2.6.1 Entertainment and Trust

Entertainment has a positive impact on consumer attitudes [33]. Entertainment can encourage consumers with positive feelings and emotions towards the brand [34]. A study had mentioned that businesses should adopt social media by creating entertaining posts to attract more audience and hence increase audiences trust towards the brand [35]. Entertainment is significantly associated with advertisement value. With a great advertisement value, consumers' trust level towards the product or service will be increased [36]. Therefore, the following hypothesis is presented:
Hypothesis 1: Entertainment has a significant and positive effect on trust.

2.6.2 Entertainment and Perceived Value

Entertainment has a positive and significant influence on the perceived value of advertising [28], [29]. Previous study proved that the greater consumers' level of enjoyment on social media, the greater the perceived value towards a product or service [31]. Entertainment content allows consumers to involve themselves in the brand and make them aware of the advertised product or service [34]. The study [29] further proved that entertainment brings a strong effect in increasing consumers' perceived value. Businesses that offer their customers entertainment content can build a foundation for strengthening the relationship and enhancing the perceived value [37]. Thus, this study posits:
Hypothesis 2: Entertainment has a significant and positive effect on perceived value.

2.6.3 Interaction and Trust

Interaction and exchange of feedback between customers enable the boost of confidence in the brand [38]. Quality brand-customer interaction on social media is able to increase consumers' trust [39]. In addition, online interaction is one major factor that influences the consumers' trust towards a particular brand [40]. Similarly, another study had proved that social network sites which provide the functions of comments and sending feedback are factors that bring trust to the consumers [41]. Frequent communications and idea exchanges among users will bring an increased level of trust [20]. Therefore, this study proposes the following hypothesis:
Hypothesis 3: Interaction has a significant and positive effect on trust.

2.6.4 Interaction and Perceived Value

Effective interaction on social media enhances consumers' satisfaction and eliminates consumers' unpleasant feelings towards the brand [42]. During the process of social interaction, the consumer's perceived value towards the brand will increase if there is more recognition gained from others about the brand [25]. A study had proved that the perceived value of online channels can be brought by frequent interaction among businesses and consumers [43]. Hence, frequent interaction on social media will lead to the increase of consumers' perceived value [39]. Thus, this study proposed a hypothesis as follows:
Hypothesis 4: Interaction has a significant and positive effect on perceived value.

2.6.5 Trust and Purchase Intention

Trust can directly influence customer purchase intention [44], [45]. Trust is significant to reinforce the relationship between customers and organizations [12]. Businesses that deliver accurate and suitable information on the site can build trust among the consumers and hence increase their purchase intention [31]. A study found that trust is a crucial criterion in any transaction especially when it involves social media [46].

A study further proved that trust can encourage future purchase intentions [21]. Hence, this study hypothesizes the following:
Hypothesis 5: Trust has a significant and positive effect on purchase intention.

2.6.6 Perceived Value and Purchase Intention

Perceived value is associated with the purchase intention, wherewith higher perceived value there will be higher purchase intention [47]. The perceived value indicates a consumer's perceived preference towards a product [23]. Consumers with higher levels of perceived values have a higher probability to be satisfied with the product or service [25]. Hence the purchase intention will be higher. The positive value bought by the social media website will positively and significantly affect consumers' purchase intention [31]. Thus, the following hypothesis is proposed:
Hypothesis 6: Perceived value has a significant and positive effect on purchase intention.

3.0 RESEARCH METHODOLOGY

3.1 Research Design

A research design is a framework or blueprint for conducting a marketing research project [48]. It specifies the essential procedures in gaining the required information to structure or solve marketing research problems. There are two key components in research design, which are exploratory research design and conclusive research design [49]. The major difference between these two research designs is the data analysis part [48]. In exploratory research design, the data analysis is qualitative while in the conclusive research design the data analysis is quantitative.

In this study, a conclusive research design is adopted to examine the relationship between social media marketing elements (entertainment and interaction), trust, perceived value and purchase intention. The main research design focus in this study will be descriptive research with a cross-sectional design.

3.2 Population and Sampling

The population can be defined as people or items which a researcher wishes to investigate [50]. Normally, a population in research is referred to as a set of people or items which share common and specific characteristics. The population of this study will be the parents who have children between ages 3 to 6 and have the intention to send them to kindergarten.

Sampling is the process of identifying a small group from the population for further investigation [50]. There are two types of sampling method which are probability and non-probability sampling [51]. Non-probability sample refers to an approach where the probability of each unit to be selected is not known. It was suggested that a sample size of 200 is considered as an appropriate number in conducting research [12]. Hence, the sample size of 200 is used in this study by the purposive sampling technique.

3.3 Research Instrument

The quantitative approach is adopted in this study to collect the primary data from the respondents. Questionnaires are distributed in Google Forms to the targeted respondents. The questionnaire consists of two sections: Section A and Section B. Section A consists of questions regarding the respondents' demographic profiles such as their age, gender, education level and employment. On the other hand, Section B examines respondents' opinions on the research variable. A five-point Likert scale is developed in Section B. All of the measurement items are adapted and adopted from a previous study [12]. After data collection, Statistical Package for the Social Sciences (SPSS) is used to process and analyze the collected data.

4.0 EXPECTED FINDINGS

This study is expected to enrich the understanding and confirm the relationship between social media marketing entertainment and interaction, trust, perceived value and purchase intention for a preschool perspective. It is believed that the adaptation of social media such as Facebook pages can enhance the purchase intention of the preschool service. This study also provides a deeper insight on the suitable content to be posted on their social media to increase their purchase intention for a kindergarten. The findings of this study also provide preschool service providers with the appropriate action and the proper implementation plan to be taken.

5.0 CONCLUSION

In conclusion, this study brings some contributions to preschool service providers to better understand ways to increase consumers' purchase intention. This study encourages businesses, especially preschool services providers to adopt social media in their marketing plan. It is shown that social media adaptation can build a stronger purchase intention among consumers. Thus, this study suggests preschool service providers take necessary action in order to survive in this competitive dynamic era.

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EFFECT OF REFERENCE PRICE TOWARD CUSTOMER PURCHASE INTENTION ON FROZEN FOOD: A CASE STUDY AT RESTAURANT VEGETARIAN S.I. JIN WEI

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ABSTRACT

Reference price is defined as the price assumption needed to pay by customers by referring to the actual price of the products. Reference price can be appeared in terms of internal (memory-based) or external (stimulus-based). Customers tend to act sensitively as the reference pricing can change their perception of its value. On the other hand, food prices increase faster than average inflation globally with the start of Covid-19 pandemic. Therefore, the price of a customer willing to pay for products and services is totally depends on its utility. In this study, researcher aims to examine the effect of reference price including price history, store visit history, customer characteristics, store environment and product category on customer purchase intention. Quantitative method was conducted by distributing 150 set of online questionnaires through Google Form. Target respondents are chosen from the individuals who have the buying experience on frozen food at Restaurant Vegetarian S.I. Jin Wei by using the purposive sampling technique. Researcher will convert all the data collected from respondents into SPSS computer software for data analysis to obtain the findings. To conclude, by knowing and understanding customer needs and wants well, it could lead to the business success.

Keywords: Reference price, Customer purchase intention

1.0 INTRODUCTION

Price is one of the most flexible elements in the marketing mix (Kemmer & Boden, 2013) especially for Restaurant Vegetarian S.I. Jin Wei in planning and selling their products to the final customers as well as retailers. It is a charge that must be paid by the customer in order to receive a product or service. Addition to that, price is one of the marketing variables which is the easiest part to change and copy by other competitors. Customers will seek for particular products or services to satisfy their needs and wants. Thus, customers will judge the value based on how much they are willing to spend and the price they are willing to pay to satisfy their needs and wants. Generally, customers are not willing to pay higher and want to pay as little as possible. Before making a purchase decision, customers will set their own price expectations towards certain products or services. Price expectations are always used as the reference points to compare the price. It is human nature to compare, judge the value based on the comparisons. Most of the customers will consider purchasing something if the price of the products or services matched with their perceived value.

Reference pricing is one of the ways that framing a price can change customer perception of its value. Reference price defines as the amount or value expected by customers to pay against the actual price of the product (Bruno, Hai & Dutta, 2012; Kopalle, Kannan, Boldt & Arora, 2012; Kumar 1998; Rajendran & Tellis 1994). There is an assumption that customers only rely on reference prices instead of the absolute price of the products or services (Kopalle, Kannan, Boldt & Arora, 2012; Thaler, 1985). Sometimes, reference prices also can come from the subconscious level and even the price of unrelated products in relation to affect customer perceived value towards the products and services. Reference prices can come from the internal part as well as the external part (Mayhew & Winer, 1992). A majority of researchers have assumed that internal reference price is based on memory for prices encountered by customers on previous observations, stored in customers' memory, recalled and reevaluated as occasions demand. Past experiences come out with the reasonable expectation on how much a product or service should cost. However, some customers may have little experience with certain products, especially in services where intangibility and heterogeneity make it difficult for the customer to judge the appropriate price. External reference price is formed at the point of purchase situation and it doesn't relate to customers' past information in memory. External references price can be influenced by the choice of environment and its product category. Some consumers may be sensitive to the drivers other than price, but it's true that price is one of the major variables that might influence customers' purchase decisions. This is because price information influences the perceived cost and perceived value of the products or services (Abrate et al., 2019; Bornemann and Homburg, 2011). Normally, customers will make their product choice by comparing the actual price of the product with the internal and external reference price.

During March 11, 2020, World Health Organization (WHO) declared the outbreak of coronavirus disease 2019 (Covid-19) as pandemic. At that moment, keep the pandemic under control and restrain the spread of the virus becoming the top international priority (Huang et al., 2020; Paules, Marston, & Fauci, 2020; Wang, Wang, et al., 2020). Covid-19 pandemic has changed human life. Many countries around the world adopted unprecedented enforcement to restrict public and stop the community spread. Today's companies have to confront an overwhelming, competitive and challenging environment. In response to the Covid-19 pandemic, the Malaysian government enforced a Movement Control Order (MCO). During MCO, a series of enforcement measures carried out by the government including close all government and private premises except for those essential services and announced travel bans on foreigners entering Malaysia and on Malaysians leaving the country even the restriction of movement within the country. All of these business sectors such as primary sector, secondary sector and tertiary sector have been threatened by this pandemic.

On the other hand, there was widespread panic among people due to the Covid-19 pandemic. Supply disruptions and the higher demand from customers stockpiling food, toilet paper, mask and hand sanitizer cause the price of these essential products to increase substantially. As a frozen food manufacturer with its products such as frozen fried mushroom and mushroom chop, it is unavoidable that Restaurant Vegetarian S.I. Jin Wei also faced the disruption of its raw material supply such as oil, raw mushrooms and fried chicken powder. Raw material shortage will definitely affect the manufacturing. The impacts from such disturbances may bring to high lead time, increase production cost, lower production level and even increase the product selling price. Furthermore, the Consumer Price Index (CPI) of food has increased faster than overall CPI in all regions of the world. Globally, food prices increase faster than average inflation with the start of a pandemic. Therefore, the price of a customer willing to pay for products and services depends on its utility. The total utility is defined as the aggregate amount of satisfaction gained by customers through the consumption of products or services. Total utility is associated with acquisition utility and transaction utility in consumption choice. Acquisition utility can be obtained by acquiring the product's need satisfying attributes at a given price. Meanwhile, transaction utility is the payoff of customers derived from realization that the purchase price is less than their reference price. Under stock-out situations in which consumers "have to" buy the product, they derive both acquisition utility and transaction utility from the purchase. When they have the option to wait (non stock-out), however, the emphasis placed on the acquisition utility will be lower, because they don't need to buy the product right away. In other words, the consumer's transaction utility under stock-out conditions will be less than under non stock-out conditions.

2.0 LITERATURE REVIEW

2.1 Frozen Food

Recently, frozen food and ready to cook food markets have been rapidly expanding and show significant growth in the market share. It comes from foods related to fish, meat, vegetables, seafood as well as snacks. Frozen snacks based products can refer to both fish and meat based snacks or vegetable based snacks including chicken nuggets, meatball, fish ball, fish cakes and spring roll (Arifeen, 2012). According to the NFRA, consumers nowadays changed their perception regarding frozen food. Due to the busy and hectic lifestyle, people are lacking time to prepare their food by themselves. That's why consumers' eating habits are different compared to previous times and they realized the value and convenience of frozen food for every meal occasion. Food preparation decision is totally influenced by the homemaker's time. The factors such as individuals' time, energy in acquisition, consumption and disposal must align with the conveniences and food consumption method. People appreciated time saving advantages of frozen processed food. Increasing the use of frozen food trends supported by the dietary consumption which has transformed from home-cooked to the use of frozen food brings to the growth of the frozen food industry (Euromonitor International, 2014).

2.2 Reference Pricing

Price perception of customers always being influence by reference price. Reference prices do usually come from competing products, thus it is important to enhance customers' perception on the product. The product will become more superior and more expensive products. The theoretical foundation of reference price is Kahneman's and Tversky's (1979) prospect theory and it includes reference dependence, loss aversion and sensitivity decrement in the theory. Previous research of (Kalyanaram and Winer, 1995) identified that the reference price comes from the product price of last purchase. Furthermore, customers will always use the reference price to make their choice of bands. Customers' choice presents loss aversion while under the influence of reference price. It shows that these characteristics are aligned with the basic characteristics of prospect theory.

Besides, there are many researchers presented that (Hardie et al., 1993; Mazumdar et al., 2005; Briesch et al., 1997) reference price can be divided in 2 parts named as internal reference price and external reference price. Internal reference price is based on the past memory and past purchase experience whereas the external reference price is triggered by the external environmental price incentives. There is a question that arises on which reference price acts significant in customer purchasing. In the study of Hardie et al. (1993), it portrays that the external reference price acts more significant than internal reference price. In contrast, Briesch and other researchers (1997) draw an opposite opinion from their study. Addition to that, according to Mazumdar's and Papatla's (2000), they identified that both internal and external reference prices have impact and it will be vary based on different market segments. For example, there are certain customers tend to be more sensitive to internal reference price while others may be more sensitive to external reference price.

The most commonly cited explanation for reference price is based on Helson's (1947, 1964) adaptation-level theory, which asserts that judgments are proportional to deviations from a comparison standard. The context of the adaptation level is quite sensitive presented by the mean of stimuli within a contextual set (Helson 1964; Wedell 1995). According to Helson's theory, it explains that there is a significant relationship between past experiences and an individual's judgement on the present day. Customers will take into account several criteria such as the reference points of previous judgments, mean of similar stimuli depending on the recency and salience. Thus, customers' past experiences and encounters related to stimuli will be the key drivers to determine the adaptation level. From the view of Monroe, 1990, customers will use the reference price to weigh average product prices from the relevant category.

2.3 Purchase Intention

Purchase intention can be defined as the consumers' preference or precedence to purchase a product or service. Addition to that, purchase intention also describes customers' evaluation towards a product or service to decide their willingness on whether to buy or not buy (Younus et al., 2015). Purchase intention is a process related to consumers' decision making which requires researchers to study about the reason why customers will purchase certain products or services according to the brand which they are more favorable. Purchase intention takes place when customers decide to buy certain product or service in a particular condition (Mirabi et al., 2015).

2.4 Hypothesis Development

2.4.1 Internal Reference Price: Price History

In Wenzel and Martin's (2011) research identified that price expectation and customer purchase intention are significantly influenced by trend, range and variance of past price. Price history involves the last price paid or "price image" that might influence how the customers act to the price change. For internal reference price customers, they will remember the past price and use that information to monitor the pricing environment and make the purchase decision based on their adaption-level. There is the direct relationship between changes of the environment and customers' behavior. This study predicts price history may influence internal reference price. Thus, this study posits:

***H1**: Price history will positively and significantly influence customer purchase intention.*

2.4.2 Internal Reference Price: Store Visit History

Effect of repetition takes place on the frequent visit to a particular store. Repetition tends to increase consumers' confidence in price knowledge and price information. Bell and Bucklin (1996) suggested that consumers' familiarity interact with store visits on a given trip or the store visit history of the consumer. The interactions of reference price effects are shown by the generally higher effects on the purchase probability more familiar than unfamiliar stores. Moreover, frequent buyers are more confident than infrequent buyers about their estimates of regular prices (Urbany and Dickson 1991), and they take less time than infrequent buyers to evaluate price (Dickson and Sawyer 1990). Repetition leads to greater confidence and has also found empirical support in the psychology literature (Dewhurst and Anderson 1999; Koriat 1993; Zaragoza and Mitchell 1996; also see Menon And Raghubir 2003). Internal reference price is a malleable construct that is sensitive to phenomenological experiences, thus it will be affected by this repetition-induced confidence. This study predicts store visit history may influence internal reference price. Thus, this study posits:

***H2**: Store visit history will positively and significantly influence customer purchase intention.*

2.4.3 Internal Reference Price: Customer Characteristics

Through Moon, Russell and Duvvuri's research (2006), consumers who have brand knowledge can access an associative network memory model held in the consumer's mind, which contains information linked to the deep memory about the brand and its meaning. This knowledge is conceptualized according to terms of two components: brand awareness and brand image. The higher the levels of brand awareness and brand image the higher the probability of brand choice and greater consumer loyalty. Brand loyalty is formed when favorable beliefs and attitudes for the brand are demonstrated in repeat buying behavior (Keller, 1993). This study predicts customer characteristics may influence internal reference price. Thus, this study posits:

***H3**: Customer characteristics will positively and significantly influence customer purchase intention.*

2.4.4 External Reference Price: Store Environment

Store environment is the most obvious frame which is related to customers' brand choice whereas other product prices displayed in store will be the reference price (Rajendran and Tellis, 1994). Reference price not just consists of the past prices but also product purchase frequency, store characteristics, and price trends (Briesch, Krishnamurthi & Mazumdar, 1997). In-store atmosphere is determined by the physical characteristics of a retail store or space utilization in creating an eye catching image to attract customers' attention and additional human senses such as sound and smell. A "pleasant" atmosphere triggered a customer buying mood in order to spend more money. This study predicts the store environment may influence external reference prices. Thus, this study posits:

***H4**: Store environment will positively and significantly influence customer purchase intention.*

2.4.5 External Reference Price: Product Category

A product able to bring both utilitarian and hedonic benefits (Hirschman and Holbrook, 1982). One of the sources of hedonic benefits came from the pleasure gained by individuals on the good taste of food. In contrast, utilitarian benefits (in this case, food) are linked to the instrumental functionality such as low price, low calorie content or high nutritional value. The products mostly seek to provide consumers with a combination of hedonic and utilitarian benefits. Customers tend to compare the price information of the brand they buy usually with the nutrition level, ingredients and way to serve before any consumers' decision making process. If the customers don't have any past price information or past experience, they are likely to use price information from other brands or product categories to form price expectations for a particular product (Jacobson and Obermiller, 1990). With the speed of changing human life, frozen food has become the more favourable choices among the individuals. This study predicts that the product category may influence external reference prices. Thus, this study posits:

***H5**: Product category will positively and significantly influence customer purchase intention.*

2.5 Research Framework

Figure 1 shows the relationship between price history, store visit history, customer characteristics on internal reference price and store environment, product category on external reference price towards customer purchase intention.

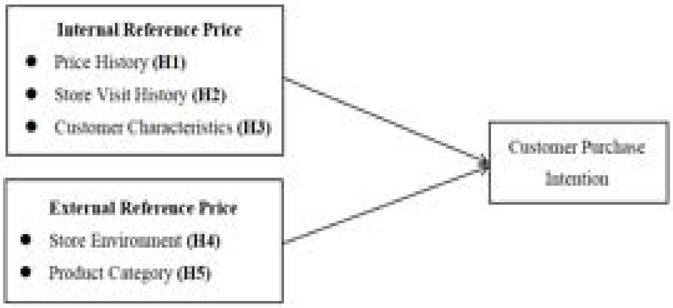

Figure 1: Research Framework

3.0 RESEARCH METHODOLOGY

3.1 Population and Sampling

According to Marczyk, DeMatteo, Festinger (2005), population defines as the individuals where the researchers would like to study. Sample size refers to the subset of the population to represent the population of a study. In this study, population refers to the customers of Restaurant Vegetarian S.I. Jin Wei. Besides, researcher adopted non-probability sampling by using purposive sampling technique to determine the sample. This study targeted the respondents who have the buying experience on frozen food at Restaurant Vegetarian S.I. Jin Wei. Hatcher (2014) sets minimum subject-to-item ratio of at least 5:1. The total items in demographic profile (8 items), independent variables (18 items) and dependent variables (4 items). The calculation of the sample size as below:

Total Number of Sample Size = Demographic + Dependent Variables + Independent Variables
= (8 x 5) + (4 x 5) + [(4 x 5) + (3 x 5) + (4 x 5) + (4 x 5) + (3 x 5)]

= 40 + 20 + 90

= 150 respondents

Based on the calculation of minimum subject-to-item ratio, it requires the sample size at least 150 respondents for this study. For the data collection, online questionnaires will be distributed to the targeted respondents through Google form.

3.2 Data Analysis Method

3.2.1 (Pre-test) Pilot Test

According to Whitehead et al., (2015), the pilot test can minimize early problems or errors as it could help researcher to refine and clarity the questionnaire. Browne (1995) also mentioned that at least 30 or more participants must be used to conduct the pilot test. Thus, researcher decide to distribute 30 set of questionnaires to the customers who have the buying experiences on frozen food at Restaurant Vegetarian S.I. Jin Wei through online questionnaire.

3.2.2 Normality Test

Sekaran and Bougie (2010) identified that a normality test is used to measure the score of each variable. To minimize redundancy, these scores should be normally distributed on the dependent variable scores expected. The normality test also includes the measurement of skewness and kurtosis and it is measured by SPSS technique. Hair et al. (2010) claimed that the data can be considered normal distributed if the p-value of each items is range between -2 to +2 for Skewness test and is between -7 to +7 for Kurtosis test.

3.2.3 Reliability

To ensure inter the item for each variables has consistence scale of measurement, reliability of the independent variables and dependent variable will be measured through Cronbach’s Alpha.

TABLE 1: Reliability for Pilot Test

VARIABLE	CONSTRUCT	CRONBACH’S ALPHA	NO. OF ITEM
IV 1	PH	0.816	4
IV 2	SVH	0.817	3
IV 3	CC	0.941	4
IV 4	SE	0.864	4
IV 5	PC	0.641	3
DV	CPI	0.948	4

Table 1 shows the reliability for pilot test through Cronbach’s Alpha between independent and dependent variables. A general accepted rule showed that the reliability values of 0.6 to 0.7 are acceptable and 0.8 and above is a very good level. (Ursachi, Horodnic & Zait, 2015). In this study, the value of Cronbach’s Alpha of independent and dependent variables are located between 0.641 to 0.948 which can be categorized as accepted reliability value and very good level of reliability value.

3.2.4 Descriptive Analysis

Respondents’ demographic profile data such as gender, age, ethnicity and monthly income and so on can be analyzed by using descriptive analysis methods. The summary of data can be presented in the form of a table, bar chart, histogram, pie chart, and so on for an easy explanation (Mellinger, 2016).

3.2.5 Multiple Regression

Multiple regression is significant to provide the findings between dependent variable (customer purchase intention) and independent variables (price history, store visit history, customer characteristics, store environment and product category). The main null hypothesis (H0) of a multiple regression is that there is no relationship between the X variables and the Y variables whereas the alternative hypothesis (H1) of a multiple regression is that there is the relationship between the X variables and the Y variables. Multiple regression may determine the overall fit of the model and the relative contribution of each independent variables to the total variance explained.

4.0 EXPECTED FINDINGS

The expected results could indicate that internal reference price includes price history, store visit history, customer characteristics and external reference price includes store environment and product category have positive and significance impact on customer purchase intention. Thus, all the hypothesis suggested are supported in this study.

5.0 CONCLUSION

Customers are the asset for all profit-making to the business, thus organization should manage them in a proper way. Since most of the customers tend to act sensitively to the price, thus business should offer the products or services which are able to maximize customers' needs and wants in various situation. In a way, build a strong customer relationship through good communication between sellers and buyers will be the essential part in attracting and retaining customers even generating business revenue. That's why researcher aims to study about the effect of reference price (internal reference price and external reference price) toward customer purchase intention.

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THE IMPLEMENTATION OF SOCIAL MEDIA INTERACTION TOWARD BRAND AWARENESS AND BRAND IMAGE FOR A PASTRY SHOP

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ABSTRACT

Covid-19 has wide range of effects on e-commerce, technology and the economy which has forced the retail stores in the country to close. Through the pandemic, the use of e-commerce and online retail applications had increased significantly. This trend has triggered social media to be an effective marketing channel in communicating brand-related information and stimulating brand engagement and brand knowledge among consumers. However, a traditional Chinese pastry shop is facing the problem of low brand awareness and brand image due to low social media interaction. Before designing a social marketing plan for a pastry shop, this study will examine the factors that influence brand awareness and brand image. Quantitative method will be conducted in this study by distributing surveys via Google form. The target population for the study is 165. This study is expected to provide deeper insight in social media interaction for the pastry shop to enhance their brand awareness and brand image.

Keywords: Social media interaction, brand awareness, brand engagement, brand image.

1.0 INTRODUCTION

Retailing involved business activities in selling products and services to consumers. Retail is the final step of distribution process from supplier to consumer [4]. In recent years, with the rise in prevalence of the Internet and smartphones, online retail has developed rapidly. Due to global pandemic (Covid-19), retail industry has faced significant change and online shopping has become more and more common and popular. During this pandemic, the usage of online retail platform and e-commerce had increased significantly. A retail survey showed that 22 million of Malaysians are digital consumers, and they spend 80% of their time online to make purchase decision [18]. Therefore, all large and small retail companies are adapting to this new trend by turning to e-commerce and e-business.

One of the common communication channels recently used by the retail sector is social media for their activities in marketing. Social media marketing (SMM) entails the creation and use of social media platforms to implement marketing strategies, deliver brand information and engaging relationships with customers [44], [41]. Therefore, social media marketing takes a part in affecting consumer's perception of company brand [29]. Several studies showed that social media interaction has a significant role to influence brand awareness and brand image [42], [17], [6]. Company use social media as a platform to connect and interact with brand information, such as sharing and updates content, collecting feedback, and access to preferences of consumer. All this method helps in managing relationships with customers and building customer brand engagement (CBE) and increasing brands awareness and brand image [10], [46].

Brand is a public-facing part of the business or organization. Therefore, it is important to consider what the customer thinks of it. Many companies do not take this into consideration, which may have negative consequences such as poor sales and weak growth [34]. This problem has happened in one of the well famous Chinese (Hokkien) traditional bakery shops in Batu Pahat for the past 80 years. Although the company is using social media to set up their brand awareness and brand image, but the frequency of interaction with their customer is low which has a substantial impact on brand awareness and brand image.

1.1 Problem Statement

Due to Covid-19, the shop has faced some challenges and the sales of their biscuit and cake are affected. One of the problems faced by the shop is they are lacking brand awareness in Malaysia and the problem leads the low sales on the Shopee platform. A positive brand image can have a significant impact on customers' purchasing intentions and lead to an effect in sales. Brand awareness may drive customers to further evaluate the product before they are considered to purchase [48]. Therefore, business organizations need to ensure that they communicate with the appropriate target market in promoting their brand awareness [8].

Most of the findings stated that social media interaction helps to build a brand and increases customer brand engagement [23], [9], [42]. In short, it is recommended that companies to use social media platforms to increase customer brand engagement and strengthen customer relationships [10], [11]. Since social media marketing is effective for a brand, this study will investigate the factors that drive the brand awareness and brand. Further, social marketing strategies are proposed for the shop to build their brand awareness and brand image.

1.2 Research Framework

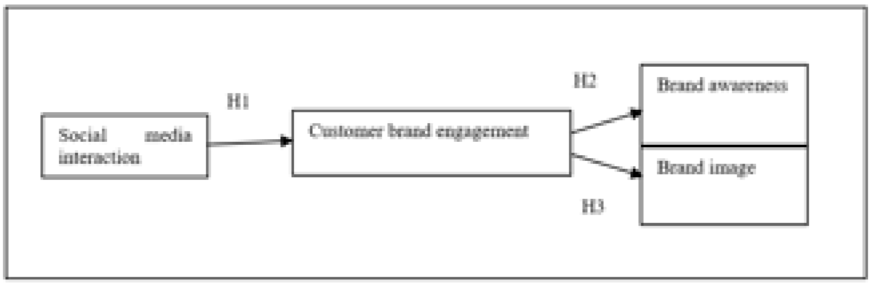

Fig. 1: Research framework for impact of social media interaction on consumer–brand engagement.

Figure 1 depicts the research framework of this study. The function is to examine the relationships between independent variables and dependent variables for business purposes. The framework of the variables in Figure 1 was adopted from [9] who highlighted the effect of social-media marketing elements, namely, interaction on consumer–brand engagement and brand knowledge.

1.3 Research Objectives

This study has posed three major research objectives:

RO1: To identify the factors that influence brand awareness and brand image of a pastry shop.

RO2: To design the social media marketing strategies that may increase the brand awareness and brand image of the pastry shop.

RO3: To examine the effectiveness of implemented marketing strategies that could increase the brand awareness and brand image of the pastry shop.

2.0 LITERATURE REVIEW

2.1 Brand Awareness

Brand awareness is linked to memory information nodes [15] and consumers' ability to recognize a brand in a variety of situations. Brand acquaintances, people remembering information, and product ideas are all include of brand awareness. [5]. In addition, brand awareness is the original level of brand knowledge, which at least involves determining the brand name or structure through detailed information [43]. Therefore, brand awareness helps consumers choose products or services when it is hard to distinguish products or services because they have the same quality [36]. Social media is a functional tool to ensure consumer familiarity toward the brand [47]. Social marketers have an emphasis on raising awareness among the public in influence perceptions, associations, and faith about a specific organization or a brand [16]. The study is aimed to investigate how social media interaction affect brand awareness on consumer brand engagement. As such, the study is to convince people that social media interaction is able to influence brand awareness of the pastry shop in the market.

2.2 Brand Image

Brand image known as consumer's personal view of the company, and this perception due to the customer's past experiences with the company [50]. The brand image is also a key tool for companies to preserve their loyal customers [38]. The brand image also can generate positive views among customers and build customer loyalty [37]. Therefore, company must allocate resources to maintain at high-level of social media interaction through each interaction process. Several studies showed that social media marketing activities have a positive relationship on consumer brand awareness and brand image [26], [13], [42], [6]. Furthermore, according to the study [39] the use of social media for marketing has a significant effect towards brand image. The study of [35] stated that the benefit of using social media marketing for small and medium-sized business included increased engagement with customers, build brand awareness and brand image, acquisition of potential customers, save promotion costs, increase sales, and handle complaints such as negative feedback. The purpose of this research is to investigate how social media interaction affects brand image on consumer brand engagement. As such, this research is to convince people that social media interaction is able to influence brand image of the pastry shop in the market.

2.3 Social Media Interaction

Social media marketing defined as marketing and customer management activities by using social media [7]. It aims to encourage consumers' interest in the brand [30] and increase customer experience [24]. Moreover, research by [19] mentioned that five most beneficial to invest in social media interaction are strengthening the relationship with customers, increasing brand awareness or brand preference, exchange information and ideas with shareholders, establish an active relationship with customers and increase the profit of organization through new products or customers. A study [51] have categorized social media marketing activities include interaction, trendiness, information, customization, and word of mouth communication (EWOM). However, one of the social marketing elements that will be examined in this study is interaction. Interaction refers to the place that provided by social media platforms enable the two-way exchange of opinions and information [11], [26]. By using social media as a two-way communication among enterprises and customers, it is a better understanding of customer need, requirement, opinion, and suggestion for the product and brand [49]. Therefore, in this study will look over the effect of interaction on customer brand engagement.

2.4 Customer Brand Engagement

Customer brand engagement (CBE) is defined as the psychological state resulting from positive interactions among customers and brands [52]. CBE can be constructed into three which is cognitive, emotional, and behavioral [14], [12]. However, in this study cognitive processing, affection and activation will be investigated. Thus, CBE is a powerful concept in increasing satisfaction of customer, customer brand love and loyalty [22] increasing the effectiveness of advertising and the achievement of an organization [28]. CBE also play an important role in marketing strategy, including the creating and enhancing consumers brand relationship [21]. On the other hand, customer brand engagement can be examined through social media metrics or insight. For instance, customers are given an interactive expression such as comment, like, rating, and share the brand's post. Therefore, it is recommended that businesses must pay attention to social media content thereby encourage customers to interact with posts and, as a result, reinforce customer brand engagement [3]. As such, this research investigates that social media interaction can influence customer brand engagement and gave impact to brand image and brand awareness.

2.5 Hypotheses Development

Social media interaction and customer brand engagement

According to the study [42] noted that social media marketing activities help in increase brand awareness and create a powerful brand image for organization and interact with their customers. In addition, interaction is the most important of social media marketing elements to build up a brand and customer brand engagement [9]. Thus, this study aims to examine the relationship between interaction and customer brand engagement, the following hypothesis is proposed:

H1*: Interaction has positive and significant relationship with customer brand engagement.*

Customer brand engagement and brand awareness

Several studies showed that sharing information about a brand among customers can increase the level of customer brand engagement and strengthen interaction and connection between consumer and brand [25], [29]. Moreover, a study [9] stated that customer brand engagement has a strong connection with brand awareness, and it is important in the brand-building process. Therefore, this study is to examine the relationship between customer brand engagement and brand awareness, the following hypothesis is proposed:

H2*: Customer brand engagement has positive and significant relationship with brand awareness.*

Customer brand engagement and brand image

Brand engagements build trust and meaningful connections between customers and brands [33]. Thus, strengthening customer brand engagement through numerous channels enables the creation of a strong and positive brand experience and brand image [10]. However, a study [9] showed that customer brand engagement is strongly related to brand image. Thus, this study is to examine the relationship between customer brand engagement and brand image, the following hypothesis is proposed:

H3*: Customer brand engagement has positive and significant relationship with brand image.*

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The study design is the conceptual blueprint of the researcher, including all sources, methods and techniques used for collecting data, measuring data, and analyzing data to achieve research goals [2]. Research [1] stated that research design is set of conditions to collect and analyze data in an integrated manner of economic and procedural relevance to research purposes.

There are two types of research designs: exploratory design and conclusive design. A study [32] pointed that exploratory design method is used to gain insights and comprehend the nature of the marketing phenomenon. However, conclusive design is to examine specific hypotheses and investigate relationships. In exploratory research, qualitative data is used, and the research process is relatively less structured and relatively flexible. On the other hand, the conclusive design research process is structured and formal. There are two types of conclusive design research: descriptive research and causal research. Moreover, descriptive research is to depict the attributes of related groups, such as customer, salespeople, and organizations. On the other hand, causal research is to examine independent variables and dependent variables of a phenomenon [31]. Conclusive design is to check the hypotheses and investigate relationships. The research procedure is formal and well-structured [31]. Thus, the conclusive research design will be used in this study to investigate the relationship between social media. interaction, customer brand engagement, brand awareness and brand image.

3.2 Population and Sampling

According to the study [27], a population is defined as the total number of people or units being studied in research. However, the sampling refers to a list of actual cases from which samples will be taken. The larger the sample, the smaller possibility of bias in the research results does exist and diminishing returns can happen quickly when samples exceed a certain size that must balance against the researcher's resources [20]. In addition, this study has a sample size of 165. Moreover, this study will use the non-probability sampling methodology which is the purposive sampling technique. Non-probability sampling is used for some studies due to time and/or cost considerations. A random probability-based sample cannot be draw [40]. The target population of this study is individuals who are using social media platforms as interaction with others in Malaysia to buy pastry products.

3.3 Research Instrument

A research instrument is a tool used to collect, measure, and analyze data from the research participants. The type of research instrument is used depends on the type of study being conducted; quantitative, qualitative or combination of the two [45]. The quantitative approach will be used in this study, and questionnaires will be used to collect data. The questionnaire is divided into 2 parts: Section A and Section B. Section A contains 8 questions about respondents' demographic profiles such as the age, gender, countries of origin, and frequency of using social media platforms. Section B consists of 26 questions that are related to brand awareness, brand image and social media interaction. There are 4 items to measure social media interaction, 10 items for customer brand engagement, 5 items for brand awareness and 6 items for brand image. In addition, the questionnaire featured 5-point Likert scales 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree) and 5 (Strongly Agree). After that, the data will be screened, processed, and analyzed with the Statistical Package for the Social Sciences (SPSS).

4.0 EXPECTED FINDINGS

This study is aimed to confirm i) the relationship between social media interaction and customer brand engagement, ii) customer brand engagement and brand awareness iii) customer brand engagement and brand image. In addition, this study provides pastry shop with a better understanding in relation to brand awareness and brand image. In the proposed social media marketing plan, the pastry shop can adjust their frequency of interaction in social media which can have an impact on their brand awareness and brand image. Besides, this study provided deeper insight in social media interaction for pastry shop to enhance their brand engagement. For example, they may engage with their customer by reply to their customer immediately, post and share relevant information, promote, and advertise through their social media platform. With the findings from this study, the shop can increase their brand awareness and brand image by utilizing social media to highly interact with their customers. It is recommended that pastry shop influence their consumer's perception to a brand through effective use of social media activities. Thus, the company can take appropriate actions to adjust and implement their strategies to not fall behind.

CONCLUSION

In conclusion, the literature review shows that social media interaction has a strong relationship in building brand awareness and brand image. As such, social media interaction is the best implemented strategy in the development of brand awareness and brand image for the pastry shop. The proposed social marketing strategies for the pastry shop may include the social engagement in which they post their products in their social media platform such as Facebook once or twice a week. Moreover, they need to check and reply to the message of their customer daily to increase the interaction. Through this, it is believed that the shop can improve brand awareness and brand image in the short-term. It is anticipated that social media interaction will be one of the most effective marketing strategies for increasing brand awareness and brand image of the pastry shop. A positive brand image may have a significant impact on customers' purchasing intentions and indirect effect in sales as well. Thus, this study will provide appropriate actions for marketers to adjust and implement the best strategies in their company.

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FACTORS INFLUENCING CONSUMER PURCHASE INTENTION : TEKPOL ELECTRIC & SUPPLY SDN BHD

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ABSTRACT

The electrical industry has always been sought for, however only faces a booming request since 2017 resulting in electrical industry has gradually receive more and more attention over the years as people start to take notice on the importance of it. This results in businesses receiving external threats coming from new company of the same category. Therefore, the company needs to understand what are the factors that will influence customer buying intentions to increase the purchase in their shop and gain competitive advantage. This study adopted the quantitative research approach by gathering respondents' data using google form questionnaire. The study targets for 120 respondents at least. The non-probability sampling technique is used in this study, which refers to purposive sampling. All the collected data will be analysed using SPSS software. Expected findings for this research is to figure the factors affecting consumer purchasing intentions of electrical stores. In conclusion, the findings are expected to improve competitive advantage of Tekpol Electric & Supply Sdn Bhd.

Keywords: electrical stores, consumer purchase intentions, competitive advantage

1.0 INTRODUCTION

The electrical industry has always been sought for, however only faces a booming request since 2017. Foreign investment value in the Malaysian electrical and electronics industry was reported to have achieved RM 10.71 billion in the year 2018. The manufacturing of electrical equipment as preliminary share of GDP at current prices in Malaysia was 0.5% in the year 2018, according to *Statista*. This shows that the electrical industry has gradually receive more and more attention over the years as people start to take notice on the importance of it.

Tekpol Electric & Supply Sdn Bhd is a company that specializes in selling electrical component, parts, and electric appliances such as ceiling fans, electrical cables, switches, and more. The location chosen took into account of the company to the public eyes, whether it is easily noticed or vice versa. Besides that, they made sure to pick a location where it is convenient to acquire supplies and provide supplies. Since the location in Malim Jaya is faced towards the main road, the company had placed themselves in a beneficial spot. Tekpol Electric & Supply Sdn Bhd was first established in 1995 by Mr Lam, a diligent contractor of his time.

Nowadays, people are keen on purchasing long lasting and good quality electrical products after the much news of short circuits costing lives and big sum of money. Moreover, people are getting busier with their work and chasing after money that they are seldom at home, and therefore the need for more safety and assuring electrical products have increased over the years. The idea of Tekpol Electric & Supply Sdn Bhd is to solve these problems, if not all, little by little. Tekpol Electric wants to become one of the most trusted brands for customers and when people talk about safe and affordable electrical products, they will be reminded of Tekpol

Electric & Supply Sdn Bhd immediately. Tekpol Electric & Supply Sdn Bhd targets domestic consumers with a few attentions given to contractors and government projects. This is because electrical components and appliances are usually sought by domestic customers rather than government projects as they rely more on manufacturing factories for supplies.

1.1 Problem Statement

The company faces an external threat coming from new companies in the same category. Not only that these companies are well-polished, they also have better system and a well organized internal management than Tekpol Electric & Supply Sdn Bhd, as well as more workers to carry out their daily activities. This is a problem to the company because when customers realize that they can obtain goods quicker at more standardized price from these well-established companies, they will stop or lessen their order from Tekpol Electric & Supply Sdn Bhd. Therefore, Tekpol Electric needs to understand what are the factors that will influence customer buying intentions to increase the purchase in their shop and gain competitive advantage.

1.2 Research Question

I. What are the factors that influence consumer's intention to purchase at electrical stores?
II. What are the the most important factor that influences consumers' intention to purchase at electrical stores?
III. Will social media strategy improve consumer purchase intention of electrical stores？

1.3 Research Objectives

i. To identify the factors influencing consumer purchasing intention of electrical stores.
ii. To investigate the most important factor influencing consumer purchase intention of electrical stores.
iii. To determine whether social media strategy improve consumer purchase intention of electrical stores.

2.0 LITERATURE REVIEW

2.1 Consumers purchasing intention

It is known that the most wide spread and influential assumption in consumer's buying intention is that their purchases come before their decision making process. There is a flowchart of what goes in their mind when they are evaluating a product which could possibly be the stepping stone to their purchase decision. According to Kotler (1997), decision making is classified as extensive problem solving. There appear to be six stages of consumer resolution making process which are awareness, liking, knowledge, conviction, preferences, and also purchase (Kotler and Armstrong, 2010). These stages allow marketers to know what attracts the customers and what does not attract them.

According to Ramya and Mohamed Ali (2016), consumer buying buying intention refers to the purchase, selection, and consumption of products and services for the satisfaction of their wants. In this study, consumers purchasing intention are triggered by a few factors such as brand, trend, and economic factor The consumer decision making process is significant to determine their purchase decision (Parwardhan et al, 2010).

2.2 Brand

Based on previous research, Khan, Rahmani, Hoe & Chen (2015) mentioned that brand image is said to be the opinions and views of buyers about the brand in question. Through the specialty of the image of brand, customers can assess the value, acknowledge a product, decrease buying hazards, and achieve satisfaction. When a product has a powerful brand image, customers acknowledge that it is of high quality. It can conclude that customers most of the time use brand image as a shorthand for expressing quality and value. Brand is also a 'perception'. This is a consumer's cognitive relation to the product. Quality comes from image and perception. Few criteria, such as practical and emotional interactions, influence customer expectations. Therefore, if a consumer's right corner of mind is filled by the world's worthiest recognition, it becomes a product.

According to Chovanová, Korshunov & Babčanová (2015),(2015), one must understand the fact that brand is the factor that has influences on the decision-making process for buyer purchases. Brands provide product information and associations that affect the consumer's mind in the purchasing process. Brand awareness is a very important category of consumer behaviour research. Appropriate forms of marketing activities as a whole can create a positive brand association and start a positive brand purchase action. Label is a certain quality in the consumer's view. The research of Chovanová, Korshunov & Babčanová (2015), according to participating survey respondents, value is a significant factor in their process in decision-making of buying a product. The behaviour of purchasers is affected by a many factors that interact in complicated ways. With a better understanding of the perceptions of the customer; companies can identify the actions necessary to meet the needs of the customer. Nowadays, market stage is becoming a position of lack of goods due to the current global circumstances, resulting in the loss of brand loyalty. As companies create loyalty agreements with their clients, these requirements can be avoided. Therefore, the value proposition of the products offered will meet the standards and expectations of consumers.

H1 = There is a positive relationship between brand and consumer purchasing intention of electrical stores.

2.3 Economic factors

Based on the economics factor of consumer decision making, there are some aspects that are categorised. It is price, personal income, family income, income expectation, savings, interest rate, and liquid assets of the consumer, consumer debit and many more. Lichtenstein et al, 1993, p.235 said price consciousness has also been defined in the marketing literature with slightly different ways, including a buyers' "unwillingness" to pay for a higher price and/ or " the exclusive focus" on paying low prices. Moreover, "distinguishing features" could also include the brand name of the national brand. According to Alfred (2013), price is one of the factors in marketing mix and they can change very easily compared to promotion, product, and place. Monroe and Krishnan (1985) said that the length of consumer price consciousness does vary across product categories, where the buyers may be more or less price-conscious when shopping for certain products in contrast to other, because of differences in the perceived riskiness of purchasing decision across categories and other reasons. Some findings from the other studies also support the idea that some consumers are more likely than others to use price as a justification of quality in most situations and products (Lichtenstein and Burton, 1989; Peterson and Wilson 1985).

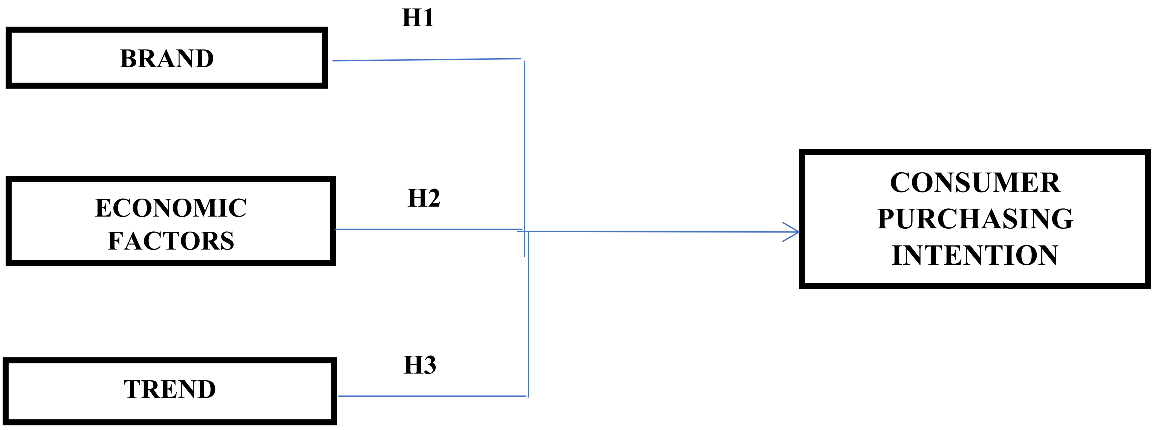
H2 = There is a positive relationship between economic factor and consumer purchasing intention of electrical stores.

2.4 Trend

Trend refers to the fashion style when people want to make decision regarding buying a goods or services. They want to always be up to date in fashion especially for people who always have social life. The more people who follow a trend, the more others will want to follow it. According to Levi and Linton (2003), what they are actually trying to sell is the norm that people in growing countries should factor trend into their purchasing intentions. This means that to produce and sell any new electrical product someone must always be alert of what is the new trend to have customers' satisfaction. Trends appear widely and are considered by readers to be the most interesting content of fashion magazines according to Bailey & Seock (2010). However, it also should be based on the original idea before making new trend. Sometimes, to get what they want, they scout and investigate about their taste and desire before choosing any new trend.

H3 = There is a positive relationship between trend and consumer purchasing intention of electrical stores.

Framework



Flowchart 1: Conceptual Framework of Factors Affecting Consumers Purchasing Intention

3.0 RESEARCH METHADOLOGY

3.1 Research Design

The framework, or collection of methods and processes used to gather and analyse data on variables stated in a specific research topic, is referred to as the research study design. This quantitative study assessed the effect of brand, economic fa/ctors and trend on consumers' intention to purchase electrical goods. Respondents were asked to select the best choice from a five-point Likert scale for a list of things presented in the questionnaire. The Likert scale included five levels of agreement: 'strongly agree,' 'agree,' 'neutral,' 'disagree,' and 'strongly disagree' (Vagias and Wade, 2006). The hypotheses were tested based on the questionnaire items that revolved around electrical goods.

3.2 Sampling Technique

Based on the researchers' own opinion, the non-probability sampling approach, specifically purposive sampling, was used in this study. Purposive sampling is not only appropriate for the research setting, but it is also rapid, easy, and cost effective.

3.3 Population and Sample

Population is defined as a collection of items that contain the information that the researcher is looking for. By selecting the target population linked to the study topic, the same common feature may be determined. The number of components that can be included in the research investigation is specified as the sample. The following formula was used to determine the best sample size for the Malaysian population. Tabachnick and Fidell (2007) state that a five-to-one ratio defines the minimal size based on the number of variables to be evaluated. As a result, 120 people were needed for this investigation. The following are the equations:

3.4 Data Collecting Method

The questionnaire survey approach was used to obtain primary data in this study. Primary data are data collected directly from respondents in order to answer the research topic (Malhotra, 2009). In this study, respondents were given questionnaires through Google Form. When a large number of people are involved in a study, the survey technique is considered appropriate. The respondents have freely agreed to take part in this survey. This study involved six marketing steps: identifying the problem, creating the technique, formulating the research design, collecting data, analysing data, and organising and presenting the study results. These procedures were followed in order to get favourable and effective results.

4.0 EXPECTED FINDINGS

The study is expected to confirm i) the relationship between brand and consumer purchasing intention, ii) the relationship between economic factors and consumer purchasing intention and iii) the relationship between trend and consumer purchasing intention. This study is important to electrical stores. This study provides Tekpol Electric and Supply Sdn Bhd with a better undersatnding in terms of key factors and can increase the level of competitiveness in the market. In this study, researcher will identify the factor that affect consumer to purchase from Tekpol Electric and Supply Sdn Bhd to have higher business competitiveness and provide a best solution to solve the problem that Tekpol Electric and Supply Sdn Bhd has been facing

5.0 CONCLUSION

This research had investigated the factors that influenced consumer purchasing intentions of electrical stores. It highlights the methods and hypotheses that addressed the problem statement and fulfilled the study objectives. By understanding the factors that are influencing consumer purchase intentions of electrical stores, companies may take initiative and improve to gain competitive advantage over other business of the same category. The results from this study encourage other researchers to look into the factors that affect consumer purchase intention of electrical stores.

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PROPOSED SOCIAL MEDIA MARKETING STRATEGIES TO ENHANCE BRAND PASSION AND PURCHASE INTENTION OF A BAKING SUPPLY STORE

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ABSTRACT

Due to Covid-19 pandemic, the new norm of retailing environment and consumer behavior has increased the usage of the Internet and social media drastically. However, some businesses could not utilize well social media into their marketing strategy. Using a baking supply store as a case, the study aims to investigate the factors that drive the purchase intention of baking products. Further, the study will propose some social media communication strategies that could increase the purchase intention of the baking supply store. Conclusive research design with cross-sectional approach is adopted to examine the relationships between firm-created and user-generated social media communication, brand passion, and purchase intention. The target respondents are Facebook users who have intention to buy baking products and the sample size is 150. The data will be collected using Google Form and analyzed using Statistical Package for the Social Sciences (SPSS) software. This study can provide baking supply retailers better insights in managing social media and utilizing the strategies during this rapid technological advancement era.

Keywords: Brand Passion, Purchase Intention, Firm-Created Content, User-Generated Content

1.0 INTRODUCTION

Due to the Covid-19 pandemic, the new norm of retailing environment and consumer behavior has increased the usage of the Internet and social media drastically. Globally, over 4.5 billion of people are using the Internet in early 2020, an increase of 7% from January 2019, while active social media users are over 3.8 billion people, an increase of 9% from 2019 [1]. As a result, the number of consumers that turning to the Internet and social media for shopping are also increased. According to Digital Commerce 360 [2] survey, majority of respondents (82%) stated that they use social media most frequently to get information about a brand and its products, and over half of respondents (62%) as well agreed that the presence of social media affects their decision to purchase from a brand. Therefore, majority of bricks-and-mortar retailers have established their online shopping facility because Covid-19 has forced them to focus their business to online shopping platform [3]. In Malaysia, more than half small businesses (61.3%) use social media to promote their business due to Covid-19 [4].

Social media communication is divided into firm-created and user-generated social media communication. Firm-created content is a form of communication whereby businesses create and control content and conversations on social media [5]. It is important for today's business as it generates higher awareness and consumers association to the brand [6]. Meanwhile, user-generated content refers to content created by the people but not a professional marketer [7]. Both social media communications are beneficial in developing the brand awareness [7]. For instance, marketers can attract more people to visit their page by creating interesting and engaging content, and that content can influence the consumers to give reviews. When the social media communication is used efficiently and effectively, brand can develop the passion for in the mind of social media users, and further encourage the purchase intention towards the brand [8].

Meanwhile, brand passion has positive impact on consumer purchase intention as well as leads to positive word-of-mouth, brand engagement, and brand loyalty [9]. Therefore, social media marketing is very useful for many new businesses to create more active and thoughtful interactions to get more reach. However, some businesses like the case for this research, a baking supply store located in Kulai, Johor, faces low customer purchase intention and brand awareness as they do not have effective marketing strategies. The store, which mainly sell bakery ingredients and tools, started its business in early February 2021. The baking supply store faces difficulties in creating social media marketing that align with the goal of the business, which is to attract more customers and increase their sales. Additionally, based on their social media page, they have low engagements due to limited posts. Hence, this study will be conducted with three main research objectives:

RO1: To examine the factors to drive purchase intention of baking products.

RO2: To investigate what marketing strategies can be used to increase the purchase intention of baking products.

RO3: To investigate the effectiveness of the marketing strategies to increase the purchase intention of baking products.

2.0 LITERATURE REVIEW

2.1 Purchase Intention

Purchase intention is defined as the preference of a consumer to purchase the product or service after evaluation [10]. Based on research by Irshad, Ahmad, and Malik [11], the factors that positively affect consumers' purchase intention are remuneration, social, and empowerment motivation. Remuneration motivation describes the desire of consumers to gain rewards and benefits such as promotional deals [12]. Irshad et al. [11] revealed that when retailers satisfy the remuneration needs of consumers, the consumers' purchase intention will be aroused. Meanwhile, social motivation is related to user-generated social media communication. For instance, when consumers get positive review from peers about retailers on social media, the purchase intention of the consumer will increase as most people are convinced by the reviews of other people and their peers [11]. Next, empowerment motivation is about individuals who use social media to implement their power on an organization or other individuals [13]. For instance, consumers can give feedback for a product, or anything related to store, and they will feel appreciated when their opinions are considered by the retailers. Hence, it is important for retailers to take note on the consumers' suggestions to build trust and increase consumers' purchase intention [11]. In the context of social media marketing, purchase intention is influenced by brand passion, while brand passion is influenced by firm-created social media communication and user-generated social media communication [8].

2.2 Social Media Communication

Baruah [14] defined social media as the utilization of web-based and mobile technologies in turning communication into an interactive discourse. Social media communication not only allow users to interact with each other, as well as exchange contents they have created, and information related to other brands [15], but it also opens an opportunity for businesses to reach new consumers [16] and acts as a key for lifelong relationship with their consumers, increase brand awareness, understand customers' needs, and improve decision-making [17]. There are two types of social media communication, which are firm-created and user-generated social media communication.

2.2.1 Firm-created Social Media Communication

Firm-created content (FCC) is a content created and managed professionally by the marketing team of a brand [18]. Example of FCC are the banner advertisements on social media platform advertising latest deals. Poulis, Rizomyliotis, and Konstantoulaki [19] stated that FCC is important for business in developing, maintaining, and boosting their relationships with their consumers. It is also important as it contributes to sales and profits [20] as well as increases the brand awareness [21]. Firm-created social media communication is a way for marketers to engage with their consumers, distribute information, as well as learn from and about their audiences [22]. Thus, FCC becomes a crucial part of branding function as it can strengthen a brand's image and help build trust [23].

2.2.2 User-generated Social Media Communication

According to Colicev et al. [18], user-generated content (UGC) is a content created by users on social media platform such as comments, shares, and likes on brand posts as well as user posts on brand pages. The contents by users on the Internet can be utilized to understand more about their preferences, needs, and latest trends, as well as to improve the quality of service or products of a brand. UGC is advantageous for business because the content can disseminate quickly and easily among consumers and consumers and brands can be exposed to each other's contents via different social media channels [23]. UGC is important to help brands to create a sense of authenticity as people nowadays depend on the reviews of past consumers of the brands before making the decision to purchase product or service provided by the brands [24].

2.3 Brand Passion

Bauer, Heinrich, and Martin [25] interpreted brand passion as an affective and positive behavior towards a particular brand which causing emotional attachment and affects important behavioral variables such as the willingness of a consumer to spread positively about a certain brand or provoke the purchase intention of a consumer. Therefore, building brand passion is important to promote long-lasting brand loyalty [26]. When customers have passion connected with a brand, they become personally invested in the brand by willingly advocate the brand, pay premium price, and follow closely their social media [27]. Therefore, brand passion is vital for business because it has considerable influence on the willingness of consumers to keep a long-term relationship with the brand [28].

2.4 Hypotheses Development

2.4.1 Firm-created and User-generated Social Media Communication

When a company communicates more through their social media platform, posting more and variety of contents in its official brand page, reaching wider audiences, the user engagement with the brand will increase [29]. This is proven by the finding by de Vries et al. [20] whereby vivid and interactive post by brands enhances the number of likes and comments. Additionally, Moreno-Munoz et al. [30] noted that effective use of social media communication can encourage consumer discussion and participation. In short, there is positive relationship between the firm-created and user-generated social media communication. Hence, the following hypothesis is presented:

H1: *Firm-created social media communication has a statistically significant impact on generation of user-generated social media communication.*

2.4.2 Firm-created Social Media Communication and Brand Passion

For consumers to generate the passions for a brand, it is necessary for marketers to develop a long-term relationship between consumers and brand using social media communication [8]. This relationship can be built by developing and distributing appealing and valuable content on social media to attract target audience [31]. A few evidence was found to prove that the firm-created social media communication positively influence the brand passion. For instance, Khalid [32] revealed that the firm-created social media communication encourages brand trust, brand loyalty, as well as brand passion. Similarly, a study by Hermaren and Achyar [6] also indicated that the firm-created content is positively impacted on brand loyalty, and eventually brand passion. Hence, the hypothesis is proposed:

H2: *There is a statistically significant impact of firm-created social media communication on brand passion.*

2.4.3 User-generated Social Media Communication on Brand Passion

In a study by Shen and Bisell [33], businesses that emphasized on enhancing consumer engagement on social media are able to improve their brand awareness, resulting in the boost of brand loyalty, which positively associated with brand passion. According to Fischer and Reuber [34], consumers feel the social satisfaction when they go through the user-generated content, and it notably impacts their behavioral responses. Consumers feel the pleasure with user-generated content on social media platform because they can get involved in sharing their passion for a brand with other consumers that share the same interest [35]. Hence, consumers can feel the passion when they go through user-generated content. Furthermore, as the use of user-generated content can positively influence brand trust, consequently it will also positively influence brand passion as well [36]. Thus, the below hypothesis is proposed:

H3: *There is a statistically significant impact of user-generated social media communication on brand passion.*

2.4.4 Brand Passion and Purchase Intention

Gilal et al. [37] have noted the importance of brand passion and revealed that a brand will likely witness improvement in consumer behavior outcomes when the brand managed to create emotional bonds with their consumers, which is brand passion. For example, Albrecht et al. [38] illustrated that the emotional connection of consumers with a brand causes a higher possibility of repeatedly purchasing the same brand. This shows that building brand passion can increase the chances that an existing consumers will keep buying from the brand or the consumers will try out other products from the brand. Based on the literatures, brand passion can seemingly influence consumer purchase intention positively. Therefore, this study hypothesizes that:

H4: *Brand passion has a statistically significant impact on purchase intention.*

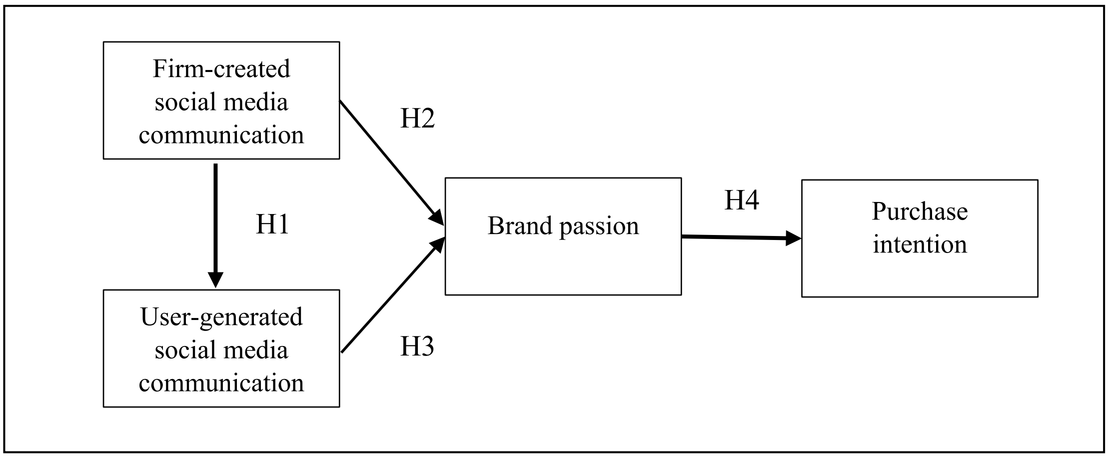

Fig. 1: Research Framework

Figure 1 shows the research framework of this study. The framework was adopted from "Social media marketing and customers' passion for brands" by Mukherjee [8] who emphasized the firm-created social media communication and user-generated social media communication can effectively cause the passion for the advertised brand and eventually creates a purchase intention in the mind of audiences.

3.0 RESEARCH METHODOLOGY

This study will employ conclusive research design that includes descriptive research and cross-sectional design to study the relationship between firm-created social media communication, user-generated social media communication, brand passion, and purchase intention of bakery products. The conclusive research design examines specific hypothesis and relationships between variables to generate findings that are useful for reaching conclusions and decision-making [39]. The research process for conclusive research is formal and structured, and the data analysis conducted in this research is quantitative. The conclusive research design can be classified into descriptive research. According to Dudovskiy [39], descriptive research is used in describing functions or characteristics of phenomenon and can be further divided into cross-sectional design. In cross-sectional design, researcher collects data from any given sample of population elements only once [40].

The target population of this study is the Facebook users who have intention to buy baking products. Memon et al. [41] suggested that a carefully selected sample of 150 and above is more meaningful. Thus, the study will adopt a sample size of 150. Furthermore, this study will employ non-probability sampling technique, specifically judgmental sampling because of the focus study which is Facebook users who have intention to purchase baking products.

Questionnaire instrument is adopted to gather the primary data from the online respondents using Google Form. The questionnaire will have two qualifying questions and two sections, which are section A and B. Section A will include questions related to the demographics of respondents such as age, gender, and income level. Meanwhile, section B contains measurement items about firm-created and user-generated social media communication, brand passion, and purchase intention. The set of questionnaires requires the respondents to tick from the given selection. All the measurement items in section B are adopted from previous study of social media marketing and customers' passion for brands by Mukherjee [8]. 5-point Likert scale is used in section B to determine the strength of the answer with levels of agreement from "strongly agree", "agree", "neutral", "disagree", and "strongly disagree". After all the data are collected, Statistical Package for the Social Sciences (SPSS) is used to screen, process, and analyze the data.

4.0 EXPECTED FINDINGS

The study is expected to verify i) the relationship between firm-created and user-generated social media communication; ii) firm-created social media communication and brand passion; iii) user-generated social media communication and brand passion; and iv) brand passion and purchase intention. Consumers are expected to react on the content created by marketers, the passion of consumers towards the brand become stronger when marketers consistently update various content, brand passion increases when there is sense of community among the consumers whereby the consumers share their perceptions and feedback, and consumers purchase intention increases when they passionate towards a brand. The findings will be important for businesses, especially the baking supply store to understand the factors that drive the purchase intention of their consumers in the context of social media. Further, several marketing strategies will be proposed for them to increase the business's visibility on social media, generate passion in the mind of social media users, and eventually build the intention of the audiences to purchase their products. Finally, the study will measure the effectiveness of marketing strategies proposed in this study, so that the baking supply store can continue adopting the strategies.

5.0 CONCLUSIONS

This study can provide baking supply retailers better insights in managing their social media and utilizing the social media in this rapid technological advancement era. This study will also be able to motivate marketers to create creative, appealing, and interactive contents that can engage consumers with the brand as well as disseminate positive word-of-mouth in the social media community. Furthermore, understanding purchase intention concept can help businesses to determine why consumers decide to purchase from certain brand. In addition, there are limited studies about the combination of variables, namely firm-created and user-generated social media communication, brand passion, and purchase intention. Hence, this study is expected to be served as guideline for future researchers.

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E-SERVICE QUALITY OF ONLINE BANKING AND ITS INFLUENCE ON CUSTOMER SATISFACTION AMONG JOHOR CONSUMERS: THE CASE AT BANK ISLAM MALAYSIA BERHAD (BIMB)

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ABSTRACT

In this day and age, customers who are highly supportive of technological innovations, particularly during this pandemic Covid-19 have a higher belief in online banking. Online banking is becoming increasingly popular right now especially during this pandemic Covid-19 due to its convenience and flexibility when people used it. In the banking business, the usage of internet banking as a cost-effective and effective instrument for providing customer value is increasing dramatically. As the rapid development of computer technology especially in business instrument, Internet banking can be applied to encourage more people to fulfill banking activities in associated institutions. By following the health recommendation, one of the most effective ways to contain the current COVID-19 epidemic is to prevent personal contact. In addition, online banking can also help customers to manage their finances more efficiently (Bank Negara Malaysia, 2017). The goal of this study is to investigate the factors influencing customer satisfaction with Bank Islam Malaysia Berhad (BIMB) among Johor consumers who use e-service quality online banking.

Keywords: Online banking, Customer satisfactions, Bank Islam Berhad Malayisa

1.0 INTRODUCTION

Many people claimed that online banking has gained higher expectation by the customers who are highly supportive of new technology. Online banking is type of financial intermediation which makes transaction through Internet (Ahanger, 2011). According to Rahmath and Hema (2010), online banking is an industry in which the majority of banks use computer technology to deliver competitive services to their consumers, indirectly it can contribute to the growth of banking practices in the banking industry. This is actively demonstrated when many people claim that to enhance the level of service quality for satisfy customers' needs and wants, technological innovations are important to implement as one of effective ways. Based on a survey taken in 2020 as to determine the percentage of Internet users that use online banking in Malaysia, it shows more than 63.8% of respondents use online banking. This represents a 15% increase over the results from 2021. Asian customers are rapidly adopting internet banking services (Barquin and HV, 2015). This is due to Asian customers increasingly trust and are satisfied with online banking services (Barquin and HV, 2015). In addition, the usage, and subscribers for mobile banking as well as internet banking have also slightly increased in recent months during this pandemic Covid-19 (Goh, 2020). To back up this claim, by referring data from Bank Negara Malaysia (BNM) shows that the increase is faster than during the Covid-19 lockdown period, when the number of internet banking individual users increased to 33.6 million in July 2020, up from 30.8 million in January 2020. In addition, there is 9% growth, compared to 3% for the same seven-month period in 2019. Meanwhile, the internet banking penetration rate to population increased to 107.4 percent, up from 92.8 percent in July 2019 and 88.2 percent in July 2018. (Goh,2020). In addition, mobile banking app, GO by Bank Islam, grew to over 500,000 users in a short time, with an average usage growth recorded 50% from March 2020, when the government imposed a Movement Control Order ("MCO") to stop virus from spreading. In fact, there are over RM2.4 billion in transactions were reported between March and September 2020. It is generally agreed that the online banking services provided by Bank Islam Malaysia Berhad (BIMB) are intended for personal or business use, unfortunately, some of the users will find that they do not meet their needs. (Singhal and Padhmanabhan, 2012). These problems can have a great impact on the banking sector.

Hence, the online banking system should always build up and improvements their service, thus the limitation are no longer limit its further improvement.

2.0 RESEARCH FRAMEWORK

The conceptual model was developed based on previous research on online banking and customer satisfaction to better understand the aspects that influence online banking and customer satisfaction. This research focuses on the e-service quality of online banking and customer satisfaction among Johor consumers who use Bank Islam Malaysia Berhad's online
Banking (BIMB).

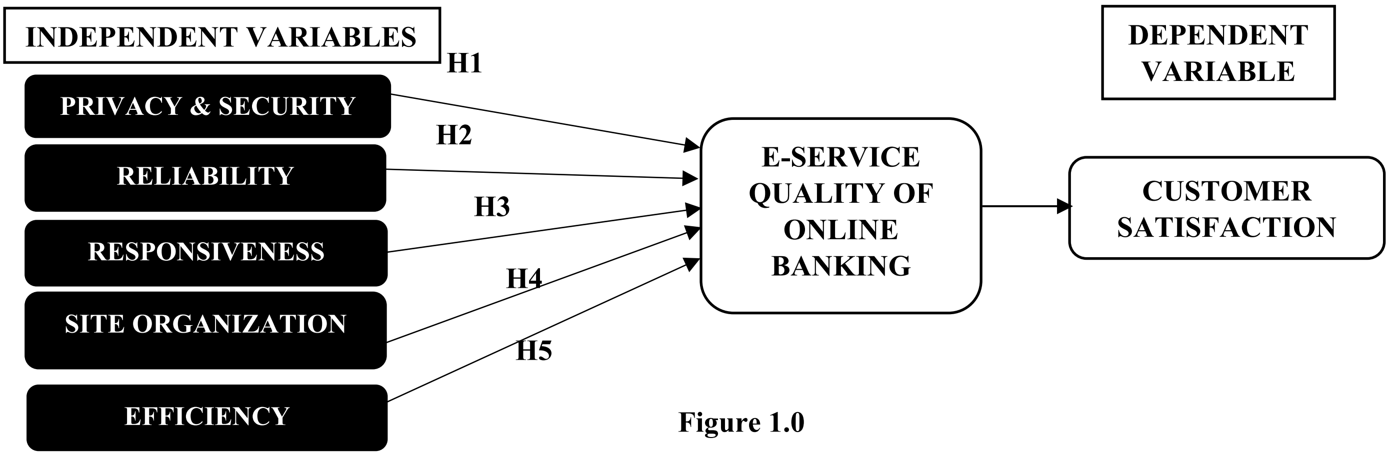

Figure 1.0

Source from Raza, S.A (2020) "Internet banking service quality, e customer satisfaction and loyalty: the modified e-SERQUAL model", The TQM Journal, Vol.32 No.6, pp.1443-1466.

2.1 HYPOTHESIS DEVELOPMENT

The literature review determines the research theory, which in turn determines the hypotheses. A hypothesis is a statement regarding the relationship between two or more variables that leads to a conclusion about the research objectives. These hypotheses are rationally generated from past discoveries or specific theoretical predictions.

TABLE 1.0

NO	OBJECTIVES	HYPOTHESIS
1	To observe the positively significant relationship between the five e-service quality element and customer satisfaction level towards online banking system.	H1: **Privacy & Security** has positively significant relationship with customer satisfaction towards online banking. H2: **Reliability** has positively significant relationship with customer satisfaction towards online banking. H3: **Responsiveness** has positively significant relationship with customer satisfaction towards online banking. H4: **Site organization** has positively significant relationship with customer satisfaction towards online banking. H5: **Efficiency** has positively significant relationship with customer satisfaction towards online banking.

2.2 Research Instrument

A research instrument is a tool for collecting, evaluating, and analyzing data from study participants. A questionnaire via an online Google form is the commonly useful tools that researcher can get to obtain data from the respondents in this study.

TABLE 1.1

SECTION	ASPECT	STRUCTURE	TOTAL QUESTION
A	Demographic profile of respondents	Optional questions	8
B	Independent Variables • Privacy & Security (PRISE) • Reliability (RELI) • Responsiveness (RESP) • Site Organization (SIOR) • Efficiency (EFFE)	Likert scale	20
C	Dependent Variable • Customer Satisfaction	Likert Scale	5
Total Questions			33

1.3 Data Analysis

TABLE 1.3

Statistical Measure	**Objective**
Descriptive Statistics	To describe the respondent's demographic profile, examine frequency and percentage such as age, gender, race, occupation, income
Reliability Analysis	To test the reliability of measurement items to ensure 0.7 and above.
Normality Analysis	To determine whether sample data has been normally distributed.
Construct Validity	To test how good the result was measure up which access through convergent and discriminant validity.
Average Variance Extracted (AVE)	To measure the overall amount of variance capture by the indicators relative to measurement error which must greater than 0.5.
Composite Reliability (CR)	To know the construct indicators indicates the latent and the value should greater than 0.7
Variance Inflation Factor (VIF)	To evaluate collinearity of the formative indicators

1.4 Reliability Test

TABLE 1.4

VARIABLES	**CONTRUCT**	**CRONBACH'S ALPHA**	**NO. OF ITEM**
IV 1	**PRISE**	**0.908**	**4**
IV 2	**RELI**	**0.897**	**4**
IV 3	**RESP**	**0.847**	**4**
IV 4	**SIOR**	**0.894**	**4**

IV 5	EFFE	0.927	4
DV	CS	0.927	5

The overall range of Cronbach's Alpha is between 0.847 and 0.927, as calculated by SPSS version 26.0. As said by Deepa-Enlighten (2017), most of the characteristics (Privacy and Security (PRISE), Reliability (RELI), Responsiveness (RESP), Site Organization (SIOR), Efficiency (EFFE), and customer satisfaction) are rated as excellent or good reliability because Cronbach's Alpha values range from 0.8 to 0.9.

2.3 Normality Test

Descriptive Statistic of Privacy & Security (PRISE)

TABLE 1.5

		Skewness			Kurtosis		
	N	**Statistic**	**SE**	**Z-value**	**Statistic**	**SE**	**Z-value**
PRISE (I)	165	-1.091	0.189	-5.772	0.208	0.376	0.553
PRISE (II)	165	-0.468	0.189	-2.476	-0.689	0.376	-1.832
PRISE (III)	165	-0.769	0.189	-4.069	-0.617	0.376	-1.641
PRISE (IV)	165	-0.802	0.189	-4.243	-0.408	0.376	-1.085

Descriptive Statistic of Reliability (RELI)

TABLE 1.6

		Skewness			Kurtosis		
	N	**Statistic**	**SE**	**Z-value**	**Statistic**	**SE**	**Z-value**
RELI (I)	165	-0.799	0.189	-4.228	0.316	0.376	0.840
RELI (II)	165	-1.252	0.189	-6.624	2.798	0.376	7.441

RELI (III)	165	-0.875	0.189	-4.630	0.381	0.376	1.013
RELI (IV)	165	-1.249	0.189	-6.608	1.912	0.376	5.085

Descriptive Statistic of Responsiveness (RESP)

TABLE 1.7

		Skewness			**Kurtosis**		
	N	**Statistic**	**SE**	**Z-value**	**Statistic**	**SE**	**Z-value**
RESP (I)	165	-0.932	0.189	-4.931	0.793	0.376	2.109
RESP (II)	165	-0.653	0.189	-3.455	0.181	0.376	0.481
RESP (III)	165	-1.230	0.189	-6.508	1.307	0.376	3.476
RESP (IV)	165	-0.928	0.189	-4.910	0.143	0.376	0.380

Descriptive Statistic of Site Organization (SIOR)

TABLE 1.8

		Skewness			**Kurtosis**		
	N	**Statistic**	**SE**	**Z-value**	**Statistic**	**SE**	**Z-value**
SIOR (I)	165	-0.880	0.189	-4.656	0.615	0.376	1.636
SIOR (II)	165	-1.183	0.189	-6.259	1.410	0.376	3.75
SIOR (III)	165	-0.682	0.189	-3.608	0.433	0.376	1.152
SIOR (IV)	165	-0.662	0.189	-3.502	-0.088	0.376	-0.226

Descriptive Statistic of Efficiency (EFFE)

TABLE 1.9

		Skewness			**Kurtosis**		

	N	Statistic	SE	Z-value	Statistic	SE	Z-value
EFFE (I)	165	-0.541	0.189	-2.862	-0.231	0.376	-0.614
EFFE (II)	165	-0.801	0.189	-4.238	0.218	0.376	0.578
EFFE (III)	165	-1.113	0.189	-5.889	1.097	0.376	2.918
EFFE (IV)	165	-1.077	0.189	-5.699	1.437	0.376	3.822

Descriptive Statistic of Customer Satisfaction (CS)

TABLE 1.10

		Skewness			Kurtosis		
	N	Statistic	SE	Z-value	Statistic	SE	Z-value
CS (I)	165	-1.532	0.189	-8.106	3.301	0.376	8.779
CS (II)	165	-1.163	0.189	-6.153	1.665	0.376	8.810
CS (III)	165	-1.135	0.189	-6.005	1.534	0.376	4.080
CS (IV)	165	-0.864	0.189	-4.571	0.427	0.376	1.136
CS (V)	165	-0.811	0.189	-4.291	1.092	0.376	5.778

Based on the result table of normality test for five independent variables namely Privacy & Security (PRISE), Reliability (RELI), Responsiveness (RESP), Site Organization (SIOR), Efficiency (EFFE), and dependent variable including customer satisfaction (CS) shows that the absolute skewness value between -2 and +2 meanwhile for absolute Kurtosis value between -7 and +7 for 165 samples was distributed (Kline, 2015). Therefore, the result shows that the data can be considered as normally distributed data

EXPECTED FINDING

Throughout this study, firstly, the researcher expected to see a huge number of Malaysian people use online banking at this time especially during this pandemic Covid-19 to prevent personal contact. Secondly, the researcher expected this bank brand can dealing with users complaining about a lack of system security and risk management when it comes to online banking. Thirdly, the layout and design offered to the user must update to the most recent user interface (UI) and possibly add more colors or images as it is also the influence of customer satisfaction. Finally, researcher want to see the acceptance among races while using this online banking. This is due to there is misunderstandings between the users and the bank. There are many people who assume this bank is only for Muslims, but the fact is also open to non-Muslim too. This bank brand has a small user base where most of their user are Muslim compared to non-Muslim because of confusion about the terms of "Islamic Concept". Overall, in this paper, researcher expected most people should realize the importance of the use of online banking for their daily life including paying bills, transferring from one account to another, and transferring money to another person**.**

CONCLUSION

To conclude in this paper, Bank Islam Malaysia Berhad (BIMB) should highlighted all the element of the e-service quality can satisfy customer satisfaction. Along the same lines, the better the degree of customer satisfaction, the easier it is for Bank to maintain existing clients while also attracting new ones. Thus, banks must be aggressive in promoting, attracting, and engaging their consumers in internet banking. As a result, this study aims to fill this research gap by performing a study factor that influences e-service quality online banking on customer satisfaction of online banking among Johor consumers. This will be measured according to independent variables (IV) of Privacy and Security (PRISE), Reliability (RELI), Responsiveness (RESP), Site Organization (SIOR), and Efficiency (EFFE).

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DEVELOPING ZOOKU MEMBERSHIP CARD ATTRIBUTES TO ENHANCE CUSTOMER LOYALTY

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ABSTRACT

Due to the pandemic of COVID-19 outbreaks around the world including Malaysia, one of the attraction places such as Zoo Negara was having a big loss and wanted to attract the customers back by improving its membership program. Zoo Negara relies on raising their fund to cover their expenses because of the restriction and social distancing which led to fund raising, sales ticketing and wanted to improve their membership card. However, Zoo Negara wanted to focus on improving its membership card because of decreasing amount of people to join the membership program. With strong membership program, the switching barriers will be decreasing because the customers choose to be loyal instead of switching to other competitors or even worse, do not renew their membership card. This study aims to improve the membership card of Zoo Negara which is ZooKu Membership Card by determining the preferred elements of ZooKu Membership Card among parents with young children and the best pricing and best attributes of ZooKu membership card among parents with young children. This research is using qualitative research design and the data has been analyzed by using thematic analysis method. The findings consist ed of eight respondents in total that showed their difference and uniqueness responds during the virtual interview. It is recommended that future research shall be conducted in other states in Malaysia or out from the country so ZooKu Membership Card can always in trend and be updated.

Keywords: Membership Program, Elements, Price, Attributes

1.0 INTRODUCTION

Zoo is a place where wild animals and domesticated animals are publicly displayed for people attraction which in the other name, they called it as a zoological garden or zoological park. In the zoo, the animals can be treated with intensive care than in nature reserves or even in sanctuaries (Britannica, 2020). Zoo is being modernized where they are not only for visiting the animals or for entertainment purpose, but for other purposes also. For instance, education, research, conservation and recreation purpose (Rose et al, 2019). Ever since the pandemic COVID-19 strikes last year on March 2020 around the world, New Straits Times by Nuradzimmah (2020) (https://www.nst.com.my/news/nation/2020/12/649305/local-tourism-sector-has-suffered-rm100-billion-losses-due-pandemic) has reported that Malaysia local tourism sector faces huge loss and suffered RM100 billion in losses. Zoo Negara relies on fundraising to cover their expenses because of the restriction and social distancing.

Based on The Star article by Agency (2020) (https://www.thestar.com.my/lifestyle/living/2020/12/19/zoos-on-the-brink-of-collapse-during-pandemic), they reported that many zoos from Europe, UK, Germany, Berlin, Poland and many zoos had relied on public donations to cover the financial crisis, while Ireland had relied on ticket sales by 90% of its funding as they needed to close down the zoo due to government restriction. To be concluded, Zoo Negara needs to raise their funds through their sales ticketing, fund raising and improving their membership card so they can attract the visitors back to come and visit the animals with lots of new attributes. ZooKu Membership Card has been lacking with benefits and membership plan since 2019 compared with another zoological park in the world.

2.0 THE MEMBERSHIP CARD

Colleran (2020) from Join It article has mentioned that membership cards are given to the customers who have signed up or subscribed to join a club or an organization. Membership cards seem pretty similar to a loyalty cards or programs where usually many big retailers or organizations always come with a lot of benefits that are exclusive to the customers.

2.1 THE TYPES OF MEMBERSHIP CARD

According to Eva, a writer from Springly article (https://www.springly.org/en-us/blog/membership-card/), there are two types of membership cards which called as physical card and digital card. TADA blog shared by Nida Amalia (https://blog.usetada.com/types-of-loyalty-membership-card-and-their-measurement-metrics) that there are many of membership card comes with different strategies based on their types such as Point-Based, Paid, Tiering, Engagement and Community type of membership card.

2.2 THE ELEMENTS PREFERRED IN MEMBERSHIP CARD

According to GlueUp article (https://www.glueup.com/blog/membership-card-designs), they found five preferred elements that many people prefer to have on their membership card. They will feel rather special through different versions of membership cards they have in their wallet. Membership cards are the best way to create engagement between the organization and the customers whether the current one or the new one. The five elements are (1) simple and clean, (2) classic yet creative, (3) textured and unique, (4) elegant and sleek, and (5) Gold Member Card.

2.3 THE BEST PRICING STRATEGY FOR MEMBERSHIP CARD

Based on Marine, a writer from Springly article (https://www.springly.org/en-us/blog/membership-pricing-strategy/), she shared five new strategies to improve the pricing strategy for membership card. The five strategies are (1) offering free trials without commitment, (2) offering joining benefits, (3) good, better, best approach, (4) offering payment by installments and (5) getting creative with discounts.

2.4 THE BEST ATTRIBUTES IN MEMBERSHIP CARD

There are some factors that influence of the loyalty program to success such as the incentive, exclusive offers or benefits provided from the organization. The influences also more on customers behavior as it focused on the customer satisfaction. Satisfied customers will spend more for more benefits in which they see the benefits as value (Villace et al, 2013). A loyalty program can deliver few types of benefits to the customers which can determine the hard and soft attributes to increase value (Villace et al, 2013).

3.0 RESEARCH DESIGN

The research design of this study is a qualitative research design. This method has become increasingly popular because it can find data where sometimes it might be hard to use the quantitative method. This study is suitable to use qualitative method because we can focus on the specific data to generate, rather than apply the ready-made structure like a form of survey. The purpose of this method is to collect in-depth nonnumerical data from small sampling (Forward & Levin, 2021).

3.1 POPULATION AND SAMPLING

Due to the pandemic of COVID-19 outbreaks, the method used is a purposive technique which is a virtual interview. The virtual interview was held in online using WhatsApp platform. The total of selected respondents was eight respondents and they were interviewed simultaneously. The respondents also were someone who had experience of being a member for ZooKu Membership Card or the one who are currently a member of ZooKu Membership Card because they had to answer the questions regarding the experience they had and they may answer some of their idea to make improvement of ZooKu Membership Card.

3.2 DATA ANALYSIS

The data was analyzed by using thematic analysis where it is widely used in qualitative research. Thematic analysis is a form of method of analyzing the qualitative data where they are commonly applying in a set of texts, for instance, the interview scripts. The researcher will examine the data to identify the common themes such as the topics, the ideas and also the patterns that repeatedly been using from the interview. There are six process that developed by Virginia Braun and Victoria Clarke; familiarization, coding, generating themes, reviewing themes, defining and naming themes and doing write up. It does involve risks, however this method is rather subjective and relies on researcher's judgement and interpretation (Caulfield, 2020).

4.0 FINDINGS

The respondents in this study are based on the criteria on previous chapter 3 where the respondents are the one who had experience of joining the ZooKu membership card and the one who are currently a member of ZooKu membership card. Following are the list of the respondents' background.

RESPONDENT	AGE	GENDER	NUMBER OF CHILDREN	CHILDREN'S AGE
Respondent 1 (R1)	32	Female	3	12, 10 & 6
Respondent 2 (R2)	29	Female	2	2 & 5
Respondent 3 (R3)	29	Female	1	4
Respondent 4 (R4)	36	Female	3	8, 5 & 1
Respondent 5 (R5)	33	Male	4	12, 10, 7 & 5
Respondent 6 (R6)	27	Male	5	6, 5, 3, 3 & 10 months
Respondent 7 (R7)	29	Male	2	5 & 3
Respondent 8 (R8)	30	Male	1	7

On the table below shows few of respondents' answers during the interview based on questions in the literature review.

TABLE 1: Respondents' Answers During Interview Session

Respondent	What type of membership card that suits your preference better?	Satisfaction towards the current elements of ZooKu membership	The preferred elements on ZooKu membership card	Satisfaction towards the current price in the ZooKu membership card	The preferred price in ZooKu membership card	Attributes that have been lacking off	The preferred attributes on ZooKu membership card	New suggestion to improve in overall marketing strategy
R1	".. tiering membership sebab kemungkinan utk sye dpt dtg zoo frequently tu ada.." "free parking, grooming service, perbanyakkan aktiviti Bersama haiwan, discount for souvenir, tram rides, etc ikut level such as 10% for regular,	"Bg perception sya design dia mcm bdk2 sikit." "colours dia ok sbb sngt attractive.. design dia perlu nmpk mcm sophisticated skit.."	"Sya personally suka card mmg ada nmpk gmbr haiwan .. & haiwan tu kna variety utk dipilih as our card" "..kena ada personalized name"	"suami ok je sbb unlimited entry kan boleh pergi bnyk kali tnpa rasa ragu utk renew tu"	"harga maybe boleh dikurangkan pd dewasa ke rm40, hrga kanak kanak tu masih ok lgi" "Sbb bg sya ni tentang tackle price, bg sya RM45 tu nmpk mahal dn RM40 tu nmpk murah" "Bg sya semuanya okey	"Benefits zooku tak sebanyak zoo lain seperti free parking, fast lane, takde special appreciation day, tak banyak activity sangat, takde perks utk enjoy points/ coupons"	"Ada option utk pilih sama ada nak card ataupun just guna apps. Improve the elements, add on tNg service"	"Tak berbaloi, open kepada semua yang anak. Students daripada kolej atau uni dapat 50% membership card for entrance fee. Opening hours open 8am-6pm"

	20% for resident, 30% for premium”				buat masa skrg”			
R2	“Paid membership card..” “..1 person register for 2 adults + 2 kids, but able to bring any other person with the same amount of other people. Im willing to pay more for more benefits..”	“Not really satisfied because the colours are not attractive”	“Solid colour with animals pattern printing such as tiger, giraffe, tenggiling, any birds, monyet, panda”	“Not really satisfied ..”	“naikkan discount from 25% to 30% to encourage people to come as a group not only as parents especially for adults”	“Tak sediakan simple snacks during tour, no complementary attributes such as change the tram ride tour to other activities because sometimes tram ride is kinda boring”	“Tukar jenis plastic card kepada eco-friendly card, I tak kisah bayar lebih as we can preserve environment at the same time, make the card like a token where people can topup the money to buy f&b and it’s applicable only in zoo negara, like starbucks”	“Bagi saya basically, saya lebih prefer digital instead of physical card because it’s more convenient sebab saya salu terlupa bawak card holder, phone sentiasa bawa so senang kalau anything happen”

5.0 CONCLUSION

To be concluded, findings from this study has discovered that Zoo Negara really must make improvement towards its membership card. By making improvement on their ZooKu Membership Card with this study, it might can help the management to bring something new that different from before. Tiering Membership Card is one the popular membership program that is using widely between the top zoos in the world. With the new attributes that was suggested by the respondents, Zoo Negara is not only can retain its regular customer, but they can attract potential customers as well. However, Zoo Negara need to take care of its zoo management because it is one of the most important elements for customers to keep on visiting and joining their membership card program. Otherwise, the customers would not want to join the membership program due to some circumstances.

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UNDERSTANDING CUSTOMER COMPLAINT ON ZOO NEGARA SOCIAL ENGAGEMENT

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ABSTRACT

In today's globalization period, the majority of individuals utilize social media as their primary means of communicating and interacting with businesses, whether they are satisfied or dissatisfied with their services. Complaining is one of the customer's feelings in which they can voice out their opinion or feedback with the services they received. Every client complaint will benefit businesses, as it will essentially improve their offerings for a better one. One of the very good efforts to connect with their customers is for a business to offer a proper platform for their customers to give feedback and one of the very powerful ways by using their social media. The goal of this study is to discover how the customer complaints behavior against Zoo Negara Malaysia using social media platforms. This research gives useful insight towards the companies where to put more effort to understand the customer behavior on their action on taking complaints towards their experience in product and services.

Keywords: Customer, Feedback, Complaints, Social Media, Zoo

1.0INTRODUCTION

Nowadays, the usage of social media has grown in popularity and has become a way of life for all types of customers, regardless of their age or origin. People are fully aware of social media's inception, and it has evolved into a platform for communication, sharing, engagement, and cooperation. Moreover, businesses utilize social media as a platform for selling their product, promoting their current brand, communicating with their consumers, and cultivating new clients, therefore social media and business are linked as it becomes something that every business really needs. As for that, any business now who have no social media as their tools on dealing with their customer will be far behind left by competitors.

However, customer complaints are usually treated on an individual basis and emotion which focuses on the symptoms rather than the root reasons of consumer unhappiness (Hsiao et. al., 2016). As there are more reasons for unhappiness, there are other reasons too such as want to resolve the problems that they are facing, seek revenge on the company, there are some who vent out because of frustration, and to give a chance to the company to make an improvement. Consumers may easily share their thoughts about the service failure in a more public and real-time environment via social media channels (Gensler et al., 2013), which will only increase the company's problems in handling the situation if it stems from their own service failure.

2.0LITERATURE REVIEW

Client complaints have become the most significant issue in the relationship between the customer and the business; complaints can be raised as a result of unsatisfactory services obtained. As a result, responding to customer complaints correctly has become a big issue (Bolton and Saxena-Iyer 2009) as well as an opportunity for both businesses and their social media operations. A favorable customer complaint will lead to a strong connection, which will eventually lead to customer loyalty and businesses should take advantage of this opportunity to handle their customer complaint effectively.

2.1 Elements of the Customer Complaint

Customer discontent is important in understanding customer complaint behaviour (Blodgett & Granbois 1992), since each act of the customer complaint has its own purpose and variables to consider. A consumer complaint, on the other hand, is described as a statement of displeasure on behalf of a consumer to a responsible party, where in business its the services provided itself (Landon 1980). Furthermore, there are a variety of reasons why a consumer would take action and file a complaint, as we feel their motivations for voicing their concerns are part of their overall behaviour and rights. As for that, we'll discover the element of the client complaint on determining their own complaint on the services supplied in this section. It includes venting frustrations, seeking vengeance against the business, sharing negative experiences, seeking understanding and respect, and finally, giving the firm an opportunity to change.

2.1.1 To Vent Frustration

According to (Mikhaylov and Mikhaylova, 2016), customers tend to address problems through interactive complaint channels such as social media, face-to-face dialogue with frontline staff or sometimes express their displeasure through bad word of mouth with family and friends. Furthermore, consumers who choose to express their frustrations always begin with an unpleasant service that did not match their expectations or in which they were handled unfairly. As a result, organisations should devise methods for responding to and resolving issues where customers choose to vent their dissatisfaction. In this situation, firms must exercise extreme caution, since any missteps will negatively impact the client.

2.1.2 Seek For Revenge

Customers' desire for revenge may often be seen in public postings on social media platforms like Facebook, Twitter, and Instagram, as well as third-party complaint sites like 'zoonegara.complaint.org' and anti-corporation from websites. In online environments, the potential damage to businesses from negative reviews, including revenge, is much greater nowadays. Not only because of the ready availability of technologies and their widespread use, but also because of their ability to make it viral and reach a large audience in a short period of time (Tripp & Gregoire, 2011). Furthermore, it will spread much more quickly as a potential client or new customer who would never test the services will be swayed by the complaint that they heard and saw.

2.1.3 Share Unfavourable Experiences

As stated by (Hollebeek and Chen. 2014) define that negative customer engagement as consumer unfavourable brand-related thoughts, feelings and behaviours during the service process. This perspective postulates that negative customer engagement and positive customer engagement are the opposite forms of the same construct of customer engagement. To add on, sharing unfavorable experiences has become one of the customer complaint examples, where customers express their feelings on unsatisfied services. Few examples that we can see, from the customer complaints on sharing their unfavorable experience.

2.1.4 Seek Understanding and Respect

Listening and comprehending consumers are crucial in managing customer complaint behaviour, according to (Dwyer et al., 1987) and (Stone, 2011). As a result, many believe that posting their negative experiences on Facebook was their final option for gaining understanding and respect from the company after failing to settle their issues personally. Had the retailer and its frontline employees listened and shown understanding of the initial complaint in the first place. (Heung and Lam, 2003) attribute this to psychological reasons such as requesting an apology and seeking an explanation from the business' services.

2.1.5 Offer Chance to Improve

Despite their dissatisfaction with their negative experiences, the findings of (Mei, Bagaas, and Relling, 2019) show that not all respondents wished to harm the shop, and that some are still on the good track. Some respondents stated that they expressed their dissatisfaction in order to give the shop an opportunity to change. As a result of the complaints, the business will not only suffer, but the service will also have a good chance to improve. If their company is aware of this procedure, they will be able to effectively use every complaint to enhance their services in the future.

3.0RESEARCH METHODOLOGY

3.1 Research Design

The research design of this study is descriptive qualitative research design. This study uses social media complaints in collecting data from prospect respondents in different social media platforms.

3.2 Population and Sampling

Population refers to the total number of people or residents in a nation or territory, as well as a collection of people or groups, events, or themes with common qualities or characteristics that serve as study subjects. The researcher used complaints from several social media platforms, including websites, Instagram, Facebook, and Twitter that are used to study the customer complaint.

3.3 Data Analysis

This study employs a thematic approach to data analysis. Data analysis is divided into three steps: generating and applying codes, establishing themes, patterns, and correlations, and summarizing the information. This method has the advantage of being dynamic and allows for the extraction of a significant amount of data from the information quality. Many scholars have used theme analysis in their study in the past. Thematic analysis, on the other hand, is split into six phases by (Braun and Clarke, 2006):

Phase 1: Researcher had to familiar and knows the data that being gather

↓

Phase 2: Code the data into meaningful groups

↓

Phase 3: Searching a theme based on the code

↓

Phase 4: Reviewing the selected theme

↓

Phase 5: Define and name a theme

↓
Phase 6: Prepared a report

Fig. 1: Six phases of Thematic Analysis

4.0EXPECTED FINDINGS

From this research it can comprehend the customer's complaint through various social media platforms, such as Twitter, Facebook, Instagram, Youtube, and websites, based on this research. As a result of this, we may use theme analysis to see that every social media site has their own unique remarks on Zoo Negara Malaysia. Furthermore, we can detect a significant difference in the segmentation of this input, which shows precisely which portion of the Zoo is lacking from the social media platform. To add on, every social media has their own demographic design that explains the users information and more.

One of the approaches to solve any company problem is to understand client concerns. This study can address the majority of the customer's inexplicable and confusing difficulties, and one of the methods to identify it is to comprehend the consumer complaint. Furthermore, a total of 30 complaints from various social media platforms will be used to identify and explore the true needs of each problem; the rationale for just 30 complaints is that most social media complaints are about the same things.

NO OF COMPLA INTS	SOCIAL MEDIA PLATFORM	COMPLAINTS
C1	Facebook	"The environment is very poor, the fish tank is very dirty, no fish can be seen at all and the animals are too thin. Feel the management is unwilling to improve these problems"
C2	Website (TripAdvisor)	"Dear Zoo Negara. Do us a favour and close down this Zoo for good. It is an embarrassing for the country."
C3	Instagram	"The entrance ticket is very expensive, have to think twice to bring the whole family as it could cost up to hundreds ringgit. If they lower the price around RM20 then maybe more people will go and visit the place."
C4	Website (Traveloka)	"Zoo is quite run-down and lack of maintenance. Will not go again."

Fig. 2: Examples of the data/ complaints collected from the 30 complaints.

5.0CONCLUSION

To sum up everything that has been stated so far, from this research it could help to clarify to Zoo Negara on where they are lacking and need to improve. As towards the end, to fulfill the needs of the customer is what every business needs to achieve.

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THE INFLUENCE OF BRAND EQUITY ON CUSTOMER'S PURCHASE INTENTION: A CASE STUDY OF KARISMA JAYA ENTERPRISE

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ABSTRACT

The purpose of this study is to investigate the influence of brand equity factors on purchase intention using Aaker's well-known conceptual framework in the F&B industry. A model of customers' purchasing intentions is presented that encompasses the primary factors of brand equity such as brand awareness, brand association, perceived quality, and brand loyalty. Because these connections have such a significant impact on marketing methods, brand equity dimensions have become critical for micro-SME. According to the report, marketers should carefully evaluate the components of brand equity when developing their branding strategies. Marketers must also adapt their branding strategies to each marketing environment and increase brand loyalty to avoid consumer switching behaviour. In this study, a quantitative method will be used. A survey will be distributed to current customers who have a presence on WhatsApp's and social media sites in order to collect data. These specifics assist us in better understanding Karisma Jaya Enterprise's growth and brand equity.

Keywords: Brand equity, Purchase intention, Consumer behaviour, Micro-SME

1.0 INTRODUCTION

1.1 Problem Statement

The spreading of COVID 19 became more aggressive in early 2020, forcing Malaysia to implement the Movement Control Order (MCO). Because of Movement Control Order (MCO), many firms, particularly small business owners, are struggling to sustain and protect their operations. Similarly did to Karisma Jaya Enterprise, which nearly went out of business when the Movement Control Order (MCO) was implemented. During Movement Control Order (MCO), Kasih Bonda Mee Kuning sales declined, affecting the company's profitability. In addition, "Since Gardenia introduced noodle goods, sales of 'Kasih Bonda Mee Kuning' have decreased, and the entrance of MUSLIM Mee noodle products, which is known for the trademark "Mee MUSLIM", has also impacted the sale of 'Kasih Bonda Mee Kuning' in this area," stated Karisma Jaya Enterprise's founder. According to his statement, the introduction of noodles from a large company into supermarkets and grocery stores in the Temerloh, Mentakab, and Jerantut districts reduced sales of 'Kasih Bonda Mee Kuning'.

Brand is a company's most asset, and it has long been recognized as an important factor in consumer choice. It serves as a tool for consumers to assess product differentiation and uniqueness, while also enhancing consumers' trust and confidence in the decision-making process, alleviating some of the problems associated with their experience and credence qualities [9]. If the consumers have more faith in a particular brand than in competitors' brands, it will increase brand loyalty and readiness to pay a higher price for it [14]. In other words, companies with significant brand equity acquire a competitive advantage and have more opportunities for successful extensions, resistance to promotional demands from competitors, and the establishment of barriers to entrance [14]. To raise the rate of customer's purchase intention towards their products, it seems important for Karisma Jaya Enterprise to pay attention to the elements of brand equity in their business, such as brand awareness, brand association, perceived quality, and brand loyalty. Brand equity refers to the additional utility or value that a product receives because of its brand name. In addition, it is commonly thought to benefit a company's long-term profitability.

The purpose of this study is to investigate the relationship between Karisma Jaya Enterprise's brand equity elements and prospective consumers' purchase intention. Due to the low customer purchase intention compared to other competitors in this market, this study will test the hypothesis either brand equity elements have a significant impact on consumer purchase intention or not. If the hypothesis constructed is accepted, then it can be proven that the brand equity elements have a significant effect to consumer purchase intention. This study will contribute to Karisma Jaya Enterprise and microbusiness in increasing customer's purchase intention through determining brand equity elements.

1.2 Research Objective

i. To investigate the effect of brand awareness on customer's purchase intention.
ii. To investigate the effect of brand association on customer's purchase intention.
iii. To investigate the effect of perceived quality on customer's purchase intention
iv. To investigate the effect of brand loyalty on customer's purchase intention.

1.3 Research Questions

i. Does brand awareness affect customer's purchase intention?
ii. Does brand association affect customer's purchase intention?
iii. Does perceived quality affect customer's purchase intention?
iv. Does brand loyalty affect customer's purchase intention?

2.0 LITERATURE REVIEW

2.1 The Effect of Brand Awareness on Purchase Intention

According to previous research on brand awareness, there is a positive relationship between brand awareness and purchase decisions [6]. Raising brand awareness is the first step in developing a product brand [4]. In addition, brand awareness influences customer behavior by delivering three benefits, according to Keller (2003): learning, consideration, and choice [8]. Brand awareness refers to consumers who are aware of a company's existence. Brand awareness has an impact on purchase intention, and the more a brand's customer awareness, the higher the buy intention [8]. Ardiansyah & Sarwoko, 2020 stated that increasing brand awareness will increase the possibility of considering brands while making purchases. Simply said, the greater the level of awareness of a particular brand, the greater the likelihood of that brand being purchased [4].
H1: Brand awareness has a significant effect on customer's purchase intention

2.2 The Effect of Brand Association on Purchase Intention

A strong brand connection increased the likelihood of repeat purchases by increasing consumer satisfaction with the brand in comparison to its competitors. Because they were perceived as having fewer risks, most consumers purchased products with a positive brand image and a good brand association [10]. Brand association effect on purchase intention partially. According to the findings of Apriyani, brand association has a positive and significant impact on purchasing decisions. This means, the higher the brand association the higher the level of purchase decisions that continue [2]. Most previous research looked at the impact of brand association on customer purchase intent and found a strong link between the two [12]. In Zeeshan (2013) research, he discovered that brand association had a considerable impact on customer's purchasing intent. As a result, entrepreneurs or business owners have to increase the brand image's worth or value by various marketing or promotions [10].
H2: Brand association has a significant effect on customer's purchase intention

2.3 The Effect of Perceived quality on Purchase Intention

Consumers would compare the perceived quality of alternatives in terms of price within the same category because perceived quality was a critical factor in their purchasing decision [10]. Perceived quality is a vague and intangible impression of a brand. Perceived quality, on the other hand, is frequently dependent on essential parameters such as product specifications (reliability, performance and brand) [12]. In addition, perceived quality also refers to a consumer's perception and attitude toward a brand, which has an impact on their buy intent. Furthermore, the higher a customer's sense of a brand's quality or superiority, the more likely they are to purchase it [5]. Product quality is an important consideration when determining purchase intent. Customers

would first evaluate the product's quality before making a purchasing decision. They would intend to buy if they considered the product quality was reasonable for the price [10]. In other words, the perceived quality of a company's product had a direct impact on its reputation.
H3: Perceived quality has a significant effect on customer’s purchase intention

2.4 The Effect of Brand Loyalty on Purchase Intention

In strategic marketing, brand loyalty has long been regarded as a crucial idea. Loyal customers share good news about the product through word of mouth [1]. Branding has a critical role in retaining a company's market share and attracting loyal customers. Customers that are loyal to a brand are more likely to repurchase and suggest it to others. Customers who are loyal to a brand will pay more for it than for similar products [13]. Previous research has shown that customers who are loyal to a company for a long time make repeat purchases, resulting in profitability and growth [12]. Previous research indicates that high levels of brand loyalty lead to the purchase of the same brand on an ongoing basis [5].
H4: Brand loyalty has a significant effect on customer’s purchase intention

2.5 Research Framework

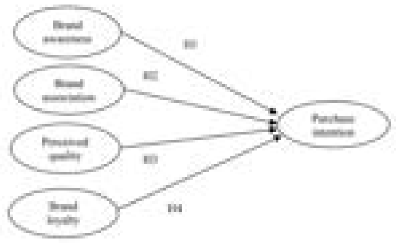

Fig. 1: The research model framework

3.0 METHODOLOGY

3.1 Research Design

This study's research design is descriptive quantitative research design. In addition, this quantitative research was conducted to study the relationship between the variables, which is the dependent and independent variables. This research will only be conducted using one method which is distributing the questionnaire via Google Forms. The researchers used online platform such as WhatsApp, Telegram and Facebook to reach out to the target respondent. The series of questions enables respondents to select from a range of choices. The five-point Likert scale is used to assess the strength of the answer.

3.2 Population and Sampling Technique

The population of this research are people from Temerloh, Mentakab, and Jerantut, Pahang. The sample technique utilized in this study is non-probability sampling. Nonprobability sampling also refers to techniques in which researchers choose sample elements depending on research goal, subject availability, subjective judgement, or a number of other nonstatistical reasons rather than a predetermined probability. Next, non-probability sampling technique used for this research is judgmental sampling. Judgmental sampling (also known as Purposive Sampling) is a sort of nonprobability or non-random sampling in which the researcher chooses units to sample based on prior knowledge or professional judgement. Thus, researcher choose this samples because respondents are selected based on researcher’s knowledge and judgment by using screening question. According to Hair et al. (2010), the minimum sample size should be 100 [7]. Thus, the target sample size for this study was 120 respondents

3.3 Data Analysis Method

The data is analyzed using the Statistical Package for Social Science (SPSS) software. The reliability test, normality analysis, and multiple regression analysis are utilized to construct a broad statistical analysis.

4.0 DATA ANALYSIS AND FINDINGS

4.1 Normality Test

According to Hair et al. (2010), the skewness and kurtosis test results should be between -2 and +2 for skewness and -7 to +7 for kurtosis [7]. For gender, age, race, district, and education level, Table 4 presents the skewness and kurtosis results. All the respondent's profile are inside the permissible ranges for skewness and kurtosis, which are -2 to +2 for skewness and -7 to +7 for kurtosis, respectively. As a result, the study's data is dispersed normally.

TABLE 1: Normality Test

Respondent's Profile	Skewness	Std. error	Kurtosis	Std. error
Gender	-.342	.221	-1.915	.438
Age	.116	.221	-1.005	-1.005
Race	-.032	.221	-1.586	.438
District	.149	.149	-1.016	.438
Education level	-.124	.221	-.967	.438

4.2 Reliability Test

The study's questionnaire construct was subjected to a reliability test to determine its reliability and internal consistency. Cronbach's Alpha values range from 0.859 to 0.926 for all variables, as shown in Table 2. The Cronbach's Alpha score of 0.7, according to Malhotra & Sebat, 2012 implies that the variables are consistent and reliable [11]. This indicates that brand awareness, brand association, perceived quality, brand loyalty, and purchase intention are all reliable.

TABLE 2: Reliability Test

Variables	No. of item	Cronbach's Alpha
Brand Awareness	5	.892
Brand Association	3	.882
Perceived Quality	4	.861
Brand Loyalty	5	.926
Purchase Intention	3	.859

4.3 Multiple Regression Analysis

As shown in Table 3, 2 the factors show a significant and positive relationship with purchase intention at p-value < 0.05. However, 2 other variables show negative relationship with purchase intention at p-value > 0.05. The accepted variable includes perceived quality and brand loyalty, but the rejected variable are brand awareness and brand association. The two accepted variable, perceived quality and brand loyalty shows the strongest predicator for purchase intention with beta value of 0.001.

TABLE 3: Multiple Regression

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.160	.229		.701	.484
	BA_AVG	.012	.110	.011	.112	.911
	BAS_AVG	.109	.098	.118	1.114	.267
	PQ_AVG	.402	.107	.331	3.763	.001
	BL_AVG	.451	.094	.479	4.790	.001
a. Dependent Variable: PI_AVG						

4.4 Summary of Hypothesis

TABLE 4: Hypothesis Testing

Hypothesis Testing	
Brand awareness has a significant effect on customer' purchase intention	Rejected
Brand association has a significant effect on customer' purchase intention	Rejected
Perceived quality has a significant effect on customer' purchase intention	Accepted
Brand Loyalty has a significant effect impact on customer' purchase intention	Accepted

5.0 DISCUSSION AND CONCLUSION

Brand awareness and brand association have no significant effect on customer purchase intention, however perceived quality and brand loyalty have a significant effect.

5.1 Recommendations For Karisma Jaya Enterprise

Since Hypothesis 3 is accepted and has a substantial effect on customer purchase intention, Karisma Jaya Enterprise must improve their quality to persuade customers to purchase it. Karisma Jaya Enterprise encouraged the use of high-quality plastic for packaging to attract potential customers and make a positive first impression on targeted buyers. Packaging material is used to wrap a product on the outside to protect it from damage. Similarly, the packaging material is referred to be a tool for communicating the value of the product to the buyer. The current plastic used for packaging appears to be cheap and oily, making people uncomfortable when they touch it. My advice to Karisma Jaya Enterprise is to switch to a different type of plastic for their packaging and figure out how to avoid making the noodle excessively oily. The packaging material used may affect the perceived quality of the goods, and packaging material can protect the product from damage. Naturally, people are more likely to purchase a product with high-quality packaging than a product with low-quality packaging [15]. Finally, Karisma Jaya urged the use of the Halal Jakim certificate to encourage customers, particularly Muslim customers, to purchase it. Even if Mee Kuning Bonda is made by Muslims, the halal certification is vital to provide customers confidence when purchasing a food product. This is because the Halal logo also indicates that the company and facility that processes the food are clean and safe. In addition, as hypothesis 4 has a significant effect on purchase intention, Karisma Jaya Enterprise must improve Kasih Bonda Mee Kuning brand loyalty. If we want to improve purchase intention in the food industries market by focusing more on brand equity, the most important thing is to make customers loyal, as this is the only component in establishing purchase recommendations in customers [13]. According to the findings of Alraja et al, 2020, effective use of social media marketing will improve firms' ability to manage organizational marketing and commercialization strategies [3]. This smart and straightforward method will raise the number of customers and hence the quantity of purchases. An effective adoption of social media marketing practices will help organizations enhance product sales and allowing them to meet their goals. Because of the growing number of efforts to improve a company's reputation, it is believed that the relationship between social media practice elements is critical to raise company profits and customer loyalty [3]. Karisma Jaya Enterprise must develop engagement with both present and potential customers to improve Brand Loyalty. Karisma Jaya Enterprise is urged to create social media to increase audience engagement. Create engaging content about Kasih Bonda Mee Kuning, such as recipe sharing, culinary activities, highlighting the benefits of using Kasih Bonda Mee Kuning, and many more, to attract customers and interact with the audience.

5.2 Recommendations For Future Studies

Based on the study's limitations, future studies can be undertaken to include other Malaysian places based on case studies. Questionnaires can be collected online and offline if the pandemic is better, such as at a stall, restaurant, or other relevant location based on the researcher's research. Meanwhile, future research should include other independent factors to examine the association with purchase intention. This is due to the outcome of multiple regression, which shows that brand awareness and brand association have no significant effect on customer purchase intention (p-value >0.5). This is since stronger client buy intentions are vital for a company's ability to boost sales and profit.

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IMPLEMENTING SOCIAL MEDIA EFFORTS AND ENGAGEMENT TO INCREASE BRAND EQUITY AND PURCHASE INTENTION OF A TELECOMMUNICATION SERVICE PROVIDER

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ABSTRACT

Telecommunication is an important component of the modern lifestyle and has a significant impact on economic development. However, Covid-19 pandemic has shattered every industry in Malaysia including telecommunication industry. Since many industries are not allowed to operate during Movement Control Order (MCO), many businesses have used online business model to survive during this critical time. This implies that social media marketing is increasingly significant for every business. Use of social media marketing is vital to increase online social interaction, brand equity, and customer's purchase intention. As such, this study aims to examine the effectiveness of the implemented social media marketing efforts to enhance the brand equity and customers' purchase intention of a telecommunication service provider. In this study, quantitative method is conducted by distributing the online questionnaires through Google Form and the sample size for this study is 200. In conclusion, the findings are expected to increase the effectiveness of the implemented social media marketing efforts that can enhance the brand equity and purchase intention of telecommunication services industry.

Keywords: Telecommunication, Brand equity, Purchase intention, Social media marketing efforts

1.0 INTRODUCTION

In recent years, the Malaysian telecommunication industry has experienced a tremendous expansion and is predicted to achieve huge expansion throughout the projection period until 2025 (Global Monitor, 2021). Cable companies, internet service providers, satellite companies, and phone companies formed the telecommunications industry. Telecommunication is an important component of the modern lifestyle and has a significant impact on economic development (Sajjad, 2017).

According to Malaysian Communications and Multimedia Commission (MCMC) (2020), the telecoms industry contributed RM130.25 billion to the RM137.74 billion market capitalization of C&M industry on June 2020. Maxis Sdn. Bhd. and Digi Telecommunications Sdn. Bhd. lead the telecommunication sector with 2.66% and 2.12% of the RM137.74 billion market capitalization of the communications and multimedia industry respectively (Malaysian Communications and Multimedia Commission, 2020). This is because they have achieved a significant social media follower by producing content that Malaysian consumers can relate to (Nadira, 2020). As a result, the utilization of social media marketing and consumer-generated content in building their brand equity are two reasons that explain the company's social media presence is high (Nadira, 2020). Therefore, it is proven that social media marketing is significant to increase the online social interaction, brand equity, and increase their customer's purchase intention.

Communication methods must be adjusted to take benefit from new technology and tools to engage customers in both commercial and consumer sectors. Using content generated by company or consumer, social media has developed into a new effective tool for interacting with the customers via online (Schivinski et al., 2016). Many e-commerce businesses are already utilizing Facebook and Instagram to not only sell effectively but also to provide extensive information to potential customers. Another factor to influence purchase intention is brand equity. In the perspective of the consumer, brand equity is established via connections with the brand

(Khamitov et al., 2019). Perera et al. (2019) and Dissabandara (2020) previously shown that purchase intention highly impacted by brand equity.

Every industry has been shattered by the COVID-19 wave. Malaysian telecommunication service providers were also not exempt from this circumstance (Kanapathipillai & Azam, 2020). There are many telecommunication service providers such as Digi Telecommunications Sdn. Bhd., Maxis Sdn. Bhd., Celcom Axiata Berhad, and other service providers. One of the telecommunication service providers is located at Yong Peng, Johor. However, due to COVID-19 pandemic and business sustainability, the telecommunication service provider is facing problems such as low sales volume. To boost the sales, it is significant to enhance their consumers' purchase intention and brand equity via social media marketing and brand-related content.

1.1 PROBLEM STATEMENT

During the Covid-19 pandemic, the revenue of a telecommunication service provider which located at Yong Peng, Johor was declining since they are not allowed to operate the business during MCO. Besides, they need to provide 1GB of internet free data every day for their customers during Covid-19 pandemic and it caused low customer purchase (Yunus, 2020). As a result, sales of telecommunication service provider also dropped in March 2020 because of the MCO of the Covid-19 pandemic in Malaysia. To survive during Covid-19 pandemic, the telecommunication service provider has started to use social media for increased sales such as creating a Facebook page for online business purposes since the social media platform has steadily grown in prominence during the crisis.

According to the Global Web Index (2021), Malaysia has 28 million social media users in January 2021. The number of Malaysia's social media users increased by 7.7% or 2.0 million from 2020 to 2021. Malaysia's social media users reached for 86% of the total population of Malaysia in January 2021. Businesses can take advantage of social media marketing because of its low cost, rapid, and extensive transmission of information, intensity of customer engagement is high, and extremely efficient management of public relations (Zhou et al., 2017).

Nevertheless, the telecommunication service provider at Yong Peng has **no active social media presence.** Yet, the telecommunication service provider only has walk-in customers. In order to enhance their online visibility, customers' purchase intention and sales, social media engagement has become a vital element of any marketing strategy. According to Chin et al. (2015), user attitude has a consistent influence on Facebook users' purchase intention. Furthermore, users' perceptions and ideas about the info they receive via social media shape their affective attitudes (Lee & Hong, 2016). On the other hand, the brand equity of an online business can also positively impact on customers' purchase intention. According to Schivinski & Dabrowski (2016), online purchase intention from social media communication that generated by both users and companies are significantly influenced by brand equity. This means, the telecommunication service provider could use social media marketing to boost their brand equity and increase their consumer purchase intention.

To get more target customers and increase their purchase intention, social media engagement strategy is vital for the telecommunication service provider from brand awareness to brand equity. Therefore, this study will examine the factors that impact consumers' purchase intention towards the telecommunication service provider. Further, the study aims to propose several social media marketing efforts to increase the customers' purchase intention of a telecommunication service provider.

1.2 RESEARCH FRAMEWORK

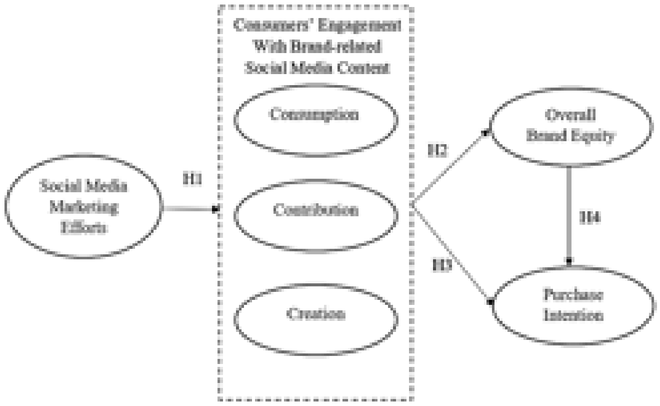

Fig. 1: Research framework for Examining Social Media Strategies To Increase Brand Equity and Purchase Intention of A Telecommunication Service Provider

1.3 RESEARCH OBJECTIVES

There are three research objectives in this study as below:
RO1: To identify the factors that enhance the customers' purchase intention of telecommunication services.
RO2: To design social media marketing efforts to enhance the customers' purchase intention of the telecommunication service provider.
RO3: To examine the effectiveness of the implemented social media marketing efforts to enhance the customers' purchase intention of the telecommunication service provider.

2.0 LITERATURE REVIEW

2.1 PURCHASE INTENTION

"Purchase intention refers to the connection between consumer's needs, attitude, and perception of the product or brand will possibly influence a consumer to buy certain product" (Beneke et al., 2016, p. 6). Consumers' perceptions of brand equity are influenced by online reviews, which, in turn, influence their purchase intention (Hayes & Carr, 2015). Besides, consumers are more inclined to buy with a known brand, and high level of brand equity is an indicator of purchase intention. According to Kahraman and Kazançoğlu (2019), consumers purchase intentions represents the likelihood of the consumers will carry out the purchasing action. Therefore, the purpose of this study is aims to examine the impact of social media marketing efforts, consumers' engagement with brand-related social media content, and brand equity on consumer's purchase intention of telecommunication service provider.

2.2 SOCIAL MEDIA MARKETING EFFORTS

Social media refers to the apps e.g., Facebook, Instagram, YouTube, WhatsApp, and Twitter, that rely on user-generated content. These apps have a significant influence on consumer buying and selling behaviors (Kapoor et al., 2018). "An interdisciplinary and cross-functional idea of leveraging social media (typically combined with other channels of communication) to reach organizational objectives through producing profit for stakeholders" described as social media marketing (Felix et al., 2017). Stokburger-Sauer et al. (2012) and Torres et al. (2017) revealed that brand social advantages lead to recognition of consumer-brand, and social media marketing activities can impact the extent to which consumers believe that their interactions with a company could establish social connections. Therefore, the purpose of this study is to identify the influence of social media marketing on the purchase intention of telecommunication service provider.

2.3 CONSUMERS' ENGAGEMENT WITH BRAND-RELATED SOCIAL MEDIA CONTENT

Consumers' online brand-related activities described by Schivinski et al. (2016) as "a collection of online actions on the consumer's part that are linked to a brand, and which vary in the degrees of interaction and participation with the consumption, contribution and creation of media content" (p. 5). Consumption, contribution, and creation are all part of a three-dimensional framework for social media engagement. In general, these three forms of usage are considered important in generating positive brand or business consequences, such as engagement, satisfaction, brand loyalty, purchase intention, and positive recommendations (Mishra, 2019; Piehler et al., 2019). Therefore, this study aims to analyze the impact of consumers' engagement with brand-related social media content on consumer's purchase intention of telecommunication service provider.

2.4 BRAND EQUITY

Since the 1990s, "brand equity" has become one of the major topics in management of marketing (Lee et al., 2017), which considered to be a critical part in achieving competitive market benefit and differentiation

(Iglesias et al., 2019). According to Bilgin (2018), social media marketing efforts are supposed to directly enhance brand equity including brand image, brand awareness, and brand loyalty. Perera et al. (2019) and Dissabandara (2020) previously showed that brand equity has an important impact on the purchase intention. In general, brand equity based on customer may use to predict whether customers will prefer a branded product over a product without brand but with same attributes (Chahal & Rani, 2017; Pappu & Quester, 2017). As a result, business firms and marketers should put a priority on brand equity for increasing the market share and profit. Therefore, this research aims to investigate the influence of brand equity on consumer's intentions to purchase telecommunication services.

2.5 HYPOTHESES DEVELOPMENT

Mishra (2019) has identified five factors under social media marketing activities as motivators for the engagement of consumers with brand's content on social media. These factors are customization, entertainment, interaction, trendiness, and word-of-mouth. According to Koch and Benlian (2015), the content customization can affect the engagement of social media users with the social media content. Therefore, the following hypothesis is developed:
H1: Social media marketing efforts will have a positive and significant effect on consumers' engagement with brand-related social media content.

Previous research had shown that the consumer participation in brand-related material can positively affect the consumer's perception of brand equity (Machado et al., 2019). Besides, the interaction between consumers and the brand can enhance brand knowledge and then brand equity, resulting in higher brand preferences (Mishra, 2019). Schivinski and Dabrowski (2016) and Schivinski et al. (2016) have demonstrated a significant and positive impact of the brand communication on social media (both consumer-generated and firm-generated) on brand equity. Thus, a hypothesis is proposed as follows:
H2: Consumers' engagement with brand-related social media content will have a positive and significant effect on overall brand equity.

According to Binwani and Ho (2019), purchase intention is influenced by social media cues. The value of the product and recommendations posted by other customers on social media platforms play a significant role in customer's decision to buy a product (Dehghani & Tumer, 2015). The desirable objective of any social media marketing activity for any company is to have a positive impact on the consumer's buying intention of the company (Mishra, 2019). Thus, based on the above discussion, the following hypothesis is proposed:
H3: Consumers' engagement with brand-related social media content will have a positive and significant effect on purchase intention of telecommunication services.

Previous research has demonstrated that higher brand equity would positively and significantly effect on purchase intention of a consumer toward that brand (Pappu & Quester, 2017). According to Suryadi (2015), brand equity (perceived quality, brand loyalty, brand awareness, brand association) has an important simultaneous impact on purchase intention. Thus, the hypothesis is proposed:
H4: Overall brand equity will have a positive and significant effect on purchase intention of telecommunication services.

3.0 RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

The research design defines the way to choose the participants, the variables included, and the way to manipulate the variables, the method to collect and analyze data, and the method to control the extraneous variability to address the main research problem (Dannels, 2018). Therefore, it is vital to develop an appropriate research design. Exploratory research and conclusive research are two types of research designs (Surbhi, 2017). This research will use a conclusive research design comprised of descriptive research and cross-sectional design to explore the link between social media marketing efforts, consumers' engagement with brand-related social media content, brand equity, and purchase intention of a telecommunication service provider.

3.2 POPULATION AND SAMPLING

A specific group of people, regardless of whether it is same nation or a group of people who share a trait is defined as population (Osikhotsali, 2021). While target population is referred to a specific group of people whose outcomes will be compared. Thus, the target population of this study is the respondents who liked and followed any of a telecommunication brand. Meanwhile, according to Vijayamohanan (2021), sampling process are entities (e.g., persons, households, and organizations) selected from a population (universe) of interest. Therefore, generalize reasonably findings back to the population from which they were chosen by analyzing the sample. The sample is the group of people that choose to be the respondents in the research. According to Azraii et al. (2021), the sample size is calculated based on the calculation of subject-to-item ratio of 5:1. Therefore, the minimum sample size of this study is 205.

3.3 RESEARCH INSTRUMENT

Research is divided into two types which are quantitative research and qualitative research. The quantitative method is adopted in this study. The primary data gathered from the respondents via online by using the Google Forms format for questionnaire instrument. The items for the questionnaire were constructed based on the previous research (Mishra, 2019; Choedon & Lee, 2020). The questionnaire is divided into 2 parts which are Part A and Part B. Part A is the questions regarding the respondents' demographic profiles. It consists of demographic questions regarding respondents' gender, age, education level, and income. For Part B, there were 33 questions to investigate the factors that drive the consumer's purchase intention of a telecommunication service provider. All these scales' items of Part B were measured by the five-point Likert scale: 1 (Strongly disagree), 2 (Disagree), 3 (Neutral), 4 (Agree), and 5 (Strongly agree). Then, using the Statistical Package for the Social Sciences (SPSS) to screen, process, and analyze the data after the stage of data collection.

A survey will be distributed to target respondents to identify what factors drive their purchase intention of a telecommunication brand. Further, social media marketing efforts and engagement strategies are proposed for the telecommunication service provider to post the content related to their products and services and renew their posting 3 times per week on their social media platform which is Facebook. This is because active on social media indicates a strong online presence of a telecommunication service provider. As a result, it can enhance the customer's purchase intention towards the telecommunication service provider.

4.0 EXPECTED FINDINGS

The research is anticipated to verify the relationships between i) social media marketing efforts and consumers' engagement with brand-related social media content, ii) consumers' engagement with brand-related social media content and overall brand equity, iii) consumers' engagement with brand-related social media content and purchase intention of a telecommunication service provider, iv) overall brand equity and purchase intention of a telecommunication service provider. In addition, the findings from this research are expected to identify the key factors that can increase customer's purchase intention of the telecommunication service provider using social media efforts. Thus, a telecommunication service provider can regulate and carry out their marketing strategies to enhance the customers' purchase intention of telecommunication services.

CONCLUSION

In conclusion, social media marketing efforts and consumers' engagement with brand-related social media content have a positive and significant effect on brand equity and purchase intention of a telecommunication service provider. The findings of this study are expected to provide deeper insights for other telecommunication industries and further researchers for understanding the factors that can increase the customer's purchase intention of the telecommunication service providers. Besides, the results of this study are expected provide insights for other telecommunication service provider to develop these marketing strategies. In addition, the findings of this study are expected provide insights to future researchers who study the marketing strategies that can increase the customer's purchase intention of telecommunication service provider. As a result, they can use the marketing strategies in this study for solving the same marketing problems they faced and studied for.

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PURCHASE INTENTION THROUGH THE MARKETING MIX FOR SEWING GARMENT INDUSTRY: ALQHADRI EXCLUSIVE

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ABSTRACT

The business needs to manage the marketing strategy system for efficient performance towards competitive advantage. The marketing mix is an important indicator to maintain a competitive advantage. This research aims to determine the marketing mix's influence on purchase intention of custom-made and ready-made dresses. This research aims to examine the factors influencing purchase intention of the tailoring industry, investigate the most important factor influencing purchase intention of the tailoring industry, and explore whether the marketing mix improves the purchase intention of the tailoring industry. This study uses a quantitative method to measure the research objective.

Keywords: *Marketing Mix, Purchase Intention, Custom-made, Ready-made*

1.0 INTRODUCTION

AlQhadri Exclusive is a business structure of tailoring and wedding couture that operates in Bandar Baru Sungai Udang, Melaka. This company was established on 15 March 2015 that provides services on tailoring and wedding planner. Before the company entered the boutique, the company was run fully online from 2010 until 2015. The company was known as Mashitah Hijabs in 2010 and in 2015 the company was changed to AlQhadri Exclusive. After that the company started to operate online and offline business. When the company entered the boutique, the company started with a cost of RM 10 000 for buying two units of sewing machines and sewing equipment. Now the boutique has eight machines with a total cost of RM 50 000 and above. AlQhadri Exclusive stated to be the first islamic tailoring and custom made attrires and AlQhadri Exclusive is your fashion specialist as per their mission and vision. The company stated their objective is reaching one million orders by 2023.

1.1 Background of The Problem

Nowadays, businesses selling ready-to-wear clothes are becoming more and more popular. The clothes sold are also much cheaper than the wages to order a pair of shirts. This is because businesses that provide ready-to-wear garments will order in bulk at garment factories. Therefore, ordering in bulk at the factory will not incur high costs.

Businesses that provide custom-made clothing services will have a loss. This is so because customers will compare the price of a particular order with ready-to-wear clothes. The cost of tailored garments is a little expensive because the tailor will sew the dresses according to the customer's size and wishes. However, custom-made clothing services also have their current competition. For example, some traders will put the price of service much lower than the current market price. Therefore, businesses that provide tailoring services will have to overcome the customers' purchase intention.

1.2 Research Questions

RQ1: What are the factors influencing purchase intention of the tailoring industry?

RQ2: What is the most important factor influencing purchase intention of the tailoring industry?

RQ3: Will the promotion strategies improve the purchase intention of the tailoring industry?

1.3 Research Objectives

RO1: To examine the factors influencing purchase intention of the tailoring industry

RO2: To investigate the most important factor influencing purchase intention of the tailoring industry

RO3: To explore whether the promotion strategies improves the purchase intention of the tailoring industry

2.0 LITERATURE REVIEW

The body of the article covers the student's Final Year Project from Chapter 1, 2 and 3 only. It should be written in MS Word format in single-spaced in 10-point Times New Roman. Do not indent the text paragraphs. Please briefly explain the aim and scope of the study, literature review, research methods, and the expected findings of the study. Please observe Figure 1 and Table 1 to include figures and tables in the manuscript, respectively.

2.1 Purchase Intention

In a previous study, Shah (2012) has stated the decision-making process that leads to customers purchasing a specific brand. Morinez (2017) defines purchase intention as a situation where consumers tend to buy a specific product in certain conditions. Purchase intention usually is related to the behavior, perceptions, and attitudes of consumers. The price or perceived quality and value will influence the purchase intention. In addition, during the buying process, customers are affected by internal and external motivations. (Gogoi, 2013). Kotler and Armstrong (2010) have six stages before deciding to buy the product: awareness, interest, preference, persuasion, and purchase. Gogoi (2013) revealed that the customer always wants to think that simple packaging, low cost, and the unbranded product is a high risk since the quality of these products is not trustable.

2.2 Hypothesis Development

The marketing mix concept is a mixer of ingredients (Borden, 1964). But, McCarthy proposed the 4Ps of the marketing mix: product, price, promotion, and place. The company would achieve its objectives by combining all elements to make a distinctive marketing mix by a marketer.

2.3 Product

The terms of products refer to all the components and elements needed to perform a service that generates value for customers (David, 1997). Products are an element of the marketing mix that respecting them in a cooperative leads to member and customer satisfaction. Mostaani (2005) stated that supplying products with trusted brands and attractive packages increases sales and customer joy.

This product is the first element of the marketing mix and influences the other three mix elements because of its nature and characteristic. Referring to Mathieu (2001), these products can be variants of their features and specialties depending on the inequality of the target market regarding the variety of needs and wants that make up the market components and marketing environment. Kotler and Armstrong (2012) figure the product as anything provided to the market for use, attention, assumption, or acquisition that may meet a need or desire. While the definition of service is activity or benefit that one party can offer to another that is essentially intangible and does not result in ownership of anything.

H1: There is a significant relationship between products with purchase intention.

2.4 Price

Kotler and Armstrong (2010) determine the price as money exchanged by customers regarding services or products or the value they receive. A company needs to retain loyal customers willing to pay a higher price for their favorite brand and not buy based on a lower price (Levy & Weitz, 2012). The company always pays greater attention and attention to loyal customers and takes the necessary steps to maintain them more profit. Wickliffe & Pysarchik (2001) explain that product characteristics such as brand and price have an inherent effect on customer behavior. Furthermore, products with lower prices also attract customers to buy more products with excellent quality. The product differentiation, market share, cost of materials, competition level, and the customer's perceived value of the product include various factors that affect the pricing strategy of an organization (Davenport & Harris, 2007).

According to Avlonitis and Indounas (2005), pricing methods have three main categories: cost-based pricing, competition-based pricing, and demand-based pricing. Avlonitis and Indounas in 2005 explain the main pricing objective is to hold on to profitable customers, attract new customers, and meet customer needs. An organization should implement appropriate pricing strategies for its products and services depending on the micro and macro environment in which it operates. For example, several companies use pricing strategies to regain their costs quickly when there is low price sensitivity in the market. Instead, some companies use price penetration strategies by setting prices lower than their competitors to gain a high market share.

H2: There is a significant relationship between prices with purchase intention.

2.5 Promotion

Promotion is one of the most vital elements in the marketing mix. It means to communicate and convince the target market by identifying the target segment's needs - to buy the company's products. The concept of promotion encompasses all marketing activities used to remind, inform and persuade the target market about a firm and its products or services in such a way as to build a good image in the minds of customers (Sidhanta & Chakrabarty, 2010). In the same context, Kotler and Armstrong (2012) identify promotion as a human activity based on a communication process directed through a personal point of sale or indirectly through an advertising message through the media.

The main objective of the promotion process is to identify the firm and its products or services for the target market and increase the level of purchases. Latif & Abideen (2011) said advertising is the most substantial element of a promotional combination because of its involvement in expanding its image in the market or putting the product in customers' minds.

H3: There is a significant relationship between promotion with purchase intention.

2.6 Place/Distribution

This place is one element of the marketing mix and includes distribution channels, warehousing facilities, modes of transportation, location, range, concentration, logistics, and inventory control 4 SAGE Open management (Singh, 2012). Distribution channels include all activities that contribute to the delivery of a product or service to customers. Kotler and Armstrong (2012) reveal these channels help organizations promote, sell, and distribute their goods to end buyers, such as resellers, physical distribution firms, marketing services agencies, and financial intermediaries.

E-commerce is also a market, and the number of retailers and the expansion in online shopping has built a competitive market. Marketing managers are more concerned with the buying intentions of their customers to increase sales of their products and services. The convenience of online shopping makes it an emerging trend among consumers, especially Gen Y. The prevalence of online shopping has increased the interest of retailers to focus on this field. In the online shopping environment, the practice of buying online has previously led to decreased skepticism and ultimately gave rise to increased buying intentions of buyers (Shim and Drake, 1990). Lee and Tan (2013) said online shoppers who have bought goods online are increasingly united and tend to buy on the internet than others. Shim, Eastlick, Lotz, and Warrington (2001) posited that past acceptable online purchases would drive future online purchases while previous harmful practices will reduce online buying intentions.

H4: There is a significant relationship between place/distribution with purchase intention.

2.7 Research framework Model

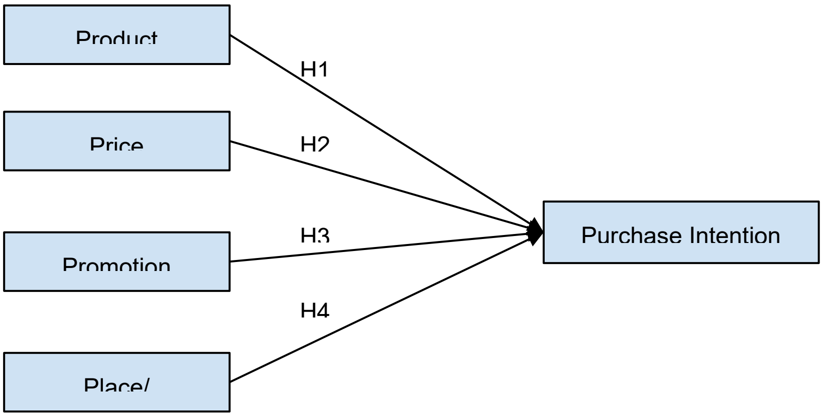

Figure 1: Conceptual Framework

Figure 1 shows the conceptual framework of this research. The function of the conceptual framework is to test the relationships between independent variables and dependent variables for academic and business purposes. The framework of the variables in This conceptual framework was adopted from Halim, Amiruddin and Isham (2020) who highlighted the product, promotion, price and place/distribution toward purchase intention.

3.0 RESEARCH METHODOLOGY

3.1 Research Design

This research design will use a quantitative method. Quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected. The data collected through questionnaires, surveys, or by manipulating pre-existing statistical data using computational techniques. Quantitative research focuses on gathering numerical data and generalizing it between people or explaining specific phenomena (Babbie, Earl R, 2010). Z Alzayat (2016) that measurable and quantifiable is the quantitative approach used to collect data.

3.2 Population and Sampling

Gathering objects that have information is known as the population that the researcher is looking for. In general, the population is selecting the target population relevant to the research problem. The sample represents the total number of components included in the research study. The following calculations were made to identify the most suitable sample size for the Malaysian population. Referring to the previous study, Tabachnick and Fidell (2007), a five-to-one ratio determines the minimum measure of the number of variables to be tested. For example, for this study, this research required 145 respondents according to the number of items. The equation is as follows:

Independent variables = (IV1 items x 5) + (IV2 items x 5) + (IV3 items x 5);

Dependent variables = (DV items x 5);

Demographic = (items x 5);

Minimum number of sample =IV items + DV items + Demographic items

3.3 Research Instrument

The use of a quantitative approach was considered most suitable for this study. The questionnaire has six sections: A, B, C, D, E, and F. Part A consists of five sample questions about the respondent's information. Meanwhile, Part B contained five questions about purchase intention as a dependent variable.. Part C included three questions about the product factor. Next, Part D included three questions about the price factor. Part E had three questions about the promotion factor. Lastly, part F is four questions about the place or distribution factor. A group of questionnaires asked respondents to choose from the options provided. The Likert scale determines the strength of answers by levels of agreement such as 'strongly agree,' 'agree,' 'neutral,' 'disagree,' and 'strongly disagree.'

TABLE 1: Sections in Questionnaire

Sections	Content
A	Demographic profile
B	Dependent variable - Purchase Intention
C	Independent variable - Product
D	Independent variable - Price
E	Independent variable - Promotion
F	Independent variable - Place / Distribution

3.4 Data Analysis Design

All the collected data were analyzed using Statistical Package for Social Science (SPSS) version 26.0 software. Data reliability was analyzed by using normality and reliability tests. Hair et al., (2016) stated that coefficient value shows the reliability of certain items, whereby reliability coefficient of .70 or higher is considered acceptable. Next, descriptive analysis was conducted to ensure that the data did not violate any assumption made by the respondents. In order to explore the relationships among the variables, the multiple regression was employed. Multiple regression is a family of techniques that can be used to explore the relationship between a continuous dependent variable and several independent variables or predictors (Pallant, 2016). One of multiple regression outcomes is standardized beta coefficient, which determines important factors within variables. Hypotheses were tested based on the analysis. Additionally, pre-test probability is the estimated probability before the test or solution apply and the post-test probability is the probability after the test or solution apply (Akobeng, 2017).

TABLE 2: Data Analysis Design

Research Objective	Variable Type		Statistical Measure
	Independent Variable	**Dependent Variable**	
To examine the factors influencing purchase intention of the tailoring industry	Product Price Promotion Place/Distribution	Purchase Intention	Multiple Regression
To investigate the most important factor influencing purchase intention of the tailoring industry	Product Price Promotion Place/Distribution	Purchase Intention	Multiple Regression
To explore whether the promotion strategies improves the purchase intention of the tailoring industry	Promotion Strategies	Purchase Intention	Pre and Post Test

4.0 EXPECTED FINDINGS

In this research, I expect to increase the purchase intention towards the AlQhadri Exclusive company. If this is my objective in this research archive, I would recommend using the promotion strategy to expand its purchase intention.

5.0 CONCLUSION

In conclusion, in the research, to find the purchase intention towards the custom-made apparels. The finding would be to use the marketing mix and focus on promotion strategy to increase the purchase intention.

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THE IMPACT OF PRODUCT PACKAGING ON CUSTOMER'S PURCHASE INTENTION

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ABSTRACT

Nowadays, people prefer something that catches their eye. Therefore, attractive product packaging will attract buyers. In the past, product packaging was more focused on product safety, but now product packaging that meets the needs and requirements of customers will be more popular in the market. This is because, customers love to judge visually before made the decision to purchase the product. The aim of this study is to investigate the impact of product packaging on customer's purchase intention. This study was conducted using Descriptive Quantitative research design and using the non-probability sampling technique. The respondent was selected from individuals who had purchase experience on Arasa shrimp paste. The questionnaire will be distributed through Google Form. The target respondents for this study is 120 respondents and this study will use (SPSS) software to analyzed the data. This finding found that packaging color and packaging graphics have strong significant relationship towards customer purchase intention This research give useful insight to Arasa shrimp paste business to increase customer purchase intention.

Keywords: Product Packaging, Purchase intention, Packaging Color, Packaging Graphic

1.0 INTRODUCTION

To remain in a competitive market, the company must successfully meet the needs and desires of consumers. Packaging plays an important role in raising customers purchase intention. Attractive packaging not only gets a place in the eyes of consumers but can also reduce promotion costs. According to Rundh (2005) stated product packaging can influence consumers' attention and intention to buy a certain product. Furthermore, customers will be more interested in product packaging that has a versatile/unique design (Belleau et al 2007). In the other word, packaging that has a unique and versatile design will influence customers to choose and buy the product rather than other similar products in the market.

According to Argo & White, 2012; Gómez et al., 2015, many businesses used 40% of selling price product to make good product packaging. Based on the research by Proctor and Gamble stated that the customer decides to buy the product in a short period of time by looking at the product packaging at the shelves. Thus, good product packaging is very important to attract potential customers.

Good packaging is very important for customers to differentiate between similar products in a highly competitive market (Rundh, 2009). The good product packaging will benefit the business such as increasing in sales, lower promotional cost and have loyalty customers. Hence, the purpose of this study to investigate the factors of product packaging of Arasa shrimp paste such as colour, material, graphic, size and shape will influence customer's purchase intention.

1.1 Research Objective

The specific objectives were listed based on the statement research question:
RO1: To investigate the impact of packaging color for Arasa shrimp paste influence customer's purchase intention.
RO2: To investigate the impact of packaging material for Arasa shrimp paste influence customer's purchase
RO3: To investigate the impact of packaging graphics for Arasa shrimp paste influence customer's purchase intention
RO4: To investigate the impact of packaging size and shape for Arasa shrimp paste influence customer's purchase intention

1.2 RESEARCH QUESTION

This study listed 4 main research questions:
RQ1: Does the impact of packaging color for Arasa shrimp paste influence customer's purchase intention?
RQ2: Does the impact of packaging material for Arasa shrimp paste influence customer's purchase intention?
RQ3: Does the impact of packaging graphics for Arasa shrimp paste influence customer's purchase intention?
RQ4: Does the impact of packaging size and shape for Arasa shrimp paste influence customer's purchase intention?

2.0 LITERATURE REVIEW

2.1 Packaging Color

Different color will deliver different meaning. For example, green color will define as fresh, nature, relaxing. Red color means hot, strong. Yellow color means cheerful. Black color indicate mystery, the power of authority and pink color means soft. Nowadays, many customers' will intend to purchase a product that have a colorful packaging or color that attract their intention. According to Keller (2009), the color of product packaging is playing important role in order for customers to purchase the product. Customers have different opinion regarding the color of the product packaging that will influence their purchase intention. Based on previous research by Javed (2015) stated that packaging that have a good combination of color will gain customers intention. The other previous study by Ali et al. (2015) stated that every color of the packaging delivered different opinion and mood by customers. Besides that, the study by Ali et al. (2015) also stated that the role of packaging color is to make customer remembered the product and differentiate from other competitor brand. Therefore, the right in choosing the color for product packaging is important in order to create customer's purchase intention. Based on this literature review, the first hypothesis is:
H1: There is a significant positive relationship between packaging color of Arasa shrimp paste and customer purchase intention

2.2 Packaging Material

According to Zekiri & Hasani, (2015), customers is more attracted to high quality products than low quality products. They also stated that packaging materials will affect the customers buying behaviour and influence the customers purchase intention. Furthermore, according to the previous research by Mutsikiwa & Marumbwa (2013), nowadays packaging material is not only used to wrap the product but also for the purpose of upgrading the material in terms of quality and durability. Packaging material is important to ensure product safety and prevent damage. Therefore, the second hypothesis tested in this study is:
H2: There is a significant positive relationship between packaging material of Arasa shrimp paste and customer purchase intention.

2.3 Packaging Graphic

Based on the previous study by Ali et al. (2015), the right selection of image on the product packaging that related with the brand can attract customers and influence the customers purchase intention. Furthermore, based on the previous research by Farooq et al. (2015), packaging that have quality graphics will attract and convince customers that the product is good quality. The attractive pictures on the packaging will also attract the customers purchase intention (Akbari, Gholizadeh and Zomorrodi, 2014). Therefore, based on the previous study, the third hypothesis is:
H3: There is a significant positive relationship between packaging graphics of Arasa shrimp paste and customer purchase intention

2.4 Packaging Size and Shape

According to the previous research by Ali et al. (2015), customers prefer products packaging that have a size and shape that makes it easy for them. Besides that, the product packaging that have large sizes give customers feel higher value compared to products in small packaging (Ali et al., 2015). Furthermore, based on the previous study by Agariya et. al. (2012), the outline shape of the packaging will influence the customer's intention to buy the product. Therefore, based on the literature review, the fourth hypothesis is:

H4: There is a significant positive relationship between packaging size and shape of Arasa shrimp paste and customer purchase intention.

2.5 Research Framework

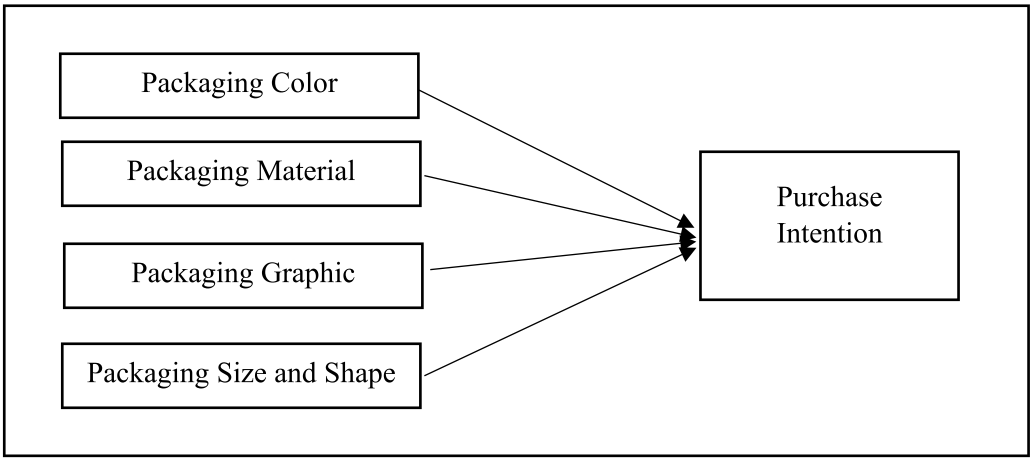

Fig. 1: Research Framework Model

Figure 1 shows the research framework of this research. The function is to test the relationships between independent variable and dependent variable for academic and business purposes. There are four main independent variables which are packaging color, packaging material, packaging graphic and packaging size and shape and customer purchase intention as dependent variable. The purpose of this research to identify the relationship between the product packaging and customer purchase intention.

3.0 RESEARCH METHODOLOGY

The purposive non-probability sampling technique is employed in the study. The questionnaires were distributed to 120 respondents Johor Bahru from November to December 2021. The questionnaire will be developing through Google Form and there are 6 section in the questionnaire where Part A is about demographic profile, Part B to E is independent variables question and Part F is for dependent variables question. All items were measured using a 5-point Likert-type scale with anchors on 1=strongly disagree and 5 =strongly agree respectively. The data then will be analyzing by using SPSS software.

4.0 DATA ANALYSIS AND FINDING

The summary of demographic information of 120 respondents which include gender, age, education level and monthly income. Based on this table, there are more number of female respondent (55.0%) than male (45.0%). The majority of the respondents are between 21-30 years old which contribute (50.0%) of the respondent followed by 31-40 years old (27.5%), below 20 years old (11.7%), 41-50 years old (10.0%) and 51 years old and above (0.8%). The respondent of this research is majority educate from bachelor degree (35.8%) followed by STPM/Diploma/A-level (28.3%), SPM (23.3%), Master (9.2%) and PhD/ DBA (3.3%). Furthermore, most of the respondent's monthly income level is RM1001-RM2000 (28.3%), followed by RM2001-RM3000 (27.5%), less than RM1000 (23.3%), RM3001- RM4000 (13.3%) and RM4001 and above (7.5%).

4.1 Reliability Test

TABLE 4.1: Result of Reliability Test

Item	Cronbach's Alpha Value
Packaging Color	0.633
Packaging Material	0.837
Packaging Graphic	0.885

Packaging Size and Shape	0.859
Customer Purchase Intention	0.766

Reliability test is to ensure data consistency. The Cronbach's Alpha will be used in order to examine the reliability of the variables. According to Ali et al. (2015), Cronbach's Alpha value range within 0 to 0.5 is not acceptable, 0.6 to 0.7 is acceptable, while 0.8 to 0.9 can be considered as excellent. Table 4.1 summarize the result of reliability test using Cronbach's Alpha. The value of Cronbach's Alpha for packaging color is 0.633, packaging material is 0.837, packaging graphics is 0.885, and the value of Cronbach's Alpha for packaging size and shape is 0.859. For dependent variable which is customer's purchase intention, the value of Cronbach's Alpha is 0.766. Overall, all the independent and dependent variables value of Cronbach's Alpha is more than 0.6 and this indicates that the question of this study is reliable and have internal consistency.

4.2 Hypothesis Result

TABLE 4.2: Result of Multiple Regression

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Result
	Beta	Std. Errod	Beta			
Packaging Color	0.285	0.081	0.271	3.523	0.001	Accepted
Packaging Material	0.063	0.070	0.075	0.907	0.366	Rejected
Packaging Graphic	0.512	0.081	0.538	6.343	0.000	Accepted
Packaging Size and Shape	-0.005	0.085	-0.006	-0.061	0.951	Rejected

Dependent Variable: Customer's Purchase Intention

Table 4.2 shows the result of multiple regression that was used to study the independent variables which are packaging color, packaging material, packaging graphics and packaging size and shape that influences the dependent variables which is customer's purchase intention. Based on Table 4.3, packaging color and packaging graphics variables are supported with customer's purchase intention where the significant value of packaging color is 0.01 which is less than 0.05 while the significant value for packaging graphics is 0.00 which also less than 0.05. This means that packaging color and packaging graphics have a positive relationship on customer's purchase intention.

However, based on the result from Table 4.2, the other two variables which are packaging material and packaging size and shape is not supported as the significant value of this two variables is exceed 0.05. the significant value of packaging material is 0.366 while significant value of packaging size and shape is 0.951. Hence, these two variables are not influence the customer's purchase intention.

In conclusion, based on the result produced by SPSS analysis, it is proven that packaging color and packaging graphics is the strongest factor that influence customer's purchase intention, thus the H1 and H3 accepted.

5.0 CONCLUSION

According to the finding of the study, packaging color and packaging graphics have an impact on customer's purchase intention. Furthermore, the study discovered that packaging color and packaging graphic have the greatest influence on customer's purchase intention. As a result, business may maintain and improve their product packaging in order to attract their potential customers and maintain their existing and loyalty customers. Besides that, this research also can be valuable to shrimp paste industry as shrimp paste industry can make reference on packaging element that can influence customers purchase intentions. Moreover, this research also valuable to packaging industry to create some innovation regarding the packaging of the shrimp paste. This is because, the packaging color and packaging graphics could differentiate the brand from other competitors.

Throughout this study, there are a few limitations that been encountered by the researcher. The first limitation is the sample size as in this study the researcher is using judgmental sampling method which just using a small sample size which is only 120 respondents. size is recommended Besides that, the second limitation for this study is the independent variables where in this study the researcher only using four independent variables of product packaging which are packaging color, packaging material, packaging graphics and packaging size and shape. In fact, there are many other independent variables of product packaging like packaging label, packaging information. The last but not least, the questionnaire that been distributed by using google form sometime get irrelevant data as it involves internet connection, and time for people to read and understand the question rather than answer the questionnaire without reading carefully.

In conclusion, since all the objectives were achieved, thus the discussion and findings from this study can be used as guideline for the purpose of research study in the future.

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THE IMPACT OF PROMOTIONAL STRATEGY TOWARDS CONSUMER'S BUYING BEHAVIOR AT PUSTAKA AZHAR

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ABSTRACT

The research explores the impact of promotional strategy towards customer's buying behavior with the purpose to identify the relationship between the promotional strategy and consumer's buying behaviors at Pustaka Azhar. Today, the rapid globalization has made almost every business whether small or large to compete globally. Hence, the businesses need to know the best and effective promotional strategy that can help them to survive in this situation. In this study, researcher use promotional strategy method such as advertising, sales promotion, social corporate responsibility, and social media. The method uses for collecting data in this study is quantitative method with a total of 150 respondents. The questionnaire was use in this study because it effective to collect data from large sample of population. The result of this research finding will help Pustaka Azhar to find the right promotional strategy for their business.

Keywords: Consumer buying behavior, Social media, Advertising, Sales promotion

1.0 INTRODUCTION

Nowadays, businesses environment always encounter change with various forms of competition. In the businesses, promotion is an important marketing tools that can attract customer to purchase their product. Moreover, promotion is also a type of communication between buyer and seller. Seller will persuade their potential buyer to purchase their products through promotions. Promotions can help customer become aware of their products or the businesses. Promotions also can help the businesses to maintain loyal customer.

According to Ville (2012) customer's buying behavior is the study of individuals, groups or organization and the processes they use to select, secure, use and dispose of products, services, experiences, or ideas to satisfy needs and the impact these processes to the consumers and society. By understanding customer's buying behavior, it can help the businesses to achieve their goals.

Therefore, by adopting the good and effective promotional strategies it can bring the success for the businesses. It also can help the businesses have a better understanding about the customer's needs and new target market. Moreover, promotional strategy affects customer's buying behaviors. Promotional strategy also can create a good impression to the customers about their brand and products.

Book industry in Malaysia begins in 1924. It was the first attempt at a properly organized and administered book development project. The primary objectives of the bureau were to produce as many books as possible for use in the Malay Schools and to produce reading materials for the general public. The most determining factor which spurred the growth of book publishing in post war Malaysia was the introduction of a National System of Education envisaged by th Razak Committee Report. The DBP, established in 1956 as a department of the Education Ministry, was therefore given the tremendous responsibility of producing a completely new set of textbooks. With the lead taken by DBP, a good number of new publishing ventures soon made their appearance. Most of them were booksellers or printers who had long-standing direct dealings with local authors.

2.0 LITERATURE REVIEW

2.1 Promotional Strategy

According to Strydom (2004) a promotion strategy is an integrated programmed of promotion mix elements that designed to present an organization and its products to prospective customers, to communicate need-satisfying attributes of products, to facilitate sales, and to contribute a long-term profit performance. Promotion is important for every business because customers can have some knowledge about a goods or services through promotion. It also can help the business to identify its target market and set business goals. Business needs to develop or adapt the right promotional strategy for the customer become aware about the brands and their products or services.

2.1.1 Direct Marketing

According to Blythe (2006), direct marketing is an interactive system of marketing which uses one or more advertising media to affect a measurable response or transaction at any location. While Housden (2004) interpreted direct marketing as a discipline, a subset of marketing, which permits us to carry out certain marketing tasks more efficiently. It does this by gathering, analyzing, and using information about individual customers and prospects. This information enables us to identify which of the people on our customer and prospect files are likely to be interested in a particular product, services or offer. In this study, researcher want to know whether the use of direct marketing can give an impact toward the consumer buying behavior at Pustaka Azhar.-Based on the explanation above, researcher hypothesize:

2.1.2 Social Media

According to Kaplan and Haenlein (2010) social media are tools that use the web 2.0 or internet as a platform to run an application or a site, and through this platform, communication, interaction, and information sharing among users is permitted and encouraged. Another definition from Berthon et al. (2012) social media is a collection of channels that facilitate and disseminate interaction between individuals and entities such as businesses. Because of the power that social media has, marketers and businesses can't help but to notice it, and why not they take advantage of the social media platform. According to Mangold and Faulds (2009), social media is a hybrid data set of a company's original promotion mix. To clarify, social media have characteristics of traditional marketing methods in that companies can communicate with customers, but they also have word of mouth as a marketing method in which customers can communicate with other customers, and companies have no control over the content of the information in this case (Mangold and Faulds, 2009). Social media is huge platform, and billions of people around the world use it. The social media platform enables people to connect and share the information with other people beyond the geographical area.

2.1.3 Advertising

Advertising is a promotional strategy used in creating product awareness in the minds of consumer to take purchasing decision (Latif & Abideen, 2011). According to C. S. Hunt and J. E. Mello (2014), advertising is a non-personal promotional communication about goods, services, or ideas that is paid for by the firm identified in the communication. Advertising can directly influence the purchase behavior decision (Kotler and Armstrong, 2009). Advertising as a promotional strategy provides a major tool in creating product awareness and condition the mind of a potential consumer to decide finally on what to buy (Ayanwale et al, 2005; Adelear, Chang, Lanchndorfer, Lee & Morimoto, 2003). Advertising is a non-personal and paid form where ideas, concepts, products or services and information are promoted through media by an identified behavior (Ayanwale et al, 2005). Advertising influences individual's attitudes, behaviour and life style. For a company product to be a well known brand, they must invest in their promotional activities especially advertising (Hussein et al, 2008). Latif and Abideen (2011) argued that advertising have the potential to contribute to brand choice among consumers.

2.1.4 Sales Promotion

Sales promotions consist of a diverse collection of incentive tools, mostly short-term, designed to stimulate quicker and greater purchase of particular products or services by consumers or the trade (Kotler et.al., 2013). While according to W.J. Stanton (2011) sales promotion includes all those activities other than advertising, personnel selling, public relations, publicity that are intended to stimulate customer demand and improve the marketing performance of sellers. Sales promotions play an important role in the marketing programs of marketers and retailers. A large percentage of marketers' sales are made on promotion. Sales promotion helps remove the consumer's dissatisfaction about a particular product, manufacturer, and create brand-image in the minds of the consumers and the users.

2.2 Consumer's buying behavior

Consumer buying behaviour is defined as the mental, emotional and physical activities that people engage when selecting, purchasing using and disposing of products and services in order to satisfy need and desires (Schifman & Kanuk, 2009). It includes purchasing and other consumption related acitivites of people engaging in exchange process. While according to Solomon et.al (2006) consumer behaviour as the study of the process involved when individuals or groups select, purchase, use, dispose of product, service, ideas or experiences to satisfy needs and desire. Consumer behaviour is affected by social and cultural factors that affects individuals buying decision but determines the kind of product to buy.

2.3 Hyphothesis Development

Based on the explanation on literature review, researcher hypothesize:

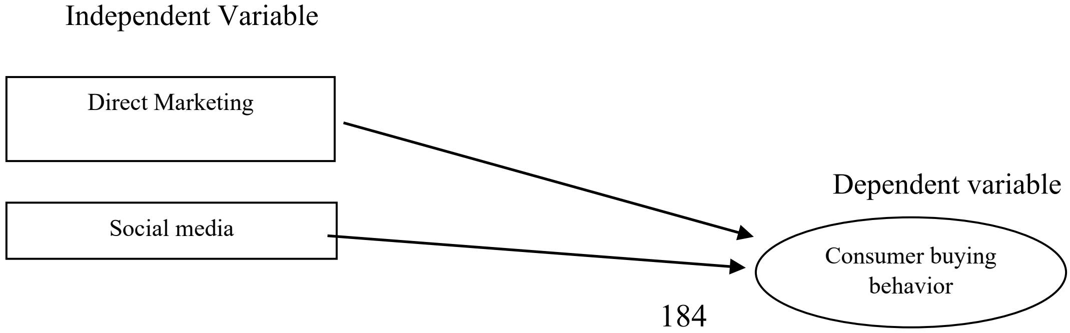
H1: There is significant relationship between corporate social responsibility and consumer buying behavior

H2: There is significant relationship between social media and consumer buying behavior

H3: There is significant relationship between advertising and consumer buying behavior

H4: There is significant relationship between sales promotion and consumer buying behavior

2.4 Research Framework



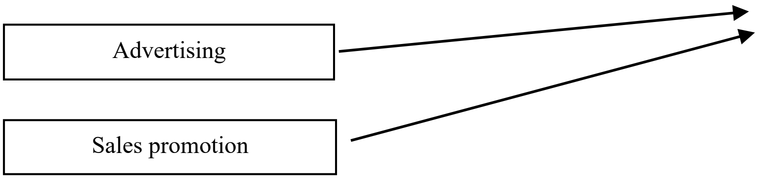


Fig. 1: Research Framework for the impact of promotional mix towards consumer buying behaviors

There are four main independent variable which are direct marketing, social media, advertising and sales promotion and consumer buying behavior as dependent variable. The purpose of this study is to identify the relationship between the promotional strategy and consumer's buying behaviors at Pustaka Azhar.

3.0 RESEARCH METHODOLOGY

In this study, researcher is using quantitative research design in conducting the research. According to (Leedy and Omrod, 2001) describe the research methodology as the holistic steps a researcher employ in embarking on a research work. This study use questionnaire to collect the data. Questionnaires provide a quick an efficient way to obtaining large amounts of information from a large sample of population. A total of 123 respondents from Johor Bahru were chosen to fill the questionnaire.

4.0 DATA ANALYSIS

4.1 Reliability Test

TABLE 4.1: Reliability Test Result

Variables	Number of Item	Cronbach's Alpha
Direct Marketing	2	0.643
Social Media	3	0.887
Advertising	3	0.680
Sales Promotion	3	0.710
Consumer Buying Behavior	3	0.809

Reliability theory is essentially the application of probability theory to the modeling of failures and the prediction of success probability. Through reliability analysis, reliability is measured with the help of Cronbach's alpha. The standard value for Cronbach alpha should be more than 0.60. If the value for Cronbach alpha is below, the instrument will not be considered reliable and need to be revised. Based on the table 4.2

above, the value for Cronbach alpha for direct marketing is 0.643. For the variable of social media, the value for Cronbach alpha is 0.887. For advertising, the value of Cronbach alpha is 0.680 and for the sales promotion the value for Cronbach alpha is 0.710. Lastly, the value for Cronbach alpha of consumer buying behavior is 0.809. Hence, all the independent and dependent variables were above 0.60 the instruments fulfill the criteria has the internal consistency and reliability.

4.2 Multiple Regression

TABLE 4.2: Multiple Regression Result

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.505	.508		4.927	.000
	Direct Marketing	.061	.060	.094	1.032	.304
	Social Media	.198	.088	.208	2.255	.026
	Advertising	.021	.066	.030	.320	.749
	Sales Promotion	.141	.092	.139	1.530	.129

a. Dependent Variable: Consumer Buying Behavior

According to the table 4.5, it depicts the beta (β) and significance (p) with respect for each independent variables towards consumer buying behavior. Direct marketing (β = 0.061, p = 0.304), Social Media (β = 0.198, p = 0.026), Advertising (β = 0.021, p = 0.749) and Sales Promotion (β = 0.141, p = 0.129), from this result, only one independent variable indicates positive values and one significance value lie on the accepted range that is $p<0.05$. Therefore, it can be concluded that the social media indicates a significance positive relationship towards the dependent variable consumer buying behavior.

5.0 CONCLUSION

In conclusion, the overall research has been identified and the finding of the data has discussed. After running the multiple regression analysis, the independent variable that can be accepted is social media. Social media show there is significant relationship towards consumer buying behavior at Pustaka Azhar. From the result finding it shown that social media has a great impact on consumer buying behavior. This is because social media is very useful for consumer to engage with the company, getting product and information very easily which influence their purchasing decision.

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I would like to take this opportunity to thank my supervisor, Dr Nor Zafir for her guideline and help in order to complete this study. I would like to show my gratitude to my parents, friends and classmate for their help and time for me to complete this study. I am very grateful to owner of Pustaka Azhar, Tuan Haji Azhar for giving me permission to carry out my research on Pustaka Azhar. I also want to thank to all the respondent for spending their time to answer all the questionnaire.

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FACTORS INFLUENCING CUSTOMER SATISFACTION AT ROUMUMMY BAKERY

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ABSTRACT

The bakery industry is an industry that has a large influence on consumerism. Hence, it is crucial to building a company reputation in a market. As a consequence, business is dedicated to figuring out customer dissatisfaction. The particular reason for the circumstance is that there is a close relationship between food attributes (quality of food, quality of service, quality of setting, and price and value) and customer satisfaction in the bakery industry. This study aimed to determine the influence of independent variables on Roumummy Bakery's customer satisfaction. A total of 126 completed and available questionnaires were collected through purposive sampling. This research applied multiple regression analysis. The aim was to determine the factors influencing customer satisfaction in Roumummy Bakery. This research found that quality of food, quality of service, and quality of setting influenced the customer satisfaction of Roumummy Bakery, while price and value had no significant influence on it.

Keywords: Customer Satisfaction, Quality of Food, Quality of Service, Quality of Setting, Price and Value

1.0 INTRODUCTION

This study aimed to figure out the factors that influence customer satisfaction in Roumummy Bakery and provide solutions for the improvement. Rumummy Bakery is a stand-alone bakery with using online business model and providing delivery services. Social media platforms used by Roumummy Bakery are Facebook account: Roumummy Bakery, WhatsApp: 013-7833282, and Instagram account: Roumummy and named Roumummy Bakery. The research objectives are to examine the influence of quality of food, quality of service, quality of setting, and price and value towards customer satisfaction.

2.0 RESEARCH METHODOLOGY

This design investigated the relationship between customer satisfaction variables; the variables were quality of food, quality of service, quality of the setting, and price and value. The target population of this study was the existing customers of Roumummy Bakery. The sampling technique was purposive sampling. The researcher selected purposive sampling because it was often used in qualitative research to identify and select informative cases for the most appropriate use of available resources (Patton, 2002). The data collection was through the Facebook account: Roumummy Bakery and Instagram account: Roumummy Bakery. Besides, the researcher also used Cohen Table for the data calculation. Cappelleri and Darlingtion (1994) pointed out that the Cohen Table is one of the most popular mediums for calculating the sample size required by the researcher. This research consists of four independent variables; 118 sample sizes needed to refer to Cohen Table. The 10% of the 118-sample size could be counted as the respondents who do not return questionnaires or other restrictions.

3.0 DATA ANALYSIS PLAN

This study collected 126 responses to analysis. The researcher discussed preliminary testing, demographic statistics, normality test, multicollinearity analysis, and multiple analyses in this research.

3.1 RELAIBILITY TEST

Cronbach's alpha is a measurement of assessing the internal consistency or reliability of a set of scale or test items. Table 1 illustrated Cronbach's Alpha results after collecting 35 responses in the pilot study. The results were in the range from 0.715 to 0.788. According to Hair et al. (2010), the results of Cronbach's Alpha must be in a value of 0.7 or higher to indicate it is accepted.

TABLE 1: Results of Cronbach's Alpha

Variables	N	Cronbach's Alpha
Quality of Food	6	0.788
Quality of Service	4	0.715
Quality of Setting	3	0.752
Price and Value	3	0.737
Customer Satisfaction	5	0.741

3.2 PROFILE OF RESPONDENTS

The table below shows the respondent's demographic profile results by gender, age, monthly income, and race.

TABLE 2: Summary of Respondent's Demographic Profile

Profile of Respondents	Frequency	Per cent (%)
Gender		
Male	83	65.9
Female	43	34.1
Age		
18-24 years old	38	30.2
25-34 years old	52	41.3
35-44 years old	23	18.3
45-54 years old	9	7.1
55-64 years old	3	2.0
65 years old and above	1	0.7
Monthly Income		
RM4,850 and below	68	54.0
Between RM4,851 per to RM10,970	34	27.0
Exceeds RM10,971	24	19.0
Race		
Malay	37	29.4
Chinese	83	65.9
Indian	6	4.8
Other	0	0

3.3 NORMALITY TEST

George & Mallery (2010) mentioned that the results for skewness and kurtosis must not be more than 2 and not smaller than -2. Table 3 shows the skewness and kurtosis results for four variables and customer satisfaction. All variables were found to have acceptable ranges of 2 and -2. Thus, this study gained the normal distribution data.

TABLE 3: Skewness and Kurtosis Result

Variables	Items	N	Skewness	Kurtosis
Quality of Food	QF1	126	-0.903	2.023
	QF2	126	-0.433	-1.215
	QF3	126	0.587	-0.998
	QF4	126	-0.708	-0.846
	QF5	126	-0.903	2.023
	QF6	126	-0.433	-1.125
Quality of Service	QSV1	126	-0.428	-0.759
	QSV2	126	-0.988	0.844
	QSV3	126	-1.199	1.542
	QSV4	126	-1.144	2.053
Quality of Setting	QST1	126	-0.553	-0.889
	QST2	126	-0.563	-0.655
	QST3	126	-0.145	-1.187
	PV1	126	-0.077	-1.397

Price and Value	PV2	126	-0337	-1.079
	PV3	126	-0.381	-0.936
Customer Satisfaction	CS1	126	-0.337	-0.750
	CS2	126	0.186	-1.160
	CS3	126	0.100	-1.421
	CS4	126	-0.676	-0.850
	CS5	126	-0.375	-1.312

3.4 UNIVARIABLE AND MULTIVARIABLE ANALYSIS

Existence of extreme value (outliners) conducted after normality test. Standardised z score and Mahalanobis D^2 Test were conducted to determine univariate outliers and correspondingly defined the presence of multivariate outliers. According to Hair et al. (2010), standardised z score values should be no values exceeding +4 to -4. Therefore, there was no value existing extremes in the data (output is not attached due to size limitation). Furthermore, Tabachnik & Fidell (2007) mentioned that the maximum value for four variables did not exceed 18.467. The results were shown in Table 4 whereas whether univariate or multivariate, it drew conclusions from extreme values and satisfied the outline's assumptions.

TABLE 4: Results of MahalaNobis, D^2

	Minimum	**Maximum**	**Mean**	**Std. Deviation**	**N**
Mahal. Distance	0.176	12.383	3.968	2.712	126

3.5 COLLINEARITY ANALYSIS

Tolerance and Variation Inflation Factor (VIF) conducted by tolerance more than 0.2 and VIF below 10 (Pallant, 2015). The result showed there was acceptance with both hypotheses, and both hypotheses correlated with the dependent variable, customer satisfaction.

TABLE 5: Collinearity Analysis

Collinearity Statistics			
Model		**Tolerance**	**VIF**
	Quality of Food	0.589	1.698
	Quality of Service	0.596	1.678
	Quality of Setting	0.378	2.645
	Price and Value	0.386	2.588
a. Dependent Variable: Customer Satisfaction			

3.6 MULTIPLE REGRESSION ANALYSIS

The results of multiple regression analysis had shown in Table 6. The adjusted R^2 for the customer satisfaction was 0.53% and showed that only 53% of customer satisfaction is significantly influenced by the factors: quality of food, quality of service, quality of the setting, and price and value. ANOVA table showed value F (34.082), and the significant value was not exceeding α (0.001); the value is p=0.000. The table concludes that the variables had a significant influence on the dependent variable, customer satisfaction.

Results of Multiple Regression Analysis in Table 8 indicated hypotheses 1 (quality of food), 2 (quality of service), and 3 (quality of setting) positively influenced customer satisfaction of Roumummy Bakery by the result H1=p<0.001, H2 = p<0.05, and H3= p<0.05. The standardised beta values were positive (0.332, 0214, 0.241). The results illustrated that the quality of food, service quality and setting quality were supported in this research. On the contrary, hypothesis 4 (price and value) did not significantly influence customer satisfaction of Roumummy Bakery with the result standardised beta value is 0.093 and H4= p>0.05 (0.356). This result illustrated that price and value was not supported in this research.

TABLE 6: Model Summary of Multiple Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.728[a]	0.530	0.514	0.55209
a. Predictors: (Constant), Quality of Food, Quality of Service, Quality of Setting, Price and Value				
b. Dependent Variable: Customer Satisfaction				

TABLE 7: ANOVA

ANOVA		
Model	**F**	**Sig.**
1	34.082	0.000
a. Predictors: (Constant), Quality of Food, Quality of Service, Quality of Setting, Price and Value		
b. Dependent Variable: Customer Satisfaction		

TABLE 8: Results of Multiple Regression Analysis

Coefficients(a)					
		Standardized Coefficients			
Model		**Beta**	**t**	**Sig.**	**ρ-value**
1	(Constant)		- 0.441	0.660	
H1	Quality of Food	0.332	4.069	0.000	p<0.001
H2	Quality of Service	0.214	2.653	0.009	p<0.05
H3	Quality of Setting	0.241	2.377	0.019	p<0.05
H4	Price and Value	0.093	0.926	0.356	p>0.05
q. Dependent Variable: Customer Satisfaction					

4.0 CONCLUSION

There were 4 variables proposed in this study. The conclusion is quality of food, quality of service, and quality of setting were positively supported while price and value were not supported. In conclusion, the fundamental question of this research was to figure out the factors influencing customer satisfaction of the selected company, Roumummy Bakery, through the quality of food, quality of service, quality of the setting, and price and value. Statistical results showed that quality of food, quality of service, and quality of setting significantly influenced customer satisfaction. Meanwhile, price and value did not have a significant influence on it. As a result, not all of these factors indicated positive results. Therefore, other considerations may need to be further explored to increase customer satisfaction.

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MARKETING REMEDIES TO INCREASE THE PURCHASE INTENTION OF MY-ROBOT TAMAN UNIVERSITI SDN. BHD

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ABSTRACT

Malaysia has transformed the education system by launching the Science, Technology, Engineering, Mathematics (STEM) education and implemented the STEM in all schools in Malaysia at the beginning of 2017. These changes have triggered the robotics academies to compete for resources and competitive advantage. Most robotic academies provide the latest innovative ways to engage students in STEM. My-Robot Taman Universiti Sdn Bhd is one of Malaysia's leading educational robotics and coding academies. During the covid-19 pandemic, many robotics educations centres have effectively used social media to increase brand awareness and purchase intention. However, My-Robot Taman Universiti Sdn. Bhd is facing low brand awareness and low purchase intention due to the low presence of social media. Therefore, this study aims to investigate factors that increase the purchase intention of robotic education and design social media marketing strategies for the company. The questionnaire will be distributed to parents in Malaysia who have children aged 5 to 15-year-old using a judgmental sampling technique. This study is expected that brand awareness, association, and perceived quality would increase the purchase intention of robotics education using effective social media marketing strategies.

Keywords: Purchase intention, Brand Awareness, Brand Association & Purchase Intention.

1.0 INTRODUCTION

Malaysia has transformed the education system by introducing Science, Technology, Engineering, Mathematics (STEM) education and implemented it in all schools in Malaysia in early 2017 (Malaysia Education Blueprint, 2013-2025). These changes have triggered how robotics academics compete for resources and competitive advantage. My-Robot academy's success as the leading educational robotics and coding academy for Malaysia's market because of its quality of services and the brand's reputation. My-Robot Sdn Bhd is a distributor of innovative teaching and learning solutions for the education market in Malaysia. They allow kids to be innovative and creative using their unique methodology and state-of-the-art learning robotics kits. However, there are 14 academy centres in Johor, which has led to fierce competition between them to increase students, and it has created stiff competition among them to increase student enrolment. Therefore, My-Robot Taman Universiti Sdn. Bhd is facing a significant problem in attracting students. The problem can be attributed to the lack of marketing efforts. As found, all number of followers of the Facebook page of My-Robot Sdn. Bhd branches in the Johor area are different. My-Robot Taman Universiti Sdn Bhd only had 634 followers, which was lower among the branch in the skudai area.

Nowadays, the Internet plays a significant role in people's daily life, and young generations are active users of social media and networking sites (Zhung, 2017). The business landscape is shifting to social media marketing. Social media marketing has many benefits, such as increased brand awareness, improved search engine rankings, and better customer service. Coca-Cola is the company in the market that uses social media to attract purchase intentions (Triago & Verissimo, 2014). Coca-Cola company effectively uses social media marketing to promote a particular state of mind, feeling, or emotion rather than just a product. They use social media platforms like Facebook to create a competitive advantage. Now the Coca-Cola Company has over 130 million followers. They update posts about every aspect of the quality of their products. The Facebook strategy has become a part of The Coca-Cola Company's branding strategy.

The success of the social media marketing strategy proves that other companies, such as robotics education, can use the platform for the purposes. My-Robots Sdn. Bhd is one of the leading educational robotics and coding academies in Malaysia. However, not all centres use social media marketing effectively to increase brand awareness and purchase intention. My-Robot Taman Universiti Sdn. Bhd faces low brand awareness and purchase intention. Therefore, this study investigates factors that increase purchase intention for robotics education and design social media marketing strategies for the company.

2.0 LITERATURE REVIEW

2.1 PURCHASE INTENTION

Traditionally, intention refers to the subjective probability that a person will perform a particular action (Kian, 2017). The intention is a plan that instructs a person to behave in a certain way (Haque et al., 2015; Kian, 2017). A person's intention to purchase a brand is known as purchase intention. Moreover, the stronger the purchase intention, the more likely a consumer will purchase a product (Gusti, 2020). Purchase intention is a multifaceted process influenced by consumer behaviour, perceptions, and attitudes. Pandajaitan (2018) concluded that a consumers' tendency to buy branded products is a challenge in the future. Marketers need to measure the level of interest of consumer generation Z in a brand and analyze the variable of interest to predict future purchase intention.

2.1.1 BRAND AWARENESS

A brand combines terms, name, design, symbol, or other characteristics that identify and differentiate the products and services offered (Mirabi, 2015). Brand awareness refers to consumers' ability to identify the brand when they perceive the products, services, logo, and packaging. Similarly, when consumers have a wide choice, the highest brand awareness will be their choice (Zhang, 2020). Meanwhile, brand recall is a concept that relates to a consumer's potential to recall or recognize a brand based on the product category and its use in a particular scenario (Arif, 2016). Ultimately, brand awareness is generated by the consumer's experience and memory.

2.1.2 BRAND ASSOCIATION

Brand association is a concept that describes information about a brand in the consumer's mind, whether good or bad, that is associated with a node of brain memory and acts as a data-gathering tool for brand differentiation and extension (Virutamasen, 2015; Le, 2019). Moreover, brand associations are the other nodes of information linked to the brand node in memory and contain the brand's meaning to consumers (Bhaya, 2017; Zaki, 2017). Virutamasen et al. (2015) emphasized the importance of brand associations in developing a brand, as they are images and symbols associated with a brand or brand benefit, and brand associations can help improve the product quality. Moreover, brand associations serve as the basis for brand loyalty and purchase decisions because most associations are linked to brand attributes, consumer target markets, and services consumers need (Farida, 2019).

2.1.3 PERCEIVED QUALITY

Perceived superiority is consumers' knowledge of a product's performance and comparison to expectation (Saleem et al., 2015). Perceived quality reviews a brand's existing attributes from the consumer's perspective, reflection, and action that will impact their prospective purchase decision intentions (Widjaja, 2019). Perceived product quality is also a factor in the customer's decision-making process because it will influence purchase behavior and product selection (Morgado et al., 2016). In perceived quality in education, students as customers will focus more on service quality. A service is an intangible activity or collection of intangible activities that occur between interactions between students and education service providers (Annamdevula, 2016). Several factors affecting student perception of educational quality include student scholarship, extracurricular activities, lecturers, physical resources, and interactive learning methods (Chaudhary & Dey, 2020).

2.2 HYPOTHESES DEVELOPMENT

2.2.1 Brand Awareness and Purchase Intention

Jamali and Khan (2018) pointed out that brand awareness refers to the possibility that a consumer knows the service, products, and features. Koliby and Rahman (2018) found that brand awareness influences purchase intention to promote a brand in a more recent study. More generally, brand awareness occurs when a user has a strong and clear image of the product or service in their mind. Most of the research findings revealed a significant relationship between brand awareness and purchase intention (Jung & Seock, 2016; Jamali, 2018, Pandjaitan, 2018, Koliby & Rahimah, 2018 Sudhana, 2020). Consumers' knowledge about a brand's product increases with brand awareness, and brand awareness is critical to purchase intention because consumers desire to purchase a product based on their familiarity with the brand. Therefore, the following hypothesis is proposed:

H1: Brand familiarity has a positive and significant influence on the purchase intention of robotics education.

2.2.2 Brand Association and Purchase Intention

Brand associations can create value for companies in information gathering, differentiate brands from each other, and enhance positive feelings toward products in brand extension (Widjaja, 2019). Brand associations with positive feelings and attitudes increase customer purchase intention (Chen et al., 2020). Shamsudin et al. (2020) mentioned that brand associations are essential for consumers when the market offers many products because they make consumers associate products based on product attributes and benefits. Grigaliūnaitė and Pilelienė (2017) found that brand associations significantly influence consumer purchase intention, and the positive brand association can directly increase consumer purchase intention. Most of the studies highlighted that brand association could help customers gather information, distinguish the brand, receive feedback, and the reason to buy the brand's products (Lee & Yu, 2018; Lee et al., 2019; Shamsudin et al., 2020). Therefore, the second hypothesis is formulated as follows:

H2: The brand association has a positive and significant influence on the purchase intention of robotics education.

2.2.3 Perceived Quality and Purchase Intention

Product quality variables such as performance, features, reliability, perceived quality influence purchase intention through brand awareness (Purba & Sadalina, 2018). Feng and Yu (2016) substantiated this argument by stating that consumers typically evaluate and compare products that understand high or low-level quality. Therefore, it directly influences consumers' purchase intentions towards a brand. Quality's positive perceptions can influence consumer choice, encourage consumer purchases, and promote brand differentiation and extension (Lee et al., 2019). Several studies found that perceived quality is considered an essential variable for brand equity in different frameworks (Feng & Yu, 2016; Purba & Sadalla, 2018; Lee et al., 2019). Saleem et al. (2015) established that a product's perceived quality has a good influence on purchase intention and found the effects of a price discount on customers' perceptions of savings, quality, and value in apparel products corroborates this finding (Lee & Yu, 2018). Consequently, the following hypothesis is proposed:

H3. The brand association has a positive and significant influence on the purchase intention of robotics education.

2.3 RESEARCH FRAMEWORK MODEL

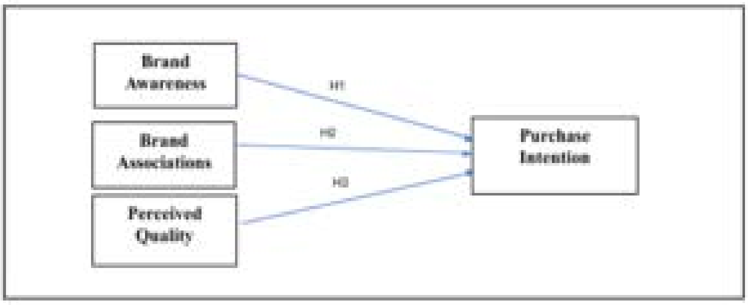

Fig. 1: Research Framework

Figure 1 shows the research framework, and it was adopted from Sudhana (2020) on the relationships between brand equity dimensions (brand awareness, brand association, and perceived quality) and purchase intention of educational robots.

3.0 RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

Research design is used to provide an appropriate framework for a study. It is defined as "procedures for collecting, analyzing, presenting, and reviewing data in research studies." (Boru, 2018, para. 2). Alberta et al. (2016) defined research design as the researcher's overall strategy for answering the research question or testing the research hypothesis. Research design can improve validity by optimizing methodological decisions in collecting empirical data (Fahmy & Sohani, 2020). As a result, the statistical evidence collected becomes more related to the study.

The conclusive research design is a method that generates findings used to test hypotheses and relationships. The conclusive research design method provides a solution to verify and quantify the findings obtained from exploratory research. Conclusive research is a technique that is typically more formal and structured. Thus, this study uses the conclusive research design, including descriptive and cross-sectional designs, to explore the relationship between brand awareness, brand association, perceived quality, and purchase intention.

3.2 POPULATION AND SAMPLING

A population is understood as a set or group of all entities that match a set of criteria (Shukla, 2020). In statistics, a population is a term that refers to an entire group for which data must be compiled. It is vital to comprise the demographic traits of the population such as age, ethnicity, socioeconomic reputation, training level, area of residence, and family income status in the research (Majid, 2018). Data sampling is the basis of the research form in collecting the data (Leavy, 2017). Sampling is a term that refers to selecting a representative sample from an individual or a large population group for research purposes (Bhardwaj, 2019).

It is necessary to include the demographic characteristics of the population as well as age, ethnicity, socioeconomic status, education level, area of residence, and family income status in the research (Memon et al., 2020). As a result, the sample size for this study is 200.

According to Alberta et al. (2016), non-probability sampling is a type of sampling in which the chance that each member of the population in the sample will be selected is unknown. Judgemental sampling is a non-probability sampling method used to select the representative from the population for the researchers to propose. Therefore, this study can use the non-probability sampling technique, a judgmental sampling technique, to select the respondents who will send their kids to robotics education. The questionnaire will be distributed using online channels such as Facebook, Instagram, and WhatsApp to 200 Malaysian parents who have children aged 5 to 15.

3.3 RESEARCH INSTRUMENT

A quantitative study could be a kind of research that collects numerical data and analyses it using statistical methods to grasp a development (Boru, 2017). Alberta et al. (2016) cited self-report instruments, surveys, observation, and biophysical measures as quantitative instruments. In this study, the questionnaire will investigate customers' purchase intent for Robotics Academy. The questionnaire in a Google Form is used to collect primary data from respondents online. The questionnaire is designed based on demographics, and a 5-point Likert scale is used to measure factors that influence the purchase intention of the respondents. As a result, it is divided into two sections: Section A and Section B. Thus, section A comprises respondents' demographic profiles, such as age, gender, and family income. Section B comprises questions about respondents' awareness and perceived quality for robotics academia (Dowlatabadi & Sheng, 2020).

In addition, four variables are examined to measure consumer purchase intentions, namely brand awareness, brand associations, and perceived quality (Shamsudin, 2020). Scales can be used to quantify specific data. For example, a Likert scale provides precise response options, such as strongly agree, agree, not sure, disagree, strongly disagree (Adams, 2016; Jilcha, 2019). The Likert scale (1=strongly disagree, 5=strongly agree) was applied in this research, in which respondents expressed their level of agreement with a series of statements. The highest score assigned to each statement reflected the degree of agreement.

Following the creation of the survey questionnaire, a pilot test will be conducted to confirm that all questions are reliable and understandable to all respondents (Dowlatabadi & Sheng, 2020). The pilot test sample size is 50, and all respondents are Malaysian parents who have children aged 5 to 15 years (Memon et al., 2020). Moreover, the unclear questions will be eliminated and replaced with more plain ones. All input from the pilot test respondents will be considered, and revisions will be made to ensure that the questions are simple to grasp and cover all of the study's problem areas. Lastly, sifting, processing, and analysis of all data obtained will be performed using the Statistical Package for the Social Sciences (SPSS).

4.0 EXPECTED FINDINGS

The study would demonstrate the following: i) the relationship between brand awareness and purchase intention; ii) the relationship between the brand association and purchase intention; and iii) the relationship between perceived quality and purchase intention. This research is pivotal to the survival of My-Robot Taman Universiti Sdn Bhd. Moreover, this study provides My-Robot Taman Universiti Sdn Bhd with a better understanding of its consumer purchase intention. Therefore, the marketing team of My-Robot Sdn Bhd can adjust their marketing strategies to increase the brand awareness, brand association, and perceived quality of the customers, which can influence their purchase intention. Besides, this study also provides a marketing solution for My-Robot Taman Universiti to develop a comprehensive website. Moreover, this study can help the marketing team of My-Robot Sdn Bhd to develop and implement specific marketing plans and strategies to differentiate their academy from their competitors. In this case study, the researchers will discover the important factors for My-Robot Taman Universiti to increase the purchase intention with effective marketing strategies.

5.0 CONCLUSION

This study aims to ascertain the elements that affect consumer intention to purchase robot education. According to previous research, brand awareness, association, and perceived quality can influence consumer purchase decisions. Additionally, brand awareness increases customers' knowledge of a brand's goods, and brand recognition is critical for purchase intention, as consumers' familiarity with the brand motivates them to purchase a product. Additionally, brand associations affect customer purchase intentions, and a favourable brand association boosts consumer buy intentions directly. A survey of educational robot purchasers is significant to elucidate the elements contributing to higher purchase intention. The findings will recommend several marketing techniques that will assist My-Robot Taman Universiti Sdn. Bhd to increase its brand awareness and purchasing intention.

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INVESTIGATE WEBSITE QUALITY AND E-TRUST FOR ONLINE BOOKING IMPLEMENTATION: A CASE OF NASESZ ENTERPRISE

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ABSTRACT

Booking services have gained popularity among various industries in the recent years due to rising importance in offering services to consumers in a convenient way. Now, website is playing a crucial role in developing customer's perception toward a business which consequently affects decision-making process when it comes to online transactions such as booking. Nasesz Enterprise is a company providing home maintenance services with challenges such as declining rate of customer acquisition. Hence, this study aims to investigate website quality and e-trust on online booking system. Further, the study proposes online booking as marketing strategy for the business to overcome their problem using the service innovation. More specifically, the study focuses on the influence of e-trust formed from the website quality attributes on customer's intention to perform appointment booking in a home maintenance service provider's website. This study will adopt the conclusive research design which consists of descriptive research and cross-sectional design to investigate the relationship between usability, ease of use, entertainment, complementarity, e-trust, and online booking intention. Survey instrument will be used and distributed to 150 respondents. This study is expected to help the company using the most influential and significant website quality attributes to enhance its customers' booking intention on the business website.

Keywords: Booking Intention, Website Quality, E-Trust, Online Booking, Field Services

1.0 INTRODUCTION

The developments in internet and technology have paved way to an enormous transformation in almost every sector using human touchpoints[38]. People are using pocket-sized smartphones for purposes other than communication, such as online shopping and appointment scheduling via the internet. With internet access at everyone's fingertips, the global digital population has expanded and created new opportunities for organisations in both public and private sectors to leverage their presence in internet. The internet has developed as a new medium for the commercialization of products and services[1]. Studies have found that website is an essential tool for any business to survive and grow in the increasingly competitive market[2]. Now, the constant technological and service innovations enable people to carry out daily activities in an easier way[37]. Many people prefer the convenience of self-service using their devices to making reservations over the old-fashioned phone call[36]. As a result, online booking culture has emerged among customers that allows them to select their preferred time in advance to enjoy the services.

Undeniably, trust has become a key driver in the customer's online booking intention because trust is very vital in the online environment due to the perceived risk and uncertainty in online transactions[14]. Trust in the online platform could dematerialize these fears by having a website that is rich with information and pictures of their services[31]. Evidently, four attributes of website quality including usability, ease of use, entertainment and complementarity have positive influence on e-trust and booking intention[5]. Moreover, a good user experience and additional features such as booking service on the website have significantly reduced the cost of customer loss[41]. Online booking, which was initially popular in the hospitality industries, has gained popularity in other sectors[8]. For example, field service industries such as home maintenance, which traditionally rely on word-of-mouth referrals, are now offering online booking services.

'Kaodim' and 'Service Hero' are emerging Malaysian home maintenance service marketplaces that allow customers to book home repair services online. Hence, online booking services could drive growth and development of field services businesses like Nasesz Enterprise. Nasesz Enterprise is a home maintenance service provider in Johor since 2010 where primary source of customers was from referrals. Unfortunately, this company is facing gradual decline in customer acquisition and in need for a better customer acquisition channel. Existing field service websites such as Kaodim are having difficulty convincing customers to book services online despite having enough website traffic[39A]. Hence, it is important to help the Nasesz Enterprise to investigate the factors related to website quality which influence online booking intention so that online booking service can be implemented for the Nasesz Enterprise.

2.0 LITERATURE REVIEW

2.1 Online Booking Intention

Online booking refers to the reservation for services made using online platforms[6]. Booking intention refers to the intention to book a service offered by a business which is closely related to purchase intention[35]. The emergence of online booking has made traditional booking channels less favored nowadays[32]. Eventually, internet and technology advancement across many industries lead to service innovations in the form of online services which resulted in greater efficiency[7]. The rising online services has made several industries to offer online booking where customers find it easier to search information and making transactions online[27]. Subsequently, online booking is expanded into other industries such as restaurant industry to serve customers on appointment basis which is widely acceptable by customers[38].

2.2 Website Quality

A business with sufficient online presence is essential to have a website that visitors find convenient when interacting with a company. A company with an appealing website has a better chance of success in the online market because it can elicit positive feelings in a person about the company's quality[8]. Online customers rely on website qualities to assess the possible benefits and implications like how they use traditional cues like brand reputation to make decisions in the offline world[3]. Evidently, website quality in term of usability, ease of use, entertainment, complementarity has positive impact on booking intention among customers[5]. The perceived website quality appears to be a precursor to customer satisfactions that positively leads to customer’s intention to do online transactions[10].

2.3 E-Trust

Trust is defined as confidence of a person who believes to another person to perform a task in a way that satisfies the trustor’s expectation[12]. In electronic transactions, trust refers to a customer’s willingness to engage in a transaction with the service provider[13]. Trust is one of the central features of buyer-seller relationships in a business environment where it has been a crucial factor in the decision-making process on purchasing a product from a store[14]. Trust is the main concern for customers make a purchase and with a lack of trust, customers may avoid purchasing online[14].

3.0 HYPOTHESES DEVELOPMENT

3.1 Usability of website

Usefulness is the primary determinant of behavioral intention to use online services[15]. A good usability of website which designed based on internet user’s and needs will make the online shopping experience easier[2]. The perceived usefulness can be one of the determinants to predict whether the customer will use the platform for online booking[6]. Moreover, as websites developed to share information and generate communications with their visitors or users, it is crucial for organizations to ensure that their website are rich in term of accessibility and usability[34]. Hence, this study proposes the following hypothesis:

H1: The usability of website positively and significantly influences the online booking intention of customers.

3.2 Ease of use

The ease of use of a website is crucial in determining users' experiences and behavior intentions on making online transactions and revisiting the website[29]. Ease of use can be considered as a critical success factor of a website where it gives impact on customers purchase related to perceptions and decision[17]. Ease of use appears when the system's operation does not need much effort, in which users feel simple to learn, easy to control the features, flexible in use, and good in time efficiency[35]. Prior studies has also found that perceived ease of use has a positive and significant influence on online purchase intention as well as generating a significant influence on intention to perform online transactions on a website[35.] A study found that ease of use has positive relationship with customer satisfaction toward the online shopping[30]. Hence, this study proposes the following hypothesis:

H2: The ease of use of website positively and significantly influences the online booking intention of customers.

3.3 Entertainment

In offline setting, businesses use entertainment activities to influence purchasing and enhance relationship with customer[18]. In contrast, online business requires customers to visit website and consequently make further action such as booking an appointment. The appealing website design and content is considered a vital factor for website success in generating first impression which is crucial regarding how people perceive, determine, and consequently act for available options on the website[20]. Hence, this study proposes the following hypothesis:

H3: The entertainment of website positively and significantly influences the online booking intention of customers.

3.4 Complementarity

Complementarity defined as completeness of transactions in the online platform where customers can obtain information and use online functions such as purchasing or booking[33]. A study regarding hotel website quality on online booking intentions has found that the customers place a high importance on complementarity factors in the context of website quality[5]. Hence, this study proposes the following hypothesis:

H4: The complementarity of website positively and significantly influences the online booking intention of customers.

3.5 E-Trust

A website success depends on how credible the website appears to consumers. Online purchase intention requires a higher degree of trust as virtual shopping or booking involves more risks and uncertainties[3]. In the online environment, trust is labelled as electronic trust (e-trust) which is determined by several key aspects including website quality[21]. Moreover, a previous study on the influence of economy hotel website quality on online booking intentions has concluded that the four attributes of website quality consist of usability, ease of use, entertainment and complementarity has significant influence on the e-trust[5]. Hence, this study proposes following hypotheses:

H5: The usability of the website positively and significantly influences the e-trust.

H6: The ease of use of the website positively and significantly influences the e-trust.

H7: The entertainment of the website positively and significantly influences e-trust.

H8: The complementarity of website positively and significantly influences the e-trust.

In addition, security tends to be a great problem preventing customers from making purchases online[22]. For instance, the rising cybercrimes particularly unauthorized data sharing has gained online consumers attention in recent years. In fact, customer's trust toward websites is a key determinant in the booking intentions[14]. Hence, this study proposes the following hypothesis:

H9: The e-trust on the website positively influences and significantly the online booking intention among customers.

4.0 RESEARCH METHODOLOGY

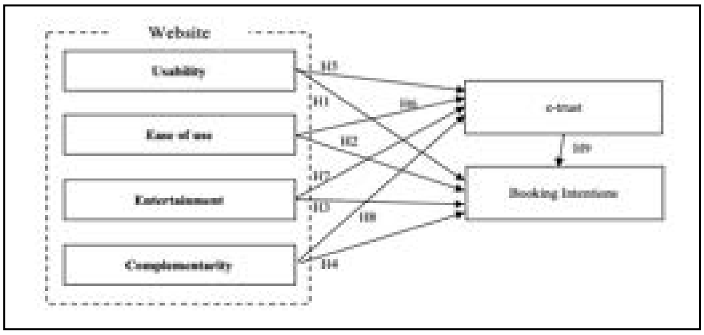

Fig. 1: Research framework for the customer's online booking intention from the perspective of website quality and e-Trust.

The research framework is adopted from a previous study[5] about relationship among economy hotel website quality, e-trust and online booking intention in China. Website attributes including usability, ease of use, entertainment and complementarity are classified as independent variables while booking intention and e-trust are acting as dependent variables.

4.1 RESEARCH DESIGN

Research design is referred as a blueprint that lays out how research will progress from the research questions and objective to the conclusions throughout several process involving collection, measurement, and analysis of the data[23]. Conclusive research design refers to a study that produces conclusions for decision making as it examines the hypotheses and relationships among each variable[24]. The data collected in conclusive research is in the quantitative form. Conclusive research design can be differentiated into descriptive and causal research. A descriptive study examines the characteristics of samples, whereas a causal study investigates the cause-and-effect relationship between variables[25]. The descriptive research can be divided into cross-sectional and longitudinal design where cross sectional studies conducted among different samples at a time while longitudinal studies investigate the same sample along the research process[25]. Hence, this study will adopt the conclusive research design which consists of descriptive research and cross-sectional design to study the relationship between usability, ease of use, entertainment, complementarity, e-trust and online booking intention.

4.2 POPULATION AND SAMPLING

From research perspectives, a population is a group of people or items who have similar and distinct features in which the researcher use them to draw a conclusion for a study[23.] Thus, the target population of this study is the residential property owners and tenants in Malaysia. Moreover, it is advised to follow rule of thumb where one should use multiplier of minimum five to determine the sample size[39]. In this research, the questionnaire contains 30 questions where each variable has 4 questions in average. Therefore, the sample size of 150 respondents (30 Questions x 5) is sufficient to conduct this research. Moreover, this research will adopt the non-probability sampling approach through purposive sampling technique because the focus of this study is residential property owners and tenants in Malaysia. This study targets property owners and tenants because they are the target market of home maintenance services industry. The responses and data collected from this specific group will be more accurate and appropriate to assist this research to confirm the proposed marketing strategy.

4.3 RESEARCH INSTRUMENT

Quantitative technique is used for this study and questionnaire instrument is employed to collect the primary data from the respondents online in the format of Google Forms. The questionnaire consists of two sections: Section A and Section B. In Section A, there are seven questions regarding the demographic profiles of respondents such as the age, gender, residential area in Johor, monthly income, education level, common booking channel, and booking experience. Section B consists of thirty questions wherein the twenty questions are related to the respondents' perceptions on the possible factors such as usability, ease of use, entertainment, and complementarity of the website while the remaining ten questions are asking on their opinions and trust towards the proposed online booking. The five measurement items of online booking intention were adapted and adopted from the previous study[5]. This measure aims to examine the online booking intention factors in term of website quality and e-trust among property owners and tenants. In addition, the five factors measuring online booking intention including the usability (5 items), ease of use (5 items), entertainment (5 items), complementarity (5 items), and e-trust (6 items) were also adopted from a previous study[5]. Moreover, 5-point Likert Scale is enacted in Section B of the questionnaire ranging from 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree), and finally to 5 (Strongly Agree). After the data collection phase, the collected data will be tested, processed, and analyzed by using the Statistical Package for the Social Sciences (SPSS) software.

5.0 EXPECTED FINDINGS

The study is expected to confirm i) The usability of website positively and significantly influences the online booking intention of customers. ii) The ease of use of website positively and significantly influences the online booking intention of customers iii) The entertainment of website positively and significantly influences the online booking intention of customers iv) The complementarity of website positively and significantly influences the online booking intention of customers v) The usability of the website positively and significantly influences the e-trust. vi) The ease of use of the website positively and significantly influences the e-trust. viii) The entertainment of the website positively and significantly influences e-trust. ix) The complementarity of website positively and significantly influences the e-trust. x) The e-trust on the website positively influences and significantly the online booking intention among customers.

Previous research on service innovation and customer satisfaction has validated that service innovation has significant relationship with customer value creation and customer satisfaction[26]. As such, this study provides Nasesz Enterprise an effective solution to acquire more customers by providing online booking option for customers and at the same time, obtain comprehensive understanding on the key elements of website quality that influence the online booking intentions. The findings of this study will reveal which elements of website quality is highly prioritized by potential customers in enabling them to perform online booking. On the other side, the study also will explore the significance of e-trust and willingness among customers in engaging with online transactions, particularly online booking for Nasesz Enterprise. Overall, findings from this study will help the business in customer acquisition by assisting them to identify and improve on the areas that customers feel attracted on both website and online booking intention.

6.0 CONCLUSION

Nasesz Enterprise is under the field services industry which refers to any work done at customer's place which consists of maintenance, and repair of equipments. The business has a great potential for acquiring many customers by allowing customers instantly schedule an appointment on the available date and time using the online booking option on their website. The process is more simplified and easier for customers when online booking is employed which could increase the customer acquisition for the business. This study can be beneficial for other businesses developments within and beyond the field services industry. For instance, this study explores the factors that closely affect the intentions to make online bookings which enables businesses to develop their marketing strategies and organize the website elements in a way that match the expectations of customers. For future researchers, this study will pave way to a deeper exploration of significant booking intention factors.

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DESIGNING SOCIAL MEDIA BRAND COMMUNICATION TO ENHANCE BRAND EQUITY OF ELECTRONIC COMPONENT RETAILERS

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ABSTRACT

Social media is booming massively, especially during Covid-19, many firms use the platforms to reach a bigger audience and increase brand equity. However, some businesses like electronics component retailers rarely use social media for marketing. For instance, Top One Technology, a small company selling electronics parts, is facing a problem promoting its brand to the local and online community. Thus, this study investigates factors to increase brand equity via social media brand communication and then design marketing strategies. This study will adopt the conclusive research design to study the relationship between social media brand communication, brand awareness and perceived quality. Purposive sampling will be utilized to focus on the Facebook user who intends to purchase electronic components, and a questionnaire instrument is used to gather primary data from respondents online using Google Forms and analyzed using SPSS software. The target population for this study is 150. The finding from this research is expected to be a guideline for electronic components retailers on how to use social media brand communication to improve brand equity.

Keywords: Social media brand communication, Firm-generated content, User-generated content, Brand awareness, Perceived quality

1.0 INTRODUCTION

Social media is booming massively, and it has become part of billions of people's daily live around the world (Dwivedi et al., 2020; Liu et al. 2021). Globally, around 4.66 billion people using internet, increasing the popularity of social media and about 53.6 percent of the world's population now uses social media (Kemp, 2021). Hence, Many firm use social media platform to reach out to bigger audience and increase brand equity (Raji et al., 2020). The benefits of social media on brand equity is to improve brand awareness (Raji et al., 2020), and perceived quality (Hermaren & Achyar, 2018). Besides, according to Hayes (2021) brand equity also allow company to have a stable long-term growth. Thus, the dimensions of social media brand communication have a statistically significant effect on brand equity (Zahoor et al., 2016).

Therefore, lots of companies use social media to increase branding and engagement (Carlson et al., 2017). For instance, Starbucks uses variety of social media tools for customer knowledge which serve as powerful branding and marketing tools for the company (Chua & Banerjee, 2013). Starbucks promotes its products through social media channels, making them instantly able to connect with a large audience and gain brand equity without spending any money (Pratap, 2019). However, contrary to food and beverage retail store, some businesses like electronics component retailers rarely use social media for marketing and seldomly being publicized. For instance, Top One Technology, a small business that sells electrical components, is having difficulty in promoting their brand to the local and online communities they serve. As a result, this study aims to investigate factors that drive brand equity of electronic component retailers. From the Top One Technology's problem, the study proposes some social marketing strategies to increase its brand equity.

1.1 Problem Statement

Top One Technology is a business that provides a range of electrical components, modules, tools, equipment, and a small volume of Printed Circuit Board (PCB) prototyping services. Mr Toh Cha Heng founded it in June 2016, and it is situated in Skudai, Johor Bahru. The most significant problem that Top One Technology is facing is a lack of brand equity, particularly in terms of brand awareness. Mrs. Joliza, the business's sales engineer, claims that many local customers and online communities are unaware of the store's existence. Top One Technology has implemented several marketing initiatives to promote and publicize its products and services, but they fail to attract more customers. This is because they do not effectively utilize their social media channel. According to Silva (2017) social media can be useless if it is not appropriately handled. This is not a good sign because brand equity is crucial for businesses as it helps to drive sales and increase market share (Carol, 2021). Hence, to create this brand equity, a reformation on how Top One Technology handles their social media is necessary. According to Stojanovic et al. (2018), intensity of social media usage can positively affect brand awareness, further brand awareness could have significant impacts on brand equity dimensions which are brand awareness and perceived quality.

One of the ways is to effectively use social media is by doing firm created social media communication where businesses may produce and manage social media content and discussions (Schivinski & Dabrowski, 2015). However, simply creating a content is not enough. Nowadays, one-way communication has evolved into multi-dimensional, two-way, and peer-to-peer communication (Berthon, et al. 2008). Therefore, doing user generated content (UCG) would also be beneficial to the company for a bigger audience. User generated content (UGC) occurs when previous buyers share their thoughts, preferences, experiences online, allowing others, including potential buyers, to read about them (Bahtar & Mazzini, 2016) in an interactive virtual community (Sethna, Hazari, & Bergeil, 2017). User generated content is praised as a highly effective hidden marketing tool for businesses because it able to improve brand equity through the user's network (Fromm, 2016). Therefore, this study aims to investigate factors that drive brand equity of electronic component retailer. From the findings, this study will propose marketing strategies that may increase the brand equity of Top One Technology Sdn Bhd. Hence, this study objectives are:

R01: To identify the factors that drive brand equity of electronic component retailers.

R02: To propose marketing strategies that may increase the brand equity of Top One Technology Sdn Bhd.

R03: To examine the best implemented marketing strategies that could increase the brand equity of Top One Technology Sdn. Bhd.

2.0 LITERATURE REVIEW

2.1 Social Media Brand Communication

The internet's presence and Web 2.0 innovation have altered how people used to live and interact (Curran et al., 2012). Web 2.0 often used interchangeably with social media (Berthon et al., 2012). To assess the effect of social media brand communications, it is essential to differentiate between two types: (1) firm-created communications and (2) user-generated communications (Godes & Mayzlin, 2009).

2.1.1 User-generated content (UGC)

User-generated content (UGC) is any digital material that is produced and shared freely by users of different social media platforms or websites in the form of videos, images, blogs, tweets, and articles (Naem & Okafor, 2019). User–generated content (UGC), often referred to as electronic word – of – mouth (e-WOM), functions identically to traditional word–of–mouth (Manap & Adzharudin, 2013). Previous study proven that UGC is useful for businesses. For instance, Stephen and Galak (2012) previous research shown that certain types of social interactions that occur on social media platforms such as referring friends features and debates in online forums may have a beneficial effect on critical marketing outcomes such as new customer acquisition and sales. Moreover, according to Sethna et al. (2017), UGC is useful for business because it enhances brand awareness, broaden market reach and the ability to gain customer insight. Few studies have been done previously regarding User-generated content (UGC). For example, Müller and Christandl (2019) studied the content influence on the content response of sponsored and user-generated content.

2.1.2 Firm-created content (FCC)

Firm-created content is defined as content produced by marketers for official brand pages on social media platforms (Colicev et al., 2019). Several studies have proven that FCC has a significant impact on the engagement and interactions of users (Hernández-Ortega et al., 2020; Huertas & Marine-Roig, 2016; Pletikosa Cvijikj & Michahelles, 2013). According to Yilmaz and Tuncel (2020), FGC is beneficial for business because businesses can attract and engage customers by producing compelling content on their social media platforms. Few studies have been done previously regarding firm-generated content (FCC). For example, the research of firm-generated content on business performance and customer engagement by Bai and Yan (2020). Besides that, Kumar et al. (2016) studied the impact of FCC in social media on customer behavior.

2.2 Consumer Based Brand Equity (CBBE)

Schivinski & Dabrowski (2015) conceptualizes CBBE as a multidimensional construct comprised of three reflective first-order variables which is brand awareness/associations, perceived quality, and brand loyalty. Numerous studies have been conducted on brand equity (Jara & Cliquet, 2012; Mahmood & Bashir, 2020; Shahid et al., 2017). For example, according to a research done by Alam et al. (2019) firm-generated and user-generated content both have a favorable effect on brand equity and purchase intentions.

2.2.1 Brand Awareness

Brand awareness is defined as how people become acquainted with a brand name and can recall and recognize it (Djakeli, 2012; Lin, 2013; Gursoy et al., 2014). According to Chaney et al. (2018) Brand awareness refers to customers' ability to identify brands under various conditions, as reflected in brand reconstruction and recall performance. Brand awareness has several levels, beginning with not recognizing the brand and progressing to brand recognition, and the top-of-mind recalling stage (Ilias et al., 2020). Strong brand awareness will provide a company with a competitive advantage in the market, enhancing its overall reputation and credibility (Latif & Mdnoor, 2014). Moreover, brand awareness is important because people often buy a known brand because they are comfortable with the known (Panchal et al., 2012). Consumers employ brand awareness as a decision heuristic, which enhances the management of customer-based brand equity (Buil et al., 2013; Huang & Sarigöllü, 2012). Most researchers agree that brand awareness and recall are important when consumers make purchasing decisions (Thoma & Williams, 2013).

2.2.2 Perceived Quality

Perceived quality is difficult to comprehend and quantify since it comes from the abstract concept of value, which has many interpretations (Yu et al., 2017). Perceived quality may be described as the customer's impression of a product's or service's overall quality in comparison to alternatives for the intended purpose (Panchal et al., 2012).Moreover, perceived quality is composed of two component which is benefits received and costs incurred (Liu et al., 2015). Several research have been done previously regarding perceived quality. For example, Christodoulides et al. (2012) studied the consumers' views of brands quality and the influenced by their engagement with brand-related user-generated content (UGC).

2.3 Hypothesis Development

2.3.1 Brand Awareness

Zailskaite-Jakste and Kuvykaite (2013) acknowledge that social media brand communication contributes to the development of brand awareness and a favourable brand image. In addition, Schivinski and Dabrowski (2015) recognized that firm-created social media brand communication produced by a business affects brand awareness/associations and affecting customer perceptions of brand quality. Furthermore, according to a research conducted by Hutter et al. (2013), consumer involvement with a company's fan page on social media and their sense of brand awareness are highly correlated. Therefore, the following hypothesis is proposed:

H1a: *A positive evaluation of firm-created social media brand communication positively and significantly influences brand awareness/associations.*

According to a research, sparking social media communication via customer involvement in brand development may increase a company's likeability (Zailskaite-Jakste & Kuvykaitė, 2013). Shojaee and Azman

(2003) indicate that UGC has a significant influence on brand awareness. Similarly, Alam and Khan (2019) validate that user generated content positively impact brand awareness. In addition, according to Malthouse et al. (2015) found that engagement via content elaboration have impact on brand awareness/associations. Therefore, the following hypothesis is proposed:

H1b: *A positive evaluation of user-generated social media brand communication positively and significantly influences brand awareness/associations.*

2.3.2 Perceived Quality

There are several kinds of research done previously regarding social media communication and perceived quality. Based on research done by Huang et al. (2018), he validate the use of social media brand communication by firm will enhance user's perceived quality of a brand. Meanwhile, according to Durmaz et al. (2018) study, there a significant correlation between how consumer perceived a brand image to perceived brand quality. In addition, Nisar and Prabhakar (2018), consumer's sentiment regarding firm moderately influence perceived quality. Therefore, the following hypothesis is proposed:

H2a: *A positive evaluation of firm-created social media brand communication positively and significantly influences perceived quality.*

Daugherty et al. (2013) acknowledge that there a positive relationship between user generated content with attitude and consumer behaviour about certain brand. Moreover, Ozuem et al. (2016) indicate that user-generated content acts as a mediator in the customer decision-making process, giving a level of credibility above and beyond that of a traditional marketing communication campaign. Besides, Christodoulides et. al (2012) found that consumer views of co-creation, community, and self-concept all have a favourable effect on UGC participation, which in turn has a positive effect on consumer-based brand equity. Perceived quality also achievable through user-generated content because family and friends are more likely to trust content from someone they know (Liu et al., 2015). Therefore, the following hypothesis is proposed:

H2b: *A positive evaluation of user-generated social media brand communication positively and significantly influences perceived quality.*

Relationship between the dimensions of CBBE which is brand awareness and perceived quality will also be studied during this research. According to Bashir et al. (2017), brand awareness does affects perceived quality. Thus, the following hypothesis is proposed:

H3: *Brand Awareness has a positive effect on perceived quality.*

2.4 Research Framework Model

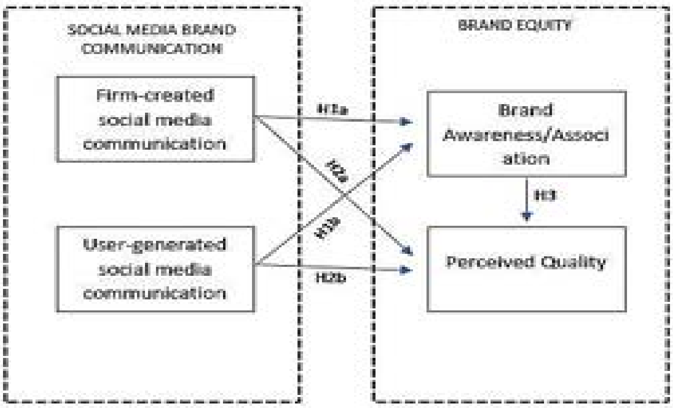

Fig. 1: Research framework for impact of brand communication on brand equity through social media.

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The research design is defined as the techniques and procedures used in gathering and analyzing necessary data and the goals that need to be fulfilled (Boru et al., 2018). Researchers may conduct their studies more smoothly if they chose a proper research design. Therefore, this study will adopt the conclusive research design to study the relationship between social media brand communication, brand awareness and perceived quality. A conclusive research design is described as research that produces results for decision-making via the validation of hypotheses and connections (Lo et al., 2020)

3.2 Population and Sampling

The term "population" refers to a group of people or things that share certain characteristics (Ranjit, 2019). Target population identifies the units for whom the survey's results are intended to be generally applicable (Flick, 2015). According to Verma and Verma (2020), a sample size of 150 is deemed appropriate for conducting research. As a result, this study's sample size is 150. Additionally, this research will use a non-probability sampling approach known as purposive sampling since the study's emphasis will be on electronic component user that have social media and stated in Malaysia. Non-probability samples are ones in which the researcher is unaware of the identification of every member of the population. (Brewer & Gregoire, 2009).

3.3 Research Instrument

Research instrument is a tool that is used for the collection, quantification, and analysis of data related to a researcher's study interests (Flick, 2015). The quantitative method is used in this research, and a questionnaire instrument is used to gather primary data from respondents online using Google Forms. Quantitative research is a method of data collecting and analysis that focuses on quantifying the data collection and analysis process (Bell et al., 2002). The questionnaire consists of two sections: Section A and Section B. In Section A, there are six questions regarding the demographic profiles of respondents such as the age, gender, and employment. Section B consists of eighteen questions wherein the first eight questions are related to the respondents' opinions and satisfaction on electronic components retailer's social media content.

The survey questions are adopted from the study of Schivinski and Dabrowski (2015) and are evaluated on a 5-point Likert scale. Links to surveys are given out via blast and direct messages to social media user on What's app and Facebook to urge them to engage in this research and collect information. The survey invitation included information on the study's subject. The procedure is carried out via data filtering and univariate outlier detection, which are both statistical techniques. After the stage of data collection, the data will be screened, processed, and analyzed by using the Statistical Package for the Social Sciences (SPSS)

3.4 Intervention Strategy

The researcher will take over and fully handle Top One Technology's social media channel for two months and apply both Firms Created Content (FCC) and User Generated Content (UGC). Firstly, set a weekly schedule. Later, create FCC that include soft selling, hard-selling, posters, video, and trendy content. Furthermore, the researcher will encourage users to create UGC by utilizing customer reviews in the post, tag, or reposting audience content. Other than contests and challenges, the UGC strategy would also include creative engagement such as polls and pop quizzes. Then, invite and encourage users to interact and engage through QnA session, comment section, or FB Live. Lastly, measure the effectiveness of the strategies using Facebook insights by looking at engagement and reach number.

4.0 EXPECTED FINDINGS

This study is expected to confirm i) the impact of social media brand communication on brand equity, ii) firm generated content and brand awareness iii) firm generated content and perceived quality iv) user generated content and brand awareness v) user generated content and perceived quality. Through the survey findings, this study is expected to provide electronic component retailers with a better understanding in term of achieving brand equity through social media communication. Top One Technology Sdn. Bhd. can adjust their social media brand communication to fit the company and the current market need to achieve brand equity. Besides, this study also provides some insights to Top One Technology manager about the users' perception toward their social media brand communication. With the findings from this study, marketeer can highlight the impact of social media communication on brand equity. The findings of this study also provide a better understanding to Top One Technology and marketeer regarding why effective social media communication is essential to achieve brand equity. Thus, they can take appropriate actions to adjust and implement their strategies to make sure that the previous issue would not be repeated.

5.0 CONCLUSION

In conclusion, this research would be one of the research that shows the FGC and UGC impact on brand equity for electronic component retailers for the use of future researchers and marketeers since most of current study is focusing on other industries. This is because this type of retailers is very minor and rarely publicize massively. Through the implemented social media marketing strategies, Top One Technology Sdn. Bhd. would be able to improve their brand awareness and improve their brand perceived value using firm-created content and user-generated content for their social media. It is expected that social media brand communication can be the best marketing strategies to increase the brand awareness of Top One Technology Sdn. Bhd. That is due to, FCC is beneficial for business to attract and engage customers by producing compelling content on their social media platforms. Meanwhile, UGC is useful for business because it enhances brand awareness, broaden market reach and the ability to gain customer insight. Thus, this research will offer marketers practical steps and strategy to modify and execute their company's best strategy using firm created content and user generated content.

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DETERMINE FACTORS THAT AFFECT CUSTOMER SATISFACTION IN COMMUNITY PHARMACY: A CASE STUDY AT MUHIBBAH JAYA PHARMACY

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ABSTRACT

Pharmacy has acknowledged the point of view that customer satisfaction is important in the success of business activities. As a result, it has become critical for the community pharmacy to attempt to manage consumer satisfaction. The aim of the paper was to examine which factors have a positive and significant impact on customer satisfaction with pharmacy. The study investigated the significance of general dimensions and specific elements of customer satisfaction in measuring satisfaction levels. The data was collected from the customers of Muhibbah Jaya Pharmacy through Google form and offline survey. The researchers successfully collected 155 respondents for this study. SPSS software was used to analysis data. The research findings found that the 5 dimensions which include facilities, reliability, process, value for money, and service quality have positive and significant impact on customer satisfaction. In contrast, dimensions of additional services and product quality have no positive and significant impact on customer satisfaction. This study helps the existing literature and marketers understand customer satisfaction, and provides pharmacies with recommendations and directions for improvement to improve customer satisfaction and thus customer retention.

Keywords: Customer Satisfaction, Community Pharmacy, Dimensions of Satisfaction, Satisfaction Levels, Sungai Siput

1.0 INTRODUCTION

Companies have traditionally depended only on product and service differences to retain customers and satisfy them. However, customers now have more options and are more price sensitive because of intense competition from new companies entering the market, duplication of new features, and growth in the number of new products. As a result, marketers have been pushed to adopt distinctive and customer-focused tactics in order to distinguish oneself from the competitors and gain a competitive edge. Consumer satisfaction in pharmacies is a predictor of customer behaviour, making it a crucial problem in the competitive retail pharmacy market (Glaveli, et al, 2021) [1]. Increasing purchase intent and pharmacy performance requires improving patient satisfaction (Yaseen et al., 2018) [2]. Research objective of this research is to examine which factors have a positive and significant impact on customer satisfaction with pharmacy.

2.0 LITERATURE REVIEW

2.1 CUSTOMER SATISFACTION

Customer satisfaction is crucial in business, because you can only conduct business if you have satisfied and loyal consumers. Minya, H (2011) [3] states that if a single dissatisfied client might cost your company more money than ten very satisfied consumers. The more you focus on client retention and satisfaction, more and more long-term business you'll get. Focusing on customer satisfaction strategies is a good thing. It's a well-known fact that no matter how big or small your company is, referrals only come from "Apostles" clients. There are many ways to describe customer satisfaction, but the one that seems to get the most attention is that satisfaction is a post-selection evaluation of a single transaction.

Satisfaction according to Hokanson (1995) [4] is affected by many factors which include friendly employees, courteous employees, knowledgeable employees, and helpful employees, accuracy of billing, competitive pricing, service quality, good value and quick service. The author focuses on seven factors of customer satisfaction for the objectives of this research: additional services, product quality, service quality, facilities, reliability, process, and value for money.

1.2 RESEARCH FRAMEWORK MODEL

The framework of the dimensions in Figure 1 was adopted from Lu and Lukoma (2011) [5] who highlighted nine dimensions to identify attributes to customer satisfaction. In this study, seven dimensions and 21 key elements will be developed to determine customer satisfaction aspects.

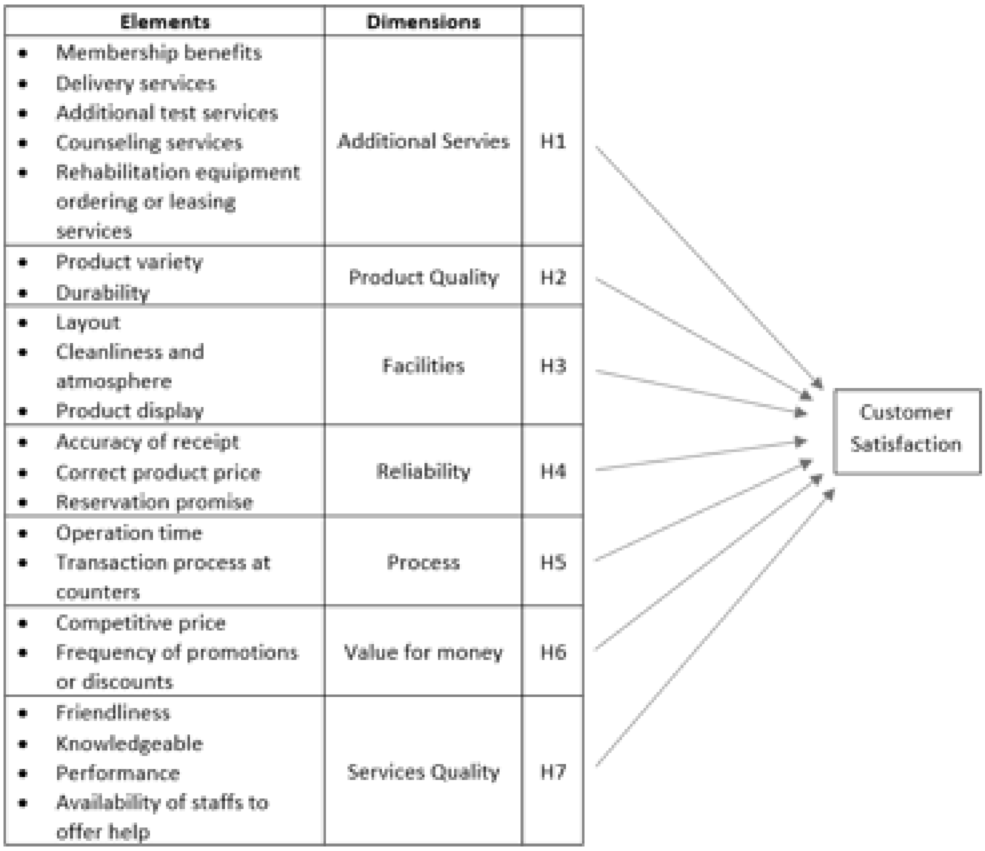

Fig. 1: Research framework for the consumer satisfaction

3.0 RESEARCH METHODOLOGY

The research design of this study is descriptive quantitative research design. This study uses survey methods in collecting data from prospective respondents. According to Bryman and Bell (2007) [6], qualitative research focuses on people' perceptions of their social reality rather than massive quantification. In this study, since the respondents were only customers of the pharmacy, purposive sampling techniques were used to select samples from the population. Questionnaires will be distributed to the respondents by using sample-to-variable ratio sampling (Memon et al., 2020) [7]. “The sample-to-variable ratio suggests a minimum observation-to-variable ratio of 5:1, but ratios of 15:1 or 20:1 are preferred” (Hair et al., 2018) [8]. Minimum of 140 respondents were required to conduct this study by referring to the calculation above. After the distribution process, the researchers managed to collect more than the minimum number of 140 respondents and archive 155 respondents. The questionnaire was developed to be distributed in two ways, which are online and offline methods. The use of Likert scale questions was considered to be the most appropriate for this study. Respondents were asked to rank the importance of these items on a scale of 1 to 5 based on their satisfaction with them. (1 = Totally Satisfied, 2 = Satisfied, 3 = Neutral, 4 = Dissatisfied, and 5 = Totally Dissatisfied.)

4.0 DATA ANALYSIS

4.1 MULTIPLE REGRESSION ANALYSIS

The relationship between dependent and independent variables was demonstrated using multiple regression analysis. Multiple regression analysis used to determine which factor variables were most predictive of influencing consumer satisfaction. If the p-value which is a significant value is less than 0.05, it is assumed that a relationship exists between the dependent and independent variables. Table 1 shows the result output by using SPSS software. The result shows that facilities, reliability, process, value for money, and service quality have positive and significant impact on customer satisfaction. The analysis presents that 5 variables' p-value is lower than 0.05. In contrast, the significant value of additional services and product quality is more than 0.05. The result shows these two variables have no positive and significant impact on customer satisfaction. From the five significant variable factors, with a beta value of 0.385, value for money is the highest predictor of customer satisfaction, followed by reliability, which is 0.254, service quality, which is 0.242, process, which is 0.118, and facilities, which is 0.110.

TABLE 1: Result of Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.139	.162		.861	.391		
Additional Services	.060	.041	.067	1.468	.144	.426	2.346
Product Quality	-.079	.051	-.076	-1.559	.121	.375	2.666
Facilities	.109	.053	.110	2.067	.041	.318	3.146
Reliability	.257	.057	.254	4.474	.000	.279	3.585
Process	.127	.059	.118	2.161	.032	.301	3.327
Value for money	.296	.032	.385	9.355	.000	.528	1.894
Services Quality	.223	.049	.242	4.533	.000	.314	3.187

5.0 DISCUSSIONS AND IMPLICATIONS

H1: Additional services have a positive and significant impact on customer satisfaction.

The research findings show that the additional services have no positive and significant impact on customer satisfaction with pharmacy. The result shown at multiple regression analysis obtained the significant value (p-value) of additional services is 0.144 ($p<0.05$). Therefore, this hypothesis is rejected. The result differs from Marković et al. (2014) [9] research which proved the dimension of additional services has the greatest impact on customer satisfaction. However, the research findings are the same with Grigoroudis et al. (2002) [10], which found the additional services criteria is the truly unimportant criteria with the customer satisfaction. The regression result showed that the expectation of customers towards the additional services is lower and not important. Additional services are very helpful in increasing customer satisfaction, but the most additional services provided by the pharmacy are only beneficial to a small percentage of customers. For beneficiary customers, additional services are important and have high expectations, but for other customers, additional services are less important and have lower expectations.

H2: Product quality has a positive and significant impact on customer satisfaction.

The result of this study found that the product quality has no positive and significant impact on customer satisfaction with pharmacy. This hypothesis is rejected due to the significant value (p-value) is 0.121 ($p<0.05$). The result is different from the previous research of Razak et al. (2016) [11], Senthilkumar (2012) [12] which proved that the quality of the product can affect customer satisfaction. However, the result in this research is in line with research from Saleem et al. (2015) [13] which found the product quality has no significant effect on customer satisfaction. Ayalew et al. (2017) [14] research presented those customers of pharmacy have a high level of expectation toward pharmacy services. Compared with pharmacy products, customers have higher attention and expectations for pharmacy services. Community pharmacies provide their customers with medicines and advice to promote the safe and effective use of medicines provided by the pharmacy. Perceived product quality had no effect on customer satisfaction, suggesting that customers may associate side effects or unsatisfactory medication with physician or active ingredient prescribing decisions rather than pharmacies (Guhl et al., 2019) [15]. The aggression analysis also found that the product quality with the lower beta value was -0.076 which shows that the customers of the pharmacy don't have much expectations on the product quality.

H3: Facilities have a positive and significant impact on customer satisfaction.

The facilities have a positive and significant impact on customer satisfaction with pharmacy. Accept this proposed hypothesis by referring to the significant value (p-value) in the regression analysis. This hypothesis was accepted with p-value at 0.041 ($p<0.05$). The finding is consistent with Hui et al. (2013) [16] which stated facilities play an important role in customer satisfaction. The previous research of Harisman el al. (2021) [17] also found that the facility significantly and positively affects customer satisfaction at pharmacy. As a result, it may be stated that the facility must exist in the organization before a subscription can be given. The facilities' interior and external design, as well as their cleanliness, must be maintained, particularly in terms of what the client feels immediately. Nawangwulan et al. (2012) [18] findings show that building conditions and facilities have a significant impact on consumer satisfaction. Thus, this means the facilities have a positive and significant impact on customer satisfaction with Muhibbah Jaya Pharmacy.

H4: Reliability has a positive and significant impact on customer satisfaction.

The research findings show that reliability has a positive and significant impact on customer satisfaction with pharmacy. The results from regression analysis show the hypothesis is accepted by having a p-value at 0.000 ($p<0.05$). This result is in line with previous research from Barusman (2019) [19], Janahi and Mubarak (2017) [20], and Minh et al. (2015) [21]. In contrast, this research finding is inconsistent with Munusamy et al (2010) [22], which responded that reliability has no significant impact on customer satisfaction. Research from Fauziah et al. (2019) [23] found that reliability is the important dimension in determining the customer satisfaction of a pharmacy. Customers of a pharmacy will certainly expect the pharmacy to deliver the service at the promised time.

H5: Process has a positive and significant impact on customer satisfaction.

The fifth hypothesis is accepted in this study. Process factor has a positive and significant impact on customer satisfaction with pharmacy. This hypothesis was accepted with p-value at 0.032 ($p<0.05$). The finding is consistent with previous research from Chan and Wong (2006) [24], Khatab at al. (2019) [25] and Ortiz (2020) [26], where the process has a positive and significant impact on customer satisfaction. Keshavarz and Jamshidi (2018) [27] supported that process quality has a significant relationship with customer satisfaction. Customers frequently wish to purchase medications at any time, thus a pharmacy that is open throughout business hours has an impact on customer satisfaction (Do and Foulon, 2018) [28]. Pharmacy can maintain or improve service processes to achieve higher levels of customer satisfaction since the process has a significant impact on customer satisfaction. Improvements to processes are vital since they will lower total prescription fulfilment time, enhance consumer satisfaction, and improve the pharmacy's organisation and structure (Ortiz, 2020) [26].

H6: Value for money has a positive and significant impact on customer satisfaction.

The research found that the value for money has a positive and significant impact on customer satisfaction with pharmacy. The result shown at multiple regression analysis obtained the significant value (p-value) of value for money is 0.000 ($p < 0.05$). Therefore, this hypothesis is accepted. The result is inconsistent with previous research from Sriratanavit (2015) [29] and Harisman el al. (2021) [17] which proved that drug price does not significantly affect customer satisfaction at the pharmacy. However, the research outcome is consistent with the previous from Indriana (2021) [30], Guhl et al. (2019) [15] and Cakici et al. (2019) [31], which showed the customer value has a positive impact on customer satisfaction. With a beta value of 0.385, value for money is the highest predictor of customer satisfaction. Consumer satisfaction is influenced by pricing; if the price is acceptable and equivalent to the product or service supplied, the customer will be satisfied. Customer satisfaction will drop if customers believe the prices paid are not equivalent to the services they obtain (Indriana, 2021) [30]. Drugs are sold on the open market, with merchants and market forces determining drug costs. Customers typically study and compare medicine costs at many pharmacies before asking for the lowest price at the pharmacy they have visited previously. Customers have additional options from different retail pharmacies, as well as branded and generic medicines. Most people visit many pharmacies to compare pricing and select the one that gives the best deal on the medicine they want.

H7: Service quality has a positive and significant impact on customer satisfaction.

The research findings show that the service quality has a positive and significant impact on customer satisfaction with pharmacy. This hypothesis was accepted with p-value at 0.000 ($p<0.05$). The result is consistent with the previous research conducted by Anwar et al. (2019) [32], Harisman el al. (2021) [17], and DAM et al. (2021) [33]. Ruzaihan, et al (2020) [34] findings showed that service quality has a significant positive impact on customer satisfaction on pharmaceutical stores. According to Parasuraman et al. (1988) [35], service quality is defined as a customer's total quality rating of a service provider based on a comparison of the customer's expectations with the perceived quality they get. The characteristics that most affected satisfaction, according to Mahmoud and Mahmoud (2016) [36], were pharmacy location, service quality, and pharmacists' ability to read medication instructions. When it comes to service quality, the majority of aspects are connected to customer satisfaction, which means that if service quality or performance does not satisfy the expectations of the customer, people will think about and make judgments based on that quality (Anwar & Balcioglu, 2016) [37]. Customers want staff to be able to deal with them, offer clear and intelligible drug information, and be knowledgeable enough to deliver correct service (Fauziah et al, 2019) [38]. Improving service quality means improving product utilization and increasing satisfaction (Abdullah et al. 2017) [39]. As a result, when it comes to improving services, community pharmacists should evaluate staff performance, and pharmacy employees should obtain adequate training and enhanced communication skills.

6.0 CONCLUSIONS

This study has investigated the factors that have positive and significant impacts on customer satisfaction for pharmacy. The research findings found that the 5 dimensions which include facilities, reliability, process, value for money, and service quality have positive and significant impact on customer satisfaction. In contrast, dimensions of additional services and product quality have no positive and significant impact on customer satisfaction. Muhibbah Jaya Pharmacy should pay attention to dimension value of money due to the dimension being the highest predictor of customer satisfaction among all dimensions. Pharmacy should focus on their pricing strategy and develop prices that are more acceptable to customers. Another recommendation is that the pharmacy can train employees to demonstrate and deliver product value to customers, and try to offer more promotion events to enhance customer satisfaction.

This study adds to the existing literature and helps marketers understand customer satisfaction, as well as providing pharmacies recommendations and directions for improvement in order to boost customer satisfaction and retention. Therefore, if pharmacies take customer perspectives into account and focus on relevant service elements, they may increase customer satisfaction and loyalty. To improve effectiveness, personal interaction appears to be the most important factor for proper resolution. The location of the pharmacy should also be easily accessible and convenient for customers. As a result, marketers and company owners should keep an eye on how to satisfy consumers and boost customer satisfaction in order to increase customer retention and profit. High satisfaction will give customers a good image of the company and create good word of mouth. If not, low satisfaction allows customers to spread their unpleasant buying experience, which can lead to other consumers shunning the brand.

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GLOBAL POSITIONING SYSTEM PERFORMANCE ASSESSMENT WITH PRECISE POINT POSITIONING AND RELATIVE POSITIONING

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ABSTRACT

Global Positioning System (GPS) is a satellite navigation system used to determine the ground position of an object in providing high accuracy in the coordinates. However, relative baseline length and duration of observations can affect the positioning accuracy. Several organizations have developed online Global Navigation Satellite System (GNSS) processing services as an alternative solution to achieve centimetre to decimetre-level accuracy. This study evaluates the positioning performance of the Precise Point Positioning (PPP) – Canadian Spatial Reference System (CSRS), and relative positioning – Australian Online GPS Processing Service (AUSPOS) methods. A commercial software Trimble Business Center (TBC) as the benchmark processing. This study area is located along the Pan Borneo Highway, East Malaysia, using the established control points. Different services are presented and compared. CSRS-PPP results show that the mean Root Mean Square Error (RMSE) are 0.039m of Easting, 0.031m of Northing, and 0.065m of Up components, respectively, which cm-level is achievable. Thus, the overall results suggest that CSRS-PPP online services are more reliable for GPS users in obtaining the high accuracy coordinate in GNSS post-processing.

Keywords: GPS, Precise Point Positioning, Relative Positioning, TBC, Online GNSS Processing

1.0 INTRODUCTION

GNSS has been used widely around the world, especially in engineering applications, positioning, navigation, and timing systems (Ocalan et al., 2016). It is a broad term used to encompass all global satellite-based navigation systems providing geospatial positioning with global coverage on or near the Earth's surface, and Global Positioning Systems (GPS) is one of the GNSS components. Commonly, most GPS users have used relative positioning techniques to provide high accuracy in the coordinates. Also, it is required fundamental knowledge of the GNSS and experience in the processing. Several organizations have developed web-based online services as an alternative solution against the conventional data processing method for reducing the cost to process GPS data. It is essentially user-friendly to achieve the centimetre (cm) to decimetre (cm) level accuracy point positions and useful for GPS users to obtain and evaluate data easily through these online services (El-Mowafy, 2011). Two types of solutions approach can be used for web-based online services to calculate the estimation coordinates: the Precise Point Positioning (PPP) solution approach that acquired the use of a single GNSS receiver while the relative (i.e., baseline, network) solution approach requires at least two receivers and one receiver must be a known station.

According to Tata et al. (2020), the online services produced the results with a few cm values by comparing the commercial software with an observation period of one (1) hour for three (3) consecutive days. Besides, Aziz (2018) studied the baseline length obtained using online services and compared it with the baseline length computed by the relative solution using TBC at different observation times of 1, 2, 3 and 4 hours. In addition, Tariq et al. (2017) studied the duration of observations for each point was measured into five periods (2-hour, 4-hour, 6-hour, 8-hour, and 10-hour) for three online services (OPUS, AUSPOS and CSRSPPP) and one post-processing software (LGO v8.3). These authors have related to the duration of observations by taking a longer time span to improve data, and users can expect reliable results at mm level for the observation period of 10-hour. However, the baseline length between two receivers must be considered, especially in Malaysia.

AUSPOS uses International GNSS Service (IGS) as the reference station, and there are only three IGS stations (NTUS, PTAG, and PIMO) in the Southeast Asia region. The error sources can come from a long baseline (>1,000km), atmospheric error and multipath effect.

In this contribution, this study determines the reliability of the online processing services for GPS users to explore the precision performance in positioning, which may be suitable for engineering works requiring a centimetre to decimetre level of precision. The experimental work has been tested along Pan Borneo Highway, located in Sarawak, East Malaysia. In this study, three areas are covered from route Sibu-Bintulu and these control points are used in the relative positioning network. In order to determine the reliability of the online processing services of point positioning, three different study areas were examined by establishing Ground Control Points (GCPs), and the duration of observations of all GCPs was performed more than 2 hours with dual-frequency carrier-phase observations in static mode. The study aims to evaluate the accuracy of the PPP and relative positioning approach by using online processing services such as in Canadian Spatial Reference System (CSRS) PPP and Australian Online GPS Processing Service (AUSPOS) as a relative network positioning while a commercial software using Trimble Business Center (TBC) as a benchmark processing in three different study areas of Pan Borneo Highway in Sarawak. The aims embark on two (2) objectives: 1) to evaluate the GNSS positioning precision level using the online processing services and the commercial software, and 2) to identify the consistency of positioning performance among the online services.

2.0 METHODOLOGY

The research methodology has represented the workflow of the study plan from data acquisition up to data analysis to achieve the research objectives, as shown in Figure 1. It is constructed into five (5) phases; Phase 1 is data collection of GNSS observations from the field before importing them into GNSS post-processing methods. Phase 2 evaluates the GNSS positioning precision level with the PPP and differential techniques using online processing services and commercial software. The coordinate systems synchronization is performed in Phase 3. In Phase 4, we assess the positioning performance of PPP and relative processing techniques on different processing platforms. Finally, in Phase 5, we interpret the results based on Root Mean Square Error (RMSE).

Prior to GNSS post-processing, GNSS observations data were collected from the field in relative static mode for more than 2 hours with dual-frequency carrier-phase observations. Data Acquisition is the process of capturing and collecting GNSS data from the field where the ground control points (GCPs) have been established along the Pan Borneo Highway. Twenty-nine (29) GCPs were established in order to investigate the accuracy of the relative and PPP methods. All GCPs have been set up in open space areas to better satellite visibility and minimize the multipath effect. According to Tata et al. (2020), the duration of GNSS observations of more than 2 hours could enhance the quality of data collected for reliable results in an accurate sense.

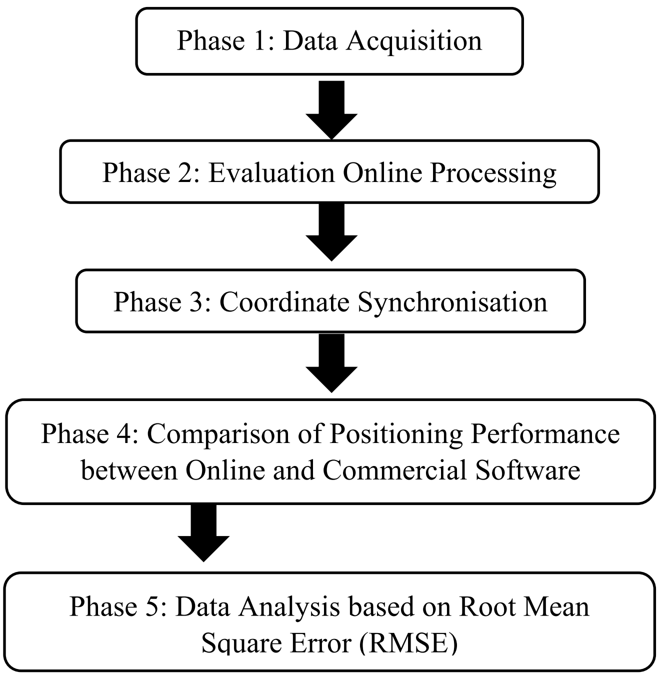

Fig. 1: The workflow of research methodology.

Once the data observations have been collected, the GPS raw data are converted into RINEX Version 3.02 by exporting all GCPs to the RINEX Converter as per the requirements of both online processing services. Two types of solutions approach to evaluate the online processing services: AUSPOS for a relative solution and CSRS-PPP method for PPP solution. Basically, the users send the RINEX files by uploading the files to the website, and then the estimated coordinates results will be resent back to the user via email. However, commercial software such as Trimble Business Center could be used as the benchmark of processing where the baseline networks were computed during data processing to obtain the final coordinates corrected from any errors. Note that the reference system in TBC has been mapped in ITRF2014 epoch 2010.0 in order to equivalent the reference frame of the online processing services for comparing the positioning accuracy.

Next, the estimated coordinates in the WGS84 (G1762) geodetic datum must be converted from the 3D geographical coordinate system (latitude ϕ, longitude λ, and ellipsoidal height h) into a 3D cartesian coordinate system (X, Y and Z) via online processing for synchronizing coordinate systems. Later, the 3D cartesian coordinate system was converted to the local topocentric coordinate (Easting, Northing and Up) to fix local points on the Earth surface via map projection. The coordinate conversion of topocentric coordinates was processed through Matlab software for both estimated coordinates in the online services as well as the final known coordinates in TBC software. Both online and commercial software of topocentric coordinates has calculated the differences for all components in Easting, Northing, and Up, as shown by Equation 1.

$$\text{Coordinate difference } (\Delta) = M' - M = (M_{estimated,i} - M_{known,i}) \quad (1)$$

where M is the known final coordinate from TBC and M' is the estimated coordinate from the online processing services.

Finally, the assessment of positioning performance of PPP and relative processing technique can be obtained through Root Mean Square Error (RMSE). RMSE is often used to measure the difference between observed values and known values from a different set of measurements. It indicates the measurement of accuracy differences relative to the known coordinates for the total number of stations. For instance, the differences between AUSPOS estimated coordinates and known coordinates in Easting had been defined as the square root of mean squared error over the total number of stations. Hence, the calculation of RMSE for Northing and Up should be applied the same formula as Easting as shown in Equation (2). The same procedures also were applied to CSRS-PPP for three areas to evaluate the precision coordinate. In order to identify the consistency of the positioning performance, the most probable values were calculated based on RMSE for AUSPOS and CSRS-PPP.

$$\text{RMSE Easting} = \sqrt{\frac{\sum_{i=1}^{n}(E_{estimated,i} - E_{known,i})^2}{n}} \quad (2)$$

where n is the total number of stations, $E_{estimated}$, $N_{estimated}$, $U_{estimated}$ are estimated local topocentric coordinates of station i from online processing services and E_{known}, N_{known}, U_{known} are processed known coordinates of the station i from commercial software (TBC).

3.0 RESULT AND DISCUSSION

In this study, the first objective is to evaluate the GNSS positioning precision level using online processing services and commercial software. Table 1 compares the estimated coordinates of AUSPOS relative solution and CSRS-PPP solution from the differences of known coordinates in TBC, which acts as the benchmark processing for the area in Area A. The results obtained from this study are that the coordinates of twelve (12) GCPs were compared to determine their relative discrepancies and accuracies based on the local topocentric coordinates by applying Equation (1). The RMSE were also calculated to measure the differences between two data sets. As shown in Table 1, the RMSE has smaller CSRS-PPP values: 2 cm of Easting, 5 cm of Northing and 9 cm of Up compared to AUSPOS, which is 11 cm of Easting, 5 cm of Northing and 11 cm of Up. This result indicates that CSRS-PPP has achieved better solution precision than AUSPOS. However, the Up component was almost a decimetre (approx. 9 cm), but the planimetric coordinates results were promising since it is suitable for engineering purposes. Finally, we remark that the position precision for Area B and Area C behaves similarly and thus is not shown for brevity.

Figure 2 presents the bar chart of the mean from a comparison between AUSPOS and CSRS-PPP in order to fulfil the second objective in this study. This showed the results of the mean obtained from Area A, Area B and Area C. Ideally, these GCPs have been tested to identify the consistency of the coordinates among three different sites of location in order to determine the changes of coordinates component. The results from AUSPOS obtained the highest RMSE in Easting that is 10 cm, followed by the Up component of 8 cm.

TABLE 1: Comparison between estimated coordinate of online services from differences of known coordinate in TBC.

Area A	**AUSPOS-TBC**			**CSRSPPP-TBC**		
ID	E (m)	N (m)	U (m)	E (m)	N (m)	U (m)
GCP1	0.053	0.028	0.091	0.005	0.014	0.048
GCP2	0.069	0.050	0.080	0.011	0.031	0.092
GCP3	0.105	0.050	0.062	0.018	0.037	0.097
GCP4	0.172	0.036	0.098	0.033	0.032	0.059
GCP5	0.103	0.024	0.034	0.008	0.015	0.039
GCP6	0.174	-0.076	-0.225	-0.025	0.061	0.169
GCP7	0.034	0.015	0.064	0.005	0.019	0.072
GCP8	0.111	0.048	0.140	0.028	0.035	0.110
GCP9	0.094	0.036	0.076	0.020	0.035	0.076
GCP10	0.094	0.079	0.082	0.045	0.076	0.079
GCP11	0.139	0.081	0.097	0.030	0.077	0.097
GCP12	0.080	0.070	0.079	0.015	0.068	0.075
RMSE	0.110	0.054	0.105	0.023	0.047	0.091

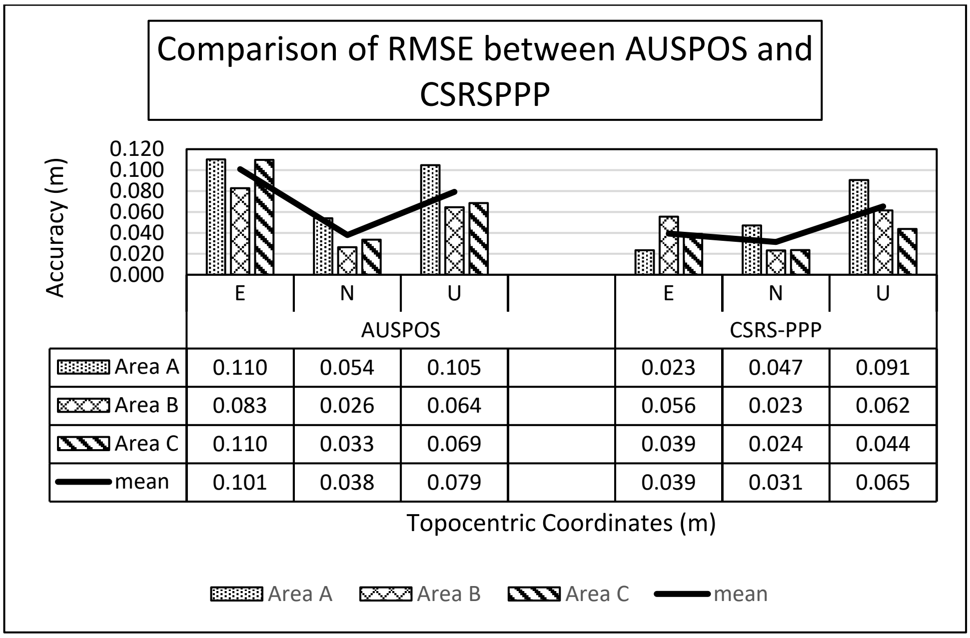

Fig. 2**:** Comparison of RMSE between AUSPOS and CSRSPPP.

It showed that Easting and Up components in AUSPOS have proved that the long baseline length has worsened the AUSPOS position precision as the reference station selections with more than 1,000 km baseline from Australia. Moreover, AUSPOS relies on the station-dependent estimated processing parameter, and these can be attributed to the 14 International GNSS Service (IGS) reference stations used in processing the data located in Australia (Tata et al., 2020). On the other hand, CSRS-PPP results showed better results than AUSPOS, which employed a PPP solution approach with the calculated RMSE of 4 cm Easting, 3 cm Northing and 7 cm Up component. In this case, CSRS-PPP used global processing parameters to resolve the ambiguity and requires corrections to reduce the satellite orbit and clock errors to determine precision coordinates. Since it requires a single receiver, the baseline GNSS processing is not required to generate the network GNSS coordinates. So, the observed points are only derived relative to the satellites but not relative to a reference station (Jamieson and Gillins, 2018).

4.0 CONCLUSION

GNSS online post-processing data has become popular nowadays as it is free and makes it easy for users to obtain the estimated coordinates results. All usage of online services is very straightforward, and the users can save time and be cost-effective. As the study is expected to determine how reliable the online services for GPS users obtain the high accuracy of coordinate in GNSS post-processing, the results have been achieved in cm to dm level accuracy with only a single receiver for all GCPs in this study. Furthermore, the duration of observations must be at least 2 hours to obtain high precision coordinates. This shows the benefits of online processing services such as AUSPOS relative positioning and CSRS-PPP, which is available for global use, especially in engineering applications. Theoretically, relative positioning has better accuracy than the PPP solution. However, in this case, the PPP solution has achieved better than the relative solution without requiring data from any reference stations for simultaneous observation. Hence, AUSPOS relative positioning is not recommended in Malaysia in terms of high precision due to a limited number of reference stations in the SEA region. However, both online services are able to produce final coordinates at the accuracy of a few centimetres to decimetres which can be applied in engineering applications such as construction works, setting out the alignment and as-built surveys jobs.

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UPIN AND IPIN: THE IMPACT OF USING ANIMATION CHARACTERS IN BRAND ELEMENTS, BRAND ADVERTISING AND BRAND AWARENESS

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ABSTRACT

Upin and Ipin successfully attracted many children to watch it until the Upin and Ipin characters became a medium for product advertising and were used as a medium to convey public awareness. Many companies now use Upin and Ipin animated as a medium to promote their products, such as SGM milk, Terlajak Laris, Colgate, Hong Leong Islamic bank, Mamee Monster, and Telekom Malaysia. This study was conducted to study the relationship between animated characters and the purchase intention. The researcher wants to study the effects of using animated characters in brand elements, brand advertising, and brand awareness. The researcher uses quantitative data to obtain the data. 150 youngsters are being chosen to answer the questionnaire. The result was interpreted by using correlation and multiple regression to study the relationship between animated characters in brand elements, brand awareness, and brand advertising with youngster's purchase intention. The result shows that brand elements, brand advertising, and brand awareness have a positive relationship with young purchase intention.

Keywords: brand advertising, brand elements, brand awareness, animation characters, purchase intention

1.0 INTRODUCTION

The famous Malaysian television series Upin & Ipin is a computer-animated produced by Les' Copaque Production that depicts the life and journeys of the twin brothers in a village environment. On September 13, 2007, Upin & Ipin's first episode was launched on Malaysia's private television channel TV9, which contains eight-episodes that tell stories about Ramadan/Eid specials to promote the importance of the Islamic holy month, particularly among children. Upin and Ipin were also broadcast on Disney Channel Asia and can be counted as the most successful computer 3D animated television series in Malaysia. Upin and Ipin are only broadcast on television for 5 minutes per episode. Upin is the more outspoken of the two brothers, while Ipin is the quieter of the two.Upin often becomes the mastermind behind the twins' mischievous antics. A hair on the top of his head distinguishes him. Ipin is Upin's little brother. Ipin is slightly quieter than her brother, Upin. His trademark is his tendency to always say "Betul, Betul, Betul" or in English, "True, True, True" three times.

The utilisation of motion elicits an emotional feeling. improving product visualisation so it can be clearer and attract customers' attention [1] In this context, animation is considered one of the design tools for advertisers because it can motivate consumer actions, behaviours, and attitudes and attract viewer attention to that product. Previous studies have shown that animated characters in advertising can greatly impact the effectiveness of TV commercials by raising viewers' interest and influencing their attitudes toward the brand advertised

The aim of this paper to study the effect of using animation characters in brand elements, brand advertising and brand awareness. This research focuses on Malaysia youngsters because youngster is referred to as a unique segment for certain specific items. Second, throughout the time of development from childhood to early adulthood, each of these client categories exhibits distinct consumer behaviours and attitudes [2] Third, juveniles have an impact on their families and influence their purchasing behaviour; finally, young consumers have the potential to influence and transform culture and society [3]

2.0 LITERATURE REVIEW

2.1 PURCHASE INTENTION

Purchasing intention is defined as a consumer's perceived demand for a product, which involves a customer's attitude and external characteristics related to the product or brand and which can predict the future behavior. "Purchase intention" relates to a consumer's willingness to pay for a product [4]. Consumers will have the intention to buy when they analyze the product brand and get trust in it in dealing with external stimuli.

2.2 BRAND ELEMENTS

The brand elements of a company or organisation are the physical characteristics that contribute to the visual and aural identification of the brand; for example, a logo, symbol, design, word mark, packaging or any other graphic that quickly recognises the product These characteristics are crucial for product distinctiveness and consumer engagement, which may have a detrimental influence on an organization's brand identity if not handled appropriately [5] However, brand elements are an organization's assets that must be protected in the promise given to consumers to sustainably increase customer loyalty.

2.2.1 Packaging

The widespread usage of anthropomorphic themes on packaging corresponds to consumers' proclivity for human analogies [6]. Individuals are more likely to intuitively anthropomorphize objects with humanlike facial traits, such as eyes or mouths [7] While previous studies have concentrated on consumer impressions of objects with humanlike facial characteristics [8]

H1: Animation characters in packaging has significant relationship with youngster’s purchase intention.

2.2.2 Logo

If creating social interactions with animate objects may make individuals feel less lonely, it can also help them feel more in control of their surroundings [8] From this vantage point, businesses are employed to satiate social needs not through their perceived warmth, but rather a need for control through their perceived capacity to assist customers in accomplishing tasks and achieving desired results. Thus, brand anthropomorphism may motivate purchase based on the brand's potential utility, thereby creating hierarchical consumer brand connections and endowing customers with a position of power over the brand [9]

H2: Animation characters in logo has significant relationship with youngster’s purchase intention.

2.3 BRAND ADVERTISING

Researchers discovered that advertising through media have been most popular, and many people prefer television ads, thus it is an effective medium to market the products such as cosmetics and FMCG [10]. The use of animated graphics, scenes, and characters to promote can bring attention to the advertising and the most crucial component is the advertising must use creative approach. Even though advertisers of customer high-involvement brands have long used animated characters as the celebrities of their ads [11] The persuasive power of anthropomorphism should be used to persuade product personality [12]

H3: Animation characters in brand advertising has significant relationship with youngster’s purchase intention.

2.4 BRAND AWARENESS

Brand awareness is defined as the acts, values, qualities, uniqueness, taste, and image of products and services. Most purchasers prefer to buy high-quality items that satisfy their needs, and brand knowledge might have a significant encouraging customers' buying intentions [13] This indicated that not all advertised brands achieve consumer awareness, trustworthiness, and value, and they do not guarantee clients' intent to buy [14] The previous research revealed that, brand advertising may impact a customer’s choice or purchase the product or service for the first time, which might influence the customer's want to continue or discontinuous usage of the product depending on the customer's satisfaction towards the product [15]

2.5 RESEARCH FRAMEWORK MODEL

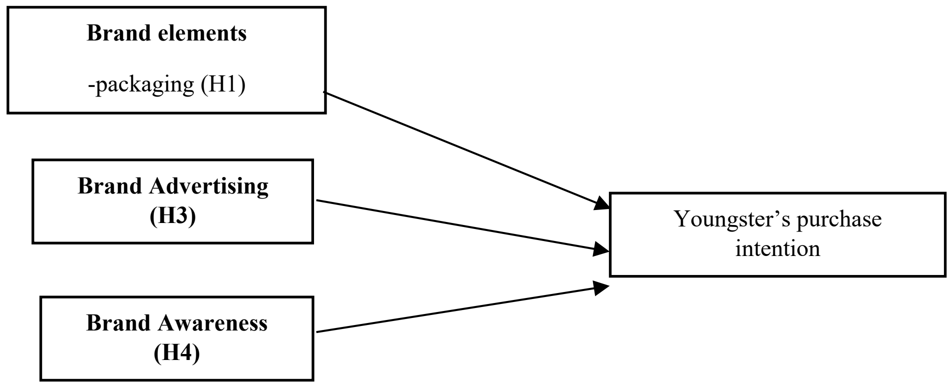

Fig. 1: Research framework for the effect of using animation characters in brand elements, brand advertising and brand awareness.

3.1 RESEARCH DESIGN

When choosing a research strategy, it is critical to evaluate the research question and the goal of the study. The approach must reflect the question. There are several research strategies that may be appropriate for this quantitative research: study and archive research (Saunders et al., 2009). These study designs are also linked to various research techniques (ibid). Due to a lack of information on the topic on which this study was based, archival research was excluded. There was insufficient information available for this article the uses of animation characters in brand elements, brand advertising, and brand awareness on youngsters' purchase intention. Therefore, surveys are the best research for this topic.

3.2 POPULATION AND SAMPLING

This research was targeted at youth people aged 15 until 25 years old who live in Malaysia. From the survey, researcher obtains 166 respondents and only accept 150 respondents or 90% of response rate.

3.3 RESEARCH INSTRUMENT

The survey questionnaire is consisted of three parts. The questionnaire has 3 sections, which is part A, B, C, D and E. Part A consists of seven simple questions about the respondent's information (age, gender, education, race). Part B contains 6 questions about the relationship between animation characters and purchase intention. Part C contains 5 brand elements questions. Part D contain 6 questions about brand awareness and Part E contain 3 questions about b. Likert scale been used to determine the strength of the answer contain with levels of agreement from 1 (strongly disagree) to 5 (strongly agree) Considering the amount and the nature of data for this research it is necessary to use statistical tools. The researcher also uses correlation and multiple regression

4.0 DATA ANALYSIS

4.1 Profile of Respondents

TABLE 1.0: Summary of Respondent's Demographic Profile

Characteristics		Frequency	Percentage(%)
Gender	Female	114	76
	Male	36	24
Race	Chinese	27	18
	Indian	2	1.3
	Malay	117	78
	Others	4	2.7
Highest Qualification	Degree	15	10
	Diploma	16	11
	Master's Degree	1	0.7
	STPM/Matriculation/Foundation	118	78.3
Current Employment Status	Full-time employment	15	10
	Part-time employment	4	2.7
	Self-employed	4	2.7
	Student	116	77.3
	Unemployed	11	7.3
Income	Less than RM1000	129	86
	RM1001-RM2000	12	8
	RM2001-RM3000	6	4
	More than RM4001	3	2
Martial Statue	Single	135	90
	Married	3	2
	Don't want to say	12	8

There are 150 respondents answer the questionnaire and 24 % was man and 76 % was women. Next, marital status category shows about 90% respondents are single. 2% of respondents were married and 8% of respondents choose to not says their status. Most of Education profiles are coming from matriculation, foundation, and STPM education background with 78.3%, followed by Diploma 16%, Degree 6%, and master's degree 0.7%. The occupation result of respondents shows that 77.3% of respondents are still studying, 10% of them are full employment, 7.3% unemployment and 2.7% of them are part-time employment and self-employed. Lastly, the monthly income of respondents' rate was less than RM1000 monthly with 86%, followed by 8% of them income from RM1000-RM2000, RM2000-RM3000 were 4% and above RM4000 was 2%..

4.2 Correlation Analysis

TABLE 3.0: summery of correlation between animation characters in brand elements, brand advertising and brand awareness.

		Purchase Intention	Product packaging	Brand Logo	Brand advertising	Brand awareness
Purchase Intention	**Pearson correlation**	1	0.497	0.345	0.449	0.235
	Sig (2-tailed)		0.000	0.000	0.000	0.004
	N	150	150	150	150	150
Product packaging	**Pearson correlation**	0.497	1	0.448	0.533	0.212
	Sig.	0.000		0.000	0.000	0.009

	(2-tailed)					
	N	150	150	150	150	150
Brand Logo	**Pearson correlation**	0.345	0.448	1	0.515	0.356
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	N	150	150	150	150	150
Brand advertisement	**Pearson correlation**	0.449	0.448	0.515	1	0.356
	Sig (2-tailed)	0.000	0.000	0.000	0.000	0.000
	N	150	150	150	150	150
Brand awareness	**Pearson correlation**	0.235	0.400	0.436	0.356	1
	Sig (2-tailed)	0.004	0.000	0.000	0.000	0.000

**. Correlation is significant at the 0.01 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

A Pearson correlation coefficient was computed by using SPSS to determine the relationship between brand elements, brand advertising and brand awareness.

Firstly, the results indicate Moderate positive relationship between purchase intention and animation characters in product packaging among the youngsters [r(150) = 0.497, p = 0.000].].The relationship between purchase intention and animation characters in the brand logo shows low positive relationship [r(150)=0.345,p=0.000].The relationship between purchase intention and animation characters in brand advertising shows moderate positive relationship [r(150) = 0.449, p = 0.000]. Brand Awareness and purchase intention shows low positive relationship [r(150)=0.235,p=0.004].

5.0 DISCUSSION

From the result, it indicates Moderate positive relationship between purchase intention and brand elements in packaging [r(150) = 0.497, p = 0.000]. .The relationship between purchase intention and animation characters in brand elements (logo) is positive low [r(150)=0.345,p=0.000].The relationship between purchase intention and brand advertising shows moderate positive relationship [r(150) = 0.449, p = 0.000]. Brand Awareness and purchase intention shows low positive relationship [r(150)=0.235,p=0.004. From this result, we can conclude the use of animation characters in brand elements, brand advertising and brand awareness can increase youngsters purchase intention. From the previous literature review, we can conclude that all the result are right. In conclusion, we failed to reject the hypothesis when we use animation characters in brand elements, brand advertising and brand awareness can influence youngster purchase intention.

6.0 LIMITATION

Firstly, the sampling technique used, convenience sampling, has some reliability and validity limitations, and future researchers may employ a various sample frame and a different target population using non-biased probability sampling techniques such as simple random sampling or stratified random sampling. Additionally, the paper focused only on three factors: brand elements, brand liking, and brand preference on purchase intention. Additionally, future studies should examine brand attachment, brand trust, brand loyalty, and brand familiarity as possible predictors of consumers' purchase intention.

Additionally, the results are using small sample with only 150 respondents, making it impossible to simplify the findings to other customers in other regions. Other researchers may choose to use amplification of sample sizes to get more representative viewpoints. Additionally, this work used a quantitative approach maybe the future research can use mixed method approach, such as in-depth consumer perspectives

7.0 CONCLUSION

In conclusion, the aspects such as brand advertising, brand awareness, and brand element are crucial in encouraging young people's buying intentions. The report also confirms that when uses animated characters in brand elements, brand advertising and brand awareness can increase youngster purchase intention. In practise, since the use of animated characters in brand advertising, brand recognition, and brand element have a favourable impact on youngsters. Animation characters in brand elements, brands advertising and brand awareness can attract attention to adults' people not only to children. Brand advertising may be enhanced by informing consumers about the advantages of the brand through television, social media, and newspapers. Brand awareness may be increased via banner, and brand element can be increased by uses more attractive logos and packaging.

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VALIDITY AND RELIABILITY OF THE INSTRUMENT OF LEVEL OF AWARENESS AND HEALTHY EATING PRACTICE AMONG STUDENTS OF THE BACHELOR OF SCHOOL OF EDUCATION (ISMP), UNIVERSITY OF TECHNOLOGY MALAYSIA (UTM) DURING THE COVID-19 PANDEMIC

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ABSTRACT

Healthy eating is an important practice in daily life. This study was conducted to obtain the content validity and reliability of the questionnaire on the study entitled the level of awareness and healthy eating practices among students of the Bachelor of School of Education (ISMP), Universiti Teknologi Malaysia during the Covid-19 pandemic. The study involved 15 respondents consisting of male and female students from three study programs namely Sports Science, Tesl and Life Skills from year 1 to year 4. The questionnaire form was developed through a content validation process through two experts in Sports Science. Researchers have refined the items of the questionnaire before distributing them to the study sample to answer through electronic media. The Cronbach's Alpha value to test the level of reliability of each item of the questionnaire for this study was implemented through the Statistical Package for Social Science (SPSS) version 27.0 and the value obtained was 0.876 for the entire item. Due to its value of more than 0.60 the questionnaire items as a whole have a high reliability value and can be used in actual studies and will be distributed to ISMP students to identify the level of awareness and healthy eating practices during the Covid-19 Pandemic.

Keywords: Level, Awareness, Practice, Nutrition, ISMP Students

1.0 INTRODUCTION

Every university student should have a positive mind and strive to do something worthwhile in daily practice. Practice carries the meaning of a good deed as a habit (Kamus Dewan Bahasa Fourth Edition, 2017). Practices or behaviors that are often performed by everyone determine life now and beyond. A life full of good things will allow students to live an actual life, always having a smart brain to think in a clear and useful direction to awaken a proactive and experienced person.

Consciousness is defined as realization or a sense of remorse to each person to do a good thing (Dictionary of Language Board Fourth Edition, 2017). This awareness can be defined as the realization to an individual who has the understanding in themselves to only practice things that bring good for themselves and those around them. By having a high self -awareness, they will keep their hands away from doing bad deeds so as to burden themselves i.e. their body. In Malaysia, various campaigns involving a healthy diet are initiated by health agencies to reduce the intake of unhealthy foods that can be detrimental to the health of the body. We must emphasize that the Malaysian society forms and generates capital, people who are always mature and positive so that peace and harmony of the country is guaranteed, for example, awareness of healthy eating. In general, everyone should adopt a healthy diet to maintain the health of the individual throughout life.

A healthy diet includes various elements such as intake according to a prescribed food pyramid, intake of supplements and selection of a balanced diet. This is very important for the formation and production of excellent human capital. An important element of a healthy diet is the intake of food according to the food pyramid as well as the intake of supplements recommended by nutritionists.

As stated by (Murthy et al., 2019) the selection of foods that meet the needs of the body is very important because it can complete the necessary nutrients and can increase the body's immunity as a protector or stimulant to the body system. Therefore, by adopting a healthy diet according to the food pyramid can reduce weight problems or obesity problems that are very popular among Malaysians. However, the level of awareness and practice of healthy eating is an objective that is difficult to achieve by students during the Covid Pandemic 19. As all Malaysians know, the Covid-19 Pandemic is still a global crisis since the World Health Organization (WHO) named it as a pandemic with a dangerous threat on March 11, 2020. According to, (Tajudin et al., 2021), a total of 147,211,802 cases were recorded with 3,110,124 deaths as of 25 April 2021. The total number of Covid-19 vaccine injections given was 1,025,601,967. Based on Google News in 2021, Malaysia recorded a total of 392,942 infections and 1,436 deaths. Malaysia is taking movement control measures, ongoing campaigns to adopt new norms, economic stimulus packages and so on like other countries to protect the well -being of the people.

Based on Che Suhaili, (2020) due to the Covid-19 pandemic, the closure of food stores caused some people to lose their source of income. This is because, the employer cannot afford to pay the employee's salary. Findings from a brief survey through social media found that many are starting to make food businesses online. This is because the capital required is lower and the skills of preparing food are already available compared to other businesses. The service also provides home delivery service. This trend has become one of the new norms that have emerged as a result of the Covid-19 Pandemic and also this PKP.

However, as stated by (Damanhuri et al. 2021) in the budget era of the Industrial Revolution 4.0, it is found that 3.3 million adolescents are obese in Malaysia (Ministry of Health Malaysia, 2018). This revelation gives a great blow showing a large number of adolescents in Malaysia are inactive and have high levels of morbidity. This number is too large and could have a negative impact on the future of the country if not taken seriously. 3.3 million teenagers compared to 32.8 million people show a number that should not be taken lightly. The issue of obesity is closely related to the level of awareness of an individual's daily healthy eating practices. With the practice of healthy eating habits and increased physical activity, the individual will become healthier and more competitive in society.

Healthy eating practices are an important indicator in the lives of students and can affect a person's health. At this age, students need enough nutrients and energy to practice an active routine. A healthy and balanced diet can meet the energy and nutritional needs of a teenager. Eating style can affect a student's level of activity and physical fitness. This is closely related to the formation of the student's lifestyle pattern.

2.0 RESEARCH METHOD

The purpose of this research is to identify the level of awareness and healthy eating practices among Bachelor's Degree Students School of Education (ISMP), UTM through aspects of nutritional practices based on knowledge and nutritional practices during the Covid-19 Pandemic. In order to conduct this study regularly, it is necessary to be given an explanation of how the data are obtained, collected and analyzed to obtain accurate results.

2.1 Procedure

The study involved 15 respondents consisting of male and female students from three study programs namely Sports Science, Tesl and Life Skills from year 1 to year 4. The questionnaire form was developed through a content validation process through two experts in Sports Science. Researchers have refined the items of the questionnaire before distributing them to the study sample to answer through electronic media. In addition, the researcher will also provide online information about the study being conducted so that respondents better understand the purpose of the study. Finally, data were analyzed using Cronbach's Alpha reliability test.

2.2 RESULT AND DISCUSSION

Cronbach's Alpha	No of Items
0.876	20

Fig. 1: Reliability statistics of items

Therefore, from the results of the pilot study conducted, the value of the alpha coefficient to test the level of reliability for the pilot study that has been implemented is obtained from the Statistical Package for Social

Science (SPSS) version 27.0 which is 0.876. Due to the value of more than 0.60, the items of the questionnaire were not repaired and corrected but the researcher has changed the sentence order of some questions so that the items are more detailed and easily understood by the respondents and the data received is more accurate.

3.0 CONCLUSION

Based on the Cronbach's Alpha value to test the level of reliability of each item of the questionnaire for this study was implemented through the Statistical Package for Social Science (SPSS) version 27.0 and the value obtained was 0.876 for the entire item. Due to its value of more than 0.60 the questionnaire items as a whole have a high reliability value and can be used in actual studies and will be distributed to ISMP students to identify the level of awareness and healthy eating practices during the Covid-19 Pandemic.

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RELIABILITY OF INSTRUMENT TO MEASURE THE FINANCIAL LITERACY OF STUDENT-ATHLETES RECEIVING FINANCIAL SPONSORSHIP

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ABSTRACT

Financial literacy is an important knowledge in making financial -related decisions for daily life. Every individual including student-athletes need to have good financial literacy knowledge to achieve financial stability. This study aimed to analyze the reliability of the questionnaire related to the level of financial literacy among students-athletes who received financial sponsorship either in the form of scholarship or financial loan. The sample of this study involved 30 respondents consisting of students of Bachelor of Science with Education (Sports Science). The constructed questionnaire was modified based on the results of content analysis from literature review. The questionnaire had also been validated by an expert. The collected study data were analyzed using Statistical Package for the Social (SPSS) software. The reliability of the items using Cronbach's Alpha was α = 0.88. This Cronbach's Alpha value indicated that the questionnaire instrument had high reliability and was in good condition and effective with a high level of consistency. Therefore, this questionnaire instrument could be used to study the level of financial literacy among students-athletes receiving financial sponsorship.

Keywords: Financial Literacy, Student-athletes, Financial Sponsorship, Scholarships, Loans

1.0 INTRODUCTION

Financial literacy is an important knowledge that everyone needs to learn including young people who are still learning to be free from serious financial problems. Financial literacy is a depth of individual understanding towards financial concepts, ability and confidence to manage personal finances through appropriate financial planning in mindful of life events and changing economic (Remund, 2010; McCoy, White, & Love, 2019). Knowledge is needed for any individuals in regards to financial matter in making decisions about daily, ways to handling financial challenges (Nurul Alya Adillah et al., 2009) and manage money properly (McCoy, White, & Love, 2019). Knowledge in finance is essential for every individual to be aware of their financial status.

Financial well-being is a state of feeling financially healthy, happy, and worry-free (McCoy, White, & Love, 2019) resulting from one's ability to sustain current and anticipated desired future living standard (Bruggen et al., 2017, (McCoy, White, & Love, 2019). Failure to plan financially in life can potentially lead to the risk of bankruptcy. Bankruptcy is a situational risk that needs to be avoided seriously as being in that status will bind any individual with various financial problems.

For athletes with shorter career life, they are responsibled for managing their money wisely (Danowski, 2012). After the end of athletic career, retirement will come shortly after regardless of if it is compulsorily, by choice, or due to injury factor. The impacts that will be faced by retirees are to adjust to a new lifestyle after retirement and finances especially if no thorough planning is done (Ismail & Vellymalay, 2016).

Student-athletes are different from the professional athletes. They are students who are also athletes that have their sport-related activities such as practicing every day, visiting the athletic trainer for injury treatment, traveling for away games, studying team plays (Watt, & Moore III, 2001) that take place at the same time on a full-time basis. Most student-athletes obtain incentives in the form of money from any organization or institution as encouragement to continue playing sports and to make proud of their institute and the country.

Student-athletes are full-time students who are not exempted from financial problems. Therefore, they need to plan the use of incentives received from various sources including scholarships before using them for any particular purpose. The question was do these student-athletes were equipped with sufficient financial literacy knowledge in making effective financial decision? Thus, this study aimed to examine the reliability of the questionnaire on the level of financial literacy among student-athletes. Awareness on financial literacy and related financial knowledge will assist student-athletes in preparing themselves for life after graduation.

2.0 RESEARCH METHOD

This study aimed to examine the level of financial literacy among student-athletes receiving sponsorship finance either scholarships or financial loans. To conduct this study, it was necessary to provide an explanation of how data were obtained, collected and analyzed to obtain accurate results.

2.1 Procedure

The sample involved in this pilot study was 30 respondents consisting of students of Bachelor of Science with Education (Sports Science). The constructed questionnaire was modified based on the results of content analysis from literature review. The constructed questionnaire went through a process of validity and reliability. For the validation process, this questionnaire had been validated by an expert. Researchers had examined the study planning to ensure that the study went smoothly. Questionnaire was built using Google Form and distributed by researchers using WhatsApp and Gmail application The researcher also ensured that the selected respondents were in accordance with the appropriateness of the study title. Respondents were required to answer the questionnaire honestly to avoid errors in the data. Finally, the collected study data were analyzed using Statistical Package for the Social (SPSS) software to obtain Cronbach's Alpha reliability values.

2.2 Result And Discussion

Cronbach's Alpha	N of Items
.768	20
B19: *"Kita tidak sepatutnya meminjam wang untuk melabur"*	
Cronbach's alpha if item deleted : 0.787	
B20: *"Pemilikan kad kredit meningkatkan kuasa beli seseorang"*	
Cronbach's alpha if item deleted : 0.772	

Fig. 1: Financial knowledge items reliability result

Based on the analysis of reliability data for the financial knowledge, the value obtained was 0.768. Based on the item-total statistics analysis for the financial knowledge category, it could be seen that items B19 and B20 were less effective. This was because if this item was discarded, the Cronbach's Alpha value would increase even higher. However, this item could still be used because the Cronbach's Alpha value for these 20 items was still high.

Cronbach's Alpha	N of Items
.885	20
C12: *"Saya meminjam wang daripada rakan untuk menampung keperluan harian"*	
Cronbach's alpha if item deleted : 0.900	

Fig. 2: Financial behavior items reliability result

Based on the analysis of reliability data for financial behavior, the value obtained is 0.885. Based on the item-total statistics analysis for the financial behavior category, it could be seen that item C12 was a poor item. This was because if this item was discarded, the Cronbach's Alpha value would increase to 0.900. However, this item could still be used because the Cronbach's Alpha value for these 20 items was still high.

Cronbach's Alpha	N of Items
.649	20
D2: *"Saya lebih mementingkan keperluan masa kini dan bukan masa depan"*	
Cronbach's alpha if item deleted : 0.699	

Fig. 3: Financial attitude items reliability result

Based on the analysis of reliability data for financial attitudes, the value obtained is 0.649. Based on the item-total statistics analysis for financial attitudes, it could be seen that item D2 was also a poor item. This was because if this item was discarded, the Cronbach's Alpha value increases to 0.699. However, this item could still be used because the Cronbach's Alpha value for these 20 items was still high.

Cronbach's Alpha	N of Items
.890	60

Fig. 4: Financial literacy instruments reliability result

Overall, the Cronbach's alpha value for the financial literacy instrument was 0.890. This indicated that 60 items in this questionnaire were acceptable and achieved high reliability values.

3.0 CONCLUSION

This Cronbach's Alpha result indicated that the questionnaire instrument had high reliability value and was in good condition and effective with a high level of consistency. Therefore, the financial literacy item in this questionnaire instrument could be used to investigate the financial literacy level of student-athletes who receive financial sponsorship during their undergraduate study.

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ANXIETY LEVEL FOR FACE-TO-FACE AND BLENDED LEARNING SESSIONS DURING TEACHING TRAINING PRACTICUM IN SCHOOL: A PILOT STUDY FOR INSTRUMENT RELIABILITY

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ABSTRACT

This study was to examine the reliability of the questionnaire on the level of anxiety of trainee teachers during teaching training courses and implementing face-to-face and blended Teaching and Learning (PdP) sessions during the Covid-19 pandemic. The study sample involved 10 respondents consisting of students of Bachelor of Science with Education (Sports Science). The instrument was modified from the Beck Anxiety Inventory (BAI). This instrument has also been validated by two experts. The collected data will be analyzed using Cronbach's Alpha reliability tests. The results of the study found that the item reliability value for face-to-face teaching type respondents was 0.96 while the item for blended learning type respondents was 0.93. Based on the Cronbach's Alpha value, it is good and shows that each item has a high reliability value. Therefore, this modified questionnaire instrument is suitable and can be used to study the level of anxiety of trainee teachers during teaching training courses and implement face-to-face and blended Teaching and Learning (PdP) sessions during future Covid-19 pandemics in schools.

Keywords: Blended Learning, Face-to-face, Anxiety, Trainee Teacher, Teaching Practice

1.0 INTRODUCTION

Teaching practice is categorized as “Professional practice” in the curriculum teaching based on the aspirations and goals of the National Philosophy of Education, Philosophy Teacher Education, vision and mission of the Ministry of Education Malaysia (MOE) and the Institute Malaysian Teacher Education (Abdullah & Dhamodarem, 2020). Therefore, each education graduate has to go through teaching training as a preparation before working as a real teacher at school later on. These trainee teachers need to ensure that they are prepared in all educational related courses such as pedagogy, psychology, teaching methods, micro-teaching and many more to help them deliver excellent performance during the training practicum. Berita Harian (2020) reported that there were three contagious positive Covid-19 cases in Selangor and Sabah on 23 January 2020. In this regard, the Ministry of Education Malaysia (2020) has issued a media statement about the implementation of teaching and learning during the Movement Control Order (MCO) to show commitment in ensuring that school students will not be left behind. For this purpose, teachers are not allowed to go to school and shall perform all tasks from home using online medium (Ministry of Education, 2020).

Due to the spread of Covid-19 virus, not only public and private servants are affected but also students who want to undertake industrial training including teaching practicums (Halim, 2021). Many studies have shown that trainee teachers are stressed during teaching training (Abdullah & Dhamodarem, 2020). Management and administrators either in schools or faculties need to be more of trainee teachers welfare who undergo teaching training especially their mental status during teaching practicum (Abdullah & Dhamodarem, 2020). According to the Djawamara (2021), teaching practicum is one of the contributors to the stress disorder among trainee teachers. Furthermore, when these trainee teachers are under pressure, it will affect their performances and achievement. In addition, learning using online medium also set few drawbacks where trainee teachers only spend time with students remotely and rarely with other fellow teachers which also demotivates them(Djawamara, 2021). Thus, it is important to study the mental health issue regarding these matter and as a starter, this study will conduct a reliability test on the questionnaire used to measure level of anxiety among trainee teachers during the teaching practicum. The questionnaire also will compare the level of anxiety between face-to-face and blended teaching and learning (PdP) sessions during the Covid-19 pandemic.

2.0 RESEARCH METHOD

The purpose of this study was to conduct a reliability test on the questionnaire used to measure level of anxiety among trainee teachers during the teaching practicum. The questionnaire also will compare the level of anxiety between face-to-face and blended teaching and learning (PdP) sessions during the Covid-19 pandemic.

2.1 Procedure

The sample involved in this pilot study was 10 students from School of Education, UTM. The questionnaire was constructed and modified based on the Beck Anxiety Inventory (BAI). The constructed questionnaire form went through a process of validity and reliability and received validation approval from 2 experts in the related field. Next, the questionnaire form has been distributed through Whatsapp application to all of the samples. In addition, the researcher provided online information in the google form about details of the study being to help respondents understand better about the nature of the study. At the end, data collected were analyzed using Cronbach's Alpha reliability test in the SPSS software.

2.2 RESULT AND DISCUSSION

Figure 1 illustrated the face to face teaching and learning reliability result. Based on the analysis of reliability data for the face -to -face teaching and learning category, the value obtained is 0.96.

<table>
<tr><td>Cronbach's Alpha</td><td>Cronbach's Alpha Based on Standardized Items</td><td>N of items</td></tr>
<tr><td>.960</td><td>.962</td><td>21</td></tr>
<tr><td colspan="3">B1 : "Saya berasa kebas semasa bersiap sedia sebelum masuk ke kelas"</td></tr>
<tr><td colspan="3">Cronbach's alpha if item deleted : 0.953</td></tr>
</table>

Fig. 1: Face to face teaching and learning reliability result

According to the 21 items in the questionnaire, it is considered acceptable and achieves a high reliability value. Based on the item-total statistic analysis, for the face-to-face teaching and learning category, item B1 is seen to be an effective item where if it is removed from the questionnaire then the Cronbach's alpha value is lower. Thus, BI items are good items to conduct the research.

Figure 2 shows the blended teaching and learning reliability result. Based on the analysis of reliability data for the blended teaching and learning, the value obtained is 0.93.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of items
.939	.962	21
C18 : *"Saya sentiasa berasa kejang di perut sekiranya terlalu takut semasa mengajar"*		
Cronbach's alpha if item deleted : 0.929		

Fig. 2: Blended teaching and learning reliability result

According to the 21 items in the questionnaire, it is considered acceptable and achieves a high reliability value. Based on the item-total statistic analysis, for the blended teaching learning category, item C18 is seen to be an effective item where if it is removed from the questionnaire then the Cronbach's alpha value is lower. Thus, C18 items are good items to be used in the research.

3.0 CONCLUSION

Overall findings have shown that all items in the modified questionnaire are good and shows that each item obtains a high reliability value. Therefore, this modified questionnaire instrument is suitable and can be used to analyse the level of anxiety among trainee teachers during teaching training practicum and also could be used to compare between face-to-face and blended teaching and learning sessions during the Covid-19 pandemic in schools.

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PILOT TEST OF PROTOKOL INTERVENSI CETUSAN KELETIHAN (PICK)

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ABSTRACT

The Protokol Intervensi Cetusan Keletihan (PICK) was developed to trigger fatigue among tennis players through movement in various directions at the maximum performance level repeatedly until maximum fatigue (volitional fatigue) is reached. The validity of the protocol was obtained through feedback from field experts consisting of sports researchers and full -time tennis coaches. To obtain the reliability of the protocol, five subjects consisting of university students-athletes were involved. All subjects had to undergo 2 sessions of PICK protocol implementation which were implemented on tennis courts on different days. Subjects heart rate (HR) were recorded throughout the implementation session. The findings of the study found that the mean heart rates of the subjects for both sessions were 124.4 ± 17.4 bpm and 121.6 ± 23.9 bpm. The Test-Retest method was used to obtain the reliability values of the protocol. The results of reliability analysis found that the Cronbach's Alpha value based on the mean heart rate was 0.961 ($p < 0.01$). These findings suggest that repeated implementation of the PICK protocol can produce a nearly identical heart rate response. Therefore, the PICK protocol developed is suitable for the purpose of triggering fatigue in tennis players and can be used to study the effect of fatigue on the performance of tennis skills.

Keywords: Fatigue, Protocol, Reliability, Heart Rate

1.0 Introduction

Tennis is a sport that depends on the technical skills of the players. However, physical factors also play an important role in ensuring that player performance is at its best (Fernandez-Fernandez et al., 2014). For competitive tennis players, among the physical abilities that need to be possessed are speed, agility, efficiency as well as good aerobic and anaerobic ability (Kovacs, 2007).

In addition, Kovacs (2007) also stated that sports can last more than 5 hours. Martin et al. (2016) meanwhile stated that the average duration of a tennis competition is between 1 to 2 hours, however there are also some match situations that can lead to 3 to 6 hours. As for the ‘Grand Slam’ tournament, Martin et al. (2016) explained that the average for a 5 -set competition duration was between 137 and 154 minutes.

2.0 Research Method

The Protokol Intervensi Cetusan Keletihan (PICK) aims to trigger fatigue among tennis players through movement in various directions at the maximum performance level repeatedly until it reaches volitional fatigue.

2.1 Procedure

The implementation of the pilot study includes two main stages, namely the development stage of the PICK protocol and the stage of validity and reliability testing of the protocol. An overview of the implementation of the pilot study is as shown in the flow chart below.

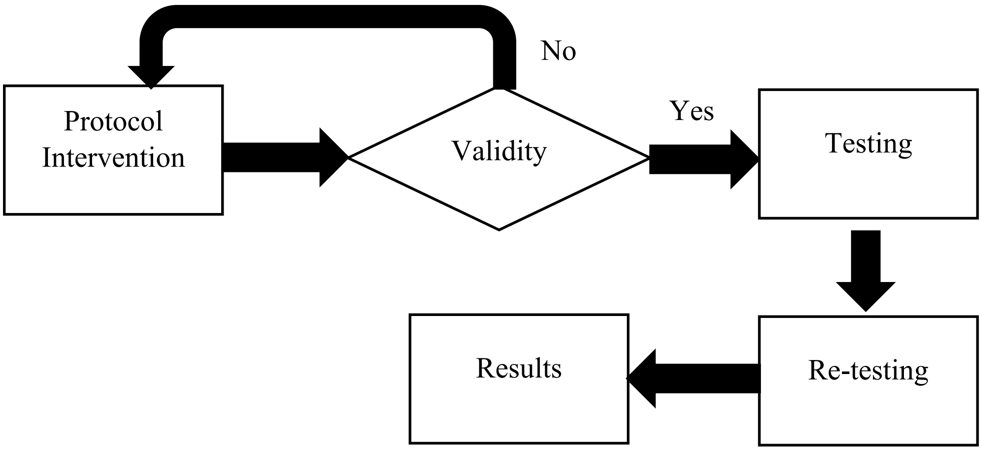

Fig. 2.1: Pilot Study Design Flowchart

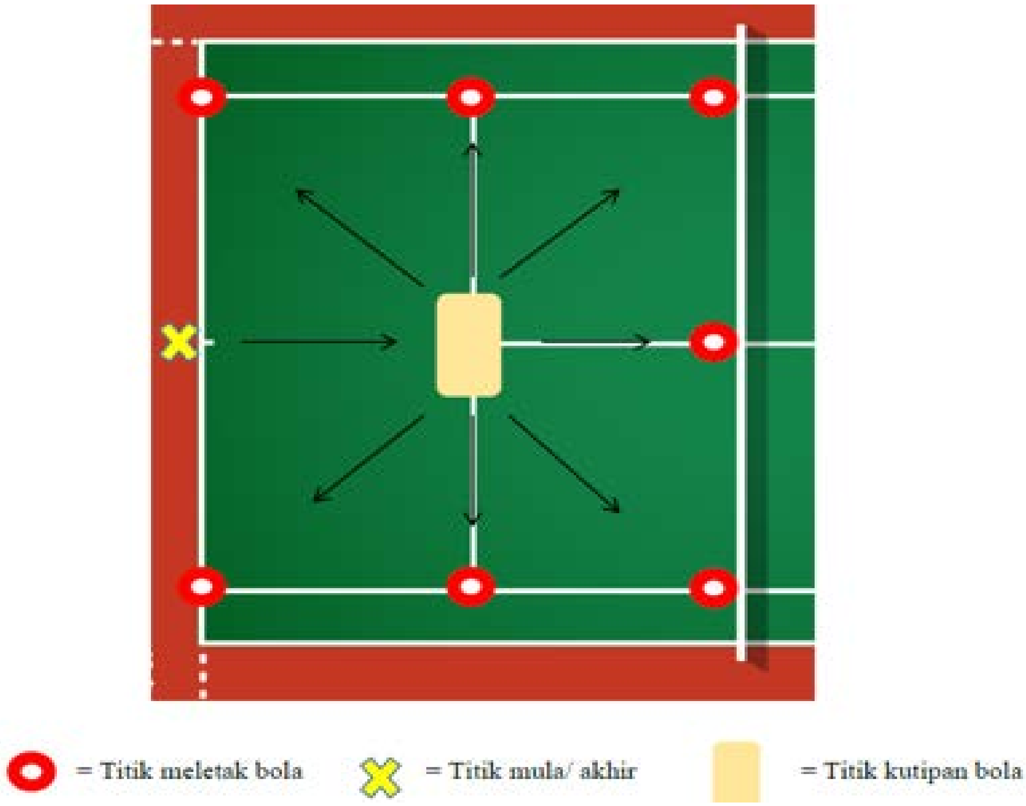

Fig. 2.2: Illustration of the Fatigue Outbreak Intervention Protocol (PICK)

All marker cones and containers containing 7 tennis balls are placed in the position as shown in Figure 2.2. Subjects wore pulse rate monitoring watches. Once the clock functionality including the GPS function is ensured to be in good condition, the subject's pulse rate begins to be recorded. Subjects were required to perform a warm-up activity for about 15 minutes by running slowly around the court for 2 laps. The activity was followed by a shuttle run at moderate capacity between the two most edge lines of the court of 10 repetitions. The count of one repetition refers to the complete run after the subject arrives back at the sideline during the start. The activity is followed by stretching the muscles of the whole body.

1.1 Result And Discussion

TABLE 2.1: Cronbach's Alpha Values

Cronbach's Alpha	Number Of Items(N)
0.961	2

TABLE 2.2: Mean And Std. Deviation

Testing	Mean	Std. Deviation	N
AVG_HR 1	124.40	17.42	5
AVG_HR 2	121.60	23.93	5

Based on the analysis of reliability data for the PICK protocol, the Cronbach's Alpha value obtained is 0.961. Based on 5 subjects that has been tested through two phases of testing, the mean value and standard deviation for the average heart rate(AVG_HR) of test 1 was (124.40 ± 17.42 %) while for test 2 was (121.60 ± 23.93 %).

3.0 Conclusion

Based on the Cronbach's Alpha value that has been accumulated, it is good and shows that the results obtained from the protocol have a high-reliability value. Furthermore, this modified protocol is suitable and can be used to induce fatigue for subjects. it is also friendly for the researcher to conduct and manage the instruments during the testing.

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IMPAK PENGGUNAAN *E-LEARNING* TERHADAP KURSUS AMALI DALAM KALANGAN PELAJAR KEMAHIRAN HIDUP DI UNIVERSITI TEKNOLOGI MALAYSIA (UTM)

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ABSTRAK

Penggunaan teknologi pendidikan menjadi salah satu tunjang utama dalam pemprosesan pengajaran dan pembelajaran seperti penggunaan *e-Learning*. Hal ini kerana keberhasilan pemahaman pelajar kursus amali merupakan kesan sebahagian daripada pemprosesan pengajaran dan pembelajaran melalui *e-Learning*. Kajian ini dijalankan untuk mengenalpasti kesan daripada penggunaan *e-Learning* terhadap kursus amali dalam kalangan pelajar Kemahiran Hidup di UTM. Kajian ini terdiri daripada tiga elemen utama iaitu untuk mengenalpasti dari segi pemahaman teori, kemahiran berfikir secara kritis dan kemahiran komunikasi di dalam kursus amali. Seramai 104 responden diambil daripada 140 orang sebagaisampel dalam kajian tinjauan ini untuk menjawab borang soal selidik. Data perolehan dianalisis menggunakan *Statistical Package for Social Science (SPSS)* versi 26.0 untuk mendapatkan nilai kekerapan, frekuensi dan, min bagi ketiga-tiga elemen utamatersebut. Dapatan kajian menunjukkan bahawa pelajar kursus amali Kemahiran Hidup di Universiti Teknologi Malaysia memperolehi impak kemahiran befikir secara kritis pada kedudukan tertinggi diikuti pemahaman teori dan terakhir adalah kemahiran komunikasi. Berdasarkan jantina pula, lelaki lebih dominan berbanding perempuan dari ketiga-ketiga elemen yang dikaji. Konklusinya, antara pihak yang akan mendapat manfaat daripada kajian ini adalah pelajar Kemahiran Hidup, pensyarah dan juga pihak UTMDigital untuk memastikan agar impak penggunaan *e- Learning* dapat diselaraskan kepada seluruh pelajar kursus amali.

Kata Kunci: e-Learning, Kemahiran Komunikasi, Kemahiran Berfikir secara Kritis, Pemahaman Teori

ABSTRACT

The use of educational technology is one of the main approaches in the process of teaching and learning such as e-Learning. This is because the success of students' understanding of practical courses is some of the effects of the process of teaching and learning through e- Learning. This research aims to identify the effects of the use of e-Learning on practical courses among Living Skills students at UTM. This study consists of three main elements namely to identify the level of theoretical understanding, critical thinking skills and communication skills in the practical course. A total of 104 respondents were taken from 140people as a sample in this survey study to answer the questionnaire. The acquired data were analyzed using Statistical Package for Social Science (SPSS) version 26.0 to obtain the percentage, frequency, and mean for the three main elements. Based on the findings the data revealed that students of the Living Skills practical course at Universiti Teknologi Malaysia scored the highest in critical thinking skills followed by theoretical understanding and lastly communication skills. Meanwhile, the results based ongender shows that males are more dominant than females from all three elements studied. In conclusion, this study will benefit Living Skills students, lecturers and also UTMDigital at UTM to ensure that the impact of theuse of e-Learning can be aligned to all students.

Keywords: e-Learning, Communication Skills, Critical Thinking Skills, Theoretical Understanding

1.0 PENGENALAN

Malaysia merupakan antara negara yang memiliki pendidikan yang sejajar dengan perkembangan teknologi semasa sehingga kini. Justeru itu, pendidikan yang berteraskan teknologi bukan sahaja dapat memberikan impak yang minimal kepada setiap individu, malah dapat membuka minda pelajar dalam penggunaan teknologi pendidikan dengan lebih luas lagi.Selain itu, kewujudan teknologi pendidikan juga telah merealisasikan perubahan dari segi penyampaian ilmu pengetahuan, memupuk kreativiti dalam diri setiap pelajar, memberikan peluang dan platform yang menarik bagi mempelbagaikan cara pengajaran dan pembelajaransekaligus membuktikan bahawa terdapat lonjakan perubahan terhadap ekosistem pendidikan di Malaysia sejajar dengan peredaran masa terkini (Zulkifli, Hamzah dan Razak, 2020). Antaranya ialah E-pembelajaran atau dikenali sebagai *e-Learning* yang merupakan satu sistempengajaran dan pembelajaran secara formal dengan bantuan sumber bahan elektronik sekaligus boleh dilakukan di dalam atauluar kelas, kampus atau bengkel di mana komponen utama yang digunakan dalam penggunaan *e-Learning*.ialah komputer dan jaringan internet *(The Economic Times*, 2021).

2.0 PERNYATAAN MASALAH

Justeru itu, melalui kajian lepas mendapati bahawa kursus amali mengalami halanganyang paling tinggi dalam proses pengajaran dan pembelajaran menggunakan *e-Learning* seperti Bidang Kejuruteraan, Elektrik dan Mekanikal kerana bidang ini lebih tertumpu kepada aspek teknikal dan penggunaaan serta pengendalian mesin (Norfarahi, Zulkifli, Mohd Isa et al.
,2020). Manakala melalui kajian Augustina, Santosa, Ferdiana et al. (2016),penggunaan *e- Learning* menyukarkan proses pengajaran dan pembelajaran dalam bidang yang memerlukan kemahiran seperti kejuruteraan, perubatan dan kemahiran praktikal di mana *e-Learning* lebih sesuai bagi bidang ilmiah dan sains sosial yang lebih tertumpu kepada konsep teori. Selain itu,melalui kajian lepas juga mendapati penggunaan *e-Learning* dalam kalangan pelajar peringkatkolej dan institusi tinggi dalam dalam bidangkemahiran seperti kejururawatan dan kedoktoran mendapati bahawa penggunaan *e- Learning* menyebabkan kemahiran

interpersonal, motivasi diri dan ingatan bagi hasil pengajaran dan pembelajaran semakin berkurangan (Abdulraheem et al., 2019).

3.0 OBJEKTIF

Oleh yang demikian, objektif kajian ini adalah untuk mengenal pasti impak penggunaan *e-Learning* terhadap kursus amali dalam kalangan pelajar Kemahiran Hidup di UTM dari segi pemahaman teori, kemahiran berfikir secara kritis dan kemahiran komunikasi di dalam kursus amali. Selain itu, kajian ini hanya tertumpu kepada pelajar yang mengambil bidang Kemahiran Hidup iaitu pelajar tahun dua sehingga tahun empat sahaja yang merupakanpelajar di bawah Fakulti Sains Sosial dan Kemanusiaan iaitu seramai 104 orang pelajar yang telah menjadi responden bagi kajian ini.

4.0 PERBINCANGAN KAJIAN

SUBJEK AMALI KEJURUTERAAN	**KOD ELEMEN GARISPANDUAN KURSUS *(Element of Course Outline)***	**HASIL ANALISIS**
• Teknologi Automotif	**KW-*Knowledge***	**KW – Pengetahuan**
• Pnemuatik dan Hidraulik	**AP – *Application***	**TH – Kemahiran Berfikir**
• Teknologi Kayu	**PS – *Practical***	**CS – Kemahiran Komunikasi**
• Elektrik dan Elektronik	**TH – *Thinking Skills***	
• Rekacipta	**CS – *Communication Skill***	
• Lukisan Kejuruteraan	**TW - *Teamworking & Leadership Skills***	
• Kimpalan dan Fabrikasi		
• Perkhidmatan Pembangunan dan Perpaipan	**ES – *Entrepreneurship Skills***	

Berdasarkan jadual di atas, terdapat lapan subjek yang menjurus kepada amali kejuruteraan di mana wajib diambil oleh pelajar kursus Kemahiran Hidup. Oleh yang demikian, setiap kursus amali di bahagikan kepada dua aspek bagi penilaian keseluruhaniaitu 30% teori manakala 70% adalah amali. Selain itu, setiap subjek berikut mempunyai garis panduan yang tersendiri berpandukan *UTM's Graduate Attributes* yang merangkumi tujuh jenis kemahiran generik yang perlu dikuasai oleh setiap individu pelajar. Oleh yang demikian, selepas pengkaji menjalankan analisis satu per satu berkenaan garis panduan *(course outline)* yang dilampirkan pada ruang lampiran bagi setiap subjek tersebut, pengkaji mendapati bahawa kesemua subjek amali ini mempunyaitiga aspek yang sama dimana pelajar perlu menguasainya mengikut tahap yang ditetapkan iaitu pemahaman dari aspek teori, kemahiranberfikir secara kritis dan juga kemahiran komunikasi.

5.0 RUMUSAN DAN KONKLUSI

BIL	PERSOALAN KAJIAN	MIN	TAHAP
1.	Apakah impak penggunaan *e-Learning* terhadap kursusamali dalam kalangan pelajar Kemahiran Hidup di UTM dari segi pemahaman teori di dalam kursus amali?	3.93	Tinggi
2.	Apakah impak penggunaan *e-Learning* terhadap kursusamali dalam kalangan pelajar Kemahiran Hidup di UTM dari segi kemahiran berfikir secara kritis?	4.04	Tinggi
3.	Apakah impak penggunaan *e-Learning* terhadap kursus amali dalam kalangan pelajar Kemahiran Hidup di UTMdari segi kemahiran komunikasi.?	**3.97**	**Tinggi**
Purata Min Keseluruhan		**3.98**	**Tinggi**

Jadual di atas menunjukkan ketiga-tiga elemen yang terdapat di dalam persoalan kajian ini bagi melihat yang manakah merupakan elemen yang paling dominanmelalui jumlahbacaan min bagi ketiga-tiga elemen. Persoalan yang paling dominan bagi jadual di atas ialah persoalan 2 dengan bacaan min sebanyak 4.04 di mana persoalan 2 mempunyai bacaan min yang paling tertinggi berbanding persoalan 1 dan3. Manakala min yang paling rendah ialah persoalan 1 iaitu "Apakah impak penggunaan *e-Learning* terhadap kursus amali dalam kalangan pelajar Kemahiran Hidup di UTM dari segi pemahaman teori di dalam kursus amali?". Jumlah min bagi persoalan 1 ialah sebanyak 3.93. Maka purata bagi keseluruhan ketiga-tiga persoalan ialah 3.98 dan masih berada pada tahap min yang tinggi.

Kesimpulannya, kajian ini dapat mengenalpasti impak penggunaan *e- Learning* terhadap kursus amali dalam kalangan pelajar Kemahiran Hidup di Universiti TeknologiMalaysia. Pelajar cenderung mengatakan bahawa impak yang paling ketara adalah dari aspek kemahiran berfikir secara kritis dalam penggunaan *e-Learning* sebagai satu medium bagi proses pengajaran dan pembelajaran. Hal ini adalah sejajar dengan kemahiran penguasaan penggunaanteknologi bagi setiap pelajar adalah merupakan satu kewajiban yang perlu dikuasai pada masa kini. Akhir sekali, pihak yang memperolehi manfaat daripada kajian ini adalah pelajar UTM yang mengambil bidang kursus amali, pihak UTMDigital dan juga pihak tenaga pengajar iaitupensyarah dan kajian ini boleh diperbincangkan kelak dengan lebih mendalam untuk bakal- bakal mahasiswa dan mahasiswi akan datang.

6.0 RUJUKAN

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COMPETENCIES OF PROSPECTIVE TEACHERS ON THE DIGITALIZATION OF TVET LEARNING

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ABSTRACT

Industrial Revolution 4.0 (IR 4.0) also known as the digital era is an era of globalization without borders. Technological advances have modernized many fields, including the field of education. This study was conducted to identify the competencies of prospective teachers on the digitization of learning in the field of TVET. This study focuses on three main aspects, namely the level of knowledge, skill level and attitude of prospective teachers towards the digitization of TVET learning. This quantitative study involved 117 people consisting of final year students of the Department of Technical Education and Engineering from the School of Education, Faculty of Social Sciences and Humanities, Universiti Teknologi Malaysia. The research instrument used was a set of questionnaires containing 24 items by using a 5 -point Likert scale. The results of the study found that the level of competencies of prospective teachers on the digitization of TVET learning from all three aspects is at a high level. At the end of the study, the researcher has put forward some suggestions that can be examined by certain parties to develop and further improve the use of digital materials among teachers.

Keywords: IR 4.0, TVET, Competencies.

1.0 INTRODUCTION

Industrial Revolution 4.0 (IR 4.0) is categorized as a new field of technology that combines three main domains namely physical, digital and biological. It includes the discovery of various new technologies such as automation, analysis, big data, simulation, systems integration, the use of robotics, cloud, Internet of Things (IoT), and similar things that will accelerate the progress of the modern world. According to Ibrahim, Baharuddin, and Baharom (2018), IR 4.0 involves automation technology that presents new challenges to all sectors in the country, including the education sector.

Hannon (2017) states that educational methods should also change to be on par with technological developments. Therefore, the Ministry of Education Malaysia has implemented reforms to the education curriculum, including the Technical and Vocational Education and Training (TVET) curriculum. According to Ivan et al. (2008), vocational education is a course or program that trains students and young people for getting employment immediately after their graduation or training. The rebranding of TVET in Malaysia is one of the efforts to drive the country to a higher level of education (Ibrahim, Baharuddin & Baharom, 2018). TVET encompasses higher education and is expected to undergo a revolution due to IR 4.0. Therefore, all teachers must be prepared to face challenges and transformations in education. The main objective is to ensure that teaching and learning methods are advanced along with IR 4.0.

2.0 LITERATURE REVIEW

The development and advancement of information technology is seen to have changed in line with the implementation of the curriculum taught in schools, especially for technical subjects such as TVET. (Assin, 2013). The teaching method approach used is a major issue that is often raised by researchers. Teaching methods are closely related to pedagogy, that is, whether it is relevant and in line with current changes and developments. Among the main challenges in the reform of education is to provide teachers who are trained and have good knowledge and skills in the field of information technology and multimedia. Past studies have also shown that the lack of use of technology applications by teachers in the teaching and learning process especially in technical subjects.

Impressed by the Coronavirus 2019 (COVID-19), the first half of 2020 has seen the closure of most economic sectors in many countries of the world. The TVET field is one of the sectors most affected by the pandemic. With quite drastic changes due to the effects of this pandemic, digital transformation requires TVET education to adapt accordingly (Harteis, 2018). A study by ADB (2016) stated that before the outbreak of this COVID-19 epidemic, only 36% of TVET institutions applied distance learning. This is because, from time immemorial, TVET programs need to include practical learning in workshops or workplaces to practice and master the appropriate skills.

Therefore, Ting and Woo (2005) stated that there are challenges and problems in the application of technology in the teaching and learning process, namely the negative attitude of teachers towards the use of technology. A study by Shafei, Haris, Hamzah (2018) also shows that TVET instructors are not fully prepared and do not understand how to implement IR4.0. According to Mirzajani & Mahmud (2016), teachers do not know the effectiveness of technology in teaching due to a lack of understanding of the importance of using educational technology in teaching. The statement is supported by Johansson (2017), he stated that when the readiness of teachers, especially in terms of knowledge, skills, and attitudes of individual teachers is not satisfactory, it will be an obstacle to the implementation of pedagogical methods in line with current developments.

3.0 RESEARCH METHODOLOGY

The research design that has been used in this study is quantitative and using questionnaire to obtained data and the information regarding to the objectives of the research. For this study, the selected population is a total of 117 people consisting of final year students of the Department of Technical Education and Engineering from the School of Education, Faculty of Social Sciences and Humanities, Universiti Teknologi Malaysia. Based on the Krejcie & Morgan (1970) table stated that the minimum sample size range for this study should exceed 92 people.

Once the questionnaire form is recollected, the researcher will begin to make a research analysis on the raw data obtained. The raw data will be analyzed using Statistical Package for Social Science (SPSS) version 26 to determine the frequency, percentage, mean and standard deviation of each item.

4.0 RESULT AND FINDING

TABLE 1: Result and finding

No.	Problem	Mean	Stage
1.	The level of knowledge of prospective teachers about the digitization of TVET learning.	4.29	High
2.	The level of skills of prospective teachers about the digitization of TVET learning.	4.03	High
3.	The level of attitude of prospective teachers about the digitization of TVET learning.	4.30	High

5.0 DISCUSSION AND CONCLUSION

Based on the findings, studies show that the majority of prospective teachers have a high level of competence in terms of knowledge. This is because, the digitization of TVET learning from the aspect of knowledge, has many advantages. This finding is not in line with the findings of Mirzajani & Mahmud (2016) who stated that teachers do not know the effectiveness of technology in teaching due to a lack of understanding of the importance of educational technology.

Based on the findings, studies show that the majority of prospective teachers have a high level of competence in terms of skills. It assume that prospective teachers are skilled in using digital materials to obtain information related to learning quickly. This item is agreed by Roslan (2014) that for a teacher, these skills are important because they will be directly involved during the teaching session in applying knowledge and skills to students. Therefore, the application of these skills is a leader for every planning to be carried out well and effectively and the information obtained is accurate (Makhbul & Hasun, 2003).

Based on the results of the study obtained on the level of competence of prospective teachers on the digitization of TVET learning from the aspect of attitude, shows that respondents gave positive answers and most of the proposed statements were agreed by many respondents. This matter is agreed by Nurulhuda (2013) that educators must equip themselves with knowledge, skills, and a good attitude to make themselves competent educators and able to develop the national education system towards a better and world-class.

Based on the study that has been conducted, it can be concluded that the level of competencies of prospective teachers on the digitization of TVET learning is at a high level. However, it still needs to be improved to produce future teachers who are more knowledgeable and skilled and have an open attitude towards changes in the education system according to world developments.

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EFFECT OF RESERVOIR CONDITIONS TO PREFORMED PARTICLE GEL (PPG) FOR SWEEP EFFICIENCY

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ABSTRACT

This research addressed the application of cross-linked polymer in the form of preformed particle gel (PPG) in manipulating the excess water from hydrocarbon production that reduces oil recovery efficiency. The purpose of this study is to investigate PPG's swelling ratio and water mobility on different brine concentrations and pH to evaluate the gel properties for reservoir adaptability. As a result, this will affect the permeability reduction factor and shows the effectiveness of preformed particle gel in tackling high water permeability layers problems. The expected outcome from this research is brine salinity indirectly proportional to PPG's swelling ratio and a known range of cross-linked polymer pH is efficient to decrease water mobility ratio. Consequently, this study helps to provide a better understanding on the mechanisms and effectiveness of gel treatment in different reservoir salinity and pH.

Keywords: preformed particle gel (PPG), pH, salinity, swelling ratio, gelation time.

1.0 INTRODUCTION

According to the forecast, global energy consumption will rise over the next 20 years as a result of industrial and lifestyle changes. Oil production will stay high, but may peak in 2030, and gas demand will climb over the following 20 years (Rassenfoss, 2019). As the world's energy demand rises in conjunction with depleting energy supplies, maximizing oil recovery is affected by high water cut in production well, leaving vast amounts of unswept oil behind and reducing the reservoir recovery efficiency due to the production of unwanted water from reservoirs. Excessive water production raises the cost of oil and gas production. The cost of disposing of this water raises the oil production unit cost and induces operational problems such as fines production, corrosion and scale formation resulting in the wells in a reservoir's recovery efficiency decreasing. The problems with other water shutoff treatment are permanent plugging for either water or oil meanwhile this study of reaction on preformed crosslinked polymer gel with excess disposal water injected to reservoir form a rigid water-based gel that conditionally plug the water flow but an open route for oil and gas. Moreover, gels reduce permeability to water more than to oil. Hence, this study aims to evaluate behaviour of crosslinked polymer gel by testing the gel properties to variation of brine concentration and pH.

2.0 Materials

Sulfonated polyacrylamide with an average molecular weight of 200kDaltons with a sulfonation degree of 25% and water content of less than 10 wt%, was provided by (SNF Co). Potassium Salt (Sigma-Aldrich Co., Germany); sodium chloride, Natrium Hydroxide, Hydrochloric Acid.

2.1 Preparation Preformed Particle Gel (PPG)

Powder sulfonated polyacrylamide powder was dissolved into deionized water for about 1 day in order to obtain a homogenized solution. The solution of pure polymer gel then reacted with crosslinker potassium salt and mixed thoroughly in a beaker using a magnetic agitator for 20 minutes until the solution was in the form of gellant. The gellant was then transferred to small bottles (50ml) and kept in the oven under 100 °C for 2 days. When the 3D gellant structure had been formed the gellant structure was placed in the oven under 100 °C for 1 day so that the polymer gel is completely dry. The dried gel was broken to obtain the desired Preformed Particle Gel (PPG).

2.2 Gelation Time

One of the parameters that is investigated in this paper is the gelation time which is defined as the amount of time taken for the gel to absorb water completely. This parameter is affected by water salinity, temperature, pH, concentration of polymer and crosslinker and lastly, the shut-in time during dynamic application of the preformed particle gel by using core-flood method. This is one of the vital parameters that need to be tested and investigated as it can be manipulated to ensure that the preformed particle gel only penetrates the targeted permeable layer, thus, in turn reducing the permeable layer. The ability of the gel to reduce the permeability is measured by the Permeability Reduction Factor (PRF).

2.3 Swelling Ratio

Water absorption or swelling ratio of the PPG thus obtained was measured using the mass-fraction method. Briefly, a known weight of the dry PPG was soaked in 100 ml of water for 24 h. After this time the residual water in the container was separated from the swollen PPG using a paper filter. The swollen PPG was then weighed and the swelling ratio was determined using the following equation (Saghafi et al.,2016):

$$\text{Swelling ratio} = \frac{m_s - m_d}{m_d}$$

Where m_d and m_s denote the mass of dried and swollen PPG, respectively.

2.5 Experimental Setup

2.5.1 Gelation Time

The Gelation Time experiment is used to investigate how the pH parameter affects the gelation time. Gelation time is defined by the time needed for each preformed particle gel to swell up and absorb water completely. The initial water that is set for each gel particle to absorb is at 150 millilitres. Other than that, this experiment was also performed at ambient conditions at 25°C and 1 atm. The procedures for the experiment are as follows:

1. 150 mL of pH solution that is being tested is measured by using a 100 mL measuring cylinder and poured into a beaker.
2. 1 grams of Preformed Particle Gel is measured using mass balance and then added to the pH solution.
3. For each hour, the mixture is filtered using a stainless-steel filter and the volume of water left is measured using a 50 mL measuring cylinder.
4. This measurement is taken for the next 3 hours and after 48 hours.
5. The volume of water left for each hour is recorded and tabulated.
6. Step 1 - 5 is repeated for every different pH solution that is being tested.

2.5.1 Swelling ratio

Water absorption or swelling ratio of the PPG thus obtained was measured using the mass-fraction method. Briefly, a known weight of the dry PPG was soaked in 100 ml of water for 24 h. After this time the residual water in the container was separated from the swollen PPG using a paper filter. The swollen PPG was then weighed and the swelling ratio was determined using the following equation (Saghafi et al.,2016)

1. A known weight of dry PPG (M_d) was measured.
2. The dry PPG was soaked in 160 ml of water for 72 hours.
3. After 72 hours, the swollen PPG is removed and filtered. Excess water is measured and The weight of swollen PPG (M_s) is measured.
4. The gel swelling ratio (SR) is calculated using the swelling ratio formula.
5. Steps 1-5 is repeated using different water salinity.

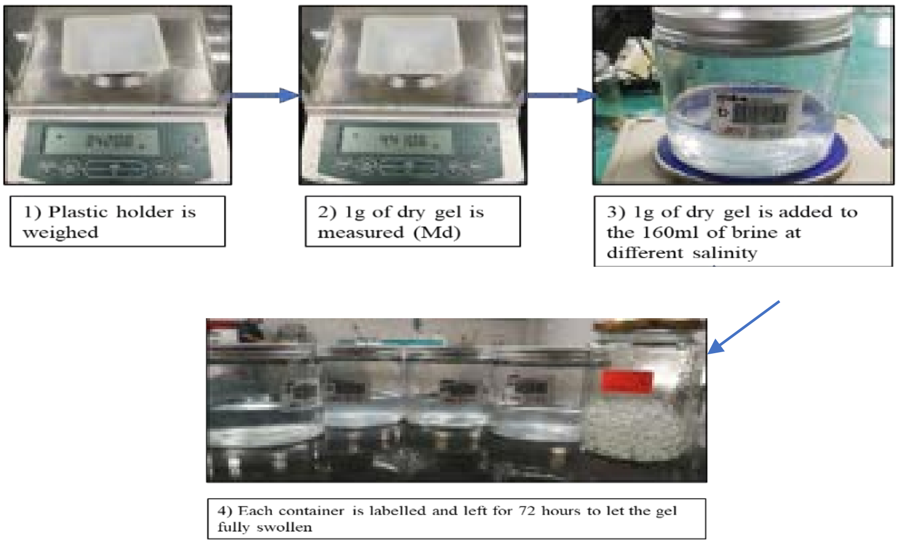

Fig. 2.1: Experiment procedure.

3.0 Results and Discussion

3.1 Effect of pH on Gelation Time

Gelation time is defined in this experiment as the time needed for the water that is set constant at 150 mL to be absorbed completely by the Preformed Particle Gel (PPG). Thus, to ensure that all the water are absorbed completely, the volume of water left that means not absorbed yet is measured for each hour. The results of the experiment are as below:

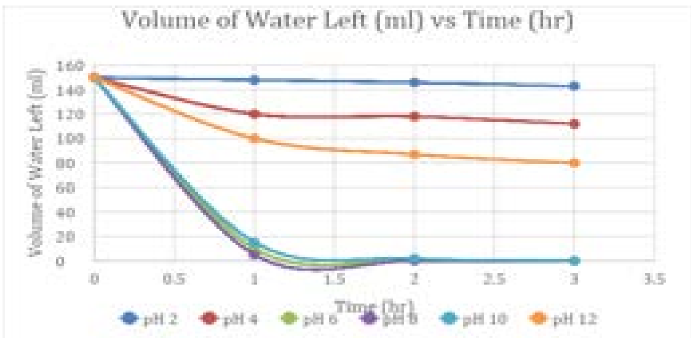

Fig. 3.1: Line graph that shows how the volume of water left (mL) varies with time.

Based on the figure above, it is shown overall the Preformed Particle Gel have absorbed the water as we can see a decreasing trend in the volume of water left across all various pH solution. Other than that, at pH 8, the gelation time is fastest at the second hour while for pH 6 and 10, the gelation time is at the third hour. The longest gelation time is at pH 2, which is the most acidic solution, that is even after 48 hours, only 10 milliliters of water has been absorbed. This is because of the ionic strength of the Preformed Particle Gel in various pH conditions. In lower pH condition (pH <6), the carboxylate groups (COO-) in the polymer chain are converted into carboxylic acid (COOH). This in turn, will reduce the negative repulsion of the polymer chain, pH values which achieve gelation time in under 3 hours, (pH 6 – 8), the carboxylate group (COO-) has been ionized, thus increasing the negative ion density of the polymer. This increased anionic-anionic repulsion will increase the water absorption of the preformed particle gel (PPG), thus, reducing the gelation time. In basic conditions (pH >8), the carboxylate group (COO-) also has been ionized, however, due to the addition of sodium hydroxide (NaOH) in basic condition, the sodium ions (Na+) will react with the carboxylate group (COO-), thus, also reducing the negative repulsion of the polymer network.

3.1 Effect of pH on Swelling Ratio

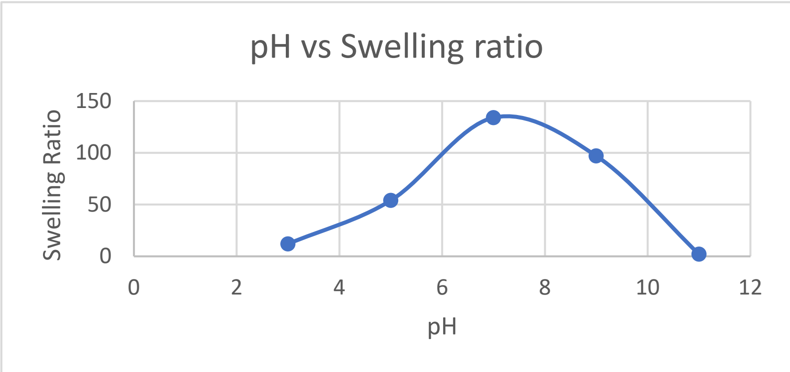

Fig. 3.2: Graph that shows how the Swelling Ratio varies with pH.

It is seen that the swelling ratio decreased drastically with lowering pH level under acidic conditions and by increasing it under basic conditions such that PPG water absorbance decreases (Lenji *et al.*, 2018). PPG is seen most efficiently on between pH 7 to 9. Under acidic conditions (pH < 6), anion groups present will react with hydrogen ion, H+ from HCl and the negative charge repulsion on the polymer chain is severely reduced. For basic conditions (pH >9), enhance more sodium ions, Na+ in NaOH to penetrate the polymer network structure and to react with the anion in the polymer chain. Both of these processes lead to reduced water absorption by the polymer network. Anion are ionized at pH levels in the range 7–9 to increase the negative ion density on the polymer chain. The increased anion-anion electrostatic repulsion on the chains leads to more water absorbed into the polymer network structure and increases PPG swelling ratio (Wang *et al.*, 2013).

3.2 Effect of salinity on Swelling Ratio

Figure 3.2 shows the effect of salinity to PPG swelling ratio in five different brines with different NaCl concentration at room temperature. It can be observed that increasing water salinity will cause PPG swelling ratio to decrease as the gel absorption become less effective.

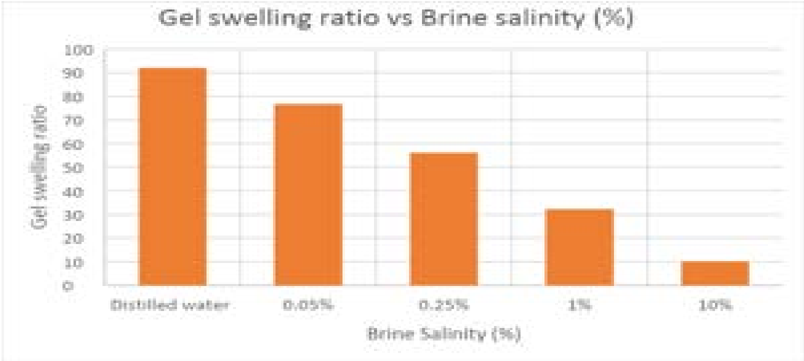

Fig. 3.2: Gel swelling ratio vs brine salinity (wt%).

PPG consist of polymer with negatively charged anionic chain. The anion-anion electrostatic repulsion in the polymer network is caused by the presence of negative carboxylate charges in the polyacrylic chain. This allows it to expand to create more space and accommodate more water within the polymer network. In brine solutions, positive ions (Na+ ions) enter the polymer network and then have a screening effect on the anion groups of the polymer chain. These positive cations reduce repulsion force lessens polymer gel expansion and prevents water's entrance to the 3D polymer network structure. In other words, high water salinity containing higher concentration of cations reduces electrostatic repulsion, decreasing less space to accommodate water and lowering the PPG swelling ratio.

CONCLUSION

Based on all this present study introduces a superabsorbent preformed particle gel (PPG), synthesized from sulfonated polyacrylamide powder, used as the polymer, and potassium salt used as the crosslinker. It was chosen because it is easily accessible and can be used for the operating conditions investigated in this study with little or no modification (Mahon *et al.*, 2019). This study proposed the effects of brine concentration and pH on the swelling ratio and gelation time of the PPG adapting reservoir conditions.

1. Brine concentration is indirectly proportional to PPG's swelling capacity.
2. Swelling ratio decreased with too acidic or basic pH level and had the highest absorbance between pH 7-
3. Neutral pH, from pH 6 - 8 will have the fastest gelation time while pH with extreme acidity and basicity will have the longest gelation time.

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SIMULATION STUDY OF LEAD REMOVAL FROM WASTEWATER BY USING TEA WASTE AS BIO-SORBENT

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ABSTRACT

Toxic heavy metals such as lead have been discharged into water streams due to industrialization, particularly from the stationery industry. Even though there are several ways for removing heavy metals, the costs of running the procedures are quite expensive. As a result, this research will simulate the performance of tea waste as a bio sorbent agent for removing lead ions from wastewater. The Fixed-Bed Adsorption Simulation Tool (FAST) program will create a simulation in this investigation. Furthermore, different manipulation factors such as lead ion initial concentration, contact time, and adsorbent dose were employed to evaluate its influence on the biosorption process. The results are comparable to previous study on tea waste as a source of biosorption. According to the previous research and case study, the optimal contact duration is 60 minutes, the best metal ion concentration for adsorption is 100 mg/L, and the best adsorbent dose is 2 g. A comparison of the Langmuir isotherm with the Freundlich isotherm reveals that the Langmuir isotherm produces better results. Moreover, when the pseudo-first-order kinetic model is compared to the pseudo-second-order kinetic model, the pseudo-first-order yields superior results.

Keywords: tea waste, FAST, simulation, lead ions

1.0 INTRODUCTION

Lead was one of the first metals discovered by humans, and it was being used as early as 3000 B.C. The used lead ancient Romans used lead to make water pipes and bath linings, and the plumber who connects and mends pipes gets his name from the Latin term plumbum, which means lead. Plumbum is also the name of the surveying phrases "plumb bob" and "plumb line," as well as the chemical symbol for lead, Pb [1]. Although it can exist in numerous chemical forms, Pb does not disintegrate in the environment. Pb-containing particulate particles can travel through the air, water, and soil. In general, atmospheric deposition is the most common source of Pb in soils that are not influenced by other non-air sources (e.g., dust from deteriorating leaded paint) [26].

The WHO's method for assessing the global burden of illness is DALYS, or disability-adjusted life years; they are defined as the total of years of life lost owing to death and impairment as a result of a certain illness or condition – in this case, lead exposure [19]. The entire disease burden due to lead is estimated to be over 9 million DALYs (disability-adjusted life years)! This DALY estimate is mostly due to mental impairment (as assessed by IQ), but it also includes elevated blood pressure (which raises the risk of ischemic heart disease), stroke, hypertensive illness, and other cardiovascular illnesses (WHO). In addition, lead poisoning was predicted to be responsible for 143,000 fatalities and 0.6 percent of the worldwide disease burden in 2004[22].

Besides, biosorption is an effective and environmental-friendly method to treat wastewater. Metal biosorption is used to remove metal ions from aqueous streams using agricultural products [21]. A solid phase (sorbent) and a liquid phase (solvent) containing a dissolved species to be sorbed are involved in the biosorption process. Due to the sorbent's high affinity for metal ion species, the latter is attracted and bound by a complicated process comprising chemisorption, complexation, adsorption on surface and pores, ion exchange, chelation, and physical force adsorption.

There are a variety of biomaterials with different sorption capabilities. The utilisation of these materials is based on their sorption capacity as well as their reusability over time [11]. Hence, tea waste will be employed as a bio sorbent in this investigation to aid lead biosorption. Tea comes in various flavors, including green, black, and Oolong, all tea drinks are made from the same fundamental tea leaves (Camellia sinensis L.). Extracts from it are utilised in various drinks, health foods, nutritional supplements, and cosmetic products [10].

Futhermore, FAST is an acronym for Fixed-bed Adsorption Simulation Tool. FAST is a water treatment program that predicts the breakthrough curves of fixed-bed adsorption filters by the simulation method. [25] Various adsorbent media, such as granular activated carbon (GAC) for or metal oxides, can be used depending on the pollutant to be removed in the process. Determining kinetic parameters from laboratory tests is another use. The homogeneous surface diffusion model (HSDM) and the linear-driving force approximation may both be solved numerically with FAST (LDF). is a valuable teaching tool for water engineering and water chemistry classes because of the extensive built-in support. [25]

2.0 Methodology

As previously indicated, we will compare the simulation findings to the experimental data in this simulation research. As a consequence, the experimental result from Mehrdad Cheraghi's publication "Removal of Pb (II) from Aqueous Solutions Using Waste Tea Leaves" is being compared to our simulation of Lead (Pb II ion) removal using tea waste.

Furthermore, the categorization of bio-sorbent properties is regarded as the initial technique here. Table 3 shows the characteristics of tea waste used by the experimental research, which will also be used in this simulation study.

TABLE 2.1: The characteristics of tea waste for this simulation study.

Parameter	Tea Waste Values
Humid (%)	10.5
Density (g cm^{-3})	0.353
Dissolved material (%)	81
Solution particles total (mg 1^{-1})	108
Organic matters (%)	85
Ash content (%)	2.85
pH_{ZPC}	6

Many process factors such as contact duration, adsorbate concentration, and adsorbent dose were evaluated. Hence, several parameters are calculated and compared with the experimental research to obtain the values for the simulation to run. Firstly, the bed density was calculated using data from an experimental case study on the biosorption of Pb (II) by tea waste. The diffusion coefficient for the film is considered to be proportional to the surface area and the difference in concentration between the bulk solution and the adsorbent surface. k_L may also be calculated by fitting the simulation to experimental data. Besides, empirical correlations for the Sherwood number are used to calculate the film diffusion coefficient $k_{L.}$

$$\frac{\partial M}{\partial t} = k_L A(c - c*) \qquad (1)$$

$$A = \pi {d_p}^2 \qquad (2)$$

Fick's second law is used to simulate mass transport in the adsorbent grain, which is considered to be homogeneous surface diffusion. Fitting the simulation to experimental data yields the surface diffusion coefficient DS.

$$\frac{\partial q}{\partial t} = D_S\left(\frac{\partial^2 q}{\partial r^2} + \frac{2}{r}\frac{\partial q}{\partial r}\right) \qquad (3)$$

To investigate the kinetics of Pb (II) adsorption by tea waste, 100 ml of 100 mg/L Pb(II) solution was mixed with known quantities of each adsorbent. For Pb, the program got to run for 120 minutes. The adsorption kinetics of Pb (II) ions were studied using Lagergren's pseudo-first-order kinetics expression and pseudo-second-order rate expression equation.

TABLE 2.2: The overall kinetic models used in this study.

Reaction Kinetic Models	Non-Linear Equation	Linear Equation	Model Parameters
pseudo-first order	$q_t=q_e\ (1-e^{-k}1^{t})$	$log(q_e - q_t) = logq_e - (\frac{k_1}{2.303}t)$	q_e , k_1
pseudo-second order	$q_t= q_e^2k_2t/(1+q_ek_2t)$	$\frac{t}{q_t} = \frac{1}{k_2 {q_e}^2} + \frac{t}{q_e}$	q_e, k_2

The adsorption of Pb (II) ions by tea waste particles adsorbents was studied using two Langmuir and Freundlich adsorption isotherm models. [18]
The Langmuir isotherm model can be written as follows:

$$q_e = \frac{Q_m K_L C_e}{1+ K_L C_e} \qquad (4)$$

Where:

q_e = the amount of lead adsorbed equilibrium (mg/g)

Q_m = the maximum monolayer coverage capacity (mg/g)

K_L = the Langmuir isotherm constant (L/mg)

The Freundlich Isotherm can be identified through:

$$logq_e = logk_F + \frac{1}{n}logC_e \qquad (5)$$

Where:

C_e = The Lead ion's equilibrium concentration in the remaining solution (in mol/L)

q_e = The adsorbed Lead ion's equilibrium concentration per unit of mass sorbent (in mol/g)

k_F = The capacity for adsorption

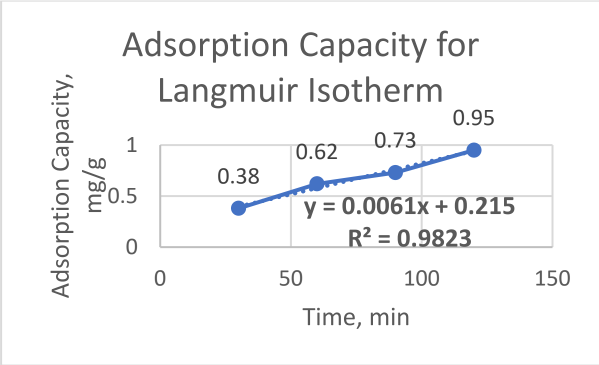
n = Related to the adsorption intensity (unitless)

To study about the effect of contact time, the contact time is varied in the range from 30 mins, 60 mins and 90 mins. The other parameters are being held constant for this study, like the Pb (II) ion concentration in wastewater to 100 mg/L and the mass of tea waste to 2g on each run. The effect of initial bio sorbent dose on % of Pb (II) ion elimination was investigated by adjusting the bio sorbent concentration of 1g, 2g and 3g. A graph of adsorption capacity vs contact time after 120 minutes was generated. To investigate the effect of metal ion concentration on the lead removal from the wastewater using the tea waste, the concentration of lead solution differs from 100 mg/L to 300 mg/L. The contact time is set to be as 60 min while the adsorbent dose is also kept constant to 2g for each run. To investigate the effect of metal ion concentration, the concentration of lead solution differs from 100 mg/L to 300 mg/L. The contact time is set to be as before which is 60 min while the adsorbent dose is also kept constant to 2g for each run.

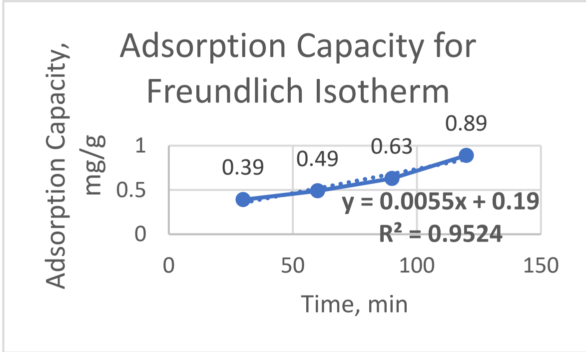
3.0 Results and Discussion

3.1 Comparison of Biosorption Isotherms with Experimental Study

In this case study, the Langmuir and Freundlich isotherms were investigated. The simulation was done using the identical settings (2g adsorbent mass, 100mg/L Pb(II) concentration, 60 minutes contact duration) for both isotherms. Figures 3.1 and 3.2 depict simulation runs for the Langmuir and Freundlich isotherms, respectively.



(a)



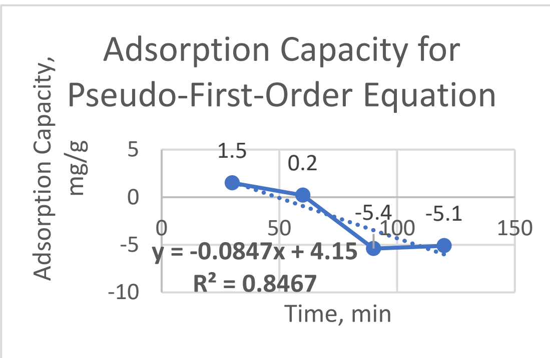
(b)

Fig. 3.1a & 3.1b: Simulation run for the adsorption capacity for Langmuir Isotherm and Freundlich Isotherm using FAST.

According to Figures 3.1 and 3.2, the Langmuir isotherm has a higher R^2 value of 0.9823 than the Freundlich isotherm. Other research studies comparing Freundlich and Langmuir isotherms have also found that the Langmuir isotherm gives the greatest value of R^2 correlation, suggesting that it is the best fit model to forecast the data's trendline. As a consequence, it may be inferred that the Langmuir isotherm outperforms the Freundlich isotherm. As a result, for this case study, the same procedure of comparing R2 is utilised to determine the most accurate isotherm.

3.2 Kinetic Study on the Lead Removal

Both the pseudo-first-order and pseudo-second-order kinetic models were explored in this research. Both models were simulated using the same parameters (2g adsorbent mass, 100mg/L Pb (II) concentration, 60 minutes contact time). Simulation runs for the pseudo-first-order and pseudo-second-order kinetic models are shown in Figures 3.3a and 3.3b, respectively.



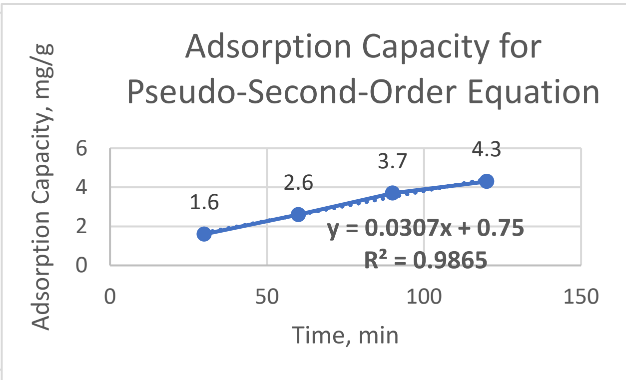
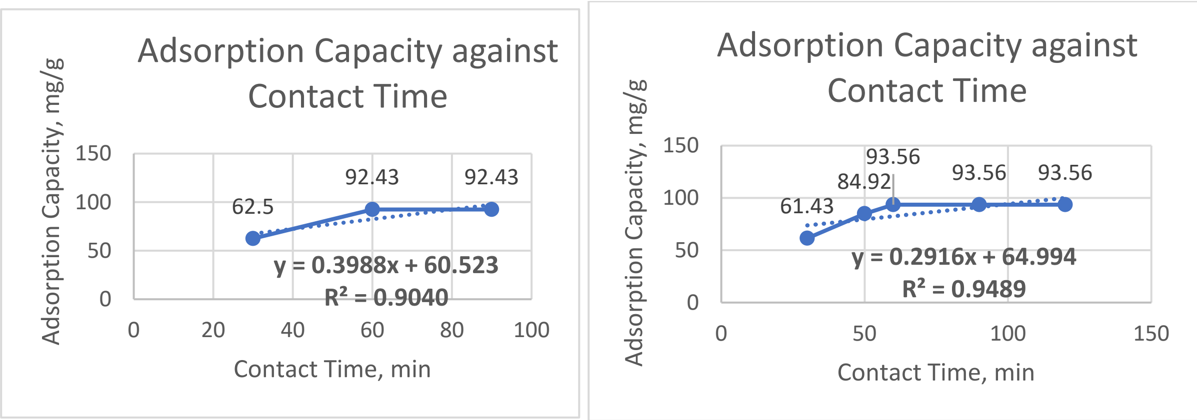


Fig. 3.2a & 3.2b: Simulation run for Pseudo-first-order equation and Pseudo-second-order equation.

The pseudo-second-order kinetic model has a higher and more suitable R^2 value of than the pseudo-first-order kinetic model. Other studies that compared pseudo-first-order and pseudo-second-order kinetic models discovered that the pseudo-second-order model had the highest R^2 correlation, implying that it is the best suited model for forecasting the data's trendline.

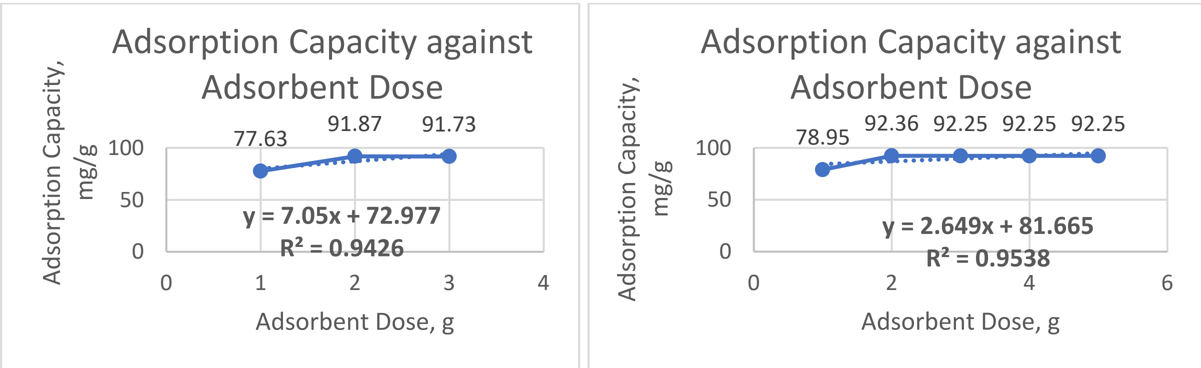
3.3 Comparison Study of Variables on Simulation Results with Experimental Results



(a) (b)

Fig. 3.3a & 3.3b: Effect of contact time to the adsorption capacity of tea waste for simulation run and experimental research.

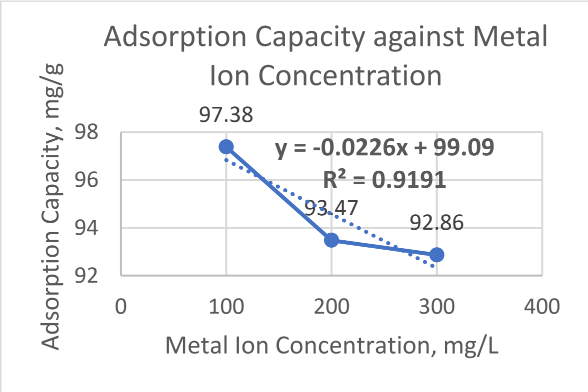
Both the simulation and experimental values indicate a rising trend in adsorption capacity and then become static after a period of time, with little difference in the values. Moreover, both findings demonstrated that the best contact time for the maximum adsorption capacity of the tea waste particle occurs at the 60th minute. The rate of adsorption was quick at the beginning of the contact period owing to the large quantity of accessible adsorbent surface. The lower adsorption effectiveness over a period of time might be attributable to two factors. To begin with, occupying the sites limited the amount of active surface sites available on the adsorbent. Second, owing to the repulsive effect of the deposited metal ions on the solid and bulk phase, the remaining unoccupied surface sites were difficult to occupy.



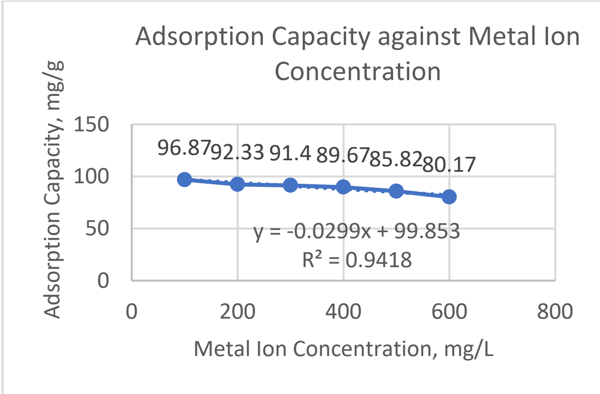
(a) (b)

Fig. 3.4a & 3.4b: Effect of adsorbent dose to the adsorption capacity of tea waste for simulation run and experimental research.

Both simulation and experimental results show a growing trend in adsorption capacity and reduces with successive dose increments until becoming static beyond a specific dosage, with less variation in the result data. Adsorption of Pb (II) is expected to rise when the dosage of adsorbent is increased. Because raising the adsorbent dosage gives more adsorption sites for a constant starting adsorbate concentration, the removal efficiency improves with increasing the adsorbent dose. Metal ion binding to tea waste's surface functional groups is another possible explanation. But beyond a certain point, increasing the amount did not influence removal effectiveness, and 2g was the optimum amount proven from both the experimental and simulation study. We discovered a similar behaviour with the graphene oxide adsorption of Zn (II) [23]. As a result, the adsorption capacity is influenced by the adsorbent mass.



(a)



(b)

Fig. 3.5a & 3.5b: Effect of metal ion concentration to the adsorption capacity of tea waste for simulation run and experimental research.

As the metal ion concentration increases, both the simulated and experimental values reveal a declining trend in adsorption capacity, and the value difference is not particularly noticeable. A rise in the initial Pb (II) concentration may have increased the driving power of the concentration gradient. As a result of the restricted number of active adsorbent particle sites and the limited uptake capacity, the removal efficiency is high at low concentrations. In contrast, when the metal concentration is high, the active sites of the adsorbent particles are occupied. Hence, it can be concluded that Pb (II) concentration will influence the adsorption capacity Furthermore, both analyses revealed that the ideal metal ion concentration for achieving maximal adsorption capacity is 100 mg/L.

4.0 Conclusion

In a nutshell, the effectiveness of tea waste as a bio-sorbent for lead ion adsorption in wastewater was investigated successfully. According to this case study, tea waste is an effective bio-sorbent for adsorbing lead in wastewater. According to this research, the ideal contact time for adsorption is 60 minutes. 100mg/L, 200mg/L, and 300mg/L of metal ion concentration were utilised in the investigation of Pb (II) concentration and adsorption capacity, and 100mg/L of metal ion concentration recorded the best adsorption capacity compared to other concentrations. The adsorbent doses employed in this case study were 1g, 2g, and 3g, with the 2g dosage having the best adsorption capacity. The comparison of Langmuir isotherm with Freundlich isotherm reveals that Langmuir isotherm outperforms Freundlich isotherm. Moreover, this study also proved that pseudo-second-order kinetic model is the best fit model for this investigation compared to pseudo-first-order kinetic model. Furthermore, in this case study, the accuracy of the simulation data was determined. The adsorption process which was aided by the FAST programme, gave accurate data. Because FAST software is specifically created for the analysis of adsorption processes, it was utilised in this case study to investigate the influence of contact time, metal ion concentration, and adsorbent dose on adsorption capacity of tea waste particles in the removal of lead from the wastewater. As a result, FAST software is employed in this case study to evaluate its efficiency, and the results are favourable.

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THERMODYNAMIC MODELLING OF ETHANOL CONVERSION TO ALDEHYDE AND HYDROGEN THROUGH DRY REFROMING

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ABSTRACT

Thermodynamic modelling of ethanol conversion to hydrogen and aldehyde through dry reforming process has been investigated based on total Gibbs free energy minimization method. The following range of equilibrium product compositions for ethanol dry reforming was determined: Temperature range: 273.15-2073.15K; CER (carbon dioxide/ethanol ratio): 1:9, 3:7, 1:1, 7:3, 9:1; and pressure range: 1-50 bar. The main products were hydrogen and aldehyde, followed by carbon monoxide and carbon dioxide. The equilibrium analysis revealed that aldehyde formation was not possible due to insufficient yield. When compared to hydrogen, carbon monoxide, water, and methane, the amount of ethylene, acetaldehyde, acetone, and diethyl ether produced was negligible. Optimum condition for hydrogen production is CER 1:9, T = 2073.15K, P = 1 bar while for acetaldehyde is CER 1:9, T=993.15K and P=50 bar. Higher pressure, lower temperature and higher CER have a negative effect on the production of hydrogen. Hydrogen and acetaldehyde production are at their peak under optimal conditions. From Gibbs analysis, acetaldehyde formation at equilibrium is thermodynamically infeasible but experimental work involving catalyst can enhance the formation of acetaldehyde.

Keywords: Aldehyde production, dry reforming, ethanol conversion, hydrogen production, thermodynamic modelling

1.0 INTRODUCTION

Recently, global warming has shown a peculiar focus on the current global scenario due to aggressive and irresponsible human activities that drive excessive carbon dioxide emissions in the atmosphere. Carbon dioxide can be considered the most significant contributor to global warming, mainly from human activities such as fossil fuel combustion, especially in industry sectors and deforestation. Due to the CO_2 pollution awareness, several studies have found out that the dry reforming process is economically and environmentally friendly which helps to reduce the emission of CO_2 into the atmosphere by utilizing carbon dioxide as raw material to be transformed into valuable products such as hydrogen, syngas, aldehydes, and carbon (Carbon nanofilament) [1]. Other products such as ethanol, carbon dioxide, carbon monoxide, methane, water, ethane, ethylene, acetone, diethyl ether and carbon (graphite C) also formed in dry reforming of ethanol. Several side reactions result in the production of undesired products along with H_2. Hence, valuable species, H_2 production, depending on the main process parameters such as temperature, pressure, and CO_2 to Ethanol molar ratio. Therefore, dry reforming process is the viable option to produce the desired products compare to steam reforming, auto thermal reforming, and oxidative steam reforming.

Dry reforming, also known as CO_2 reforming, has been widely used to yield valuable products for different purposes. There are several reactions involved in the ethanol dry reforming, for instance, dehydrogenation of ethanol, decomposition of acetaldehyde, reformation of acetaldehyde, dehydration of ethanol, polymerization of ethylene, decomposition of ethanol, methanation, CO_2 reforming of methane, Water Gas Shift reaction, decomposition of methane, Boudouard Reaction, reduction of carbon oxide, reduction of carbon dioxide [2].

Ethanol is an up-and-coming candidate in the dry reforming process because it is easy to be collected and cheaper in price. Ethanol is replaced to be alternative renewable energy to reduce the dependence on fossil fuels. There are many advantages of using ethanol fuel over other fuel sources. First, ethanol burns cleanly without the emission of dangerous greenhouse gases, which can cause global warming. Therefore, it is ecologically effective compared to other fuel sources. Furthermore, ethanol fuel is cost-effective and easily accessible in many countries because it is biofuel, an energy that extracts from plants that convert the sun energy into valuable energy. Ethanol is mainly manufactured through biomass fermentation or renewable raw materials—for instance, waste materials from agro-industries, organic solid waste generated by households such as food leftovers. At the same time, food consumption can be avoided by converting the leftovers food into ethanol as renewable energy. Ethanol formed from the raw materials is classified as bioethanol or biomass-derived Ethanol [3]. Hence, ethanol is the most exciting option for the dry reforming process to produce valuable products.

One of the valuable products from ethanol dry reforming is hydrogen. Hydrogen is viewed as the energy carrier in the future because it can be generated from renewable sources such as solar energy and biomass and converted into high-efficiency electricity by a fuel cell that only generates water vapour as a by-product and emitting zero carbon and dangerous greenhouse gases that has no significant harm to the environment [3]. Hydrogen can be attained from many different methods, for instance-hydrocarbon reforming and electrolysis process. However, these processes are not economical, requiring high processing cost due to the high feed price; hence a more convincing and cost-effective way to obtain hydrogen is needed. Ethanol dry reforming utilizes bioethanol from biomass resources (renewable energy), an ecologically and economically friendly feedstock; hence, dry reforming is the best way to produce hydrogen.

The purpose of this research is to determine the possibility of producing the hydrogen and aldehydes from ethanol dry reforming process via total Gibbs free energy minimization method. This study attempts to illustrate the effects of the process variables, carbon dioxide to ethanol feed molar ratio (CER), temperature and pressure in ethanol dry reforming.

2.0 METHODOLOGY

Thermodynamic study was performed to investigate overall reactions and products formation trends based on the reaction temperature, pressure and feedstock ratio using HSC Chemistry version 6.0 based on the minimization of the total Gibbs energy. The Gibbs programme looks for the most stable species combination and the phase composition where the system's Gibbs energy is at its lowest at a fixed mass balance, constant pressure, and temperature. In this study, the feed materials considered were ethanol and carbon dioxide. Meanwhile, the ethanol dry reforming process produces hydrogen, acetaldehyde, carbon, water, carbon dioxide, methane, carbon monoxide, diethyl ether, acetone, and ethylene as reaction products. At the reactor's exit, the reaction products were assumed to be in thermodynamic equilibrium. The total number of reactant moles was set at 1Kmol. The operating temperatures ranged from 273.15K to 2073.15K, with pressures are fixed at 1bar and carbon dioxide to ethanol feed ratios (CER) of 1:9, 3:7, 1:1, 7:3, and 9:1. In all cases, complete ethanol conversion (100%) and positive product yields were observed, indicating the feasibility of the ethanol dry reforming process.

3.0 RESULT AND DISCUSSION

One of the most significant advantages of the dry reforming process is that CO_2 can be converted into valuable products and synthesis gas, or it can be sequestered from the biosphere cycle. [4]. The possible reactions that may occur in ethanol dry reforming and its calculated enthalpy heat of formation are listed in Table 1.

TABLE 1: Possible Reaction in Ethanol Dry Reforming

Reaction	Type of Reaction	Reaction	ΔH_{298} (kJ/mol)
R1	Ethanol Dry Reforming	$C_2H_5OH + CO_2 \rightarrow 3H_2 + 3CO$	296

R2	Dehydrogenation of Ethanol	$C_2H_5OH \rightarrow CH_3CHO + H_2$	.768.
R3	Decomposition of Acetaldehyde	$CH_3CHO \rightarrow CH_4 + CO$	4-18.78
R4	Reformation of Acetaldehyde	$CH_3CHO + CO_2 \rightarrow 3CO + 2H_2$	5228.2
R5	Dehydration of Ethanol	$C_2H_5OH \rightarrow H_2O + C_2H_4$	45.
R6	Dehydration of Ethanol	$C_2H_5OH \rightarrow \frac{1}{2}H_2O + \frac{1}{2}C_2H_5OC_2H_5$	4-12.0
R7	Polymerization of Ethylene	$C_2H_4 \rightarrow Polymers \rightarrow 2C + 2H_2$	-
R8	Decomposition of Ethanol	$C_2H_5OH \rightarrow 3H_2 + CO + C$	124.3
R9	Decomposition of Ethanol	$C_2H_5OH \rightarrow CH_4 + H_2 + CO$	49.7
R10	Decomposition of Ethanol	$C_2H_5OH \rightarrow \frac{3}{2}CH_4 + \frac{1}{2}CO_2$	-73.9
R11	Decomposition of Ethanol	$C_2H_5OH \rightarrow \frac{3}{5}CH_3COCH_3 + \frac{6}{5}H_2 + \frac{1}{5}CO_2$	1.2
R12	Methanation	$2H_2 + 2CO \rightarrow CH_4 + CO_2$	-247.0
R13	Methanation	$4H_2 + CO_2 \rightarrow CH_4 + 2H_2O$	-14

			6.7
R14	CO_2 reforming of Methane	$CH_4 + CO_2 \rightarrow 2H_2 + 2CO$	247.0
R15	Water Gas Shift reaction	$H_2O + CO \leftrightarrow H_2 + CO_2$	-41.4
R16	Decomposition of Methane	$CH_4 \rightarrow C + 2H_2$	74.6
R17	Boudouard Reaction	$CO \rightarrow \frac{1}{2}C + \frac{1}{2}CO_2$	-86.2
R18	Reduction of Carbon oxide	$CO + H_2 \rightarrow C + H_2O$	-131.3
R19	Reduction of Carbon Dioxide	$\mathrm{CO_2 + 2H_2 \rightarrow C + 2H_2O}$	-90.1

Fig 1(a) illustrated the effect of CER on hydrogen production at various process temperatures at 1 bar pressure. The moles of hydrogen formation increasing with the temperature which can be explained by the fact that equilibrium constant of R4 increase when temperature increase [5]. From the figure, it can be observed that the number of moles of hydrogen for every CER increase enormously at first and then hydrogen production started to saturating until the end of the investigated temperature. This phenomenon can be explained by R16 which produce H_2 as one of the products in this decomposition of methane. The hydrogen yield reached its maximum at the temperature range of 1083.15-2073.15K. When the CER increase, the hydrogen yield decreases at constant pressure. CER 1:9 generates the highest amount of hydrogen, while CER 9:1 generates the lowest amount of hydrogen.

Fig 1(b) exhibited the number of moles of carbon monoxide produced from ethanol dry reforming as a function of temperature and CER at 1 bar pressure. It was observed that the carbon monoxide yield began to increase at 723.15K in all CER. It then reached its maximum production at temperature 903.15-1083.15K before decreasing at higher temperature. CER 1:1 generates the highest amount of CO while CER 9:1 generates the lowest amount of CO. Consider all the data points, the maximum CO yield was 1.2898 Kmol at CER 1:1 with the temperature of 1083.15K while the minimum CO yield was 2.79×10^{-16} Kmol at 2073.15K. Bourdard reaction (R17) plays more significant role than Water Gas Shift (R15) in the production of CO because H_2O is present in reaction in small amount than CO_2. The increase of the CO from 273.15K to 1083.15K can be explained by the fact that the equilibrium constant of R1 increases with then increase in temperature until it reaches its peak [5]. CO concentration increased gradually when the temperature greater than 750°C this is due to the reverse Bourdard Reaction because this reaction is no longer thermodynamically favoured and result in no C production is possible [5].

The number of moles of carbon dioxide produced at different temperatures and CER at 1 bar pressure was illustrated in Fig 1(c). High CER tended to produce more carbon dioxide at lower temperature and the number of moles for carbon dioxide at equilibrium reached maximum between 700-900K regardless of CER due to the reformation of CO_2 with CH_4 (R14) where high temperature benefits the conversion of CO_2 [5]. However, at the temperature higher than 900K the formation of carbon dioxide reduced because of the reformation of CO_2 with CH_4 to produce syngas (R14). It is noticed that the moles of CO_2 at equilibrium is less than the initial input amount which is a positive sign. CER 9:1 generates the highest amount of CO_2 while CER 1:9 generates the lowest amount of CO_2. The increase in number of moles for carbon dioxide at low temperature can be related to the methanation process (R14), and Boudouard reaction (R17).

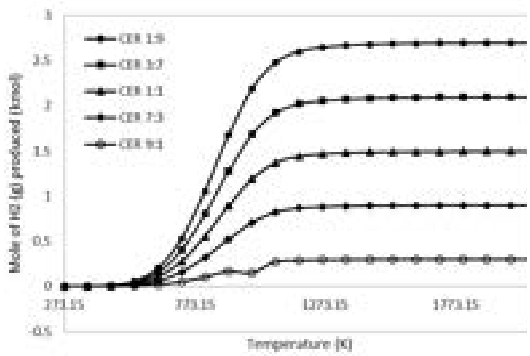
Water is an unwanted product in the ethanol dry reforming process because it lesser the hydrogen yield although it is vital in the Water Gas Shift reaction (R15). Fig 1(d) showed the moles of water formed at different temperatures and CER at 1 bar pressure. The water formation decreased with temperature and higher CER seems to promote less water formation in the process at a temperature above 1083.15K.The maximum H_2O production is 1.3321 Kmol which happened at the temperature of 273.15K with CER 1:1, while the minimum H_2O yield was at 2073.15K with CER 9:1. More water is formed at a lower temperature due to the role played by reduction of CO and CO_2 (R18 and R19). As the temperature increased, these reactions were affected by equilibrium limitation.

Methane is a by-product of the ethanol dry reforming process. Fig 1(e) depicted the moles of methane produced at different temperatures and CER. More methane was formed at lower temperature but gradually diminished as the temperature increased. The higher reaction temperature inhibits the production of CH_4. This can be clearly described by the exothermicity of the methanation process (R12 and R13). In the figure, it showed that at temperature lower than 1083.15K, the methane formation is higher when CER is lower. CER 9:1 generates the lowest amount of CH_4 while CER 1:9 generates the highest amount of CH_4. More importantly, the existence of CH_4 can react with the CO_2 via CO_2 reforming with methane process (R14) to produce a syngas which are CO and H_2.

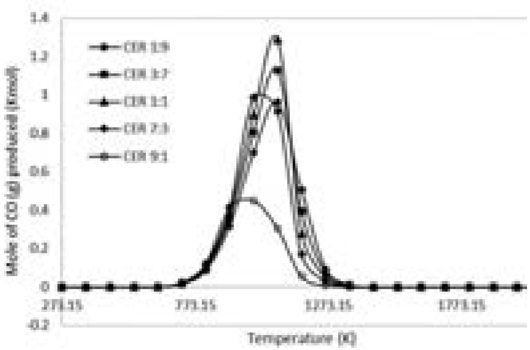
Carbon is an undesired product in the ethanol dry reforming as it deactivates the catalyst and increases pressure drop in reactors. However, carbon nanofilaments can be produced if suitable catalyst is used. The carbon formation at different temperatures and CER was shown in Fig 1(f). Carbon is favoured at the low CER and high temperature. Carbon formation is originated from R8, R16, R17, R18, and R19. The amount of C production is the smallest at the CER 9:1 while the highest yield of C is at CER 1:9. The reaction temperature is also influencing the amount of C produced. The yield of C has the lowest amount at the temperature range of 993.15 to 1083.15K for all CER. Then the formation of C increase after 1083.15K then remain almost constant at higher temperature for all CER.

The number of moles of C_2H_4O produced at different temperatures and CER is showed in Fig 1(g). It can be observed that the number of moles of C_2H_4O for all CER are very minimal which almost approach zero over the entire temperature range. The C_2H_4O for all CER starts to rise from the temperature of 723.15K and then goes to the maximum between 993.15K and 1083.15K. The C_2H_4O production increase when the CER decrease. CER 9:1 generates the lowest amount of C_2H_4O while CER 1:9 generates the highest amount of C_2H_4O. The formation of acetaldehyde is related to the dehydrogenation of ethanol reaction (R2) as ln K value in R2 is negative at higher and lower temperature.

(a)



(b)



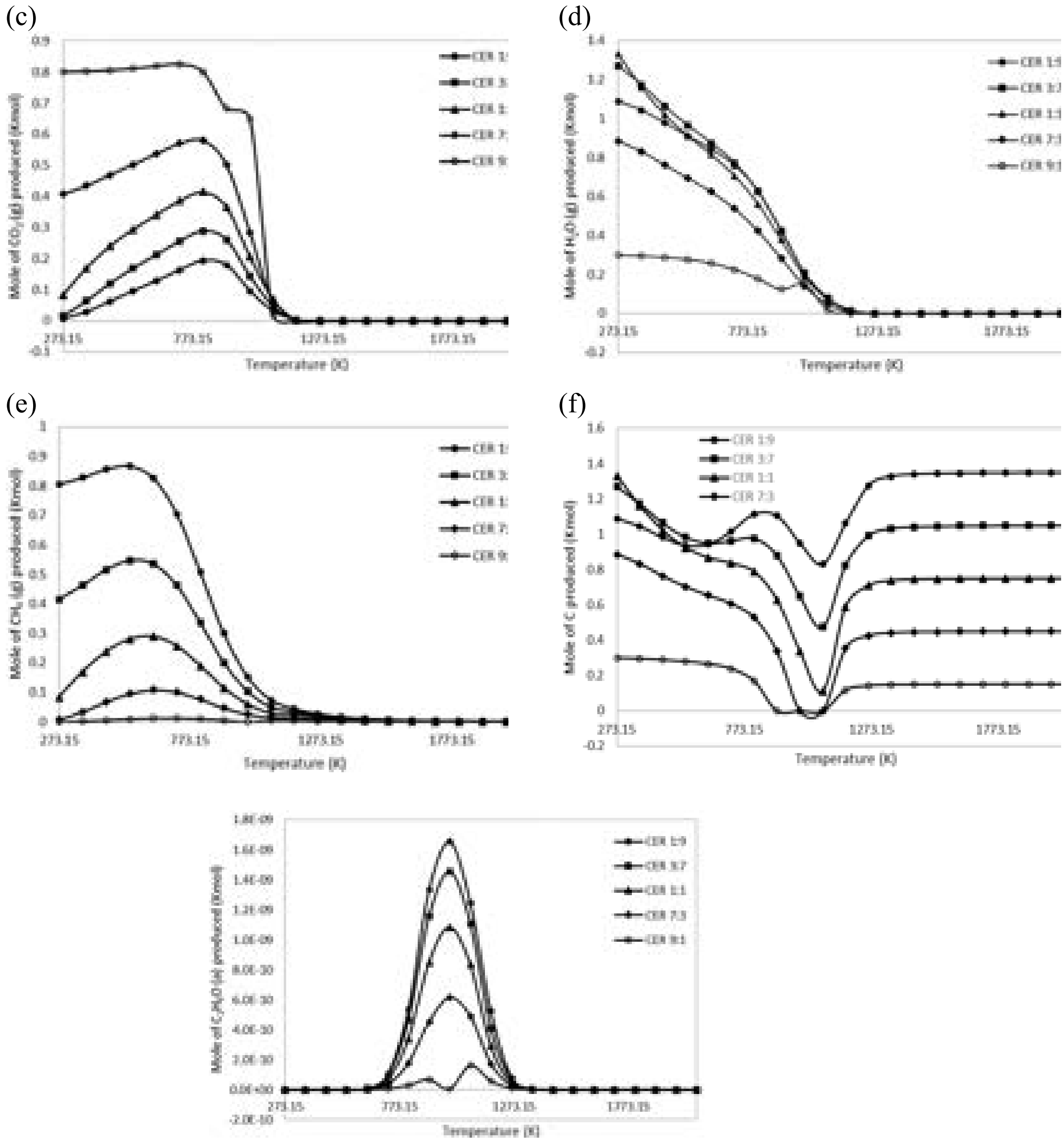


Figure 1: Yield of (a) H_2, (b) CO, (c) CO_2, (d) H_2O, (e) CH_4, (f) C and (g) C_2H_4O

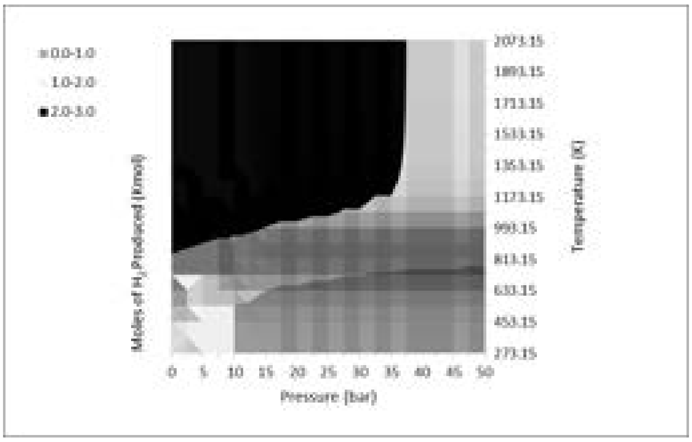


Fig. 2: Contour plot of hydrogen formation (in Kmol) as a function of temperature and pressure for CER 1:9

4.0 CONCLUSION

Thermodynamic equilibrium analysis favours hydrogen production, with the greatest hydrogen production occurring at 2073.15K, 1 bar, and CER 1:9. Nonetheless, in the presence of a catalyst, acetaldehyde production can be increased. As a result, an appropriate Ni-based catalyst should be used to improve acetaldehyde production.

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THERMODYNMAIC ANALYSIS OF LIGHT HYDROCARBON PRODUCTION FROM BIO OIL MODEL COMPOUND THROUGH CRACKING

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ABSTRACT

Bio oil considered to be potential candidate which obtain from various renewable resources as it is very complex mixtures. In order to make use of the available bio-oil, the relatively longer carbon chain of bio-oil will be cracked to smaller carbon compounds. It has been discovered equilibrium thermodynamic analysis of light olefins yield from bio-oil model compound has conducted using total Gibbs free energy minimization technique. The following parameter range was used to compute the thermodynamic equilibrium number of moles for co-cracking of ethyl acetate: temperature (300-1,200 °C), Ethyl acetate/methanol ratio (EAMR) and ethyl acetate/ethanol ratio (EAER) of 1:12, 1:6, 1:3, 1:1, 2:1 and pressure (1 bar). Hydrogen as the main product, followed by ethylene and carbon monoxide, based on detailed review of all the possible reactions. Optimum conditions for the production of ethylene are EAMR ratio 2:1, at 1,200 °C and 1 bar, and EAER ratio 2:1, at 1,200 °C and 1 bar. Since ethylene synthesis is not thermodynamically possible at equilibrium based on Gibbs analysis, experimental work using catalyst may help boost ethylene production.

Keywords: EAMR; EAER; Gibbs free energy minimization; Thermodynamic analysis

1.0 INTRODUCTION

Over centuries, energy generated through burning of fossil fuels are required to propel our vehicles, produce and provide electricity to our homes and power the manufacturing industries. [1] states, that fossil energy is the primary source in the world. Energy sources can be characterized as renewable and non-renewable energy. Renewable energy sources refer to clean energy that comes from natural processes and source that can be replaced in time and will not run out for decades. Non-renewable energy sources, in the other hand, will not be replenished and eventually run out. Fossil fuel such as oil, natural gas and coal are common resource of non-renewable energy. These resources are physically and economically limited [2]. Baz, Cheng [3] states, that high consumption of energy results in high levels of carbon emission especially from fossil fuel resources. Combustion of coal generates two times more carbon dioxide than combustion of natural gas according to Paraschiv and Paraschiv [4]. In view of the increasing energy demand, the world has aroused considerable interest in renewable, sustainable usage and environmentally friendly fuels. The emergence of renewable fuels simultaneously eases the diminishing fossil fuels concern that are known to deplete in future and also eradicate the environmental issues triggered. More studies and researches are being ongoing for the development of renewable energy.

Biofuel such as biogasoline is one such promising candidate for the replacement of fossil fuels which reduce greenhouse gas (GHG) emissions and maintain a sustainable environment [5]. It has been stated that biofuels are categorised as first, second and third generation [6]. First generation refers to biodiesel, bio alcohols, bio gas, vegetable oil and syngas manufactured from various feedstock such as starch sugarcane by-product, plant oil and animal fatty acids. Grasses, plant, seeds and trees are some of the sources for secondary generation and algae based oil as third generation of biofuels. Sumathi, Chai [7] states that biodiesel is safe, non-toxic, biodegradable and produce less air pollution than petroleum-based diesel (petro-diesel).

However, it would not be adequate to depend on biodiesel and biogasoline to fulfil the great global energy needs. Clean fuel or bio-oil can be the answer to supplement the energy demand. Bio-oil can be obtained from endless biomass supply around us and can be regarded as nature's abundant resources. Fast pyrolysis process of biomass increases the yield of bio-oil. Zhang, Hu [8] states that bio-oil is a complex chemical compound comprising lightweight or heavy oxygenated compounds such as ketones, aldehydes and carboxylic acids. Bio oil has drawbacks such as high oxygen and water content, high viscosity, high acidity and thermal instability [9]. A crude bio-oil model compound is chosen for catalytic cracking to convert it into light hydrocarbons by removing carbon monoxide, carbon dioxide, and water as unwanted by-products [10]. Many researches were carried out to obtain a high yield of target products and minimum composition of coke by optimizing catalysts and operating conditions. Methanol and ethanol serve as solvents that could be added to crude bio-oil to maximize the hydrocarbon yield and minimize the coke formation.

The study hypothesis is that light hydrocarbon (which in this case represented by ethylene can be produced from bio-oil (represented by ethyl acetate). In order to achieve this hypothesis, experimental work could be conducted but it may lead to higher cost and consume more time and energy. Thermodynamic analysis is the optimal method for conducting swift investigation which avoids and eliminates all of the disadvantages associated with substantial experimental effort. Many thermodynamic studies have been reported, for example, thermodynamic analysis of steam reforming of propinoic acid as bio oil model compound to produce syngas (hydrogen and carbon monoxide), carbon dixiode and methane as desired products and carbon (coke) as an undesired product at temperature (500-900 °C); pressure (1-10 bar), and H_2O/HPAc ratio (0-4 mol/mol) [11]. [12] used acetic acid and as model compound together with methanol/ethanol co-reactant to represent bio-oil to produce light hydrocarbon as well. To the best of our knowledge, no thermodynamic analysis has been made to study the co-cracking of ethyl acetate to light hydrocarbon. The objective of this research is to conduct a thermodynamic analysis of the equilibrium reactions between ethyl acetate and solvents (methanol and ethanol) to generate light hydrocarbon, which in this case represented by ethylene via the minimization of total Gibbs energy method. Co-products of the reaction such as hydrogen, carbon monoxide and coke were also assessed.

2.0 TABLES AND FIGURES

HSC Chemistry software Version 11 was used to simulate the thermodynamic analysis of the production of light hydrocarbon from bio-oil model compound, which in this case is ethyl acetate. HSC Chemistry software calculates the equilibrium composition of all possible combination of reactions that are able to involve in the thermodynamic system. Minimization of the Gibbs free energy technique is the main feature used to solve the equilibriums of chemical reactions involved for the analysis of the systems in the software. The feedstock species considered were (i) ethyl acetate with methanol and (ii) ethyl acetate with ethanol. Methanol and ethanol were selected as co-reactant to provide additional carbon, hydrogen and oxygen for the reaction. The process produced ethylene, hydrogen, carbon monoxide, and coke as by-products. Ethylene is the sole considered light hydrocarbon representative, with other light hydrocarbons excluded because preliminary investigation found that other light hydrocarbon formation is too small.

2.1 Tables

Table 1 lists the various reactions that may occur during the ethyl acetate co-cracking process, as well as the calculated heat of enthalpy of thermal decomposition of ethyl acetate [10]. Heat of enthalpy for other reactions also has been calculated [13].

TABLE 1: Possible reactions of co-cracking of ethyl acetate

R	Type of reaction	Chemical reaction equation	ΔH (kJ/mol)
1	Thermal decomposition	$CH_3COOC_2H_5 \leftrightarrow CH_3COOH + C_2H_4$	+65.81
2	Thermal decomposition	$CH_3COOC_2H_5 \leftrightarrow CH_3CH_2OH + CH_2CO$	+163.43
3	Steam reforming	$CH_3COOC_2H_5 + 6H_2O \leftrightarrow 4CO_2 + 10H_2$	+322.20
4	Water gas shift reaction	$CO + H_2O \leftrightarrow H_2 + CO_2$	-41.14
5	Methanation	$CO + 3H_2 \leftrightarrow CH_4 + H_2O$	-206.10
6	Methanation	$CO_2 + 4H_2 \leftrightarrow CH_4 + 2H_2O$	-165.10
7	Methanation	$2CO + 2H_2 \leftrightarrow CH_4 + CO_2$	-247.30
8	Oxidative coupling of methane	$4CH_4 + O_2 \leftrightarrow 2C_2H_6 + 2H_2O$	-87.80
9	Oxidative coupling of methane	$2CH_4 + O_2 \leftrightarrow C_2H_4 + 2H_2O$	-140.40
10	Ethylene dimerization	$2C_2H_4 \leftrightarrow C_4H_8$	-105.20
11	Dehydrogenation of ethane	$C_2H_6 \leftrightarrow C_2H_4 + H_2$	+136.33
12	Methane decomposition	$CH_4 \leftrightarrow 2H_2 + C$	+74.52
13	Disproportionation	$2CO \leftrightarrow CO_2 + C$	-172.44
14	Hydrogenation of carbon dioxide	$CO_2 + 2H_2 \leftrightarrow 2H_2O + C$	-90.16

15	Hydrogenation of carbon monoxide	$CO + H_2 \leftrightarrow H_2O + C$	-131.30
16	Ketonization	$CH_3COOH \leftrightarrow CH_2CO + H_2O$	+144.40
17	Ketene decomposition	$2CH_2CO \rightarrow C_2H_4 + 2CO$	-76.90
18	Allene formation	$2CH_2CO \rightarrow C_3H_4 + CO_2$	-110.70
19	Hydrocarboxylation of ethylene	$C_2H_4 + H_2O + CO \rightarrow CH_3CH_2COOH$	-171.59

2.3 Figures and Graphics

Figure 1 shows the temperature dependence of the equilibrium constants for all of the processes mentioned in Table 1. When the reaction results into larger ln K value which indicating the reaction is more likely spontaneous as the Gibbs free energy change (ΔG_r) is negative. When ΔG_r is positive, the reaction is limited thermodynamically. The equilibrium constant (K) determined the extent to which the reaction occurs.

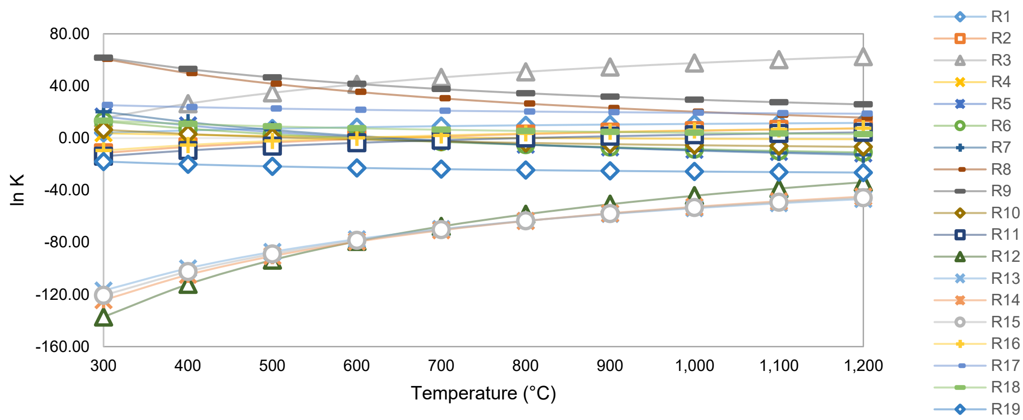

Fig. 1: Temperature dependence of the equilibrium constant for co-cracking of ethyl acetate reaction at atmospheric pressure

Based on Figure 1, the thermal decomposition reactions (R1 and R2) and steam reforming of ethyl acetate reaction (R3) are highly spontaneous reactions that occur at any temperature within the specified parameter range. The water gas shift (R4) reaction is restricted to the whole temperature range. The methanation reactions (R5, R6 and R7) are exothermic, which most probably takes place at lower temperatures (<600 °C) due to a positive magnitude of ln K. Due to their negative magnitude of ln K and equilibrium constraints, the methanation processes are limited to high temperatures (>600 °C).

The natural logarithm of the equilibrium constant values for oxidative coupling of methane reactions (R8 and R9) drop as temperature rises, indicating that these reactions are not possible at high temperatures. The reaction of dehydrogenation of ethane (R11) is effective at temperature (>800 °C). At temperature (<800 °C) the reaction is affected by equilibrium limitations. Carbon is more likely form at lower temperature for R13, R14 and R15. Formation of ketene (R16) from acetic acid will only occur at high temperature and restricted at low temperature due to equilibrium limitations. Ketene then undergoes ketene decomposition (R17) and allene formation (R18). The hydrocarboxylation of ethylene is an unfavourable reaction within the studied period.

Figure 2a and 3a shows the variation in hydrogen yield at specified operating temperatures range and 1 bar with change the of EAMR and EAER ratios. Hydrogen yield was found to rise gradually with temperature. Lowest EAMR and EAER results in highest yield of hydrogen. EAMR generated more hydrogen than EAER due to the fact that ethanol solvent contributed to some hydrogen gas due to its ability to supply more hydrogen atoms. The increase in hydrogen production was triggered by the third reaction (R3). Hydrogen was not absorbed by methanation reactions (R5, R6 and R7) since they only possible at low temperature. The quantity of carbon monoxide rose gradually until a specific threshold was reached, and then stayed constant from 615 °C for both EAMR and EAER. The water gas shift reaction elucidates this situation (R4).

The carbon monoxide production from EAMR and EAER co-cracking at 1 bar and the different temperature range are shown in Figure 2b and 3b. Methanation reactions (R5, R6 and R7) and disproportionation reaction (R13) rigorously consume carbon monoxide which lead the unchanged yield of carbon monoxide at temperature >615 °C. The amount of ethylene generated as a result of the action of EAMR and EAER at various temperatures at 1 bar is shown in Figure 2c and 3c. Maximum yield of ethylene was obtained for both EAMR and EAER of 2:1 at 1,200 °C but EAER yield higher amount of ethylene, 0.76 kmol compared to EAMR, 0.558 kmol of ethylene.

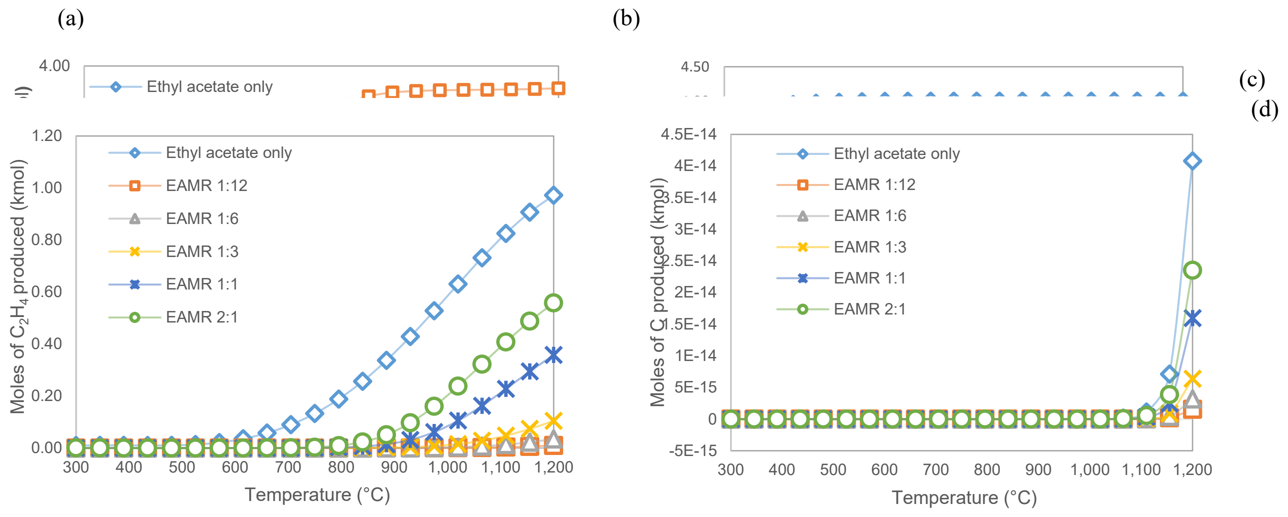

Fig. 2: Yield of (a) H_2 (b) CO (c) C_2H_4 and (d) C for different EAMR at 1 bar

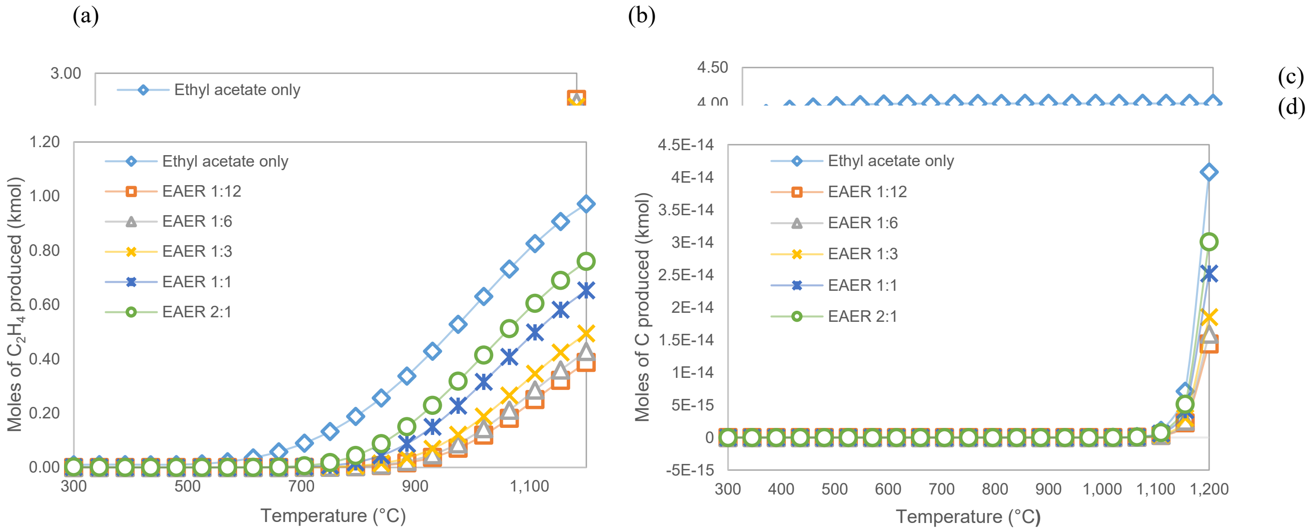

Fig. 3: Yield of (a) H_2, (b) CO, (c) C_2H_4, and (d) C for different EAER at 1 bar

As a result, ethylene production was significantly increased when ethane (R11) was dehydrogenated, as opposed to oxidative coupling of methane (R9), which was more limited by equilibrium constraints. The generation of ethylene grew gradually on a thermodynamic basis, based on R10. Another alternative of direct conversion to light hydrocarbon (ethylene and ethane) is oxidative dehydrogenation which is also known as oxidative coupling of methane (R8 and R9). Methane reacts with oxidant (oxygen or carbon dioxide) at lower temperature and produce C_2 products.

Methanol and ethanol solvent contribute to light hydrocarbon production in the process by enhancing the properties of ethyl actetae. Coke is an undesired product, which is regarded as problem of the choke point in the co-cracking of the ethyl acetate reaction. It inhibits the other light hydrocarbon production. Figure 2d and 3d shows the coke formation at 1 bar and designated temperature range with different EAMR and EAER. The amount of coke formed was almost zero (<1,100 °C) and began to increase (>1,100 °C). The lowest amount of coke formed for EAMR compared to EAER with slightly more amount. It is due to reaction of ethanol contribute to carbon formation. Liang, Mohamed [12] states that high AMR (acetic acid/ methanol ratio) and low AER (acetic acid/ethanol ratio) contribute significant carbon yield.

R12, R13, R14 and R15 displays coke formation yield. Considering that the equilibrium constants of the reactions are very minimal, the processing parameters could relatively favour to influence these reactions. The disproportionation reaction represented by R13, commonly known as the Boudard reaction, may appear to be significant contributor of large chunk of coke formation. The carbon dioxide formation enthalpy is larger than carbon monoxide, although entropy generation is an integral part of this process. Carbon dioxide total free energy change of formation by oxidation is almost constant disregarding the temperature. This indicates that if catalyst is employed, it may easily be poisoned at lower temperatures, because the balance supports the production of exothermic carbon dioxide and coke. The generation of R12, R14 and R15 coke is mostly unplausible because the reactions are negatively influenced by the equilibrium limitation. In overall, the thermodynamic analysis supported by the complex reaction discussion provided better comprehension to design the cracking reaction of bio-oil model compound. At its present state, ethylene formation seems to be the most compared to another light hydrocarbon which appears to be too small. Ethanol as a co-reactant boosted the formation of ethylene, but it looks like if ethylene is the main target, it is better off to have ethyl acetate only for the cracking process.

3.0 CONCLUSION

It was discovered that the yield of ethylene synthesis was not promising via thermodynamic modelling and equilibrium analysis, but quite impressive for hydrogen and syngas. EAMR of 2:1 at T = 1,200 °C and P = 1 bar was the optimum condition for ethylene production when methanol and ethyl acetate were considered as the feedstock. The optimal conditions for ethyl acetate and ethanol were found to be at T = 1,200 °C and P = 1 bar with EAER 2:1. The findings provide valuable information on the best performing process parameters for ethylene formation. It is significant for the study of bio-oil upgrading to hydrocarbon which is more precious. Future study includes conducting experimental work using the model compound for verification reasons.

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THE EFFECT OF SONICATION PARAMETERS ON STRUCTURAL, MORPHOLOGICAL AND ELECTRICAL PROPERTIES OF POLYPYRROLE NANOPARTICLES

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ABSTRACT

Polypyrrole (PPy) was chemically synthesized using ferric chloride ($FeCl_3$) and hydrochloric acid (HCl) as oxidant and dopant, respectively. The polymerization of PPy was performed under varying sonication time and sonication power. The effects of various sonication time and sonication power on the electrical conductivity of PPy were investigated. Response Surface Methodology-Analysis of variance (RSM-ANOVA) has been used to optimize the polymerization of PPy. Based on RSM-ANOVA, the highly conductive PPy (0.024 S/cm) can be produced by using sonication time of 17 minutes and sonication power of 24 watts. The electrical conductivity of the samples was experimentally evaluated by the four-point probe in order to compare with the predicted results from RSM-ANOVA. The optimized sample was characterized using SEM, FTIR, DSC and TGA, respectively. The PPy produced exhibits a nearly spherical. Therefore, the outcomes of this research show that the RSM-ANOVA was an effective approach to optimize the synthesis parameters of PPy. The obtained PPy can be a promising conducting material to be used in various applications such as supercapacitors, sensors, and other smart electronic devices.

Keywords: polypyrrole; RSM-ANOVA, optimization

1.0 INTRODUCTION

Polypyrrole, PPy is an organic electrical conducting polymer that formed by polymerization of pyrrole monomer. PPy has attracted many scientists and researchers from industries because PPy can be used as bio sensors, gas sensors, light weight rechargeable batteries and blend of PPy based polymer protect the corrosion of metal. Polymerization of pyrrole maybe carried out chemically or electrochemically and PPy majorly prepared by oxidation (p-doping) of pyrrole using Ferric Chloride [50]

However, chemical oxidation might alter the structural, morphological and electrical properties of PPy nanoparticle. To overcome this problem, Sonication is an alternative solution to retain the electrical, morphological and structural of PPy. Structure of PPy also contribute significantly for electrical conducting properties.[50]

Sonochemistry is one of the methods for the production of nanomaterials. Sonochemistry is a technique where high intensity of ultrasound is induced to produce high temperature ranging above 500K, pressure exceeding 1000 atm and cooling rates in excess 10^{10} K per second. The speed of sound normally ranges 1000 until 1500 ms^{-1}, wavelengths vary from 100 µm until 10cm and frequency which ranges 20kHz to 15MHz. The physical and chemical changes of nanoparticle is due to growing and implosive collapse of cavitation bubbles. The oscillating cavitation bubbles can accumulate ultrasonic energy until growing to a certain size before collapsing.[6]

Response Surface Methodology (RSM) is a combination of mathematical models and statistical methods to optimize a response which is influenced by a number of independent variables.[11] RSM also includes experimental strategies which imposed for mathematical modelling and solving engineering problems because we have to deal with a lot of variables. RSM also known as statistical method which implement quantitative data from an experiment to solve multi-variable equations. [2]

Analysis of variance is a statistical technique to analyze the variations in a response or in other words continuous random variable. Normally, we use ANOVA technique to compare variance among groups or which known as random error.[22] ANOVA technique was developed by Sir Ronald Fisher to analyze agricultural experiments. Nowadays, ANOVA is a common technique where it is used in all experimental sciences because we can input the data and run ANOVA easily. But still, challenges arises when to choose appropriate ANOVA for various experimental designs for the appropriate assumptions and it is challenging to interpret the data correctly. [22]

For the first time, the present study considers the two main variables, i.e. sonication time and sonication power in the fabrication of PPy by direct ultrasonic irradiation polymerization method; thereby a combination of RSM-CCD and ANOVA were employed in the experimental design. The key objective of the current work was to obtain the optimum sonication time and sonication power order to fabricate highly conductive PPy. In addition, the morphological and structural properties of the optimized PPy sample were also studied.

2.0 Materials and Methods

Pyrrole, Py (98% purity) was procured from Sigma Aldrich (M) Sdn. Bhd;$FeCl_3$ (analytical grade) and HCl (37%) were procured from Progressive Scientific Sdn. Bhd. and Qrec (Asia) Sdn. Bhd., respectively. All the chemicals were used as received without further purification and distilled water was used throughout the experiments.

An ultrasonic equipment was used to enhance the chemical oxidative polymerization of PPy nanoparticles in this research. The ultrasonic equipment which aids the polymerization of PPy is BILLION-1200Y ultrasonic reactor. PPy nanoparticles synthesized via ultrasonic irradiation method and modified with some adjustments such as sonication power and sonication time. There was no purification imposed on the materials used. In the sets of experiments, the reaction kept at 0-5 ºC. The concentration of Py fixed at 0.05M, $FeCl_3$ fixed at 0.1M meanwhile HCl fixed at 1M.

At first, 1.3418g of Py and 6.488g of $FeCl_3$ weighed using electronic balance scale. 1.3418g of Py was added with 0.4L of HCl (1M) in a beaker to achieve 0.05M meanwhile 6.488g of $FeCl_3$ was added with 0.4L of HCl(1M) to achieve 0.1M. The Py mixed with HCl solution stirred using a magnetic stirrer for 30 minutes and $FeCl_3$ mixed with HCl stirred for 10 minutes. After that, both solutions are mixed together where the final volume is 0.8L.

The pyrrole solution kept inside the sonication chamber under iced water bath. Sonication imposed on the pyrrole solution according to the sonication parameters designated by DOE software. The solution was left overnight for the polymerization. The next day, the precipitate collected by vacuum filtration using a nanosized filter paper. Followed by that, the precipitate washed by distilled water until the precipitate achieve pH of 7. Finally, the filter cake dried at temperature of 50ºC in an air oven for one day (24 hours) and it was stored in a zip lock bags for further experimentation. After that, the samples tested for conductivities.

By using Design-Expert 11 software, the RSM-ANOVA was employed to study the effect of sonication time (A) and sonication power (B) on the conductivity of PPy. The experimental design of the levels for each variable presented in Table 1 was based on the results of the preliminary references. A total of 13 experiments were designed by RSMCCD, and the data were analyzed by multiple regressions to fit the second-order quadratic polynomial model based on the Equation (1)

$$Y = b_0 + \sum_{i=1}^{K} b_i x_i + \sum_{i=1}^{K} b_{ii} x_i^2 + \sum_{i}^{k} \sum_{j}^{k} b_{ij} X_i x_j \quad (1)$$

where Y is the response value of electrical conductivities (the area under the curve), b_0 is the constant, b_i is the linear effect of the factor xi (i = 1 and 2), b_{ii} is the quadratic effect of the factor x_i and b_{ij} is the linear interaction effect between the input factors, x_i and x_j.

TABLE 1. Experimental design of the levels of the independent variables

Factor	Symbol	Low Level (-1)	Intermediate Level (0)	High Level (+1)
Sonication time (mins)	X_1	15	67.5	120
Sonication Power (W)	X_2	10	30	50

The conductivity of each PPy sample will be measured using a four-point probe electrical conductivity tester (Model: ST2258C, Jiangsu, China). The morphology of PPy analyzed by SEM and thermal stability determined using DSC and TGA analysis. The chemical structure of PPy analyzed by FTIR spectra.

3.0 Results and Discussion

3.1. Optimization using RSM and ANOVA for the electrical conductivity of PPy

A total of 13 experiments were performed based on the RSM-CCD and the results are presented in Table 2. According to the experimental results obtained from RSM-CCD, the quadratic models in terms of the coded and actual value of variables are shown in Equations 2 and 3, respectively.

$$Y= -0.0028-0.0113X_1-0.0080X_2+0.0142X_1X_2+0.0102X_1^2+0.0052X_2^2 \qquad (2)$$

$$Y= 0.079751-0.001122X_1-0.002095X_2+0.000014X_1X_2+3.71 \times 10^{-6} X_1^2 +0.000013X_2^2 \qquad (3)$$

TABLE 2 Experimental parameters obtained from RSM-ANOVA analysis using Design Expert 11 for the preparation of the PPy polymerization

Run	Sample Name	Time (min) X_1	Power (W) X_2	Electrical conductivity (S/cm)	Average Resistivity (Ω)
1	S1	15	10	5.85×10^{-2}	77.2
2	S2	15	30	2.44×10^{-3}	1.85k
3	S3	15	50	1.03×10^{-4}	43.8k
4	S4	30	30	1.57×10^{-2}	0.288k
5	S5	30	50	1.06×10^{-3}	4.27k
6	S6	67.5	10	3.90×10^{-6}	117.03k
7	S7	67.5	30	2.90×10^{-5}	154.78k
8	S8	67.5	50	2.40×10^{-5}	184.775k
9	S9	75	10	3.80×10^{-5}	118.775k
10	S10	75	30	2.40×10^{-4}	19.53k
11	S11	120	10	3.20×10^{-5}	140.68k
12	S12	120	30	5.00×10^{-5}	90.36k
13	S13	120	50	3.9×10^{-5}	115.42k

ANOVA was used to analyze the model and evaluate the statistical significance of each examined factor. The importance of the influence of each factor was described based on the Fisher's statistical test (F-value) and probability (P-value) of the results of ANOVA for the quadratic model. The larger F-value with the smaller

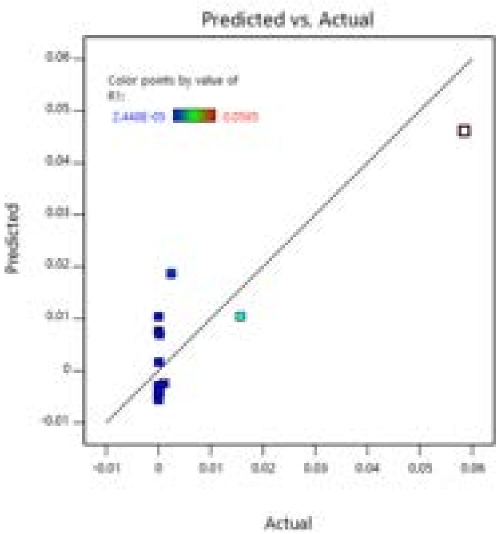
P-value (<0.05) suggests the significance of the corresponding coefficient term. On the contrary, when P-values are higher than 0.10, they are generally regarded as being insignificant. Table 3 shows the ANOVA results of the response surface quadratic model.

TABLE 3. ANOVA results for response surface quadratic model

Source	Sum of Squares	df	Mean Square	F-value	p-value
Regression model	0.0024	5	0.0005	4.44	0.0385 **(significant)**
X_1	0.0009	1	0.0009	7.88	0.0262
X_2	0.0005	1	0.0005	4.53	0.0707
X_1X_2	0.0009	1	0.0009	8.04	0.0252
X_1^2	0.0003	1	0.0003	2.52	0.1562
X_2^2	0.0001	1	0.7482	0.7482	0.4157
Residual error	0.0008	7	0.0001		
R^2	0.7602				
Adjusted R^2	0.5888				
Predicted R^2	-0.6984				
Adequate Precision	7.2702				

Table 3 shows the ANOVA for each term of the model. Significant terms can be determined from the large F-values and p<0.05 as it previously discussed. The model F-value of 4.44 implies the model is significant. There is only 3.85% chance that an F-value this large could occur due to noise. The results of ANOVA suggests that the model can be explained for about 76.02% (R^2= 0.7602). The other term which is X_2^2 does not influence the conductivity of PPy.

Figure 1 shows the plot for the predicted conductivity of PPy by the developed model against the experimental data. Based on the figure, the model depicted the relationship between the two process parameters and conductivity of PPy. Besides that, from the figure, many experimental values are deviated from the 45° line. The perturbation plot of the process variables on the conductivity of PPy illustrated in Figure 2. This perturbation plot gives an overview on the output response, which is conductivity of PPy. Based on the figure, we can deduce that both process parameters which are sonication time and sonication power have equal effect on the conductivity of PPy.



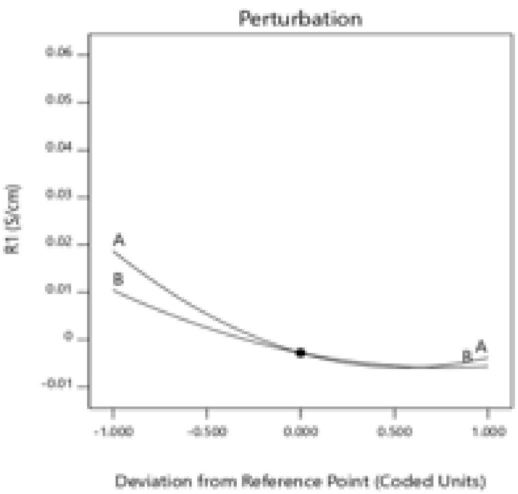


Fig.1 Predicted vs actual conductivity of PPy

Fig. 2 Perturbation plot of process parameters on the conductivity of PPy

The response surface and contour plots of the influence of sonication time (A) and sonication power (B) on the conductivity of PPy are presented in Fig.3 (a and b). Considering sonication time and sonication power as the two significant parameters affecting conductivity, Fig.3 illustrates the combined effect of these two factors on conductivity. It is evident from Fig.3 that both parameters which are sonication time and sonication power have significant influence on conductivity of PPy. The reason is higher sonication power can disturb the polymer chain and increase the resistivity.

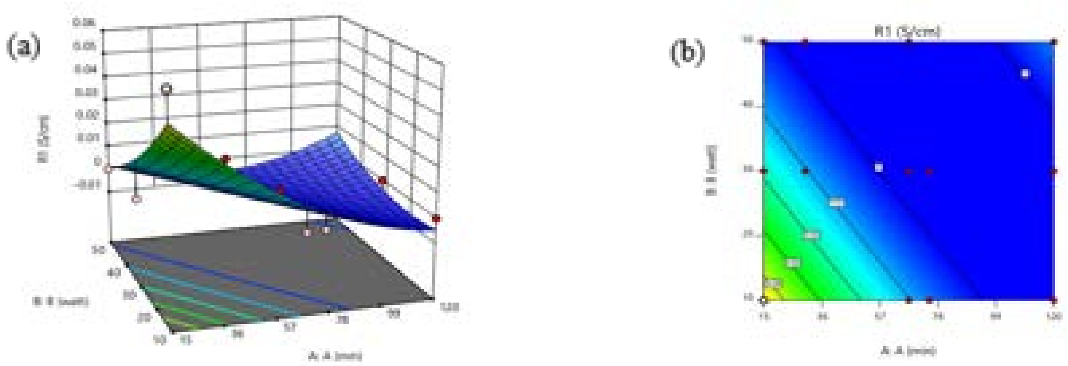


Fig. 3 (a) response surface plot (b). contour plot

Furthermore, Table 4 shows the comparison of the conductivity of PPy obtained from the predicted model and the actual experimental measurement. Based on Table 4, under optimum sonication time and power, the conductivity of PPy obtained from the experimental was 0.02405 S/cm, whereas it was predicted to be 0.02249 S/cm by the RSM-ANOVA analysis. A good agreement between the experimental and predicted data is observed with an acceptable relative error of 6.86%.

TABLE 4. Comparison of the conductivity of PPy obtained from the predicted and the experimental data

Process Parameters	Model Optimized	Experimental Value
Sonication Time (mins)	17.7	
Sonication Power (Watts)	24.3	
Conductivity (S/cm)	0.02249	0.02405

Fig.4 (a) present the SEM micrographs of PPy synthesized under optimum parameters. In Fig.4a, the fabricated PPy particles were seen to be closely packed to each other and appeared in a nearly spherical shape. A similar observation was also reported by other researchers [25] Moreover, the average particle size of PPy was found to be about 350 nm.

FTIR Analysis

The FTIR spectra of optimized PPy is shown in Fig.4b. The peak belonged to 2356 cm^{-1} belonged to C-N group. Meanwhile, the peak 1539 cm^{-1} attributed to secondary amide where a nitrogen atom attached to two carbon atoms. The occurrence of wide peak of 1185 cm^{-1} is in good agreement with C-N vibrations. The characteristic peak at 794 cm^{-1} is due to C=C bending. Moreover, the peak of 1043 cm^{-1} also can be assigned to stretching of C=C vibrations.[47] Additionally, PPy also shows its characteristic peaks at 924 cm^{-1} corresponding to C-H out of plane deformation, ring deformation vibration and C-H wagging.[25]

DSC Analysis

In order to determine the thermal stability of PPy, DSC testing was performed to get the T_g value. Fig 4.c shows the DSC curve for optimized PPy. The mobility of PPy undergoes a stepwise increase at the onset glass transition, T_g= 124.26 ºC and begins to melt at T_g= 457.32 ºC. .

TGA Analysis

Figure 4.d shows the TGA curve for optimized sample of PPy. The fluctuation in weight losses of the samples with increasing temperature is noticed in thermogravimetric analysis. Weight loss occurs as a result of volatiles being driven off, as well as breakdown products at higher temperatures. The degradation mechanism is thought to consist of two or more processes. The host polymer reacts with the dopant anion in one reaction, while the polymer reacts with oxygen or water in the other. [44] Weight loss started to occur at 30.02 ºC where 1.7740 mg of PPy sample losses 3.89% of initial weight. Significant weight loss can be seen at temperature of 275 ºC. At temperature of 931.8 ºC, PPy loses all of its weight.

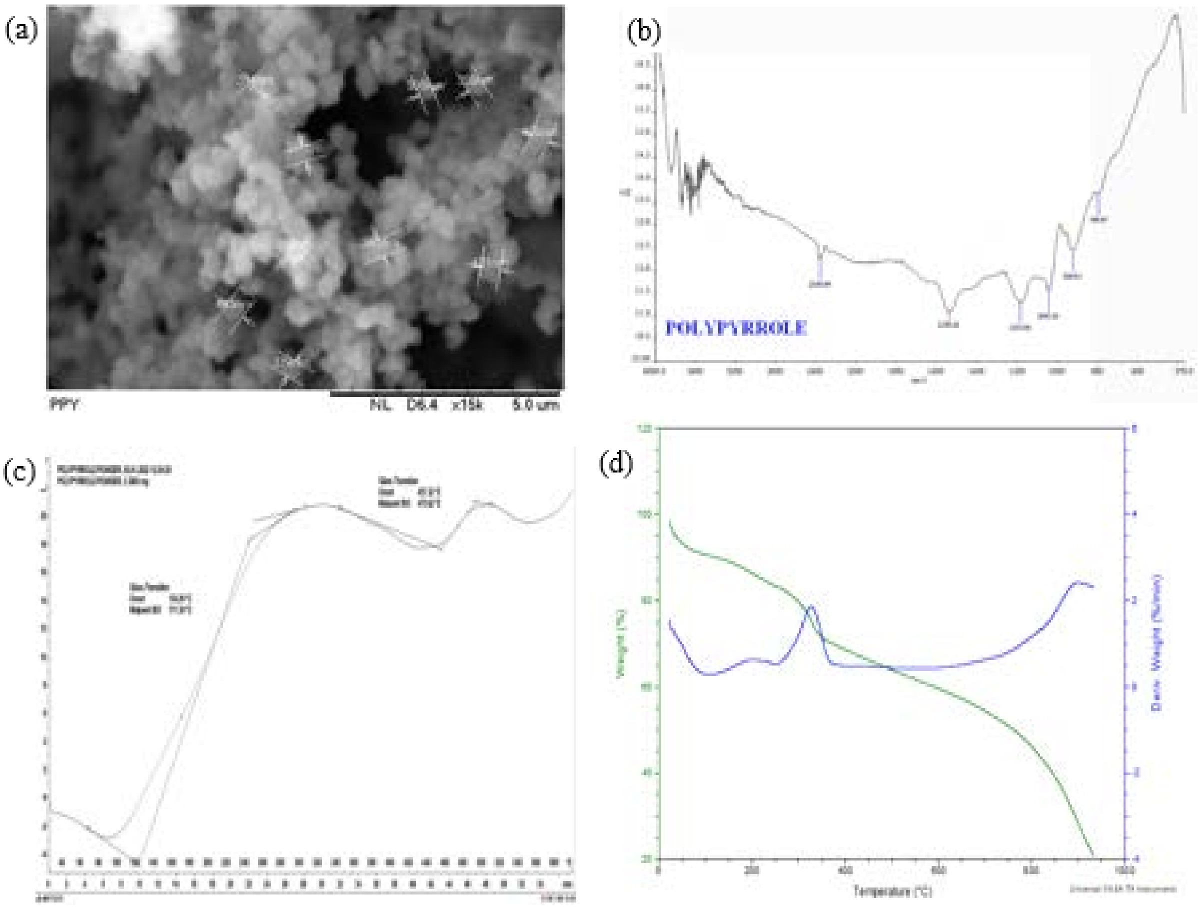


Fig. 4a.SEM micrograph b) FTIR analysis c) DSC analysis d) TGA analysis

CONCLUSIONS

PPy was synthesized under ultrasonic irradiation by varying the sonication time from 15 minutes to 120 minutes with sonication power from 10 W to 50 W. In this study, RSM-ANOVA analysis was used to optimize the conductivity of PPy. The effect of the two factors, namely, sonication time and sonication power has been evaluated. From the findings, both parameters has the strongest effect on PPy conductivity. The model optimized values suggested that desirable conductivity of PPy can be achieved at 17 minutes and 24 Watts for sonication time and sonication power, respectively. The relative error between the experimental and model values achieved was 6.86%. PPy was also successfully prepared under ultrasonic irradiation with cauliflower-like structure revealed by SEM. FTIR analysis confirmed the polymerization of PPy monomer meanwhile DSC and TGA analysis showed that PPy is highly stable with increasing temperature.

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THERMODYNAMIC ANALYSIS OF FUEL OIL BLENDED STOCK (FOBS) TO LIGHT HYDROCARBON

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ABSTRACT

With the limitations of fossil fuels and their harmful usage to the environment, efforts have been made to develop cheaper raw materials to meet the growing global energy market demand. Oxidative Cracking of Fuel Oil Blended Stock (FOBS) has been developed as hydrogen and light hydrocarbon production alternative to replacing fossil fuels. In this study, thermodynamic analysis was used to investigate the cracking of n-eicosane, C_{20}, a FOBS surrogate fuel, under different n-eicosane to oxygen ratios (EO). Equilibrium calculations were carried out using the total Gibbs free energy minimization approach at a temperature range of 573.15 K – 1273.15 K and a pressure range of 0 bar - 20 bars. The optimum condition for EO was found at 0.95: 0.05 under the atmospheric pressure condition. Results revealed that the optimum temperature for methane synthesis was 573.15 K, while hydrogen was 1273.15 K. Other light hydrocarbons such as ethane, ethene, propane, and propene were also produced. For the pressure, temperature, and EO addressed in this work, a complete conversion of n-eicosane was obtained.

Keywords: Thermodynamic Analysis, Oxidative Cracking, Fuel Oil Blended Stock, Light Hydrocarbon, Hydrogen

1.0 INTRODUCTION

According to World Bank, in 2020, the utilisation of fossil fuels are still the main energy source in many countries due to the limited development of renewable energy technology [1]. Because of the finite supply of fossil fuels, efforts have been made to develop cheaper raw materials capable of replacing fossil fuels in fulfilling the expanding global energy market demand. Despite massive investments in new technology to encourage the exploitation of fossil fuels, the global energy supply remains lower than the worldwide energy demand, with a billion people worldwide lacking access to power [2]. Throughout this context, the rise in global fuel prices as a result of the shortage of natural oil and gas and the tightening of environmental regulations on sulfur emission [3] have piqued the interest of academics in cheaper fuel oil feedstocks. Recently, researchers have focused on heavy fuel oil (HFO), a common FOBS component. HFO is a byproduct of the crude oil refining process and is a low-cost and common fuel for industrial units, furnaces, and marine engines. The abundance of heavy oil resources encourages research into upgrading HFO to produce lighter fuel that burns cleanly [3].

HFO is usually blended with light distillates to match fuels requirements. This shows that HFO could be a viable component of the diverse range of alternative fuels required to meet rising energy demand. Saturates, aromatics, resins, and asphaltenes (SARA) are the primary components of HFO [4]. The precise composition varies depending on the original source and the component of combining cutting stock. It is generally high in saturates and aromatics. The present of asphaltene contributes to its black colour and high viscosity. The fuel oil upgrading process also provides a modern strategy to dispose of HFO sustainably, hence reducing the environmental impact of HFO. The common thermochemical conversion processes used to upgrade FOBS are thermal cracking, hydrocracking, catalytic cracking, and pyrolysis [5].

Thermal cracking and pyrolysis of FOBS are both low-cost methods without the use of catalysts [6,7]. These processes require fuel to heat the cracking reactor to temperatures greater than 350 °C. However, fuel combustion outside the reactor emits significant pollutants into the environment. The production of coke is usually highlighted and the amount of light fraction production is lower in these processes. The cracking of FOBS with oxygen was introduced with multiple advantages. The advantages of using oxygen include increased light fraction production and decreased coke formation in the reactor [8,9]. Oxygen also enhances the rate of cracking reaction, reducing the amount of fuel required in the upgrading process. The overall pollutant emissions from oxidative cracking are lower than conventional cracking processes.

This study focused on the oxidative cracking of the FOBS model compound into light hydrocarbons with higher economic value. The majority of current research concentrates on using catalysts or other co-reactants to improve the yield of liquid products. Only a few studies have been undertaken to study the cracking of HFO with oxygen. Furthermore, no prior studies on oxidative cracking of *n*-eicosane, C_{20} as a surrogate fuel had been done. In order to perform a swift analysis in finding the feasibility of oxidative cracking of FOBS with oxygen, thermodynamic analysis was applied in this study. It is one of the best ways to do a quick examination since it avoids and eliminates all of the drawbacks associated with comprehensive experimental work. The use of oxygen in this research aims to improve the cost-effectiveness of the oxidative cracking by using thermodynamics analysis method.

2.0 METHODOLOGY

HSC Chemistry version 11.0 software was used to perform the thermodynamic analysis of oxidative cracking of *n*-eicosane ($C_{20}H_{40}$) with oxygen (O_2). The minimization method of total Gibbs energy was performed to identify the stable chemical species when the system reaches equilibrium at a constant temperature, pressure, and mass balance. *N*-eicosane and oxygen were input into the software as the reactants. The total moles of reactants are 1 kmol. Based on reviews of the literature, the reaction products were postulated. The reaction products were hydrogen (H_2), coke (C), methane (CH_4), water (H_2O), carbon monoxide (CO), carbon dioxide (CO_2), ethane (C_2H_6), ethene (C_2H_4) and acetylene (C_2H_2). The generation of minor byproducts was not taken into account in this investigation. Reaction kinetics, reactor design, and operation were not considered in this study. The following parameters: temperature, pressure and *n*-eicosane to oxygen ratios (EO) were studied. The working temperature was held between 573.15 K and 1273.15 K, and the pressure was kept between 0 bar and 20 bars, while the EO were 0.5:0.5, 0.7:0.3, 0.8:0.2, 0.9:0.1, and 0.95:0.05. In all studied reaction parameters, complete (100%) conversion of *n*-eicosane was observed, showing that n-eicosane cracking with oxygen is plausible.

3.0 RESULT AND ANALYSIS

20 feasible reactions for oxidative cracking of *n*-eicosane with oxygen at 1 bar were listed in Table 1. The main oxidative cracking of *n*-eicosane occurred via R1, a highly exothermic reaction. The cracking of FOBS with oxygen provides an exothermic route in the cracking process compared to the endothermic route in conventional cracking. After forming the first products via R1, R2 and R3, other side reactions occurred subsequently. Other than C-C bond homolytic scission, the inclusion of oxygen as a co-reactant enhanced cracking by encouraging cleavage in the C-H bond.

Figure 1 depicted the equilibrium constants of all reactions as a function of temperature. When the Gibbs free energy change (ΔG_r) is negative, the reaction is spontaneous. Positive ΔG_r indicates a reaction is thermodynamically limited. The oxidative cracking (R1) and partial oxidation (R2, R3) of *n*-eicosane were highly spontaneous under-investigated temperatures. All partial oxidation reactions (R3 to R9) were exothermic and spontaneous, increasing temperature reducing the plausibility of reactions. Among the partial oxidation processes, only R3 recorded a

TABLE 1: Feasible reactions in oxidative cracking of *n*-eicosane with oxygen

No.	Type of Reaction	Equation
R1	Oxidative cracking of *n*-eicosane	$C_{20}H_{42}(g) + 3\ O_2(g) \rightarrow 2\ H_2(g) + 6\ CO(g) + 2\ CH_4(g) + 3\ C_2H_6(g) + 3\ C_2H_4(g)$
R2	Partial oxidation of *n*-eicosane	$C_{20}H_{42}(g) + 10\ O_2(g) \rightarrow 21\ H_2(g) + 20\ CO(g)$
R3	Partial oxidation of *n*-eicosane	$C_{20}H_{42}(g) + 20\ O_2(g) \rightarrow 21\ H_2(g) + 20\ CO_2(g)$
R4	Partial oxidation of methane	$2\ CH_4(g) + O_2(g) \rightarrow 4\ H_2(g) + 2\ CO(g)$
R5	Partial oxidation of methane	$CH_4(g) + O_2(g) \rightarrow 2\ H_2(g) + CO_2(g)$
R6	Partial oxidation of ethane	$C_2H_6(g) + O_2(g) \rightarrow 3\ H_2(g) + 2\ CO(g)$
R7	Partial oxidation of ethane	$C_2H_6(g) + 2\ O_2(g) \rightarrow 3\ H_2(g) + 2\ CO_2(g)$
R8	Partial oxidation of ethylene	$C_2H_4(g) + O_2(g) \rightarrow 2\ H_2(g) + 2\ CO(g)$
R9	Partial oxidation of ethylene	$C_2H_4(g) + 2\ O_2(g) \rightarrow 2\ H_2(g) + 2\ CO_2(g)$

No.	Type of Reaction	Equation
R1	Oxidative cracking of *n*-eicosane	$C_{20}H_{42}(g) + 3\ O_2(g) \rightarrow 2\ H_2(g) + 6\ CO(g) + 2\ CH_4(g) + 3\ C_2H_6(g) + 3\ C_2H_4(g)$
R10	Methane decomposition	$CH_4(g) \leftrightarrow 2H_2(g) + C(s)$
R11	Dehydrogenation of ethane	$C_2H_6(g) \leftrightarrow C_2H_4(g) + H_2(g)$
R12	Dehydrogenation of ethylene	$C_2H_4(g) \leftrightarrow C_2H_2(g) + H_2(g)$
R13	Oxidative dehydrogenation of ethane	$2\ C_2H_6(g) + O_2(g) \rightarrow 2\ C_2H_4(g) + 2\ H_2O(g)$
R14	Oxidative dehydrogenation of ethylene	$2\ C_2H_4(g) + O_2(g) \rightarrow 2\ C_2H_2(g) + 2\ H_2O(g)$
R15	Water gas shift reaction	$CO(g) + H_2O(g) \leftrightarrow H_2(g) + CO_2(g)$
R16	Boudouard Reaction	$2CO(g) \leftrightarrow CO_2(g) + C(s)$
R17	Methanation	$CO(g) + 3\ H_2(g) \leftrightarrow CH_4(g) + H_2O(g)$
R18	Methanation	$CO_2(g) + 4\ H_2(g) \leftrightarrow CH_4(g) + 2\ H_2O(g)$
R19	Reduction of CO	$H_2(g) + CO(g) \leftrightarrow H_2O(g) + C(s)$
R20	Reduction of CO2	$CO_2(g) + 2H_2(g) \leftrightarrow 2H_2O(g) + C(s)$

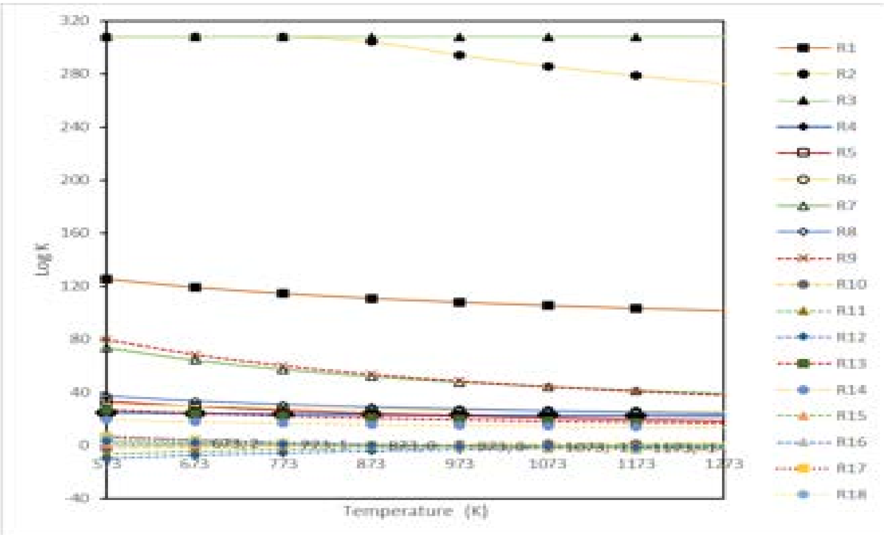

Fig. 1: Equilibrium Constant of Reactions in the Oxidative Cracking of *n*-Eicosane with Oxygen at 1 bar

constant log K value within the studied parameter. Methane decomposition (R10) and dehydrogenation of ethane (R11) were restricted at lower temperatures with a negative log K value. These reactions were only feasible at high temperatures. The negative log K value in the dehydrogenation of ethylene (R12) indicated that this reaction could only occur at extremely high temperatures. At any temperature within the examined parameter, oxidative dehydrogenation of ethane (R13) and ethylene (R14) occurred spontaneously with positive log K value. Reactions R15 - R20 were exothermic and were more likely to occur at temperatures lower than 873 K due to their positive log K value. Because of their negative log K and equilibrium constraint, these reactions were limited at high temperatures (>873 K).

The formation of hydrogen from *n*-eicosane oxidative cracking was shown in Figure 2(a). Hydrogen is always the most dominant product produced understudied temperature ranges. The yield of hydrogen increased with increasing temperature. The hydrogen production is highest in EO 0.95:0.05, whereas EO 0.5:0.5 produced the least hydrogen. The rise in hydrogen production

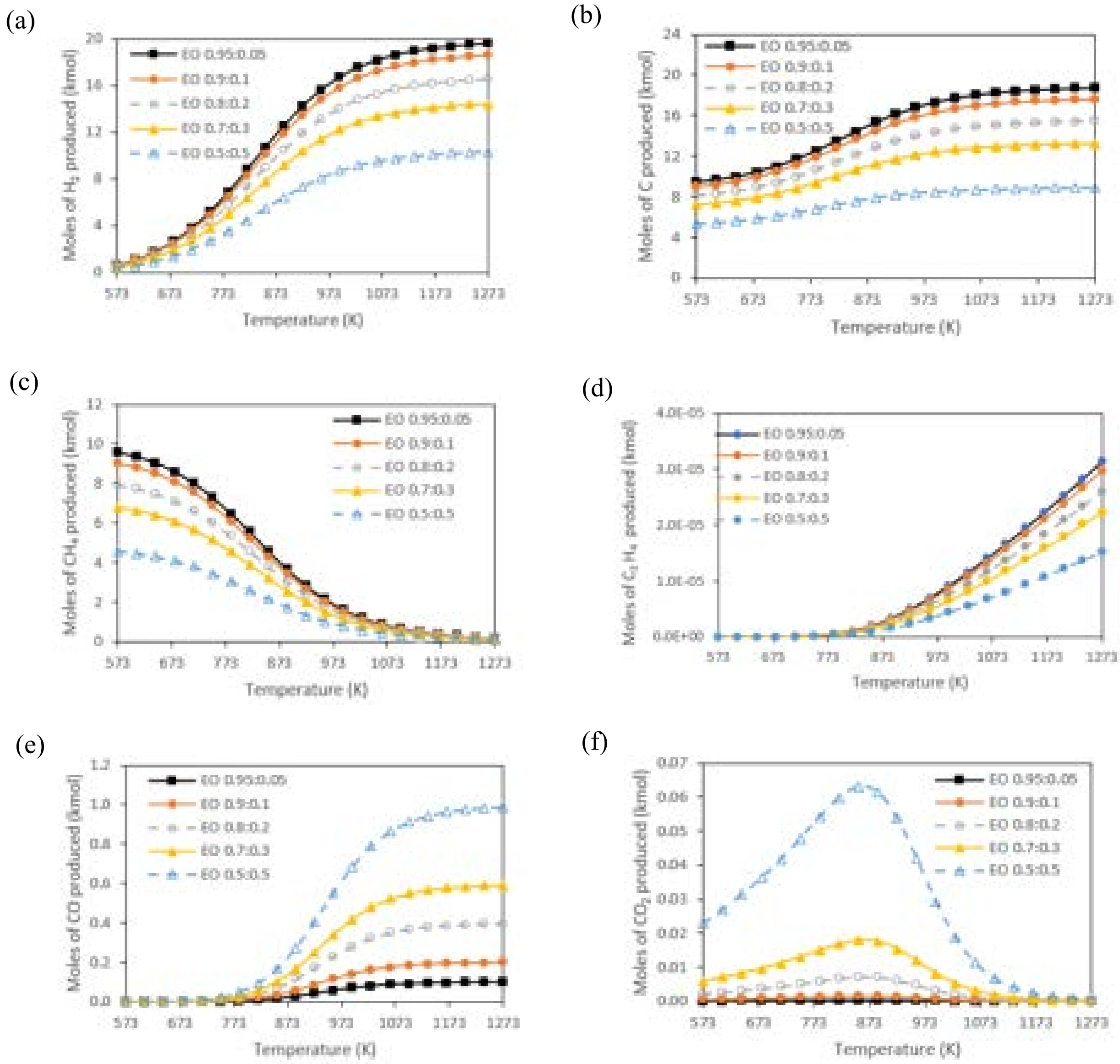

Fig. 2: Moles of (a) H_2 (b) C (c) CH_4 (d) C_2H_4 (e) CO and (f) CO_2 produced for different EO at 1 bar

was mainly attributed to R1, R2 and R3. The significant hydrogen content proved that oxidative cracking is a promising technology for producing clean fuel.

Figure 2(b) illustrated carbon production at different temperatures and various EO at 1 bar. The carbon synthesis was highest in EO 0.95:0.05 due to greater amount of carbon in the reactant. EO 0.95: 0.05 also showed the highest increment of carbon production when the temperature increased. This was due to the methane decomposition favoured high temperatures increased both carbon and hydrogen productions [10].

Figure 2(c) illustrated the number of moles of methane produced at 1 bar. The synthesis of methane is crucial because it serves as a precursor to hydrogen production. The yield of methane decreased with increasing temperature. The decline in methane yield with increasing temperature could be attributed to the R17 and R18 that were thermodynamically limited at higher temperatures. Ethylene was the highest yield olefin formed in the oxidative cracking of *n*-eicosane at 1 bar.

The yield of ethylene formed versus temperature under various EO at 1 bar was shown in Figure 2(d). Ethylene was the main alkene in the products. The number of moles of ethylene was highest at EO 0.95:0.05. The rise in temperature accelerated ethylene production in all EO after 773 K. The equilibrium constraint of R11 limited ethylene synthesis at low temperatures. The β-scission of radicals facilitated ethylene formation when the temperature increased [11].

Figure 2(e) and (f) showed the CO and CO_2 synthesis from different EO at 1 bar, respectively. Low EO (0.5:0.5) and high temperatures favoured CO production. There was a low CO yield before 873 K due to methanation (R17) consuming CO to produce methane. Under low EO, moles of CO_2 reached a maximum at around 800 K to 900 K. The decreased CO_2 production beyond the maximum point was contributed by boudouard reaction (R16), which was reactant preferred at higher temperatures. Other than enhancing the selectivity of CO compared to CO_2 synthesis, the oxidative cracking process also minimised CO_2 synthesis by reducing the energy needed for the combustion of fuel outside the reactor [12].

A variation in pressure and temperature was also performed to investigate production trends. As shown in Figure 3(a), the effect of pressure and temperature on hydrogen yields at optimum EO (0.95:0.05) was analysed. Hydrogen yield was highest under high temperatures and low pressures. At pressures greater than 1 bar, the hydrogen yield was less than 1 mol at low temperatures. Thus, the atmospheric pressure condition proved economically viable for hydrogen production.

Figure 3(b) illustrated methane yield as a function of temperature and pressure. At optimum EO 0.95:0.05, the number of moles of methane was optimum at low temperatures and high pressures. The increment in methane yield was not significant under investigated pressure. This

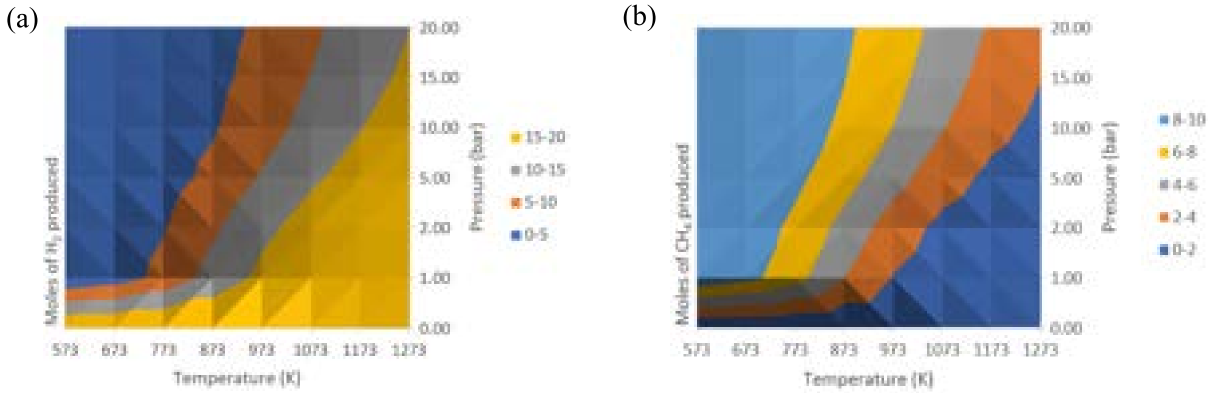

Fig. 3: Moles of (a) H_2 (b) CH_4 as a function of temperature and pressure for optimum EO 0.95:0.05

proved that atmospheric pressure (1 bar) is feasible for methane production while considering safety and economic factors.

4.0 CONCLUSIONS

Thermodynamic equilibrium favoured methane and hydrogen generation at atmospheric pressure (1 bar) and EO 0.95:0.05. The optimum condition for methane production was recorded at 573.15 K and hydrogen at 1273.15 K, respectively. In both the case of pressure and temperature, more hydrogen was formed as the pressure decreased and temperature increased. This study demonstrated significant environmental benefits in handling FOBS by converting it to more valuable compounds. The oxidative cracking of FOBS is economically feasible because it only requires little adjustment to deliver oxygen stream into the reactor.

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METAL IONIC CROSSLINKED CARBOXYLATED NITRILE BUTADIENE RUBBER GLOVE

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ABSTRACT

Crosslinking is one of the processing steps that enormously affects the tensile strength and flexibility of nitrile rubber-based hand gloves. A low-cost sulphur vulcanisation is commonly used in many glove industries to crosslink the latex. Alternatively, sulphur can be replaced with metal ions to form ionic bonds, together with the covalent bonds in latex enhance the glove properties. Hence, different types of metal ions have been proposed as crosslinkers and their effects on the physical and mechanical properties of the glove were investigated. Iron (III) ion derivative and zinc oxide (ZnO) were utilised as metal ion crosslinkers. About 1phr of crosslinker was added into carboxylated nitrile butadiene rubber latex (XNBR). pH of the latex mixture was adjusted to 9-10 by adding 5wt% of potassium hydroxide solution. The physical and mechanical properties of the gloves obtained were determined using FTIR analysis, solvent swelling, and tensile tester. The gloves crosslinked with Iron (III) ions exhibited higher tensile strength and crosslink density but lower elongation at break and modulus at 500% than the control sample crosslinked with ZnO.

Keywords: XNBR Glove, Metal Ion Crosslinker, Vulcanisation

1.0 INTRODUCTION

Gloves generally can protect the user's hands from the heat and cold environment, damage by friction, abrasion or chemicals, and provide protection to the bare hand. Gloves can be categorised based on usability, material, end-user, glove type, protection and region [1]. In terms of usability, the market is categorised into 2, disposable and reusable gloves. The disposable glove comprises natural rubber, nitrile, vinyl, neoprene, polyethylene, and other materials. It is widely used in the food, hospital, medical, pharmaceutical, laboratory other fields.

Rubber gloves are normally made up of polymers from the natural latex of the rubber tree or synthetic rubber such as nitrile rubber, blended with various additives, including vulcanising agents, accelerators, and fillers. The amount of additive added depends on the characteristics of the rubber latex gloves. However, a study showed that latex gloves negatively impact the user, such as skin irritation due to allergy to latex gloves. The study by Heese et al. [2] clarified that using an accelerator in the latex glove will cause type-IV allergy issues like human dermatitis contact. Not only that, Charous et al. [3] disclosed that the use of natural rubber latex as one of the raw materials in manufacturing the latex rubber gloves also cause the allergy to sensitive skin as it contains protein in the latex. Thus, the use of synthetic rubber polymer as the raw material for rubber gloves has become popular such as nitrile butadiene rubber (NBR), and carboxylated nitrile butadiene rubber (XNBR).

Crosslinking process is an essential part of the manufacturing of rubber hand gloves to improve the properties of the rubber hand gloves. Sulphur vulcanisation is a favourable method chosen by the manufacturer when manufacturing rubber latex gloves due to the low operating cost, but it will bring a few problems during the production process. The discharge of sulphur gas from the glove or production process will cause a negative impact on the environment, and it will also affect body health. Other than that, the poor properties of the rubber glove, such as lower tensile strength, will be obtained by this sulphur vulcanisation process due to glove are generally stiffer and exhibited low crack resistance [4].

Metal ionic crosslink is one of the crosslinking processes to produce the glove. It is used with polymers containing co-polymerisable acid groups to crosslink with the presence of different types of multivalent metal ions [5]. By using the metal ionic crosslink process, the mechanical and physical properties of the glove are improved [6] due to the increasing crosslinks of polymer chains [7]. Crosslink density between the metal ion and latex is also one of the factors that will affect the properties of the glove. Several factors can affect the crosslink density, including the amount of metal ion used in the crosslinking process. It is directly proportional to the crosslink density formed in the rubber [8] and the vulcanisation time, where the longer time will cause higher crosslink density.

Thus, this research aims to investigate the physical and mechanical properties of the XNBR latex film by using metal ion crosslink method where the metal ion used was fixed at 1phr for all the samples.

2.0 METHODOLOGY

2.1 Material and Chemical Preparation

The XNBR latex used, CSW1221, was supplied by Synthomer (M) Sdn Bhd. The properties as received were; 45.24 % total solid content, pH of 7.99, the viscosity of 51.4 mPa.s and the surface tension of 29.3 mN/m. The pH adjuster, potassium hydroxide (KOH), was purchased from Merck with the properties of 85wt% concentration and density 2.04g/cm^3. The filler, titanium dioxide (TiO_2), was purchased from Huntsman Corporation with a density of 4.05g/cm^3. Iron (III) ion derivative and zinc oxide (ZnO) crosslinkers were purchased from Sigma Aldrich.

2.2 Compounding Formulation

The pH of the XNBR latex was adjusted to 10 by adding 5wt% of KOH solution. For ionic crosslinking, 1 phr of metal ion was added to the latex mixture according to Table 1. Titanium Dioxide, TiO_2 was also added to the XNBR latex. All latex mixtures comprising the metal ion were compound at room temperature for 1 day before thin gloves were made.

TABLE 1: Latex Mixture Compound Formula

Sample Code.	A1	A2
Composition Ratio (phr)		
XNBR Latex	100	100
Potassium Hydroxide, KOH	1	1
Titanium Dioxide, TiO_2	1	1
Zinc Oxide, ZnO	1	0
Iron (III) Ion Derivative (Fe^{3+})	0	1

2.3 Identification of Function Group (FTIR)

Identification of the functional groups of the latex films was performed using Attenuated Total Reflection Fourier transform infrared (ATR-FTIR) Thermo Scientific model Nicolet 6700 FT-IR spectrometer. Each of the specimens was recorded in a frequency range between 300cm^{-1} to 4000cm^{-1} with a resolution of 4cm^{-1}.

2.4 Solvent Swelling

The latex film sample was cut with a diameter of 25mm and thickness was measured. The cut sample was then immersed in cyclohexanone solution and its swelling degree was observed. Diameter of the sample was measured with graph paper every 5 minutes interval until 30 minutes. The percentage of linear swell for the sample was calculated based on the following formula:

$$\% \, Linear \, Swell = \frac{x - 25mm}{25mm} \times 100 \quad (1)$$

2.5 Tensile Properties

The testing was carried out with a tensile tester, using an Instron machine model 5567 equipped with an extensometer according to ASTM 6319. The testing was performed at room temperature, 25°C, with a constant strain range of 1000%. 40mm was set as a distance between the upper and lower clamps and 50N of load range, and 500mm/min crosshead speed. At least twelve specimens were conducted in the test to ensure the accuracy of the result obtained. Several properties of the rubber glove were determined from this testing, such as tensile strength and elongation at break.

3.0 RESULT & DISCUSSION

3.1 Identification of Function Group (FTIR)

Figure 1 shows FTIR spectra comparing pure XNBR latex with metal ion crosslinked XNBR latex. According to Figure 1, all spectra look similar. The spectra peaks were detected at 2925cm^{-1}, indicating the asymmetric stretching of the C-H bond. Another peak, 2237cm$^{-1,}$ was present in all the samples, which shows stretching vibration of the nitrile group (-CN). The presence of this peak proves that the samples consist of nitrile group, as expected for carboxylated nitrile butadiene rubber (XNBR) latex. Another two similar peaks in Figure 1 are 1440cm^{-1} and 968cm^{-1}. The spectra peak of 1440cm^{-1} shows the asymmetric stretching of methyl (-CH^3) while the 968cm^{-1} corresponds to the C-H bending vibration of the trans double bond (-CH=CH-) present in all samples.

The only difference found in Figure 1 was the small band at the wavelength between 1698cm^{-1} and 1571cm^{-1}. The peak of 1698cm^{-1} found from the pure latex shows the presence of the carboxylic groups (COO$^-$) in the latex. While samples A1 and A2 that contain the peak at 1571cm^{-1} indicated the carbonyl stretching vibration of zinc and iron carboxylated salt, respectively. Based on the difference between the peak, it can show that the carboxylic group in the XNBR latex has been consumed in samples A1 and A2, where the ionic bond formation has occurred between the metal ion derivative and the XNBR latex.

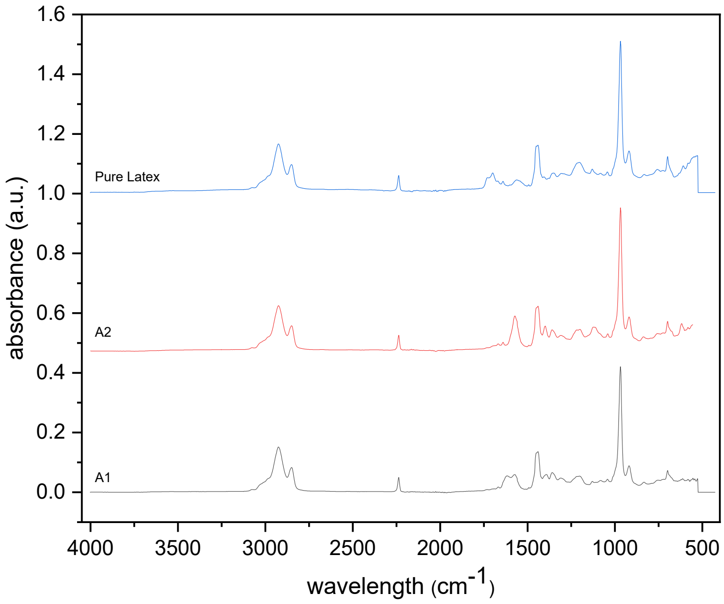

Fig. 1: FTIR Spectra Analysis

3.2 Solvent Swelling

Figure 2 shows crosslink density of each sample. The lowest percentage of linear swell indicates that the crosslink density of the sample is the highest. The result shows that the sample A2 with Iron (III) ion, Fe^{3+} exhibited the highest crosslink. In contrast, the crosslink density for sample A1 using Zinc Oxide as crosslinker was slightly worse than sample A1. This is mainly because the bulk density for the Iron (III) Ion derivative is higher than the zinc oxide. According to the study by Zhao et al., the crosslink density will increase when the chemical's bulk density also increases. Thus, sample A2 with Iron (III) ion as crosslinker exhibited higher crosslinked density.

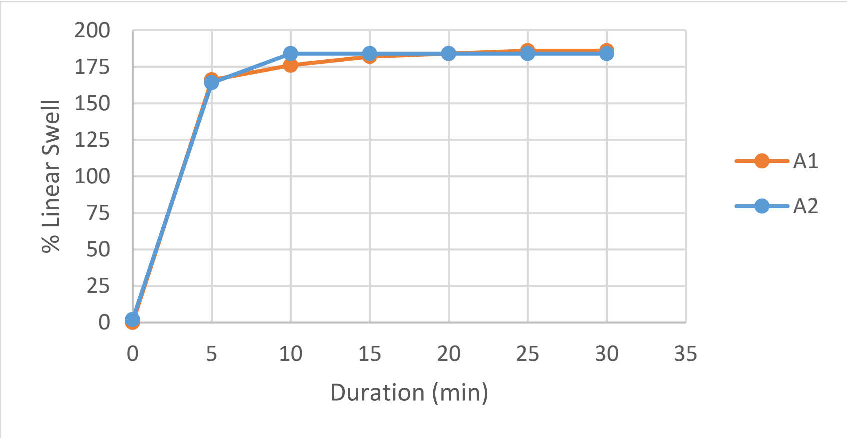

Fig. 2: Solvent Swelling result for test sample

3.3 Tensile Properties

Table 2 shows the mechanical properties (tensile strength, elongation at break, and modulus) for samples A1 and A2. From Table 2, it can be known that sample A2 has higher tensile strength at 18.8 ±1.50 MPa, with lower elongation at break and modulus. In comparison, sample A1 exhibited a lower tensile strength (18.45 ±2.30 MPa) and high elongation at break and modulus than sample A2. Thus, based on the result, the tensile properties are directly proportional to the crosslink density. However, the elongation at break and modulus are inversely proportional to the crosslinked density. The is likely to be because the restriction between the molecule due to high crosslink density results in the heat being unable to dissipate via the molecule's motion, which causes the difference in some of the properties [4].

TABLE 2: Mechanical Properties of test samples

Sample Codes	A1	A2
Tensile Strength (MPa)	18.45	18.8
Elongation at Break (%)	650.5	641
Modulus @ 500%	5.84	5.76

4.0 CONCLUSION

In conclusion, the crosslinking process is an essential step to produce glove. It is also a step to affect properties of the glove. Metal ion crosslink by using different types of metal ion showed different properties of hand glove. XNBR latex that is crosslinked with Iron (III) ion derivative as crosslinker exhibited a better tensile strength with a higher crosslink. In comparison, the elongation at break and the 500% modulus are lower than that of the sample A1 which uses zinc oxide as crosslinker.

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THE IMPACT OF CELEBRITY ENDORSEMENT THROUGH BRAND IMAGE ON PURCHASE DECISIONAMONG INDONESIAN YOUTH FEMALE

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ABSTRACT

In recent years, the influence of celebrities in promoting a brand is quite promising. By promoting the product through celebrity endorsements will increase the brand awareness of the business. This study aims to analyze the effect of celebrity endorsement and brandimage on consumer purchasing decisions for skincare products in Indonesian youth females. To test hypotheses, this study uses descriptive analysis by reducing the data, selecting emerging themes, and coding to conclude the results. The results of this study are expected to be a strategy that can be applied to marketing strategies for companies and interested parties to increase and maximize the use of celebrity endorsements and brand images to get a positive effect that can direct customers in making purchasing decisions.

Keywords: Celebrity endorsement, brand image, purchase decision

2.0 INTRODUCTION

Chapter one introduced an overview of the growing concern about the impact of celebrity endorsement through brand image on purchase decisions among Indonesian youth females. In the beginning of this chapter, researchers will provide background of the study, problem statement, research problem and objectives, the impact of the study, the scope of the study, and the structure thesis discussed. And at the end of this chapter, the significance of study and scope of study will be given in detail.

2.1 Background of Study

Human needs are human desires for goods or services that can fulfill spiritual and physical satisfaction for their survival. Skin care is also one of the needs that cannot be underestimated anymore because both women and men every day cannot be separated from the use of skin care ranging from powders, lotions, deodorants, moisturizers, sunscreens to soaps where these needs continue to change from time to time and follows by the function required by consumers.

Basically skin care is needed when someone is experiencing skin problems and wants to maintain healthy skin. But now, along with technological developments, skin care has become a trend due to a rise in consumer's awareness towards their physical appearance and characteristics. In addition,skin care products are divided into four categories which are to support skin integrity, enhancing, nourishing skin condition and cosmetics to improve skin's look and presence. Most women are using makeup on a daily basis, especially in urban and metropolitan areas. This led to growth in the skin care industry that results in 30% of total global sales by 2020, especially from a millennial(Deloitte, 2017)

In Indonesia, Wardah is presented as the first halal cosmetic based on research results. In a country where the majority of the population is 87% Muslim, Wardah is increasingly popular, especially among young Indonesian women. This is also because Wardah focuses on halal products. Referring to aCommerce (2017) the Wardah brand is claimed to control around 30% of the makeup market share and is identifiedas the only Indonesian cosmetic brand that recorded sales growth of more than 20% in 2015-2016.

One indicator of a successful product is becoming popular brands. For a long time, Wardah products could only be found in salons in Indonesia because they were unable to compete with both local and global cosmetics brands such as Sariayu Martha Tilaar, Mustika Ratu and L'Oreal. Then it became more difficult because of promoting halal cosmetics, so people assumed that Wardah was selling religion.

2.2 Problem Statement

Wardah is a local Indonesian brand that has been in the cosmetic industry since 1995 under the auspices of PT Paragon Technology and Innovation (PTI). The company journey started from the home industry in the Cibodas area, West Java. The founder is Nurhayati Subakat who initially created the Putri brand which is a salon product. Two decades later which in 2018 based on interviews conducted by detik.com, Wardah was listed as the number one cosmetic company in the field of selling moisturizers that managed to beat other cosmetic brands thatare widely present in Indonesia.

The company's popularity was given a boost after it became the sponsor of the Indonesian box-office movie "99 Cahaya di Langit Eropa" in 2013. Since then, Wardah has regularly been spotted partnering in many interesting things, especially in the world of entertainment. Starting from collaborating with Tulus who is a male singer as a brand ambassador in 2014. Then also collaborating in fashion events by Indonesian designers, one of which is Anniesa Hasibuan, the first Indonesian to present a New York Fashion Week collection in 2013.

But in 2020, Wardah drew controversy and sharp criticism from its users. This is because the Wardah brand appeared as a sponsor in a religious lecture poster with the theme "The Dangers of Feminism and LGBT". This led to a quick response from Indonesian netizens to enter the ranks of Indonesia's trending twitter topics.The second reason that caused annoyance and anger for netizens, especially Wardah users, which led to the tone of boycott, was that the ustadz who was the speaker was a vocal figure in opposing the Draft Law on the Elimination of Sexual Violence (PKS), which was also a hot issue being discussed in Indonesia at that time.

This phenomenon affects Wardah's business in an unclear manner. Most of the business and brand observers regretted the statement made by Wardah regarding the use of the logo that was used without approval because it was not included with further actions that would be taken by the company party on this matter. More likely to be a belief-driven buyer.

It is of course then becomes difficult and will always be a challenge for companies to correctly approve customers and convince them. Thecompanies want their customers to know their brand and then pursue to buy it. There are many theories and studies behind purchase decisions and how to address it in order to successfully attract customer's attention and make them a target to buy the products offered. With the development of digital technology, more ways have been developed which are celebrity endorsement to influence its target market. This celebrity endorsement refers to a marketing strategy whose purpose is to use one or multiple celebrities to advertise a specific product or service. The goal of it is to reach a greater audience and also to be represented by the celebrity's fan base.

From a combination of interesting information to discuss along with the demands of the needs of skin products, especially female in Indonesia. In addition, it is also important to know the best factor assessment model to evaluate customer purchasing decisions that are influenced by celebrity endorsements and brand image, the researcher wanted to examine “THE IMPACT OF CELEBRITY ENDORSEMENT THROUGH BRAND IMAGE ON PURCHASE DECISION AMONG INDONESIAN YOUTH FEMALE”.

2.3 Research Questions

Based on the background describe, the problem that can be raised in this study are as follows:

1. Does celebrity endorsement have a direct effect on brand image?
2. Does brand image have a direct effect on purchasing decisions?
3. Does celebrity endorsement have a direct effect on purchasing decisions?

2.4 Research Objectives

Based on the formulation of the problem that has been described, the research objective raised in this study are as follows:

1. To find out the direct effect of celebrity endorsement on brand image.
2. To find out the direct effect of brand image on purchasing decisions.
3. To find out the direct effect of celebrity endorsement on purchasing decisions.

3.0 LITERATURE REVIEW

3.1 Definition of Marketing

The activity that occurs within a company must be related to marketing activities, meaning that the purpose of marketing is more than just dealing with the customer but also includes building customer value and satisfaction as the heart of modern marketing thinking and practice to gain profit for the company. The core of marketing according to Kotler and Keller (2016:27) is identifying and meeting human and socialneeds.

The definition of marketing according to Kotler and Armstrong (2012) is a process of working with the target market to realize the potential exchanges with the intention of satisfying human needs and wants, building profitable relationships and understanding customers needs, providing superior value, setting price,distributing, and promoting them effectively.

3.2 Purchase Decision

According to Kotler (2007:223), purchasing decisions are stages taken by consumers before making a decision to purchase aproduct. Then as a reinforcement of the opinion of Schiffman, Kanuk (2004: 547), purchasing decisions are the selection of two ormore alternative purchasing decision choices, meaning that a person can make a decision there must be several alternative choices.

TABLE 1: Factors Influencing Purchase Decision

Cultural	**Social**	**Personal**	**Psychological**
Culture Subculture Social Class	Group Family Role and status	Age and life cycle Occupation Economic situation Lifestyle Personality	1. Motivation 2. Perception

Source : (Kotler and Keller,2013)

3.3 Celebrity Endorsement

The definition of endorser according to Shimp (2003:459) is an ad supporter or also known as an advertisement star to support a product.Meanwhile, celebrities are figures (actors, entertainers or athletes) who are known for their achievements in different fields from the products they support (Shimp, 2003: 460). Celebrities are seen as individuals who are liked by society and have attractive advantages that distinguish them from other individuals.And celebrity endorsers are using artists as advertising stars in the media, ranging from print media, social media, and television. In addition, celebrity endorsements are also used for certain reasons such as their famous attributes includinggood looks, courage, talent, elegance, strength and sexual attractiveness which represent the attractiveness desired by the advertised brand. With the use of celebrity endorsements, it is expected to be able to represent the brand image to fulfill purchasing decisions.

The reason why celebrities are in great demand by producers in advertising their products is because the messages conveyed become more attractive because celebrities who are more popular will get greater attention and are easier to remember (Royan 2004: 2). Then as areinforcement, Sumarwan (2004:258) argues that in purchasing products and services as well as brand selection, celebrities can have a strong influence on consumers. Celebrities can be a very important marketing tool for a product because of their great appeal and also because of the reason they have a huge fan base that no one else has. Celebrities also have inner beauty, charisma and credibility.

3.4 Brand Image

Brand image is a series of associations (perceptions) that exist in the minds of consumers towards a brand, when usually its organized into a meaning.The relationship within a brand will be stronger if based on experience and get a lot of information. All images or associations represent the perceptions that can reflect objective reality or not. This image that is formed from association (perception) is what underlies the decision to buy even brand loyalty from consumers. Brand image includes knowledge and trust in brand attributes (cognitive aspects), consequences of the use of the brand and appropriate usage situations, as well as evaluation,feelings and emotions that are perceived by thebrand (affective aspects).

According to Kotler and Keller (2007:34), brand image is the perception and belief of consumers, as reflected in the associations that occurin consumer memory. By creating the right brand image for a product, it will certainly be very useful in marketing, because the brand image will affect consumer assessments of alternative brands that are expected to meet consumer needs and also provide better and more guaranteed satisfaction. As stated by Schiffman and Kanuk (2000:141), consumers will always choose products based on their image. If they don't have experience with a product, they are more likely to "trust" a preferred or well-known brand. A positive brand image will result in consumer loyalty, consumer confidence in the positive brand value, and willingness to look for brands.

3.5 Research Framework Model

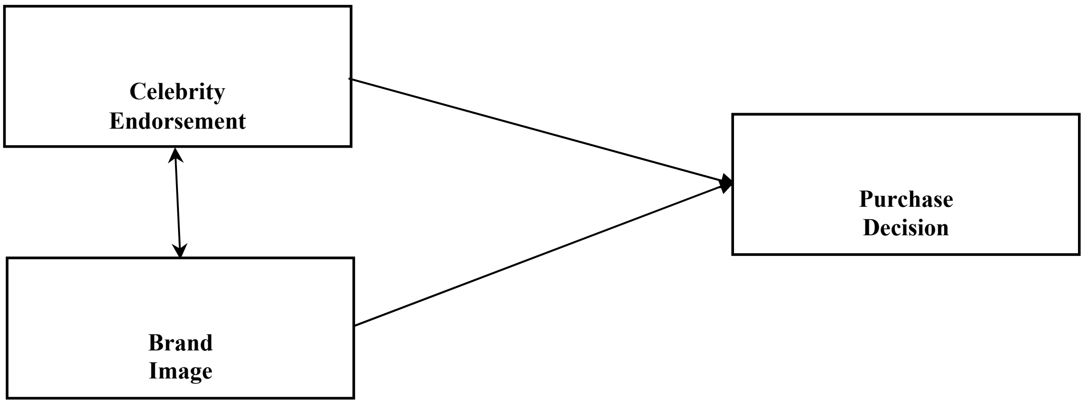

Fig. 1: Research framework for the consumer's purchase decision towards skin care product among Indonesian young females

4.0 RESEARCH METHODOLOGY

This study uses a qualitative method. Perreault and McCarthy (2006:176) define qualitative research as a type of research that seeks to dig up information in depth and is open to all responses and not just yes or no answers. This research tries to ask people to express their thoughts about a topic without giving them much direction or guidance on what to say. According to Moleong (2011:6) qualitative research is research that intends to understand phenomena about what is experienced by the subject of research, such as behavior,perception,motivation,action,etc.holistically, and by means of descriptions in the form of words and language, in a special naturalcontext by utilizing various natural methods.

Qualitative research aims to explain the phenomenon profusely through deep data collection. This study does not prioritize population size or sampling,even sampling is very limited. If the data collected is deep and can explain the phenomenon under study,then there is no needto look for sampling the other. Qualitative research focuses more on the problem of depth (quality) of data rather than the number (quantity) of daya (Kriyantono,2009:56).

Researchers are an integral part of the data, meaning that researchers participate actively in determining the type of data to be used. Thus, researchers become research instruments that must go directly to the field. Therefore, qualitative research is subjective, the results are morecasuistic, and cannot be generalized. Research design may change or be adapted to developments or research.

In general,research that uses qualitative methodologies has the following characteristics (Kriyantono,2009 :57-58):

1. Intensive,long-term participation of researchers in field setting,researchers are the main instrument of research.
2. Careful recording of what happened with field notes and other types of documentary evidence.
3. Analysis of field data.
4. Report the results including detailed descriptions,quotes and comments.
5. There is no single reality,every researcher creates reality as part of the research process. Reality is seen as dynamic and as a product of social construction.
6. Subjective and only in the researcher's reference. Researchers as a means of extracting data interpretation.

4.1 Population and Sampling

Population sampling is the process of taking a subset of subjects that is representative of the entire population. Nevertheless, the sample must have enough size to warrant statistical analysis and justification (Rea & Parker 2014). Malhotra (2012) define populace as theentire number of persons or inhabitants in a country or region, this could be as a group of humans or community or the subjects that sharedtraits or characteristics that reflect the subject of the matter to the examiner. Moreover, populace may involve a bigger number of persons.

In line with this research the data source used is the primary data source. Primary data sources were obtained directly from respondents byconducting direct interviews conducted with the consumers of skin products. The criteria for selecting informants are based on two things,which are as follows:

a) Buyer of the product
b) User of the product

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OBJECT DETECTION USING AI

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ABSTRACT

With rapid development of AI there are various opportunities being created on ways we can help disabled people. AI based applications or hard wares can help any blind or visually impaired person in their daily tasks like navigation, searching objects, view better or give idea of the surrounding etc. Current advancement in computer vision and machine learning models has made it possible for creating such applications. In this project, a deep learning-based model will be used to make suitable mobile application for the visually impaired. The application will be able to detect objects from camera or pictures and deliver it to the disabled personality to help them and boost their self-belief for living an independent life.

Keywords: Not more than 5 keywords, italic

1.0 INTRODUCTION

Visual Impairment can be defined as a decrease in the capability to discern surroundings which cannot be fixed by glasses or contact lenses. It is a different state from blindness which is the state of losing eyesight completely due to disease, injury or genetic condition. Usually for a visually impaired individual the visual acuity is 20/70 or worse which means when we visit any ophthalmologist to get our eyes checked they ask us to read a letter chart from a certain distance so a person with 20/70 visual acuity who is 20 feet away can see what a person of 20/20 visual acuity can see from 70 feet away [1]. This way distance for a visually impaired person might differ depending on the type someone has.

1.1 Problem Statement

A study between 2 groups of 12 visually impaired and 12 normal sighted persons aging from 14 to 44 were given some recreational tasks. After observation it was seen that only there was no significant difference between both the groups while performing the task.

The main limitation for visually impaired people is not being able to see through eyes only. They can perform a lot of tasks without any one's assistance, but the feeling of dependency makes them low and causes a lot of mental health issues.

Health Related Quality of Life Measure	n	Total % (95% CI)	No Difficulty Seeing % (95% CI)	Little Difficulty Seeing % (95% CI)	Moderate/Severe Difficulty Seeing % (95% CI)
Life dissatisfaction (yes)	6,915	5.8	3.7	6.0	13.3
		(5.6–6.1)	(3.5–4.0)	(5.6–6.5)	(12.3–14.3)
Disability (yes)	27,991	24.8	19.3	27.4	41.2
		(24.3–25.4)	(18.6–19.9)	(26.2–28.5)	(39.7–42.8)
Self-reported health (fair/poor)	19,182	17.1	12.4	17.8	33.0
		(16.6–17.6)	(11.8–13.0)	(16.9–18.7)	(31.4–34.5)
14 to 30 physical unhealthy days	14,196	12.4	9.2	12.7	23.7
		(12.0–12.8)	(8.7–9.7)	(12.0–13.5)	(22.4–25.1)
14 to 30 mental unhealthy days	12,388	11.0	7.7	11.7	21.7
		(10.6–11.4)	(7.3–8.2)	(11.0–12.4)	(20.4–23.1)
14 to 30 activity limitation days	9,571	8.2	5.5	8.5	17.8
		(7.9–8.6)	(5.2–5.9)	(7.9–9.1)	(16.6–19.1)

Fig. 1.1 Unadjusted Health-Related Quality of Life Among Those Ages 40 to 60 by Visual Impairment Status in 22 States,a 2006 to 2010, United States[9]

1.2 Research Objectives

1. To develop a system using object detection methods.
2. To develop a mobile application using the system.
3. To validate the use of a designed machine learning app in helping the disabled.

1.3 Scope

The scope of this project is to construct a mobile application using AI. I will use the YOLO model for machine learning and TensorFlow Lite. At first, we will prepare a custom dataset to train YOLOv4 tiny Darknet and then convert Darknet model to TensorFlow lite. Hence the initial stage of our mobile application will be built.

2.0 IMAGE CLASSIFICATION TECHNIQUE

For picture categorization, the Deep Neural Network is the most advanced approach. Several DNN approaches [3] have been developed to improve classification abilities utilizing various DNN architectures. Figure 2.1 depicts various recent DNN algorithms and their accuracy.

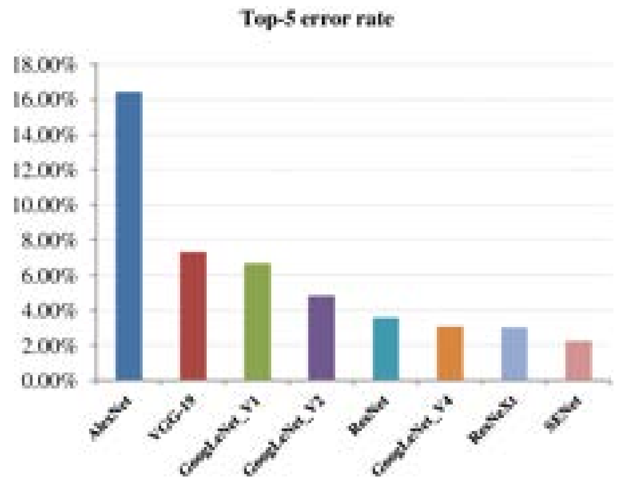

Fig. 2.1 – Image Net Classification

2.1 AlexNet

AlexNet is a DNN-based image classification system that contains 60 million features and eight neural network layers. It was created in 2012. It has five convolutional layers and three fully linked layers. For the non-linear portion, the ReLu function was employed, while Tanh and Sigmoid functions were used for classification, with ReLu being significantly quicker than Sigmoid.

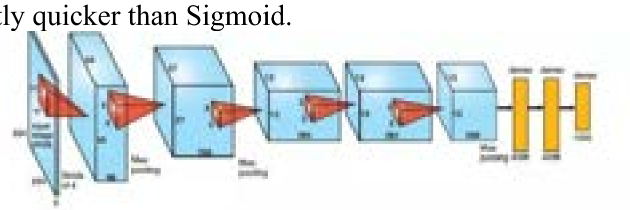

Fig. 2.2 AlexNet

2.2 VGGNet

VGGNet is an image classification approach that enhanced AlexNet by raising the number of layers to 16 and the number of connections to 130 million. It includes a lot of interconnected layers, which makes the model rather large. The network breadth starts off small and increases by a factor of two after each sub-sampling/pooling layer. On ImageNet, it achieved a 92.3 percent accuracy rate.

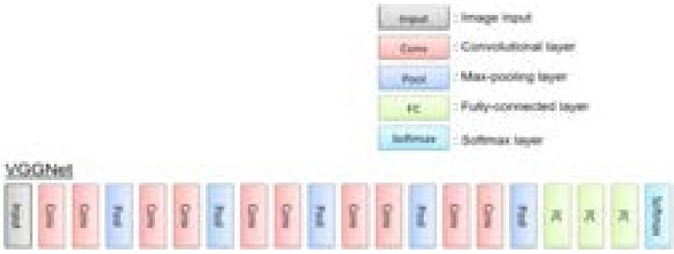

Fig. 2.3 VGGNet

2.3 GoogleNet

GoogleNet is a classifier method introduced by Google in 2014 that reduces the error rate in AlexNet and VGGNet by scaling up the convolution layers using different convolution kernels [6]. In 2014, it had a 6.67 percent mistake rate, while in 2016, it had a 3.1 percent error rate. The GoogleNet algorithm focuses on growing network breadth and depth while maintaining a constant computing cost.

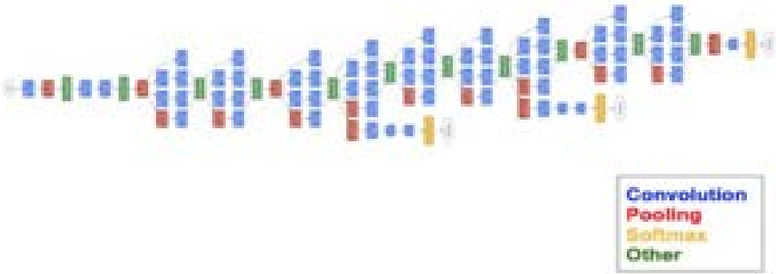

Fig. 2.4 GoogleNet

2.4 ResNet

ResNet is another image classification approach that was introduced in 2015 and significantly improved classification accuracy over prior algorithms. It is a strong representation capable of training hundreds of layers and producing precise results.

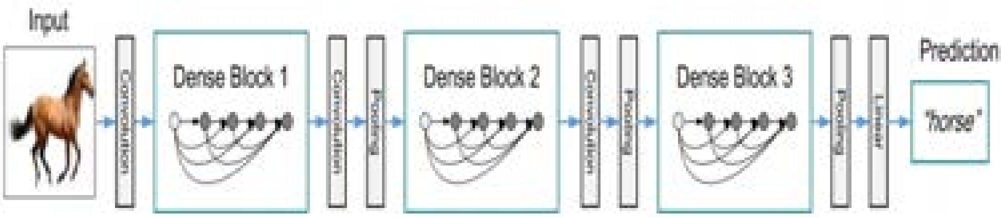

Fig. 2.5 – ResNet Architecture

3.0 OBJECT DETECTION TECHNIQUE

When one item is present in a picture, image classification refers to anticipating the object's class, whereas object detection entails classifying and localizing one or more objects in a single image and then drawing a bounding box around the objects. Based on the structural level, CNN-based object detectors may be classified into two categories: There are two types of detectors: (1) single-stage detectors and (2) multiple-stage detectors.

3.1 Single Stage Detectors

Single-shot detectors conduct a single CNN on the entire picture at the same time. Single-stage detectors have a faster computing speed than multiple-stage detectors, but their accuracy is lower. The most recent algorithms for this method are SSD and YOLO. The whole technique for single stage detectors is shown in figure below.

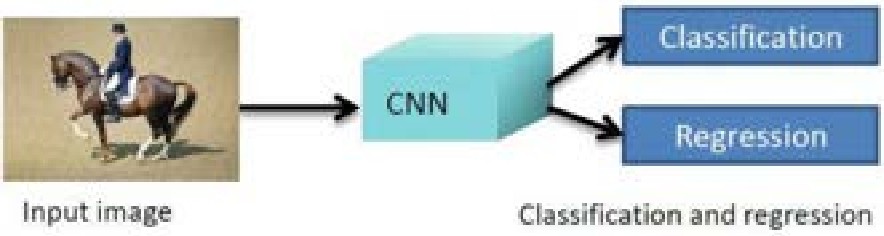

Fig. 3.1 – Single Stage Approach

- **Single Stage Detectors (SSD)**
  SSD is a detection method that combines feature extraction with a convolutional filter and relies on only one deep neural network. It was released by Google in 2016. Figure 2.8 depicts the SSD layers' structure and order. SSD On the one hand, it provides excellent object detection accuracy, but on the other hand, it takes a long time to compute.

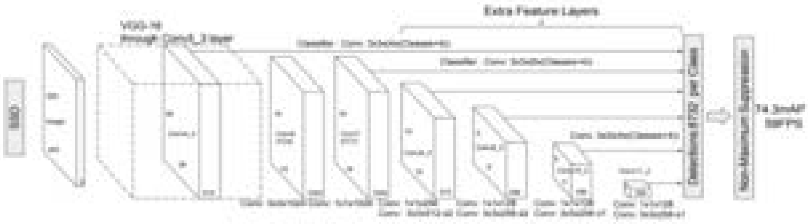

Fig. 3.2 SSD Architecture

- **You Only Look Once (YOLO)**
  YOLO is a detection method that treats each image as a regression problem, splitting it into a grid of S*S cells and assigning class probabilities to each cell. It was created to do real-time detection and provide high accuracy results while computing quickly. It was upgraded to YOLO9000 in 2017 by improving memory and localization, as well as boosting its detection capabilities to 9000 object types.

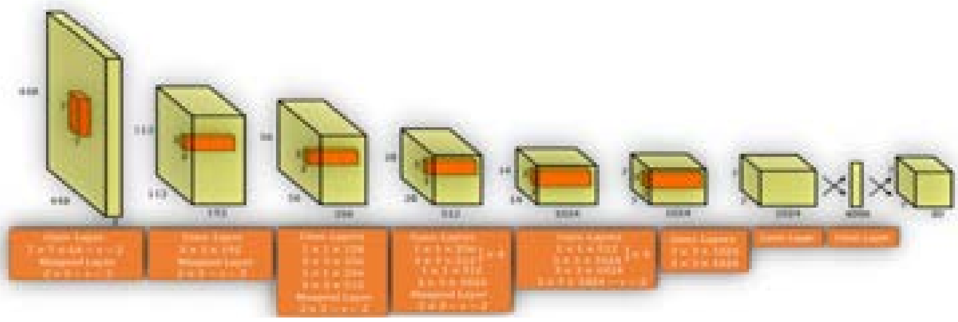

Fig. 3.3 YOLO Architectures

4.0 METHODOLOGY

This section provides a flow of work for this project.

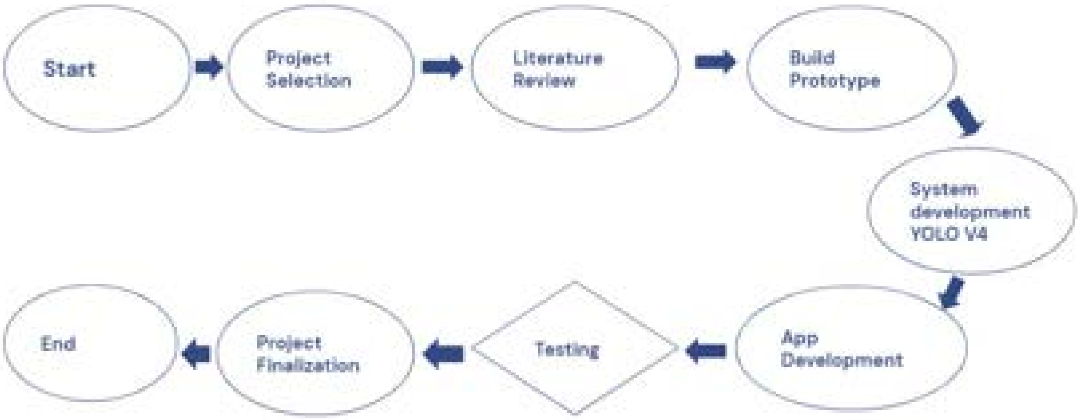

Fig. 4.1 – Project Flowchart

4.1 Object Detection Model

YOLOv4 is a cutting-edge object identification method that was published in the journal in April 2020. It outperforms the other detection algorithms in terms of accuracy, as measured by average precision (AP), and speed, as measured by the number of frames per second (FPS), as shown in figure 4.1. As illustrated in Figure 4.1, the YOLOv4 architecture is separated into four primary elements. The backbone, or feature-extraction architecture, receives the input picture. YOLOv4's backbone is CSPDarknet53, which is made up of 53 convolutional layers. Overall, the YOLOv4 method operates by first localizing the items in a frame and then classifying the observed objects using a single CNN network in a single step. Bounding boxes containing class predictions of these items in the form of bounding boxes are the outcome of this stage (x, y, w, h, confidence) where x and y are the box coordinates, w and h are the box width and height, and confidence is the class probability. For the execution of the object detection model application, we will go through following steps from data to deploy

• Prepare YOLOv4 tiny Darknet Custom Data
• Train YOLOv4 tiny Darknet
• Convert Darknet Model to TensorFlow Lite
• Weights to Export for Future Inference
• On-Device Deployment

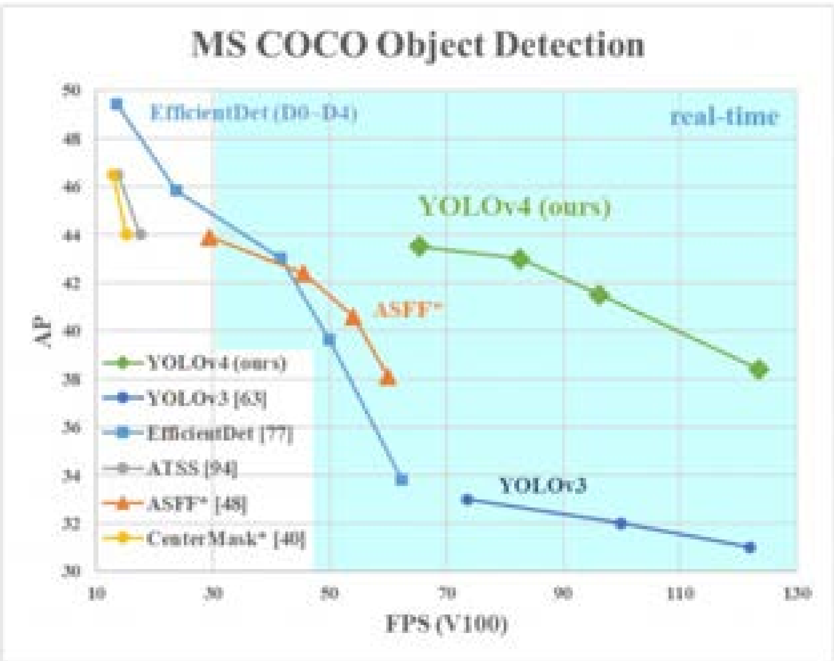

Fig. 4.2 YOLOv4 performance vs others

4.2 Results and Preliminary Results

Fig. – Real time searching with my app

5.0 USAGE

For a blind person, the most valuable thing would be independence. Small equipment which can help them lead a life independently can make their life less challenging. My project aims in making an equipment which helps the visually impair people live life with a little less hurdle. I have tried to design a software which uses image recognition to identify any object if lost or the respective individual is searching for it.

6.0 RELATED WORK

There are few ways a blind person has to help his aesthetics at the moment. Several traits can be used for colour recognition indirectly. We should apply to "Be My Eyes" in terms of smartphone apps, which consists of a video chat service where someone is available to attend to it and support the blind in their field of view. This is an application, however, for IOS only [2].

Another IOS program that consists of having the RGB and HUE components of the medium colour within the camera region through a screenshot is the 'Colour Detector.' The colour tone that is supposed to be received can also be set by this application by sending a warning to know if the picture is beyond that tone. It is also used in this context to explain the colour of clothing selected at the time [3].

Concerning mobile gadgets, the 'Colorino' allows selecting fabrics, washing processes, and colour variations, being able to differentiate between more than 150 colours and tones, as well as versions of tones of the same colour [4].

The "Assistive Clothing Pattern Identification for Visually Disabled Persons" is contained in a literature analysis, which consists of identifying clothing patterns that can recognize 11 clothing colours and recognize 4 types of clothing patterns [5]-[6][7].[7]. The paper “Rotation and Illumination Invariant Texture Analysis” suggests a form of clothing combinations of complex patterns for visually impaired people [8] [9]. The project described in the paper "Recognizing clothing patterns and colours for blind people using neural network" also helps a camera to identify the type of pattern of clothing by extracting its features [10]-[11][12].

7.0 CONCLUSION

In this project, a single object detection model algorithm was used of YOLOv4 with TensorFlow Lite to build a mobile application to help visually impaired people in day to day lives. Till now it is still able to detect object only without any voice recognition which is the next part for the project.

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I would also like to thank my family and friends for constantly supporting me and giving the motivation to me for moving forward despite all the hurdles.

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A MCKIBBEN ACTUATOR SOFT SPLINT DEVICE FOR POST-STROKE HAND REHABILITATION

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ABSTRACT

An enhanced soft splint actuated via McKibben actuator is developed with its control panel. The aim of this system is to provide an extensive dose of training for stroke patients to their limbs without the need to regularly visit rehabilitation therapists and spent unreasonable amount of money and time for that. The splint can be also used with daily life activities such as gripping and pinching objects. The design of this glove will be discussed along with its control panel which controls the motion of the splint by adjusting the air flow to each channel of the analog valve. The range of motion of joints MCP & PIP will be analyzed to ensure a safe and sufficient performance of the splint to stroke patients.

Keywords: Stroke**,** soft splint, McKibben actuator, Rehabilitation.

1.0 INTRODUCTION

Stroke is a major public health issue that affects people all over the world. Every year, about 13 million people are impacted by stroke, with 5.5 million of them dying as a result. Statistics show that if no action is taken, the number will climb to 6.7 million [1]. 'Stroke rehabilitation' is a procedure that stroke survivors must go through. It's a sort of stroke treatment that aims to speed up the patient's rehabilitation, reduce his disability, and encourage him to resume normal activities [2]. Up to 80% of stroke survivors experience upper limb impairment. According to a study conducted by The Early Prediction of Functional Outcome After Stroke (EPOS) [3], recovery of upper extremity function may be strongly predicted within 6 months if the spastic finger or shoulder is presented for therapy within the first 48 hours after stroke.

As the number of stroke cases around the world has increased, so has the demand for therapists and neuropsychologists. Their calendars are busy, and the majority of them must work overtime. As a result, stroke survivors will not have enough time to recuperate, which may cause their recovery to take longer than expected. Over the last few decades, substantial advancements in the field of rehabilitation robots have emerged from the scientific and technological revolution, which has been mirrored in all aspects of life. Although this cutting-edge technology is a feasible alternative to traditional therapy, in some cases it is still required [4].

Soft robots have gained a lot of press recently. These robots are composed of soft materials such as polymer, rubber, and silicone and are controlled by electrically activated components. They are based on biological systems that surround us and are made of soft materials such as polymer, rubber, and silicone. As a result, this research describes a soft hand rehabilitation splint that employs a McKibben actuator (S-muscle SM series) that has a contraction ratio of up to 25%. The McKibben actuator was chosen above other soft actuators because of its simplicity, durability, and high force-to-weight ratio for an input pressure [5]. The glove is controlled by a control panel coupled to an air pump, with an analogue valve incorporated in the panel limiting the air flow rate.

2.0 METHODOLOGY

Figure 1 depicts the system's construction technique and general flow. The system is separated into three sections, starting with hardware development, which includes designing a soft splint, fabricating McKibben actuators, and assembling the control box and its components. The second phase focuses on software development, with Arduino mega being programmed using the Arduino IDE to handle CKD MEVT (Analogue valve) operations and actuator control. Finally, the system's performance will be evaluated in terms of the resulted motion of joints MCP & PIP including joints ROM and their linear kinematics characteristics to ensure that the system provides a safe human-machine connection.

Fig. 1: System's flow overview

2.1 Fabrication of McKibben actuators

Eight McKibben muscles were fabricated along the forearm each extends up to 16 cm, where each finger has two muscles connected to it to control its flexion and contraction. The PFA tubes were sleeved into one end of the McKibben actuator to create a linear McKibben actuator. For pressure supply, a PFA tube was placed into the inner rubber tube of McKibben's same end, and the connection was secured with Loctite® 401TM (Dusseldorf, Germany). The PFA tube was put across the connection, and Loctite 401 was used to seal the McKibben's outer sleeve. On the opposite end of the actuator, these procedures were repeated, but the PFA tube was plugged with wire and sealed with Loctite 401.

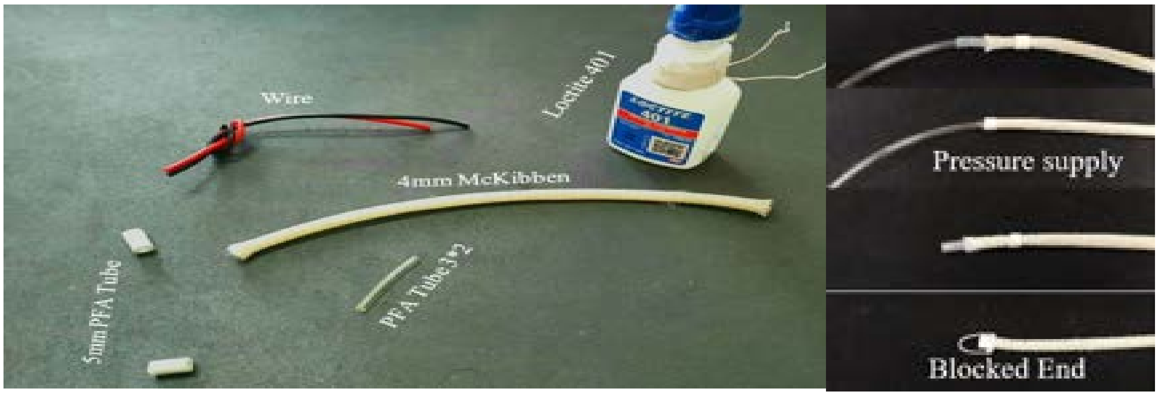

Fig. 2: Fabrication of 4mm McKibben muscles

2.2 Fabrication of soft splint and its components

The fingers and palm strip exoskeleton of the glove was designed in RDWORKS v8 to fit the left hand's index, middle, ring, and little fingers. It was created to be average in size in order to accommodate a wide range of sizes, taking into account the sizes of each finger and wrist, as indicated in table 1 in cm. The designed parts were uploaded to laser cutting machine to ensure an actuate and sharp design. Then, metal rings were integrated with the silicon rubber in the form of spring for each joint so that the size can be adjusted accordingly.

TABLE 1: Average size of human limbs [6]

	Male		Female	
	5th	95th	5th	95th
Hand Length	16.8	20.2	14.7	18.8
Hand Breadth	7.9	8.8	6.5	8.3
Hand Thickness	2.3	3.0	2.0	2.8
Thumb Breadth	1.8	2.3	1.5	2.1
Forefinger Tip Breadth	1.4	1.8	1.3	1.8
Wrist Circumference	14.2	18.6	13.5	17.9
Hand Circumference	18.1	22.1	15.5	19.8
Thumb Circumference	6.8	8.2	5.8	7.2
Index Finger Circumference	5.8	7.3	5.2	6.6
Middle Finger Circumference	5.7	7.6	5.2	6.8

A 3d holder was designed in SOLIDWORKS in order to be paced around the forearm so that the artificial muscles can be held and constant during the actuation process. The holder can be adapted to the size of the patient forearm due the attached Velcro on its top**.** Figure 3 indicates the components used in developing the soft splint.

Fig. 3: Soft splint components

2.3 Designing the control panel

The control box serves as the primary brain of the system. It is composed of four primary knobs, each of which has a specific purpose. The pressure can be adjusted to regulate the DOF of each finger using an analogue valve. Additionally, there is an emergency bottom that, when pressed, immediately brings the system to a halt in the event of an unfavorable incident. Figure 4 shows the overall control system and how the electronic components are set together. CKD MEVT valve receives 0-10 V as its input from the potentiometers in which 10v is the max air flow and 0v to stop the air from flowing through the channel. MCP4922 (12 bits DAC) translated the digital signal into analog signals to the valve, however, DAC is only limited to 5v, thus TLC272 (op amp) with gain of 2 was added to amplify the signal to 10v which will be sent to the valve.

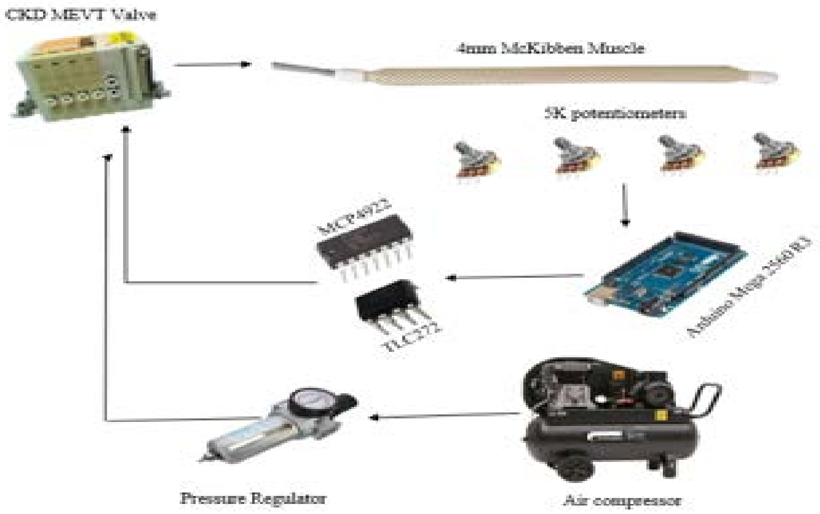

Fig. 4: Overview of control system

2.4 Analyzing the range of motion for joints

In order to ensure that the developed splint is sufficient for stroke patients by producing a proper flexion angle and valid range of motion, Kinovea software was used for this purpose, where each joint was labelled so that the software can track its motion easily. Other marks were also done using the software to extract the linear kinematic graph for the motion. This test was applied to MCP & PIP joints multiple times to ensure a valid outcome.

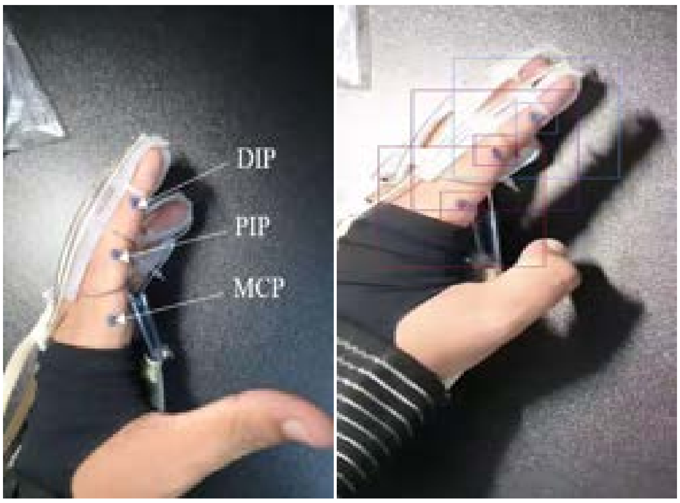

Fig. 5: MCP, PIP & DIP joints labelling

3.0 RESULTS & DISCUSSIONS

In this section, we will be discussing the result of the applied methodology. By referring to figure 6 we can see the developed splint in both top and bottom view, where every two muscles are attached to a finger connected the designed control panel which is accounted for controlling the splint.

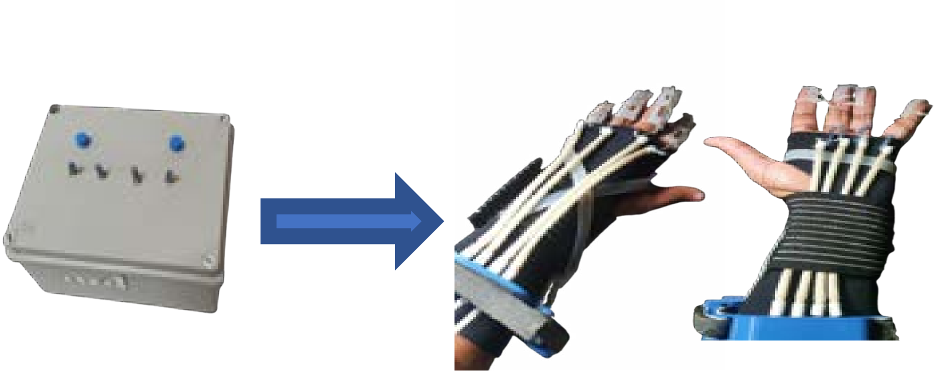

Fig. 6: Top and bottom view of the soft splint with its control panel

Based on the analysis done in Kinovea for MCP joint, it is found that the angle produced by its flexion can reach up 72 degrees from the initial position which is 107.3 degree.

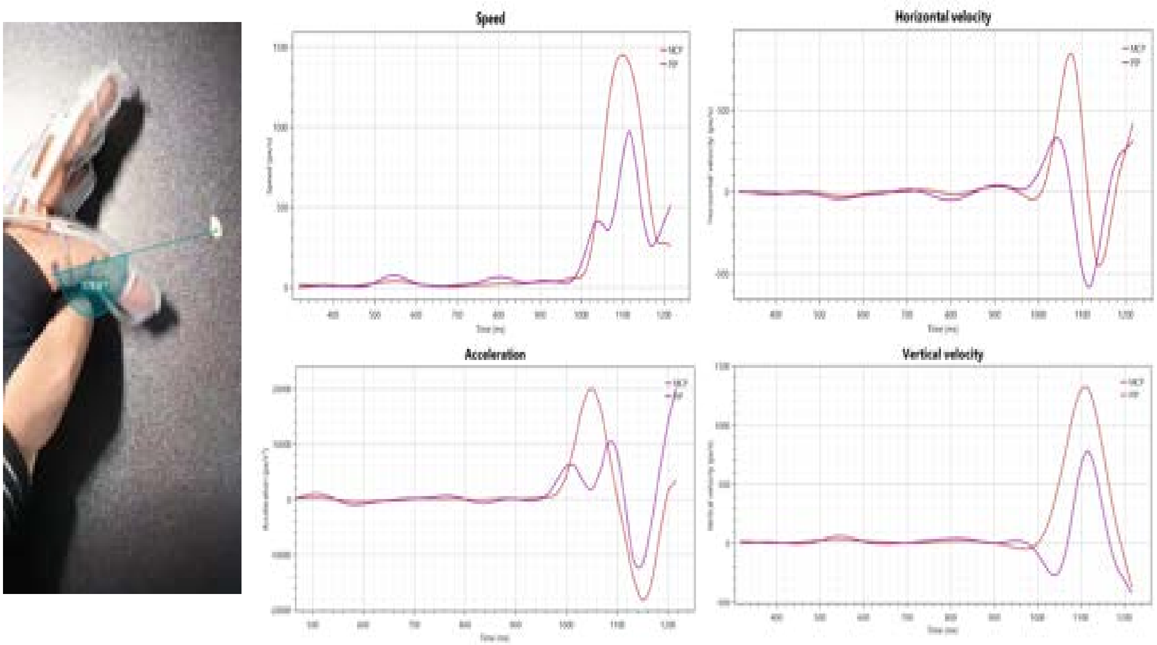

Fig. 7: MCP joint range of motion and linear kinematic analysis

Also, MCP joint analysis found that the angle produced by its flexion can reach up 110.7 degree from the initial position which is 166.4 degree.

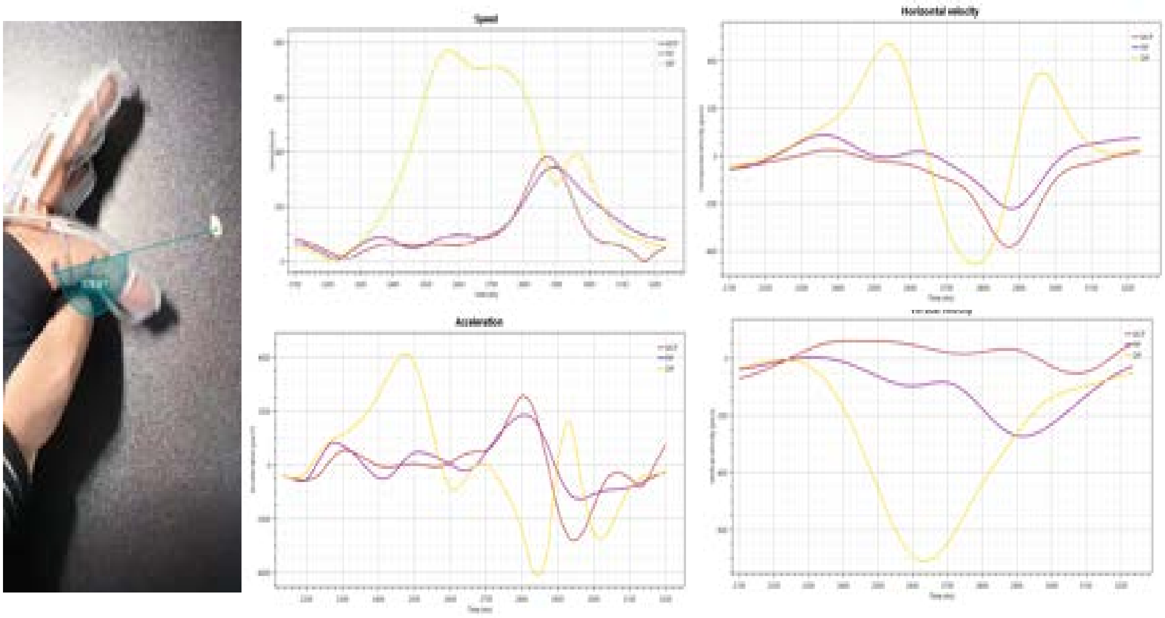

Fig. 8: PIP joint range of motion and linear kinematic analysis

4.0 CONCLUSION

Silicone rubber was used to make an upgraded soft glove that was actuated by McKibben actuators that were compressed by pressurized air and provided up to 25% contraction to move each finger's joint in either flexion or extension. The splint is operated by a specially built control panel that aims to repeatedly train each finger within a wide range of mobility depending on the patient's situation. Finally, the system performance was analyzed using AI software in both joints MCP& PIP.

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EDIBLE BIRD'S NEST AS A SOURCE OF NATURAL INGREDIENTS IN SKINCARE FOR ITS ANTIOXIDANT AND ANTI-AGEING PROPERTIES

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ABSTRACT

Edible Bird's Nest (EBN) is produced from the secretion of the swiftlets salivary gland and is commonly found in Southeast Asian countries. The total protein content of EBN extract measured was 59.25 ± 0.10% of the dried weight. 16 types of amino acids were quantified and identified in the EBN extract. The antioxidant activity of the EBN extract was measured following the protocols of ABTS assay and DPPH assay at 39.77 ± 1.05% and 49.70 ± 0.40%, respectively. For the anti-ageing analysis, the cytotoxicity effect of EBN extract on human skin fibroblast cells was not observed. The organoleptic assessment survey consisted of 50 respondents of both genders from different age groups. All four skincare formulations were considered stable due to the slight changes in pH and colour difference, and rated on their effectiveness by respondents after an application period of four weeks. The results obtained from this study were used to provide insight into the use of EBN extract as the active ingredient in the cosmetic industry, particularly in skincare.

Keywords: *Edible bird's nest, skincare formulations, antioxidant activity, anti-aging activity.*

INTRODUCTION

Edible Bird's Nest (EBN) is produced from the secretion of swiftlets [1] and is commonly found in Southeast Asian countries [2]. EBN's history began with the Tang (618–907 AD) dynasty [3]. Where in Chinese literature, EBN is referred to as "Yan Wo", which means "swift's nest". It was reported that Aerodramus fuciphagus, Aerodramus maximus, and Collocalia esculenta are the three main species of swiftlets that were producing most of the EBN in Southeast Asia [4]. In Malaysia, EBN was mainly produced from A. maximus (black-nest swiftlets) and A. fuciphagus (white-nest swiftlets) for commercialisation and trading [3]. The soup made from EBN was believed to improve skin condition and could be a beauty enhancer [4]. Chinese locals discovered EBN as a tonic in traditional Chinese medicine, acknowledging the significance of Panax Ginseng, which is their native ginseng [5].

EBN is renowned for its limited supply, high nutritional content and therapeutic effects. It is rich in protein, amino acid, sialic acid, carbohydrates and lipid [6]. Protein is the main component in EBN, with an average of 50% dried weight [7]. Protein is essential in forming cells and tissues, and carrying out most of the major metabolic processes [8]. Besides protein, sialic acid is one of the most abundant glycoproteins found in EBN, containing about 10% dried weight. Sialic acid promotes cell tissue repair, enhances cell division, and increases cell proliferation [9]. It was also suggested that sialic acid content in EBN is essential for immunity enhancement, neurological improvement, and brain development [10]. EBN is now believed to promote anti-inflammatory, anti-influenza, antioxidant, whiten the skin, strengthen bone, and enhance epidermal growth activities [8, 10]. As a result of its therapeutic effects and high nutritional content, EBN is widely utilized as a health food supplement and as an active ingredient in cosmetics.

According to the study, some people believe that the shape and texture of EBN resemble collagen jelly, whereby it may supply facial collagen or improve skin conditions including sagging skin [11]. When suspended in water, glycoproteins and polysaccharides in EBN resemble a collagen-like texture. However, the benefits of EBN towards skin cells, for instance the anti-ageing properties of EBN, remain unclear and yet to be proven by previous studies. Besides skin cells, EBN has previously been shown to proliferate retinal cells and uterine cells [12]. Nevertheless, the cell proliferation effects have yet to provide sufficient evidence regarding EBN's anti-ageing properties. On the other hand, the antioxidant and anti-aging bioactivity of EBN extract act as the active ingredient in formulated skincare have yet to be documented by previous studies. According to [13], their research showed the lightening and the moisturizing effect of EBN cream on white mice. They reported that skincare containing EBN extract acted as the active ingredient and claimed to possess lightening and moisturizing effects on the skin. Still, there is no proven evidence on the effectiveness of antioxidant and anti-ageing properties of the formulated EBN cream.

Together with the skincare formulators, researchers have been practiced using natural ingredients in skincare to substitute synthetic ingredients due to the adverse effects caused. Based on the study carried out by [14], cosmetic companies are encouraged to seek sustainable practices that preserve the ecosystems and biodiversity while simultaneously providing cosmetics that cater to a wide range of benefits. For example, synthetic surfactants produced from petroleum wastes are non-biodegradable and harmful not only to humans but to the environment as well [15]. It is also reported that hair damage caused by synthetic surfactants in shampoos, resulting in the drying of the follicle, scalp irritation, and hair loss problems [14]. Therefore, EBN extract was selected as the natural ingredient for the skincare formulation to solve the problem that arises due to synthetic ingredients.

The high demand for natural ingredients used in anti-ageing skincare products in the cosmetic market has contributed motivation to conduct the present study. Therefore, this study aimed to investigate the chemical and biological properties of EBN extract as a source of natural ingredients for the skincare product formulation. In addition to that, the skincare formulations derived from EBN extract were then evaluated on its antioxidant and anti-aging properties. Hence, a DPPH scavenging assay was conducted to determine the antioxidant property. At the same time, cell proliferation in human skin fibroblasts was measured to prove further the anti-aging activity of the skincare formulation in this study.

METHODOLOGY

EBN Extraction

The water extraction method was employed to extract raw EBN following [16] to extract EBN with minor modifications. Briefly, three replicates of 0.5 g ground EBN samples were dissolved in 50 mL distilled water. The EBN extract was heated with a stirrer for 2 h at 80 °C. Next, the samples were left overnight for 15 h. Then, the EBN samples were heated up at 80 °C for 20 min. The EBN samples were centrifuged at 4000 rpm using the centrifuge machine (UNIVERSAL 320, Hettich, North America) for 15 min. The supernatant, which is the EBN extract, was transferred to test tubes and will be stored at 2°C in the refrigerator until used.

Total Protein Content

The Bradford method was used to determine the total protein concentration of EBN extract [17]. The EBN extracts were diluted with distilled water at a ratio of 1:4 (EBN supernatant: distilled water). 0.060 mL EBN extract was combined with 3 mL Bradford reagent for 1 minute at room temperature. The absorbance was measured at 595nm using a UV-Vis Spectrophotometer (UV 1800, Shimazu, Japan). A Bradford assay standard curve was plotted for protein quantification.

Amino Acid Content

AccQ Fluor Reagent kit (Waters) was used to identify and quantify the amino acid content in EBN samples, as described by [16]. The samples were derivatized and analysed according to the instructions provided by the manufacturer. Firstly, each EBN sample was weighed and separated into vials containing 0.1 g. After that, each sample was added with 15 mL of 6 N hydrochloric acid (HCl). All bottles were firmly sealed, and the samples were hydrolyzed in a convection oven (UM 100, Memmert, Germany) for 24 h at 110°C. After hydrolysis, the solutions was diluted to 100 mL with distilled water and filtered with Whatman filter paper (No. 41) and a syringe filter (0.45 m). Performic acid oxidation was conducted to quantify methionine levels as described previously [18]. A Water Alliance HPLC system (Model 2695, Mildford, MA, USA) was employed to separate the amino acids. The system used an isocratic solvent solution with a sodium acetate buffer concentration of 0.0085 M as a mobile phase. The sample injection volume was 10 L and the HPLC system was set at 1.0 mL/min flow rate, with 250 nm (excitation) and 359 nm (emission) detection wavelengths. The amino acid analysis was performed in triplicates using the applicable amino acid standard (Pierce "H" standard, Thermo Fisher Scientific) as a validation tool.

Sialic Acid Content

Sialic acid content was determined following the method studied by [19] with slight modification. 5 mg of EBN was hydrolyzed with 1 mL of 0.5 M sodium bisulphate aqueous solution in a water bath at 80 °C for 30 min. The EBN extract was mixed with 1 mL of 20 mg/mL O-phenylenediamine dihydrochloride solution for pre-column derivatisation. It was then heated in a water bath for 40 min at 80 °C. A 20 µL derivatized solution was filtered and injected into an HPLC system (UltiMate 3000, Dionex Co., Sunnyvale, USA) with the fluorescence detector (FLD-3400RS, Dionex Co., Sunnyvale, USA).

Toxicology Analysis

In vivo toxicology analyses were conduct by sending the EBN extract to the SIRIM Berhad (Malaysia). Two types of toxicology analyses were performed to evaluate the biological properties of the EBN extract, which are acute dermal toxicity and acute oral toxicity. The acute dermal toxicity test was conducted using a fixed dosage approach following the OECD (Organization for Economic Cooperation and Development) guideline number 402 for chemical testing whilst the acute oral toxicity test was performed according to OECD guideline number 425 for chemical testing [20]. The acute oral toxicity test also was used as a limit test.

Antioxidant Assay

2.6.1 ABTS Scavenging Assay

The potential of a formulated skincare (ampoule and cream) containing EBN extract to scavenge radicals was investigated using ABTS assay with minor modifications [21]. $K_2S_2O_8$ solution (2.45 uM) was freshly prepared by dissolving 6.62 mg of $K_2S_2O_8$ in 10 mL distilled water, and 7 mM ABTS was freshly prepared by dissolving 38.4 mg in 10 mL distilled water. The reagents ($K_2S_2O_8$ and ABTS) were combined and incubated at room temperature for 4 minutes in the dark. Before usage, the mixture's spectrophotometric absorbance at 735 nm was confirmed to be 0.700 ± 0.005. The reduction in spectrophotometric absorbance observed by the EBN extract was compared to ascorbic acid as a positive control. The percentage reduction in absorbance was used to calculate the ABTS radical cation scavenging activity.

Eq. 1 was used to calculate the ABTS Scavenging (%):

$$\text{ABTS scavenging activity (\%)} = [(A1 - A2)/A1] \times 100\% \qquad (1)$$

A1 and A2 are the absorbance of ABTS blank and with sample, respectively.

2.6.2 DPPH Radical Scavenging Assay

The potential of formulated skincare (ampoule and cream) containing EBN extract to scavenge radicals was investigated using a stable DPPH radical following a previous study with slight modifications [22]. Briefly, 1 mL of DPPH solution (80 g/mL) was added to 1 mL of ethanol (0.08 mg/mL) to dilute the sample. After 30 minutes of incubation in the dark at 25 °C, the absorbance of the mixture was measured at a wavelength of 517 nm. A 0.5 mL DPPH solution and 0.5 mL blank solution (ethanol) were used. The reduction in UV absorbance observed by the tested sample was compared to the positive control, butylated hydroxytoluene (BHT).

Eq. 2 was used to calculate the DPPH Scavenging (%):

$$\text{DPPH scavenging activity (\%)} = [(A1 - A2)/A1] \times 100\% \qquad (2)$$

A1 and A2 are the absorbance of DBBH blank and with sample, respectively.

Anti-ageing Assay

2.7.1 Cell Viability Assay

The cell viability assay was conducted by sending the EBN samples to Phyto Biznet Sdn. Bhd. The assay was done using human skin fibroblast cell lines (HS1184) and MTT assay kit (American Type Culture Collection, ATTC) following the protocols provided by the manufacturer. Briefly, the cell culture was prepared, by growing the normal human fibroblast cell line in Dulbecco's Modified Eagle's Medium (DMEM) supplemented with 10% fetal bovine serum (FBS) and 1% penicillin–streptomycin. The incubation was carried out in a 5% CO_2 incubator at 37°C. The medium was changed after 24 h with the addition of different concentrations of EBN sample and incubated for 24 h. After 24 h, the culture medium was removed and incubated with MTT solution at 37°C for 90 min. The solution was replaced with 0.04 N HCl– isopropyl alcohol solution, and further incubation was done at room temperature for 30 min. Absorbance was measured at 570 nm using microplate reader. The cell viability was calculated using Eq. 3 as follows:

Cell viability = [(Sample – Blank)/(Control – Blank)] × 100% (3)

2.7.2 In Vitro Pro-Collagen Assay

In vitro pro-collagen assay was conducted by sending the EBN sample to Phyto Biznet Sdn. Bhd. The collagen content analysis was performed using human skin fibroblast (HSF1184) cell lines [23] according to the previous study [24]. Normal human skin fibroblasts cells were seeded at a density of 5 × 104 cells/well in a 24-well plate and cultured in complete DMEM to 70% confluent. The cells were then starved in serum-free DMEM for 24 h and rinsed with phosphate-buffered saline (PBS). Exposure to UVB irradiation was performed at 312 nm, 20 mJ/cm2 (UVLMS-38, USA), as measured with a UV light meter (YK-35UV, Taiwan). The UVB-irradiated cells were cultured in serum-free DMEM with or without EBN or ascorbic acid (Sigma, USA) for 48 hr. At the end of the treatment period, the spent media was collected and filtered using a 0.22 µm membrane filter to remove any possible particulates. Then, a collagen content in the spent media was quantified using soluble collagen content kit (Sircol, United Kingdom) following manufacturer procedure.

Skincare Formulation

The cold process method was applied in the EBN formulation study. Two types of formulation were prepared (ampoule and cream) using EBN extract as the active ingredient in both formulations.

2.8.1 Formulation of Ampoule

Two formulations of ampoule were prepared, one with EBN extract as the active ingredient and the other without EBN extract as the placebo. The formulation of ampoule consisted of 50% w/w EBN extract as the active ingredient and 50% w/w distilled water, while for the placebo, distilled water was replaced the EBN extract. The formulation components used are shown in Table 1.

Table 1: EBN extract ampoule formulation

No.	Ingredients	Formulation (% w/w)	
		1	2 (Placebo)
1	EBN extract	50	-
2	Distilled water	-	50
3	Mint water	48.7	48.7
4	Phenoxyethanol	0.7	0.7
5	C12-15 Pareth 12	0.5	0.5

2.8.2 Formulation of Cream

Similarly, two formulations of cream were prepared, one with EBN extract as the active ingredient and the other without EBN extract as the placebo. EBN extract was used as the active ingredient for the formulation of cream. The formulation components used are shown in Table 2. All aqueous-soluble materials were dissolved in water, while all oil-soluble ingredients were combined separately in separate beakers at room temperature. After that, the aqueous phase was slowly added to the oil phase while being constantly stirred with a homogenizer.

Table 2: EBN extract cream formulation

No.	Ingredients	Formulation (% w/w)	
		1	2 (Placebo)
1	EBN extract	1.0	-
2	Deionized water	80.9	81.9
3	EDTA	0.1	0.1
4	Mint water	4.0	4.0
5	Plant-based preservative	2.0	2.0
6	Lecigel	1.9	1.9

7	Olive squalene	3.0	3.0
8	Butylene glycol	1.5	1.5
9	Sweet almond oil	2.5	2.5
10	Honey locust seed extract	2.0	2.0
11	Liposomal retinol	1.0	1.0
12	Rose germanium essential oil	0.1	0.1

Physical Stability Assessment

The stability study for the skincare formulation containing EBN extract was conducted under four distinct conditions: (i) room temperature (25 ± 2 °C), which was protected from light; (ii) room temperature (25 ± 2 °C), which was exposed to light; (iii) oven (45 ± 2 °C); and (iv) refrigerator (5 ± 2 °C) [25]. The skincare formulations (ampoule and cream) were stored in tightly screwed transparent glass containers for four weeks in the four scenarios indicated above. The physical stability of the cream and ampoule formulations were determined by the pH and colour of the formulations for four weeks. The skincare formulations' colour was determined using a colorimeter (CR-400, Konica Minolta). The pH of the solution was measured with a pH metre (FiveEasy, Mettler Toledo, Malaysia) after 0.5 g of the formulation was weighed and dissolved in 50.0 mL of distilled water. Standard buffer solutions (pH 4, 7, and 10) were used to calibrate the pH metre before usage [26].

Assessment Survey on the Organoleptic Properties and Effectiveness of the Skincare Formulation

The Quantitative Description Analysis (QDA) was performed to measure the organoleptic characteristics and effectiveness of the formulated skincare. The organoleptic assessment survey for the formulated skincare was given to 50 respondents from different age groups; 20-29 years old, 30-39 years old, 40-49 years old and 50-59 years old. The survey required respondents to apply the formulations on their faces and assess its organoleptic properties (smoothness, stickiness, freshness, and smell) for a duration of four weeks [27]. The results obtained from the survey were further analysed and tabulated using radar charts that consisted of a scale from 0 (least favorable) to 5 (most favourable) to present the average scores of 50 respondents who completed the organoleptic survey after using the formulated skincare for four weeks. Besides, the effectiveness of the formulations also was rated based on the capability to reduce wrinkles, hydrate the skin, and brighten the skin. The least effective parameter was rated as 0 while the most effective parameter received a score of 5 [28]. The effectiveness of the skincare formulations were displayed in bar charts which shows the mean and standard deviation of the scores rated.

RESULTS AND DISCUSSIONS

Analysis of EBN Content

3.1.1 Total Protein Content

The total protein content of EBN extract measured was 59.25 ± 0.10% of dried weight. According to [29], the protein content of EBN measured was in a range from 50 to 55% of dried weight, while [8] reported that the total protein content of EBN was 62 to 63% of dried weight. The total protein content obtained in this research was similar compared to previous studies, which showed the consistency of Bradford method to measure the total protein content.

3.1.2 Amino Acids Composition

In this study, 16 types of amino acids were quantified and identified in the EBN extract using HCl hydrolysis, alkaline hydrolysis and performic acid oxidation methods. The 16 types of amino acids are alanine (Ala), serine (Ser), histidine (His), valine (Val), phenylalanine (Phe), threonine (Thr), aspartic acid (Asp), arginine (Arg), isoleucine (Ile), tyrosine (Tyr), proline (Pro), glycine (Gly), leucine (Leu), lysine (Lys), methionine (Met), and glutamic acid (Glu). The compositions of each amino acids were summarized in Table 3. There were differences in the number of amino acids detected compared to previous studies. [30] reported 16 types of amino acids, which was similar to the results obtained from this current research. On the other hand, [31] reported 18 types of amino acids, [19] reported 15 types of amino acids, while [32] reported 14 amino acids in EBN. A possible explanation for the different types of amino acids found in the EBN from these studies was the different preparation methods used prior to HPLC analysis.

Table 3: Amino acids composition in EBN

No.	Amino acids	Type of amino acid	w/w%
1	Arginine	Essential	1.28 ± 0.10

2	Histidine	Essential	2.53 ± 0.08
3	Isoleucine	Essential	1.92 ± 2.72
4	Leucine	Essential	3.14 ± 0.29
5	Lysine	Essential	2.18 ± 0.11
6	Methionine	Essential	3.46 ± 4.34
7	Phenylalanine	Essential	3.30 ± 0.20
8	Threonine	Essential	3.41 ± 0.42
9	Valine	Essential	1.42 ± 1.87
10	Aspartic acid	Non-essential	6.59 ± 0.54
11	Alanine	Non-essential	3.79 ± 0.13
12	Glutamic acid	Non-essential	6.22 ± 0.11
13	Glycine	Non-essential	2.11 ± 0.47
14	Proline	Non-essential	6.13 ± 0.32
15	Serine	Non-essential	7.61 ± 0.17
16	Tyrosine	Non-essential	0.33 ± 0.18

3.1.3 Total Sialic Acid Content

The sialic acid content of EBN extract in this current study was 9.7%. This result is comparable to the previous studies [2, 33], where it was around 10%. Sialic acid is one of the main glycoproteins in EBN extract and has been reported to promote the cell tissue repair, cell division, and cell proliferation [9]. In addition, a previous study also discovered that sialic acid inhibited tyrosinase activity, which may affect melanin synthesis and reduce the production, thus responsible for brightening effects in EBN [33].

Toxicology Analysis

Toxicology analysis was performed to determine whether the EBN extract is safe to be applied in skincare formulation. The toxicology of the extract was evaluated by the median lethal dose (LD50), a parameter to determine the test substance dosage, which leads to 50% mortality rate of certain animals [34]. In this study, acute dermal toxicity and acute oral toxicity were done to evaluate the safety of formulated skincare [35]. Based on both analyses conducted by SIRIM Berhad, EBN extract showed a median dermal lethal dose (LD50) of greater than 2000 mg/kg body weight. Hence, EBN extract is classified as Category 5 according to the Globally Harmonised System for the classification of chemicals which have relatively low acute toxicity but which under certain circumstances, may pose a hazard to vulnerable populations. EBN extract is under the category of "Not Classified" according to CLASS Regulation 2013 where it does not meet the classification criteria for any hazard class. These results indicated that EBN extract is safe for skincare application and not harmful for consumer use.

Antioxidant Activity

EBN has been reported to be antioxidant-rich. In this study, DPPH and ABTS assays were conducted to measure the antioxidant radical scavenging activities of EBN extract using ascorbic acid as a control. Table 4 shows the antioxidant activity of the EBN extract measured following the protocol of ABTS and DPPH. For the ABTS assay, the activity was recorded to be 39.77 ± 1.05% compared to the positive control, ascorbic acid which was 93.13 ± 0.90%. In contrast, for the DPPH assay, the antioxidant radical scavenging activities of EBN extract and ascorbic acid were slightly higher at 49.70 ± 0.40% and 95.78 ± 0.81%, respectively. The present results corresponded to the previous study reported that the highest DPPH radical scavenging activity was 46.15% [36]. The high scavenging activities suggested that EBN sample operate as a good proton donor capable of reacting with free radicals to break down radical chain reactions.

Table 4: Antioxidant radical scavenging activities using ABTS and DPPH assays for EBN sample and ascorbic acid as a standard

Sample	Antioxidant Scavenging Activities (%)	
	ABTS	DPPH
EBN extract	39.77 ± 1.05	49.70 ± 0.40
Ascorbic acid (Standard)	93.13 ± 0.90	95.78 ± 0.81

Anti-ageing Activity

3.4.1 Cell Viability Analysis

Based on the study conducted by [37], in-vitro analysis was required to evaluate the potential adverse effects of bioactive compounds in the EBN extract. It is also to determine whether the EBN extract is suitable to be used in skincare formulations. Cell viability assay was conducted to investigate the cytotoxicity effect of EBN extract using a series of concentrations on human skin fibroblast cells. The average values for each EBN sample concentration were determined, and the concentrations of EBN samples ranged were set from 39.0625 µg/ml to 10000 µg/ml. The cell viability of the normal human skin fibroblast was calculated using Eqn. 3 and the results were plotted as the mean and standard deviation. As shown in Figure 1, the cytotoxicity effect of EBN extract on human skin fibroblast cells was not observed, and no IC_{50} value was recorded within the range of EBN sample concentration tested. This shows that EBN extract will not be harmful to human skin cells and it is safe to be incorporated as one of the active ingredients in the skincare formulation.

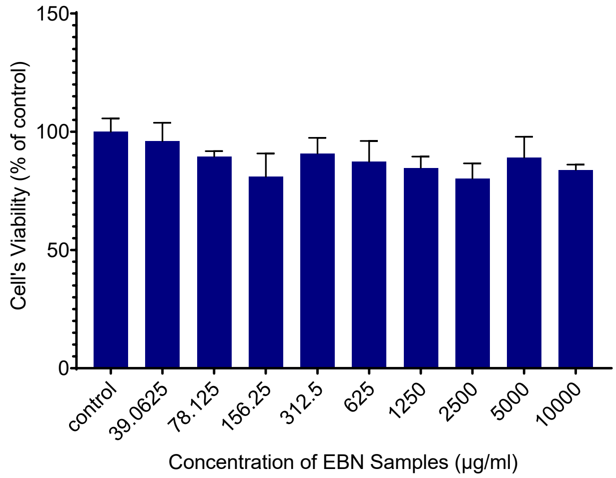

Figure 1: Cell viability assay for different concentrations of EBN samples.

3.4.2 In Vitro Pro-Collagen Analysis

Figure 2 shows the effects of different concentration of EBN extract on the collagen content in human dermal fibroblasts. The cells were treated with different concentrations of EBN extracts ranging from 10 to 500 µg/ml and ascorbic acid (25 µM) as a standard. Although the collagen content was slightly decreased as the concentration of EBN samples increase, however, it should take into consideration that the total collagen content in the cells were increased after treated with 10 µg/ml EBN (29.15 ± 1.36 µg/ml) compared to the untreated cells (17.33 ± 1.39 µg/ml) following the 20 mJ/cm^2 UVB irradiation. This finding suggest that EBN extract may restored the expression of gene that regulated the synthesis of collagen and thus can be used as anti-ageing factor caused by UVB irradiation.

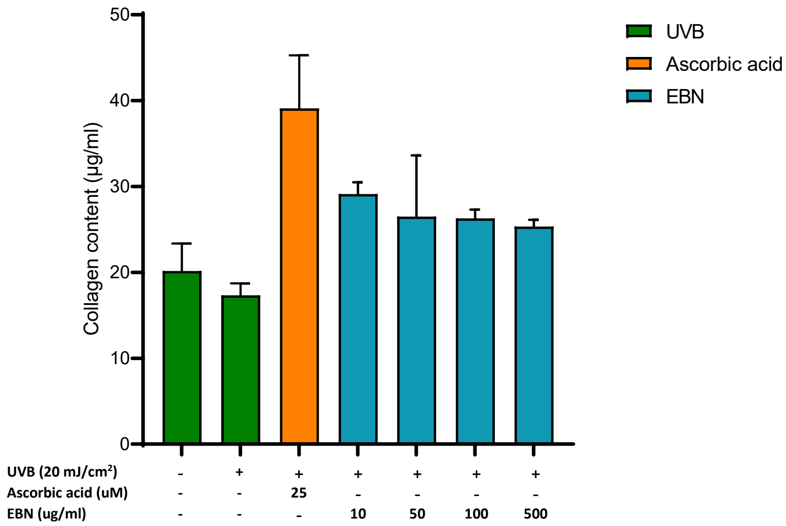

Figure 2: Collagen content of EBN samples with different concentrations and ascorbic acid as a standard.

Stability Test

There were four different skincare formulations produced in this study. All formulations were kept for a period of four weeks under four different storage conditions: (i) room temperature (25 ± 2 ºC), which is protected from light; (ii) room temperature (25 ± 2 ºC) which is exposed to light; (iii) oven (45 ± 2 ºC); and (iv) refrigerator (5 ± 2 ºC). The formulation stability in terms of the texture of the formulation, including colour and pH was monitored and the observation was recorded every week for a period of 4 weeks using a calorimeter (CR-400, Konica Minolta) and pH meter (ThermoScientific). Based on the observation, the skincare formulations were homogeneous without signs of phase separation at all four conditions. In terms of colour changes and pH of both ampule and cream formulation, there were no significant differences throughout the four weeks of observations. The stability tests conducted on the pH and colour were important to ensure the quality and safety of the skincare formulations, as well as to reduce the risk factors to consumers [38]. In summary, both formulations are stable and safe to be used by consumers.

Assessment Survey on the Organoleptic and Effectiveness of the Formulation

An assessment survey on the organoleptic ad effectiveness of the formulation was conducted according to the previous study [27]. The first evaluation based on the organoleptic properties of the skincare formulations was analysed in radar charts. The five organoleptic properties of cream rated by respondents were a smell, appearance, texture, smoothness, and freshness. According to Figure 3, the smell, texture, smoothness, and freshness of cream placebo were rated slightly lower compared to cream with EBN. A notable observation was that the appearances for both cream formulations were rated the highest at a score of 4.60. In an overall view, both cream formulations were acceptable by the respondents.

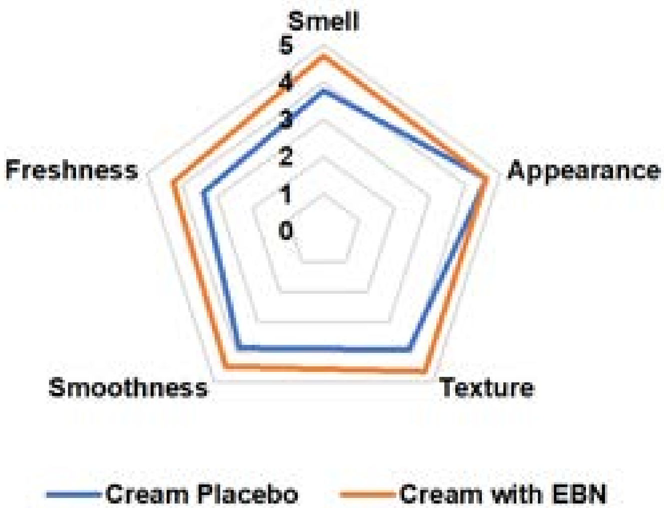

Figure 3: Comparison between the organoleptic properties of the cream formulations

On the other hand, the five organoleptic properties measured for the ampoule formulations were a smell, appearance, texture, freshness, and fluidity. The smoothness of the formulation was replaced with fluidity due to the liquid form of ampoule as compared to cream. According to Figure 4, all organoleptic properties of the ampoule formulations were considered acceptable and satisfactory by the respondents. However, the fluidity of the ampoule placebo was rated slightly below satisfactory, indicating that respondents agreed that the fluidity of ampoule with EBN extract is better than the ampoule placebo.

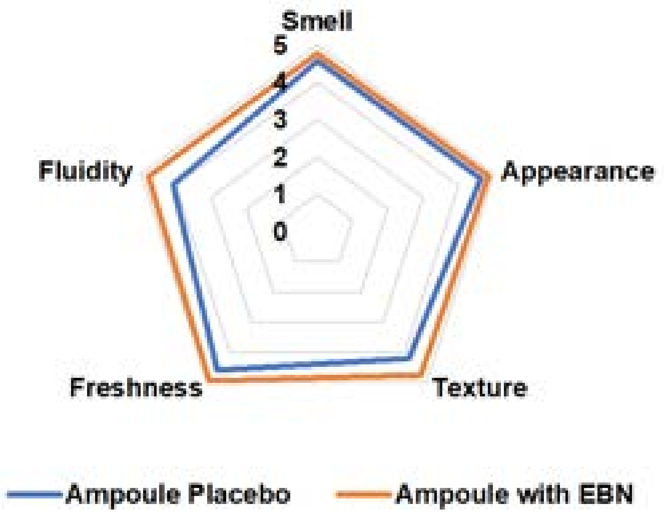

Figure 4: Comparison between the organoleptic properties of the ampoule formulation

All four skincare formulations were also rated based on respondents' effectiveness after an application period of four weeks. The three effectiveness parameters being rated in the survey were reducing wrinkles, hydrating the skin, and brightening the skin. The evaluation based on the effectiveness of the formulation was tabulated in the bar graphs. From Figure 5, it can be concluded that the cream with EBN was rated higher in terms of effectiveness than the placebo. Rating for the respondents' effectiveness was also significantly different ($p<0.05$) for the placebo and cream with EBN. Overall, the respondents agreed that the effectiveness of the cream with EBN was higher than the placebo after using them for four consecutive weeks. Similarly, respondents' results regarding the effectiveness of ampoule formulation with EBN were higher than that of the placebo. The comparison between the effectiveness of ampoule with EBN and the placebo was shown in Figure 6. To summarize the findings from the organoleptic assessment survey, the cream with EBN and ampoule with EBN showed effectiveness in the skin conditions of the respondents, which were reduced wrinkles, hydrated skin and brightened skin. The findings indicate that EBN extract was effective in reducing wrinkles, skin hydration and skin brightening. This may be due to the sialic acid content in EBN, which has been previously contributed to the regulation of cell tissue repair, cell division, and cell proliferation, which further leads to reducing wrinkles, skin hydration and skin brightening actions [9, 39].

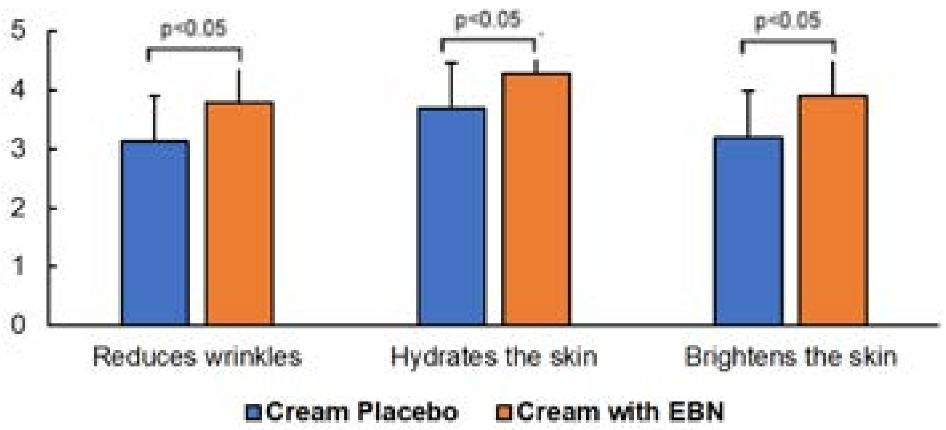

Figure 5: Comparison of the effectiveness between the placebo and cream with EBN

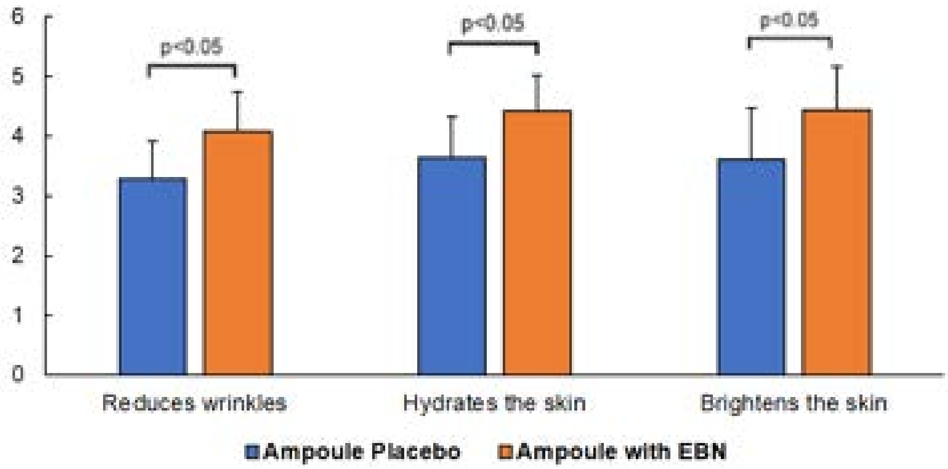

Figure 6: Comparison of the effectiveness between the placebo and ampoule with EBN

CONCLUSION

The present study has characterized two formulations of EBN based skincare to ensure the stability and safety of the formulated product for consumers. Acute oral and dermal toxicity studies of the EBN extract have shown no toxicity indicated it can be used for a food-grade cosmetic and skincare formulation. In addition, antioxidant and anti-ageing activities of the EBN extract also were investigated. The results revealed a promising antioxidant and anti-ageing properties when tested on healthy human dermal fibroblast cells. These results may be the reason for the effectiveness of the formulated EBN skincare in improving skin texture such as reducing wrinkle, hydrating the skin and brightening the skin complex, as claimed by the respondents through the survey conducted. Owing to the unique of its composition, it is proven that the incorporation of the EBN extract in skincare formulation as active ingredient will enhance the quality and effectiveness of the skincare formulation.

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AUTHOR CONTRIBUTIONS

CYYE performed the experiments, analyzed, interpreted the data, and wrote the original manuscript. NH, LCH and LTH designed the study, guide the experiments and wrote the manuscript. All authors read and approved the final manuscripts.

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