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Kandungan

Prakata Pengarah PMM

Assalamualaikum WBT dan Salam Sejahtera

Bijak Laksana Tuah, Berani Laksana Jebat.

Alhamdulillah, syukur ke hadrat Allah SWT kerana dengan limpah kurnia-Nya, inisiatif penerbitan ini dapat dijayakan. Terlebih dahulu, saya ingin mengucapkan syabas dan tahniah kepada Unit Penyelidikan, Inovasi dan Komersial (UPIK) Politeknik Merlimau (PMM) dan seluruh ahli jawatankuasa yang bertungkus lumus dalam menjayakan penerbitan e-Digest PMM Edisi 2 ini.

e-Digest PMM ini merupakan salah satu wadah kepada para pensyarah politeknik bagi memperluas dan memperkembangkan ilmu melalui perkongsian hasil penyelidikan dan inovasi mereka. Budaya penyelidikan dan inovasi ini dapat memberi impak positif daripada pelbagai aspek seterusnya membantu ke arah pemantapan kualiti pendidikan di Politeknik dalam mentransformasi Pendidikan Tinggi Negara.

Tahniah juga diucapkan kepada para pensyarah politeknik yang menyumbang idea penulisan sekali gus menjadi wadah kepada mereka untuk berinteraksi dan berkongsi pengalaman kajian meliputi bidang kejuruteraan, pelancongan dan hospitaliti, perdagangan serta sains sosial. Saya berkeyakinan usaha murni untuk menjayakan penerbitan e-Digest PMM Edisi 2 akan membantu kita lebih berjaya pada masa akan datang.

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Prakata KUPIK , PMM

Syukur dengan izinNya, kompilasi penulisan penyelidikan penyelia projek akhir pelajar berjaya diterbitkan dalam e-Digest Perkaya Inovasi terbaru bagi tahun 2023.

Penerbitan e-Digest Perkaya ini merupakan Edisi ke 2 di mana penerbitan ini telah berjaya mengumpulkan sebanyak 29 kertas penyelidikan daripada lima jabatan utama di PMM iaitu Jabatan Kejuruteraan Elektrik, Jabatan Kejuruteraan Awam, Jabatan Kejuruteraan Mekanikal, Jabatan Perdagangan dan Jabatan Pelancongan dna hospitaliti.

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Pelan Pembangunan Pendidikan Tinggi mempunyai matlamat untuk meningkatkan kualiti penyelidikan, dan menggalakkan penyelidikan dan inovasi dalam bidang-bidang strategik. Oleh yang demikian, aktiviti pembangunan projek inovasi seterusnya penerbitan kertas penyelidikan merupakan aktiviti penting dalam usaha untuk merealisasikan matlamat Pelan Pembangunan Pendidikan Tinggi ini. Selaras dengan keperluan tersebut, e-Digest PERKAYA INOVASI ini mensasarkan penerbitannya setiap tahun agar aktiviti penyelidikan, penulisan dan penerbitan menjadi budaya di kalangan warga Politeknik Merlimau khususnya dan warga Jabatan Pendidikan Politeknik dan Kolej Komuniti (JPPKK) amnya.

Melalui penerbitan ini, pembaca akan menemui pelbagai topik penyelidikan yang terdiri daripada penyelidikan sains sosial sehinggalah pelbagai cabang ilmu dalam penyelidikan sains fizikal. Setiap artikel mewakili perjalanan penerokaan idea, fasa pembangunan seterusnya pengujian bagi melengkapkan prosedur penyelidikan masing-masing.

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TRACK 1

INNOVATION PRODUCT DEVELOPMENT

Smart Rubbish Bin with Filter Box: An Innovative Solution For Efficient Waste Sorting

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Abstract. The growth of the restaurant industry in Malaysia has a significant impact on the generation of organic waste or food waste. If the amount of food waste produced continues to increase and is not managed properly, it will result in a rise of garbage sent to landfills. This will also require the government to allocate a considerable amount of funds to handle the waste. This study is based on a project regarding a Smart Rubbish Bin with Filter Box that makes it simple for students in a commercial restaurant class to dispose of food waste. A mixture of storage boxes is used to implement the conventional approach. The objective of this project is to create a smart rubbish bin with filter box, to find out the functionality, to investigate the safety aspect and to ascertain the longevity of the smart rubbish bin with filter box. A quantitative research method was employed in this study, wherein a total of 30 questionnaires were disseminated to 30 participants who were randomly selected from the population of commercial class students in PMM. The data was analyzed using the Statistical Package for Social Science (SPSS). The effectiveness of the Smart Rubbish Bin with Filter Box was assessed using a questionnaire survey, and the results were presented as mean scores and percentages. Based on the data interpretation analysis conducted, the mean scores for the functionality and safety aspects of the product were both rated highly at 4.02. Meanwhile, the durability factor received a slightly lower but still high mean score of 3.95. In conclusion, the Smart Rubbish Bin with Filter Box is an effective solution for managing organic waste in restaurants, as indicated by the high mean scores for functionality, safety, and durability. However, more research is necessary to assess its long-term effectiveness in different restaurant settings.

Keywords: food waste, rubbish bin, restaurant

1. INTRODUCTION

The development of the restaurant industry in Malaysia currently greatly affects the generation of food waste or organic waste. If the production of this food waste is increasing and is not managed using good methods, it will cause the garbage thrown into landfills to increase. In addition, the government also has to spend a lot of money to manage the waste. The increase in dining out frequency in transitional economies presents a substantial societal challenge concerning food waste generated by restaurants, (Filimonau, Fidan, Alexieva, Dragoev, Marinova, 2019). The emergence of food waste, primarily from restaurant sources, has presented a concerning challenge as a point source of pollution affecting land, water, and air (such as greenhouse gas emissions). Consequently, managing and recycling food waste from restaurants have gained significant importance, requiring focused efforts from restaurant owners to minimize the quantity of waste they produce (Dahlan, Yusoff, Akinbile, Wang, 2022).

2. LITERATURE REVIEW

Recycling, composting and the conversion of waste to energy go hand-in-hand in Malaysia, which striving for sustainable waste management. RM Rodzi (2019) stated that the highest composition for both sampling points was organic or food waste with cafeteria generating 82.87% (20.84kg/day) in Malaysia TVET Campus. From that Three viable strategies for enhancing solid waste management in commercial settings, specifically within TVET campuses in Malaysia, involve implementing food waste composting, employing incentive schemes (reward/merit/penalty) for enforcement, and ensuring the provision of systematically segregated recycle bins. According to Hussin, Shamsuddin, Jumaidin, Zakaria, Jenal (2018) 94% of 51 owners of the restaurant, agree that the inclusion of oil separator is important as preventive maintenance. However, none of them are willing to spend more than MYR 400 to have the grease trap with oil separator. According to a prior study, a bigger proportion of Malaysia's municipal solid wastes are organic wastes. If these wastes were separated, this would assist local businesses manage garbage more affordably and with less negative environmental effects like landfill emissions (IA Jereme, C Siwar, RA Begum, B Abdul, 2017). Smart trash bin filter made to facilitate the disposal of food waste so that the sink is not clogged with food waste that has been thrown in the sink. In addition, this smart trash bin trolley is easy to carry anywhere because it has wheels. Next, it makes the work of garbage disposal easier because it can separate solid waste and liquid waste.

3. RESEARCH METHODOLOGY

There are several things in the methodology such as prepared product, method analysis and production flowchart. This study was conducted using quantitative analysis. The objective of this project is to create a smart rubbish bin with filter box, to find out the functionality, to investigate the safety aspect and to ascertain the longevity of the smart rubbish bin with filter box. To achieve the objective, the researcher will do a sampling, research instrument, and data collection method. The preparation of product started from the sketch until the production. The method that has use were measure and cutting, screwing and drilling as shown at Figure 1.

Figure 1: Flowchart Production of Smart Rubbish Bin with filter Box

In this study, the researchers aimed to evaluate the effectiveness of a Smart Rubbish Bin with Filter Box in managing waste in the commercial class at Politeknik Merlimau, Melaka. The researchers selected 30 students from commercial class as the target respondents and developed the smart rubbish bin to simplify the rubbish disposal process.

Likert Scale of Smart Rubbish Bin with Filter Box

To gauge the participants' attitudes towards the product, the researchers used the Likert scale approach, which simplifies the collection, analysis, and interpretation of survey data. The Likert scale approach provides a standardized way of measuring and making it easier to draw meaningful conclusions from the data collected. Overall, the study aimed to identify the feasibility and effectiveness of the Smart Rubbish Bin with Filter Box in the commercial setting and provide insights into the potential benefits. The diagram questionnaire has 4 section which section A focuses on the demographic, section B function aspect, section C safety factor and section D durability factor.

Strongly Disagree	Disagree	Undecided	Agrees	Strongly Agree
1	2	3	4	5

Figure 2: Likert Scale

Mean interpretation table as shown as Table 1 was used to determine evaluate the acceptance of the smart rubbish bin with filter box among commercial student. If findings show that 1.00 – 2.49 it can be considered as low and need improvement. If finding show that 2.50 – 3.49 it can be considered as medium and need improvement and if finding show that 3.50 – 5.00 it can be considered as high.

Table 1: Table of Interpretation Mean range

Score Mean	Interpretation	Level
1.00 until 2.49	Low	Poor
2.50 until 3.49	Medium	Medium
3.50 until 5.00	High	Good

(Wiersma, 1995)

4. RESULT AND DISCUSSION

Based on surveys and analyses the been made, this product is completely accepted by consumers and clearly scores high mean values for each factor that has been divided. The mean value for the function factor with the highest mean score is 4.10 which is an easier product for respondents who work in the kitchen. It indicates a strong consensus among respondents that making something easier is highly desirable or important. This term likely represents a key factor in the context being assessed. The second mean score is 4.07 for the product is easy to clean and portable. It indicates that respondents value portability is an important aspect in the scenario under consideration. The analysis for safety factor interprets that all criteria score high. Two criteria score the highest mean is brake and can use in dry area 4.17. It indicates that respondents attach great importance to the braking mechanism. This suggests that a reliable braking system is a key safety feature in the context provided. Additionally, respondents also consider the usability of the product in dry areas as crucial. This feature is likely seen as a safety or efficiency consideration.

Durability factor has been analyzed and overall, the consistently high mean ratings across all criteria underscore the critical importance respondents place on durability score 4.23 when evaluating the product. Factors such as strength, material quality, heat resistance, ability to fill up, and the overarching aspect of being durable are viewed as essential components of a long-lasting product. These insights provide valuable guidance for product development, emphasizing the need to prioritize durability to meet consumer expectations and satisfaction.

The results of each condition is tabulated as in Table 2 – Table 4.

Table 2: Result Function Aspect

Criteria	Mean	Interpretation
Save time	3.97	High
Easier	4.10	High
Separate	3.87	High
Clean	4.07	High
Portable	4.07	High

Table 3: Result Safety Factor

Criteria	Mean	Interpretation
Safe to use	3.97	High
Avoid incident	3.80	High
Reduce movement	4.00	High
Brake	4.17	High
Can use in dry area	4.17	High

Table 4: Result Durability Factor

Criteria	Mean	Interpretation
Strong	3.83	High
Material	3.97	High
Heat resistant	3.83	High
Fill up	3.90	High
Durable	4.23	High

5. CONCLUSION

As a conclusion, a thorough analysis of the study's results regarding the Smart Rubbish Bin with Filter Box. The assessment of acceptance levels among community JPH revealed a highly positive response, underlining the product's user-friendly design and its potential for successful integration. Moreover, the durability analysis demonstrated the product's robustness and garnered positive feedback from users, affirming its reliability over time. Moving forward, it is recommended to enhance the product's size and structural materials, particularly for accommodating larger restaurant establishments. By improving the material composition and design, the Smart Rubbish Bin with Filter Box can endure longer usage periods, meeting the demands of larger-scale waste management. Additionally, upgrading critical components like the grease trap with advanced materials will enhance its functionality and position the product for sustainable use in the future, aligning with evolving waste management needs and environmental considerations. These recommendations aim to elevate the product's effectiveness and expand its application, contributing to efficient waste management practices in the hospitality industry.

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Banana Peel Coffee: An Innovative Approach to Reduce Food Waste and Enhance Value-added Products

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Abstract. The banana is a popular fruit and a significant agricultural crop around the world. Unfortunately, banana manufacturing and processing generate significant fruit waste, especially banana peels, which are frequently dumped as waste. Banana peels are high in nutrients and bioactive substances, and their potential application has grown in popularity in recent years. The popularity of banana production and consumption, the development of banana peel waste, and the various uses of banana peels are all highlighted in this study. Banana peels are currently considered waste, generating pollution and unpleasant smells in the environment. Rather than being classified as waste, this research concentrates on identifying the acceptance of respondents and the caffeine contained in Banana Peel Coffee. This can be conducted by conducting a quantitative research study to determine the acceptance of Banana Peel Coffee in the community of Merlimau, Melaka. Sensory evaluation questionnaires will be distributed to 35 random respondents, and their evaluations of the taste, smell, texture, and appearance of Banana Peel Coffee will be analyzed. To produce an accurate statistical report outcome from the data acquired, the Statistical Packagefor Social Science (SPSS) program technique was utilized to examine the study's findings. The study indicated that respondents accepted Banana Peel Coffee, with an overall mean score of 4.33 and a high mean score in a sensory evaluation including taste, texture, color, smell, and overall acceptability. Banana Peel Coffee emphasizes its distinct flavor, caffeine-free status, use of discarded banana peels as packaging material, and environmental friendliness. Banana Peel Coffee is highly accepted by respondents and contains no caffeine, indicating that it has market potential as a new variety of coffee. The researchers propose more research into the possible uses of banana peels in the food and beverage industries and alternatives to ensure the product's economic success.

Keywords: banana peel, caffeine, coffee, food waste, sensory evaluation

1. INTRODUCTION

Banana plants are parts of the Musaceae family, which is composed of three plant families: Musa, Ensette, and Musella, all of which are members of the same family but contain multiple species under Musa (Hamid et al., 2016). Banana is one of the world's ten most important harvests, and the fourth largest producer, with about 7 million tons produced by traditional agriculture. over 90 million tons of banana fruit are produced each year, with the majority produced in tropical locations such as South Eastern Asia (47%), South and Central America (28%), and Africa (13%) (Pyar & Peh, 2018). Banana is the second most planted fruit in Malaysia, the most-eaten fruit, and one of the most significant tropical fruits on the global market (A'bidin et al., 2019). Since bananas are a popular fruit in Malaysia, many entrepreneurs produce a range of banana by-products. Banana chips are a well-known byproduct. Banana chips are one of the mass-produced items. Between 1996 and 2000, Malaysia's industrial growth performance of banana chips increased by 70% (A'bidin et al., 2019).

The agricultural and fruit processing sectors generate a huge amount of fruit waste. Banana, papaya, apple, pomegranate, pear, citrus, and grapefruit waste are examples of fruit waste (Qureshi et al., 2017). The banana is a popular fruit due to its cheap cost and high nutritious content. Due to environmental pollution, peel or skin is commonly seen as a waste product (Puraikalan, 2018). Every day, several tons of banana peel trash is produced in fruit markets and home garbage, causing an unpleasant odor caused by anaerobic digestion of the biomass, which produces gases that disrupt the natural system of air.

Fruit peels have often been used to keep people healthy. The use of fruit peel extracts for antibacterial activities can be highly beneficial in therapeutic treatments (Chabuck Zainab A.G. et al., 2013). As banana peel is high in dietary fiber, proteins, essential amino acids, polyunsaturated fatty acids, and potassium, it can help with discomfort, swelling, itching, bruising, wrinkles, and sunburn (Khan et al., 2018). According to a previous study, the disposal of this massive amount of wet organic waste will potentially harm the ecosystem and cause human health problems (Sultan & Johari, 2017). The amount of banana peel waste is increasing year after year (Santosa, 2019). Therefore, developing returns from waste, such as banana by-products, should be considered as one method of creating an environmentally friendly environment for future generations. As a result, the objectives of this study are to examine the sensory evaluation of Banana Peel Coffee among respondents and to quantify the caffeine level of Banana Peel Coffee.

2. LITERATURE REVIEW

2.1 Banana and banana peels

Musa sapientum, the scientific name for the banana, is a herbaceous plant in the Musaceae family. It is well known that it originated in Southern Asia's tropical regions (Hamid et al., 2016). The banana with a worldwide yield of over 80 million metric tons, is the fourth largest food crop in the world after rice, wheat, and maize. With an annual production of 23.205 million metric tons from an area of 0.647 million hectares, India is the world's greatest producer of bananas. The fruit banana is very calorie-dense. They are an excellentsupplier of magnesium and potassium (Khan et al., 2018). Bananas are a highly well-liked fruit due to their inexpensive cost and great nutritional content. The peel or skin is usuallyconsidered a waste product as a result of environmental pollution (Puraikalan, 2018).

The banana fruit's peel serves as protection and is discarded once its inner fleshy portion has been eaten. After the peel has been peeled off, the fruit can be eaten raw or cooked, andthe peel is usually thrown away. The disposal of tons of banana peels in some regions of the world, particularly in developing nations, contributes to the waste management problem. The production of banana cake, banana chips, banana fritters, and other banana-based items is one of several industries in Malaysia. Banana flesh is used as a raw material in those enterprises, and the peels are thrown away after processing (A'bidin et al., 2019; Sultan & Johari, 2017). Banana peels were typically discarded as solid waste. As a result, there are increasingly more banana peels wasted each year (Santosa, 2019).

Banana peel typically includes 20–30% fiber and 6-9% dry matter protein (Mondal & Roy, 2018). Although there were some varietal differences, it was determined that banana peel also had significant antioxidant potential. Therefore, banana peel can be used for its nutritional and anti-inflammatory properties. Additionally, the banana peel contains iron, magnesium, phosphorus, potassium, fiber, gallocatechin, dopamine, vitamin E, vitamin B6, malic acid, succinic acid, and palmatic acid (Chabuck Zainab A.G. et al., 2013).

2. 2 Effect of caffeine

Caffeine consumption can have both positive and bad effects. Numerous studies have been conducted to determine how caffeine affects the cardiovascular system (McCusker et al., 2003). At very high intake levels, caffeine can cause a variety of negative side effects, such as anxiety, restlessness, nervousness, anxiety, insomnia, excitation, psychomotor agitation, and loss of thought and speech. Extremely high levels of caffeine from tablets or supplements in either powder or liquid form have typically been the cause of caffeine- related deaths (van Dam et al., 2020)

3. RESEARCH METHODOLOGY

3.1 Preparation of Banana Peel Coffee.

Banana peels were gathered from local stalls. The banana peels were then cleaned and dried for 30 minutes in an electric oven. The amount produced was measured and bananapeels were dried at 180℃ before being ground into a fine coffee powder.
Analysis of Sensory Evaluation
The research method used in this study is quantitative. To determine the level of acceptance of Banana Peel Coffee, a set of sensory evaluation questionnaires by using a hedonic scale was handed to the population in Merlimau, Melaka. The sampling area was at Merlimau, Melaka, and 35 respondents were chosen at random. The sensory evaluationof Banana Peel Coffee was analyzed the senses of the smell, texture, color, and taste.

The Statistical Package for Social Science (SPSS) will be used for analyzing the data gathered from the research. The program will generate an accurate percentage report andmean score outcome from the data collected. The mean value range, as indicated in Table 1, will be used to interpret the mean score.

Table 1: Mean Value Range Interpretation

Mean Score	Interpretation	Level
1.00 to 2.33	Low	Weak
2.34 to 3.66	Medium	Moderate
3.67 to 5.00	High	Good

Ref: Sekaran, 1992

3.2 Caffeine Content of Banana Peel Coffee

A sample of Banana Peel Coffee will be used to determine the caffeine amount. The sample will be submitted to SGS (Malaysia) Sdn. Bhd. in Selangor to obtain information regarding the product's caffeine content.

4. FINDINGS AND ANALYSIS

4.1 Finding of Sensory Evaluation

The findings indicate an almost even distribution of male and female respondents, with males representing marginally more than half of the sample population 51.4 % and femalesresulting in the remaining 48.6%. The total mean score for Banana Peel Coffee is 4.33, indicating that the respondents' interpretation is acceptable. The mean scores for taste, texture, color, smell, and overall acceptability are all relatively high, indicating that respondents prefer coffee in every aspect.

Table 2: Mean Score of Sensory Evaluation

Characteristics	Mean Score	Interpretation
Taste	4.23	High
Texture	4.37	High
Colour	4.46	High
Smell	4.26	High
Overall mean	4.33	High

It would be advantageous to retain marketing and promote Banana Peel Coffee as an exclusive and tasty alternative to regular coffee. In order to improve any prospective areas for improvement, such as taste or texture, it may also be worthwhile to explore conducting additional research and development.

4.2 Finding of Caffeine content in Banana Peel Coffee

The researcher determined that there was no caffeine present in the Banana Peel Coffee based on information gathered by SGS (Malaysia) Sdn. Bhd concerning the caffeine level ofa product. Caffeine was not identified in the analysis. Further testing may be required to confirm the absence of caffeine or to discover any potential contamination issues that mayhave influenced the results of the analysis.

The research findings indicate the marketing approach for Banana Peel Coffee should include emphasizing its unique taste and absence of caffeine. This might be appealingto those seeking a caffeine-free substitute for regular coffee. As the product uses banana peels that would otherwise be disposed of as waste, the marketing approach might additionally emphasize presenting the product as an environmentally friendly alternative.

5. CONCLUSION

Determining the level of customer acceptance of Banana Peel Coffee was the study's main objective. The overall average of mean score indicated that Banana Peel Coffee had a strongand favorable acceptance score from respondents. Banana Peel Coffee flavor received positive feedback from the responders, who also gave the product excellent reviews for taste, texture, color, and smell. Given the high degree of respondents acceptance, this finding suggested that Banana Peel Coffee had an excellent opportunity of succeeding in the market.

The second objective of this research was to determine the amount of caffeine in the coffee prepared from banana peels. The study revealed that the result contained no caffeine. This discovery was significant since it might serve as a selling factor for customers looking for caffeinated coffee substitutes. This implied that Banana Peel Coffee might appeal to a larger clientele, including individuals who were sensitive to caffeine or desired to reduce back ontheir intake.

As conclusion, the study determined that banana peel coffee had a high level of respondents acceptance and could be successfully introduced to the market. The absence of caffeine can represent an advertising feature for the product, and a marketing campaign could be designed to emphasize the product's unique flavor and environmental friendliness. In addition, the researcher should explore analyzing other qualities of the product, such as taste, texture, and smell, to obtain a broader overview of the product's quality.

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Wheels of Astronomy Simulation

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Abstract: This study aims to produce an extended simulation from Topic 1 to Topic 5 for the Astronomy course and summarize the Teaching and Learning notes from Topic 1 to Topic 5 in simulation. Due to the deterioration of the final year result in session 2: 2021/2022, students have difficulty understanding the complicated notes with static diagrams. The goal of this study is to simplify a notes with movable diagrams to facilitate student review. This study uses a sample taken by class, which is classes from semester 2 to semester 4 only. The selected respondents are a total of 64 students of the Diploma in Geomatics programme. The products use recycled materials such as cardboard, transparent film, thumb tacks and thread. This research uses a series of questionnaires as tools to obtain data. The result shows that a simulation product can have a positive effect, arouse students' interest, stimulate learning with simple methods and make learning enjoyable.

Keywords: astronomy, simulation

1. INTRODUCTION

According to the Fourth Edition Hall's dictionary, simulation means an act based on or using something designed or made up but similar to or close to what actually simulates reproduce the situation certain for study or training purposes. Astronomy is the study of everything in the universe outside the earth's atmosphere. That too including objects that we can see with our naked eyes such as the Sun, moon, planets and stars. In addition, it also includes objects that we can only see with telescopes or instruments others such as distant galaxies and small particles. The meaning of Astronomy comes from the Greek word, astronomical which means about the stars. Thus astronomy can be defined as a field of study to know the position, circulation, movement, description as well horizon phenomenon. (Masiri Kaamin, 2010). Astronomy related to the field of Geomatics or Land Survey is a study Astronomy deals with the relative positions of horizons such as the sun, moon and star with human position on earth. This means insight into the horizon done to help get the position on the earth in the form of latitude, longitude, time and azimuth.. The determination of the position on earth is also related to the worship practices of Muslims such as determining prayer times, Qibla directions, the beginning of fasting and Eid. Astronomical Studies in This field of Geomatics is called Field Astronomy or Positional Astronomy. (Masiri Kaamin, 2010).

This product is called Wheels of Astronomy. This study is focused on semester 2 students at Merlimau Polytechnic. In addition, this study is also to focus on the sketches found in Topic 1 to Topic 5. The main purpose of Wheels of Astronomy is to summarize Teaching and Learning from Topic 1 to Topic 5 of the DCG20063 course is a simulation. Besides, produce a pilot study so that you can see the level of reliability of the study.
This study was carried out due to deterioration of final result for session 2: 2021/2022 which mostly students obtained below 50% for the Field Astronomy course. Figure 1.1 shows the year of session 1 : 2021/2022 the percentage of scores increased but in session 2 : 2021/2022 shows the percentage scores decreased for the Field Astronomy course. The graph shows the comparison scores in two semester.

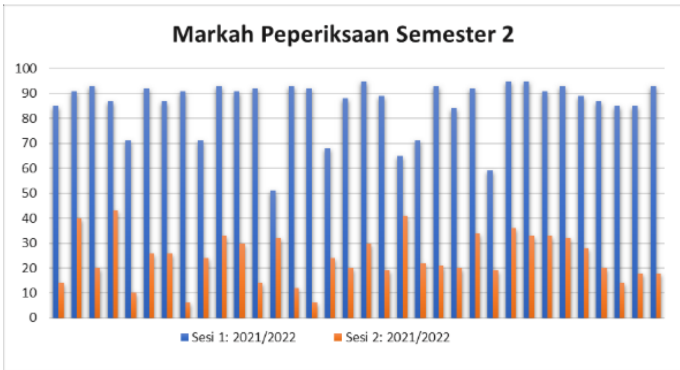

Figure 1 The final result data of Filed Astronomy course for session 2:2021/2022

In order to solve the problems faced by geomatics diploma students, Merlimau Polytechnic, a solution needs to be found in order to attract students' interest in studying for the DCG20063 course. Therefore, to overcome this problem we created a product called Wheels of Astronomy Version 2. The main function to create this product is to produce advanced simulations from Topic 1 to Topic 5 of the DCG20063 course for students. In addition, with the availability of this product, Learning and Teaching for this course can be summarized. The objective of this study is to easily reference the notes by simulating them with a movement graphics. The goal is to raise this course's final grade average.

2. LITERATURE REVIEW

Roslah et. al (2018) through their study of The Discussion of Teaching and Learning Styles in Mathematics Subject: A Traditional Versus Interactive-Engagement Approach used a Simulation gaming in improving achievement understanding in mathematics. Computer games can also be highly effective in increasing children's learning and enjoyment of mathematics. Mobile educational games have been developed by combining the fun factor of mobile games, the flexibility of mobile learning and the benefits of games. This study found encouraging evidence which points to the improvement shown by students using the math apps in particular the struggling students. According to the research, learning mathematics is made easier to understand and more pleasant through simulation learning.

Seng Yue Wong et. al (2022) used a gaming simulation as learning tool. The analysis results uncovered to what extend students differ in their perception of participating simulation games and attitudes towards utilizing simulation games as learning tool. The survey results have shown most of the respondents agree and give positive responds on utilization simulation games as learning tool in higher education institution. Students' perceptions (simulation as valid presentation, apply relevant theoretical knowledge to the game, and ease of use interface) also have shown their predictive effect in their learning from the participation of simulation game, with the variances 97.7%.

Fahimul Amri et. al (2020) through their research The Effect of Using Simulation on Developing Student's Character Education in Learning Economics aims to explain the effect in using simulation to develop students' educated character. The quantitative analysis uses pre- and post-test experimental design, while descriptive analysis is completed with percentage analysis and the category of the mean score. Instruments of data collection use observation rule and questionnaire by using four scale assessments start from very good/strongly agree until very bad/strongly disagree. The result of the research shows that there are different characters in education development before and after implementation simulation in learning economics. The use of simulation in learning economics has an effect on the development of student character education. The simulation in learning economics can develop the students' character with very good category, with a total percentage that shows the number of good at 56.29% and very good at 42.71%. This research shown that the simulation technique in learning effected the student's character to be better.

According to all available evidence, simulation can help students become more responsible learners. Compared to traditional approaches, students are more engaged and have more attention. The simplest technique to aid pupils in understanding a particular subject is through simulation-based learning.

3. METHODOLOGY

The methodology of this project work is shown in Figure 2, as well as description of main process is presented in the following subsections.

Figure 2: Research Flowchart

3.1 Product Development

In our product we use additional materials such as glue, thread and press nails to attach to A4 diagrams in each subtopic. Finally, once completed, we use a metal ring binder to attach each of the sketches.

3.1.1 Transparency Sheet

Figure 3: Transparency Sheet

This transparency is prepared through chemical polymerization on the surface of the transparent sheet. A typical coating layer with a surface resistance of 103 -104
Ω and a transparency of 60% - 70% at 500 nm on the surface of a transparent sheet can be obtained.

3.1.2 Cardboard Paper

Figure 4: Cardboard paper

The cardboard used in the study is type 'C'. It consists of 100% recycled cellulose fibers. The thickness is 0.26mm and 0.21mm for the well.

3.2 Production techniques

In order to produce this project we used A3 sized cardboard, then each diagram has been created referring to the actual notes of field astronomy and also we refer in google to get a more interesting picture.

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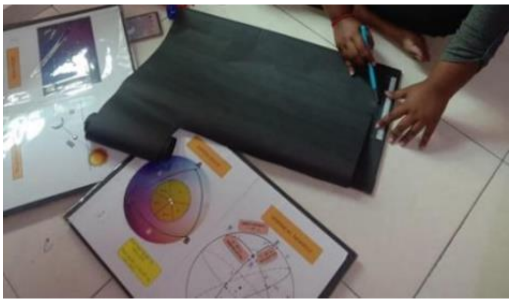

Figure 5: The process of making a sketch

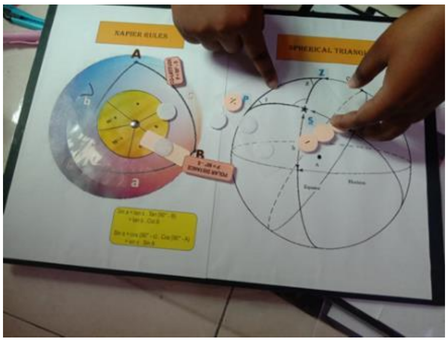

Figure 6: Napier's formula arrangement in wheel concept

The diagram above shows that each board has two subtopics that are simulated with the help of transparent paper that adds a realistic look to the diagram. Transparent is used so that the sketch is easy to move or rotate.

Figure 7: Astrogeodesy in simulation

4. RESULTS AND ANALYSIS

4.1 Introduction

This section discusses data analysis and findings based on the survey question items. This questionnaire was conducted using google form. The data of the research study was obtained based on the answers given by the study respondents from the students of semesters 2, 3 and 4. This questionnaire focused on the students of semesters 2, 3 and 4 who had taken astronomy courses.

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4.2 Demographic profile of respondents

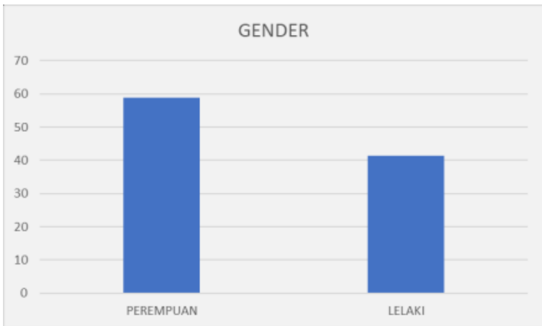

Figure 8: Respondents

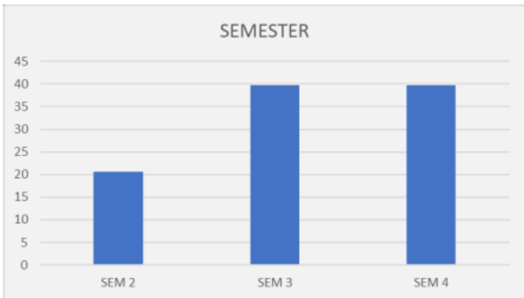

Figure 9: respondents for the semester

The respondents according to semester are 21.9% of semester 2 respondents, 39.1% of semester 3 respondents and 39.1% of semester 4 respondents. This part is to prove whether after analyzing the questionnaire using google form software. A total of 3 parts, which is part B consists of 6 questions while part C consists of 6 and part D consists of 5 questions in total 16 questions that were asked through the google form that has been given to Diploma geomatics students from semesters 2 to 4. Respondents who answered the questionnaire through google form is a total of 64 students.

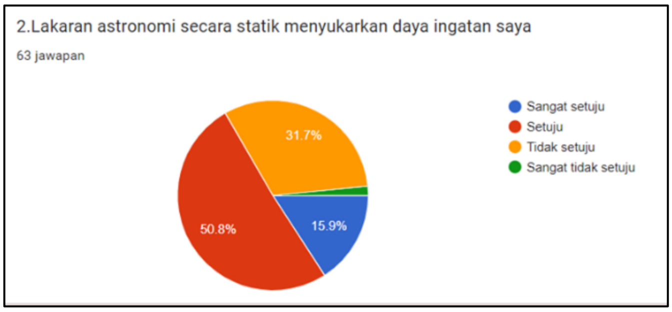

Figure 10 : Finding of the static astronomy sketch

Showing that as much as 50.8 % of the highest percentage agreed for the astronomical sketch statically strained my memory. In addition, 31.7% disagreed with the static astronomical sketch making it difficult for one's memory. While 15.9% strongly agree and the lowest percentage is 1.6% strongly disagree with static astronomical sketches making memory difficult. This is because students have a confidence that static astronomy sketches are not difficult to remember.

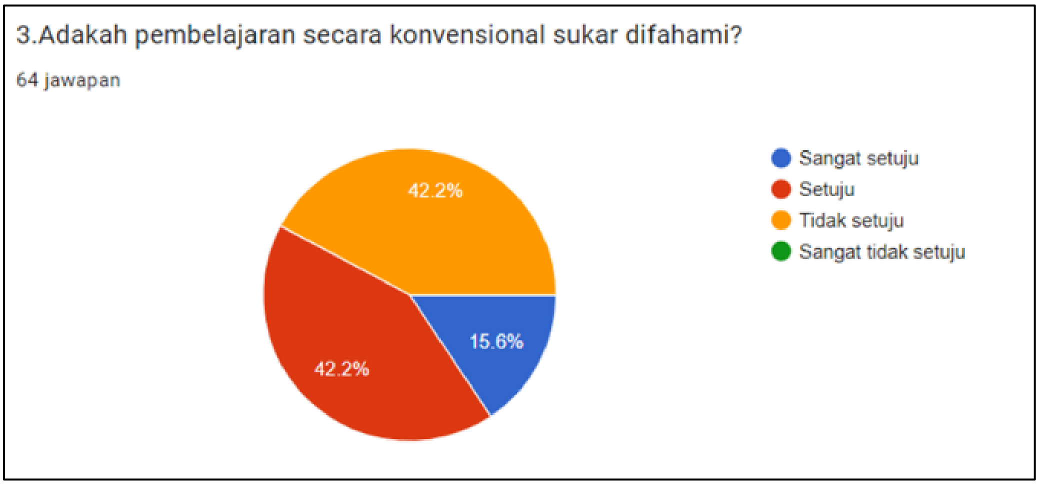

Figure 11: Finding of conventional learning are difficult to understand

The graph above shows that 42.2% agree that conventional learning (reading) is difficult to understand. While 42.2% who disagree with conventional learning is difficult to understand. The lowest percentage is 15.6% who strongly agree with conventional learning. This is because they think conventional learning is not difficult for students.

Figure 12: Finding of learning astronomy creatively with positive impact

Based on the pie chart above, 68.3% agree that learning astronomy in a creative way will have a positive impact on their learning process. While 31.7% strongly agree with the statement that learning astronomy creatively has a positive impact on them because it can help in learning.

Figure 13: Respondents of the simulation method attract students' interest

Showing the highest value is 71.4% who agree that the simulation method used can attract interest. This proves that students are more interested in using simulation methods in learning. In addition, 1.6% is the lowest percentage and does not agree with this statement. This is because maybe this simulation method is new for them to make in learning.

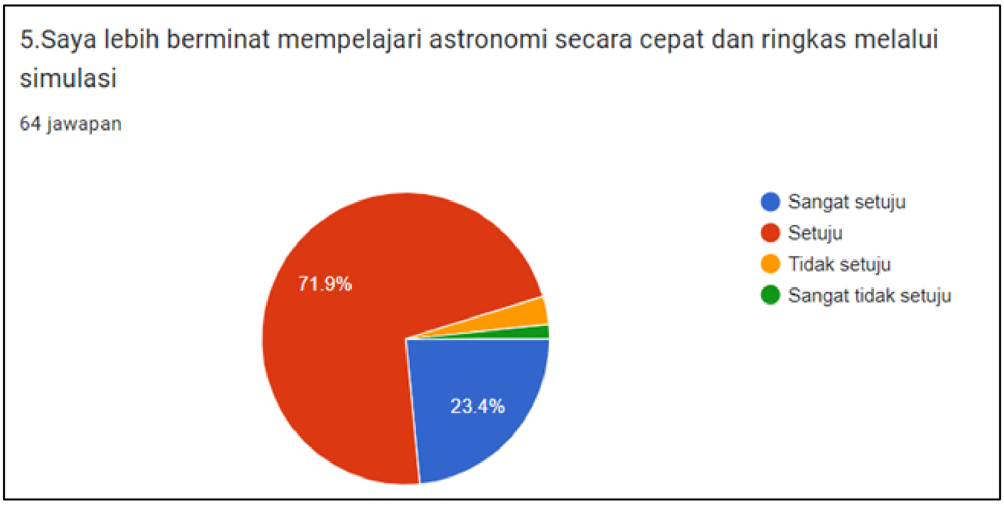

Figure 14: Finding of getting rapidly and easily engaged in understanding astronomy through simulation

Shows that 71.9 % is a high value. This is because they agree and are interested in learning astronomy quickly and simply through simulation. In addition, 1.6%, which is only one person, strongly disagree with learning astronomy quickly and simply through simulation.

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5. CONCLUSION

As a conclusion, Wheels Of Astronomy Simulation provide an effectiveness for the students of Diploma In Geomatics. It can attract the student's behavior learning from conventional to creative techniques. Static sketches make learning difficult to remember. Conventional learning is also challenging to comprehend since occasionally word explanations have distinct meanings from their visual representations. Students choose for creative learning that enhances their academic performance. Simulation techniques also facilitate quick and easy learning. In the future, we anticipate that the simulation's advancement will improve the final year exam result.

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Potensi Kacang Ma Sebagai Produk Kesihatan Pelbagai Nutrisi

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Abstrak. Kajian ini merupakan satu kajian analisis yang bertujuan untuk melihat potensi herba kacang ma sebagai produk kesihatan pelbagai nutrisi. Kacangma *(leonurus sibiricus linn.)* ialah herba tradisional yang popular di kalangan penduduk Sarawak sebagai herba ubatan dan ramuan di dalam masakan. Herba kacang ma atau nama saintifiknya iaitu *"leonurus sibiricus herbs"* juga dikenali sebagai rumput untuk ibu atau *"Chinese Motherwort".* Herba kacang ma mempunyai pelbagai manfaat kepada pengguna seperti dapat mengatasi masalah penyakit senggugut yang berlebihan, membantu memanaskan badan, mengecutkan rahim wanita selepas bersalin, melancarkan kitaran haid serta peredaran darah, membantumengurangkan tekanan darah tinggi dan membantu meringankan kesakitan ketika datang haid dengan mengurangkan kekejangan di bahagian rahim wanita. Objektif produk ini dicipta adalah supaya masyarakat wanita terutamanya di Malaysia akan mempunyai lebih banyak pilihan produk kesihatan di dalam pasaran untuk masalah penyakit dalaman wanita dan kami menyediakan alternatif yang lebih sihat, harga mampu milik dan sesuatu yang unikdengan menggunakan bahan semula jadi sebagai ramuan utama. Produk berasaskan kacang ma ini juga disasarkan kepada seluruh masyarakat dan pengguna di Malaysia. Kajian potensi kacang ma sebagai produk kesihatan multi nutrisi ini adalah dengan menganalisis deskripsikacang ma itu sendiri dalam aspek kebolehfungsian dan manfaat produk. Di akhir kajian ini akan menentukan tahap potensi kacang ma untuk dijadikan sebagai produk kesihatan multinutrisi. Sebagai kesimpulannya, penghasilan produk inovasi berasaskan kacang ma ini diyakini dapat membuka mata dan minda pengguna terhadap potensi kacang ma yang sangat terkenal di negeri Sarawak tetapi jarang didengari oleh masyarakat di bahagian semenanjung Malaysia. Dengan informasi yang terhad, potensi kacang ma untuk dijadikan sebagai produk kesihatan multi nutrisi adalah sangat besar.

Kata Kunci: kacang ma, 4P, herba, potensi

1. PENGENALAN

Terdapat pelbagai bahan yang sengaja ditambah kepada produk makanan harian perlu dikaji untuk memastikan ia selamat untuk dimakan. Terdapat pelbagai piawaian yang diterima di peringkat antarabangsa dan pendekatan yang diambil untuk penilaian keselamatan produk makanan. Penentuan tahap selamat pelbagai ramuan makanan termasuk herba dan rempah ratus perubatan dan masakan adalah bertitik tolak daripada beberapa siri kajian *in vitro* dan *in vivo* dalam haiwan eksperimen (WHO 1987). Banyak herba telah digunakan selama berabad-abad dan secara amnya dianggap ringan dan selamat terutamanya kerana asal semula jadinya. Kacang ma atau bahasa saintifiknya *leonurus sibiricus linn* merupakan herba tradisional yang popular yang telah digunakan sejak beberapa dekad oleh masyarakat Sarawak sebagairamuan herba atau bahan masakan (Chai et al. 1989; Teo dan Chua 2001). Peranan kacang ma sebagai herba yang kurang dimanfaatkan dengan potensi nilai ekonomi telah diiktiraf (MOA 1995; Paulus dan Lau 2004). Seterusnya, usaha dilakukan untuk meningkatkan penggunaannya dengan membangunkan herba kacang ma kepada pelbagai produk herba istimewa yang mempunyai kepentingan komersial seperti kacang ma kering mekanikal, ayam dalam tin dalam sup herba kacang ma, pes, taburan dan agar-agar gula-gula (Chua 2005).

Herba kacang ma merupakan sejenis herba yang dijadikan makanan kesihatan serta popular di kalangan penduduk di Sarawak. Hasil kajian yang dijalankan Institut Penyelidikan dan Pembangunan Pertanian Malaysia (MARDI) mendapati kacang ma kaya dengan khasiat dan mempunyai nilai kesihatan yang tinggi. Kacang ma adalah sejenis herba tradisional yang sekian lama digunakan penduduk Sarawak sebagai herba ubatan dan makanan kesihatan. Herba ini dipercayai berkesan untuk membaiki peredaran darah,menjaga kesihatan wanita khususnya untuk melancarkan kitaran haid dan mempercepatkan pengecutan uterus selepas bersalin. Semua bahagian pokok kacangma dan biji mempunyai nilai perubatan. Disebabkan khasiat dan rasa herbanya yang unik, kacangma turut digunakan sebagai ramuan masakan terutama untuk menyediakan makanan kepada ibu selepas bersalin atau dalam pantang. Oleh itu, dengan sumber data yang terhad, kajian ini dibuat bertujuan untuk mengkaji potensi herba kacang ma sebagai produk kesihatan pelbagai nutrisi di pasaran.

2. SOROTAN KAJIAN DAN PEMBINAAN HIPOTESIS

Kajian yang dilakukan oleh Chai et al, Teo dan Chua terhadap kacang ma mendapati kacangma atau bahasa saintifiknya *leonurus sibiricus linn* merupakan herba tradisional yangpopular yang telah digunakan sejak beberapa dekad oleh masyarakat Sarawak sebagai ramuan herba atau bahan masakan. Herba ini dipercayai mempunyai khasiat dari segi memperbaiki peredaran darah, merendahkan tekanan darah, menjaga kesihatan wanita misalnya melancarkan kitaran haid serta merapatkan pengecutan uterus selepas bersalin selain memperihalkan herba kacang ma dari segi, tatanama, botani, agronomi, kegunaan, komposisi zat makanan dan fitokimia, aktiviti biologi, kajian ketoksikan, pemprosesan danpembangunan produk.

Kajian yang telah dijalankan oleh Paulus dan Lau (2004) juga mendapati bahawa peranan kacang ma sebagai herba yang kurang dimanfaatkan dengan potensi nilai ekonomi telah diiktiraf. Seterusnya, usaha dilakukan untuk meningkatkan penggunaannya dengan membangunkan herba kacang ma kepada pelbagai produk herba istimewa yang mempunyai kepentingan komersial seperti kacang ma kering mekanikal, ayam dalam tin dalam sup herba kacang ma, pes, taburan dan agar-agar gula-gula melalui kajian yang dijalankan oleh Chua (2005). Justeru, usaha sudah diambil untuk mempertingkatkan penggunaannya melalui pembangunan pelbagai produk bernilai komersial. Beberapa produk makanan seperti herba kacangma, sup kacangma ayam dalam tin, pes, sapuan dan jeli konfeksi telah dibangunkan berasaskan herba ini. Kajian yang dijalankan oleh Institut Penyelidikan dan Pembangunan Pertanian Malaysia (MARDI) mendapati kacang ma kaya dengan khasiat dan mempunyai nilai kesihatan yang tinggi. Kacang ma adalah sejenis herba tradisional yang sekian lama digunakan penduduk Sarawak sebagai herba ubatan dan makanan kesihatan. Herba ini dipercayai berkesan untuk membaiki peredaran darah, menjaga kesihatan wanita khususnya untuk melancarkan kitaran haid dan mempercepatkan pengecutan uterus selepas bersalin. Semua bahagian pokok kacangma dan biji mempunyai nilai perubatan. Disebabkan khasiat dan rasa herbanya yang unik, kacangma turut digunakan sebagai ramuan masakan terutama untuk menyediakan makanan kepada ibu selepas bersalin atau dalam pantang. Penanaman pokok kacangma, memerlukan penjagaan yang rapi serta semburan racun serangga supaya tidak diganggu oleh makhluk perosak. Ia lebih sesuai ditanam di batas tanah yang sudah digemburkan, dengan jarak tidak terlalu rapat bagi menghasilkan pokoklebih besar dan subur.

3. METODOLOGI KAJIAN

Menurut ‘Hornby’ (1985) metodologi merupakan satu set kaedah yang digunapakai untuk menjalankan sesuatu kajian ke atas subjek kajiam tertentu. Oleh itu, tujuan metodologi dilakukan adalah untuk membantu dan memahami derngan lebih meluas atau terperinci tentang kaedah membuat membuat huraian terhadap proses kajian. Kajian terhadap potensi kacang ma sebagai produk kesihatan pelbagai nutrisi ini menggunakan kaedah menganalisa dokumen dengan cara pengumpulan data menganalisa data hasil daripada dokumen yang diperolehi.

3.1 Analisis Situasi Pasaran Semasa

Kedudukan ekonomi Malaysia pada ketika ini berada di landasan yang kukuh dan stabil, walaupun diancam ketidakstabilan ekonomi global yang dicetuskan oleh ketegangan geopolitik dan faktor luar. Menteri Kewangan Tengku Datuk Seri Zafrul Tengku Abdul Aziz berkata kerajaan akan terus mengambil langkah proaktif mengawal pergerakan ekonomi semasa bagi memelihara kesejahteraan keluarga Malaysia. Kerajaan dengan kerjasama sektor swasta dan awam telah berjaya menyokong perniagaan tempatan dan merangsangekonomi melalui dasar yang responsif dan bertanggungjawab serta menyokong pertumbuhan ekonomi negara yang baik pada kadar 8.9 peratus dengan kadar pengangguran 3.7 peratus. Seterusnya, untuk keadaan dan situasi semasa di negara Malaysia pada tahun 2022 menunjukkan kenaikan harga bahan mentah yang mendadak. Akhbar Sinar Harian pada 18 mei 2022 mengatakan harga semua barangan keperluan dijangka meningkat sehingga 60 peratus pada bulan hadapan (Jun) berikutan kerakusan dan keperluan peniaga serta pelaksanaan gaji minimum RM1,500. Menurut laporan media,rakyat Malaysia telah pun merasai kenaikan itu sejak bulan Ramadan, apabila harga barangan keperluan asas kritikal seperti daging, ayam dan sayur-sayuran melambung tinggi. Ketidakseimbangan antara penawaran dan permintaan menjadi antara punca kenaikan harga barangan, kata Menteri Komunikasi dan Multimedia Tan Sri Annuar Musa Annuar, yang juga Pengerusi Pasukan Khas Jihad Tangani Inflasi, berkata justeru pasukan itu akan membincangkan semula kaedah atau cara untuk mewujudkan keseimbangan antara kedua-duanya.

3.1.1 Mengenal pasti dan membuat keputusan bidang atau aktiviti yang ingin diceburi

Permintaan untuk suplemen atau makanan tambahan meningkat di negara kita seiringdengan tumbuhnya cendawan usahawan produk-produk berkaitan makanan kesihatan. Pengguna cuba untuk memanjangkan jangka hayat dan memastikan kualiti hidup yang lebih baik. Usahawan menggunakan kesempatan ini untuk menghasilkan pelbagai produk, meningkatkan jualan dan memastikan keuntungan berganda.Dipercayai makanan harian kita pada hari ini tidak lagi berkhasiat, dicemari racun dandiubahsuai secara genetik. Ubat-ubatan moden pula diberitahu mengandungi bahan kimia berbahaya. Pengguna beralih kepada produk makanan tambahan dan perubatanalternatif yang dikatakan lebih semula jadi dan selamat. Terdapat pelbagai pilihan suplemen di pasaran, merangkumi vitamin, mineral, asid amino, enzim, probiotik, minyak ikan dan sebagainya. Pengguna yang memilih cara tradisional pula boleh mengambil produk kesihatan yang berasaskan ramuan herba, organik atau makanan sunnah dalam usaha mempertingkatkan tahap kesihatan.

Di Malaysia kita lihat pelbagai tumbuhan tradisional diubahsuai, diformulasikan dan dikomersialkan mengikut keperluan pasaran. untuk memasarkan produk kepada pelbagai lapisan masyarakat dan umur, pengeluar menghasilkan produk dalam pelbagai formulasi. Ada dalam bentuk sirap, untuk mudah di konsumsi, ada yang dalambentuk pil, kapsul, tablet dan sachet, untuk mudah dibawa ke mana-mana, ada juga dalam persediaan susu formula, untuk bayi, kanak-kanak dan ibu mengandung. Seterusnya, makanan harian kita sebenarnya menawarkan tiga faedah utama berbanding makanan tambahan. Pertama, lebih berkhasiat. Makanan biasa lebih kompleks, satu hidangan sahaja boleh mengandungi pelbagai nutrisi yang diperlukan oleh tubuh kita. Kedua, mengandungi serat. Makanan seperti bijian, kekacang, sayur- sayuran dan buah-buahan kaya dengan serat yang penting untuk kesihatan usus dan mengelakkan sembelit. Ketiga, mengandungi mikro nutrien yang penting untuk mencegah penyakit dan mineral yang berfungsi untuk menstabilkan elektrolit di dalam cecair badan.

3.1.2 Produk yang akan dibangunkan serta peluang yang lebih baik dan berdaya maju

Produk yang akan dibangunkan adalah produk kesihatan pelbagai nutrisi yang merupkangula atau "gummies". Perbezaan produk ini berbanding produk kesihatan lain yang ada dipasaran adalah produk ini menggunakan bahan utamanya iaitu herba kacang ma. Herba kacang ma adalah herba yang sangat terkenal di negeri Sarawak, Malaysia dan banyak digunakan sebagai ubat-ubatan herba atau makanan kesihatan. Herba kacang ma mempunyai banyak faedah dan kebaikan seperti contohnya dapat melancarkan kitaran haid, mengurangkan penyakit senggugut, melancarkan aliran darah, mengurangkan kesakitan ketika haid dengan mengurangkan kekejangan di bahagian rahim dan membantu mengurangkan tekanan darah tinggi. Produk kesihatan pelbagai nutrisi ini jugaadalah campuran gula dan herba kacang ma yang dibuat khas untuk para wanita tetapi boleh juga digunakan oleh para lelaki. Produk berasaskan kacang ma ini merupakan sejenis suplemen dan dikategorikan sebagai suplemen makanan tambahan kesihatan yang boleh dimakan dan dikonsumsi apabila penyakit senggugut datang dan untuk faedah- faedah yang lain. Produk berasaskan kacang ma ini juga mempunyai peluang yang baik danberdaya maju untuk mencatatkan nama di pasaran tempatan dan pasaran global. Hal ini adalah kerana majoriti responden yang telah kami kaji apabila kami menyebut perkataan herba kacang ma, mereka akan mengatakan itu adalah kali pertama mereka mendengar tentang herba kacang ma. Hal ini membuktikan bahawa pengetahuan masyarakat Malaysiatentang herba kacang ma adalah sangat rendah dan herba ini terkenal hanya di negeri Sarawak, Malaysia sahaja.

3.1.3 Pelanggan berpotensi dan bakal pelanggan

Pelanggan berpotensi tinggi dan bakal pelanggan kami adalah daripada golonganwanita yang mengalami penyakit senggugut atau kitaran haid yang teruk sehingga tidak boleh membuat pekerjaan dan mengalami sakit yang berpanjangan. Golongan iniamat memerlukan produk yang dapat membantu mengurangkan penyakit dalaman mereka agar mereka dapat meneruskan aktiviti dan kehidupan mereka secara normal. Seterusnya adalah golongan wanita yang telah mencuba pelbagai jenis suplemen dan ubat tetapi tidak dapat melihat hasil dan seterusnya telah membuka pintu hati untuk mencuba perkara yang baharu

3.1.4 Perbezaan produk kacang ma berbanding produk pesaing

Perbezaan utama produk kacang ma berbanding produk pesaing adalah ia menggunakan bahan utamanya iaitu herba kacang ma yang dikategorikan sebagai bahan semula jadi. Jika kita bertanya kepada adik beradik perempuan kita ataupun ibu kita sendiri samaada mereka pernah menggunakan ubat tahan sakit ataupun lebih dikenali dengan nama Panadol "painkiller" pasti jawapannya adalah pernah. Tetapi tahukah anda hasil kajian daripada Dr. Pratima Thamke daripada Motherhood Hospital, Mumbai mengatakan bahawa penggunaan pil atau ubat tahan sakit yang berlebihan mempunyai banyak kesan sampingan seperti contohnya, sembelit, cirit- birit, muntah-muntah, loya dan macam macam lagi. Seterusnya, perbezaan daripada segi rasa. Ubat tahan sakit tidak mempunyai rasa kerana ia adalah di dalam bentuk pil tetapi produk kacang ma mempunyai rasa yang manis kerana ia adalah campuran gula dan juga herba kacang ma yang bertindak sebagai suplemen makanan tambahan kesihatan.

Selain daripada itu, tahukah anda hasil kajian daripada "National Library of Medicine" mengatakan lelaki lebih cenderung untuk menyukai makanan yang lazat seperti contohnya ayam, ikan, daging dan telur manakala perempuan lebih cenderung untuk menyukai makanan yang manis seperti contohnya pastri, coklat, gula, aiskrim dan sebagainya. Ini merupakan satu peluang untuk kami menggabungkan suplemen yang mereka perlukan dengan kategori makanan kesukaan mereka dengan harapan produk ini dapat membezakan dirinya berbanding produk pesaing. Akhir sekali, perbezaan daripada segi bentuk. Produk kacang ma berbentuk hati yang berwarna merah dan tujuan produk ini dicipta sedemikian adalah untuk menarik perhatian remaja perempuan dan golongan wanita di Malaysia.

4. KEPUTUSAN KAJIAN DAN ANALISIS

Hasil daripada dapatan dan analisis data yang dilaksanakan terhadap herba kacang ma ini, mendapati bahawa terdapat tiga elemen penting yang boleh diputuskan.

4.1 Fungsi produk

Produk Multinutrient Candy adalah dikhaskan untuk mengurangkan penyakit senggugut para wanita. Produk ini menggunakan ramuan utamanya iaitu herba kacang ma
Produk ini juga dapat melancarkan kitaran haid, melancarkan peredaran darah,mengurangkan tekanan darah tinggi dan membantu meringankan kesakitan ketika datang haid dengan mengurangkan kekejangan di bahagian rahim wanita
Produk ini digunakan apabila penyakit senggugut mula dirasai sehingga penyakit senggugut kurang dirasai

4.2 Manfaat produk

Produk ini dapat membantu para wanita menjalani hari mereka dengan normalketika mereka datang bulan dan mempunyai masalah penyakit senggugut yang berlebihan, Produk ini menggunakan bahan semula jadi sebagai ramuan utama. Herba kacang ma adalah herba atau ramuan yang sangat terkenal di negeri Sarawak, Malaysia dan sekarang telah diinovasikan dengan dimasukkan kedalam produk kesihatan pelbagai nutrisi. Produk kesihatan merupakan pengganti produk-produk lain di pasaran untuk penyakit dalaman Wanita. Produk ini tidak mempunyai kesan sampingan jangka masa pendek atau jangka masa panjang kerana ianya menggunakan bahan semula jadi sebagai ramuan utama

4.2.1 Bahan-bahan di dalam produk

Bahan utama yang digunakan iaitu herba kacang ma adalah sejenis herba tradisional yang sekian lama telah digunakan oleh penduduk Sarawak sebagai herba ubatan dan makanan kesihatan.

Herba ini dipercayai berkesan untuk membaiki peredaran darah, menjaga kesihatan wanita khususnya untuk melancarkan kitaran haid dan mempercepatkan pengecutan uterus selepas bersalin.

5. KESIMPULAN

Secara kesimpulannya, herba kacang ma ini diharapkan dapat membuka mata ramai pihak untuk menghasilkan satu produk inovasi yang dapat memberikan kemudahan kepada masyarakat tentang khasiat dan kebaikannya. Walaupon herba kacang ma ini jarang didengari oleh masyarakat di bahagian semenanjung Malaysia tetapi ia sangat popular di kalangan masyarakat Sarawak.Herba ini dipercayai mempunyai khasiat dari segi memperbaiki peredaran darah, merendahkan tekanan darah, menjaga kesihatan Wanita. Misalnya melancarkan kitaran haid serta merapatkan pengecutan uterus selepas bersalin. Berdasarkan kepada pemerhatian dan potensi serta permintaan kacang ma ini, satu produk inovasi berasaskan kacang ma perlu dibangunkan kerana ia mempunya pelbagai nutrisi serta kebaikan kepada pengguna. Tidak mustahil kacang ma akan muncul sebagai satu komoditi penting satu hari kelak dan menjadi salah satu sumber pendapatan utama penduduk di Sarawak dan di Malaysia.

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The Effectiveness of Tenderizer Meat Using Papain Tea Bag

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Abstract: In this era of modernity, various tools exist to facilitate human daily affairs. There is a researcher's idea to create a new meat tenderizer. The problem came when researchers found that existing meat tenderizers can change the taste and texture of meat. Although some do not change the taste and texture of the meat, it costs very high, for example pressure cooker. Therefore, the researcher came up with a solution to create a meat tenderizer that is cheap, easy to use and does not change the taste and texture of the meat. Papain, a proteolytic enzyme extracted from the raw fruit of the papaya plant, is a popular ingredient in meat tenderizer due to its ability to break down proteins into smaller protein fragments called peptides and amino acids (Brynne,2022). The purpose of the research is to study the level of acceptance of the Papain tea bag as a meat tenderizer among the residents of around Merlimau Utara, Jasin, Melaka. The researchers have selected 50 respondents to participate in the study and used a questionnaire with a Likert scale of 5 which includes strongly agree, agree, neutral, disagree, and strongly disagree to gather data. The data has been analyzed using the Statistical Package of Social Science (SPSS) version 29. The data showed a total mean interpretation score of 4.21 which is high and level of good. Thus, it can be concluded that the new product of Papain tea bag as a meat tenderizer is accepted by the community because of the benefits to the local community.

Keywords: meat, tenderizers,

1. INTRODUCTION

Meat basically made of muscle. Each cut of meat is made up of muscle fibers bound together by protein filaments of collagen. Tenderizing meat means breaking the long strands of muscles as well as softening the collagen until it turns into gelatin. This soft gelatin soaks into the meat, tenderizing it and adding moisture to make the meat juicy. This tenderizing can be accomplished through physical means like pounding, or through the chemical reactions caused when it is exposed to the acids in marinades and powdered meat tenderizers (Brynne,2 023). Naturally tender cuts of meat tend to be more expensive, and serving meat on a budget can be a challenge. There are many ways to tenderize tough meat before cooking it, which include pounding, scoring, soaking in a marinade and sprinkling it all over with a powdered meat tenderizer.

Researchers founded several methods that can be used in tenderizing meat, from the article showed some trick used spoon into the pot to boil the meat to soften the meat. Official studies have been conducted to see the effectiveness of how to tenderize meat using a spoon. Logically, if stainless steel spoon deep into the pot soften the meat, the pot or pan being used also made of the same material, it may only release iron or chromium compounds. Pressure cookers are the most advanced tools in tenderizing meat. However, there is a traditional way of tenderizing meat which has been put aside since it has not been noticed by science.

Papain is a proteolytic enzyme extracted from the raw fruit of the papaya plant. Proteolytic enzymes help break proteins down into smaller protein fragments called peptides and amino acids. This is why papain is a popular ingredient in meat tenderizer (Coalition, 2021). Based on statement from Patricia in year 2022, the article mentioned that using a solution of baking soda and water to tenderize meat works differently than using a brine. Baking soda neutralizes acid and raises the pH level on the surface of the meat, causing the outside to become more alkaline. This chemical reaction makes it more difficult for the proteins inside the meat to tighten up, and when proteins can't bond, the meat stays tender when cooked instead of constricting and toughening up.

Therefore, the purpose of creating new products of meat tenderizer is to help consumers with more options for tenderizing meat. Meat tenderizer tea bag will be are used to break down the connective tissues in meat, which can make it tough and difficult to chew using natural ingredients. By developing a meat tenderizer tea bag, researcher can offer produced meat tenderizer that contain enzymes or acids to break down the meat fibers from chemical which offer consumers a wider range of options, such as affordable, easy to use and safe natural ingredients

2. LITERATURE REVIEW

2.1 History of tenderizer

A genuine tenderizer did not appear until the late 1940's, after two young men discovered a restaurateur in California. Which they learned secret process for tenderizing his steaks this was more or less the start of a commercial meat tenderizer based on use of the papaya enzyme. It was not exactly a new idea, for the Central and South Americans had been using papaya leaves to tenderize for generations.

However, it was entirely new and magical to North America, and soon the market was flooded with tenderizers of different brands and qualities. Through continued research the effectiveness of the original tenderizer has been improved far more than most of the others. (Alexshakh, 2018)

For centuries the Indians of Latin America have wrapped their tough, fresh-killed meat in leaves from the papaya tree before cooking it. They never knew why. but the leaves made the meat tender, kept in its juices. For decades scientists have known why: papaya leaf and the juice of the papaya fruit contain an enzyme which breaks down protein tissue in the same way as the stomach's digestive juices. (Time, 2022)

Meat tenderization has been practiced for centuries, dating back to ancient civilizations. In early times, various methods were used to tenderize meat, including pounding it with stones or other blunt objects, marinating it in acidic liquids like vinegar or lemon juice, and even burying it in the ground to allow natural enzymes to break down the muscle fibers. During the Renaissance era in Europe, meat tenderization techniques began to evolve and become more sophisticated. French chefs, in particular, became renowned for their skills in tenderizing meat using a variety of methods, such as larding by inserting strips of fat into the meat, braising with slow cooking in liquid, and basting by applying liquid to the meat while it cooks (P.D. Warriss, 2018)

The development of equipment for mechanically tenderizing meat began in the 19th century as meat processing became more industrialized. One of the earliest machines for tenderizing meat was the Jaccard Meat Tenderizer, invented by Louis Jaccard in Switzerland in 1855. The Jaccard Tenderizer used a series of blades to pierce the meat and breaking up the connective tissue. The machine was particularly effective for tenderizing tougher cuts of meat like beef or pork. (Fred, 2019)

Meat tenderizer powder is a product that is used to tenderize meat by breaking down the proteins and connective tissues in the meat. The powder is typically made from a mixture of enzymes that are derived from natural sources like papaya or pineapple. These enzymes, such as papain and brome lain, can help to break down the tough fibers in meat. The development of meat tenderizer powder can be traced back to the early 20th century. (John, 2018)

2.2 Benefit of Papaya and Jackfruit

Both of papaya and jackfruit have numerous health benefits. It also has been used since time to remedy different ailments with therapeutic properties, distinctive flavor, fragrance and rich in vitamin.

2.2.1 Papaya

Papayas contain high levels of antioxidants vitamin A, vitamin C, and vitamin E. Diets high in antioxidants may reduce the risk of heart disease. The antioxidants prevent the oxidation of cholesterol. When cholesterol oxidizes, it’s more likely to create blockages that lead to heart disease. (Poonam, 2022)

Papaya has high fiber which may reduce the risk of heart disease. High-fiber diets lower cholesterol levels. Papaya has folic acid, which is essential for converting the amino acid homocysteine into less harmful amino acids. High levels of homocysteine, an amino acid primarily found in meat products, are a risk factor for heart disease. So eating papaya in your diet may lower homocysteine levels, reducing this risk factor (Ani, 2020).

Papaya is a good source of the carotenoid lycopene, a natural pigment found in red or orange foods that are believed by some experts to reduce the risk of prostate cancer, with some studies suggesting that consuming a diet high in lycopene, including papaya, along with green tea can significantly reduce the risk of prostate cancer (Natalie, 2018).

2.2.2 Jackfruit

Jackfruit is a good source of several nutrients that are important for maintaining overall health, including vitamin C, potassium, and fiber. These nutrients can support good sleep hygiene by promoting overall physical health and reducing stress levels.

Additionally, jackfruit contains a compound called tryptophan, which is an amino acid that can help the body produce the neurotransmitter serotonin. Serotonin is involved in regulating sleep, mood, and appetite, so consuming foods that contain tryptophan may help promote healthy sleep patterns.

While jackfruit may not directly prevent insomnia, consuming this fruit as part of a balanced diet may support overall health and improve sleep hygiene. As always, it's important to consult with a healthcare professional before making significant changes for diet or lifestyle (Adam, 2022). Jackfruit is rich in magnesium, a mineral linked with helping the body relax which can help to prevent from insomnia and sleep. (Charlotte, 2020)

3. RESEARCH METHODOLOGY

The study was designed based on providing a standard ingredient formulated to ensure that it follows the correct measurement and the preparation process of the papain tea bag product production process.

3.1 Standard Ingredients

Table 1 shows standard ingredients of papain tea bag using papaya leaves, papaya leaves.

Table 1: Standard Ingredients of Papain Tea Bag

Per serving: 1 tea bag	
Ingredients	**Quantity**
Papaya leaves	**12 Gram**
Jackfruit leaves	**12 Gram**
Tea bag	**6 piece**

3.2 Method of preparation

Figure 1 below shows the method of preparation of papain tea bag. Researcher will select and separate papaya and jackfruit leaves accordingly and wash the leaves to remove dirt then dry it using clean cloth. Next chop the leaves and prepare it in a dehydrator machine at temperature of 110c for 8 hours. Finally, the dried leaves will be inserted in a tea bag and weighed before pack into the box.

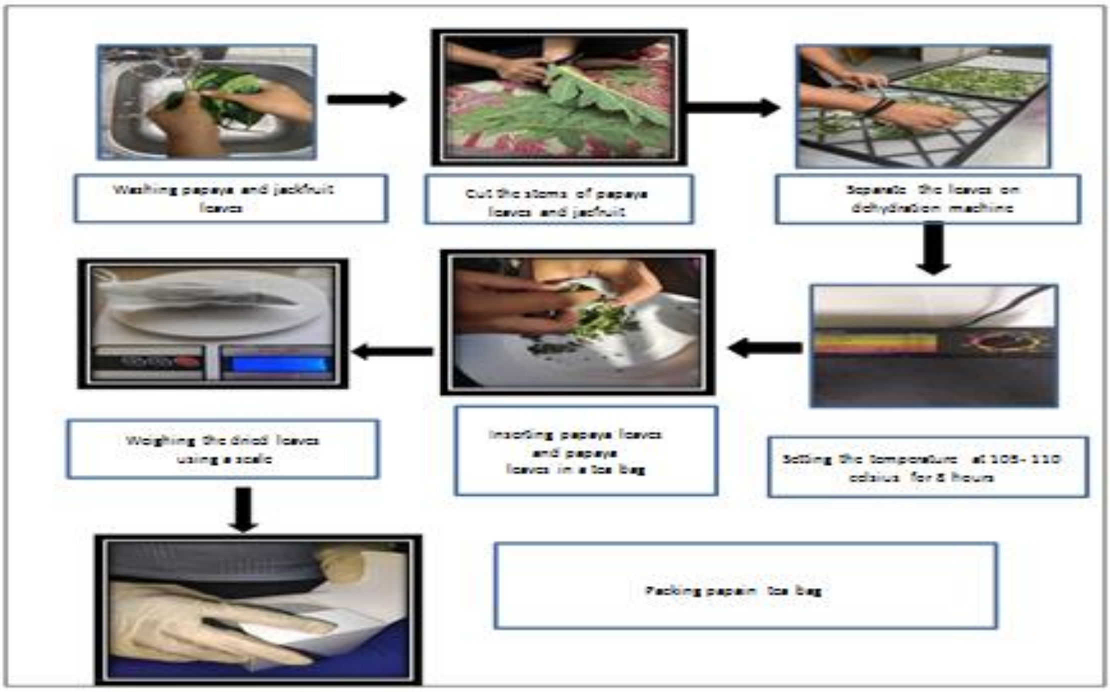

Figure 1 Method of Preparation of Papain Tea Bag

4. RESEARCH FINDINGS AND ANALYSIS

Respondents chosen by the researcher are residents of around Merlimau Utara, Jasin, Melaka. Good feedback, response and review from targeted 50 respondents.

The research instrument used is a questionnaire using the Hedonic Scale. Statistical Package for Social Science (SPSS) version 29.0 was used to analyze the collected data. The method used by the researcher for the questionnaire is the hedonic scale.

Data was collected and analyzed using the Statistical Package for Social Science (SPSS). Information obtained from product data conducted by researchers in the form of percentage, frequency and analysis.

Table 2: Demographic based on Occupation

OCCUPATION	FREQUENCY	PERCENTAGE
Government	11	22%
Housewife	7	14%
Private Sector	11	22%
Others	21	42%
Total	50	100%

Based on the Table 2 it shows demographic based on occupation. The highest percentage was 42% of others with frequency of 21 respondents. Second was 22% of government and private sector with frequency of 11 respondents. Third was 7% of housewife with frequency of 7 respondents. Analysis showed in Table 3 that the papain has been accepted by respondent with high interpretation of mean score 4.21 and the level is good.

Table 3 Interpretation of Mean Score for Papain Tea Bag

ITEM	MEAN	INTERPRETATION	LEVEL
Effectiveness	4.21	High	Good

5. CONCLUSIONS

As conclusions, of tenderizer meat using papain tea bag was effective because it contains natural ingredient, packaging size is suitable, neat and not easily damaged. It also safe from any chemical which does not affect the taste, smell and changes in structure of meat. The price of papain tea bag are reasonable and affordable to be compared with similar product. It also gave customer options in making a purchase in the future.

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Potential of Board Games to Create Social Interaction through The Activity of Play

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Abstract This article investigates into the capacity of board games to encourage social interaction via the medium of play. Utilizing a document analysis approach, this investigation examines the methods by which board games promote and enhance social interaction among participants. The focus centers on comprehending how board games stimulate problem-solving, collaboration, and strategic thinking within a social framework. The analysis references a variety of academic articles, research papers, and applicable literature to establish the links between board games and social interaction. The conclusions demonstrate that board games furnish a distinct platform for persons to engage in interpersonal interactions, promoting active communication, teamwork, and collective decision-making. Furthermore, the analysis emphasizes the cognitive advantages of board games, which facilitate the growth of problem-solving abilities and strategic planning aptitude. Through the lens of document analysis, this study highlights the importance of board games in encouraging social interaction and indicates the potential of incorporating these activities into educational and recreational environments to cultivate interpersonal dynamics and cognitive growth.

Keywords: social interaction, board game, problem solving, strategy, collaboration

1.0 INTRODUCTION

Social interaction is the involvement of individuals with one another in information-exchange activities that can affect how they feel, think, and act. It involves both in-person and online connections and comprises a variety of communication channels, including verbal and nonverbal interactions. Social interaction is important for establishing relationships between individuals; creating social networks, and promoting a sense of togetherness. Social interaction and its effects on people's wellbeing and the growth of the entire community have drawn a lot of attention in recent years. Overall, many past studies support that the impact of social interaction on well-being is evidenced through the individual's primary need to socialize and, the desire to live in a group. A person's mental health and social connections have all been shown to improve when they participate in meaningful social interactions, among other advantages. This social interaction can happen either with family members or friends through activities carried out together. Consequently, friendship interactions may help in the creation of meaning, which results in social behavior that supports their psychological wellbeing (Ramkissoon, 2020). Contrary, according to Orben et al., (2020), lack of social interaction will have a negative impact on a person's mental well-being, especially for people who have developed a need for face-to-face interaction with others over a period of their lives.

Traditional forms of social connection have experienced significant changes as a result of the development of technology and the rising use of digital gadgets. In addition, during the COVID-19 pandemic, face-to-face interaction between individuals has been disrupted, resulted a number of negative impacts on people's wellbeing, particularly in contexts where the usage of electronic devices increased (Naser et al., 2021). Communication through digital tools, such as video calls or text messages that are widely used especially during the pandemic phase is seen as not the same as face-to-face communication, especially in terms of facial expressions, gestures and body language. This element actually plays an important role in conveying emotions, understanding intentions and building relationships. The absence of these signals in digital communication can lead to misinterpretations, misunderstandings and reduced emotional connections, and ultimately negatively impact individual well-being. Although digital devices play an important role in maintaining relationships and reducing the effects of physical distancing during the pandemic, their excessive use has contributed to negative effects on social interactions and individual well-being. Therefore, it is important for individuals to find a balance between digital engagement and finding opportunities to interact socially in a safe and personal way to ensure overall well-being especially emotional health.

However, dependence on digital devices during the pandemic has affected social interaction post-covid. This dependency could create a precedent for the post-COVID-19 new normal where the use of digital platforms could become commonplace, usual, and expected (Sim, et.al, 2021). This is particularly applicable in the sector of education, where during the pandemic phase nearly the entire study institution is closed for face-to-face learning and instruction sessions are delivered online. Novianti et al., (2021) in their research concluded that e-learning can replace face-to-face learning at school, but the e-learning process is not very effective. Students face difficulty understanding the content of lessons and learning and lead to learning performance. This may negatively affect one's personal wellbeing.

Therefore, as suggested by Kuzairi (2022), strengthening learning interactions during and after the pandemic requires special attention because the pandemic cannot be used as an excuse not to interact or the existence of technology is not an excuse to completely replace the interaction that should still exist. Thus, one possible method of addressing this dilemma is by incorporating games into the teaching approach (Radu & Mateescu, 2018). The integration of games in education is not a novel concept where, games are extensively utilized in order to accomplish a multitude of aims, such as enhancing decision-making skills, formulating strategies and adjusting them in real-time, collaborating to attain superior outcomes, and also competing to augment performance.

Hence, this paper explores the advantages of using board game activities as a way to create and enhance an individual's social interaction to shift the focus of individuals, especially students, towards gadgets.

2.0 LITERATURE STUDY

Board games, which have been present for some time, are now emerging as tools capable of developing connections with others and encouraging face-to-face involvement in the era of this digital transformation. Usually, this board game will involve many players allowing interaction to occur during the playing process. There are various items in the game board set including cards, dice, puzzles and boards that can be manipulated to complete the game.

Most board game titles are capable of accommodating more than three players. Through the implementation of diverse variations, board games have the potential to foster collaboration amongst players in order to triumph over the game itself, engage in negotiations, role-play, engage in deception or other actions that require players to interact with one another. In addition to the principal objective of achieving victory, each player subconsciously engages in intense communication with other players throughout the course of the game, whether it be for the purpose of outsmarting, jesting, negotiating or discussing the established rules. They permit non-verbal interactions outside of dynamic settings and may be utilized to scrutinize social dynamics and interactions within groups (Purwanti & Ramadhani, 2018).

According to Doyran et al., (2021), board games may provide insight into psychological implications within multi-person exchanges. It shows those who partake in board games tend to manifest various social cues that are strongly linked to the decisions made, outcomes achieved, and progress attained in the game. Through the game, various scenarios can occur which change the behavior related to the displayed response. These responses can include displays of frustration, anger, joy, boredom, excitement, disappointment, concentration, confusion, anticipation, pride and shame. The engagement between the player and the board game itself will contribute to the various possible responses.

Besides, board games may act as a positive stimulus to encourage social interaction and preserve cultural values, particularly among children (Radu & Mateescu, 2018). In his study, it was found that 44.30% of the respondents in the questionnaire considered human interaction in the game as the most important. Students show a positive attitude towards socializing elements and show a higher level of attention during the process of playing. Similar with Z. Zhang et al., (2021), he has designed games that involve teamwork and cooperation in the classroom. Each student gets together with one or two other students, and they will work together and discuss to solve the problems in the game. The players then have to convince the other team by explaining their answer. By involving group discussions, students will be able to share and evaluate ideas and further develop their critical thinking

Based on the literature, it can be concluded that a board game is a game where players gather together to play by managing and playing related items (dice, cards) around a specially designed surface called a board. One of the most interesting parts of board games is the sheer amount of face-to-face interaction. Players are usually co-located, so spoken language and emotionally relevant communication cues such as body movements and facial expressions are useful information related to cooperation and competition. These factors can increase sociality in board games.

In addition to optimizing the use of this board game for playing purposes that promote social interaction, some studies also show the potential of this tool as a learning aid. Board game can be implemented to enhance the educational process, augment knowledge and skills, and stimulate motivation to learn on the factor of playing itself (Sulistianingsih et al., 2019). Notably, the utilization of board games is crucial in facilitating social interactions and can be implemented in diverse environments to promote educational and cultural objectives.

3.0 METHODOLOGY

The value of the board game in promoting interaction was examined in this study employing a qualitative approach using document review. The study intended to explore and assess the literature on the topic of board games' effects on social interaction, covering academic publications, research papers, books, and online resources. The approach had been chosen because it provides an organised examination and review of both printed and online content (Sallabaş, 2013).

A comprehensive search technique was initially created to find relevant records relating to the board game's influence on social interaction. The search conduct consisted of manual searches of pertinent journals and publications as well as electronic resources (including Google Scholar, academic databases, and online libraries). "Board game," "social interaction," "social engagement," "game-based learning," and related themes were among the keywords and search terms utilised. Following that, the identified documents were acquired and arranged for a comprehensive inquiry. Each document, including theoretical frameworks, study methodology, findings, and any related limitations or recommendations, was examined to extract pertinent information related to the board game's impact on social interaction.

For the data analysis procedure, the data gathered from the reviewed documents was analysed using a thematic method. To become familiar with the content and spot repeating themes concerning the board game's effect on social interaction, the documents were first read and reread. There are three themes have been developed for defining the social interaction which are problem solving, collaboration and strategy. After that, a code framework was created using the themes that had been found. By tagging text passages that reflected particular topics with pertinent labels or codes, the papers were methodically coded.

By using document review as a qualitative research approach, this study aims to contribute to the body of knowledge on board games and their effect on social interaction. The aforementioned methods for data collecting and analysis were used to make sure that the research issue was thoroughly and methodically investigated.

4.0 RESULT AND DISCUSSION

The beneficial effects of board games on problem-solving abilities, collaboration and strategizing skill in the setting of social interaction were constantly identified in the reviewed publications. The study of the reviewed documents indicated consistent results regarding the influence of board games on solving problems, working together, and social interaction approach. It was discovered that playing board games helped participants develop their critical thinking, teamwork, and strategic decision-making skills.

i. Problem solving

The major part of the research found that playing board games helped participants become more proficient in critical thinking, logical reasoning, and making decisions. The examination of the reviewed documents revealed some common themes. First, it was discovered that playing board games helped players develop cognitive flexibility because they had to balance many viewpoints and methods. Second, participants engaged in talks and negotiations to work together to solve hurdles inside the game and emphasising collaborative problem-solving. Third, the trial-and-error nature of board games allowed players to grow from their failures and acquire adaptable problem-solving skills.

For example, research by Permanda & Wahyudi (2020 discovered that, playing board games as part of the learning process increased students' problem-solving skills from 65% to 79%. They used the pre- and post-test scores the data analysis to present the connection of board game and problem-solving skill. Similarly, experiment conducted by Chu & Hung, (2015) shows that game development-based learning strategy might successfully foster students' problem-solving abilities.

Based on the analysis, it can be concluded that, due to its participatory character through the board game activities, it required players to analyses complex situations, adapt their methods, and come up with original solutions to problems, which improved their problem-solving abilities. In a study by Doyran et al., (2021) , there are four categories of games for therapeutic use: communication games, problem-solving games, ego-boosting games, and socialization games. Therefore, a game board that provides a problem-solving environment can be a tool as therapeutic purposes.

ii. Collaboration

Based on the analysis that has been done, previous studies show how playing board games with others affected people's capacity for cooperation, collaboration, and joint effort. Significant findings about the relationship between playing board games and collaborative skills were drawn from the data analysis. The results demonstrated playing board game allow the player to share tasks, actively solicited feedback from their teammates, and demonstrated an ability to work well together to accomplish shared goals. Zhang et al., (2012) in his study found that social bonding did have a significant impact on the frequency and pattern of collaboration in tabletop games, and that competition and collaboration made for a more enjoyable experience for players.

The element of collaboration is painted in board game activities when players work together to achieve a single goal or complete a mission designed by the game. This is shown through the board game's design by T. Zhang et al., (2012) where they planned the gameplay to encourage cooperation and teamwork in a classroom environment. Each student is placed in a group of one or two other students, and they will collaborate to debate and work through the game's issues.

These results from earlier studies demonstrate how cooperative and interactive board games are as collaboration facilitators. Participating in board game activities offers individuals an organised setting to hone and improve their interpersonal, cooperative, problem-solving, and trust-building skills.

iii. Strategy

For the strategy element, the goal of the study was to determine how playing board games affected the participants' abilities for planning, strategizing, and making wise decisions in a game environment. The results offer significant new insights of how board games encourage the development of planning skills and their potential effects on cognitive ability.

According to Miller et al., (2019), players must utilize thinking skills to develop effective strategies to achieve the end goal or win the game. Players need to think the strategy so that their turn to play at that time can contribute points to the game. In board games, the mainstay of the game is usually the use of repeated moves, and planning skills are required to analyse the situation as a whole to see if the strategy is appropriate.

In addition, the dynamic element of the game that symbolizes the behavior of the runtime player input and output over time requires continuous strategy planning. Players will strategize their moves and decide when or what technique to use when it comes to the turn of the game. This creates a competitive feeling that will be manifested through the storyline in the game. Players will have the passion to win the game and at the same time try to understand the concept, the fun, the fear and the use of strategy while playing without them realizing it (Ramesh & Sadashiv, 2019).

The results of the document analysis show that there is a positive relationship between board game play and the development of planning abilities. Playing board games offers an organised environment that motivates players to think strategically, deconstruct difficult situations, and arrive at reasonable judgements. Board games encourage cognitive skills related to planning, problem-solving, and adaptability because of their participatory character. Therefore, this strategy element exists when the player plans and solves problem while playing.

In conclusion, based on the literature's findings, this study presents evidence that upholds the positive relationship between social interaction and the development of cooperation, problem-solving, and strategic skills. The interactive nature of social interaction, particularly in board game activities, acts as a stimulant for the cultivation of these cognitive and interpersonal abilities. The results of this study highlight the value of face-to-face interaction in promoting teamwork, cooperative decision-making, analytical thinking, and adaptability. By participating in social activities such as board games, individuals not only reaffirm their personal connections but also develop skills that can be utilized in different areas of life especially in social relations. This study reinforces the value of utilizing interactive activities as a tool to improve collaborative and cognitive skills, further contributing to holistic personal growth. Figure 1 shows the potential of board games to create the social interaction through the activity of play.

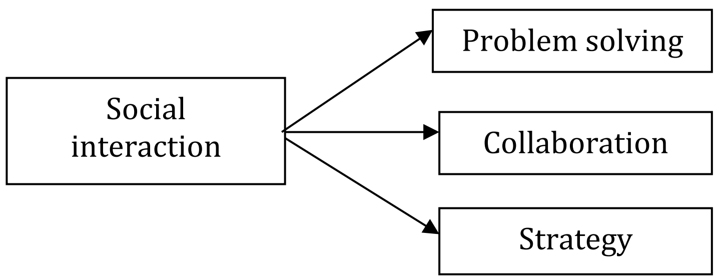

Figure 1. Potential of board games to create the social interaction through the activity of play.

5.0 CONCLUSION

In conclusion, this study highlights the important potential of board games in creating social interaction through play, especially in improving problem-solving skills, cooperation and strategy. However, aware of the limitations of the study, it is important to explore this relationship further through cross-cultural studies, regression analysis and comparative research.

Since board games can serve as an interesting tool to promote cognitive development and foster interpersonal relationships, this future study will contribute to a more comprehensive understanding of its effects in various contexts. The findings of this research contribute to increasing knowledge surrounding the various benefits and potential of board games as a tool to encourage the sense of togetherness that lead to people's wellbeing.

Therefore, the findings from this study can be used as a guide in designing a game board that can support the subject of the study. It can then be used as a learning tool in the classroom by integrating the playing concept during learning session. Generally, games are always considered fun by students, therefore when the concept of education is combined with what they find interesting, the level of involvement in the learning session will increase and lead to the active teaching environment.

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TRACK 2

COMMERCE

Faktor Yang Mempengaruhi Keputusan Pemilihan Tempat Makan Dalam Kalangan Pelajar

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Abstrak Kelangsungan sesebuah perniagaan banyak dipengaruhi oleh selain dari fatkor 4P, juga ditentukan oleh permintaan pengguna. Dalam era globalisasi di mana perkongsian maklumat berlaku dengan sangat drastik, dinamik permintaan pengguna juga turut terkesan dengan perubahan gaya hidup, citarasa, keutamaan dan lain-lain faktor yang mana mungkin sebelum ini tidak menjadi ancaman kepada perniagaan. Kajian ini dijalankan bagi mengenalpasti faktor yang mempengaruhi keputusan pemilihan tempat makan dalam kalangan 151 pelajar Politeknik Merlimau. Responden kajian terdiri dari pelajar semester 1 hingga 7 merentas jabatan. Maklumbalas kajian dikumpulkan melalui soalselidik yang dibangunkan oleh pengkaji dan ujian rentas telah dilaksana dengan nilai Alpha Cronbach 0.971, bagi menentu kesahan dan kebolehpercayaan soalan yang dibagunkan. Data yang dikumpul telah dianalisis menggunakan perisian SPSS for Window Version 23.0 dan dapatan kajian dibentangkan dalam bentuk skor min. Analisis data menunjukkan faktor produk serta tempat menjadi pertimbangan utama pelajar dalam menentukan pemilihan tempat makan. Dapatan kajian ini boleh dijadikan rujukan oleh pengusaha makanan untuk menambahbaik ruang niaga mereka dan juga menyediakan produk makanan yang menepati citarasa pelanggan, meningkatkan keberhasilan perniagaan sekaligus memastikan kelangsungan dan daya saing.

Kata Kunci: pemilihan, tempat makan

1.0 PENGENALAN

Perniagaan makanan samada restoran, gerai, kafetaria mahupun kantin adalah salah satu jenis perniagaan yang utama dan berkembang dengan pesat kerana terdapat permintaan yang berterusan. Ditambah dengan perubahan cara dan gaya hidup, disesuaikan dengan keperluan dan kehendak pengguna, permintaan kepada penawaran produk makanan yang pelbagai tidak menunjukkan penurunan. Walaubagaimanapun, untuk peniaga terus kekal beroperasi, mereka tidak boleh hanya berharap dan berpegang semata-mata hanya kepada prinsip makanan adalah keperluan asasi manusia. Corak permintaan pelanggan terhadap sesuatu produk boleh berubah dan banyak dipengaruhi oleh pelbagai faktor. Perkongsian maklumat tanpa batasan juga banyak mempengarui perubahan tingkah laku pengguna dalam membuat pembelian. Faktor-faktor seperti produk, harga, tempat dan promosi (4P) tidak lagi menjadi komponen elemen asas dan utama dalam menentukan corak keputusan pengguna membuat pembelian. Berbalik kepada perniagaan makanan, selain dari faktor 4P yang dinyatakan di atas, ianya dikembangkan lagi mencakupi perkara-perkara yang dilihat semakin penting dalam pembuatan keputusan pembelian. Sememangnya harga merupakan faktor utama yang dipertimbangkan apatah lagi dalam situasi pasca pandemik yang membawa kesan besar terhadap ekonomi rakyat. Namun faktor lain berkaitan produk seperti kepelbagaian, rasa, persembahan produk tidak kurang pentingnya. Selari dengan konsep value for money, ramai pengguna yang tidak memberi perhatian berat terhadap harga, jika peniaga dapat menawarkan produk yang memberi nilai kepada wang dibelanjakan. Begitu juga dengan lain-lain faktor seperti konsep kedai, ruang yang kondusif dan sebagainya. Sejajar dengan perubahan gaya hidup, peralihan citarasa terutamanya dalam kalangan generasi muda, faktor-faktor ini perlu diberi perhatian. Para peniaga seharusnya mula memberi perhatian kepada minat, kehendak dan keutamaan pelanggan dalam membuat keputusan pembelian. Menawarkan makanan yang murah semata-mata bukan lagi merupakan tiket mudah untuk para peniaga mendapat pulangan jualan yang tinggi.

1.1 Penyataan Masalah

Perubahan gaya hidup, cita rasa serta kehendak manusia berubah selari dengan lambakan maklumat tanpa sempadan. Perkara yang dahulunya adalah sesuatu yang biasa tidak lagi relevan pada masa kini. Malah ianya telah diambil alih secara drastik dan adakalanya tanpa disedari, telah sedikit sebanyak memberi kesan kepada apa jua yang diusahakan.

Begitulah fenomena yang kita dapat lihat pada hari ini. Kerancakan pertumbuhan sektor perkhidmatan makanan menunjukkan permintaan masih tinggi kerana makanan merupakan keperluan asasi manusia. Namun kita dapat lihat berlaku anjakan paradigma dalam kalangan pengguna berhubung apa yang meraka makan dan di mana mereka makan. Ianya dapat dikaitkan secara relatif dengan kemahuan dan keutamaan yang berbeza antara generasi, pengaruh maklumat yang tersebar secara meluas, usaha-usaha promosi yang lebih dinamik secara langsung mahupun tidak langsung telah memberi kesan dalam mana pelanggan membuat keputusan pemilihan tempat makan.

Pada era pasca pandemik yang serba mencabar disusuli dengan rentak ekonomi yang perlahan dan kini sedang bangkit semula, rata-rata pengguna di mana-mana sahaja peloso dunia yang terkesan, sangat menitikberatkan bagaiman mereka berbelanja atas pendapatan yang diperolehi. Tidak terkecuali dalam hal memenuhi keperluan asas kehidupan iaitu makan dan minum, pengguna menjadi semakin selektif. Sudah pastinya faktor harga adalah sangat penting dipertimbangkan. Walaubagaimanapun, dalam memenuhi keperluan asas, pengguna mungkin memberi sedikit kelonggaran dalam pertimbangan mereka berkaitan harga jika peniaga dapat menawarkan produk sesuai dengan nilai yang dibelanjakan. Ada banyak faktor yang boleh mempengaruhi seseorang pelanggan membuat keputusan dalam menentukan tempat makan. Contohnya, harga makanan yang disediakan, menu makanan, lokasi tempat makan, dan sebagainya.

Perubahan corak permintaan pengguna dalam kalangan generasi muda mencakupi pelajar di institusi pengajian turut memberi kesan kepada peniaga dalam kalangan pengusaha yang dilantik untuk mengoperasi perkhidmatan makanan di dalam kampus. Sasaran pasaran utama mereka adalah para pelajar, yang mempunyai citarasa yang berbeza dari generasi pertengahan usia. Pendakatan pembelian meeka lebih berorientasikan citarasa, kelazatan, persembahan dan lokasi. Dan ini memberi cabaran kepada pengusaha untuk memastikan mereka dapat terus beroperasi apatah lagi dengan adanya deretan kedai penyedia makanan yang lebih bercirikan menu kontemporari dan viral, terdapat desakan untuk pengusaha menambahbaik penawaran produk mereka. Ditambah dengan cabaran kewangan pasca Covid19 dengan pengenalan menu rahmah, apakah faktor 4P ini perlu diperhalusi oleh peniaga. Justeru itu, kajian ini dijalankan untuk mengkaji faktor yang mempengaruhi keputusan pembelian dalam kalangan pelajar di Politeknik Merlimau, Melaka.

1.2 Objektif kajian

Kajian ini dijalankan untuk:

i. Mengenalpasti faktor yang mempengaruhi keputusan pemilihan tempat makan dalam kalangan pelajar Politeknik Merlimau, Melaka.
ii. Menganalisis faktor paling dominan yang mempengaruhi keputusan pemilihan tempat makan dalam kalangan pelajar Politeknik Merlimau, Melaka.
iii. Mengemukakan cadangan penambahbaikan berdasarkan hasil dapatan kajian.

1.3 Persoalan Kajian

1.3.1 Apakah faktor yang mempengaruhi keputusan pemilihan tempat makan dalam kalangan pelajar Politeknik Merlimau, Melaka?
1.3.2 Apakah faktor paling dominan yang mempengaruhi keputusan pemilihan tempat makan dalam kalangan pelajar Politeknik Merlimau, Melaka?

1.4 Kepentingan Kajian

1.4.1 Peniaga

Hasil dapatan kajian ini dapat memberi input kepada peniaga makanan berhubung faktor yang mempengaruhi permintaan produk dalam kalangan pengguna pada masa kini. Melaluinya mereka boleh membuat penambahbaikan berdasarkan faktor yang paling dominan dan relevan yang dapat meningkatkan permintaan seterusnya mendatangkan hasil jualan yang tinggi.

1.4.2 Pensyarah

Pelaksanaan kajian ini membantu pensyarah dalam meneroka perkara-perkara baharu berhubung fenomena yang mempengaruhi pertimbangan pengguna dalam memilih tempat makan dan seterusnya mengemukakan cadangan yang boleh diaplikasikan oleh peniaga.

2. 0 SOROTAN KAJIAN

2.1 Produk

Produk adalah perkara yang ditawarkan oleh peniaga kepada pengguna. Perkara tersebut mempunyai ciri-ciri yang boleh pelanggan miliki dan dapat menarik perhatian mereka. Bagi menjadikan produk ini berupaya menarik minat pelanggan, ianya perlulah mempunyai faedah dari segi fizikal dan psikologi yang boleh menambat hati dan kehendak pegguna semasa pertukaran. Apabila produk dihasilkan, kualitinya perlulah dijaga.
Produk yang dapat mewujudkan kepuasan kepada pelanggan juga penting kerana ia merupakan faktor penting dalam mewujudkan kepercayaan dalam kalangan pelanggan serta usaha yang sesuai untuk menciptakan pengembangan perniagaan di pasaran dalam jangka masa yang panjang (Muhammad Ryan Fauzi, 2019). Manakala Evi Permatasari (2022) menyebut produk yang bagus adalahberpengaruh terhadap pembelian berulang, dan kualiti produk juga berpengaruh kepada pelanggan untuk pembelian kerana ia adalah faktor penting dalam menumbuhkan kepercayaan pelanggan untuk sentiasa menjadikan sesuatu perniagaan itu menjadipilihan pelanggan untuk melakukan urusan jual beli (Diana Noviyanti, 2022).

2.2 Harga

Harga merupakan suatu alat pengukuran nilai untuk memperolehi sesuatu barangan atau perkhidmatan. Harga merujuk kepada nilai produk makanan yang ditawarkan kepada pengguna. Penetapan harga makanan di antara satu peniaga dengan peniaga yang lain boleh jadi berbeza walaupun bagi makanan yang sama. Harga merupakan satu pertimbangan yang paling penting bagi seseorang pengguna dalam berbelanja. Pengguna pasti menjangkakan mereka akan menerima produk yang mempunyai nilai atas amaun yang dibayar.
Menurut Fifia Febyanti (2022) harga merupakan satu alat dalam bentuk wang yang digunakan sebagai pertukaran kepada pemerolehan produk atau perkhidmatan bagi membolehkan pengguna mendapatkan hak serta manfaat atas barang atau jasa tersebut.
Dan secara tidak langsung ianya akan digunakan sebagai satu cara untuk membandingkan nilai yang mereka terima dari produk yang ditawarkan oleh peniaga sesuai dengan penyataan Abdul Gofus (2019) di mana harga berpengaruh positif dan signifikan terhadap kepuasan pelanggan dan Surya kencana (2019) yang mana harga juga penting dalam persaingan kerana ia menjadi tanda aras atau sebagai perbandingan bagi harga yang akan ditetapkan.
Kepuasan pengguna terhadap kesetaraan nilai yang dibelanjakan dengan nilai produk yang diterima akan mempengaruhi kebarangkalian pembelian ulangan. Menurut Evi Permatasari (2022) harga juga mempengaruhi terhadap pembelian ulang kerana harga dapat mempengaruhi terhadap keputusan pembelian pelanggan menurut Tamengkel (2021) kerana pelanggan akan berfikir sebelum membeli sesuatu produk. Jika terlalu mahal pelanggan akan mencari kedai lain untuk mendapatkannya dengan harga berbeza yang lebih murah untuk kebaikkan.

2.3 Promosi

Promosi adalah cara untuk memberi informasi atau cara mempengaruhi pelanggan. Ini selari dengan pendapat NNR Respati (2019) di mana promosi dikatakan sebagai satu arah yang dibina untuk mengarahkan sesebuah organisasi untuk bertindakan menciptakan proses pertukaran di dalam pemasaran. Promosi terbahagi kepada pelbagai cara, bentuk dan media di mana ianya disebarkan sesuai dengan pandangan Ismail Razak (2019) campuran promosi adalahtermasuk dengan publisiti, jualan langsung, promosi jualan dan pengiklanan. Menurut Priccilia Natalia (2021) promosi adalah merupakan satu alat yang penting dan bagus digunakan dalam perniagaan secara berstrategi melalui pelbagai medium. Peranan promosi tidak dapat dikesampingkan oleh perniagaan dan mereka perlu memperuntukkan sejumlah wang bagi tujuan tersebut.

2.4 Tempat

Pada masa kini, lokasi perniagaan makanan sudah mencapai satu tahap yang merupakan cabaran besar kepada sesetengah peniaga. Pemilihan lokasi, susun atur tempat, kebersihan, kemudahan awam, hiasan, keselesaan, eksklusiviti dan lain-lain sudah semakin menjadi faktor penting yang mempengaruhi keputusan pengguna. Dengan pertumbuhan tempat makan yang semakin hari semakin banyak serta menawarkan kepelbagaian makanan, memberi lebih banyak peluang kepada pengguna untuk membuat pilihan (Kevin Hartato Muliadi, 2019). Muhammad Muqris (2022) menyatakan berkata kemudahan asas awam adalah nadi bagi OKU dalam menjalani kehidupan sosial mereka. Adil Fadhilah (2020) menyatakan peniaga perlu menjaga kebersihan kerana ia akan mempengaruhi kepuasan pelanggan kerana pengaruh pelanggan adalah pengaruh yang positif dan signifikan.

3.0 METODOLOGI KAJIAN

Kajian ini adalah kajian deskriptif yang berbentuk tinjauan iaitu dengan menggunakan kaedah borang soalselidik yang diedarkan kepada responden yang terdiri daripada pelajar Politeknik Merlimau, Melaka. Pengumpulan maklumat dibuat menggunakan pendekatan persampelan merangkumi dari aspek populasi kajian, sampel kajian dan tempat kajian bagi mendapatkan maklumat dan seterusnya dianalisis untuk memperoleh hasil kajian. Soalselidik telah diedarkan kepada 151 orang pelajar yang telah dipilih sebagai populasi kajian. Dua kaedah utama pengumpulan data digunakan dalam kajian ini iaitu data primer dan data sekunder. Dalam kajian ini data primer diperolehi dengan menggunakan borang soalselidik yang dibina terdiri daripada beberapa bahagian yang dikemukakan kepada responden berdasarkan kepada objektif kajian. Manakala data sekunder pula diperolehi melalui sumber internet, buku rujukan dan akhbar dalam talian.

3.1 Instrumen kajian

Kajian ini menggunakan instrumen soalselidik yang dibahagikan kepada dua bahagian iaitu Bahagian A merangkumi maklumat demografi responden kajian dari aspek jabatan, semester pengajian dan tempat tinggal manakala bahagian B pula merupakan soalselidik berkaitan dengan 3 objektif kajian. Soalselidik ini telah dibangunkan berdasarkan objektif kajian dan *pilot test* telah dijalankan bagi menguji kesahihan soalselidik tersebut dan mencatat nilai Alpha Cronbach 0.971. Ianya menujukkan soalselidik yang dibentuk mempunyai kebolehpercayaan yang tinggi.

Analisis kajian ini adalah menggunakan analisis min bagi objektif pertama dan kedua dalam mengenalpasti faktor yang mempengaruhi keputusan pemilihan tempat makan dalam kalangan pelajar Politeknik Merlimau, Melaka. Tafisran nilai min yang diperolehi adalah mengikut jadual 3.3 dan tafsiran min menggunakan min tertinggi, terendah dan sederhana untuk setiap pembolehubah yang dipilih.

Jadual 1 : Pembahagian item di dalam borang soalselidik.

Bahagian soalan	Item
Bahagian A	Maklumat Demografi
Bahagian B	Faktor yang mempengaruhi keputusan pemilihan tempat makan

Jadual 2 : Markat, Skala Likert dan Penyataan

Markat	Skala Penyataan
1	Sangat Tidak Setuju
2	Tidak Setuju
3	Sederhana Setuju
4	Setuju
5	Sangat Setuju

Jadual 3 : Skor Min dan Tahap Tafsiran Min

Skor min	Tahap kecenderungan
1.00 – 1.50	Sangat rendah
1.51 – 2.50	Rendah
2.51 – 3.50	Sederhana
3.51 – 4.00	Tinggi

(Adaptasi daripada Mohd Asri harun et al, 2016)

4.0 ANALISIS DAN KEPUTUSAN

4.1 Analisis Dapatan Kajian Bahagian A (Demografi)

Bahagian ini melaporkan analisis latar belakang pengajian responden yang terdiri daripada jabatan, semester pengajian dan tempat tinggal responden semasa pengajian. Bagi item jabatan menunjukkan 13.9% adalah responden daripada JKA, 29.8% adalah daripada JKE, 9.3% adalah daripada JKM, 22.5% adalah daripada JP dan 24.5% adalah daripada JPH. Manakala bagi item semester pengajian pula, responden merangkumi pelajar semester 1 hingga semester 7. Terdapat 18.5% responden daripada pelajar semester 1, semester 2 16.6%, semester 3 6.0%, semester 4 12.6%, 43.7% pelajar semester 5, 2.0% semester 6 dan 0.7% semester 7. Bagi item tempat kediaman pula, responden yang tinggal di rumah sewa mewakili 56.3% dan baki 43.7% tinggal di kamsis.

4.2 Analisis Dapatan Kajian Bahagian B (Objektif Kajian)

Analisis Objektif 1 : Faktor yang mempengaruhi keputusan pemilihan tempat makan dalam kalangan pelajar Politeknik Merlimau, Melaka.

4.2.1 Produk

Pada keseluruhannya, faktor kelazatan, kepelbagaian menu dan menu mengikut citarasa pelanggan mencapai tahap yang tinggi dengan nilai min adalah 3.63 dan 3.52 berbanding kesegaran bahan dan ramuan, makanan yang menyihatkan, makanan yang dihidangkan masih panas dan pilihan menu yang berbeza setiap hari pada tahap sederhana dengan nilai min 3.50, 3.41 dan 3.46.

Jadual 4: Analisis Min Dapatan Bagi Faktor Produk

NO	ITEM SOALAN	KEKERAPAN/PERATUSAN					JUMLAH	SKOR MIN	TAFSIRAN
		STS	TS	TP	S	ST			
Faktor yang mempengaruhi pembuatan keputusan pemilihan tempat makan									
1.	Makanan yang disediakan sedap dan lazat.	10	20	24	59	38	151	3.63	Tinggi
		6.6	13.2	15.9	39.1	25.2	100		
2.	Kesegaran bahan dan ramuan.	10	21	33	58	29	151	3.50	Sederhana
		6.6	13.9	21.9	8.42	19.3	100		
3.	Kepelbagaian menu	9	23	34	50	35	151	3.52	Tinggi
		6.0	15.2	22.5	33.1	23.2	100		
4.	Makanan yang menyihatkan	10	25	37	51	28	151	3.41	Sederhana
		6.6	16.6	24.5	33.8	18.5	100		
5.	Makanan yang dihidangkan masih panas.	15	21	33	43	39	151	3.46	Sederhana
		9.9	13.9	21.9	28.5	25.8	100		
6.	Menu yang mengikut citarasa pelanggan.	11	24	29	50	37	151	3.52	Tinggi
		7.3	15.9	19.2	33.1	24.5	100		
7.	Pilihan menu yang berbeza setiap hari.	15	19	35	45	37	151	3.46	Sederhana
		9.9	12.6	23.2	29.8	24.5	100		

4.2.2 Harga

Analisis menunjukkan nilai min bagi semua faktor berkaitan harga mencapai tahap sederhana iaitu di antara 3.26 hingga 3.48. Ini jelas menunjukkan faktor harga tidak merupakan faktor yang dominan yang mempengaruhi keputusan pemilihan tempat makan dalam kalangan responden.

Jadual 5: Analisis Dapatan Bagi Faktor Harga

NO	ITEM SOALAN	KEKERAPAN / PERATUSAN					JUMLAH	SKOR MIN	TAFSIRAN
		STS	TS	TP	S	ST			
Faktor yang mempengaruhi pembuatan keputusan pemilihan tempat makan									
1.	Harga yang berpatutan mengikut menu	15	22	31	42	41	151	3.48	Sederhana
		9.9	14.6	20.5	27.8	27.2	100		
2.	Harga sesuai dengan keenakkan makanan	16	21	26	41	38	151	3.45	Sederhana
		10.6	13.9	17.2	27.2	25.2	100		

3.	Harga sama seperti dipamerkan	22	23	36	33	37	151	3.26	Sederhana
		14.6	15.2	23.8	21.9	24.5	100		
4.	Harga yang dicaj sama dengan harga dipamerkan	21	22	31	38	39	151	3.34	Sederhana
		13.9	14.6	20.5	25.2	25.8	100		

4.2.3 Promosi

Item susunatur makanan mencapai tahap tinggi dengan nilai min 3.52 manakala lain-lain item mencapai tahap sederhana dengan nilai min di antara 3.31 hingga 3.36.

Jadual 6: Analisis Dapatan Bagi Faktor Promosi

NO.	ITEM SOALAN	KEKERAPAN / PERATUSAN					JUMLAH	SKOR MIN	TAFSIRAN
		STS	TS	TP	S	ST			
Faktor yang mempengaruhi pembuatan keputusan pemilihan tempat makan									
1.	Peniaga menawarkan menu istimewa (menu of the day)	22	19	36	38	36	151	3.31	Sederhana
		14.6	12.6	23.8	25.2	23.8	100		
2.	Susun atur makanan yang praktikal (memudahkan pengambilan dan pergerakkan pelanggan)	15	20	34	36	46	151	3.52	Tinggi
		9.9	13.2	22.5	23.8	30.5	100		
3.	Peniaga menawarkan pembelian istimewa (beli makanan percuma minuman)	27	17	27	39	41	151	3.33	Sederhana
		17.9	11.3	17.9	25.8	27.2	100		
4.	Menawarkan harga istimewa bagi pembelian berikutnya	25	17	32	32	45	151	3.36	Sederhana
		16.6	11.3	21.2	21.2	29.8	100		

4.2.4 Tempat

Analisis menunjukkan semua item berhubung faktor tempat mencapai tahap tinggi dengan nilai min di antar 3.72 hingga 3.97. Ianya jelas menunjukkan faktor ini mempengaruhi keputusan responden memandangkan kekangan masa antara waktu kuliah dan waktu rehat.

Jadual 7: Analisis Min Dapatan Bagi Faktor Tempat

NO	ITEM SOALAN	KEKERAPAN / PERATUSAN					JUMLAH	SKOR MIN	TAFSIRAN
		STS	TS	TP	S	ST			
Faktor yang mempengaruhi pembuatan keputusan pemilihan tempat makan									
1.	Lokasi yangstrategik.	7	10	34	51	49	151	3.83	Tinggi
		4.6	6.6	22.5	33.8	32.5	100		
2.	Kebersihan dari semua aspek.	10	7	36	44	54	151	3.83	Tinggi
		6.6	4.5	23.8	29.1	35.8	100		
3.	Kemudahan awam yang disediakan.	7	12	33	50	49	151	3.82	Tinggi
		4.6	7.9	21.9	33.1	32.5	100		
4.	Tema kedai makan yang menarik.	7	12	42	46	44	151	3.72	Tinggi
		4.6	7.9	27.8	30.5	29.1	100		
5.	Mesra pengguna (contoh: fasilitiOKU).	9	10	38	45	49	151	3.76	Tinggi
		6.0	6.6	25.2	29.8	32.5	100		
6.	Ruang yang luasdan selesa.	10	7	29	36	69	151	3.97	Tinggi
		10	7	29	36	69	100		

Analisis Objektif : Faktor yang paling dominan mempengaruhi keputusan pemilihan tempat makan dalam kalangan pelajar Politeknik Merlimau, Melaka.
Analisis di bawah objektif 1 menunjukkan faktor paling dominan yang mempengaruhi keputusan pemilihan tempat makan adalah faktor produk (faktor kelazatan, kepelbagaian menu dan menu mengikut citarasa pelanggan). Manakala bagi kesemua item di bawah faktor tempat adalah penting dalam membuat keputusan pemilihan tempat makan.

5.0 KESIMPULAN

Secara keseluruhannya, berdasarkan kepada objektif pertama kajian ini iaitu mengenalpasti faktor yang mempengaruhi keputusan pemilihan tempat makan dalam kalangan pelajar Politeknik Merlimau, adalah didapati faktor tempat amat mempengaruhi keputusan responden dalam memilih tempat makan. Dua faktor lain iaitu produk dan promosi menunjukkan tahap tinggi dan sederhana bagi semua item yang dikaji. Manakala faktor harga menunjukkan pengaruh yang paling kurang dominan dalam mempengaruhi keputusan responden memilih tempat makan.

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Potensi Tombong Kelapa Dalam Pembuatan Jeli

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Abstrak. Jeli merupakan makanan ringan yang popular di kebanyakan negara. Salah satu jeli yang dihasilkan daripada kelapa ialah *nata de coco*. Permintaan buah kelapa tidak pernah merosot daripada kalangan isi rumah mahupun pemain industri. Harga kelapa melonjak naik bagi tempoh tahun 2016-2019. Secara puratanya, Malaysia mengimport kelapa segar sebanyak 183 ribu metrik setahun dari tempoh 2015-2019. Ini menunjukkan terdapat banyak produk hasil kelapa yang menyebabkan negara mengimport bekalan kelapa biji tua bagi menampung keperluan industri. Namun demikian, berdasarkan pemerhatian di pasaran,kurangnya pengkomersilan produk berasaskan tombong kelapa. Pengkomersilan kelapa (*cocos nucifera*) kebiasaannya tertumpu kepada isi kelapa, air kelapa atau daun kelapa. Hanya sedikit produk inovasi daripada tombong kelapa yang dihasilkan seperti penghasilan cuka tombong kelapa, tepung tombong kelapa. Oleh itu, Nucifera Jelly dihasilkan daripada tombong kelapa dan di olah menjadi makanan ringan jeli *"ready to eat"*. Nucifera Jelly ini diperbuat dari bahan-bahan seperti gelatin, stevia, tombong kelapa dan air kelapa. Objektifkajian ini adalah bertujuan untuk melihat potensi tombong kelapa sebagai makanan ringan yang berkhasiat berasaskan jeli. Berdasarkan kajian, didapati bahawa tombong kelapa mengandungi vitamin dan mineral penting seperti karbohidrat, protein, lemak, mineral dan vitamin. Tombong kelapa juga dapat membantu mengawal masalah kesihatan seperti pencegahan hipertensi, pencegahan kerosakan pembuluh darah, kanser hati dan banyak lagi. Kaedah kajian ini menggunakan kaedah kualitatif berdasarkan analisis dokumen. Kajian ini juga menjelaskan mengapa tombong kelapa perlu dikomersilkan yang mana sebelum ini ianya dianggap kurang bermanfaat. Oleh yang demikian, kajian terhadap penghasilan makanan jeli yang berkhasiat berasaskan tombong kelapa adalah dicadangkan untuk penyelidikan masa hadapan.

Kata Kunci: tombong kelapa, jeli, kelapa

1.0 PENGENALAN

Jeli merupakan makanan ringan yang popular di kebanyakan negara, dan menjadi makanan kegemaran di kalangan kanak-kanak mahupun dewasa. Jeli merupakan makanan ringan yang menyegarkan dan sesuai dimakan pada cuaca panas atau sebagai hidangan penutup selepas menikmati makanan berat. Pada umumnya, jeli ini diperbuat daripada campuran cairan seperti jus buah-buahan, susu atau pewarna makanan yang dibenarkan, kemudian ianya di olah dengan menggunakan bahan pengental seperti agar-agar. Perkembangan industri jeli makanan ringan di Malaysia dapat dilihat dengan adanya perkembangan produk tersebut daripada pelbagai bentuk, rasa dan cara penyediaan. Namun demikian, lambakan makanan ringan jeli di pasaran yang mengandungi kandungan gula yang tinggi adalah amat tidak baik untuk kesihatan. Makanan ringan yang mempunyai kandungan gula yang tinggi boleh menyebabkan karies gigi terutamanya kepada kanak-kanak.

Tombong kelapa merupakan makanan yang unik tetapi kurang dikomersilkan. Tombong kelapa atau juga di kenali sebagai kentos, gendos, *haustorium, coconut sprout* merupakan satu struktur embrio yang terdapat dalam buah kelapa tua yang disimpan untuk proses percambahan. Tombong kelapa ini berwarna putih krim kekuningan. Pada kebiasaannya, tombong kelapa berbentuk bulat, lonjong atau berbentuk seperti *'pearl'* bergantung kepada umur dan jenis kelapa. Kebiasannya, tombong kelapa ini dibuang apabila isi kelapa diambil.

Tombong kelapa ini dibuang kerana dianggap tidak bermanfaat. Namun demikian, tombong kelapa sebenarnya mengandungi serat yang penting untuk proses pencernaan. Serat dapat membantu mencegah sembelit dan menjaga kesihatan usus. Selain itu juga, tombong kelapa mengandungi vitamin dan mineral penting seperti karbohidrat termasuk gula larut, serat, kalium, mangan, kalsium, fosfur dan magnesium. Menurut Chikku dan Rajamohan (2012), *coconut sprout* (kecambah kelapa) merupakan salah satu bahagian yang dapat dimakan dari kelapa dan memiliki sejumlah kandungan zat gizi yang diperlukan oleh manusia untuk proses metabolisme tubuh, antara lain karbohidrat, protein, lemak, mineral dan vitamin serta komponen-komponen bioaktif seperti alkaloid dan polifenol.

Secara umumnya, jeli mempunyai tekstur yang kenyal dan biasanya memiliki rasa manis serta menyegarkan. Justeru itu, dalam usaha mempelbagaikan makanan ringan, satu pembangunan produk inovasi daripada jeli di lihat berpotensi dikembangkan adalah melalui penggunaan tombong kelapa. Jeli sesuai di olah bersama tombong kelapa untuk menjadikannya sebagai satu makanan ringan yang berkhasiat. Namun begitu, kurangnya kajian yang menggunakan tombong kelapa sebagai bahan utama dalam pembuatan jeli. Oleh yang demikian, objektif kajian ini adalah untuk melihat potensi tombong kelapa sebagai makanan ringan yang berkhasiat berasaskan jeli.

2.0 SOROTAN KAJIAN DAN PEMBINAAN HIPOTESIS

Tombong kelapa merupakan bahagian di dalam buah kelapa yang sudah tua. Buah kelapa yang sudah tua dan bertunas mempunyai embrio yang berbentuk seperti bola. Embrio kelapa mempunyai warna putih krim kekuningan yang berada melekat dibahagian dalam biji kelapa yang bercambah. Lazimnya, tombong kelapa ini hanya akan dibuang begitu sahaja. Walaupun tombong kelapa ini boleh dimakan, tetapi, bahagian kelapa ini kurang dikomersilkan. Melalui kajian Sumiaty Aiba et.al (2019), beliau menyatakan bahawa sumber gizi utama yang terkandung pada tombong kelapa ialah karbohidrat, protein, lemak dan mineral seperti kalsium. Di dalam satu kajian melalui hasil penelitian telah membuktikan bahawa sumber nutrisi yang terkandung pada tombong kelapa dapat meningkatkan hormon progesteron. Hormon progesteron ini mempengaruhi pertumbuhandan perkembangan kelenjar susu sewaktu proses kehamilan. Selain itu juga, mekanisme tombong kelapa terhadap hormon prolaktin dalam penghasilan air susu ibu juga dipengaruhi dengan peningkatan hormon progesterone.

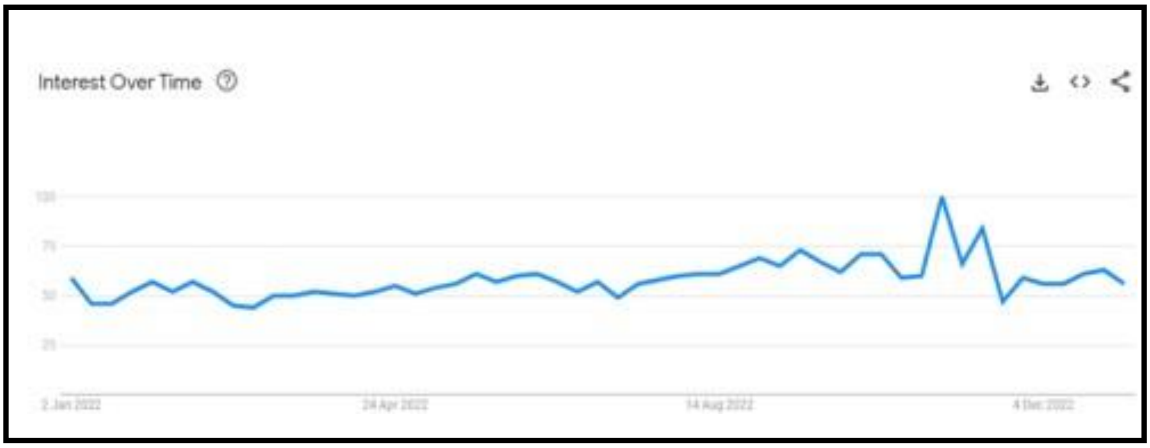
Kajian yang telah dijalankan oleh Arief Azis (2020), menyatakan bahawa tombong kelapa ini bermanfaat sebagai antidepresi yang mana ianya telah diuji pada haiwan tikus. Tombong kelapa juga boleh digunakan untuk mencegah hipertensi melalui kegunaannya sebagai antioksidan. Antioksidan ini boleh berfungsi untuk mengatasi radikal bebas yang boleh menyebabkan tekanan oksidatif. Tekanan oksidatif ini boleh menyebabkan peningkatan tekanan darah terhadap wanita yang hamil. Antidepresi atau antikemurungan adalah wujud daripada faktor tekanan. Ia mempunyai prestasi yang sama seperti antioksidan untuk mencegah dan menghalang radikal bebas daripada tekanan oksidatif.

3.0. METODOLOGI KAJIAN

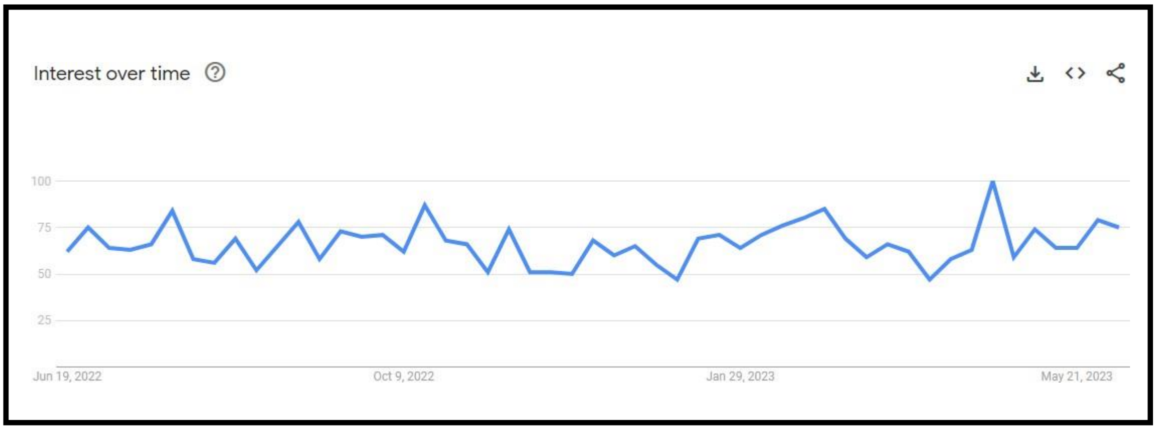
Kajian terhadap potensi tombong kelapa dalam pembuatan jeli ini menggunkan kaedah Analisa dokumen dengan cara pengumpulan data menganalisa data hasil daripada dokumen yang diperolehi. Berdasarkan kepada analisis dekriptif yang dijalankan secara kualitatif, potensi berikut adalah dikenalpasti:

3.1 Permintaan makanan berasaskan jeli

Berdasarkan hasil carian, didapati bahawa rakyat Malaysia gemar dengan makanan yang berasaskan jeli. Hal ini disokong dengan hasil carian tentang jeli di *Google Trends* pada tahun 2022 dan 2023. Hasil carian menunjukkan permintaan makanan berasaskan jeli masih lagi mempunyai peningkatan pada tahun 2023. Selain itu juga, hasil carian makanan berasaskan jeli dilihat banyak di negeri Terengganu, Kelantan, Pulau Pinang, Melaka dan Pahang untuk tahun 2022. Pada tahun 2023, carian *Google Trends* masih kekal dilihat banyak kepada negeri Terengganu dan juga Kelantan walaupun ada sedikit perubahan pada data carian tersebut.



(a)



(b)

Rajah 1: Perbandingan carian Google Trends terhadap makanan jeli pada tahun 2022 dan 2023 (Sumber: Carian Google Trends, 2022 dan 2023)

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(a)

(b)

Rajah 2: Perbandingan carian Google Trends terhadap makanan jeli mengikut negeripada tahun 2022 dan 2023 (Sumber: Carian Google Trends, 2022 dan 2023)

3.2 Kesihatan

Sebahagian kalangan rakyat Malaysia adalah penduduk yang mempunyai masalah kesihatanyang serius memandangkan jumlah rakyat yang menghidapi penyakit jantung dan obesiti adalah tinggi. Hal ini adalah kerana kesedaran tentang aspek kesihatan dalam kalangan rakyat adalah masih berada di tahap rendah (Harian Metro, 2021). Perkara ini mungkin disebabkan oleh masalah gaya pemakanan yang diambil dan diamalkan oleh rakyat Malaysia dimana seorang daripada 20 rakyat Malaysia tidak mengamalkan pemakanan mengikut nutrisi yang betul. Corak pengambilan makanan yang teratur dan seimbang sepatutnya dimulakan sejak kanak-kanak dan perlu diteruskan sehingga dewasa terutama apabila usia semakin meningkat (Siti Nadirah, 2018). Selain daripada masalah pengambilan makanan bernutrisi, Malaysia berdepan dengan masalah psikologi dan kesihatan mental iaitu kemurungan. Berdasarkan statistik rasmi melalui Kajian Kesihatan dan Morbiditi Kebangsaan (NHMS) yang dijalankan pada 2019 menyatakan bahawa hampir setengah juta orang dewasa mengalami kemurungan. Statistik ini merangkumi 2.3% rakyat negara ini berusia 16 tahun ke atas dan 9.5% kanak-kanak berusia 10-15 tahun mengalami masalah mental. Statistik menunjukkan dimana seorang daripada 20 orang kanak-kanak berusia 5 hingga 9 tahun di Malaysia kini mengalami masalah mental. Kementerian Kesihatan Malaysia (KKM) telah merekodkan sebanyak

424,000 kanak-kanak di Malaysia disahkan mengalami masalah mental. Pencegahan hipertensi secara alternatif telah banyak diusahakan oleh masyarakat melalui penanaman sumber tanaman yang berpotensi untuk merawat hipertensi. Salah satu manfaattanaman yang kurang dikomersilkan untuk tujuan pencegahan hipertensi ialah tombong kelapa. Menurut Aiba (2017), tombong kelapa sangat relevan untuk dijadikan bahan nutrisi alternatif mencegah hipertensi. Ini kerana sumber kandungan nutrisi tombong kelapa yang kaya akan bahan senyawa fitokimia dan boleh berperanan sebagai antioksidan. Melalui kajian Aiba (2016), tombong kelapa mengandung nutrisi berupa protein yang berperanan dalam komposisi darah yang kaya akan zat besi, serta senyawa flavonoid yang dapat mempertahankan kesihatan pembuluh darah. Diet tombong kelapa dapat dijadikan sebagai sumber nutrisi atau makanan alternatif untuk memperbaiki dan mempertahankan kesihatan secara optimum. Oleh yang demikian, tombong kelapa dilihat mempunyai kebaikan dan khasiat sebagai alternatif di dalam mencegah dan merawat hipertensi serta membekalkan sumber nutrisi daripada bahan semulajadi.

3.3 Komersial

Penghasilan produk daripada tombong kelapa adalah tidak banyak di pasaran. Permintaan tombong kelapa adalah sedikit kerana tidak ramai yang mengetahui khasiat tombong kelapa. Di sebabkan khasiat tombong kelapa ini kurang diketahui, penggunaan tombong kelapa di dalam industri makanan adalah sangat terhad. Menurut Made Bima (2022), tombong kelapa yang cukup besar memiliki tekstur yang lebih lembut dan rasa yang lebih manis daripada tombong kelapa yang masih sangat kecil. Tombong kelapa memiliki rasa yang cukup manis dengan tekstur yang empuk. Dengan rasa dan tekstur tersebut, satu kajian berhubung penggunaan tombong kelapa sebagai penambah rasa dalam pembuatan Gelato telah dilaksanakan dengan melihat perbandingan daripada aspek tekstur, rasa, aroma dan warna.

Industri kelapa merupakan industri daripada sektor pertanian yang telah lama bertapak di Malaysia. Peningkatan eksport produk kelapa dari tahun ke tahun menunjukkan potensi industri ini semakin meningkat di pasaran. Harga kelapa mula melonjak naik pada tahun sekitar 2016 sehingga 2019. Permintaan buah kelapa ini tidak pernah merosot samaada daripada pengguna isi rumah mahupun pemain industri. Ini menunjukkan hasil produk berasaskan kelapa mempunyai potensi untuk di kembangkan. Antara produk hasilan kelapaseperti santan, air kelapa, minyak kelapa dara, arang tempurung, karbon teraktif dan *cocopeat*. Penghasilan kepelbagaian produk berasaskan kelapa mampu merangsang permintaan kelapa yang tinggi melalui persaingan keperluan industri produk nilai tambah dan peningkatan keperluan isi rumah. Melalui proses tambah nilai produk berasaskan kelapa, produk ini telah mendapat permintaan yang tinggi di dalam negara malah mampu dipasarkan ke seluruh dunia (Mohd Hafizudin Zakaria, 2020). Namun demikian, tidak semua masyarakat mengetahui kepelbagaian produk berasaskan buah kelapa. Berdasarkan Dwi Zulfita et.al (2018), satu latihan dan bimbingan telah dijalankan kepada penduduk Desa Panjang, Pontianak untuk melestarikan kebun kelapa dalam memberikan inovasi baharu kepelbagaian aneka produk berasaskan kelapa seperti penghasilan minyak kelapa dara *(virgin coconut oil),* sabun mandi padat, kicap air kelapa, gula-gula jeli tombong kelapa dan kompos hampas kelapa untuk meningkatkan nilai tambah produk, daya simpan produk dan meningkatkan pendapatan masyarakat kelompok petani kelapa. Walaupun, permintaan kepada penghasilan produk kelapa dilihat tinggi, namun demikian, ianya lebih tertumpu kepada buah kelapa sahaja berbanding inovasi produk daripada tombong kelapa.

3.4 Pengganti pemanis mulut

Kebanyakkan rakyat Malaysia suka untuk mengambil pemanis mulut selepas makan. Pemanis mulut selalunya makanan yang manis dan mempunyai pelbagai perisa. Mereka lebih menyukai makanan pemanis mulut yang mudah untuk dimakan dan dibawa kemana sahaja. Antara bahan yang boleh menggantikan penggunaan gula putih di dalam pembuatanjeli tombong kelapa ialah dengan menggunakan pemanis daripada stevia. Ia memiliki beberapa kelebihan dibandingkan dengan gula, diantaranya memiliki tingkat kemanisan 300 kali lebih tinggi dari sukrosa (Agus Limanto, 2017). Dari aspek lain juga, penggunaan ekstrak stevia dapat memberikan kesan baik kepada kesihatan seperti mengurangkan tekanan darah tinggi, mengurangkan paras gula dan membantu peningkatan fungsi buah pinggang. Penggunaan stevia juga dikatakan dapat menurunkan tekanan darah sistolik dan diasistolik. Maka, penghasilan produk inovasi jeli tombong kelapa ini dilihat sebagai makanan ringan yang lebih sihat. Selain itu juga, penggunaan stevia ini menjadikan jeli tombong kelapa sebagai produk manisan yang mesra diabetis dan obesiti.

4.0 KEPUTUSAN KAJIAN DAN ANALISIS

Hasil daripada dapatan dan analisis data yang dilaksanakan terhadap jeli tombong kelapa ini, mendapati bahawa terdapat tiga elemen penting yang boleh diputuskan iaitu:

4.1.1 Fungsi produk

i. Tombong kelapa yang mempunyai bahan nutrisi alternatif untuk mencegah hipertensi.
ii. Tombong kelapa mempunyai sumber nutrisi daripada bahan semulajadi untuk memperbaiki dan mempertahankan kesihatan secara optimum.
iii. Tombong kelapa dapat menambahkan perasa didalam penyediaan makanan.

4.1.2 Manfaat produk

i. Produk ini boleh dijadikan sebagai kudapan yang berkhasiat kerana sumber gizi utama iaitu karbohidrat, protein, lemak dan mineral.
ii. Sumber kandungan nutrisi tombong kelapa yang kaya akan bahan senyawa fitokimia dan boleh berperanan sebagai antioksidan.
iii. Tombong kelapa mengandung nutrisi berupa protein yang dapat mempertahankan kesihatan pembuluh darah.
iv. Pencegahan hipertensi berasaskan sumber rawatan alternatif melalui pemakanan tombong kelapa.
v. Sumber nutrisi yang terkandung pada tombong kelapa dapat meningkatkan hormon progesterone yang mana hormon ini membantu perkembangan kelenjar susu sewaktu proses kehamilan.

4.1.3 Bahan-bahan di dalam penghasilan produk jeli

i. Bahan utama yang digunakan di dalam penghasilan Nucifera Jelly ialah tombong kelapa. Tombong kelapa ini merupakan bahagian buah kelapa yang tidak dimanfaatkan secara sebaiknya.

ii. Penggunaan bahan pemanis stevia bagi menggantikan penggunaan gula putih. Stevia merupakan pemanis alternatif terutamanya kepada pesakit kencing manis dan kelompok individu yang berdiet. Ini kerana stevia mempunyai kandungan kalori yang sangat rendah serta tidak mengandungi karbohidrat, lemak dan protein.

iii. Kandungan air kelapa mengandungi vitamin C. Air kelapa kaya dengan potassium (kalium). Kandungan kalium ini dapat membantu tekanan darah dan meningkatkan kesihatan jantung.

5.0 KESIMPULAN

Secara kesimpulannya, tombong kelapa dilihat sebagai satu manfaat baharu dalam penghasilan produk inovasi daripada sumber kelapa. Potensi tombong kelapa dalam penghasilan jeli tombong kelapa ini dapat menyokong prinsip *zero waste* dengan mengubahnya menjadi produk yang bermanfaat kepada kesihatan khususnya. Tombong kelapa merupakan sumber alam yang kaya dengan nutrisi dan dapat dimanfaatkan sepenuhnya untuk mengurangkan pembaziran dan memberikan nilai tambah kepada produk yang dihasilkan. Pengolahan tombong kelapa menjadi Nucifera Jelly ini dapat membantu mengurangkan sisa kelapa dan menyokong kepada pendekatan lestari terhadap penggunaan sumber semulajadi. Potensi tombong kelapa sebagai pembuatan jeli perlu diperluaskan agar manfaat produk ini dapat membantu meningkatkan tahap kesihatanmasyarakat dengan menggunakan sumber semulajadi yang kaya dengan nutrisi.

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Level of job satisfaction among gigworkers; evidence from rider in Melaka, Malaysia

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Abstract: This project will examine level of job satisfaction among Gig Workers which is Riders of Grab Food in Melaka. Job satisfaction is a positive feeling about their job. From the previous research, many grab riders are facing job security issue such as road accidents, lack of legal protection and lack of road awareness among riders. In addition, grab riders also received low incentives and inconsistent wages. Thus, the researcher executes a descriptive study to determine the level of job satisfaction among riders in Melaka using a statistical analysis. A survey questionnaire was used to collect data from 118 respondent via google form. The findings of this project show that the level of job satisfaction among riders are moderate on the lower scale for payment and job security issues. Therefore, the Grab food management and government should implement lifetime insurance for riders and the government could improve the EPF policy to increase level of job satisfaction.

Keywords: Gig workers, Job satisfaction, Grab riders, Payment, Safety

1.0 Introduction

Gig workers, also known as independent contractors, freelancers, or on-demand employees, are becoming an increasingly important element of today's employment. These workers are self-employed and do not often have a set, long-term employer-employee connection with the firms for which they work. Instead, they do short-term or project-based job for a variety of clients or consumers, sometimes via online platforms or applications. (Nursilah Ahmad, 2020). Next, according to Tracy Brower (2022), Gig workers have existed for centuries, but the growth of digital technology and the gig economy has resulted in a considerable increase in the number of individuals working in this way. People from various walks of life have been drawn to the gig economy, including students, retirees, and individuals who are unable or unwilling to perform regular employment. For some, gig work offers freedom and the opportunity to make additional cash on their own terms. Others see it as a full-time job that allows them to live a more entrepreneurial lifestyle and follow their passions. Platform-enabled gig work, on the other hand, is a hybrid form of work made possible by digital technology and enabled by platform companies such as Grab.

Grab Malaysia is the Malaysian branch of Grab, a Southeast Asian technology business that provides ride-hailing, food delivery, and financial services. Anthony Tan and Tan Hooi Ling created MyTeksi in Malaysia in 2012, and it was later renamed as Grab in 2016. Additionally, with the introduction of Grab Financial in 2018, Grab has extended into financial services. Grab Malaysia is now one of the country's main ride-hailing and food delivery platforms, having a significant presence in key cities such as Kuala Lumpur, Penang, and Johor Bahru. These three states their working hour is 24 hours. Its services have also been extended to other Southeast Asian nations such as Singapore, Indonesia, and the Philippines. Overall, Grab Food has grown in popularity throughout Southeast

Asia, offering clients a simple and fast method to enjoy their favourite meal from a range of eateries. With the work of grab food, Malaysians can generate a lot of income and can afford a high standard of living nowadays. (Ed Joven,2019)

The gig economy has become a significant contributor to the world economy, with many workers are attracted to the flexibility and freedom it offers. The Grab Food delivery service is a popular platform that provides Malaysians with a means to earn a living and enjoy a high standard of living. However, job satisfaction is critical for gig workers, particularly in terms of safety and payment methods. Safety concerns are essential, and Grab's insurance coverage is critical to ensure gig workers' safety while delivering food. Furthermore, gig workers' satisfaction with payment methods is vital as it affects their earnings and livelihood. A sustainable and beneficial gig economy can only be achieved if gig workers are satisfied with their job and feel protected and valued. This research aims to explore the job satisfaction of Grab riders in Melaka, with a focus on safety and payment methods.

2.0 Literature Review

The rise of ride-hailing services has brought convenience to many people around the world. In Malaysia, Grab is one of the most popular ride-hailing services that has gained a large customer base due to its affordability and reliability. However, there have been concerns raised about the payment and safety issues faced by Grab riders in Melaka, Malaysia. Payment issues include delayed payment, incorrect payment, and the high commission charged by Grab, which affects the earnings of riders. Safety issues, on the other hand, range from physical assault, theft, and harassment faced by riders while on duty. These issues not only affect the financial well-being of the riders but also pose a threat to their personal safety. To understand the impact of these issues on Grab riders in Melaka, Malaysia, this review will explore the existing literature on payment and safety issues faced by ride-hailing drivers globally and in Malaysia. It will also analyse the policies and regulations governing ride-hailing services in Malaysia and the measures taken by Grab to address these issues. The literature review will provide insights into the experiences of Grab riders in Melaka, Malaysia, and the challenges they face while working for the company. It will also identify gaps in the existing literature and highlight the need for further research in this area. Ultimately, the findings of this review will help inform policymakers, stakeholders, and the public on the necessary measures to improve the payment and safety of Grab riders in Melaka, Malaysia.

3.0 Research Methodology

In this section, we will discuss the research methodology used to investigate the level of job satisfaction among Grab riders. Job satisfaction is an important aspect of an employee's overall well-being, as it is closely linked to their productivity andperformance at work. With the rise of the gig economy, more and more individuals are now opting to work as gig workers, including Grab riders. However, the level of job satisfaction among gig workers, specifically Grab riders, remains largely unexplored. The research design is a crucial aspect of any research project, and in this study, a quantitative research design will be employed. The data collection method used is a survey questionnaire, which have been distributed to a sample of Grab riders in Melaka. The sample selected using a probability sampling technique, specifically simple random sampling.

The target population for this study will be Grab riders in Melaka, and the sample size is determined through the number of active riders in the Melaka Grab rider's community. The research instrument will be a structured questionnaire, which consist of closed-ended questions. In conclusion, the methodology used in this study will provide valuable insights into the level of job satisfaction among Grab riders. The use of a structured questionnaire, a probability sampling technique, and statistical analysis will ensure the accuracy and validity of the findings.

4.0 Data Analysis

Data analysis is the process of examining, transforming, and modelling data with the goal of discovering useful information, drawing conclusions, and making informed decisions. In this case, our group is conducting a questionnaire to examine the level of job satisfaction among gig workers, specifically riders in Melaka, Malaysia. To ensure that the data collected is representative of the population, a simple random sampling method was used, where each member of the population has an equal chance of being selected. The questionnaire data was collected by referring the Krejcie and Morgan (1970) method, which determined that at least 118 respondents should be surveyed from a total population of 170. Through careful analysis of the data collected, our group will be able to draw meaningful insights and conclusions about the job satisfaction of gig workers in Melaka. In our project, SPSS has been chosen as the tool for data analysis. The statistical packagefor social science (SPSS) is a software package commonly used in social science researchfor data analysis and management. It allows us to enter, clean, and transform our data, aswell as conduct various statistical tests to draw meaningful insights from your data. The data collection method for our project involves using a questionnaire to gather information about the level of job satisfaction among gig workers in Melaka, Malaysia. The responses from the questionnaire are then inputted into the SPSS software for further analysis. This allows us to organize and manipulate the data in a way that makesit easier to interpret and draw conclusions.

4.1 Demography profile of respondent.

This section explains the analysis of the demographic background of respondents which consist of questions such as gender, age, level of education, employment type, and weekly income. Percentage method is used to analyze the items in question. The data analysis on background analysis is shown in the tables and 4.1 through 4.5

i. Gender

Based on the table 4.1, most of the respondents are male which is 89 (75.4%) while the female respondents are female which is 29 (24.6%). This is shown by the findings of Ahmad Zulfiyan (2020) which said that due to the vulnerability of women, men tend to dominate the food delivery services since these types of job often sends the riders to unfamiliar territories.

Table 4.1: Respondents by gender

GENDER	FREQUENCY	PERCENTAGE
Male	89	75.4
Female	29	24.6
TOTAL	**118**	**100**

ii. Age

Table 4.2 show the age category of respondents. The highest percentage of respondents being in the 18-28 age category at 64.4% (76) while the lowest percentage of respondent is situated in the 59 and above age category at 2.5%. This is further supported by Tracy Brower (2022) who state that many people from various walks of life, particularly students who are unable or unwilling to perform regular employment. This statement is even more corroborated by the findings of Nursilah Ahmad (2020) who states that the flexibility and adaptability provided by Gig labour, allowing Gig workers to choose their own hours, tasks, and clients, are a major reason why students tend to gravitate to Gig economy.

Table 4.2: Respondents by age

AGE	FREQUENCY	PERCENTAGE
18-28	76	64.4
29-38	21	17.8
39-48	14	11.9
49-58	4	3.4
59 and above	3	2.5
TOTAL	**118**	**100%**

iii. Level of Education

Table 4.3 gave evidence that a majority percentage of respondents are actually have diploma level of education with 47.5% while the lowest percentage are actually having master level education with 1.7%.This is further evidenced by the finding of Nursilah Ahmad (2020) who states that due to the flexibility and adaptability of Gig work, many students, particularly Diploma students, tend to gravitate to Gig economy because it allows them to have a supplementary income on their own term.

Table 4.3: Respondents by level of education

LEVEL OF EDUCATION	FREQUENCY	PERCENTAGE
Not go to school	9	7.6
SPM	32	27.1
Diploma	56	47.5
Degree	19	16.1
Master	2	1.7
TOTAL	**118**	**100%**

iv. Employment Type

As shown on Table 4.4, many riders are part-timers, with them making up most of the percentage, which is 65.3% of the riders. The rest are made up by full-time worker, coming up to 34.7% of the riders. This is backed up by the findings of Nursilah Ahmad (2020) who said that the popularity of part-time Gig employment is due to that it allows a Gig worker to have an income anytime they needed without any hassle.

Table 4.4: Respondents by employment type

EMPLOYEMEENT TYPE	FREQUENCY	PERCENTAGE
Part time	77	65.3
Full time	41	34.7
TOTAL	**118**	**100%**

v. Weekly Income

Evidenced by the Table 4.5, many the riders only made between RM 0-400 a week doingdelivery at 36.4% while the small number of riders made up to RM 1201 and above weekly at 16.9%. This is evidenced by the finding of Dzamira Dzafri (2022) who states that due to intense competition from other delivery services and the surplus of delivery rider, the pay they receive reflects the situation they are in.

Table 4.5: Respondents by weekly income

WEEKLY INCOME	FREQUENCY	PERCENTAGE
0-400	43	36.4
401-800	34	28.8
801-1200	21	17.8
1201 And above	20	16.9
TOTAL	**118**	**100%**

vi. Level of Job Satisfaction

Table 4.6 show level of job satisfaction among riders through payment and job security factors. This study shows that the riders moderate views are gravitating towards the lower end of the scale, signifying that they are not happy with the current status quo. These are further evidenced by the past findings of Yusuke Uchiyama, Fumitaka Furuoka, and MD Nasrudin (2020), which shows that because Gig workers lack the same protections that are afforded to regular worker such as health insurance, paid time off, etc., making it difficult for the Gig workers. this has led to an increase of frustration among them as they lack basic protection and support in times of crisis. This is further corroborated by the research of Dzamira Dzafri (2022) who states that the insufficient pay of the Gig workers and the increasing cost of living mean that Gig workers are often underpaid, which results in them becoming more and more frustrated and becoming more dissatisfied with the current pay rates.

Table 4.6: Level of Job Satisfaction Overall

ISSUE	MEAN	INTERPRETATION
Payment	2.41	Moderate
Security	2.44	Moderate

5.0 Recommendation and conclusion

Based on the finding of our research, there are several conclusions that can be made. The level of job satisfaction among Grab riders are moderate, trending to the lower end of the scale. This is because the factors we have discussed prior, which is payment and job security, is a critical issue for these riders. A majority of the riders have voiced their dissatisfaction regarding these issues.

These riders work hard to provide efficient and reliable services to their customers, but often face low payment rates and lack of job security. This not only affects their livelihoods but also their motivation to continue working for the platform. Through our discussions, we have come up with answers to the 3 objectives we have come up with. For objective 1, we achieve our answer by reading a lot of article and research to complete the SWOT analysis. We have concluded that based on the weakness of SWOT analysis, Grab Riders do face several issues, particularly through payment and job security issues.

For objective 2, we have identified the level of job satisfaction through payment and job security issues. Throughout our research, we have identified that the job satisfaction for both issues are moderate in nature, trending towards the lower end of the scale. This situation is proven by our finding which is the mean level of job satisfaction through payment and job security issues are at the value of 2.41 and 2.44 respectively.

For objective 3, we have come up with two solutions for each of the three affected parties. For Grab company itself, they can implement life time insurance for riders and identifying their operating weakness for a better future planning. Grab riders themselves can demand extra pay for each order and can demand for improve the working condition.

Finally, the government can improve EPF policy for Gig workers and lay up better legal law for Gig workers. Grab and other similar platforms must recognize the importance of providing fair and stable payment rates to their riders, as well as offering better job security. By addressing these issues, we can hopefully establish a more equitable and suitable platform for all parties involved.

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The Role of E-Menu System in Purchasing Behavior At Sarang Tujoh Café

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Abstract. Many restaurant service is not effective because of employee have to serve customer directly for take their orders. It is because a high-quality service system should be focusing on customer demand and what they want. The system should be recognizing customer information, supply menu, and expenses records for the customer services. This study focus on the technologies, and a menu suggestion to develop e-menu system. It also conducted in choosing restaurants indicate the proposed system has been potential in providing customer service. From the observations, interviews with the owner and staff members, and questionnaires given in thelocal community shows that the majority of customers felt the menu provided was difficult to identify. Over 60% of customers at Sarang Tujoh Café are unsure about the available menu. Following this issue, a study of the customer's needs for the restaurant is required. The objective of this study is to identify service factors that influence purchasing behaviour with the e-menu system. The survey results verified the effectiveness of the proposed system in providing customer service is very high (mean=4.35). The e-menu system can be accessedvia the URL provided on the Sarang Tujoh Café's in social media page. Customers will appreciate with highly quality service provided indirectly in turn highly promotes business image and increases business revenue to the company.

Keywords: E-Menu system, social media, Digital Information, Sarang Tujoh Café

1.0 Introduction

With digital technology all the service activity in restaurant industry such as making reservations, processing orders, and delivering meals requires for increase productivity. Customers just ordering the meals and all the information will transmit to the kitchen for preparation. Lastly, the process will be finished with customer pays the bill and the amount due is calculated by the cashier. This procedure is simple, but still increase the employee workload. The cause errors in menu ordering can be happen, especially when the number of customers suddenly increases during busy hours. This situation shows the impact to overall service quality. Based on advanced technologies it will improve service quality and attracted much attention. Through the development of technology it has been increasing work fast, with can certainly facilitate human work (Rano Kurniawan et al. 2020).

E-menu system aims to facilitate the process of ordering food & drink by customers. Customers can view the menu list before placing an order without visiting the store. If the menu that they want to order is unavailable on the day, they can save money and energy by not going to the store simultaneously. Besides that, e-menu system is also easy to change. With a digital menu display, the system administrator can change the menu themselves without incurring any costs from the store. The system administrator will have the system rights to add or change the price of food items anytime (Vishal Gupta et al. 2020). They can also remove underperforming items. Previously studies have recently show the various of product recommendation systems. This system can enhance customer satisfaction and create the creative quality of service. Through the customer buying behaviors and histories of purchased products, it canbe developed a systematic system like a E-Menu system.

a. Problem statement

According to a survey conducted at Sarang Tujoh Café, they had received many complaints about the weakness of the menu system. Due to the lack of information posted online, 60% of the customers complain that they are unable to gather information about the available prices and items. With the medium of social media, indirectly will save the time and fast toallow customers get the latest information. This method also get the trends in products or services offered by the company (Ardy Wibowo et al. 2020).

During an interview with Sarang Tujoh Café's employees, the employee response that they usually have to explain about the menu to customer because customers have no idea about the menu appearance. This situation happened because of the owner decided not to display menu's picture that aren't ordered, as it would be costly.

Sarang Tujoh cafe also lacks of a signature menu to attract customers and make their cafe more recognizable due to its seasonal raw material. It is also not stated in the existing menu which menu is frequently the focus of customers or best-selling in their cafe, which can contribute to the existence of the signature menu in the Sarang Tujoh cafe.

b. Project Objectives

The objective of this study is to:

i. To determine factors of services that will influence purchasing behaviour at SarangTujoh Café.
ii. To formulate business strategy using e-menu system at Sarang Tujoh Café.

c. Justification of Project Selection

i. Justification to company

This project should be conducted at Sarang Tujoh Cafe in order to assist the owner, Encik Arief Junaidi, in improving the accuracy of company information provided to consumers. Furthermore, it can improve customer access to sales-related information, which will improve and increase sales.

ii. Justification to customer

Customer satisfaction is important for the success of a company. This project will assist customers with menu choices, ensuring their purchase behavior when they visit Sarang Tujoh Cafe. Furthermore, this project will help customers understand the menu.

iii. Justification to student

This project allows students to apply the knowledge gained from lectures. Furthermore,it encourages students to think critically to solve problems, enhance communication skills, and build a sense of teamwork. Furthermore, it assists students in improving theirability to solve problems and provide suggestions and solutions to the company.

2.0 Literature Review

This part discusses theories and models related to the study and the instruments used. Among the measurement theories discussed with the model involved with this study are intelligent e-restaurant for customer. It also explains the important terms used in detail foraddition to explaining the findings of this study.

a. Purchasing Behavior

Implementing digital online technology in the restaurant industry, will enhance the customer experience (Atikahambar Yusni et al. 2020).

b. Digital Information

According to Noradzhar Baba, Aslinda Mohd Shahril & Mohd Hafiz Hanafiah (2020), using of digital technology it can improve many things such as menus, time and increasing possibility of changing any items in that restaurant. Customers also have a chance to get more information and can increase their happiness. This technology will help to minimize mistakes and failures.

c. E-menu System

An ordering media that utilizes information technology as a medium for selecting food and beverage which can provide information. The menu details can help and facilitate customers in making an ordering. (Rano Kurniawan; Ahmad Sutawan & Rizky Amalia 2020).

d. Social Media Platform

According to Ardy Wibowo et al. (2020), social media is real time fast, allowing customers to get the latest information and trends in products or services offered by thecompany.

3.0 Methodology

This section describes the methodology used to collect and analyze the data obtained to answer the research questions presented. It includes a description of the study design, population and research sampling, research instruments, research procedures, implementation of pilot studies, data collection procedures and data analysis procedures.

3.1 Data collection method

a. Primary data

The major source for this project was an interview with Mr. Arief Junaidi bin Muhammad Shamel, the owner of Sarang Tujoh Café on 14 February 2023 and also with his employee. The interview session was held to identify strengths, weaknesses, opportunities, and threats in order to create a SWOT analysis. Besides that, the data collection supported by quantitative method through questionnaire.

b. Secondary data

Secondary data is a data that gathered from the primary sources. It is easily available for use by researchers in their own research analysis. The type of data that has previously been collected. Secondary data for this research is gathered from articles, journals and books found on the internet.

c. Research instrument

The researcher choose a quantitative approach because this approach points focus on objective testing based on numerical data collection using questionnaire instrument to measure research variables through statistical description to make descriptive and statistically test with the assumption that every event in this life can be explained with measure the elements involved in the incident (Creswell 2014; Ghazali Darusalam & Sufean Hussin 2016; Ruhizan Mohammad Yasin & Maizam Alias 2013).

A research instrument is the method of data collection. They are questions or statements designed to obtain information regarding the project being carried out. The journal 'Customers' Satisfaction towards Online Digital Menu Experience and Intention to revisit Family-Style Restaurants post the COVID-19 Pandemic' is the primary reference for this project. In this journal, it talks about customer satisfaction with digital menu. This questionnaire is divided into two sections. Section A provides respondent demographics such as age, gender, race, religion, status, and distance from home to Sarang Tujoh Cafe. Section B includes research objectives-related questions.

d. Design and sampling data

i. *Target population*

The population of this study consists of the average customer in a week which is 100 to 110 people.

ii. *Sampling techniques*

This project uses simple random sampling as a sampling technique. It's essential to havea group of respondents who will take part in the randomization and represent the whole target population.

iii. *Sample size*

This study's population consists of 100 persons, representing the average customer in a week. As a result, 40 people were chosen at random to complete the provided questionnaire.

iv. Statistical analysis

Following the distribution and completion of all questionnaires by Sarang Tujoh Cafe customers, the data will be analyzed using the Statistical Package for Social Science (SPSS) statistical software, Windows Version 29. In order to fulfil the study's goal, frequencies and means. To investigate respondents' demographic and behavioral traits,frequencies were computed. The mean of the scores was calculated to examine the roleof the e-menu system in purchasing behaviour at Sarang Tujoh Café.

4.0 Findings and Analysis

Table 1 shows the analysis of customer feedback on e-menu system of SarangTujoh Café. The average customer score for all items is 4.42. The interpretation of this feedback is very high. This shows that most respondents give very good feedback to the e- menu system because it gives a good perspective to the café and help customers to easily reach the menu anywhere. In short, respondents strongly agree with the use of the e-menu system.

Table 1 : Business strategy using e-menu system at Sarang Tujoh Café

Statistic items	Mean	Interpretation
The e-menu system on Sarang Tujoh Café's social media speeds up my process to choose food	4.33	Very High
The e-menu system on Sarang Tujoh Café's social media is able to influence me to decide in purchasing food	4.53	Very High
The e-menu system on Sarang Tujoh's social media can save selection time because it has been supplied with clear pictures of the food	4.40	Very High
AVERAGE	4.42	Very High

Refer to the Table 2, it shows the analysis of customer feedback on social media platform of Sarang Tujoh Café. The average customer score for all items is 4.35. The interpretation ofthis feedback is very high. This shows that most respondents give good feedback to the socialmedia platforms. This situation also gives a good perspective to the cafe and help customersto easily reach the menu. In short, respondents strongly agree with the use of the e-menu system on social media platforms. To measure usefulness and behavioral intention of the proposed system, an informationsystem model used to evaluate why individuals should accept and use a new technology. Easy to use will help the employee complete their task effectively.

Outcome quality including waiting time and tangibles was applied to evaluate quality service of proposed system. At least customers are required to benefit from the customer service provided by the proposed. Following completion of this study, a questionnaire was administered to employee to assess the perceived ease of use toward using the proposed e- menu system.

Table 2 : Factors of services that will influence purchasing behavior at Cafe

Statistic items	Mean	Interpretation
I found a list of menus on social media platforms already prepared	4.47	Very High
I can see the e-menu list before making a purchase	4.30	Very High
The picture of menu provided is interesting and influenced me to make a purchase	4.35	Very High
The system is simple and customer friendly which attracts me to make a purchase	4.38	Very High
The menu provided is constantly updated	4.25	Very High
Average	4.35	Very high

5.0 Conclusion

This study aims a system using the digital technologies to offer a menu recommender for customer. From this method, business can enhance customer service quality. It also will improve healthy restaurant industry competitiveness. The proposed system enhances the easy way for table service and help an employee to access customer information. Customers can make orders using new e-menu system. Owner of the company also can access the database to evaluate business status anytime. Restaurant can prepare and make appropriate for food materials. All ordering is digitized for database storage. This method which allows restaurant owners to consider discounts or customer promotions based on expenses statistics. It also will help the increasing in sales. Customers also can appreciate high quality service, which in turn highly promotes enterprise image and increases business revenue for the restaurant. The results of the study and the results of the data analysis that has been carried out are based on the objectives of the study. Factors of services that influence purchasing behavior will improve the accuracy of business information in menu because of easier accessibility and will increase sales. Facilitate menu selection also can improve customer's understanding about the menu.

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Tarikan Yang Mendorong Pembelian Pelanggan Di Syarikat Bundle Kasut Merlimau

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Abstrak. Perniagaan bundle adalah jenis perniagaan yang unik serta mempunyai kelas dan permintaan yang tersendiri. Kedai Bundle Kasut Merlimau adalah premis yang dipilih dalam kajian perniagaan ini. Dikenalpasti berdasarkan tinjauan awal menunjukkan situasi yang dihadapi Kedai Bundle Kasut ini ialah berlakunya penurunan jumlah jualan produknya iaitu kasut selama 4 tahun secara berterusan dari tahun 2019 hingga 2023. Objektif kedua kajian berfokus kepada faktor yang mendorong pembelian pelanggan selain mengenalpasti strategi untuk meningkatkan jualan syarikat ini. Seramai 307 responden yang dipilih secara rawak telah menjawab soalselidik yang diedarkan. Pengumpulan data dibuat dengan mengedarkan borang soal selidik yang mengandungi 24 item dengan nilai kebolehpercayaan Alfa Cronbach bagi ketiga-tiga elemen faktor tarikan ialah bagi elemen harga ialah 0.80, bagi elemen promosi pula ialah 0.7 dan bagi elemen kebersihan ialah 0.78. Data diperolehi dianalisis dan diterjemahkan dalam bentuk peratusan dan min dengan menggunakan perisian *Statistical Package for Social Science (SPSS) For Window Version 24.0.* Secara keseluruhan dapatan menunjukkan faktor-faktor pembolehubah ini memberikan nilai skor purata min yang tinggi iaitu faktor kebersihan 4.53, harga 4.46 dan promosi 4.06. Cadangan penambahbaikan dipilih berfokus kepada promosi dengan mengaplikasikan konsep *visual merchandise* sebagai strategi meningkatkan jualan dan dipersetujui oleh pemilih premis tersebut.

Kata Kunci: bundle, faktor tarikan, *visual merchandise*

1.0 Pengenalan

Apa itu “Bundle”? Tahukah anda merujuk kepada (Kamus Dewan, 2005) carian perkataan ‘bundle’ tidak memberi apa-apa maksud dalam Bahasa Malaysia. ‘Bundle’ sebenarnya diambil daripada perkataan Inggeris yang memberi maksud ikatan ataupun bungkusan. Berdasarkan maksud tersebut, kita boleh membuat andaian bahawa itu adalah pakaian-pakaian yang telah dibungkus atau diikat. Menurut (Bundle, 2019), proses bermula dengan pakaian dibungkus, kemudian di ‘compress’ dan akhir sekali diikat. Inilah yang dikenali sebagai guni ataupun ‘tokol’ secara amnya di kalangan penggiat tegar serta professional dalam profesion bundle.

Syarikat perniagaan yang telah dipilih adalah kedai Bundle Kasut. Pemilihan premis kedai ini berikutan kedai Bundle Kasut tersebut belum pernah dipilih oleh para pelajar lain untuk membuat kajian dan bersesuaian dengan objektif yang ditetapkan. Justeru itu, berdasarkan perbincangan dan kepakatan, kajian ini mengambil peluang yang telah diberikan untuk memilih kedai Kasut Bundle tersebut sebagai pemis perniagaan untuk dilaksanakan kajian projek perniagaan kali ini. Terdapat tiga objektif utama dalam kajian ini iaitu mengenalpasti situasi yang berlaku dalam syarikat atau premis yang dipilih iaitu Kedai Kasut Bundle, objektif kedua ialah mengenalpasti faktor yang situasi tersebut dan objektif ketiga ialah mengenalpasti strategi untuk menambahbaik bagi mengatasi masalah tersebut.

Berdasarkan temu bual awal dengan pengurus juga pemilik kedai Bundle Kasut di Merlimau yang menjalankan perniagaan ini selama 4 tahun, dapatan pertemuan tersebut mengenalpasti bahawa masalah utama Kedai Kasut Bundle tersebut ialah berlakunya penurunan jualan selama 4 tahun berturut semenjak dari tahun 2021 hingga tahun 2023. Penurunan jualan tersebut berlaku sebanyak hamper 75%. Sebenarnya, Bundle Kasut ini merupakan hanya satu perniagaan sahaja yang menjual kasut *bundle* di Merlimau ini tetapi syarikat juga terjejas dari segi jualan. Selain itu berdasarkan tinjauan awal secara umum yang dilakukan melalui soalselidik ringkas menggunakan "Google Form" membuktikan bahawa pelanggan di Merlimau ini jarang melakukan pembelian di kedai Bundle Kasut itu. Maklumbalas hasil tinjauan tersebut menunjukkan, mempunyai beberapa orang yang pernah pergi ke kedai itu tetapi tidak terdorong untuk membeli kasut. Tinjauan awal dari 44 responden secara rawak ini menunjukkan faktor harga menjadi dorongan pembelian dan sebaliknya. Harga sesuatu produk akan mempengaruhi keputusan pelanggan dalam pembeliannya (Hermana, 2019). Manakala faktor promosi juga memberi signifikan dalam jualan. Promosi merupakan satu elemen yang penting dan pasti dapat meningkatkan perhatian pelanggan (Anim, 2020). Selain itu faktor kebersihan juga menjadi fokus pemilihan barangan kasut bundle ini. Walaupun kasut-kasut yang dijual di premis tersebut kasut itu adalah kasut terpakai, kebersihan kasut itu perlu diambil kira. Hal ini dibuktikan dengan kata-kata (Fitria Esfandiari, 2021) tentang kebersihan produk juga penting untuk menentukan kualiti sesuatu produk. Dalam pada itu hasil ini juga berpadanan dengan analisis SWOT yang dilakukan terhadap premis tersebut yang menunjukkan bilangan pelanggan adalah berkurangan dari tahun ke tahun.

Skop kajian ini untuk mengenalpasti faktor yang mendorong pembelian di Kedai Bundle Kasut, Merlimau, serta strategi terpilih untuk membantu meningkatkan jualan di kedai itu. Bundle Kasut ini terletak di JC 51, Jalan BMU 3, Bandar Baru Merlimau Utara, 7300 Merlimau, Melaka. Justifikasi kajian ini dijalankan bagi membantu pemyelesaian isu-isu yang sedang dihadapi oleh pemilik kedai iaitu jualan merosot dan penurunan jumlah pelanggan. Selain itu dapatan kajian memberi nilai tambah kepada pelanggan serta membantu dan menyokong pelajar Politeknik Merlimau untuk bekerjasama atau berkolaborasi dengan penduduk tempatan dan peniaga. penyelidik juga boleh menguasai pengetahuan berkomunikasi mereka dengan berinteraksi dengan penduduk tempatan, peniaga dan pemilik kedai. Justeru, Politeknik Merlimau akan mempunyai imej yang positif melalui impak dan implikasi yang baik melalui projek ini.

2.0 Sorotan Kajian

Sumber utama data bagi projek adalah dari sumber primer dan data sekunder. Analisis SWOT digunakan untuk medapat maklumat serta menyokong isu yang dihadapi oleh Bundle Kasut. Tujuan utama adalah untuk mengukuhkan objektif kajian ini yang ingin mendalami faktor tarikan yang mendorong pembelian pelanggan di kedai Bundle Kasut.

2.1 Faktor Dorongan Pembelian Pelanggan

Pelanggan adalah pengguna yang memperoleh atau membeli produk dan perkhidmatan yang ditawarkan oleh sesebuah perniagaan atau perdagangan. Perkataan pembeli merupakan kata sinonim bagi pelanggan yang membawa maksud kepada individu yang mampu membayar untuk mendapatkan sesuatu produk dan perkhidmatan.

Pelanggan terdiri daripada pelanggan tetap dan pelanggan sekali-sekala yang menjalinkan hubungan dengan peniaga sesebuah syarikat. (Nasuka, 2017).

2.1.1 Harga

Penetapan harga juga merupakan aspek penting dalam sesebuah perniagaan. Penetapan harga yang sepadan dan sesuai juga boleh menjadi faktor tarikan pelanggan untuk membuat pembelian. Harga terjadi atas dasar keadilan dan suka sama suka antara penjual dan pembeli. Penetapan harga yang dilakukan oleh penjual akan mempengaruhi pendapatan atau penjualan yang akan diperolehi. (Effendi, 2021). Tidak dipertikaikan harga adalah salah elemen yang amat penting bagi mendorong peningkatan jualan. Hal ini disokong oleh (Elphibot, 2013) bahawa harga dalam konsep ekonomi adalah nilai sesuatu barang atau perkhidmatan dengan kiraan wang. Menurut (Sadiq, 2020), semakin tinggi harga sesuatu produk, semakin sedikit unit yang dijual. Sebaliknya, produk yang dijual pada harga yang lebih rendah daripada kadar pasaran diandaikan menjual pada volum yang lebih tinggi. Harga yang tinggi dalam pasaran yang sangat kompetitif boleh kehilangan pelanggan secara kekal akibat kesan kenaikan harga. (Kotler, 2012). (Al-Salamin, 2015). Pengguna yang berpuas hati percaya bahawa nilai barangan dan perkhidmatan adalah setanding dengan harga, yang akan mendorong mereka untuk membeli produk tersebut menurut (Zeithaml, 1988). Menurut Bei (2001) , harga adalah digambarkan sebagai memberi atau berkorban untuk memperoleh perkhidmatan atau produk.

2.1.2 Promosi

Promosi adalah bahagian dan proses strategi pemasaran sebagai cara untuk berkomunikasi dengan menggunakan komposisi promosi campuran (Tasruddin, 2015) . Promosi adalah aktiviti pemasaran yang biasanya dilakukan oleh pemasar untuk memberikan maklumat mengenai sesuatu produk dan mendrorong pengguna untuk melakukan pembelian tersebut. (Boyd, 2023) Promosi merupakan sesuatu perkara yang penting dan perlu dititikberatkan oleh setiap pengurus perniagaan kerana ia adalah kunci kecemerlangan sesauatu perniagaan dalam pasaran menurut (Ansari, 2011). Menurut Obeid, (2014), menyatakan bahawa promosi ialah alat penarik minat pelanggan untuk pembelian seterusnya atau pengguna produk atau perkhidmatan baru. Menurut Warraich (2021), promosi telah lama digunakan oleh peniaga dalam pasaran untuk memangkinkan jualan. Menurut (Maymand, 2011*), "Visual merchandising"* adalah pameran kedai atau jenama dan barangan kepada pelanggan melalui pasukan kerja daripada pengiklanan, pameran, penyelarasan fesyen, acara tertentu untuk menjual barangan dan perkhidmatan yang ditawarkan oleh kedai. Paparan produk dan suasana kedai mempunyai kesan positif dan ketara ke atas pembelian dorongan pengguna. (Rahmadana, 2016). Menurut (Sudarsono, 2017), terdapat beberapa aspek- aspek penting yang menyokong pengadaan *"visual merchandising"* dalam sebuah kedai iaitu *"window display"*, *"mannequin display"* dan *"floor merchandising"*.

2.1.3 Kebersihan

Premis yang digunakan bagi atau berkaitan dengan penyimpanan, pengiriman, pengedaran atau penjualan apa-apa produk tidak kotor dan tidak tercemar. (Aziz, 2014). Tahap kebersihan barangan terpakai selamat dipakai, atau tidak terdedah dengan pelbagai penyakit. Barangan terpakai juga mestilah bebas dari najis, kotoran atau elemen yang tidak menyenangkan pandangan (Yuyue, 2018). Menurut (Ismail, 2013) amalan kebersihan di premis merupakan satu aspek yang harus dititikberatkan kerana kebersihan merupakan asas utama kesihatan dan menjadi lebih penting kerana ia melibatkan orang awam dan masyarakat setempat.

3.0 Metodologi Kajian

Kaedah pengumpulan data dalam kajian ini adalah gabungan data primer dan data sekunder. Data utama yang dipilih bagi mengumpulkan data adalah dengan sesi temu bual bersama pemilik kedai. Segala butiran masalah yang dihadapi oleh Bundle Kasut telah dapat diperolehi dengan menemu bual pemilik kedai tersebut. Dalam pada itu, soal kaji selidik akan dijalankan terhadap semua pelajar Politeknik Merlimau bagi mengenalpasti punca-punca berlakunya masalah yang dihadapi oleh kedai tersebut. Data sekunder menggunakan jurnal, artikel kajian lepas dan sebagainya.

Kajian ini adalah kajian deskriptif berbentuk kuantitatif. Instrumen kajian menggunakan borang soalselidik yang diedarkan kepada responden berdasarkan sampel yang telah ditentukkan bilangannya berdasarkan jadual persampelan Morgan & Krejie (1975) berdasarkan populasi kajian ini terdiri daripada pelajar-pelajar Politeknik Merlimau yang berjumlah sebanyak 4302 orang, sebanyak 307 responden yang dipilih secara rawak telah memberikan maklumbalas.

Borang soalselidik ini mengandungi 24 item bagi Bahagian B untuk faktor-faktor yang mempengaruhi tarikan pembelian. Manakala Bahagian A adalah maklumat berkait demografi responden. Item dibangunkan berdasarkan adaptasi kajian lepas oleh Sadiqm. W (2020), Fill (2002) dan Yun&Good (2007).

Data yang diperolehi ditadbir dan dianalisis menggunakan perisian *Statistical Package for Social Science (SPSS).* Nilai Cronbach alpha digunakan untuk menentukan kebolehpercayaan item. Bagi faktor kebersihan keseluruhan nilai Cronbach's Alpha ialah 0.78 dan faktor promosi berjumlah 0.77, manakal bagi item harga ialah 0.80. Ini menunjukan item-item soal selidik ini boleh diterima untuk digunakan dalam soal selidik. Seterusnyaa kajian ini akan menggunakan analisis deskriptif untuk menentukan kekerapan dan purata.

4.0 Keputusan Kajian Dan Analisis

Perbincangan dapatan hasil kajian projek ini berdasarkan tinjauan yang dibuat dan pengedaran soalselidik menggunakan *Google form* semasa kajian dijalankan kepada responden yang telah dipilih secara rawak. Di samping itu, ia juga merangkumi analisis yang diperoleh melalui SWOT dan TOWS bagi kedai Bundle Kasut.

4.1 Penemuan Projek (Project Finding)

4.1.1 Skala Likert

Skala likert digunakan untuk mengukur sikap, pendapat, dan persepsi seseorang atau sekelompok orang tentang fenomena sosial. Dengan Skala Likert, pembolehubah yang akan diukur diterjemahkan kepada penunjuk pembolehubah.

Soal selidik ini disediakan berdasarkan Skala Likert. Skor yang didapati dalam ujian soal selidik diberi markah seperti Jadual 1:

Jadual 1: Skor Likert

Pilihan jawapan	Kadar skor
Sangat setuju	5
Setuju	4
Memuaskan	3
Tidak setuju	2
Sangat tidak setuju	1

Sumber: Kaedah Penyelidikan (Sabilan et al., 2017)

4.2 Analisis untuk tafsiran data pembolehubah

4.2.1 Demografi

Jadual 2 dibawah menunjukkkan ringkasan analisis demografi responden kajian ini:

Jadual 2: Analisis demografi

No.	Item		Kekerapan (orang)	Peratus
1	Jantina	Lelaki Perempuan	134 173	43.5 56.5
2	Jabatan	JKE JPH JP JKA JKM	38 63 105 44 57	12.5 20 34.4 14.4 18.7
3	Umur	18 – 20 Tahun 21 – 23 Tahun 24 Tahun dan ke atas	148 145 14	48.2 47.2 4.6
4	Punca Sumber Kewangan	Ibu Bapa PTPTN Biasiswa/Tajaan Lain Lain	113 133 31 30	36.8 43.3 10.1 9.8

4.2.2 Analisis Faktor Harga

Jadual 3 dibawah menunjukkan dapatan analisi bagi faktor harga.

Jadual 3: Faktor Harga

	Item Statistik		
No.	Soalan	Purata	Interpretasi
1	Harga yang murah dapat mengalakkan saya untuk membeli kasut	4.42	Tinggi
2	Harga yang murah adalah pilihan utama saya untuk membeli kasut.	4.38	Tinggi
3	Saya mampu membeli kasut kerana harga yang ditawarkan lebih rendah dari harga asal.	4.43	Tinggi
4	Saya mementingkan harga yang setanding dengan kualiti kasut yang ditawarkan	4.43	Tinggi

5	Saya percaya bahawa harga kasut yang berpatutan dapat menarik lebih ramai pembeli.	4.54	Tinggi
6	Semasa membuat pembelian kasut, saya memastikan perbelanjaan itu berbaloi.	4.52	Tinggi
7	Saya sentiasa membuat perbandingan harga untuk mendapatkan nilai kasut yang terbaik bagi setiap pembelian.	4.53	Tinggi
8	Saya percaya bahawa harga yang ditawarkan berbeza dengan jenama kasut yang ditawarkan	4.42	Tinggi
	SKOR PURATA	4.46	Tinggi

Data menunjukkan skor min tertinggi bagi item *Saya percaya bahawa harga kasut yang berpatutan dapat menarik lebih ramai pembeli pada nilai 4.*54 manakala min purata terendah ialah pada item *harga yang murah adalah pilihan utama saya untuk membeli kasut iaitu 4.38.* Keseluruhan purata min adalah pada tahap tinggi melebihi 4.0. Ini menunjukan bahawa harga sesuatu produk akan mempengaruhi keputusan pelanggan dalam pembeliannya (Hermana, 2019).

4.2.2 Analisis Faktor Promosi

Jadual 4 dibawah menunjukkan dapatan analisi bagi faktor promosi yang terima daripada soalselidik yang diedarkan*.*

Jadual 4: Faktor Promosi

Item Statistik			
No.	Soalan	Purata	Interpretasi
1	Saya pernah melihat promosi yang dilakukan oleh syarikat tersebut	2.60	Sederhana rendah
2	Saya pernah melihat promosi syarikat tersebut di media sosial	2.67	Sederhana rendah
3	Saya percaya promosi melalui media sosial sangat berkesan pada masa sekarang untuk menarik minat pelanggan	4.36	Tinggi
4	Saya lebih berminat untuk membeli kasut dengan harga promosi	4.48	Tinggi
5	Menyertai festival perniagaan dapat mempromosikan produk yang ditawarkan	4.39	Tinggi
6	Rekaan dalaman yang lengkap, dapat menarik minat saya untuk membeli	4.42	Tinggi
7	Susun atur yang menarik dapat mendorong saya untuk membeli kasut.	4.42	Tinggi
8	Penggunaan patung Mannequin dapat menarik perhatian saya untuk membeli.	4.27	Tinggi
9	Promosi Buy 1 Free 1 dapat mendorong saya untuk membeli kasut yang ditawarkan	4.54	Tinggi
10	Promosi Mata Ganjaran Keahlian dapat mendorong saya untuk membeli kasut yang ditawarkan	4.42	Tinggi
	SKOR PURATA	4.06	Tinggi

Data dari jadual 4 menunjukkan skor terendah ialah dengan skor min 2.60 dan 2.67 iaitu pada tahap sederhana rendah. Ini menjelaskan bahawa Syarikat Bundle tersebut tidak pernah melakukan apa apa promosi untuk syarikat mereka. Purata tertinggi adalah 4.54 iaitu pelanggan sangat bersetuju bahawa mempelbagaikan promosi di Syarikat dapat menarik minat ke arah produk dan mendorong untuk membeli lebih banyak barang iaitu item *Promosi Buy 1 Free 1* *dapat mendorong saya untuk membeli kasut yang ditawarkan.* Keseluruhan skor pada tahap tinggi iaitu 4.06. Ini menunjukkan kebanyakan responden dikalangan penduduk Merlimau menyukai atau bersetuju jika promosi yang dilakukan. Ini menunjukkan faktor promosi signifikan dalam mempengaruhi peningkatan dalam jualan. Promosi merupakan satu elemen yang penting dan pasti dapat meningkatkan perhatian pelanggan (Anim, 2020).

4.2.3 Analisis Faktor Kebersihan

Jadual 5 dibawah menunjukkan dapatan analisis bagi faktor kebersihan yang terima daripada soalselidik yang diedarkan dan diterima dari 307 responden.

Jadual 5 : Faktor Kebersihan

	Item Statistik		
No.	Soalan	Purata	Intergrasi
1	Saya mementingkan kebersihan ketika membeli kasut.	4.55	Tinggi
2	Setiap kasut yang dijual hendaklah dalam keadaan bebas habuk.	4.55	Tinggi
3	Setiap kasut yang ditawarkan hendaklah dalam keadaan tidak berbau kurang menyenangkan	4.59	Tinggi
4	Saya tahu penyakit yang boleh dijangkiti jika menggunakan kasut yang berhabuk	4.45	Tinggi
5	Saya selesa berbelanja di premis yang bersih.	4.53	Tinggi
6	Persekitaran premis yang bersih dapat menarik minat saya untuk membuat perbelanjaan.	4.53	Tinggi
	SKOR PURATA	4.53	Tinggi

Dapatan jadual 5 menunjukkan Purata terendah ialah 4.45 kerana terdapat segelintir pembeli mempunyai masalah kulit jika memakai kasut yang tidak dijaga dan dibersihkan. Purata tertinggi ialah 4.59 iaitu pelanggan sangat bersetuju bahawa kebersihan kasut mendorong saya untuk membeli lebih banyak.

Sehubungan itu faktor kebersihan juga menjadi fokus pemilihan barangan kasut bundle ini. Walaupun kasut-kasut yang dijual di premis tersebut kasut itu adalah kasut terpakai, kebersihan kasut itu perlu diambil kira. Hal ini dibuktikan dengan kata-kata (Fitria Esfandiari, 2021) tentang kebersihan produk juga penting untuk menentukan kualiti sesuatu produk.

5.0 Kesimpulan

5.1 Perbincangan

Melalui kajian ini kami dapat menunjukkan bahawa situasi yang dialami oleh kedai Bundle Kasut Merlimau ialah penurunan jualan akibat pelanggan kurang melakukan pembelian di kedai kasut tersebut. Faktor yang mempengaruhi pembelian pelanggan di Bundle Kasut Merlimau ialah promosi, harga dan kebersihan produk. Skor purata bagi promosi adalah 4.06, tinggi dan membuktikan bahawa pelanggan sangat bersetuju untuk mempelbagaikan Promosi di syarikat bundle kasut dapat menarik minat ke arah produk dan mendorong untuk membeli lebih banyak barang. Seterusnya, untuk skor purata bagi harga adalah 4.46, ini membuktikan bahawa harga pasti mempengaruhi pelanggan untuk membuat pembelian di syarikat bundle kasut.

Harga sesuatu produk sangat penting kerana ia mempengaruhi keputusan pelanggan dalam pembeliannya telah dikatakan oleh Hermana (2019). Akhir sekali, skor purata bagi kebersihan produk adalah 4.53. Kebanyakan responden kami sangat bersetuju bahawa kebersihan kasut juga akan mendorong mereka untuk pembelian. Kenyataan ini juga telah disokong oleh Ismail (2013) bahawa kebersihan adalah aspek yang perlu dititikberatkan.

Selain dari itu dapatan juga menunjukkan bahawa berdasarkan jadual 5 menunjukkan skor terendah ialah pada item *Saya pernah melihat promosi yang dilakukan oleh syarikat tersebut dan Saya pernah melihat promosi syarikat tersebut di media sosia*l, dengan skor min 2.60 dan 2.67 iaitu pada tahap sederhana rendah. Ini menjelaskan bahawa Syarikat Bundle tersebut tidak pernah melakukan apa apa promosi untuk syarikat mereka. Terdapat keperluan untuk syarikat ini melakukan tindakan penambahbaikan dalam promosi yang dilakukan.

Syarikat perlu melakukan tindakan proaktif untuk melakukan promosi antaranya ialah melalui kaedah *Visual Merchandising*. Menurut (Maymand, 2011), *visual merchandise* adalah pameran kedai atau jenama dan barangan kepada pelanggan melalui pasukan kerja daripada pengiklanan, pameran, penyelarasan fesyen, acara tertentu untuk menjual barangan dan perkhidmatan yang ditawarkan oleh kedai. Ini akan memberikan satu landskap baharu dalam strategi meningkatkan jualan syarikat.

5.2 Cadangan

Seterusnya adalah diharapkan syarikat memberi perhatian yang sewajarnya dalam usaha meningkatkan jumlah jualan berdasarkan input yang diperolehi dalam kajian ini. Tindakan jangka masa pendek mahupun jangka masa panjang boleh dilakukan secara berperingkat kerana ia melibatkan kos serta ketersediaan syarikat untuk merealisasikan cadangan yang dinyatakan. Beberapa cadangan dikemukakan kepada pengkaji akan datang untuk membantu meningkatkan jualan syaraikat tersebut. Cadangan tersebuat ialah:

i. Faktor atmosfera syarikat dalam mempengaruhi tarikan pelanggan
ii. Kesan visual merchandise sebagai promosi yang berkesan
iii. Pemilihan jenama kasut dalam mempengaruhi pembelian oleh pengguna.

5.3 Penutup

Adalah diharapkan kajian ini memberi input dan manfaat kepada pihak syarikat terlibat mahupun kepada organisasi lain dalam melakukan strategi untuk meningkatkan jualan. Selain itu semoga kajian ini memwujudkan kolaborasi baharu bersama komuniti dan agensi yang berkepentingan yang lain.

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Persepsi Warga Politeknik Merlimau terhadap Sistem MyPCC

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Abstrak Permintaan terhadap industri perkhidmatan kurier atau parcel di Malaysia dewasa ini telah mengalami peningkatan yang sangat drastik, Penggunaan sistem seperti sistem barcode dan sistem laman sesawang dilihat sangat membantu memudahkan kerja seharian kita seperti merekod dan menyimpan data yang lebih teratur. Kaedah manual yang digunakan kini oleh Inkubator Polytechnic Courier Centre (PCC) Politeknik Merlimau (PMM), di samping penyimpanan data yang kurang sistematik telah menyebabkan sistem MyPCC dibangunkan bagi membantu mereka dalam proses pengurusan penerimaan dan penyimpanan parcel serta penyimpanan data yang lebih sistematik. Justeru, kajian ini dilaksanakan bagi mengenalpasti tahap kepuasan warga PMM terhadap sistem MyPCC dengan menggunakan kaedah kuantitatif melalui soal selidik secara google form. Seramai 104 orang responden yang terdiri daripada 37 orang staf dan 67 orang pelajar PMM telah dipilih menggunakan teknik persampelan rawak mudah dan dianalisis menggunakan perisian Statistical Package for Social Science (SPSS) Versi 27. Hasil kajian mendapati warga PMM sangat berpuas hati dengan kewujudan sistem MyPCC dengan nilai min 4.54 dan berada pada tahap yang tinggi. Tahap kepuasan dan servis yang baik ini bukan sahaja dapat menarik perhatian pelanggan, malah ianya juga boleh meningkatkan imej dan keuntungan inkubator pada masa akan datang.

Kata Kunci: Parcel, tahap kepuasan, sistem MyPCC

1.0 PENGENALAN

Dasawarsa ini, jelas sekali kita dapat melihat pembelian secara *online* semakin berleluasa dari hari ke hari. Hal ini juga menyebabkan jumlah parcel yang perlu dihantar dari rumah ke rumah semakin meningkat dengan mendadaknya setiap hari. Pembelian secara dalam talian dapat memudahkan pelanggan untuk membeli barang dan hal ini dapat dijadikan sebuah alternatif baru dalam berbelanja. Berdasarkan hasil penilitian, alasan mahasiswa pada masa kini gemar berbelanja secara *online* kerana barangan yang dikehendaki mudah untuk dicari dan tawaran harganya juga lebih murah (Gama Pratama, 2020). Bungkusan parcel kebiasaanya akan diterima terlebih dahulu oleh mana-mana pusat kurier untuk penyimpanan sementara. Walau bagaimanapun, disebabkan kekurangan pemantauan atau pengurusan bungkusan yang tidak cekap menyebabkan ia boleh berpotensi untuk hilang atau tidak dapat dikesan. Oleh itu, kajiansemasa mencadangkan pendekatan yang lebih sistematik untuk membentuk sistem yang bolehmemberi manfaat kepada penerima sebaik sahaja item diterima oleh pusat kurier (Juanita Zainudin, 2021).

Politeknik Merlimau telah menyediakan satu pusat pengurusan parcel yang dinamakan sebagai Inkubator Polytechnic Courier Centre (PCC) di bawah penyeliaan pensyarah Jabatan Kejuruteraan Awam iaitu Puan Juliawati, Puan Hidayah dan Puan Syahidah. PCC mula beroperasi secara rasminya pada 16 Mac 2020. Idea untuk mewujudkan perkhidmatan pengurusan parcel bagi seluruh warga Politeknik Merlimau tercetus daripada hasrat mantan Pengarah PMM yang ke-5 iaitu Tuan Haji Roslibin Hamid bagi menyelesaikan isu pengurusanparcel yang kurang teratur di ruang legar bangunan pentadbiran PMM. Tujuan utama inkubatorini adalah untuk menyediakan servis penerimaan dan penyimpanan pelbagai jenis parcel warga PMM. Melalui kaedah kajian

yang dijalankan seperti temubual, tinjauan secara *online*, (googleform) dan pemerhatian, kami dapati terdapat permasalahan di PCC iaitu penyimpanan data yangtidak sistematik dan perekodan data yang masih secara manual. Hal ini agak sukar bagipihak PCC untuk sentiasa mengemaskini nama penerima parcel di buku catatan mahupun telegram. Sebab utamanya adalah aplikasi Telegram ini menggunakan jalur lebar yang besar menyebabkan kuota internet pelajar banyak digunakan (Wakhidin Shodiq, 2021).
Oleh kerana itu, sistem MyPCC telah dibangunkan sebagai transformasi daripada sistem bertulis yang kurang efektif kepada sistem *barcode* dan laman sesawang yang lebih sistematik. Menurut Mohamad Asyarul Azmi Mohamad Azmi (2021), kaedah bertulis ini sukar digunakan untuk membuat pencarian semula maklumat dalam jumlah yang banyak di dalam semua buku rekod yang pernah digunakan. Menurut Amelia Sulaiman(2021), sistem pengurusan maklumat berasaskan web boleh digunapakai oleh kakitangan supaya proses pengurusan dan penilaian dokumentasi data dapat dikendalikan dengan lebih sistematik. Tujuan sistem ini diwujudkan adalah untuk memudahkan pihak PCC dalam pengurusan penyimpanan parcel- parcel warga PMM serta menjimatkan masa mereka untuk mengemaskini data-data penerima dengan lebihcepat. Dalam pada itu, MyPCC ini bukan sahaja boleh merekod data secara menaip, malah ia juga boleh digunakan dengan cara mengimbas *barcode* kad pelajar atau staf menggunakan alat pengimbas.

i. Isu dan masalah perniagaan

Antara isu yang didapati berdasarkan pemerhatian yang dilakukan di Inkubator Polytechnics Courier Center (PCC) Politeknik Merlimau, Melaka:

i. Penyimpanan data yang tidak sistematik
ii. Penggunaan kaedah manual secara bertulis

ii. Objektif Kajian

Objektif kajian ini adalah untuk mengenalpasti tahap kepuasan Warga Politeknik Merlimau terhadap sistem MyPCC.

2.0 KAJIAN LITERATUR

Kebanyakan sistem yang dibina dan digunakan oleh pelbagai organisasi kini bermatlamatkan untuk penyimpanan pelbagai jenis data. Oleh yang demikian, salah satu kaedah seperti sistem yang berasaskan web ini sangat membantu dalam memudahkan urusan sekaligus tahap kecekapan yang lebih tinggi dapat dioptimakan. Menurut Nik Yasmin dan Norhanim (2023), Sistem Pengurusan Bungkusan Pelajar yang di bangunkan secara dalam talian ini telah memudahkan pihak kelab kebajikan staf dalam menguruskan maklumat bungkusan pelajar. Melalui sistem ini, staf boleh menyimpan rekod dengan lebih cepat dan teratur tanpa perlu mengisi pelbagai borang.

2.1 Konsep Projek Dan Konstruk Akademik

i. Kepuasan

Kepuasan pelanggan merupakan suatu ukuran keberhasilan untuk semua pengembangan dan implementasi sistem informasi (Heni Sulistiani, 2021).

ii. Pelanggan

Pelanggan bermaksud seseorang yang membeli barangan atau perkhidmatan dan membayar harga untuknya. Perkataan pelanggan berasal daripada istilah 'adat' yang bermaksud 'amalan', jadi perkataan pelanggan bermaksud individu atau entiti yang membeli produk atau perkhidmatan daripada penjual pada jangka masa yangtetap. Dia juga boleh dikenal pasti sebagai pelanggan atau pembeli (weblogographic,2022).

iii. Parcel

Bungkusan ialah objek atau koleksi objek yang dibalut dengan kertas atau plastik untuk dibawa atau dihantar melalui pos. (Muhammad Aqil Hakimi et al, 2022).

iv. Sistem MyPCC

Sistem ini dibangunkan bagi memudahkan penyimpanan data yang lebih sistematik dan pelanggan dapat menerima parcel dengan lebih cepat.

3.0 METODOLOGI KAJIAN

Metodologi sesuatu kajian adalah teknik dan kaedah tertentu yang digunakan bagi memperolehi maklumat yang diperlukan bagi menyelesaikan masalah. Dapatan yang sah dan boleh dipercayai perlu mencapai objektif dan menjawab persoalan kajian melalui teknik dan kaedah yang dipilih. Kajian yang dijalankan ini adalah kajian deskriptif yag berbentuk pemerhatian dengan menggunakan soalselidik *google form* yang diedarkan kepada warga Politeknik Merlimau yang menggunakan servis Inkubator Polytechnics Courier Center (PCC) untuk mendapatkan maklumat tentang masalah yang berlaku di inkubator tersebut serta cadangannya. Selain daripada itu, kajian soal selidik turut diedarkan kepada warga PMM bagi mengetahui tahap kepuasan mereka terhadap sistem MyPCC.

3.1 Kaedah Persampelan

Kaedah persampelan yang digunakan dalam kajian ini adalah kaedah persampelan secara rawak. Responden dalam kajian ini terdiri daripada pelajar dan staf Politeknik Merlimau. Kaedah persampelan kajian turut merangkumi dari aspek populasi kajian, sampel kajian dan lokasi kajian untuk mencapai hasil penyelidikan kajian.

3.1.1 Populasi kajian

Populasi kajian ini terdiri daripada warga Politeknik Merlimau merangkumi pelajar dan staf. Berdasarkan data yang diperolehi daripada Jabatan Hal Ehwal dan Pembangunan Pelajar Politeknik Merlimau, jumlah pelajar semasa adalah seramai 4,280 orang. Manakala bilangan staf pula seramai 430 orang. Menurut jadual Krejcie dan Morgan (1970), jumlah sampel yang diperlukan adalah seramai 351 orang. Walau bagaimanapun, hanya 104 orang responden sahaja menjawab soal selidik melalui *google form* yang disediakan.

3.2 Instrumen Kajian

Instrumen kajian merupakan cara yang digunakan untuk mengumpulkan data-data iaitu dengan menggunakan soal selidik melalui *google form*. Soal selidik yang dibangunkan bertujuan mendapatkan maklum balas daripada responden. Soal selidik ini juga terbahagi kepada dua bahagian iaitu Bahagian A yang mengandungi soalan berbentuk demografi responden, manakala Bahagian B mengandungi 8 soalan bagi mengetahui tahap kepuasan pelanggan terhadap penggunaan Sistem MyPCC.

3.3 Analisis Data

Setelah kesemua borang soal selidik diedarkan dan dijawab oleh warga PMM yang menggunakan servis PCC, data tersebut seterusnya akan dianalisis menggunakan perisian Statistical Package for Social Science (SPSS) Versi 27. Pengkaji turut menggunakan perbandingan antara skor min dan skor min purata, selain, jadual 3.1 iaitu tahap pengukuran min dan pernyataan juga digunakan.

Jadual 3.1: *Tahap pengukuran min dan pernyataan*

Pernyataan	Markat
Lemah	1.00 – 2.40
Sederhana	2.41 – 3.80
Tinggi	3.81 – 5.00

(Adaptasi daripada Choizes, 2019)

4.0 KEPUTUSAN KAJIAN DAN ANALISIS

Hasil dapatan projek berdasarkan beberapa tinjauan yang dilakukan dan mengedarkan borang soal selidik kepada responden yang terlibat. Selain itu, ia juga merangkumi analisis melalui SWOT yang menganalisis persekitaran dalaman dan luaran serta faktorfaktor yang boleh memberi kesan kepada daya maju sesuatu keputusan bagi Polytechnics Courier Centre (PCC). Data yang terhasil daripada tinjauan yang lebih terperinci dapat membuat kesimpulan berdasarkan objektif kajian yang telah dinyatakan.

i. Profil Demografi dan Responden

a. Analisis Data Perbandingan Sebelum dan Selepas Bagi Soal Selidik Tentang Pengurusan Di Inkubator PCC.

Berdasarkan jadual di atas, nilai min purata tahap kepuasan warga sebelum wujudnya sistem MyPCC adalah 3.06 dan ia adalah sederhana tinggi, berbanding selepas wujudnya sistem MyPCC dengan nilai min puratanya 4.54 dan ia menunjukkan kepuasan responden berada pada tahap yang tinggi.

Ini menggambarkan bahawa sistem MyPCC telah banyak membantu warga PMM amnya dan Inkubator PCC khususnya dalam memastikan kelestarian dan pengurusan parcel di PCC dapat dipertingkatkan.

Jadual 4.1.1: Analisis Data Perbandingan Sebelum dan Selepas

No.	ITEM	MIN	
		SEBELUM	SELEPAS
1	Sistem MyPCC mudah	3.55	4.51
2	Menunggu giliran untuk mendapatkan parcel	3.36	4.51
3	Tertukar parcel	3.28	4.55
4	Kehilangan parcel	2.29	4.57
5	Notifikasi daripada PCC	2.81	4.58
	Min Purata	3.06	4.54

b. Data Analisis Soal Selidik Tentang Tahap Kepuasan Warga PMM menggunakan Sistem MyPCC

Jadual 4.1.2 : Data Analisis Soal Selidik Tentang Tahap Kepuasan

No.	ITEM	MIN	KEPUTUSAN
1	Sistem MyPCC mudah untuk digunakan	4.51	Tinggi
2	Sistem MyPCC mudah untuk diaksesoleh warga PMM	4.63	Tinggi
3	Sistem pengurusan parcel menjadi lebih teratur selepas kewujudan MyPCC	4.55	Tinggi
4	Penerima parcel tidak perlu mengambil masa yang lama untuk mengambil parcel	4.51	Tinggi
5	Selepas kewujudan MyPCC, risiko pertukaran parcel semakin berkurang	4.55	Tinggi
6	Selepas kewujudan MyPCC dapat mengurangkan risiko kehilangan barang	4.57	Tinggi
7	Saya mudah mengetahui keberadaan parcel melalui status disistem MyPCC	4.58	Tinggi
8	Saya berpuas hati dengan kewujudan sistem MyPCC	4.52	Tinggi

5.0 PERBINCANGAN DAN KESIMPULAN

Merujuk kepada Jadual 4.1.2, didapati bahawa skor min keseluruhan bagi persoalan kajian adalah 4.55. Skor min ini menunjukkan tahap kepuasan dalam kalangan responden terhadap sistem MyPCC adalah berada pada tahap yang tinggi. Tahap kepuasan yang tinggi ini bukan sahaja dapat menarik perhatian pelanggan, malah turut dapat meningkatkan persepsi positif pelanggan terhadap perniagaan di samping memudahkan pengurusan pengambilan parcel oleh warga PMM. Pelanggan perlu mendapat layanan yang baik dan mesra, sepertimana yang dinyatakan oleh Nazeri (2014), supaya kita berusaha untuk meningkatkan dan memantapkan kualiti perkhidmatan selaras dengan perkembangan dan perubahan persekitaran serta penambahan pelanggan yang menggunakan perkhidmatan tersebut. Secara kesimpulannya, kepuasan pelanggan terhadap perkhidmatan yang disediakan adalah sangat penting bagi memastikan imej Inkubator PCC dapat ditingkatkan. Namun begitu, kajian kali ini hanya memfokuskan kepada tahap kepuasan warga PMM yang menggunakan sistem MyPCC. Oleh yang demikian, dicadangkan pada masa hadapan, projek yang sama dilakukan tetapi memfokuskan kepada keberkesanan sistem MyPCC terhadap warga PMM. Akhir sekali , dengan nilai min purata 3.06 sebelum wujudnya sistem MyPCC dan sederhana, berbanding 4.54 tahap kepuasan warga selepas kewujudan sistem MyPCC dan berada pada tahap yang tinggi. Ini menunjukkan bahawa sistem MyPCC telah banyak membantu warga PMM amnya dan Inkubator PCC khususnya dalam memastikan kelestarian dan pengurusan parcel di PCC dapat diperkasakan.

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SWOT Analysis of Marketing Mix at Kue Street Café

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Abstract. This study aims to obtain a situational analysis using SWOT analysis at Kue Street Café. Kue Street Cafe is a shop that sells coffee, desserts, snacks, toast, and foods in Merlimau, Melaka. This cafe has been operating since 2020 and currently, the café has more than 40 menus and they have a problem delivering the menu list to the customers due to the shortage of employees to handle multiple tasks in the café. Besides that, the fast phase of digital technology applied in business is notfully utilised. Therefore, determining the internal dan external factors is very crucial to facilitate thecustomer in purchasing process. The scope of the study are three elements of the four elements of marketing mix that consist of product, price and promotion that relate closely to purchasing processissues at Kue Street Café. The data is collected by distributing questionnaire from the existing customers of Kue Street Café. The findings are summarized in SWOT analysis and a strategy can be proposed to overcome the issues of delivering menu list to the customer.

Keywords: SWOT analysis, purchasing process

1.0 INTRODUCTION

Kue Street Cafe is a cafe that selling desserts, coffee, snacks, and food located in Merlimau, Melaka. In the beginning of the operation in 2020, the café only sold coffee and desserts. However, due to the current trends and populations in Merlimau, the management decided to offer variety of fried foods and snacks. Currently, the café offered 40 menus to the customers.

However, the customers are having difficulties to identify the menu offered as the menu list and description are not clearly provided at the café. The menu list, description and price of the foods and drinks offered at the café is not fully displayed at social media. Therefore, the customer needs to contact the café using WhatsApp to get the menu list. In order to determine the main issue faced by the customer, a survey of 52 respondents has been obtained through interview and short questionnaire from the customer that hasvisited and made purchase at the café. The issue faced by the customer is likely related to purchasing decision process. The five steps of the customer buying decision process are problem recognition, information search, evaluation of alternatives, purchase decision and post-purchase behaviour (Kotler, 2018).

The process of purchasing is closely related to the marketing mix. According to Kotler (2012), marketing-mix tools named the four Ps of marketing are product, pricing, place, and promotion. The combination of the four Ps can effectively achieve its organizationalgoals and the highest level of customer pleasure in decision making process. However, the scope of this study focused only in the elements of product, price and promotion.

Based on the issues, the objectives of the study are to perform situational analysis and determine the marketing mix elements that affect the purchasing process at Kue Street Café. SWOT Analysis is used to determine the internal and external factors for the café toplan a suitable strategy according to the strength, weaknesses, opportunities and threats according to the findings of the survey.

2. LITERATURE REVIEW

a. Purchasing Decision Process

The five stages of purchasing decision process consist of problem recognition, information search, evaluation of alternatives, purchase decision, and post-purchase behavior. It illustrates how a consumer starts thinking or having something in mind before buying a product and going through the five stages during decision making process towards a product. Perhaps, the buyer can also skip the one or more stages which depends on consumer mind (Kotler at el. 2017).

b. Problem Recognition

The first stage purchasing decision process is problem recognition. The consumer might recognize the problem with the basic needs of himself such as hunger for food. The food needed is its desire, but a delicious and filling food may satisfy him.

c. Information search

Information search include searching for related information from any sources such asfamily and friends or through advertisement, web or mobile sites. Besides that, public source through social media and consumer rating could facilitate the information search. Experimental source is also one of the main sources to get the information by examining and using the product.

d. Evaluation of alternatives

Upon completion of the search of information, the consumer will then rank the productor brand to evaluate it. For example, a consumer wants to have a cake and coffee, he will collect information about the coffee shops or cakes shops nearby and will evaluateall the cakes and coffee offered from the different shops. This evaluation might considerthe marketing mix of the product (product, price, promotion and place).

e. Purchase decision

At this stage, the consumer has decided on the product to be purchase. The purchase is according to the highest rank in the stage of evaluation of alternatives. The decision canbe influenced by the price, brand, review or rating by existing consumer or impulsiveness.

f. Post purchase behaviour

The last stage is post purchase behaviour where the consumer is satisfied or dissatisfied with the purchase. Satisfaction can drive to the chances of retention or repurchasing the goods or services. He might also introduce the goods or services to others to buy the product.

g. Marketing Mix

According to Singh (2012) in Išoraitė (2016) marketing mix is the combination of different marketing decision variables being used by the firm to market its goods and services. A firm need to gather the basic information about the related variables of the goods and services offered. Then, next step is to set the direction of market programming and to decide the strategy and instruments to meet the needs of the customers exceeding of what the competitor has offered. The optimum combination of all marketing ingredients will be realising the main objectives of the company such as profit, sales volume, market share and return on investment.
The marketing mix is grouped under four elements i.e., Product, Price, Place, Promotion. Therefore, while satisfying the needs of consumers, the company makes decisions related to the product, its price, distribution / place and promotion, and the four of the group is considered to be the key marketing mix elements also called - "4P" marketing mix (Gronholm (2012).

Design; technology; utility; value convenience; quality; packing; brand; guarantees	**4P's** Product Price	Price list; discountscredit conditions;
Channels; logistics; product inventory (balances / reserves); transport; the range;place	Place Promotion	Advertising; public relations; support; sales promotion; direct marketing; purchase point /location; exhibitions and fairs; private sale; leaflets / posters; free gifts; posters;

Figure 1: "4P" marketing mix elements (Gronholm (2012)

2.1 SWOT Analysis

According to Emet Gurel (2017), SWOT analysis is a tool used for strategic planning and strategic management in organizations. SWOT stands for strengths, weaknesses, opportunities, and threats. In order to sustain and compete in an industry, a firm can used SWOT analysis to build organizational strategy and develop a competitive strategy.It is a powerful tool to keep growing and gaining advantages from the availability of internal factors and external factors. The resources of a firm can be size up according to,its strengths and market opportunities with taking advantages of the opportunities. (Thompson et al., 2007).

Strengths and weaknesses are internal factors and attributes of the organization, opportunities and threats are external factors and attributes of the environment. In a simplest way, SWOT analysis can be drawn out in a four-quadrant box that allows for a summary that is organized according to the four section titles of strengths, weaknesses, opportunities and threats.

3. RESEARCH METHOD

a. Research Aim

The aim of the study is to perform a situational analysis at Kue Street Café to obtain internal and external factors that are relevant to improve marketing strategy.

b. Research Design

The research has been conducted using questionnaire consists of demographic information and items regarding consumer purchasing process and marketing mixelements using Likert Scale.

c. Population and sampling

52 respondents have been chosen randomly to answer the questionnaire that includes students of Politeknik Merlimau and Kolej Komuniti Jasin and residents around Merlimau using random sampling.

d. Data collection

The questionnaire has been distributed to the respondent using Google Forms and were given to respondents face-to-face.

e. Data analysis

A descriptive analysis using frequency and mean using Statistical Package for the Social Sciences (SPSS 27.0).

4.0 FINDINGS AND ANALYSIS

4.1 SWOT Analysis

From the observation and the interview of he owner of the café and supported by a survey using questionnaire to the customers, the SWOT analysis of Kue Street Café can be summarized as follows:

Table 1 : SWOT Analysis of Kue Street Café

STRENGTHS Offering a variety of food based oncurrent trends. Skilled and experienced workers in fieldof beverages. Employees can handle a variety of jobduties. The provided foods and beverageshave their own lovers.	WEAKNESSES There is no description on menu at KueStreet Cafe's Instagram page. Shortage of employees to take an order
OPPORTUNITIES Application of technology forpurchasing foods. The use of the current trends concept ina business with a minimalist concept.	THREATS Competition with other cafes that offerssimilar menu. Application of digital technology asmarketing tools.

a. Strengths

The strength of this Kue Street Cafe is from the product itself where it offers a variety of food and drink such as menus produced according to current cafe trends such as coffee and matcha. The prices offered are quite reasonable for customers. Another factor contributing to Kue Street's strength is their talented staff, which consists of individuals with experience and training in the kitchen. It also strengthens Kue Street when employees can handle a variety of job duties. Moreover, the provided foods and beverages have their own lovers. Kue Street Cafeoffers a wide variety of interesting and delicious menus that can entice customers to repeat their purchases. In addition, nowadays most customers like coffee drinks.So, having delicious coffee that suits the taste of customers can give them satisfaction and a good experience in trying the coffee offered at the cafe.

b. Weaknesses

Customers are unaware of the menu list. This cafe only displays the menu in front of the counter, through WhatsApp and the Instagram page. However, they do not put a description for each of their food menus which makes customers puzzle about the menu such as Nasi Goreng Ayah Garang which is fried rice with meat and Nasi Goreng Bocah which is butter fried rice and non-spicy. Another factor of weaknesses is shortage of employees to take an order due to the space of the cafe and to save cost.

c. Opportunities

The minimalist concept used by Kue Street is compatible with the lifestyle of customers who follow current trends. It is an opportunity for Kue Street because the technology application to buy food is now increasingly being used by the food and beverage industry so when this application is used in Kue Street Cafe business, it makes Kue Street Cafe move as advanced and comparable to other shops or cafes.

d. Threats

Competition between other cafes that offer almost the same menu is also a threat to the Street Cafe Cake Business because the menu offered is almost the same as other cafes. In addition, technology which is continually advancing quickly and making business management techniques becoming more successful, is the external issue that causes a threat to Kue Street Cafe. This presents a threat if Kue Street Cafe, a tiny business, is unable to keep up with technological advancements like other cafes that currently use food ordering technology to help order taking by customers and the owner.

4.2 Marketing mix element

The mean score for purchasing decision process, product, price and promotion is summarize in Table 2. Findings shows that the customer buy food and drinks at the café to satisfy their needs and made purchases from the information shared on social media. Overall the respondents are repetitive customers and satisfied with the purchase at Kue Street Café.

a. Product

The menu is diverse with plenty of choices ranging of foods and beverages. The respondents agreed that the information of the menu can be found mostly by the display at the café, shared information from friends and family and via Instagram. However, the description of the menu is not included on the list of menu in the KSC Instagram page. For example the customer is wondering about what is Nasi Goreng Ayah Garang is likely to be.

b. Price

The respondent also agreed that the price offered is comparable to the quality of the menu and it can be referred clearly through the display at the café and WhatsApp reply when the customer contacted the café via WhatsApp.

c. Promotion

The promotion is at medium score as the customers got the information about the café through friends and family, Instagram page of the café and they rarely found the café's information through Instagram Ads.

Table 2 : Score mean for Product, Price, Promotion ang Purchasing Decision Process

The Items	Score mean
Product	3.40
Price Promotion	3.02
Purchasing decision process	2.89
	3.00

5.0 CONCLUSION

A SWOT analysis evaluates internal factors that represent the strengths and weaknessesof a company and examines external factors that represent opportunities and threats affecting the company. This tool helps to analyse strengths, weaknesses, opportunities, and threats in business and can further applied to solve the problems faced by Kue Street Café with a strategic improvement.

With variety of foods offered based on current trends and having skilled and experienced workers, Kue Street Café will be able to use the strengths and opportunity in digital technology to facilitate consumer buying behaviour. One that can be implemented couldbe the usage of QR Code scanning to ease the reference of consumer to buy the foods anddrinks.

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An Effective Way To Choose Hairstyles At Dall Barbershop

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Abstract. A person should give special attention to keeping their hair healthy and well-groomed. We'll need a barber for that. As a result, barbershops rank among the most promising industries with a good chance of success. Dall Barbershop is a barbershop in Merlimau. It has been going for about a year. Mr. Muhammad Amsyar bin Mohammad, the owner of Dall Barbershop, operated his company door to door before opening a premises. The purpose of this study is to help make easier for customers and barbers to resolve the confusion that occurs when they want to get a haircut at Dall Barbershop. It is a strategic planning technique that assists in identifying a company's strengths, weaknesses, opportunities, and threats. With the use of this study, the organization can lessen risks, strengthen its points of weakness, seize its opportunities, and exploit. SWOT and TOWS analysis been done to help understand the problems occurred. This is fundamental research and mix quantity and qualitative data where the primary data is from interview with owner of Dall Barbershop and survey through questionnaires. Secondary data from journal and previous research. Population for Merlimau is 39,754 but the samples only 60 persons due to limited time and resources. All gathered data been analyst with SPSS version 29. By doing these analysists, we were hoping that our recommendation can help Dall Barbershop be more competitive and successful in future.

Kata Kunci: Barbershop, TOWS, SWOT, owner, competitive

1.0 INTRODUCTION

A barbershop is a business that addresses the issue of dull hair. It's almost like a long-term business because tidy and attractive hair is more of a necessity than a pleasure. It will always be required. Barber shops are thus one of the most promising companies, with the potential for success if properly managed. In contrast to other businesses, customer retention in a barbershop is extremely high. clients should be well-treated, such as with a nice haircut service that is expertly cut and always presents a positive image to clients. I choose Dall Barbershop because the owner Mr. Muhammad Amsyar bin Mohammad agreed to provide all the information needed for this study. This barbershop offers a specialized haircut service for males. The Barbershop is fully equipped to offer a wide range of hairstyles

1.1 Business Issues

This barbershop provides a haircut service that is specialized for men. The Barbershop have the complete equipment to do the variety of hairstyles but the problem occur when customers ask to style their hair which does not suit their face shape.

When the customers are not satisfied with the selection of their hairstyles, they will give negative feedback to the barbershop. The barber does not know how to give to the customers the right knowledge about the right hairstyle for them. When the barber puts too many pictures of a hairstyles around the shop it will fill the space and make the customer uncomfortable with the view in the shop.
The inside area of the shop is very compact and not suitable for placing many pictures.

Expanding the shop area requires very high cost and maintenance. The Barber has no plan yet to expand his shop. So far, the barber is satisfied with the decoration at the shop. Meanwhile, customers must wait outside the shop when the waiting room inside is full. The inside of the shop can only accommodate 5 customer including customers who are getting their hair cut.

The main problem is customer always choosing a hairstyle that does not suit for their face shape and it will make difficult for the barber to explain and cut them. Then, it will take time to explain it while other customer waits for their turn. So, the time for hair cutting will be longer.

1.2 Objective

The objectives of this study are:

i. Identify customers satisfaction with selection of appropriate hairstyles
ii. Analyze customers demand for the variety of hairstyles
iii. Suggest a platform as an effective way to choose hairstyle

1.3 Justification

The reason behind choosing this barbershop is because the owner agreed to provide all the information needed for our project and it is a simple network that gives us relatively easy access to collect our information.

This study can help Dall Barbershop to make it easier for customers to choose the type of hairstyle that suits their face shape. Choosing the right hairstyle is very important for individuals so that they can have the confidence in public (Wisuwat Sunhem and Kitsuchart Pasupa, 2016). As we know, everyone has different face shape and hair type. To get the best results they need to know their face shape.

At the same time, it can also save the customer's time during the hairstyle selection process. So, customers who are waiting for their turn do not have to wait for a long time. The ideal time allocation for a haircut is 20-30 minutes. Without us realizing we can increase the average number of daily customers.

1.4 Scope Of Business Project

Scope of this research is the people who lives around the Barbershop as our respondents. Other than that, a lot of information been gathered from owner of Dall Barbershop specially to do SWOT and TOWS analysis

1.5 S.W.O.T Analysis

Table 1: SWOT Analysis

	Helpful	Harmful
Internal	**Strengths** - Friendly attitude - Offering a variety of Haircut - Trained Professional	**Weaknesses** -Located quite far from the Polytechnic Merlimau. - Shop is too small - Dall barbershop not having enough internet marketing experience.
External	**Opportunities** - New technology which is customers can make advance reservations through online reservations. - Provide hair care product for the convenience of customers to buy it.	**Threats** - Many and strong competition in 500m such as Sojaa barbershop, Muhammad barbershop, Amir's barbershop. - Competitor's strategies - Hair trends that change rapidly - Inflation in the economy

1.6 TOWS Analysis

Table 2: TOWS Analysis

Internal factor / External factor	Strengths - Barber is friendly -Offering a variety of Haircut - Trained Professional	Weaknesses - Located quite far from the Polytechnic Merlimau - Shop is too small - No internet marketing experience.
Opportunities - New technology - Provide hair care product	S-O Strategy i) S1-O1, owner can leave contact information for guests so that guests can consult information conveniently ii) S2-O2, with the ability to enrich the variety of hairstyles, customers can use the hair care products.	W-O Strategy i) W2-O1, customers do not have to wait in long queues if they make reservations online ii) W3-O2, owners can sell hair care products through existing platforms such as IG, Shoppe, Lazada and more.
Threats - Many and strong competition - Competitor's strategies - Hair trends that change rapidly - Inflation in the economy	S-T Strategy i) S2-T1, the shop owner must cut each hairstyle delicately, to allow customers to come in droves. ii) S3-T3, professional and experienced barbers are able to adapt to changes or current hair style trends	W-T Strategy i) W1-T2, make a promotion or promotion so that Dall Barbershop is better known ii) W2-T4, the owner can provide sanitizer, seating must be 1 meter and display instructions to remind customers that they must wear a mask

2. 0 LITERATURE REVIEW

Based on Wisuwat Sunhem, Kitsuchart Pasupa (2016) for an approach to face shape classification for hairstyle recommendation, it is important to choose a good and suitable hairstyle for the individual their personality confidence. This can also relate on our first objective which is to identify customer's satisfaction with selection of appropriate hairstyles. This is because one of the factors to consider for choosing the right hairstyle is the individual face shape and hairstyles. According to research they are six types of individual face shape which is round, oval, square, oblong, oval, diamond, and triangle. Based on this face shape, not all hairstyles are compatible with the shape and may be possible to distort a person's image and appearance

Based on Maria E Kovalkova Ti, (2021) which provides about the usefulness of a system that can get and give suitable information about the type of hairstyle and guide on how to do the hairstyle by the photo of sampling of the haircut style needed by the person. This can also support our second objective which is to analyze customers demand for the variety of hairstyles. By this, it allows the information needed accurately to determine the types of style that want to be chosen by the individual by determining through their knowledge about their hair or through photos given by the customer and by asking the barber itself about their hair.

Based on G.A.F. Maulani, S. Nugraha, N.A. Hamdani, T.M.S. Mubarok (2020) for information technology resources in barbershop business. The application of information and communication technology is a decent strategy to maintain business. Nonetheless, information and communication technology are still not well utilized in the barbershop industry. Based on the research, it was discovered that IT supporting elements had a very large and significant influence on Barbershop. Therefore, it can be concluded that information technology resources had a very significant influence on the Barbershop. This journal can significantly support third objective which is suggest a platform as an effective way to choose hairstyles.

3.0 RESEARCH METHODOLOGY

In this chapter, it elaborate about the data collection method such as primary data, secondary data, sampling design such as target population, sampling technique and sample size data analysis and also application of business tools.

For collect all data, I choose interview and questionnaire. I had interview session with manager of the company to get the details about the problem that occur at the company. A questionnaire was distributed to the public to determine the QR code hairstyle can help customers choose a hairstyle that suits their face shape more easily.

3.1 Data Collection Method

3.1.1 Primary Data

Primary data will be collecting in two way, namely qualitative and quantitative. For qualitative, information is obtained from interviews with owners of Dall Barbershop

which is Mr. Muhammad Amsyar bin Mohammad and the place at Merlimau, Melaka. However, the barbershop is located quite far from Polytechnic Merlimau. From the interview, we will identify the problem such as Strength, Weakness, Opportunities, and also Threat for developing SWOT Analysis. Next, it is quantitatively measured through a questionnaire filled out by Dall Barbershop customers.

3.1.2 Secondary Data

Secondary data refers to data which is collected by someone who is someone other than the user. Secondary data can be collected from journals, article, newspapers and other publication such as internet sources. For this research, secondary data was obtained from articles and journals which is retrieved from the internet.

3.2 Sampling Design

3.2.1 Population

The population for Merlimau residents is 39,754 and we have to take a sample of 380 people from the population according to Krejcie and Morgan.

3.2.2 Sample Size

Because we were limited in time, we only took 60 respondents who were customers of Dall Barbershop to answer the questionnaire.

3.2.3 Sampling Technique

For the sampling technique, this research used a convenience sampling because the population is large. Questionnaires has been distributed to the sample who came to Dall Barbershop.

3.2.4 Questionnaire

Questionnaires been set up in Google Form and it was filled out by 10 Dall Barbershop customers as a sample for pilot testing. After the pilot test was analyzed and Cronbach's alpha 0.776 proved the questionnaire valid, we just continue to distribute it to customers up to 60 respondents.

3.3 Data Analysis

After all the questionnaires were distributes and responded by the sample, the data will code in the software of Statistical Package for Social Science (SPSS) Version 29. Descriptive analysis to determine frequency and mean.

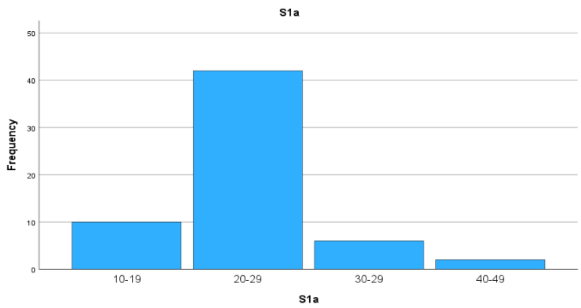
4.0 FINDING AND ANALYSIS

This section shows the findings of the project based on a survey through the distribution of questionnaires during the study. This study will examine important elements such as external and internal of this organization.

4.1 Demography Profile And Respondents

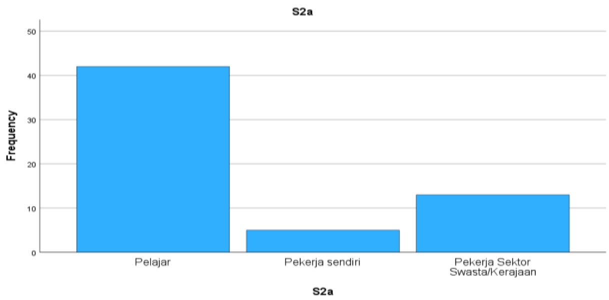
The data was obtained through a survey that was distributed to the close acquaintances and people around Dall Barbershop. It consists such as age, profession, and frequency of visiting a barber shop in 3 months.

4.1.1 Age of Respondents



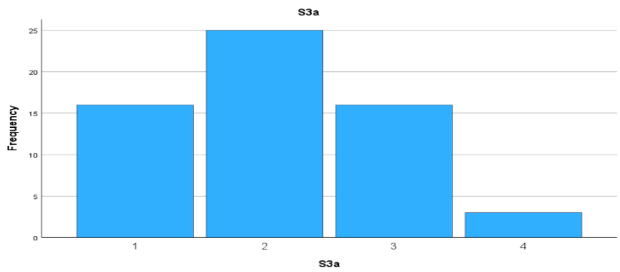
Graph 1 shows 4 categories of the age of respondents. There consists of 10 age 10-19 (16.7%), age 20-29 (70%), age 30-39(10%) and age 40-49 (3.3%).

4.1.2 Profession of Respondents



Graph 2 shows 3 categories of respondents. 70% of respondents were student, 8.3% were self employed and from Private/Government Sector is 21.7%

4.1.3 Frequency of Visiting A Barbershop In 3 Months



The Graph 3 shows the frequency of visiting a barbershop in 3 months. The highest is visit 2 times(41.7%). Followed with 1 times and 3 times (26.7%). Lastly, is 4 times (5%).

4.2 PROJECT FINDINGS

The findings of the project refer to the results of the principle of the project, what is proposed, shown or disclosed by a research project.

4.2.1 Analysis for customers satisfaction with selection of appropriate hairstyles

Table 3: Descriptive statistics copywriting about identify customer satisfaction with the selection of appropriate hairstyles

No	Statement	Mean
1	Adakah anda suka dengan gaya rambut yang telah dipilih?	1.10
2	Adakah tukang gunting rambut Dall Barbershop memberi cadangan gaya rambut yang bersesuaian dengan bentuk muka anda?	1.23
3	Adakah anda berpuas hati dengan pilihan gaya rambut yang ditawarkan oleh penggunting rambut Dall Barbershop?	1.15
4	Adakah pemilihan gaya rambut yang sesuai memainkan peranan terhadap keyakinan diri anda?	1.07

The table above illustrates the overall mean of identify customer satisfaction with the selection of appropriate hairstyles section. With mean of 1.07, respondents strongly agreed that the right hairstyle plays a role in your self-confidence. Respondents also strongly agreed that love the hairstyle you chose. This result is evidenced by a mean score of 1.10. Furthermore, with a mean of 1.15, respondents are satisfied with the selection of hairstyles offered by Dall Barbershop barbers. Finally, with the mean of 1.23, respondents disagreed that the Dall Barbershop barbers recommend hairstyles that suit your face shape. As a result, we can conclude that the respondents are satisfied with the selection of appropriate hairstyles.

4.2.2 Analysis the customer requests for various hairstyles

Table 4: Descriptive statistics copywriting about analyzing customer requests for various hairstyles

No	Statement	Mean
1	Adakah anda mengetahui tentang gaya rambut yang bersesuaian dengan bentuk muka?	1.45
2	Adakah bentuk muka anda bersesuaian dengan gaya potongan yang diinginkan?	1.22
3	Adakah anda akan cuba gaya rambut yang berlainan serta bersesuaian dengan bentuk muka?	1.17
4	Adakah anda yakin dengan gaya potongan yang telah dipilih bersesuaian dengan bentuk muka ?	1.13

The table above illustrates the overall mean of analyzing customer requests for various hairstyles section. With an average mean of 1.45, most of the respondents do not know about the hairstyle that suits the face shape. Respondents agreed that the shape of your face is compatible with the desired cut style. This result is evidenced by a mean score of 1.22. Next, with a mean of 1.17, respondents agreed that will try different hairstyles that suit the face shape. Finally, with the mean of 1.13. Respondents strongly agree that they are confident in the cut style that has been chosen to suit the shape of the face. As a result, we can conclude that respondents would be less likely to request other types of hairstyles. So, the owner needs to recommend more types of hairstyles to the customer so that the customer can choose the hairstyle that he feels will suit him.

4.2.3 Analysis for recommend the platform as an effective way to choose a hairstyle

Table 5 Descriptive statistics copywriting about recommend the platform as an effective way to choose a hairstyle

No	Statement	Mean
1	Sebelum penggunaan QR code hairstyle, adakah anda berasa susah menentukan gaya rambut yang bersesuaian?	1.27
2	Sebelum penggunaan QR code hairstyle, adakah anda berasa malas untuk mendapati maklumat tentang gaya rambut?	1.20
3	Selepas penggunaan QR code hairstyle, adakah anda berasa senang menentukan gaya rambut yang bersesuaian?	1.10
4	Selepas penggunaan QR code hairstyle, adakah anda berasa mudah untuk mendapati maklumat tentang gaya rambut?	1.13

In the table above, the overall mean of recommend the platform as an effective way to choose a hairstyle section is shown. With a mean of 1.27, respondents agreed about before using the QR code hairstyle, they find it difficult to determine the appropriate hairstyle. With a mean of 1.20, respondents agreed about before the use of QR code hairstyle, they feel lazy to find information about hairstyle. According to the mean score of 1.10, respondents stated that they strongly agree that after using the QR code hairstyle, they feel comfortable determining the appropriate hairstyle. Finally, respondents also strongly agreed that after using QR code hairstyle, they feel easy to find information about hairstyle. As a result, we can conclude that respondents strongly agree that the platform as an effective way to choose a hairstyle.

5.0 CONCLUSION & RECOMMENDATION

As a conclusion, this study achieved all objective that been set up earlier. Choosing the right hairstyle is very important for our confidence. Dall Barbershop often faces the problem that customers ask him to style their hair which is does not suit for their face shape. When the customers are not satisfied with the selection of their hairstyles, they will give negative feedback to the barbershop. The barber does not know how to give to the customer the right knowledge about the right hairstyle for them. In this project variety of method been used which are interview, observation, questionnaire, SWOT Analysis and TOWS Analysis. All information gathered from owner of Barbershop, respondents and also from journal. From the data we can clarify the selection of hairstyles that suit the face shape. So, we have found the best method to make it easier for customers to choose their hairstyle before getting a haircut. Then, for the third objective which is to suggest a platform as an effective way to choose hairstyles. So, QR code been created for customers to get information about the appropriate hairstyle before making a haircut. Customer gave good feedback after they used the QR code.

5.1 Recommendation

All information obtained from journal about hairstyle that suit with face been put in PowerPoint, then customize it to make it easier for customers to receive the information. Next, discussed with the owner to put the appropriate theme color. Next, convert the PowerPoint to PDF for setting the QR Code. Then laminated it and display at the Barbershop. So easier to be tested and we get positive feedback from customers.

5.1.1 QR Code Background

The background of the QR code been changed to attract customers to scan, as shown in Figure 1. This QR code been displayed in the customer waiting room which is inside and outside the shop. From observation, many customers happy using this QR code and help a lot in choosing suitable hairstyle.

Figure 1: background of QR code

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TRACK 3

TOURISM AND HOSPITALITY

Investigating the Relationship Between Mental Factors and Sugar Consumption Among JPH Students

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Abstract. Sugar can be more addicting than cocaine and increasing fat, diabetes and has impact on mental health. Looking at the severe consequences, this research aimed to make preliminary survey to identify the level of sugar addiction among students in Tourism and Hospitality Department (JPH). Therefore, objectives of this study are to determine types of sugary foods and drinks preferred by respondents and correlation between students' mentality towards their selection sugary foods and drinks. 248 samples from 713 population Semester 1 to Semester 4 students from JPH were randomly selected. Questionnaire was used as research instrument while SPSS Version 25 used to analyze Normality Test (P-P Plot) and calculate mean score and Pearson correlation. Result indicated data were normally distributed. Analysis also shows that majority of respondents are worry of their health when consuming sugary food, with mean score 3.91. At 99.9% confidence intervals the p value = 0.00, is lower than 0.001 and r value = 0.465 indicated student mentality significantly affect selection of sugary foods and drinks at weak level. According to the results of r values of 0.679 p values of 0.000, there is a substantially weak association between variables for students' actions to restrain themselves from consuming sugary foods and beverages mentally. In conclusion, although JPH students have sugar addiction, they are nonetheless able to control it mentally.

Keywords: sugar, addiction, mental, adolescents, food

1.0 INTRODUCTION

The term "food addiction" has been used to describe certain eating patterns that resemble addictive-related disorders (Pursey et al., 2022). While (Hebebranda et al., 2014) reported that, food addiction is a behavioural addiction characterised by compulsive eating of appetising meals and the associated activation of the brain's reward system. The term "sugar addiction" has, however, been deemed suitable when there is a large physical and/or psychological dependence on high sugar, or when there is a corresponding increase in the desires for items that include sugar. While there is evidence for and against sugar addiction and its role in the emergence of eating disorders, obesity, and/or both (at least in humans), research into how sugar or diets high in sugar affect human health is ongoing (Olsen, 2011). Environment, diet, genetics, energy metabolism, lifestyle, and exercise have all been connected to the pathophysiology of obesity and the accompanying dysmetabolism. The development of obesity, the metabolic syndrome, and diabetes mellitus are all related to sugars, sugar-related substances like high-fructose corn syrup, and/or high-sugar beverages, according to current research findings (Onaolapo et al., 2020). Bernama Berita Harian (2020) reported, the National Health and Morbidity Survey (NHMS) 2019 found that 3.9 million adults in Malaysia who are 18 and older, or one in five, have diabetes. Diabetes prevalence was determined to have climbed in the nation, rising to 18.3% percent from 13.4% percent in 2015, according to Datuk Seri Dr. Adham

Baba, Minister of Health. In addition, 37.3% of people are overweight, which is a risk factor for diabetes. According to the 2002/2003 Food Intake Study among Malaysian Adults, adults in Malaysia add 7 teaspoons of sugar per day to their beverages—4 teaspoons of granulated sugar and 3 teaspoons of sweetened condensed milk. The World Health Organisation (WHO) and the Malaysian Diet Guide recommend that the daily intake of sugar not exceed 50g (Amarra et al., 2016). The amount of sugar added to this beverage alone has exceeded these limits. Therefore, the objectives of this study are to determine respondents' mental sound behaviour when dealing with sugary foods and drinks and to determine the strength of the correlation between respondents' mental control and their behaviour when consuming sugary foods and drinks.

2.0 LITERATURE RIVIEW

This section provide literature for the history of sugar, evidences suggesting the addictive potential of high-sugar foods, and the possible mechanisms involved in sugar addiction.

The history of sugar

It has been demonstrated that the sweet component sugar enhances the flavour of our food. Additionally, there have been claims that it calms down human emotions and mood. Early human civilisations cultivated plants and fruits with high sugar content for a variety of reasons, including its capacity to enhance food flavour. According to historical records, the first civilisations to successfully domesticate the sugarcane plant were those of New Guinea some 10,000 years ago. Up until the 7th century, when the Arabs invaded Persia and swept throughout the region, the presence of sugar and the sugarcane plant remained a well guarded secret (Onaolapo et al., 2020). As a result, sugar manufacturing was established in the Arab-conquered territories. The first successful attempt at extracting and crystallising sugar from sugarcane was made in northern India around CE 350 as knowledge of its presence spread throughout Polynesia and Southeast Asia (Onaolapo et al., 2020). When German scientists and chemists discovered sucrose in beet root and built the first sugar beet production facility in the late 18th century, the history of sugar production underwent a dramatic transformation.

The concept of sugar addiction

According to research (Avena & Hoebel, 2003), sugar produces behavioural and neurological effects that are somewhat similar to drug abuse. Rats that were given access to sugar for 12 hours followed by 12 hours of food deprivation have been shown to engage in behaviours like bingeing and seeking. While there is a school of thought that contends that consuming diets high in sugar may cause the brain reward system to be stimulated in ways similar to addictive drugs, some researchers still think there is not enough proof to describe sugar addiction in humans (Wiss et al., 2018). To assert that sugar is addictive is to invoke a phrase whose connotation has long been ambiguous. The histories of substances that are typically thought of as addictive, such as illegal drugs, alcohol, and tobacco, show how the regulatory and conceptual underpinnings of addiction and the substances it is linked with have changed and been unevenly applied (Throsby, 2020). Sugar has been shown to cause more symptoms in animal studies than is necessary for a chemical to be classified as addictive. The consumption of added sugars and drug-like effects, such as bingeing, seeking, tolerance, withdrawal, cross-sensitisation, cross-tolerance, cross-dependence, reward, and opioid effects, have been linked in a major way by animal studies. According to(DiNicolantonio et al., 2018), sugar addiction appears to be a dependent on the naturally occurring endogenous opioids that are generated after consuming sugar.

Does sugar behave like a drug of abuse?

Understanding drug addiction is necessary in order to determine whether sugar is addictive. Understanding drug addiction is necessary in order to determine whether sugar is addictive. Consider opiate addiction, which can be identified if the opiate antagonist drug naloxone results in withdrawal symptoms. Surprisingly, this is exactly what happens when animals are given naloxone and subsequently sucrose. More importantly, naloxone withdrawal in these animals eating sugar is comparable to nicotine or morphine withdrawal (DiNicolantonio et al., 2018). The relationship between sugar and drugs is even stronger since there may be a "addiction transfer" between sugar and alcohol, illicit drugs, and sugar (Fowler et al., 2014).

Contrary to addiction to drugs or alcohol, sugar addiction generally has little direct negative social impact on people or their families. One glaring effect of sugar addiction on society's health is that it causes obesity and metabolic disease. When taken in tiny amounts, the fructose found in sucrose, honey, high-fructose corn syrup, and fruits has little effect on fat accumulation (Sun & Empie, 2012). It seems evident that this was the predominant way that people dealt with simple sugars in the past. When fruit or honey was available, our prehistoric ancestors would gorge on them, although these incidents were undoubtedly infrequent. These episodes of desire and bingeing would nearly be continual in today's environment with the 24/7 availability of highly processed food rich with added sweets, resulting in a noticeably increased intake of fructose. Fructose consumption that is excessive encourages the storage of fat, particularly in the liver (Schwarz et al., 2017). This is evidence for the proverb "the dose makes the poison"

Sugar consumption among adolescents

The risk of cardiometabolic disease is increased by sugar-sweetened foods and beverages. With regard to relative increases in obesity over the past few decades, young people have consumed the most of this food. Both caffeine and sugar, the main components of sugar-sweetened foods and beverages, have been shown to have addictive qualities (Falbe et al., 2019). Adolescence is a particularly vulnerable time for addiction since it is at this time that still-growing brains are highly sensitive to substances and that risk-taking is more likely as a result of a limbic system that supports emotion that is developing more quickly than the prefrontal cortex. Little is still known about college students' knowledge, beliefs, and attitudes regarding sugar intake in its many forms, their perceptions of the amount of sugar present in various foods, and their knowledge of the maximum daily allowance of sugar (Prada et al., 2021). The majority of qualitative studies have only focused on sugary foods and drinks.

The gut-brain axis and sugar addiction

Science has continued to look at the potential causes of human desires for food and/or sugar. Recently, there has been a rise in interest in the potential roles played by the gut microbiota in influencing both our dietary preferences and appetites for certain foods.

Additionally, during the past five years, there has been a significant advancement in our knowledge of the functions of the gut-brain axis (Onaolapo et al., 2020). Additionally, according to a few studies, the makeup of the gut microbe can affect digestive behaviors (Vijay-Kumar et al., 2010). The struggle to withstand sugar cravings becomes a way of life for a sizable portion of people(Alcock et al., 2014). The difficulty of upholding good eating habits has been attributed to a variety of factors, including a lack of self-control. The emotions of anxiety or sadness, which have been linked to the stimulation of cravings, changes in eating patterns, and satiety, are further ways that gut microorganisms affect human behavior (Onaolapo et al., 2020).

3.0 RESEARCH METHODOLOGY

The researcher employed a quantitative research design for this study. A questionnaire is employed as the primary tool for data gathering throughout the investigation. By using surveys, we can get a lot of data quickly (Mohamad Khatim et al. 2002). Determining the validity and reliability of a study is dependent on the methodology used.

Research instrument

The questionnaire with Likert Scale is the research instrument used to collect data. The 'Likert scale' approach, according to Wiersma (1995), is appropriate for use in research since it is an attitude assessment that captures individual feelings towards an idea, procedure, and social institution. This approach can be utilised as a measuring tool as well. Students can choose the corresponding score. For this Likert scale, respondents had to choose to agree or disagree even if they felt doubtful and uncertain about the statements given in the measurement instrument. The scaling levels used is shown in Table 1

Table 1: Likert scale score

Level of agreement	Score
Strongly not Agree	1
Not Agree	2
Not Sure	3
Agree	4
Strongly Agree	5

Source: Wiersma (1995)

Population and sampling

Population size is 713 students from five different diploma courses. They are Diploma in Event Management, Diploma in Tourism Management, Diploma in Culinary Arts, Diploma in Hotel Management, and Diploma in Halal Food Service. Cluster sampling, according to Mohammad Khatim et al. (2002), involves segmenting the population into different groups and then choosing all of the individuals inside each group. While the units between the groups are heterogeneous, the units within the group have a high correlation. The choice of clusters determines the sampling's randomness. According to Chua (2006), cluster sampling can be utilised when a study is conducted on a population with a broad geographic region and numerous participants in the population and a list of subjects cannot be gathered. In this study, cluster sampling was made at Department of Tourism and Hospitality, Merlimau Polytechnic Melaka. This questionnaire was distributed to students of semester 1 to 4 in the Tourism and Hospitality Department. Random sampling method to select 263 students as respondents as shown in Table 2.

Table 2: Questionnaire distribution and sampling

Program	Class	Population	Percentage (%)	Sample size
Diploma in halal foodservice halal practice	1A	38	5	13
	2A	20	3	8
	2B	21	3	8
	3A	21	3	8
	3B	21	3	8
	4A	24	3	8
	4B	24	3	8
Diploma in culinary art	1A	29	4	11
	2A	39	5	13
	3A	36	5	13
	4A	21	3	8
Diploma in hotel management	1A	25	4	11
	2A	34	5	13
	3A	26	4	11
	4A	34	5	13
Diploma in tourism management	1A	46	6	16
	2A	44	6	16
	3A	33	5	13
	4A	32	4	11
Diploma in event management	1A	34	5	13
	2A	39	5	13
	3A	40	6	16
	4A	32	4	11
Total		713	100%	243

Mean interpretation

The mean score value analysis approach was used to examine the data for the survey questions. Based on the interpretation of the mean value range, data are analysed. Next, a modified source from Mohamad Najib Abd Ghafar (2003) states that the following Table 3 should be used to interpret the mean score values obtained.

Table 3: Mean range interpretation

Mean score range	Interpretation	Level
1.00 – 2.33	Low	Weak
2.34 – 3.66	Medium	Medium
3.67 – 5.00	High	Good

Source: Mohamad Najib Abd Ghafar (2003)

Constructing questionnaire items

To construct reliable items in questionnaire, there are six specific references which have suitable samples of question that has been adapted and customised to fit this study. The list is presented in Table 4.

Table 4 : References to customise questionnaire items

Researcher	Year	Title
Dawna Stone	2009	Are You Addicted To Sugar? Take This Quiz To Find Out https://www.mindbodygreen.com/articles/are-you-addicted-to-sugar
Naglaa Fawzy, Dalia Salah El-Deen	2018	Assessment of Sugar Addiction among Non-Diabetic Patients https://scholar.cu.edu.eg/sites/default/files/dalia_elsedawy/files/ assessment_of_sugar_addiction_among.pdf
Marygrace Taylor	2015	Are You Addicted to Sugar? https://www.prevention.com/food-nutrition/healthy-eating/a20484945/sugar-addiction-quiz/
QuizExpo Quiz Team	2021	Am I Addicted to Sugar? This Quiz Analysis 20 Factors https://www.quizexpo.com/am-i-addicted-to-sugar/
Katewalker	2022	How Much of A Sugar Addict Are You? Take Our Quiz! https://www.proprofs.com/quiz- school/story.php?title=nzgyntgx1znj
By Eat This, Not That!	2016	QUIZ: Are You Addicted to Sugar? https://www.eatthis.com/addicted-to-sugar-test/

Data analysis

Data obtained from questionnaires that have been distributed the respondent of Department of Tourism and Hospitality Polytechnic Merlimau, Melaka. The data that are collected were analysed by using SPSS software. Statistical Package for the Social Sciences (SPSS) were used to determine the mean score of type of sugary food and beverages preferred by respondents and correlation between mental control and sugar addiction.

4. RESULT AND DISCUSSION

Result and finding obtained are as follows:

Mean score of respondents' behaviors in controlling sugary foods and drinks. There are eight different actions provided in the questionnaire for respondents to choose their behavior towards sugary foods and drinks. Referring to Figure 1, it is shown that the highest mean score is 3.91 which indicated that most respondents are fear at high level of their health status when consuming sugary foods and drinks, while the lowest mean score with 3.14 value indicated a moderate action of going to store only to buy sweets and to finish a box of chocolate quickly. The other items also show mean score at moderate level on how respondents act in controlling intake on sugary food and drinks.

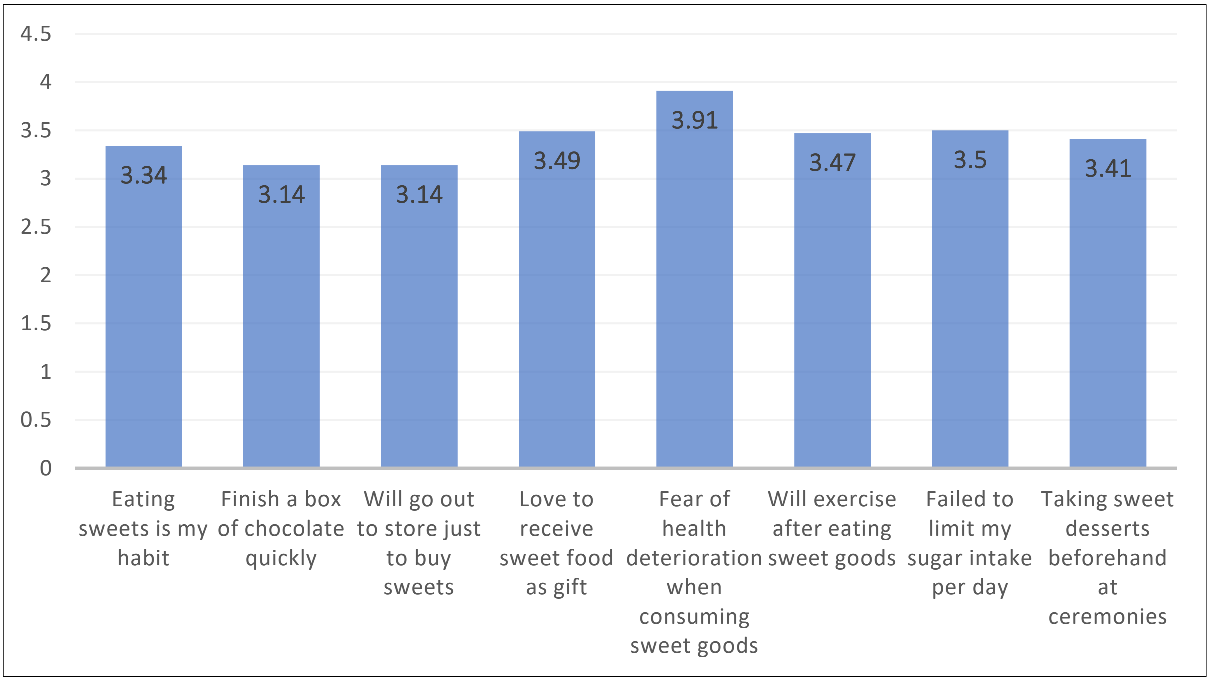

Figure 1: Mean score of respondents' behaviour in controlling sugary foods and drinks

Pearson correlation result between respondents' mentality and taking sweet food and beverages

Relationship	Food selection		
Mental	*r* value	*p* value	Relationship
	0.485	0.000	Weak

Hypothesis$_0$: Students' mentality does not significantly affect the selection of sweet foods and drinks.

The Pearson correlation analysis in this study shows a weak but significant correlation between respondents' mentality and their selection of sweet foods and beverages. This result suggests that students' mindset plays a role in their choice of sugary items, even if the association is not strong.

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The rejection of the null hypothesis (Hypothesis$_0$: Students' mentality does not significantly affect the selection of sweet foods and drinks) indicates that mental factors do indeed affect food selection. This finding supports the idea that students' attitudes and beliefs towards sugary foods and drinks influence their dietary choices. However, it is worth noting that the correlation is weak, which means that other factors, such as taste preferences, availability, and social influences, may also impact food selection. Further studies can explore these factors in more detail and how they interact with students' mentality towards sweet foods and beverages.

Pearson correlation result between respondents' mentality and method in controlling themselves from consuming sugary food and beverages

Relationship	Mental		
Action	*r* value	*p* value	Relationship
	0.679	0.000	Moderate

Hypothesis0: Students' mentality does not significantly affect their actions to control themselves from consuming sugary foods and drinks. The Pearson correlation analysis in this study shows a moderate but significant correlation between respondents' mentality and their ability to control themselves from consuming sugary foods and beverages. This result suggests that students' mindset plays a role in their ability to restrain from consuming sugary items.

The rejection of the null hypothesis (Hypothesis0: Students' mentality does not significantly affect their actions to control themselves from consuming sugary foods and drinks) indicates that mental factors do indeed affect students' ability to control their sugar consumption. This finding supports the idea that students' attitudes and beliefs towards sugary foods and drinks influence their ability to limit their intake.

The moderate correlation suggests that students' mental factors are moderately influential in their ability to control their sugar consumption. However, it is worth noting that other factors, such as availability and accessibility of sugary foods and beverages, may also impact their ability to control their intake.

This study emphasizes the importance of understanding students' mentality towards sugary foods and beverages and its potential impact on their dietary choices. The moderate correlation between students' mental factors and their ability to control their sugar consumption suggests that interventions targeting students' mindset may have a positive effect on their dietary habits. Further studies can explore these factors in more detail to identify effective strategies to promote healthy dietary choices.

5.0 CONCLUSION

In conclusion, respondents can moderately control their mind and action when dealing with sugary foods and drinks in different situation while still aware of their health status. It can also be concluded that there is a weak relationship between respondents' mentality and taking sweet food and beverages while there is moderate relationship between respondents' mentality and their action controlling themselves from consuming sugar and food beverages.

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Enhancing Accessibility In Tourism: A Study On The Effectiveness Of D'me Apps As A Communication Aid For Mute And Deaf Tourist

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Abstract. This study aims the communication challenges faced by hearing and speech impairment people and aims to identify suitable apps as communication aids for them while traveling. Communication is vital for individual worldwide, but communication can be challenging for those who do not have the required language skill, including foreign languages and sign language for the people with disabilities. This study is to evaluate the effectiveness of application to ease communication among hearing and speech impairment tourist. Therefore, it is essential to develop communication aids that are accessible, easy to use and can be used in real-time. A quantitative research approach was used and form of questionnaire was distributed to 21 respondents from Persatuan Orang Pekak Negeri Melaka (POPNM). The collected data were analyzed using Statistical Package for Social Science (SPSS) to obtain the percentage and mean score. The result of this study indicate that all respondents agreed on development of D'Me Apps as a communication aid for mute and deaf tourist with overall mean score of 3.61, indicating a medium level of agreement. It is expected that the result of this study will contribute to the development of effective communication aids for mute and deaf people, leading to improve communication and enhanced quality of life.

Keywords: Mute and Deaf, application, communication

1.0 INTRODUCTION

It is difficult for deaf and mute people to receive assistance when shopping. They simply can't seem to locate someone who can relate. It's not that they don't want to inquire. Since they have hearing loss, they mostly use sign language to communicate. This behavior is almost universal among the deaf and the mute, although most people don't learn sign language. As a result, it might be challenging to communicate with a deaf or mute person who does not know sign language. Although mobile technology is evolving at a rapid pace, deaf and mute persons haven't achieved much progress in this field. Only sign language is available in current mobile phone applications as a means of communication. There was no smartphone app in the market prior to this project that utilized deaf and mute disturbed speech for the purpose of social connectedness.

Smartphones with Android are currently widely employed in a wide range of areas as a result of the information technology industry's explosive growth. A significant future trend is the use mobile devices and diverse applications in training, education and computer-assisted instruction. The majority of application, however are made for average user and not usable by deaf and mute persons unless special adaptive tools and user interfaces are made for them. Normal people never give sign language a lot of thought, although the fact that it is essential for deaf and mute persons to communicate with others and with themselves. We as normal people frequently undervalue the importance of sign language unless we have relatives who are deaf and mute. Using a sign language interpreter's service is one technique to communicate with the deaf and mute, according to Suharjito et al. (2017). An interpreter who speaks sign language must be paid, nevertheless. A low-cost solution is necessary to allow normal people and the deaf and mute to communicate properly. So, in order to engage with hearing individuals, researcher are striving to provide a way of communication for deaf and mute people. The novel aspect of this is the sign language recognition system. The system aims to comprehend sign language and translate it into the target language verbally or in writing. However, creating this technology proved extremely expensive and difficult to utilize on a daily basis (Alka et al. 2020).

Developing D'Me Apps for mute and deaf tourist help this community to communicate with normal people by using symbolic language. They cannot communicate and hear in a good way. So, this apps will make it easier for them to communicate with normal people and assist normal people to interact to them. So, to identify effectiveness of D'Me application to deaf and mute people is importance in this study.

2.0 LITERATURE REVIEW

In the travel industry, communication will be a barrier to individuals due to language differences, not being fluent in foreign languages or those among people with disabilities (OKU) such as deaf and mute tourist. According to Badaruddin *et.al* (2007), tourism is an activity performed while individuals are or living in a destination such as shopping and interacting with other communities as well as using what has been provided in the tourism area to meet their needs. However, the host community does not understand sign language while sign language is very important to deaf and mute people, to communicate both with normal people and with themselves, is still getting little attention from the normal people.

Deaf and mute tourist communicate through sign language, which is a physical activity involving hands and eyes. Currently there are a few devices and that can be used to interpret sign language for deaf and mute people. Through the research found that the aid or devices are still lacking to meet the needs of the deaf and mute to communicate more easily. For example, Lean Motion controller which a system has sensor that detects the hand movement and transform the signal into the computer command. But the lack of this system was low accuracy and reliability.

Data gloves are another technology that recognizes hand gesture signals using several sensors and converts them into code. When this system's accuracy was 90%, a weakness was found. The many limitations of a gesture recognition technology will be overcome by a new communication aid for deaf and mute tourist (Kakde, *et al*¸ 2016). Using a mobile phone, which everyone uses for communication, is one way for deaf and mute tourist to develop efficient visual communication with regular people. With the use of these apps, they will be able to recognize images and provide information using symbols.

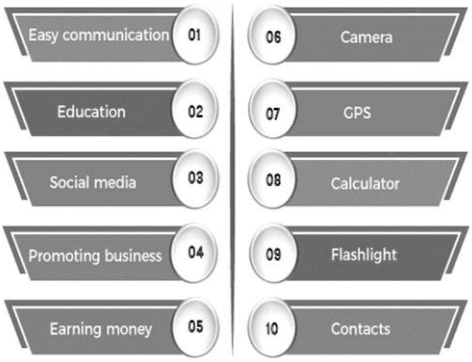

Figure 1: Advantages of Mobile Phones

Relation Between Communication and Technologies

According to William (2021), there are a number of factors that have contributed to the widespread adoption of communication technology. Costs associated with implementation decreased as technology advanced. There are widely available internet-connected devices and communication solutions at every level on the market. One of the biggest problems facing our society is the difficulty that deaf and mute people have in keeping up with the continuously changing technologies. Having access to communication tools is now essential for persons who are impaired. Although they frequently struggle to do so with non-sign language users, the majority of deaf and mute people use sign language to communicate. We need a translator so that we can understand what they are saying and communicate with them. (Shraddha, 2013).

Types of Platforms

According to Raven et al. (2020), the majority of deaf and mute people typically adhere to simple tasks to prevent themselves and others from becoming frustrated. The majority of the time, deaf and mute people feel agony while carrying out their regular tasks. For those who are deaf or have trouble speaking or hearing, many have tried to develop alternative means of communication, such as sign language. The problems can be handled by integrating a bilateral communication system that uses full duplex serial communication protocol to send and receive text and voice responses in real-time. In order to increase communication between deaf and mute persons and hearing people, the device also contains an operating system that can translate sign language into text, visuals, and audio.

Sensor Module Technology Approach.

According to Sharma et.al (2020), which is used wearable sensor gloves for detecting the hand gestures of sign language, sensors and touch screen technology can be integrated in a system to bridge the communication gap between the deaf and mute and normal people with or without knowledge in sign-language.

Visual Module Technology Approach.

According to Soltani et.al (2020), many vision-based technological interventions, are utilized to identify deaf and mute people's sign languages. The Voice for the Mute (VOM) system was developed to take input in the form of fingerspelling and convert it into corresponding speech. The images of finger spelling signs are retrieved from the camera. One example is the development of a gesture-based game for deaf and mute people using Microsoft Kinect, which recognizes the gesture command and converts it into text so that they can enjoy the interactive environment.

Product Design and Development Approach

The system aims to enhance how deaf and mute and normal people now communicate with one another. To encourage proximity and face-to-face socializing between the parties engaged, a bilateral communication device is created.

Mobile Application Technology Approach

Numerous modern smartphones come equipped with cutting-edge sensors, powerful CPUs, and high-resolution cameras. For deaf and mute people, a real-time emergency assistant called "I Help" has been proposed, where they can report any type of emergency. A smartphone's integrated GPS system provides access to the user's current position. The user can receive rescue via I Help since the management receives the information about the emergency by SMS, and it is then forwarded to the closest qualified rescue units. An Android programmed called MonoVoix doubles as a sign language interpreter. A mobile phone camera is used to record the signs, which are subsequently translated into speech. An Android app for deaf and mute people is called Sahaaya. To converse with regular humans, it employs sign language.

The Importance of Apps

Deaf people have difficulty communicating daily with others due to varied degrees of hearing loss, according to Yuan et al (2020). Deaf and mute persons may also have trouble identifying facial emotions due to hearing loss, which will make it even more difficult for them to interact with others. In order to overcome the hearing impairments, language barriers, regional language barriers, and emotional barriers faced by deaf and mute individuals, cutting-edge information technology is used. As a result, communication between deaf and mute and normal people is facilitated. Additionally, improving the educational system for everyone will not only have enormous practical ramifications but will also help deaf and mute individuals overcome the difficulty of traveling independently without aid from the general public.

3. 0 RESEARCH METHODOLOGY

This study was conducted using quantitative analysis. There are to identify the effectiveness D'Me Application for mute and tourist. Set of questionnaires was distributed to 21 respondents from Persatuan Orang Pekak Negeri Melaka (POPNM). The collected data were analyzed using Statistical Package for Social Science (SPSS) to obtain the mean score.

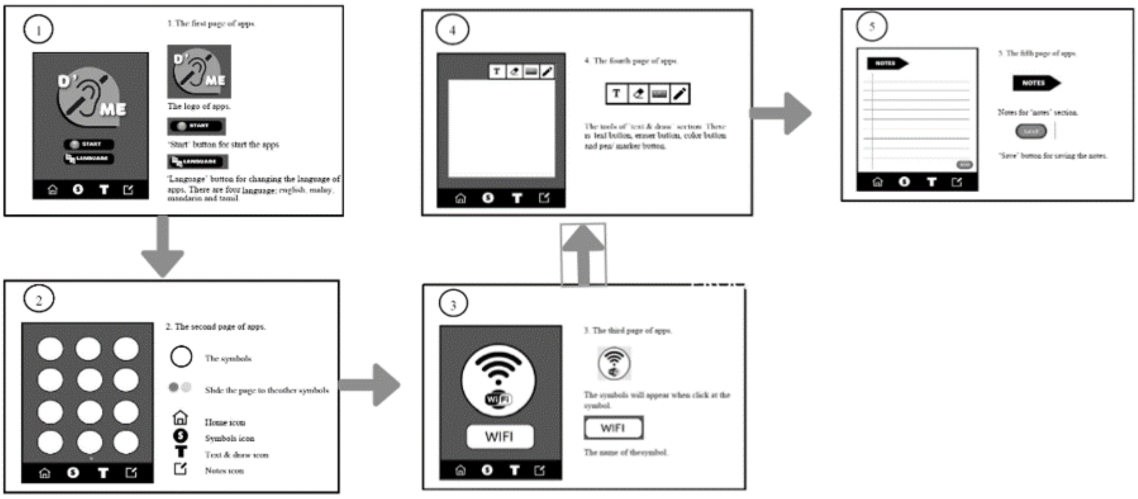

Figure 2: Product Description to identify effectiveness of D'Me Application

4.0 RESULT AND ANALYSIS

Table 1: result of effectiveness of D'Me Application for Mute and Deaf tourist

Item	Mean score
Grafik yang sesuai	3.91
Persembahan aplikasi yang menarik	4.00
Mudah di aksess	4.09
Mudah dimuat turun	3.82
Simbol yang mudah difahami	4.36
Penggunaan warna yang besesuaian	4.00
Fungsi yang pelbagai	4.18
Fungsi yang memudahkan berkomunikasi	4.09
Fungsi yang mudah difahami	4.00
Kos yang berbaloi	4.09

Table 2: Mean interpretation table

Mean Score	Reasoning Level
1.00 – 2.33	Low
2.34 – 3.67	Moderate
3.68 – 5.00	High

(Wiersma, 2000)

The highest mean score statistic based on the questions given to POPNM reveals that the D'Me application utilizes an understandable symbol of 4.36. For persons who are mute and deaf to easily communicate with those of normal intelligence, symbols are crucial. The app's content is quite compliant and offers users, especially deaf and mute users when traveling, convenience.
Communication involving symbols should be emphasized to tourists to understand the concept and purpose of the symbols requested or displayed. While the symbol is a marker that performs a function as a marker has been used traditionally and is commonly used in society (Freddy, 2000). The level of respondent responds the effectiveness of D'Me Application as a communication Aid for Mute and Deaf tourist is highly accepted.

5.0 CONCLUSION

In conclusion, an idea of D'Me application it is highly accepted by respondents.

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A Comprehensive Website Approach to Increasing Motorhome Tourism in Malaysia

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Abstract. The debut of Malaysia's first motorhome website has revolutionized outdoor enthusiasts' rental services, providing a convenient and flexible housing alternative for their travels while allowing cost savings on lodging and transportation. The motorhome industry, on the other hand, confronts obstacles such as limited demand, parking availability, high expenses, and environmental issues. To address these challenges and promote digital tourist growth in Malaysia, the creation of a complete website that provides easy access to rental businesses and campsites is critical. The purpose of this study is to create and assess user approval of a motorhome website among Malaysian service providers, with a concentration on motorhome centers in Bukit Gambir, Johor. To acquire insights into these centers' viewpoints and experiences, qualitative research approaches will be used. To increase user pleasure and engagement, the study emphasizes the necessity of increasing website usability, content clarity, and the availability of precise information. Implementing user recommendations, performing regular updates, and improving the overall browsing experience are critical tactics for achieving these objectives. The discussion focuses on two main goals: providing users with complete RV information and addressing accessibility issues. While consumers like the contact information for motorhome owners, some complain about the limited information and reliance on QR codes. Collaboration with the motorhome association, offline information choices, and research on customer happiness, trust, and long-term participation are among the proposed additions. By making these changes, the motorhome website will be able to better meet the demands of users, increase trust, and encourage positive user experiences, thereby contributing to the growth of motorhome tourism in Malaysia.

Keywords: motorhome website, rental services, user acceptance, comprehensive information, digital tourism growth.

1.0 INTRODUCTION

Tourism in Malaysia is vital to the country's economy, with its numerous attractions and cultural history attracting a large number of visitors. Malaysia offers a diverse selection of experiences for visitors, from its stunning beaches and dynamic cities to its lush jungles and animals. Kuala Lumpur, Langkawi, Penang, and Sabah are popular tourist destinations, each with their own distinct offerings and natural beauty. Malaysia has established itself as a renowned destination for medical tourism, delivering economical and high-quality medical services in addition to leisure travel. Road, rail, air, and marine transportation are all types of transportation in Malaysia. The country has a significant road network that connects major cities and communities via highways, motorways, and roads. Taxis, buses, and private vehicles are common modes of transportation on the road. In the Kuala Lumpur metropolitan region, rail transit is provided by the Keretapi Tanah Melayu (KTM) network and the Light Rail Transit (LRT) system. Malaysia Airlines, AirAsia, and other airlines operate from major cities, with Kuala Lumpur International Airport (KLIA) and Kota Kinabalu International Airport serving as key hubs. Given Malaysia's coastline topography, sea transport is important, with ports such as Klang Port, Penang Port, Johor Port, and Kuantan Port aiding maritime activity. Recognizing the potential of motorhomes as a new tourism product, Malaysia's Ministry of Tourism, Arts, and Culture is aggressively developing motorhomes in conjunction with local governments and allied ministries to attract tourists beyond conventional sites. The popularity of self-driving motorhomes was highlighted in feedback from the last Arabian Travel Market, notably among young families from West Asia (Puvaneswary, 2022). In keeping with this, the development of a mobile website for RV owners and travelers has been recommended. This website intends to offer features like motorhome site booking and connecting with other motorhome enthusiasts. Tourists benefit from a variety of advantages, including flexible mobility, cost savings on lodging and transportation, and the ease and comfort of well-equipped facilities. Transportation is essential for facilitating mobility, economic growth, and regional integration. It provides people with access to work, shopping, and leisure activities, thereby stimulating economic activity. Furthermore, effective transport networks are critical for moving goods and services, promoting economic growth and trade. Furthermore, transportation promotes regional integration by increasing market access and resource availability. It also improves people's quality of life by giving them access to critical services like healthcare, education, and recreation.

The launch of Malaysia's first motorhome website promises to expedite motorhome rental services for outdoor activities enthusiasts. Customers will be able to quickly book motorhomes in convenient locations, giving them a pleasant and flexible accommodation alternative for their outdoor adventures, thanks to this platform. Customers can save money on accommodation and transportation by using an online platform for motorhome rental, while still enjoying the convenience and comfort of a well-equipped mobile home. Despite the growing popularity of motorhomes as a form of transportation and recreation in Malaysia, there are important difficulties that must be solved. Limited demand figures, few parking spots, expensive purchase and maintenance prices, and environmental effects are among the issues. To address these concerns, a comprehensive website catering to visitors and recreational enthusiasts is required, allowing easy access to rental businesses and campsites around Malaysia. Adopting digital solutions in the tourism business can increase convenience, improve consumer experiences, and propel the country's digital tourism growth (Drew, 2022; Pandey, 2022; OECD, 2020). In conjunction with this trend, the aims of this paper are to develop and gauge user acceptance of the motorhome website among the service provider in Malaysia.

2.0 DEVELOPMENT OF THE RECREATIONAL VEHICLE SECTOR AS A NEW TOURISM ATTRACTION IN MALAYSIA

The recreational vehicle (RV), commonly known as the motorhome, has a long history dating back to the early twentieth century. Custom-built motorhomes were popular among wealthy Americans in the 1910s and 1920s, acting as mobile homes while traveling. In the 1930s, the availability of mass-produced motorhomes increased as firms such as Airstream transitioned from creating travel trailers to producing motorhomes. As leisure travel became more popular after WWII, the demand for RVs grew. In the 1950s, motorhomes began to offer facilities such as air conditioning and televisions, catering to a more comfortable experience. The "hippie" motorhome culture emerged in the 1960s and 1970s, leading to the development of smaller, more portable RVs for adventurous persons wanting a mobile home experience. Motorhomes in other countries and Malaysia differ in terms of design, features, legislation, and availability (Corbett, 2023: Puvaneswary, 2022). Overseas motorhomes range in size and style from small camper vans to huge Class A motorhomes with cutting-edge amenities. Malaysian motorhomes, on the other hand, are often built on truck or bus chassis and have simpler designs. Overseas motorhomes include complex electrical and plumbing systems, whereas Malaysian motorhomes have more basic amenities including a kitchenette, toilet, and sleeping spaces. In outside markets, stringent rules maintain design and safety requirements, but Malaysia has fewer controls. Motorhomes are more widely available in abroad markets, where established rental and sales organizations exist, but the Malaysian market is still in its early stages.

2.1 Type of Motorhome

Motorhomes are classified into two types: Class A and Class B (Motorhome Escapes, 2020). Class A motorhomes are huge and opulent, with considerable space and high-end amenities. They are built on bus or truck chassis. Class B motorhomes, commonly known as camper vans, are smaller and built on van chassis, providing convenience and fuel efficiency, making them suited for solo or couple travelers. Class C motorhomes are built on truck chassis and have cab-over beds. They have larger living space than Class B RVs and have separate living and sleeping rooms. Class C motorhomes are a less expensive option than Class A RVs.

Figure 1: Class A

Figure 2: Class B

Figure 3: Class C

2.2 The importance of Website

Websites have grown integral to a variety of activities and services, and their importance on our daily lives cannot be understated (Pandey, 2022). Because of the tremendous improvements in information technology, particularly the internet, the tourism business has undergone significant disruption. The growing number of online users and transactions demonstrates the appeal and widespread use of technology in a variety of industries, including tourism. In order to reach organizational goals, firms, particularly customer-centric and information-intensive tourism enterprises, must embrace e-business techniques. Maintaining a successful website has emerged as a critical aspect for organizations to create and cultivate customer relationships, expand their market share, and deliver relevant information and services to their clients (Ho & Lee, 2007; Rob Law, 2009). motorhomes.my a dedicated motorhome website that caters to the different demands of consumers seeking both self-drive and chauffeur-driven alternatives, is one notable example in the domain of motorhome rentals in Malaysia. The website prioritizes comprehensive information transmission, providing detailed insights into the numerous rental motorhome types. Rental pricing, locations, and booking methods are widely displayed, allowing potential renters to make informed judgments. The website includes an intuitive layout that allows for easy navigation and access to the necessary information to create a seamless user experience. Furthermore, it enhances the user's journey by giving a variety of visual aids, such as photos, specifications, and amenities, allowing consumers to obtain a thorough grasp of each motorhome's features. This comprehensive presentation seeks to simplify the decision-making process for prospective renters, allowing them to select the best motorhome for their preferences and needs (El Maazouzi, 2020).

2.3 Motorhome as a new tourism product

Motorhomes have emerged as a distinct and versatile tourism product, offering travelers a unique and adaptable method to visit countries (Puvaneswary, 2022; Biggers, 2020). Visitors who rent a motorhome have the opportunity to travel at their own leisure, take side trips, and discover hidden gems off the usual road(Hayesbc, 2023; Unusual Places, 2023) . Furthermore, when compared to typical camping experiences, motorhomes provide greater convenience and comfort. Motorhomes provide a home-away-from-home experience while on the road, with facilities such as comfy mattresses, kitchenettes, and restrooms. Recognizing the potential of motorhomes as a specialist tourism product, the creation of a dedicated website becomes not only useful but also vital, particularly in Malaysia, where they are widely used. A website like this would make it easier to buy or rent motorhomes, thereby helping to boost enterprises in this industry.

The local government and related ministries have backed the development of motorhomes as a new tourism product in Malaysia, with inspiration drawn from input gathered during the Arabian Travel Market. According to market insights, young families from West Asia would be willing to explore sites outside of the usual hotspots like Kuala Lumpur, Langkawi, and Genting if self-drive motorhomes were made widely available (Puvaneswary, 2022). Motorhomes have the ability to encourage sustainable tourism practices by decreasing the negative environmental impact of travel, in addition to their convenience and attraction (CanaDream, 2023; Bunkcampers, 2022). Tourists can lower their carbon footprint while traveling by using more fuel-efficient and environmentally friendly transportation methods. Furthermore, RVs provide an alternative to typical housing options, potentially reducing demand for hotels and other facilities that may have a bigger negative impact on the environment.

Motorhomes are a popular tourist attraction with a long history and a variety of classes. In Malaysia, the designs are simpler. Websites are essential for connecting businesses with clients, such as motorhomes.my. Motorhomes provide flexibility, comfort, and environmentally friendly travel options. The Malaysian government encourages their growth, and rental websites enable market expansion.

3.0 METHODOLOGY

The research process for creating a website can be divided into numerous parts. First, the researcher must establish the website's goal and target audience. Understanding what the website intends to achieve and whom it is intended for is required. This data will help guide decisions about the website's features, design, and functionality. The following stage is to collect data to help guide the development process. This can be accomplished through the use of surveys, focus groups, user interviews, and the analysis of existing user data. Motorhome website trends and best practices can also be learned from industry publications and studies.

With a firm grasp of the website's purpose and target audience in hand, the researcher may plan the website by developing a detailed project plan that includes a list of features, a timeframe, and a budget. It is critical to estimate the cost of the website. The overall cost will be influenced by factors such as complexity, development team rates, location, and desired features and functions. Costs for hosting and maintenance should also be considered. The development phase entails writing the code that allows the website to function. The programming languages and frameworks utilized will be determined by the platform in question. After the website has been created, it must be tested for functionality and usability. This can be accomplished through either human or automated testing. Any faults discovered during testing must be resolved. In the event of an issue, the researcher must collect information, characterize the problem, identify the main cause, create a patch, and test it before deploying it to the live website. It is critical to communicate with users about any changes or steps they must take. Following the resolution of any detected issues, a final round of testing should be performed to confirm that the website is functional and user-friendly. Once the website has been tested and approved, it can be published on the internet by following the requirements and submission procedures. It is critical to monitor the website once it has been launched to confirm that the problem has been handled and that no new problems have occurred. If any remain, the procedure may need to be repeated.

Creating a motorhome website necessitates the use of software, hardware, and other resources. Testing necessitates the use of mobile devices such as smartphones or tablets, as well as the selection of supported operating systems and device variants. Integration with cloud services and provider selection is required. Software development tools, hardware, cloud services, design tools, testing, deployment, and data management are all part of the process. This project uses a Canva application to design the website. Qualitative research approaches can be used to better understand the viewpoints and experiences of motorhome centers in Bukit Gambir, Johor. Conducting mobile phone interviews with three respondents and transcribing the recordings for analysis are part of this. In-person or remote in-depth interviews with owners and tenants might be structured or unstructured. A motorhome center can host group conversations to gain opinions. Surveys and social media monitoring gather qualitative information on customer satisfaction, suggestions, and developing trends. These strategies can be used individually or in combination to gain significant information about platform user experiences.

4.0 FINDING

The study of the data reveals numerous significant results about the respondents' perceptions of the website. These findings highlight the importance of improving user-friendliness, material clarity, and the inclusion of supplementary information. By resolving these issues and implementing user feedback, the website may improve its

performance, fulfill user expectations, and create higher levels of user happiness and engagement. Regular updates and the supply of comprehensive resources will be critical in accomplishing these goals.

Table 1 : Structure interview finding

No	Item	Finding
	What do you like about our website?	33%
	Is our website user-friendly?	0%
	What would you like to change or add on our website?	100%
	Did you find the content on the website relevant	100%
	Did it take too long to load the website?	100%
	Do you think there was are better way to present the same content?	100%
	Did you face any challenge while using our website?	0%
	How was the experience with our website on your smartphone?	100%
	On the scale of 0-10, how would you rate the usability of our website and why?	5
	On scale of 0-10, how do you rate the clarity of the content?	5
	On scale of 1-10, how likely are you to recommend our website to your friend or family?	6

Item 1: Approximately 33% of respondents expressed a favorable opinion of the website, while others advised that more information be provided and the title be changed. This shows that there is still potential for improvement in terms of content and branding.

Item 2: None of the respondents thought the website was easy to use. This is a key area of concern that must be addressed in order to improve the overall user experience.

Item 3: Respondents stated that the website would be more useful to recreational vehicle members if it featured facility information and contact information for recreational vehicle accessory suppliers. This suggests that the website's content and resources should be expanded to meet the demands of certain users.

Item 4: All respondents agreed that the website's material is relevant, implying that the information offered corresponds to their expectations and interests.

Item 5: While all respondents agreed with the website, it was observed that internet dependence could have an influence on user experience. Some respondents recommended Google as a browser, showing a preference for a dependable and efficient browsing experience.

Item 6: All respondents agreed that the information on the website should be updated on a regular basis. This emphasizes the significance of maintaining materials current and relevant in order to match consumer expectations.

Item 7: Respondents encountered no difficulties while using the website, indicating that its functionality and usability are satisfactory.

Item 8: All respondents had a pleasant experience using the website, reflecting a favorable overall assessment of its performance.

Item 9: Due to its limited nature, 100% of respondents stated that the information on the website still needs to be improved. This underscores the importance of expanding and improving existing content in order to satisfy user expectations and provide a more comprehensive resource.

Item 10: All respondents agreed that the website's content was unclear, highlighting the need for improved information organization, clarity, and presentation.

Item 11: All respondents agreed that more information is required before they would suggest the website to friends or family. This implies that offering more useful and thorough material would increase the possibility of user referrals.

The analysis emphasizes the need for enhancements in terms of usability, content clarity, and the supply of more comprehensive information. Incorporating user suggestions, routinely updating information, and improving the overall surfing experience can increase user happiness and engagement with the website.

5.0 CONCLUSION

Based on the information, the discussion centered around two objectives relating to the motorhome website. The primary goal is to supply consumers with information and make it easy for them to find RVs and popular sites. The second goal is to remedy the website's lack of motorhome information and increase accessibility. According to the responses, the website was successful in reaching its first purpose. Users like the availability of motorhome owners' contact information, which makes it easier for them to find information and communicate directly with owners. This functionality improves the user experience and assists in meeting their needs. It establishes the website as a trustworthy source of motorhome information and services.

The second objective, on the other hand, emphasizes some of the respondents' difficulties. Many visitors reported their frustration with the website's lack of thorough information concerning RVs. This knowledge gap impedes their decision-making process and makes evaluating the available options harder. Furthermore, the reliance on QR codes for information access was noted as a significant impediment, particularly in places with low internet availability. According to respondents, this could be time-consuming and inconvenient. Several enhancements are proposed to address these problems and facilitate wider acceptance of the motorhome website. Collaboration with the Malaysian Motorhome and Campervan Association is a critical improvement. The website can provide more extensive information on motorhomes by integrating information offered by the association, such as forthcoming events, club members, safety guidelines, and available facilities. This relationship will provide users with a reliable and respectable source of information, boosting their faith in the website's products.

Furthermore, other methods of getting information must be considered, especially for people with limited internet connection. Offline options, such as downloaded PDFs or printed brochures, can reach a wider audience and improve accessibility. By applying these changes and responding to customer input, the motorhome website may increase its operation, user-friendliness, and reputation. It will eventually lead to a greater user acceptance rate and create a positive user experience. Future research should look into how proposed enhancements affect user happiness and acceptance. Surveys and testing can be used to evaluate the efficacy of collaboration with the motorhome association, investigate offline choices for information access, and investigate user views of trust and credibility.

Longitudinal studies can analyze user engagement and retention over time. This research will help to improve the website's offers, answer user needs, and provide a comprehensive platform.

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TRACK 4

ELECTRICAL ENGINEERING

Solar Powered Emergency Distress Light and Sound Code Device for Fisherman Boat Using Arduino

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Abstract. The safety aspect is an important feature that needs to be emphasized no matter what vehicle is being used, including when using a fishing boat. Usually, fishing boat users use a life jacket with a whistle as safety equipment if an accident occurs while on the water. On some boats, there are special communication devices used to report emergency situations, and this may involve high costs. This innovation project produces a security alarm device based on sound and light. This siren tool was developed using an Arduino network controller that allows the siren lights to be flashed based on the blinking of 'SOS' in Morse code, which means 'Save Our Soul'. This device works when the alarm switch is activated and can operate for more than 48 hours. It is supplied with a 12 VDC battery that obtains its energy source from a solar panel measuring 80cm by 50cm. The luminescent light produced by this siren device is more than 7000 lx, which can be seen as far as 250 meters during daylight and 380 meters at night. While the sound strength value produced is 106.4 dB, which can be heard as far as 380 meters. This distance value of sound and light is practically observed. The innovative tools produced are able to be used and function practically for the use of fishermen and other watercraft for the safety of users.

Keywords: Solar energy, Morse distress code, fisherman boat, Arduino.

1.0 INTRODUCTION

Seafood plays an essential role in feeding the world's growing population. Healthy fish populations lead to healthy oceans, and it's our responsibility to be a part of the solution. The resilience of our marine ecosystems and coastal communities depends on sustainable fisheries. The fisheries sector is significant to the Malaysian economy for four main reasons: as a source of food and protein; as a contributor to gross domestic product (GDP); as a source of employment; and as a source of foreign exchange earnings. The fishery industry is very important as it is one of the sources of protein. Referring to the Food and Agriculture Organization of the United Nations, in 2017, Malaysia managed to produce about 1.7 million metric tonnes (MT) of fishery products, including 1.5 million MT from captured fish and 0.2 million MT from aquaculture. Even at the time of the COVID-19 pandemic, the Malaysia Fisheries Sector reported that it successfully produced 1.85 million metric tonnes (MT) of fishery resources, including aquaculture, capture fisheries, and inland fisheries, with a value estimated at USD 3.3 billion, which shows the importance of this fishery sector for the country (Azra et al., 2021).

In an effort to increase economic productivity for the fisheries sector, safety features when operating boats and when going to sea must be constantly monitored. Based on the Malaysian Maritime Enforcement Agency, the agency lists some important equipment that must be brought by boat supervisors or fishermen before going to sea, namely navigational help tools, communication equipment, a torchlight, a safety jacket, an emergency box, a fire extinguisher, and a boat hock. Accidents and fatalities may result from failing to abide by boating safety regulations. Boaters and fishermen are also susceptible to weather-related accidents. Every week, boats sink as a result of unpredictably bad weather. Another issue is the absence of safety procedures taken by the locals before going to the beach or the ocean. The tragic capsize of a local fishing boat at Kuala Kemasin, Bachok, Kelantan, should serve as a lesson to the community, especially maritime recreation lovers or fishermen, as 20 local victims were left unprotected and without buoys and other safety equipment (Suzanna Razali Chan, 2020). The following safety precautions should be seriously considered by the community, especially by those who enjoy sea recreation.

The most crucial piece of emergency gear is an emergency notification tool since search and rescue (SAR) crews can easily see or hear them. The important features required for emergency notification tools are that they are user-friendly, portable, energy-saving, and cheap, i.e., without the use of complex technology. Therefore, this innovation project was inspired and developed to become one of the emergency aid tools for fishing boat users. This project is quite helpful in assisting fishermen in overcoming safety concerns, and it has the potential to become an essential piece of gear for a boat in order to avoid things that are undesirable. This initiative was started to make it easier for the fishermen who need assistance due to boat engine failure. The goal of the project is to create a solar-powered emergency notification distress light and sound code device that can attach to a fisherman's boat and is unexpansive, compact, portable, and simple to operate. The light and sound distress code is a nautical emergency signal in Morse code called 'S.O.S', or Save Our Souls. The layout of this project guarantees 360-degree sight. There are several objectives that have been identified in the development of this project, including the creation of a distress light code circuit for fishing boats using an Arduino microcontroller and producing a device that is compact, portable, and easy to assemble on the fishing boat. This innovation project also uses solar energy tools that can help power the project to support sustainable energy.

2.0 LITERATURE REVIEW

In order to implement this innovation project, several studies related to the project and innovation products that have similar functions are sought to be seen and learned onto appropriate methods and to see the weaknesses and advantages of the project. In addition, some important references are explored to see how far this project can be implemented to serve as a useful guide in producing a better innovative product. There is no denying that solar energy is the best way to reduce the carbon footprint, and it does not cause environmental pollution. Not only that, solar energy is a clean and renewable source of energy and does not release any greenhouse gases. There are too many studies and innovative products that successfully apply projects with solar energy and have been proven to be safer, more environmentally friendly, and more economical (Hill, C. A., 2012). For fishermen who use small boats, the use of solar power can certainly reduce their dependence on the use of petrol or diesel fuel for generating electricity.

The results of the search and survey conducted online found that there are many commercial products on the market that have the same goal and purpose as emergency notification tools. Most of them use Very High Frequency (VHF) technology and the Global Positioning System, or GPS (Saravanan, K., 2019), which can be tracked in real-time through satellites that are directly connected to an emergency notification network that definitely uses subscription costs and expensive equipment that may not be affordable for low-income fishermen.

Distress code, which is the special code 'S.O.S' is an emergency code that is familiar to any rescue agency in the world. The 'S.O.S' code is a simple code produced from Morse code, it reads 'dit-dit-dit' as the letter S, dah-dah-dah' as the letter O, and back to 'dit-dit-dit' as the letter S. Apart from sound, this code can be generated based on light flashes. Morse code was first created to replace the human voice, which at that time was not yet a technology. The use of Morse code is still used by uniformed units such as the military and police through shortwave radio communication. A unique feature found in Morse code eventually produced a special code 'S.O.S' known as the distress code, which was inspired by the words 'Save Our Ship' or 'Save Our Souls' which were used before the Second World War or WW2 and are still used today. There are many innovative technologies or products that use the special code feature 'S.O.S' to represent the special notification of emergency situations that are found to be used in various applications, including tracking for child abduction and other emergency situations (Young, R., 2012; Moodbidri, A., and Shahnasser, H., 2017). The use of this special code 'S.O.S' is clearly able to replace the use of sophisticated technology such as GPS and VHF, which is definitely able to reduce the cost of technology and hence affordable to all groups of people, including low-income fishermen.

The results of information gathering show that most innovative products and studies conducted use the code 'S.O.S' to describe emergency situations, and there is also a study of the use of solar technology that shows the importance of the use of green technology in the trend of innovative products. The information obtained from the literature review was then used as a guide and inspiration in completing this project.

3.0 METHODOLOGY

To make this project a ready-to-use product with high safety standards, a comprehensive strategy is being implemented. The methodology is essential to ensuring the project is completed according to the target schedule based on a step-by-step procedure. The project was developed to help fishermen who find themselves in precarious situations, such as boat engine failure in the middle of the ocean or far inland, and facilitate rescue teams in quickly locating the boat's position. The project is light and portable, in addition to being easy to operate and using renewable energy sources. The light it creates is in the form of 'S.O.S', or "Save Our Souls". This signal is a reference to the emergency signal often used by sailors while at sea. In addition, the design of this project has been made to ensure that it can be seen from any angle, complete with 360 degrees.

In this innovation project, an Arduino Uno type microcontroller is used in a closed-loop network system. The Arduino IDE software is used to embed the programming on the Arduino Uno board, which focuses on delaying the ignition of the pin for the signal output around a 3 second interval and repeating it every 1 minute. The project is assembled in a single casing box, where the light beacon is mounted on the top of the box and the solar panel is located outside the box, where it has been mounted in any convenient spot on the fishing boat. Figure 1 shows the basic process block diagram of the relationship between input, processing, and output for the developed project. This project uses two main inputs produced from solar panel energy, which are 9 VDC and 12 VDC to supply the microcontroller and relay, while 240 VAC is used to supply the sound and light beacon.

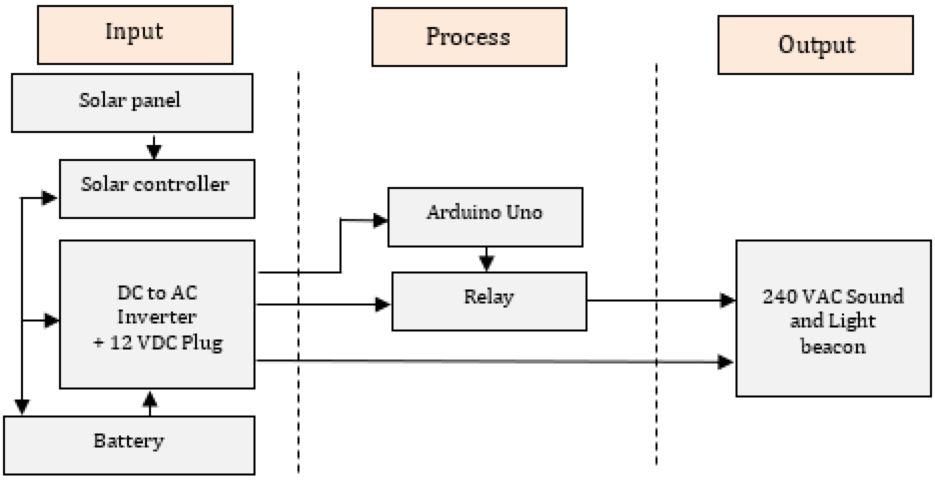


Figure 1: Block diagram of the project.

This project uses some hardware, which is the main electronic and electrical components that are connected, referring to the block diagram produced. This project uses a solar energy system that includes a solar charge controller and rechargeable battery. The solar charge controller controls the voltage and current that are transferred from the solar panels to the battery and back again. The detailed listing of the main components used for this project is as follows: optocoupler PC817, solid state relay SSR-40DA, AC220V lamp bulb rotating emergency beacon lighting, solar panel with an inverter, 12VDC rechargeable battery, and Arduino Uno. Figure 2 shows the connection diagram of the circuit for the developed innovation project.

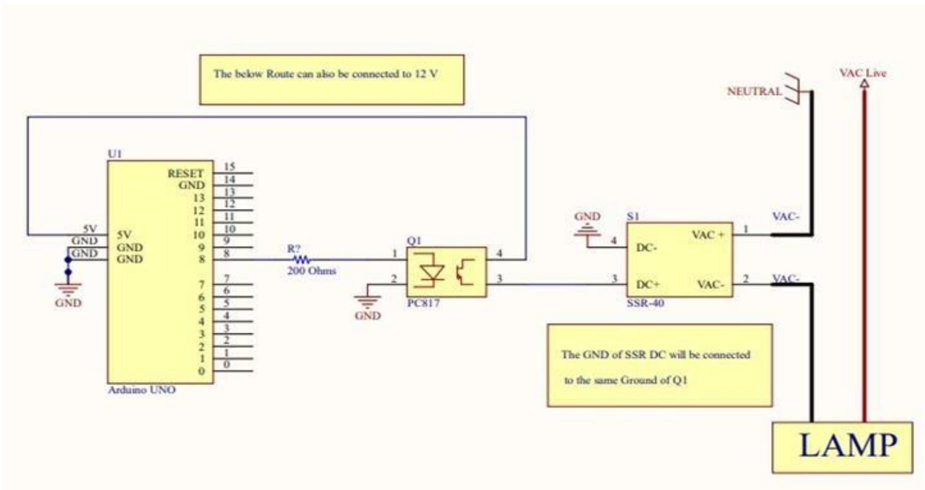
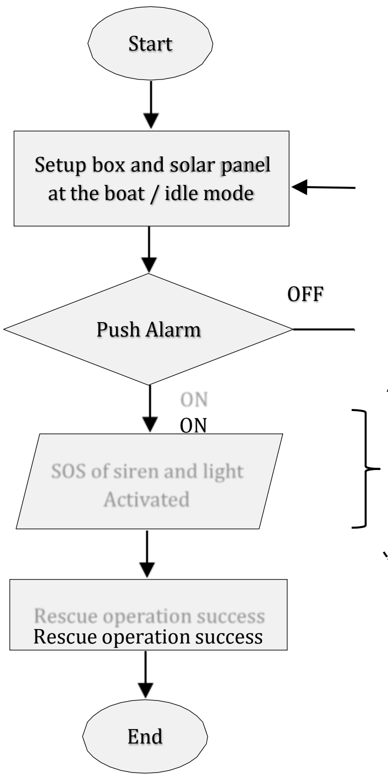


Figure 2: Circuit schematic diagram of the project

Figure 3 shows the simplified process of the flowchart and several main code functions in the Arduino IDE for the operation of the project. This project only works when the switch button is activated and the 'SOS' sound and light in Morse code turn on. To deactivate, simply press the switch button again. This simple operation manual reflected the goal of the project, which was to produce a simple and user-friendly product. Figure 4 shows a complete picture of the exterior of the project that has been produced.




```
/////////////////////////////////////////////
// void SOS_MorseCodeSequence(void);
// This function to generate the sequence
//    of SOS Morse Code
/////////////////////////////////////////////
void SOS_MorseCodeSequence(void) {
  Serial.println("Generating S");
  SoundMorseCode_S();  // S sound Pattern
  Serial.println("Generating O");
  SoundMorseCode_O();  // O sound Pattern
  Serial.println("Generating S");
  SoundMorseCode_S();  // S sound Pattern
}
void loop() {
    SOS_MorseCodeSequence();
  delay(60);
}
```

Figure 3: Simplified operational flowchart and several main code function of Arduino IDE for the project.

Figure 4: Picture finishing of the project

4.0 RESULT AND DISCUSSION

In this section, some important measurement results on innovation product output have been obtained. These results are then used to measure the adequacy of the objectives that have been set. The results of this section are then summarized in detail in the next section, which is the conclusion.

In order to gain insight into the final results and output of the innovative products produced, several methods have been implemented that are based on the measurement of the value of electrical elements, the physical parameters of the object, and scientific measurements of sound strength and light brightness using the appropriate software from a smartphone.

Table 1 shows the specification output for the innovative products. These informations are obtained mainly based on the output of the alarm beacon. In addition, other details are obtained based on the exterior of the project and specifications for rechargeable batteries. The total weight of the project is estimated at approximately 8 kg, with size dimensions of 50 cm x 12 cm x 35 cm, which is easy to carry and can be placed anywhere on the fishing boat. This project uses a small current of 0.5 A to activate the 3 W power rating output from the 240 VAC supply obtained from the solar system. The volume of the alarm is more than 95 dB, with 90 to 150 times per minute of light rotation frequency. Based on the observation of usage testing, the operating voltage range to turn on this product is between 10.2V to 13.8V, which is based on the capacity of the supplied rechargeable battery.

Table 1: Technical output specification of innovation product.

Descriptions	Details
Working rate voltage	AC 240V
Working rate current	0.5 A
Power rating	3 W
Buzzer volume	> 95 dB
Rotating frequency	90 – 150 times/min
Product box	Hard plastic
Product dimension	50 cm x 12 cm x 35 cm (approx.)
Gross weight	8kg (approx.)
Box color	Blue black
Battery rating operation	10.2V – 13.8V

Table 2 shows the data for the output test results performed on innovation products based on the observation method. The data in the table shows that the maximum distance for human vision to detect light from the output of this project is approximately 250m during the day and 380m at night. The difference in distance between day and night is due to sunlight drowning out the amount of luminance emitted by the alarm. While the maximum listening distance that humans can successfully hear when the alarm device of this project is activated is approximately 380m. It can be seen that the maximum distance for visibility and hearing is relatively lower than it should be. In the worst-case scenario, which is during an emergency situation in the middle of the ocean, this device should be visible and audible at least at a distance of 5 kilometers. These data are obtained using simple observations, which lead to incorrect distance estimates and less accurate results. The testing is done on the land site by placing it in a certain open space location and marking it on a printed map. Then, using the senses of the eye and ear, the last observable distance was recorded and marked on the map. The measurement is made based on the estimated distance between two marked locations on the map. The location map is obtained from Google Maps. However, roughly speaking, the actual distance for this project might be within the range of 0.5 km to 1km.

Table 2: Findings data for sight and hearing distances of emergency alarm devices

Description	Results
Maximum distance is seen by daylight	~ 250 meters
Maximum distance is seen by night view	~ 380 meters
Maximum distance heard by the human ear	~ 380 meters

Table 3 shows the data of measurement results obtained from observations using the Android software application, namely Lux Light Meter - Illuminance produced by Mirco Inc and Decibel X:dB Sound Level Meter software produced by SkyPaw Co. Ltd. This application can be obtained for free on the Google Play Store. The results show that the sound power value produced by this innovative product is 106.4 dB. While the total light brightness value of more than 7000 lx is obtained from the Lux Light Meter software.

Table 3: Findings data for sound decibel and illuminance measurement

Description	Results
Maximum sound decibel measured	106.4 dB
Maximum illuminance measured	> 7000 lx

The information obtained shows that the project is safe to use at close range and can be heard or seen at a long distance. In addition, the results obtained from this innovation project show that it has succeeded in targeting all the objectives of the project, which is to produce an electronic circuit that can turn on the emergency lights and sounds based on the 'S.O.S' code that uses Arduino Uno micro-controllers for the use of fishing boats. The data of the results obtained also support the fact that this innovation project was successfully produced in a compact, light, portable, and easy-to-install form on a fishing boat. This project has also successfully used a solar energy system that is able to preserve the environment in addition to giving added value to commercialization elements.

5.0 CONCLUSION

It can be concluded that an innovation project titled "Solar Powered Distress Light and Sound Code Device for Fisherman Boat Using Arduino" has been successfully developed and has been proven to work well and safe. This device has been successfully designed for the purpose of sending an emergency signal by using a siren light to notify or warn any nearby boats of help in the event of significant danger or a situation requiring immediate assistance. This device is programmed using an Arduino Uno to emit the signal code "SOS" which means "Save Our Souls" or "Save Our Ships" in Morse code. This equipment has been tested to be easily heard from a distance of at least 380m and can be easily seen at a distance of at least 380m at night and 250m during the day.

For the purpose of improvement, several suggestions and approaches have been identified to be highlighted in the future, namely by improving the circuit system and replacing necomponents that are more robust and durable, including the use of solar panels that have a faster charging rate. The exterior finish of the project will also be improved by using special coating paint that is resistant to the effects of river water or salt water, as well as reflective paint for the box case and switch buttons. In addition, the additional use of an automatic GPS tracker is needed to be placed on the project, and it can be accessible to everyone on a smartphone based on the given internet protocol (IP) address or website link.

Lastly, this project has a potential impact as one of the useful alternatives in supporting rescue efforts for any boat stranded in the waters, especially in the middle of the ocean. With this product, it is hoped that it can be applied to fishing boats or any type of boat that uses amedium, such as a river, lake, or ocean, as a route. The use of Morse code "S.O.S" is an elementthat needs to be highlighted to the public so that more relevant parties understand the meaning of the code. This project successfully achieved the goal and objective of producing a solar-powered emergency signal device for the use of fishing boats. Nothing is more important than saving human lives, and this product hopefully proves that.

ACKNOWLEDGEMENT

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The Development and Utilization of the Basic Circuit Training Kit (BCTK) as a Teaching and Learning Aid

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Abstract. In order to aid students in understanding the subjects they are learning, a student-centered learning approach should be implemented to enhance teaching. One example of a teaching aid is the Basic Circuit Training Kit (BCTK), an innovative kit designed and utilized for the courses Electrical Technology (DET10013) and Electrical Circuit (DET20023). The need for this kit arose due to the malfunction of existing teaching aids, which hindered the acquisition of accurate readings. Therefore, the BCTK was designed and used in the Department of Electrical Engineering, Politeknik Tuanku Sultanah Bahiyah (PTSB). The primary objective of designing this kit was to create a more practical and student-centered teaching aid that could yield better results. The kit was also designed to be user-friendly for both students and educators and to assess its effectiveness. The implementation process followed the ADDIE Model, consisting of five phases: Analyze, Design, Develop, Implementation, and Evaluation. The effectiveness was evaluated by distributing questionnaires to 54 respondents, including first and second-semester students taking the Electrical Technology and Electrical Circuit courses at PTSB. The questionnaires consisting of 20 Likert-scale items divided into 4 sub-topic categories: motivation, design, application understanding, and kit usability comfort. The analysis of the minimum scores shows that each assessed aspect scored above 4.00, with the design aspect and user comfort receiving the highest minimum scores of 4.54 and 4.67 respectively. The findings of this innovative design demonstrated that it is a motivating, well-designed, and comfortable teaching aid for the users.

Key Word: basic circuit, training kit, student-centered, electrical technology, electrical circuit

1.0 INTRODUCTION

The misconception that electrical engineering is a difficult subject among students is made worse by the use of ineffective teaching methods in the classroom. This circumstance calls for action in the search for technology solutions that can be created or designed to enhance the delivery of instruction. Because they serve as the foundation for electrical engineering, the electrical circuit and electrical technology courses are fundamental concepts that call for extremely high proficiency. This will require deft manipulation, logical reasoning, and care to assure accuracy. This is covered when they enroll in practical sessions, where the theory is also applied to training that takes the form of installations. To create positive results, an efficient delivery plan is required.

In order to properly accomplish the process of knowledge transfer from lecturers and ensure that students can acquire the fundamentals, interactive learning is provided through this kit. If students are actively engaged in the learning process, teaching aids that support the delivery of the instruction will be more successful and may attract their interest. To prevent the education sector from becoming out of date, it is crucial to change instructional aids through learning. The teaching and learning process now has a new look as a result of the adoption of the current technological revolution in education, which promotes variety and creativity across the educational landscape of the country. The use of innovative teaching tools in the classroom, such as models, creative kits, or teaching and learning simulations, facilitates students' problem-solving in the course they are taking. The benefits of learning media clarify the delivery of material learning messages so that they can increase student attention and interaction and can equate student perceptions (Hamid, et al., 2020). TVET (Technical and Vocational Education and Training) graduates are expected to demonstrate a range of competencies. These competencies encompass the ability to think logically, critically, creatively, and innovatively when making decisions. Furthermore, TVET graduates are anticipated to possess the necessary skills to effectively analyze and solve complex problems. These attributes contribute to their overall preparedness for the demands of the professional world.

Studies have shown that 'hands-on' learning can aid in developing skill (Shamsudin & Hassan, 2021). And a study was carried out by Wan Mustaffa & Halim (2016) in which one of the 'hands-on' learning activities included electric circuit kit activities. Students will operate the equipment on their own, based on their understanding of the theory they have acquired, thanks to the "trainer," which tries to put this into practice. Students' misconceptions about electrical circuits can be reduced by teaching through hands-on experiences. This is so that students are able to absorb abstract and complex ideas through their own independent research. Additionally, in order to ensure precise output, teaching aids must be in good condition. Insufficient provision of learning aids by institution is identified as one of the factors contributing to students' lack of interest in learning, particularly in the context of practical training programs. When schools do not have adequate facilities to support hands-on learning experiences, it can hinder students' engagement and motivation. The absence of necessary resources and learning aids can limit students' ability to actively participate in practical activities, diminishing their overall enthusiasm for the learning process.

In general, training aid can be divided into two types: electronic media and non-electronic media. The innovated training aid in this case is through non-electronic media, specifically in the form of model kits to obtained this objective:
Designing a more practical and learner-centered teaching aid that enables good learning outcomes.
Designing a teaching kit that is user-friendly and suitable for both students and educators.
Evaluating the effectiveness of its usage.

2.0 LITERATURE REVIEW

Teachers need to be creative in designing appropriate teaching methods and utilizing teaching aids to stimulate students' potential to a high and effective level. In this regard, the success of the kit can greatly assist students in connecting theory with practical applications, which can be achieved through the use of the teaching kit.

According to Farrokhnia & Esmailpour(2010) it is stated that comprehensive learning of electric circuits is more effective when conducted through a combination of virtual and physical laboratories. By incorporating both virtual and physical laboratory experiences, students can gain a more holistic understanding of electric circuits and their practical applications. This approach allows for a well-rounded learning experience that bridges theoretical concepts with hands-on experimentation, enhancing the overall learning outcomes in the field of electric circuits.

Anwar, Triyono, Ta'ali, Hidayat, and Syahputeri (2021) noted that, the absence of adequate laboratory equipment for supporting practicum activities has hindered students from attaining skill competency. As a result, there is a pressing need for a trainer kit, which serves as effective learning material for practical activities. The trainer kit can bridge the gap caused by the lack of laboratory equipment, providing students with a hands-on learning experience and enabling them to develop the necessary skills and competencies required in their field of study.

Trainer kits designed by Sillang, Patricia, & Fata (2020) are ideal for implementing fundamental knowledge in various electronic professions during practical tests. Where this are designed to support activities such as building, testing, repairing, and overall testing processes. A research study by Hashimuddin & Hassan (2020) has been carried out to find out the level of effectiveness of using the trainer Kit in improve students' understanding of the skills of connecting electronic circuits.

Ariffin & Mokhtar (2015) production of the kit has proven to be beneficial in enhancing students' understanding. The kit offers the advantage of portability, allowing students to utilize it not only during practical sessions but also during theory classes. This versatility enables students to apply their knowledge and engage in hands-on learning experiences, both inside and outside the classroom. By integrating the kit into theory sessions, students have the opportunity to reinforce theoretical concepts through practical application, resulting in a more comprehensive understanding of the subject matter.

Furthermore, there have been modifications to the transparent kit. Zahri & Osman (2019) designed kit features a circuit printed on a transparent surface along with "plug-in" components. This design aims to facilitate the circuit processing for students, thereby enhancing their understanding. The transparent nature of the kit allows students to visually analyze and comprehend the connections and components within the circuit more effectively. By providing a user-friendly interface, the kit simplifies the learning process and promotes a deeper understanding of circuitry concepts.

While Ismail, Abd Rahim, & Haris, (2022) teaching aids have demonstrated a positive impact on student understanding and interest in the course, even in situations where students are learning remotely and are physically distant from the lecturer and laboratory. These teaching aids, designed by Ali, effectively supplement the learning process by providing visual and interactive materials that enhance student comprehension. By utilizing these aids, students can actively engage with the course content, fostering a deeper understanding of the subject matter. Moreover, the use of these teaching aids helps sustain student interest and motivation, even in non-traditional learning environments, by offering an interactive and stimulating learning experience.

The design of "Digital Trainer Book Kit" by Mohammad, Halim, Jamil, & Abdul Razak, (2018), has a book concept to overcome the problem of the conventional "Trainer Board". This kit, has four main components, namely test book, conductive pen, electronic module kit and sheet metal. And it is with a small scale and more conducive need to be developed for the use of students and lecturers to overcome traditional trainers that are large in size and high costing.

3.0 METHODOLOGY

The methods employed in creating a quality kit should be well known. This is done in order to make the kit design process more organized and systematic. The ADDIE Model served as a guide for creating this kit, Figure 1 during its development. The analysis phase, design phase, development phase, implementation phase, and assessment phase are the five phases that make up the ADDIE Model in total. The procedure for creating this kit was translated into a framework for kit development, like Figure 2, which was modified from the ADDIE Model (Koohang & Harman, 2007).

Figure 1: Basic Circuit Training Kit

The Analysis phase, according to this construction paradigm, is a phase in which the kit's goals and requirements are established. This stage will reveal whether the teacher was successful in facilitating the student's learning. The design phase, which comes after that, involves figuring out how to make the kit ultimately suit the demands of the students as described by (Nasohah, Che Razali, & Jalil, 2015).

This step translates to kit specifications, such as Figure 2, which is a circuit, and the other components and tools that should be in the kit are highlighted as this is a crucial skill that students will acquire in accordance with the demands of the laboratory. In this phase of development, the design is converted into a kit, model, or prototype, which is then assessed and tested to check if the analysis and design requirements have been met. The kit is utilized by the faculty throughout the fourth phase of implementation, after which it is taught to the students. Improvements and purifications are made to the kit throughout this procedure in response to any flaws discovered during execution. The evaluation phase, the last step in the kit's creation, is when it will be determined whether the primary objective was achieved as well as whether the kit's fundamental analysis needs were satisfied.

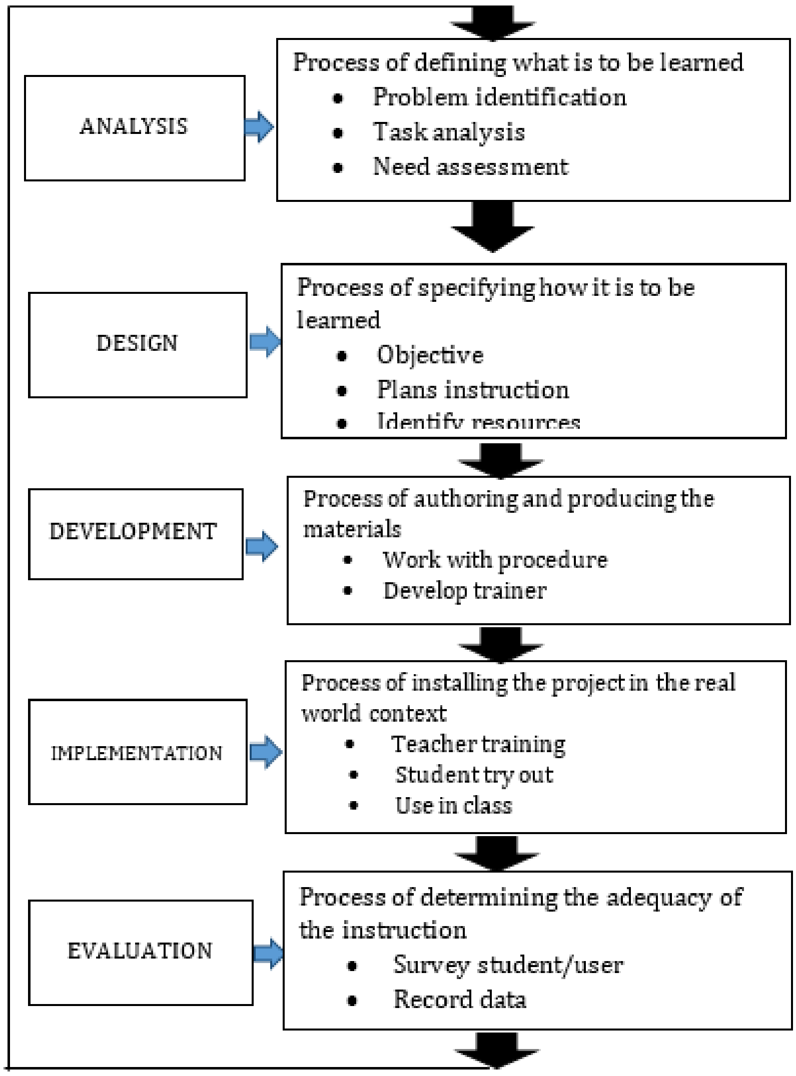

Figure 3: The modified framework of the kit, derived from the ADDIE model
(Koohang & Harman, 2007)

Figure 2: The layout of the circuit from upper side.

Figure 2 show the layout of the circuit of BCTK. This circuit consists of five practical circuits tailored to the hands-on experience provided in the practical class. These circuits are categorized into both series and parallel configurations, allowing students to select the most relevant circuit for their specific practical task. Moreover, the circuits can be adapted to accommodate varying component quantities; in cases where components are not available, direct wire connections can be made to the connectors. In terms of input sources, it is equipped with integrated DC inputs, including 10V, 7V, and 5V. For AC input, direct connections to the function generator are possible. Additionally, the circuit setup includes a multi meter assembly for conducting measurements.

4.0 RESEARCH FINDING AND ANALYSIS

An analysis of the effectiveness study was conducted in the form of an adapted questionnaire based on a study by Nor, Selamat, Johari, and Omar (2005), where a pilot study was carried out and obtained an alpha value of 0.8446. However, the questionnaire was adjusted/improved to align with the innovations of the constructed kit. The collected data was then used to calculate the total number of students for each item and scale. Prior to that, the items were categorized into four categories: motivation, design, application understanding, and kit usability comfort.

The assessment was conducted on 54 students, including 27 first-semester students taking the DET10013 (Electrical Technology) course and 27 second-semester students taking the DET20033 (Electrical Circuit) course. Regarding the effectiveness of this innovation development, it involved a questionnaire consisting of 20 Likert-scale items divided into 4 sub-topic categories: motivation, design, application understanding, and kit usability comfort. The Likert scale positions are as follows, as shown in Table 1.

Table 1: Likert Scale

Scale	Option
1	Strongly Disagree
2	Disagree
3	Somewhat Disagree
4	Agree
5	Strongly Agree

The data and information obtained from the questionnaire were processed and analyzed to obtain meaningful results or findings regarding its effectiveness. The data obtained is in quantitative form and is analyzed based on min scores. The interpretation of the min score from the research findings through the questionnaire assessment on students' evaluation of all aspects was analyzed using a min score level consisting of four levels, as shown in Table 2.

Table 2: Minimum Score Level

Interpretation	Scale	Usage Level	Min Range
High	5	Strongly Agree	4.5 until 5.0
	4	Agree	3.5 until 4.4
Moderate	3	Somewhat Disagree	2.5 until 3.4
Low	2	Disagree	1.5 until 2.4
	1	Strongly Disagree	1.0 until 1.4

Source: Oxford (1990) in (Razaki, Nafi, & Nasir, 2020)

Here is Table 3, which presents the demographic characteristics of the respondents involved in the survey on the usage of this innovation. All respondents are among the 54 students.

Table 3: Demographic Characteristics of Respondents

Demographic Characteristics		Frequency	percent (%)
Age: 18-20		54	100%
Semester	Sem 1 Sesi 1 22/23	27	50%
	Sem 2 Sesi 2 21/22	27	50%

The respondents were selected because all of them are enrolled in courses that require the use of basic circuits, namely the Electrical Technology and Electrical Circuit courses. The distribution of the questionnaire involved 27 students (50%) from the first semester who are taking the DET10031 (Electrical Technology) course. The remaining 50% (27 students) are from the second semester and are enrolled in the DET20023 (Electrical Circuit) course.

4.1 Analysis of Motivation Data

From the above Table 4, it can be observed that the average min score falls within the Agree range, with an overall average of 4.37. This indicates a high level of motivation. The highest min score is recorded in statement 3, with a score of 4.46. This clearly demonstrates that the respondents are more motivated to engage in the teaching and learning process with the use of the developed kit.

Motivation is considered one of the important elements that enable students to actively engage, while making the learning process take place in a meaningful and enjoyable situation. Furthermore, motivation is crucial in determining learning objectives, as it drives individuals to act and strive towards their desires, goals, or achievements. When students are motivated, they are more likely to be enthusiastic, focused, and engaged in the learning experiences.

Table 4: Min Scores for evaluating the motivational aspect

Item	**Statement**	**Min**	**level**	**interpretation**
1.	I enjoy using the Basic Circuit Training Kit (BCTK)	4.28	Agree	High
2.	The practical process using this kit motivates me to delve into the field of electricity.	4.44	Agree	High
3.	The learning and teaching process using this kit sparks my interest	4.46	Agree	High
4.	The kit provides me with the opportunity to personally try and understand basic circuits	4.22	Agree	High
5.	The kit provides me with the opportunity to personally engage in practical exercises	4.44	Agree	High
Overall Score		**4.37**	**Agree**	**High**

4.2 Analysis of Design Aspect Data

Table 5 shows the min scores for evaluating the design aspect. The table indicates that the overall average min score for evaluating the development of the Basic Circuit Training Kit (BCTK) in terms of interface design falls within the High range. The overall average min score obtained is 4.54. It can be observed from item 10 that the highest min score is obtained with a value of 4.70, while the lowest min score is 4.31, which still falls within the High interpretation.

Table 5: Min Scores for Evaluating the Design Aspect

Item	Statement	Min	Level	Interpretation
6.	The kit provides an easy and organized wiring method	4.56	Strongly Agree	High
7.	The components in the kit are suitable and relevant to the learning process	4.65	Strongly Agree	High
8.	The kit is suitable and facilitates activities based on the level of circuit learning	4.31	Agree	High
9.	The overall design accurately represents the process of basic circuitry	4.50	Strongly Agree	High
10.	The provision of this kit does not pose any harm to the user	4.70	Strongly Agree	High
Overall Score		**4.54**	**Strongly Agree**	**High**

The selection and evaluation of design play a crucial role in ensuring that the materials used for teaching and learning are suitable for achieving the desired teaching objectives and align with the level of achievement and abilities of the students. The proper selection of design involves careful consideration of the needs, goals, and specific characteristics of the learning environment and desired outcomes. It involves selecting relevant, engaging, and appropriate teaching materials, resources, and strategies for the intended learning outcomes. Through evaluation, educators can gather feedback and data to determine whether the materials meet the intended goals, address student needs, and support their progress. It allows for identifying any adjustments or improvements needed to optimize the teaching and learning experience. Overall, the selection and evaluation of design ensure that the materials used in teaching and learning are carefully tailored to meet the objectives and needs of the students, promoting effective and meaningful learning experiences.

4.3 Analysis of Application Understanding Data

Based on Table 6, the highest shared min score is for items 11 and 12, which recorded a min score of 4.56. On the other hand, item 14 is the lowest statement in this section, with a min score of 3.98. This statement indicates that the BCTK can train students/users to understand basic circuits in electrical courses. The overall average min score for the evaluation of the application understanding aspect is 4.70, indicating a high interpretation.

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Table 6: Min values for the assessment of the application understanding aspect

Item	Statement	Min	Level	Interpretation
11	The process involved in using this is explained in detail	4.56	Strongly Agree	High
12	The kit provides me with a clear understanding of the application of basic circuits	4.56	Strongly Agree	High
13	The kit can train students to make series and parallel circuit connections	4.50	Strongly Agree	High
14	The kit can stimulate the development of ideas in basic electrical circuits	3.98	Agree	High
15	I feel that the use of this kit is highly suitable in the teaching and learning process	4.70	Strongly Agree	High
	Overall Score	**4.46**	**Agree**	**High**

From this understanding assessment, it can be seen that students/users strongly agree that this kit can help and enhance their learning understanding. Indeed, the basic circuit kit can be a meaningful tool in assisting students in improving their understanding of electrical learning. The basic circuit kit can support and enhance their learning through hands-on experience, experiential learning, concept reinforcement, independent exploration, and real-world application (theory and real-world application). When this innovation is used, active learning is applied as students will exploit the innovation themselves. The best teaching and learning environment is created when educators can utilize the kit to stimulate all the students' senses and provide engaging active learning that captures their interest, attention, sharpens their thinking, and develops their creativity.

Overall, the basic circuit kit provides students with practical and interactive learning experiences, fostering a deeper understanding of circuit concepts and real-world applications. The interpretation suggests that the respondents highly agree that the kit enhances their understanding and learning experience in the field of electrical circuits.

4.4 Analysis of user comfort data

Based on Table 7, the highest min score is obtained for item 20, which recorded a min score of 4.78. Three out of the five statements received a "Strongly Agree" level, while two statement reached the "Agree" level. However, the level for all five items is still within the high interpretation range. The overall min score for this survey question is 4.57 (Strongly Agree), leading to a high interpretation. This shows that the use of the BCTK is easy and enjoyable for users.

This data shows that the BCTK innovation has been successful overall in attracting interest to teaching and learning and is highly innovative in providing new ideas to users. Through the use of this innovative kit, it can serve as a resource that enables students/users to understand basic concepts and motivates them.

Table 7: Minimum scores for assessing the aspect of user comfort

Item	Statement	Min	Level	Interpretation
16	This kit is easy to use	4.72	Strongly Agree	High
17	I did not experience any difficulties during wiring and circuit connections	4.43	Agree	High
18	Every instruction provided in the user manual is easy to understand and implement	4.50	Strongly Agree	High
19	I do not need to prepare many additional/supplementary equipment to perform the experiments	4.44	Agree	High
20	I feel that using this kit is highly suitable for the teaching and learning process	4.78	Strongly Agree	High
	Overall Score	**4.57**	**Strongly Agree**	**High**

After analysing (Sapon, Mad Yunus, & Jaffar, 2023) the desired four aspects, motivation is interpreted as high when the overall score is 4.37. Likewise, for the design aspect, a high interpretation is obtained with an overall score of 4.54. Both 4.46 and 4.57 are interpretations for the understanding and comfort aspects, respectively. Table 8 shows the interpretation level for the min range of each assessment aspect. Based on this table, the interpretation level for all assessment aspects is high.

Table 8: Interpretation level for the min range of each assessment aspect

Aspect	Overall Min Average	Interpretation
MOTIVATION	4.37	High
DESIGN	4.54	High
APPLICATION UNDERSTANDING	4.46	High
USABILITY	4.57	High

BCTK kit has been successfully developed and proven to be effective. The survey conducted on this kit shows that overall respondents have a high interpretation that the kit is useful in the teaching and learning process. The analysis of the minimum scores shows that each assessed aspect scored above 4.00, with the design aspect and user comfort receiving the highest minimum scores of 4.54 and 4.67 respectively.

4.5 Comments and Suggestions from questionnaire

There is a section for comments and suggestions included in the conducted survey. Table 9 below summarizes some of the comments and suggestions provided by the respondents. The comments and suggestions from the respondents indicate that the kit is highly suitable for beginners in dealing with circuits and is easy to understand.

They praise the effectiveness of the kit for understanding and learning circuits, noting that it resembles a real circuit and is easily visualized. There is also a suggestion to eliminate the use of a switch, as it can cause confusion when not turned on.

Table 9: Summary of respondent's comments and suggestions

No.	Comments and Suggestions
1	Very good for beginners in dealing with circuits and easy to understand
2.	An excellent material to use.
3.	Switch is not necessary as it confuses students when it is not turned on.
4.	In my opinion, this tool can help understand and learn circuits.
5.	The kit resembles a real circuit, easy to visualize.

5. 0 CONCLUSION

The BCTK serves as an enhancement tool that can be utilized in learning, developed, and adapted according to the current conditions and learning objectives. The primary objective of designing this kit has been successfully achieved, as it provides a more practical and student-centered teaching aid that facilitates effective learning outcomes. The kit is designed to be user-friendly and suitable for both students and educators, and its effectiveness has been interpreted as high in the evaluated aspects. The study's findings and analysis indicate that the use of the BCTK as a teaching and learning aid is effective. The results show that the BCTK motivates students, has a good design, provides a good understanding, and offers comfort to users. Overall, the respondents provided positive evaluations of the BCTK in all the assessed aspects.

The learning process becomes more engaging, with active interactions among students and an improvement in their understanding of the subject matter. The kit allows students to have hands-on experiences, involving their senses and personal engagement in the learning process. With the presence of this kit, the role of educators is not limited to theoretical teaching to fulfill the curriculum requirements. As stated by Sapon, Mad Yunus, & Jaffar (2023) the availability of teaching kits leads to an improvement in practical handling skills and facilitates the lecturer's tasks, ultimately enhancing productivity by allowing them to deliver additional information to students.

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A Proposition of Portable and Cost-Effective Healthcare Monitoring System Using ESP8266 and Blynk Application

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Abstract. The impact of COVID-19 across the country has changed people's atmosphere, style, and daily routine. Many studies have shown that the use of treatment tools in hospitals and clinics has to some extent increased the spread of the COVID-19 epidemic. Therefore, this study was carried out to develop an IoT application to monitor the health of individuals with COVID-19 symptoms that can be done when they undergo self-quarantine at home. Most of the existing applications in the market only detect one value and are high-cost. This IoT application is an affordable and cost-effective application with its development using an ESP8266 microcontroller device that controls the MAX30100 Pulse Oximeter sensor and DS18B20 Temperature Sensor. The use of the Blynk application is to control all those components through a smartphone. Several tests have been performed on several samples, showing that this application has worked successfully as planned. The displayed record of temperature, heart rate, and oxygen level in accurate values successfully shows and differentiates between ordinary and unhealthy people. This study proves that by simply using a combination of sensors to detect some important health data for an individual, self-monitoring can be done anywhere at any time with a reasonable cost. Indirectly, it can curb the spread of the COVID-19 epidemic from continuing to increase.

Keywords: IoT, healthcare, treatment, temperature

1.0 INTRODUCTION

Health monitoring from home is part of remote patient monitoring which is the latest option to get the new normal way of health consultation. Health devices are amazing tools because they help individuals monitor their condition and improve their health. Continuous health monitoring helps patients and doctors take the right action in terms of treatment based on records of blood pressure, blood glucose, body temperature, pulse, heartbeat, and breathing (Dr Wong, 2021). Nowadays treatment at the hospital or clinic will be troublesome for people at certain times especially the kids because they will be susceptible to various diseases, especially during the ongoing COVID-19 pandemic across the country. Health parameters such as temperature, oxygen level, and heart condition can help detect Covid-19 virus infection earlier. Internet of Things (IoT) based health monitoring systems are potentially immensely beneficial for everyone to make sure they can monitor their health level especially when the Covid19 symptoms have appeared. Meanwhile, the existing systems in the market are usually expensive and cannot easily produce a proper health record to be monitored regularly. Besides, the data sometimes is not accurate. Valuable data need to be collected to improve the care provided which is the access to care, to increase the quality of care, and to reduce the cost of care. Therefore, this study was carried out to develop an IoT application to monitor the health of individuals with Covid19 symptoms that can be done when they undergo self-quarantine at home.

2.0 LITERATURE REVIEW AND HYPOTESIS

Internet of Things (IoT) based health monitoring systems are potentially immensely beneficial for COVID-19 patients. This study presents an IoT-based system that is a real-time health monitoring system utilizing the measured values of body temperature, pulse rate, and oxygen saturation of the patients, which are the most important measurements required for critical care (Hindawi, 2021).

According to The Star, 8 Jun 2022, it is impossible to monitor the parent health of people in remote areas during Malaysian movement control. So, this project introduced a method that continuously monitors the parent's condition and automatically sends the data to the apps, so people can access the data continuously and people can intimate caretaker when parents are in an unstable condition. In previous methods, monitoring of parents can be done only by using different instruments for different parameters. So, this project decided to monitor the required conditions of parents by assembling different instruments in a single module. The project recorded the data of each sensor and uploaded the data into the application.

2.1 Previous Method of Healthcare Monitoring System

There is a lot of available methods that use health monitoring system. However, every method has its own advantage and disadvantage belong to themselves by using own safety measures. According to Anaanda Mohon Ghosh, 5th 2016, this project is built for the cloud as well as IoT (Internet of Things) and mobile technologies to make it easier to monitor patient health conditions by sharing health information with health care teams such as doctors, nurses and specialists. The project will allow guardians along with doctors to remotely monitor the health conditions of patients via the internet. So, remote monitoring and guidance awareness by sharing information in an authenticated manner is the main focus.

IOT Based Health Monitoring System are built for monitoring the health parameters of coma sufferers (P Vinu, 2020). Temperature, Heartbeat, and SPO2 (Peripheral Capillary Oxygen Saturation) sensors for fetching the patient's body temperature, coronary heart rate, eye movement, and oxygen saturation percentage of the patient. The patient's vital parameters are transmitted to the smart telephones and laptops of the legal individual by the use of a cloud server. According to Subhash Chand Gupta, 2018, the objective of this project is specially to monitor old age patients and inform doctors and loved ones. Temperature and heartbeat sensor for tracking patient health is used in this project. Both the sensors are connected to the Arduino-Uno. To track the patient's health microcontroller is in turn interfaced to an LCD display and wi-fi connection to send the data to the webserver (wireless sensing node). As a result, the system shows the patient's temperature and heartbeat tracked live data with timestamps over the Internetwork. Health monitoring using the Internet of Things (IoT) is used to trace patient's health with the assistance of sensors and the internet. The system can keep track of the patient's pulse rate, eco rate of heart, pressure level rate, and temperature. As a result, this will be alerting the user concerning the patient standing over IOT and additionally shows details of the heartbeat and temperature of the patient live over the internet (S Sundar, 2019).

According to Vivek Pardeshi, 2017, health monitoring systems using IoT and Raspberry Pi - A review is a project that monitors health problems like cardiac failure, lung failures & heart-related diseases that are arising day by day at a very high rate. The project will be developed a brilliant and inexpensive health monitoring system for providing more comfortable living to people suffering from various diseases using leading technologies like wireless communications, wearable, and portable remote health monitoring devices. Thus, visits of doctors to the patient constantly are decreased as the information regarding patient health directly reaches to doctor's monitor screen from anywhere the patient resides.

3.0 RESEARCH METHODOLOGY

A NodeMCU ESP8266 microcontroller is used in the development of this system with a link to the Blynk application that requires an authentication token every time it is used. The ESP8266 is a wire-tap module that connects to any internet connection. The Blynk application on a smartphone is connected via Wi-Fi or any ISP used. The programming of this system uses the Arduino IDE loaded into the ESP8266.

3.1 Application Design

This system is designed using the NodeMCU ESP8266 module. Later, this MAX30100 Pulse Sensor will detect the heart rate and will respond by emitting a display on the sensor screen as it is to notify that there is a reader of the patient's heart rate. Furthermore, DS18B20 Sensor will scan body temperature and the result will be seen on the apps. The microcontroller will be programmed using Arduino IDE by adding the name of SSID and password of internet access. The Blynk application eventually will relate to the NodeMCU through the project authentication token when the project at Blynk is created. Figure 1 illustrated the connection of this project.

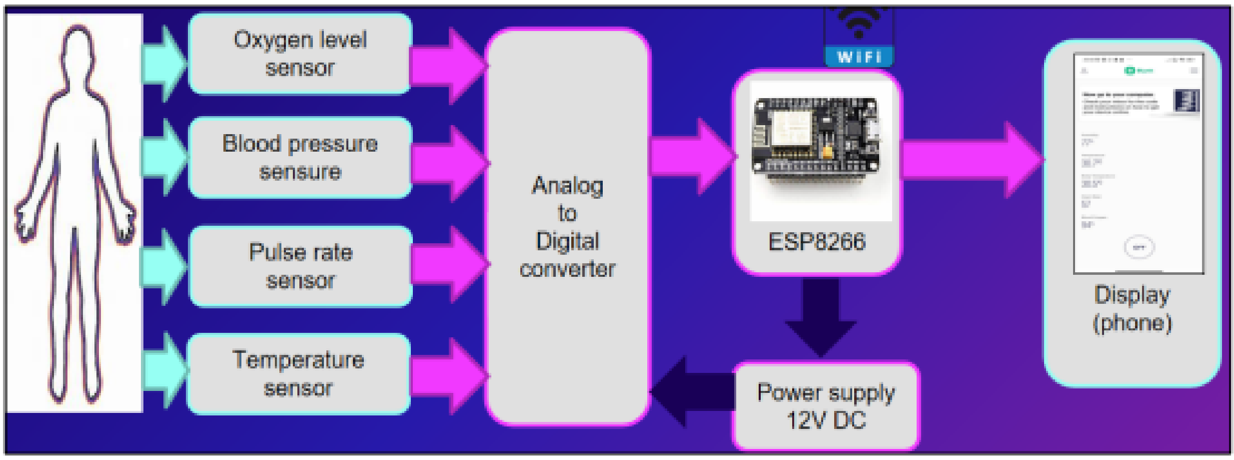

Figure 1: Block Diagram

3.2 Flowchart of the System

Figure 2 illustrates the sequential steps involved in a health monitoring system. The purpose of this system is to track and manage various aspects of patient health and well-being. This system will initially detect heart rate readings, body temperature, and oxygen value and then identify the value. If the Oximeter and DS18B20 readings are inactive, the system needs to restart to detect the readings. If successful, the Blynk Application will display the reading value on the mobile phone.

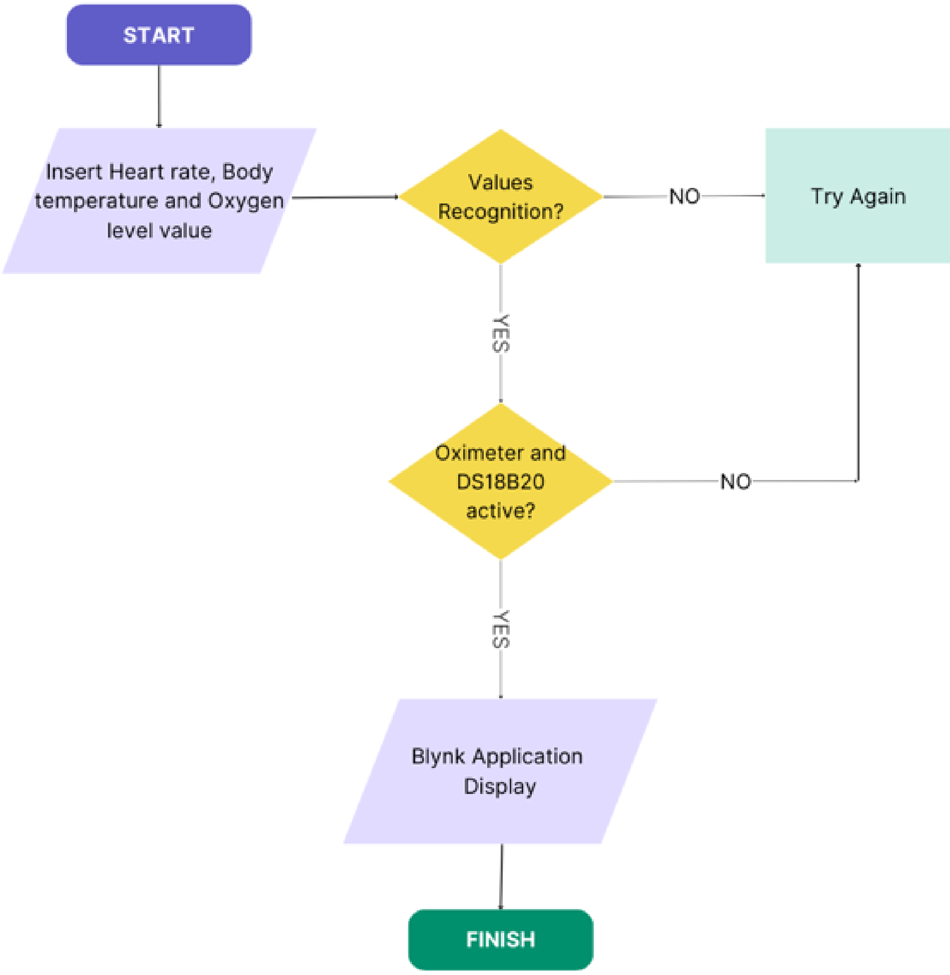

Figure 2 : System Flowchart

4.0 RESULT AND ANALYSIS

This project at last demonstrates the function of the entire endeavour once the product is prepared. The MAX30100 pulse sensor detects the oxygen level and heart rate. While DS18B20 temperature sensor and DHT11 humidity detect body temperature. It is then processed by the microcontroller, which in this case is an ESP8266, and the level of oxygen and heart rate is displayed on the phone using Blynk application. For instance, a group of Politeknik Merlimau samples have been asked to test as part of this project. To begin, the MAX30100 and DS18B20 were tested with the first student, and the data will be shown and recorded through Blynk application. Therefore, the student can know whether their health level was good or ill.

Table 1: Table of the oxygen level and heart rate

Oxygen Level	Heart Rate	Blynk
>97%	<60	Normal
93-94%	>60	Not Normal
97%	<100	Normal
<92%	>100	Not Normal

Table 1 shows oxygen levels going normal if under 97% and not normal if under 97%. Heart rate is normal if under 60 pulse rate and not normal up to 60 pulse rates.

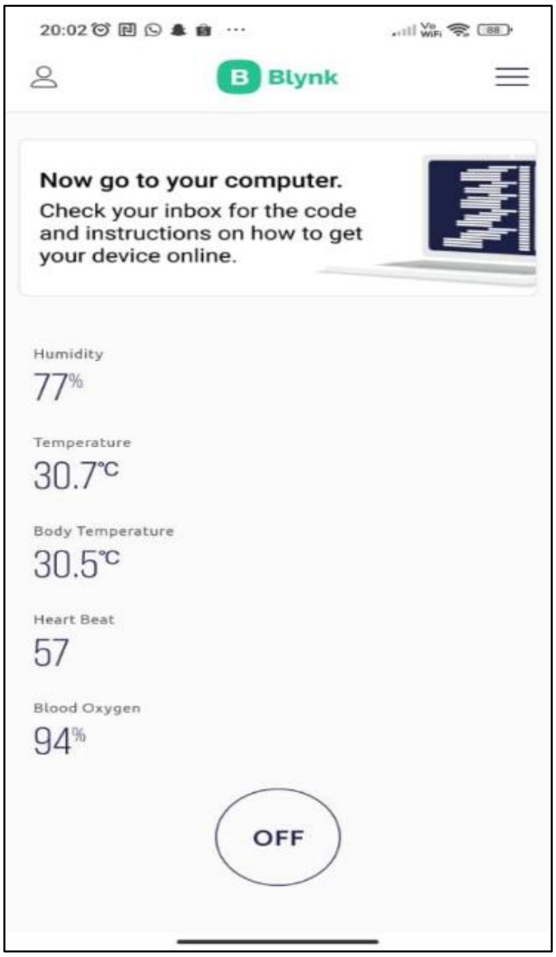

Figure 3: Display 1 health level

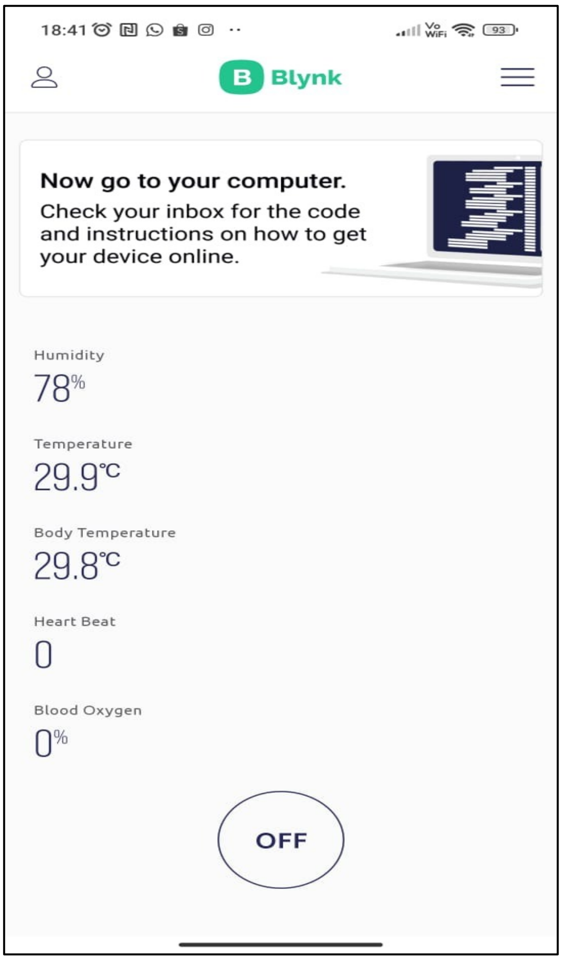

Figure 4: Display 2 health level

Based on Figure 3 and 4 shows the display health level status of a user. Blood oxygen will be detected until 95% on Blynk display which means 100%. Heart rate can be detected until 200 pulse rate and body temperature will be detected until 50.

The output of the project shows the detection of oxygen level, heart rate, and body temperature. The user can monitor their health level through Blynk apps. If the measurement of health level is low they must be referring to the hospital because this project only checks and monitor health level. Numerous physical problems with the circuit and components occur during this project.

The MAX30100 pulse sensor being used has issues such as incorrectly detecting values and readings that are not accurate. This issue needed to be resolved for the MAX30100 sensor to operate properly. These types of issues must be resolved to obtain the desired results. After several solutions and testing, the system is successfully showing the accurate result. This IOT Health and Parenting system is cost-effective and versatile in nature, which makes it easier to screen patients' well-being regardless of where they are. This product may potentially be valuable during the COVID-19 pandemic for saving people's lives. In the future, more sensors can be added to this system to monitor more physiological parameters of the human body and can be linked to the hospital or clinic for updating health records continuously.

This project involves the cost of purchasing components and materials throughout its implementation components involving the cost of hardware. Most of the hardware components are from online purchases. The price is compared from surveys at several online shops such as Shopee and Lazada. This method makes it easier as well because it will save time and costs.

Table 2: List of the components and materials

No.	Component and Material	Price	Quantity	Total
1	ESP8266 Board	RM26.00	2	RM52.00
2	Pulse Oximeter Sensor	RM20.00	1	RM20.00
3	DS18B20 Sensor	RM10.00	1	RM10.00
4	Connecting Wires	RM5.00	10	RM5.00
5	Breadboard	RM5.00	1	RM5.00
6	Nodemcu Sheild	RM26.00	1	RM26.00
7	Blockduino	RM10.00	1	RM10.00
8	Plastic Box	RM7.00	1	RM7.00
9	Adapter 12v	RM10.00	1	RM10.00
			TOTAL	RM145

The overall gross budget estimate of this project is RM145 as shown in Table 2. According to this budget cost, this project is compared to other projects that can cost over a thousand ringgit. The cost of the project is also in line with one of the key features of a good project developer which is low cost but a high-quality project.

5.0 CONCLUSION

This IoT application has been developed using a NodeMCU ESP8266 microcontroller to control the MAX30100 Pulse Oximeter sensor and DS18B20 Temperature Sensor. The control of each component involved is designed on the smartphone by using the Blynk application to display the record of patient temperature, heart rate, and oxygen level. It was tested and verified for five samples and the results obtained from the system were promising. The data acquired from the system appeared and was found to be accurate when compared to other commercially available devices such as thermometers and oxygen meters. This portable IOT Health and Parenting system is user-friendly, cost-effective, and versatile in nature, which makes it easier to screen patients' well-being regardless of where they are. This product may potentially be valuable during the COVID-19 pandemic for saving lives.

The design of the product is only in the kit from this project, and the customers can put this kit in their homes. The recommendation is to enhance the device by, chance the used sensor with other sensors to make the data more accurate. For example, DS18B20 chance to MLX 9061 contactless sensor. This project only requires the user to touch the sensor wisely to make sure the sensor gives the best data. Therefore, the display and recorded health level can be sent directly to hospital management. This will reduce the number of patients that come to monthly treatment.

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Home Rental System Using MySQL

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Abstract There are an abundance of hotel recommendation system available on the Internet such as Trivago, Trip Advisor and Expedia. For rental house, it is very difficult to find the same recommendation system and usually the owner not advertise their house on Internet but, promote it to the resident. Problem arise when it is hard to find the nearby house rental with the Polytechnic. Usually, the student will go out and ask for the resident. It will take so much time for student to find their shelter for the whole semester. To solve this problem, we need a platform that will help student to find the house. The owner also can promote their house on the platform as it can attract the student. The system will find the nearby house rental that available and it will make comparison with other house for the student to make their choice according to the features requirement.

Keywords: IoT, Healthcare, Treatment, Temperature

1.0 INTRODUCTION

As a student studying distant from home and without access to a hostel, we must find a nearby house to rent. House rentals near the Polytechnic are frequently chosen by students. Students who wish to rent a property will have a difficult time finding one that is acceptable for them. Not all of the property rentals listed on the website are available, and some are rather far from the Polytechnic. The owner normally does not publicise their house and instead spreads word of mouth among the residents. The student will have to ask around for available rent houses, which will take a long time.

The PMM student will have a difficult time finding a rental home because they are unaware of the closest houses in Merlimau that are open for rent. Some of them use a specific website to search will rarely discover the rental homes that are close to the polytechnic, only those that are far away.There are several housing rentals with various owners, each with their own advantages and disadvantages. It will be challenging for the student to make an intelligent decision regarding the ideal residence for them. We want to know the comparison for each rental home as a consumer,so that we can decide whether to rent a property.In addition, the student must approach the resident for assistance in locating the rental home.Because the owner does not market their home, not all residents are aware that it is for rent. They only told others about their rental home through word of mouth.The total number of students in PMM is approximately 4000 students and 3500 students live outside PMM. There are approximately 1722 houses and 689 houses are houses for rent.

2.0 LITERATURE REVIEW AND HYPOTESIS

The need for adequate housing alternatives for students has increased, and as a result, home rental programmes designed especially for this group have emerged. These platforms are designed to give students a simple and effective way to look for, choose, and rent residences close to their places of study. The goal of the literature review on house rental programmes for students is to give a thorough overview of the body of scholarly work in this area.

It attempts to compile and analyse pertinent studies, papers, and publications to obtain understanding of the various facets of student-specific house rental schemes.

The objectives of the literature review include to investigate the trends, obstacles, and influencing elements in the student housing market today, to evaluate the usability and user experience of student housing rental systems and to explore design considerations and principles specific to student-oriented rental platforms.

2.1 Previous Method of Home Rental System Using MySQL

There is a lot of available methods for home rental system using MySQL. However the aim of this review was to present a thorough overview of the academic literature and research that has already been done in this area and to highlight important trends, issues, and factors pertaining to these systems. For a thorough grasp of the state of the art in the area of student housing rental systems, consult this literature review. It includes information on many facets of these systems, identifies knowledge gaps, and makes recommendations for further study and improvement in the field of student housing.
The system can provide a framework that allows managers to conduct reasonable transactions within a limited time frame. This system is meant to satisfy the needs of rental house owners. Several user-friendly interfaces have also been adopted. In this system, MySQL used for create and edit the database. Sublime text is prime text editor for all the codes. PHP, JAVA, and HTML are the languages that write all the codes. LARAVEL was used for some secure feature designs. CSS, JAVASCRIPT and AJAX were used for the frontend design of the system. (D Voumick, 2021). To develop a rental house management system that allows the user to view customer data as well as houses record. The software can be used as an inventory system to provide a frame work that enables the mangers to make reasonable transactions made within a limited time frame. Each transaction made on the system go hand in hand with the data being updated in the database in our case it is Microsoft Access 2007 which is the back end. (Henry Peter Gommans, 2014).

According to (Shiram, 2019), Effectively resolving the apartment issues is important to the buyer's long-term future, the Home Rental Project will be an important tool for creating rental housing stability by helping tenants speak with greater credibility through initiating and documenting communications and building productive relationships with sellers. Home Rental project provides buyers of specific housing associations and social sellers International Journal of Pure and Applied Mathematics Special Issue 1681 with a simple way to report and arrange repairs to properties.

3.0 RESEARCH METHODOLOGY

Methodology is the process, step or stages used to collect information and data for the purpose of making decisions. The methodology is chosen from the software development life cycle model. The system development life cycle SDLC that will be used for this project is Iterative and Incremental Model.

Iterative method is a mathematical procedure that generates a sequence of improving approximate solutions for a class of problems. It is an act of repeating a process with the aim of approaching a desired goal, target, or result.

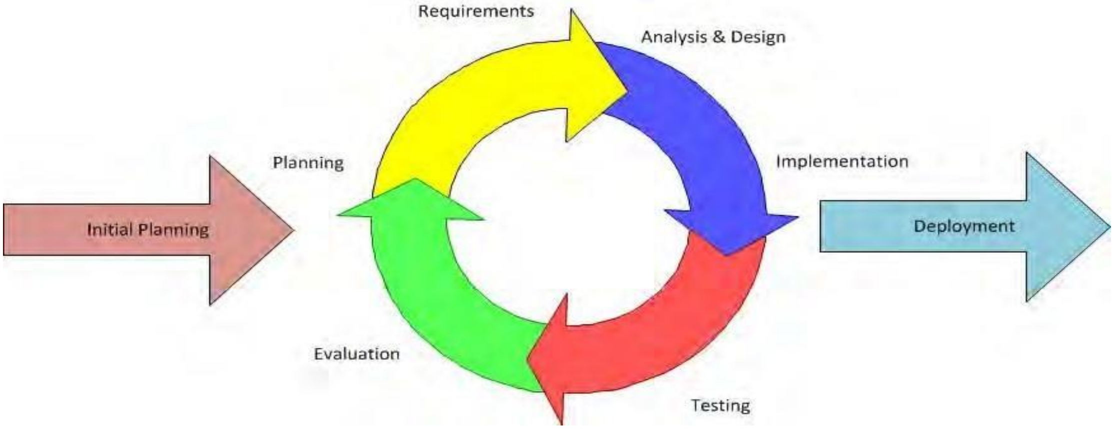

Figure 3.1 : Iterative And Incremental Model

Application Design

i. Initial Planning Phase

The phase starts with brainstorming the ideas of current problems and system requests. Then, continue the discussion with the supervisor to choose a project to be implemented. Literature reviews with the current similar system are studied to find the problems of the systems

ii. Planning Phase

After deciding the title of the project and the approach to be used, the discussions continue on defining the problem statements, decide an objectives and define scope for the system. In order to get a better understanding, existing systems are reviewed, observe and the constraint and limitation are gathered.

iii. Requirements Phase

During this phase, existing systems are analysed and all the requirements that are needed to develop the new system are identified. In this phase, the information regarding House Rental System either in the form of journal, articles or research papers are gathered and studied. All source that found was analysis and observe the advantage and disadvantage. The information obtained about the House Rental System and TOPSIS method is crucial in producing the end product and achieve the system objectives.

ii. Analysis and Design Phase

In this phase, the design of the system is created and the development of the prototype based on the functionalities that will be built such as add house, update house and delete house. The data or requirement obtained during the requirement phase is transformed into a design.Examples of diagrams that will be builds are Context Diagram (CD), Data Flow Diagram (DFD), Entity Relationship Diagram (ERD). All of these diagrams are built as a guideline of the flow of the system.

V. Implementation Phase

The phase also known as code generation phase.Developer writes codes based on the previous phase. The system will build using PHP language and MySQL as the database platform.User interfaces are also included in the phases as they are important in delivering information and messages to the user.

Vi. Testing & Evaluation Phase

Every sub-module needs to be tested before it will implement into the system. Any changes of the coding, error, functionality or upgrades are also will be tested. User interface will be checked to ensure they are connected to database and appropriate with the system.

vii. Evaluation Phase

System will be evaluated to check for bugs or errors. Any best practices and techniques that will be used in the first iteration then can be used for the next requirement changes and needed in the next iteration.

Flowchart of the System

From the system flow chart, first, student login the system and all information will be display. User will follow the steps for booking and contact house owner. Admins can also clear used data to fill in new data.

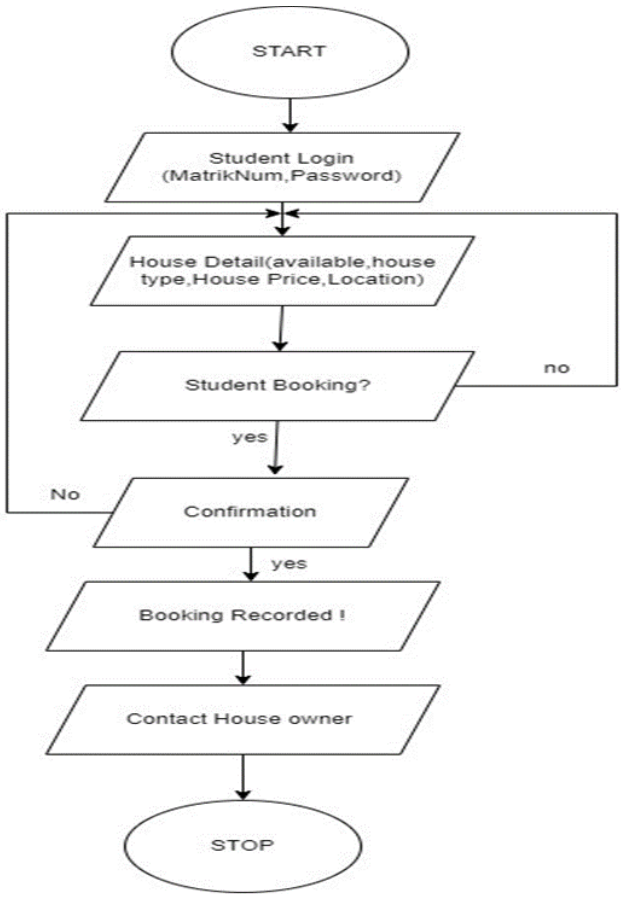

Figure 3.2 : Flowchart

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4.0 RESULT AND ANALYSIS

The user acceptance testing for the Home Rental System is presented in this section. The evaluation, known as the user acceptability test, that was gathered from renters, agents, and administrators is discussed during this phase. There were a total of 10 respondents that took part in the test. The system's user interface design for the user acceptance test.

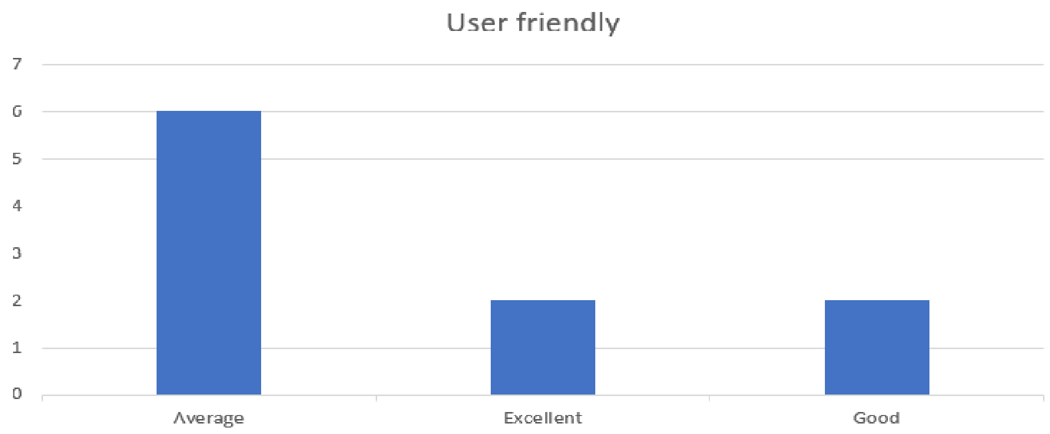

Figure 4.1 : User acceptance test User friendly

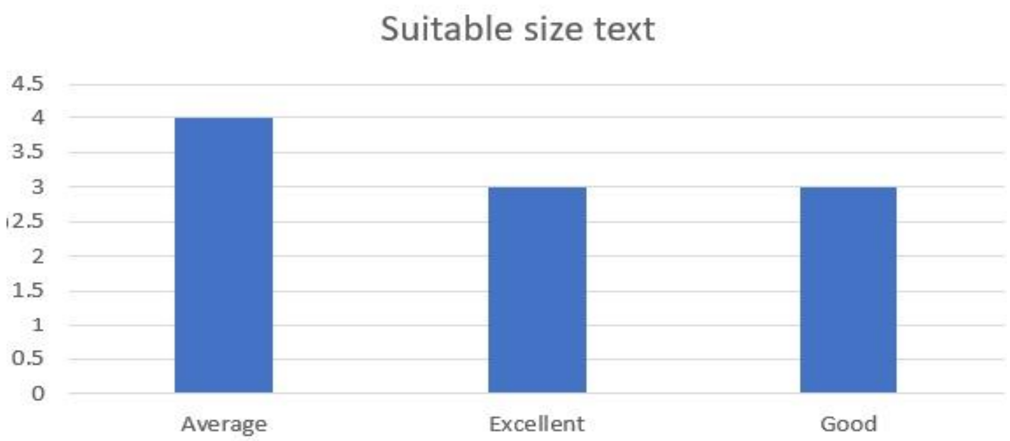

Figure 4.2 : User acceptance test Suitable size text

Figure 4.3 : User acceptance test Menu

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4.1 System Analysis

An essential stage in creating and assessing a system for renting out homes is system analysis. To assure the system's efficacy and efficiency, it entails analysing the requirements, procedures, and features. The following are significant findings of a system analysis for a house renting system:
Requirements Gathering: Gathering requirements from stakeholders, such as students, landlords, and administrators, is the first step in the system analysis. This entails determining the particular requirements, preferences, and difficulties that each user group faces. Features for property listings, search filters, channels for communication, and administrative capabilities are a few examples of requirements.
Use Case Analysis: The many functions and interactions inside the system can be identified with the use of use case analysis. It outlines the behaviours, capabilities, and connections between system users and themselves. The following use cases are possible: user registration, messaging, admin management, and property search.
Data Modeling: Designing a successful database structure requires carefully considering the relationships and requirements for the data. The relationships between entities like users, properties, bookings, and reviews can be modelled using entity-relationship diagrams (ERDs). This analysis guarantees the accuracy of the data and makes it possible to save and retrieve information quickly.

Table 4.1 shows a brief description of the specifications of the System produced. The system developed named as “Home rental system” with a selling price as low as RM 500.00 along with target users who interested in buying it.

Table 4.1: List of the components and materials

Descriptions	Details
Commercial name	Home rental system
Target price	Rm500
Product function	Property Listing and online booking
Target user	PMM’s student

5.0 CONCLUSION

The house renting system offers a practical and effective way for renters who are students to locate appropriate housing. The system provides a simple user interface, thorough property listings, online booking capabilities, and effective routes for communication between tenants and landlords. Positive findings and high levels of user satisfaction were found in the study that was done to assess the system's performance and user happiness. By giving them quick access to a variety of rental homes and important information, the home rental system simplifies the rental process for students. Students can make well-informed judgements based on their tastes and requirements thanks to the thorough property listings. The search and filtering tools make it easier to select the best rental properties by reducing the number of available choices. However, there are areas for improvement, such as enhancing landlord responsiveness to improve the communication experience further. Feedback from users should be considered to continually enhance the system's functionality, usability, and performance.

ACKNOLEDGEMENTS

The author would like to thank the contributor of this project, Mr. Syahriz Iskandar bin Samion (14DTK20F2040) for his committed to accomplishing this project. This project is believed can give benefits to the society of the Politeknik Merlimau in their vision to design and develop interactive system interface using Visual Studio code that helps users navigate the system.

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A Mini Rescue Robot Car for Search and Mapping Operation

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Abstract. This project is designed for rescue operations after natural disasters such as floods or landslides. The robot is designed to tracked and locate trapped, possibly injured victims, triangulate life in the debris, create a map of the disaster area, and gather the necessary information. This rescue situation can endanger the life of the rescue team and efforts to save more victims become thin. The robot system has sensors that may notify the user if something unexpected appears while the robot is operating. Both automatic and manual operation modes are available for this full robot system. Each of the four mechanical wheels is mounted on a motor. The axis of rotation of the roller, which is parallel to the axis of rotation of the wheel, is 45 degrees apart. The design center will house every electronic component. There will be a four-wheel option for the robot's movement mechanism. The camera, motor, power supply, and electrical system are all carried by the body. The L298N, located in the center of the body, has the ability to control the speed and direction of rotation of a DC or stepper motor.

Keywords: robot, rescue, sensor, motor, camera

1.0 INTRODUCTION

The increase in the number of deaths due to natural disasters is a result of the lack of timely emergency aid. The impossibility of dealing with the situation immediately or not, can determine the position of the victims of the disaster. Floods are one of the natural disasters that often hit the country, especially in Malaysia. The incident will happen almost every year, especially in the monsoon season. The coast of peninsular Malaysia is the most vulnerable to flooding, especially during the northeast monsoon. Search and rescue operations used to be done with the help of human and animal power which led to dramatic consequences. The use of a rescue system using robots has been designed to help rescue operations become more systematic. Unfortunately, disaster victims' chances of survival are measured in minutes.

Common situations that use rescue robots are mining accidents, urban disasters and hostage situations. Search and rescue technology to date still relies on technology, but old technology that has been used for decades is less effective. Intelligent robots equipped with advanced sensors are increasingly attracting the attention of researchers and rescuers. When a living being tries to perform a rescue operation, the rescuer's life will be at great risk. In such a situation, technology will be very important. Therefore, this project will present, Rescue Robot to help the rescue operator. This Rescue Robot will be a lifeline for victims of natural disasters who are trapped in the outside world. The design of the hardware for rescue operations is to assess the circumstances of the incident.

Background Research

Evaluating the situation, finding the victims' coordination, and making initial contact with them are the first and most important responsibilities in rescue efforts. For human rescuers, doing this is extremely perilous and difficult. The collapsed structures are not resilient, gaps and holes may be too small for people to get through, it may be difficult to go about amid the rubble and fire and smoke may obscure vision. Rescue teams may sustain injuries from the secondary disaster because of the hazardous circumstances in which they must operate in. Then, in fire- brigade stations, police stations, railway stations, and city offices, rescue devices or robots that save human lives in the dangerous atmosphere of disaster must be designed and provided.

Problem Statement

Contemporary approaches to such activities suggest the use of complex machines and special rescue equipment. During the disaster, rescuers were unable to enter the narrow space. The main reasons are problems in detecting the location of the victims under the wreckage, the slow-motion capacity of the construction equipment, the limits of the rescue equipment, and the need for an educated team. The rescuer's vision was limited which can't be seen into small gaps and holes to search for any evidence of victims. To do this is both very difficult and very risky for human rescuers. The collapsed structures are not resistant, holes and gaps could be too narrow for human passage, orientation is difficult in debris, and fire and smoke can hold back sight. Then, the rescuer searched for the victim is too long resulting in the loss of life.

Research Objective

There are several objectives that have been identified in the development of this project such as:

i. To design the robot car to go further through the wreckage to map the disaster region and find the victims and life cavities.
ii. To create a robot car with current equipment including small cameras and light are generally used for searching activities in a narrow and dark place.
iii. To rescue the victim in the shortest time with a minimum injury that locates the coordination.

Scope Research

In this study several scopes and limitations of the project have been identified such as:

i. The robot will be controlled via Wi-Fi using an ESP 32-cam-based interface that can be accessed by a device inside the local network.
ii. The movement of the motor is in a more than 360' degree rotation about a 2meter distance.
iii. Effective range Wi-Fi is no more than 4-6 meters along in one journey below ground surface.
iv. This device is developed using Arduino UNO and dc motor control circuit using motor driver module L298N.

Project Significance

Highly useful mobile robots may act as very useful tools to help human rescuers in these activities. Consequently, the robots autonomously provide useful information to the rescuers. On the other hand, a human must always be present to assess the accuracy and implications of the provided data. A small, highly mobile robot can more easily look for holes in a confined space where victims are unable to feel them. The safety of everyone, especially the team members, is the rescue team's top priority during a rescue operation. Buildings that have collapsed are frequently unstable and dynamic.

The second mobile robot car can change the brightness of the lights and display the victim's condition. An unstable structure can be easily searched by a robot, and team members can gather data from the robot from a safer distance. It is interesting to notice that after ordinary disasters, dead bodies are recovered more frequently than alive ones during rescue attempts. The quick recovery of dead remains is equally useful to the surviving family and is frequently crucial in some cultures, even though live rescues are the main objective. Without endangering the rescuers, a robot can do the quick recovery of dead victims as well. In this project, a rescue robot is created for use in emergency situations. The mechanical design of the mobile robot for rescue robot applications to assist people in the wake of disasters is the main emphasis of this thesis.

2.0 LITERATURE REVIEW

The objective review was how to reduce deaths in disasters even more so in floods. Generally, it is machine or robot that functions instead of living person. Robots are used for special applications like handling hazardous situations and task that need high accuracy, speed and remote locations where humans cannot access. A danger event is normally happened by the negligence of humans. This project surely creates revolution in defence systems as a surveillance and inspection robot. This robot can travel through tough terrains and can also go to places where humans cannot such as deep into mines and dangerous place with debris and narrow place.

Available Method of Mini Rescue Robot Car for Search and Mapping Operation

There is a lot available methods to rescue the victims. However, every method has advantage and disadvantage belong to themself by using own safety measures.
Below is the method used to rescue the victims.

Obstacle Avoiding Robot Car

According to (Michael Akwe Ari,2020), the objective of this project is to implement a robot car, which while moving should have the ability to detect obstacles in its path and change direction where obstacles are present without any form of external influence. The new direction to be taken to avoid collision is the direction that has the most distance between the obstacle and the sensor and this is determined by the robot based on sensor inputs. This implementation was done using an ultrasonic wave sensor, which measures distance by sending pubes.

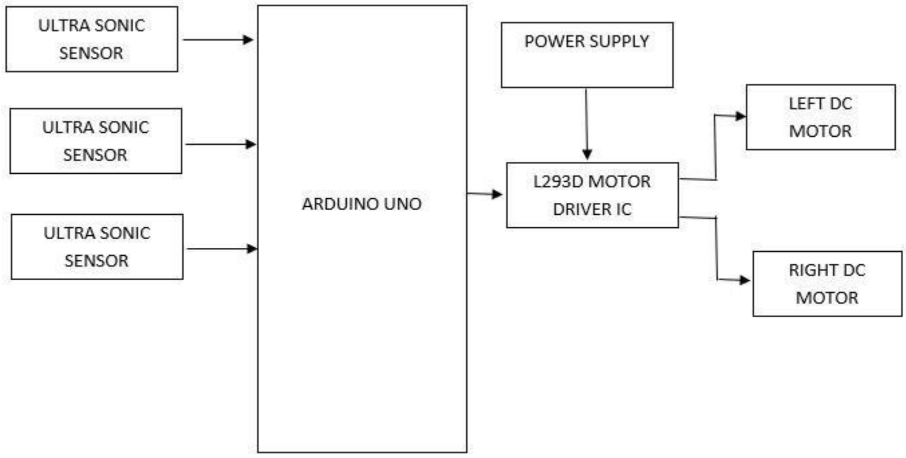

Figure 1: Block diagram of obstacle avoiding robot car

Wireless Voice controlled robot car using Arduino

According to (Shubh Srivastava, 2020), the aim of our project is to make a Voice Control Robot Car. The working is based on an Arduino microcontroller, motor drivers, a Bluetooth module. The coordination of the control unit with a Bluetooth gadget is accomplished by utilizing a Bluetooth module to catch and read the voice orders. The controlling remote is a smart android device with Bluetooth application.

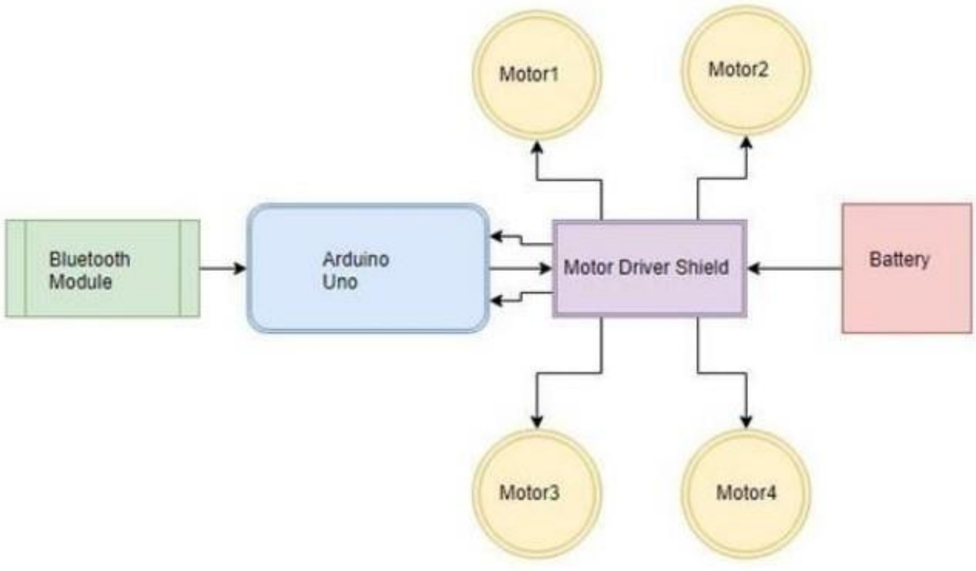

Figure 2: Block diagram Wireless Voice controlled robot car using Arduino 2.2.3

Ultrasonic sensor capability in human following robot system

According to (S.A Abdul Shukor,2019), the purpose of this project a human following robot system that utilized ultrasonic sensors. The ultrasonic sensor is preferred for humans following robots due to their wide detection area. Especially at the legs and the data collected from the sensors were used in the design of the sensor platform.

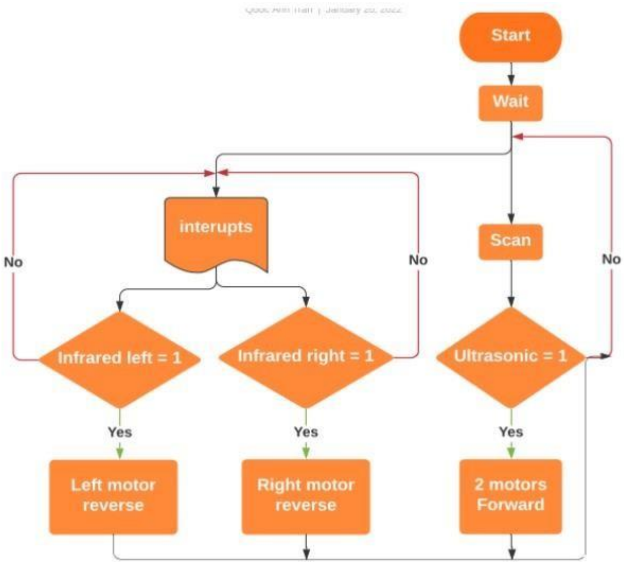

Figure 3: Block diagram ultrasonic sensor capability is human following robot system.

Ball Tracking for Robot Table Tennis

According to (Gomez-Gonzalez,2019), Robot table tennis systems require a vision system that can track the ball position with low latency and a high sampling rate. Altering the ball to simplify the tracking using, for instance, infrared coating changes the physics of the ball trajectory. As a result, table tennis systems use custom tracking systems to track the ball based on heuristic algorithms respecting the real-time.

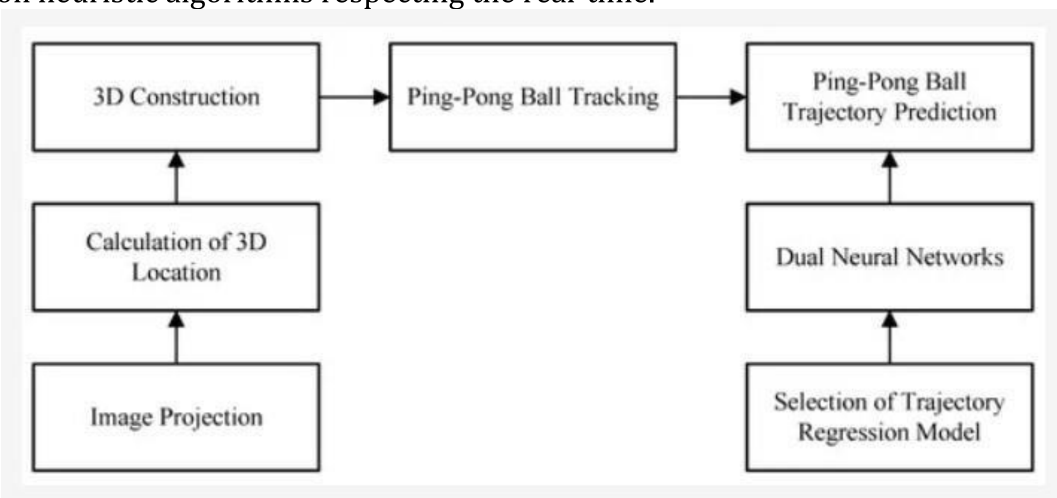

Figure 4: Block diagram Ball Tracking for Robot Table Tennis

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Gesture Signals Processing for a Silent Spybot

According to (SaiChinmayi, 2015), In this paper, a prototype silent Spybot is developed that operates by processing the gesture commands signal. The prototype uses video processing with an object tracking algorithm to understand the gesture commands.

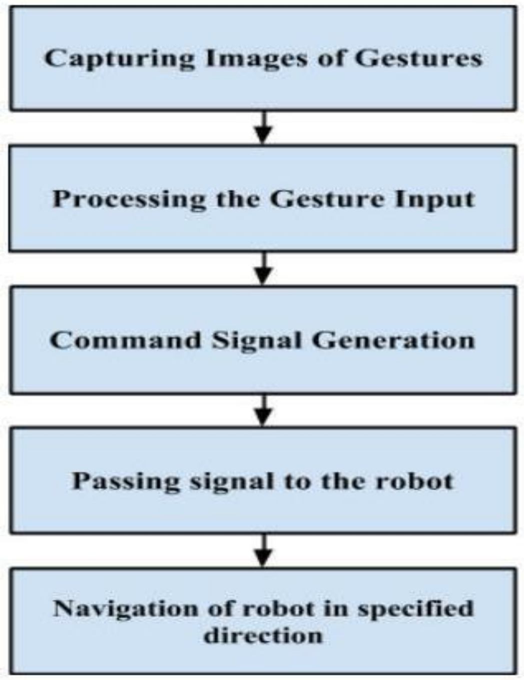

Figure 5: Block diagram of gesture signals processing for a silent spybot

A Mini Rescue Robot Car for Search and Mapping Operation

This prototype that is consists of rescue robot to search and mapping the situation of victims. The power supply connected to Arduino for process. Mobile phone will be the main device for interface and pop up the display, cursor movement mobile car, light and speed. ESP 32-CAM will generate IP address and L298N L298N is a type of motor driver IC that can control the direction of rotation and speed of a DC motor or stepper motor. Capable of output voltage for dc motor and stepper motor

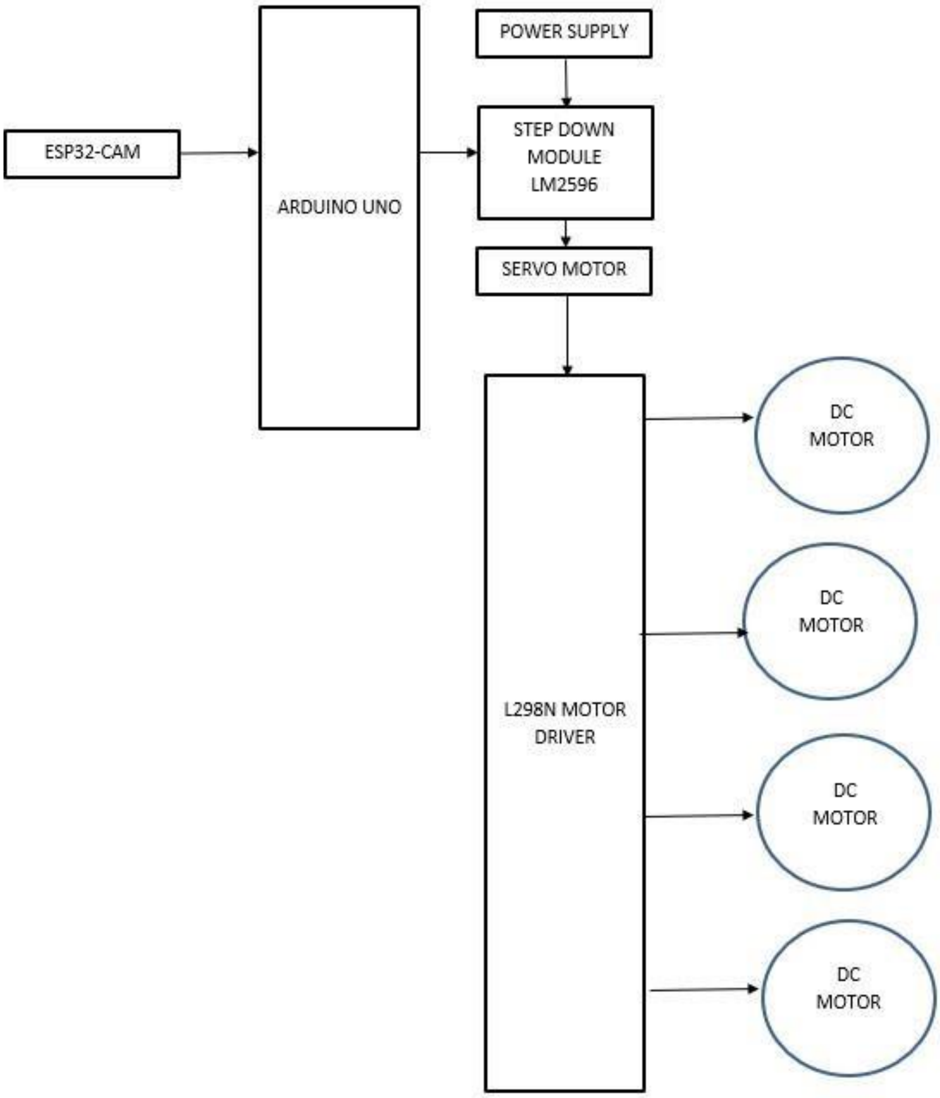

Figure 6: Block diagram of the project system

3.0 RESEARCH METHODOLOGY

To realize this project as a product that ready to use with safety characteristic, a very comprehensive plan is undertaking. A step procedure is done so that the Project can be completed in time.

The main function of the Rescue Robot is to detect survivors using Arduino and ESP 32-CAM real time video transmission The video camera will also be connected to mobile phone or laptop wirelessly for real time video transmitting. The DC TT motor and Mecanum wheel will also help this operation by giving highly performance movement and it have the location where rescuers are to be sent.

3.1 Project Design and Overview

As mention in the previous chapter, the designed controller is using a closedloop system with Arduino as the main controller. The design of the controller circuit using Arduino is for the process. The ESP32-CAM for input and L298N Motor module, Mecanum wheel and DC TT Motor system for output.

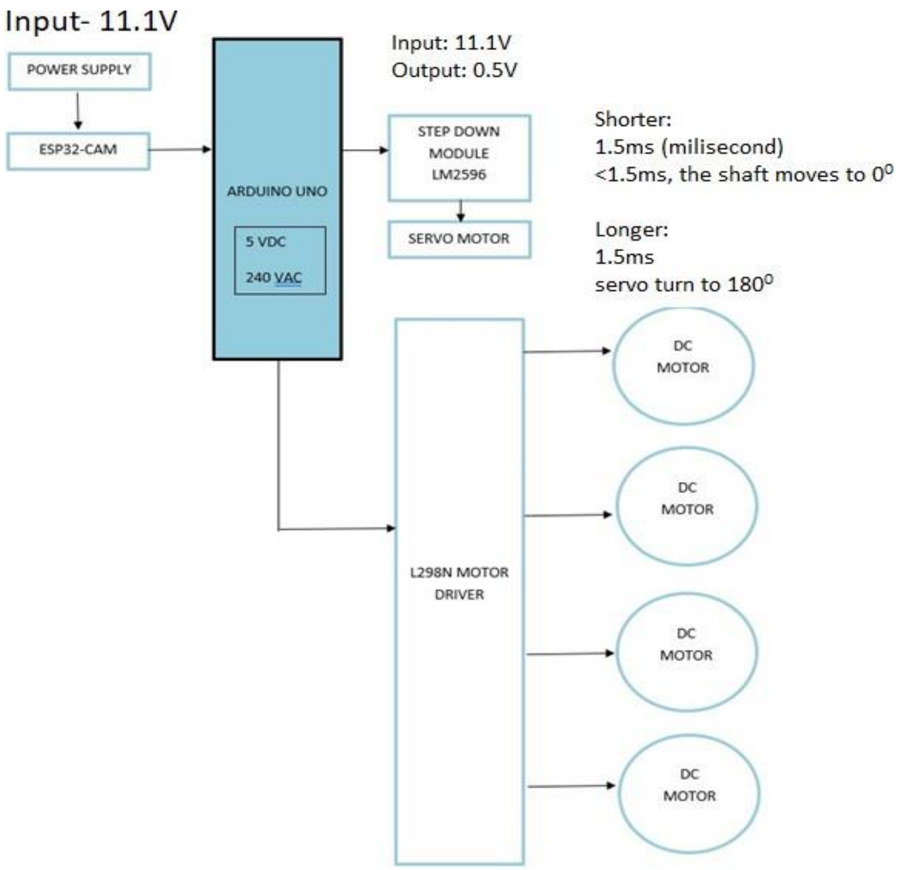

Figure 7: Block diagram for the project A Mini Rescue Robot car for Search and Mapping operation

3.2 Flowchart of project

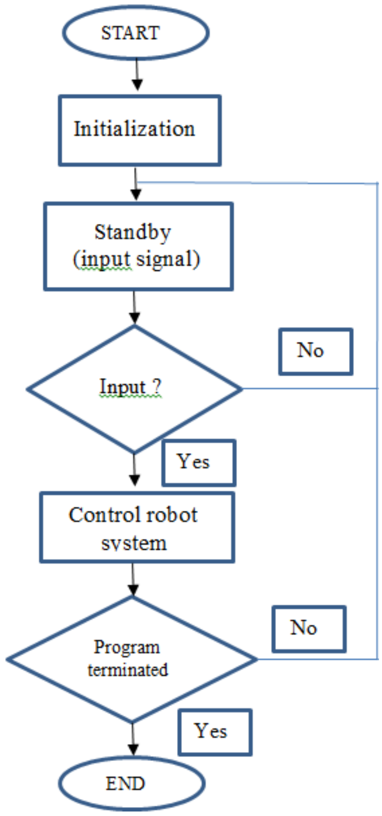

Figure 8 : Flowchart of operation system

3.3 Project Hardware

As mention in previous section , this design is used Arduino Uno, ESP32-CAM, Mecanum Wheel, L298N Motor Module DC TT Motor. Usually video cameras are used as search cameras that are mounted on some device. A robot can easily search under an unstable structure and the team members can collect data from the robot at a safer distance.

a. Schematic Circuit

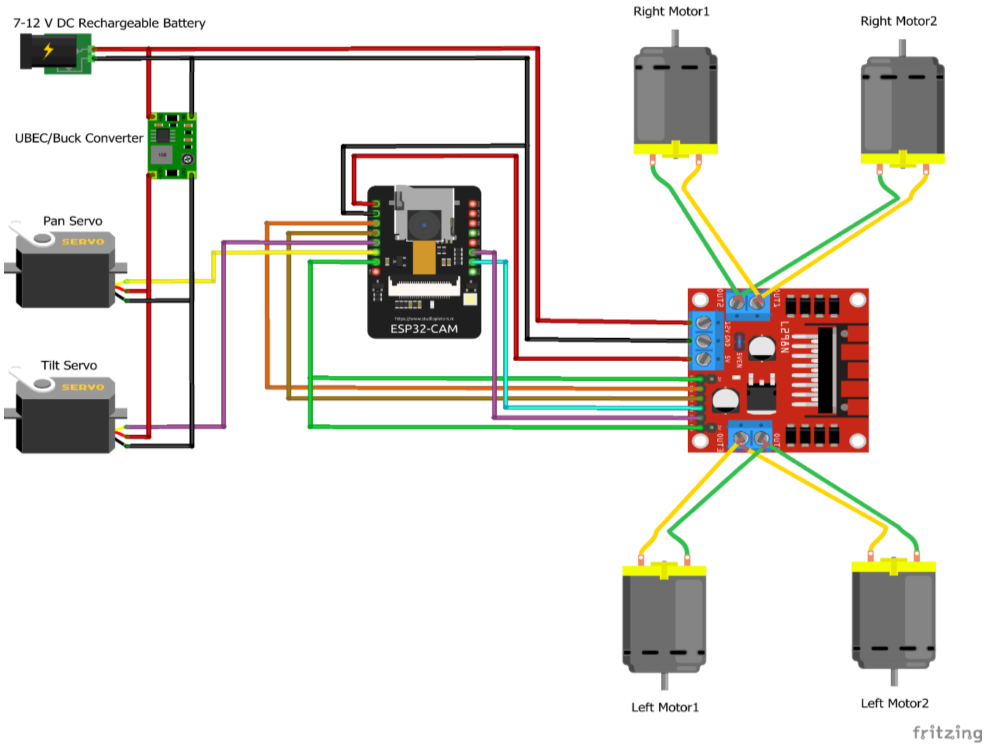

Figure 9: Show circuit diagram that connect to ESP32-CAM with L298N Motor Driver, Dc motor and Pan servo.

b. Description of Main Component

i. Arduino Uno

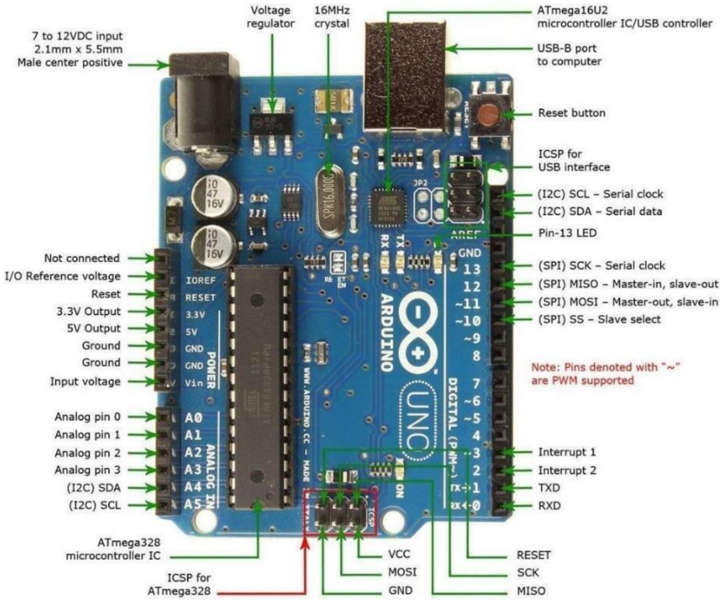

Figure 10: Details of Arduino Uno R3 schematic board

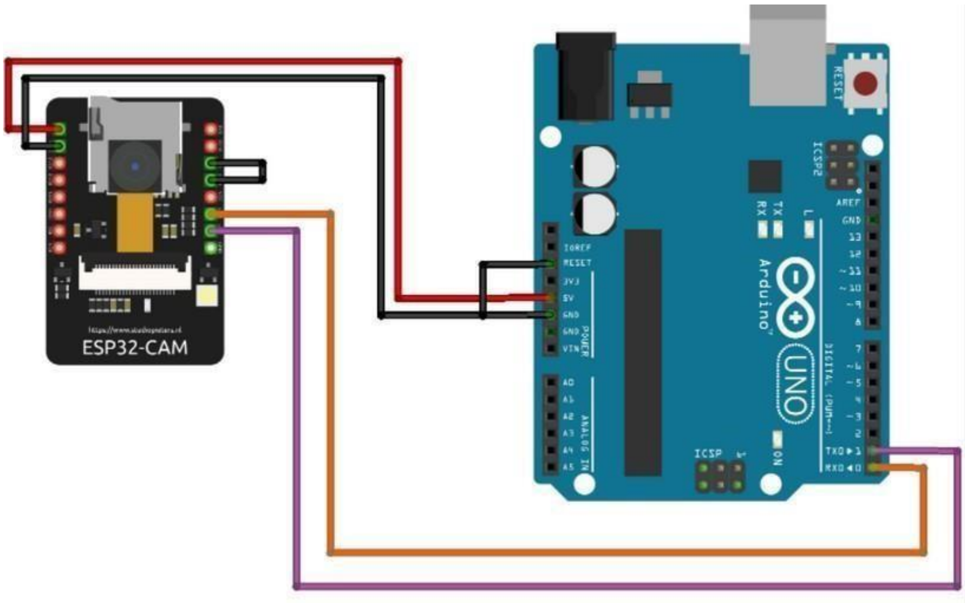

Figure 11: Process of programming diagram of Arduino Uno R3 to ESP 32-CAM

A microcontroller board called Arduino UNO is based on the ATmega328P. It contains 6 inputs, a 16 MHz ceramic resonator, 14 digital input/output pins (six of which can be used as PWM outputs), a USB port, a power jack, an ICSP header, and a reset button. It comes with everything needed to support the microcontroller; to get started, just plug in a USB cable, an AC-to-DC adapter, or a battery. You can experiment with your UNO without being overly concerned about making a mistake; in the worst case, you can replace the chip for a few dollars and start over

ii. ESP32-CAM

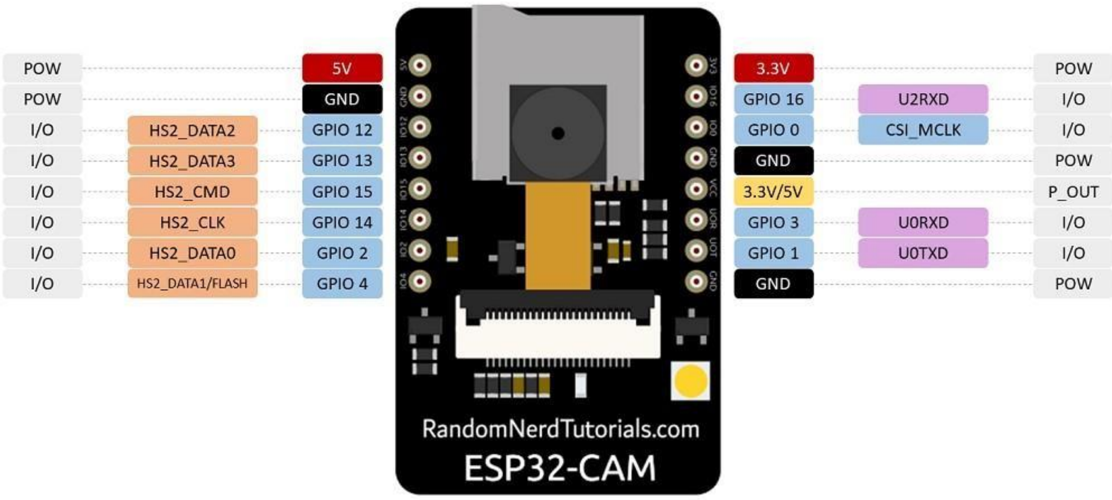

Figure 12: ESP32-CAM pin out

Based on ESP32, the ESP32-CAM is a compact, low-power camera module. It features an inbuilt TF card slot and an OV2640 camera. The board includes two powerful 32-bit LX6 CPUs, Wi-Fi, standard Bluetooth, and low-power BLE. The main frequency adjustment runs from 80MHz to 240MHz, and it uses a 7-stage pipeline architecture, an on-chip sensor, a Hall sensor, a temperature sensor, and other sensors. It can be used as a master mode to build an independent network controller or as a slave to other host MCUs to add networking capabilities to existing devices. It is fully compliant with Wi-Fi 802.11b/g/n/e/i and Bluetooth 4.2 standards.

Supports WI-FI video monitoring and WI-FI image upload
Power supply: 5V
Supported TF card: up to 4G
Antenna: On-board PCB antenna
Dimensions: 40.5mm x 27mm x 4.5mm

iii. Mecanum Wheel

Mecanum wheels are special because they can freely move in both directions. It can either roll laterally using the wheels around its perimeter or normally like a wheel. A robot can go from a non-holonomic robot to a non-holonomic robot using these wheels. Only two of a non-holonomic robot's three degrees of freedom, forward/backward motion and rotation, are controllable.

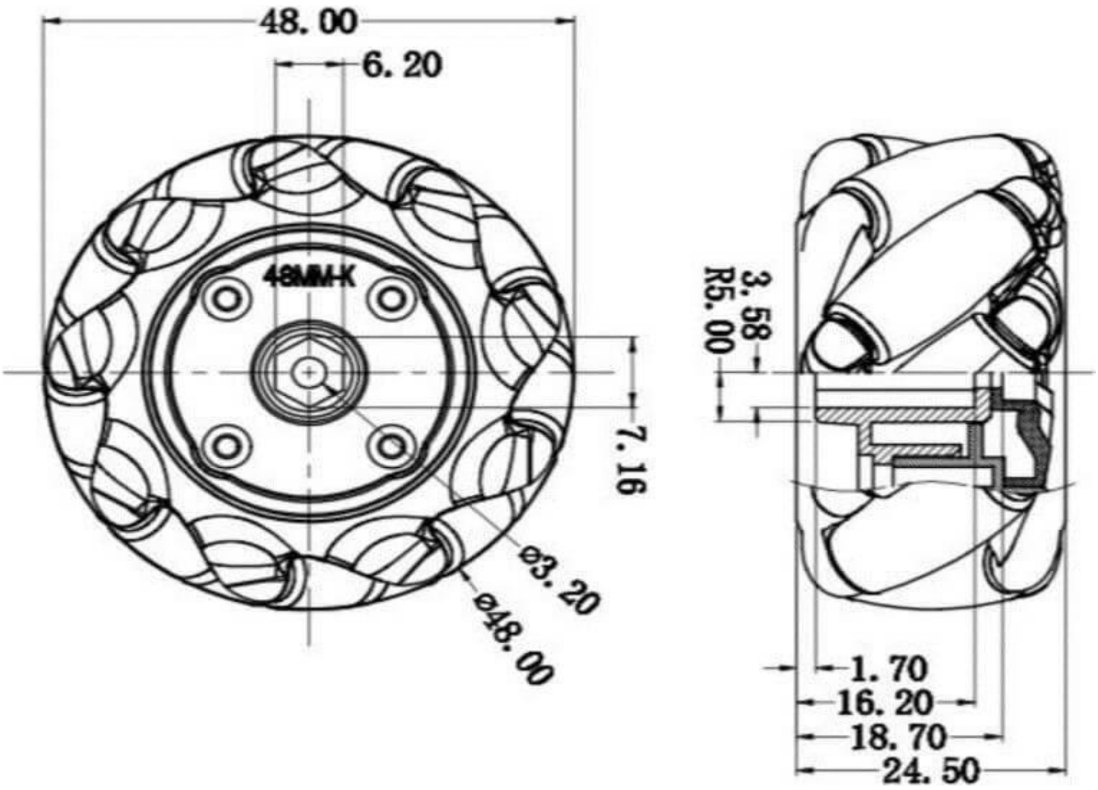

Figure 13: Mecanum Wheels

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- Allows robots to move in Omni-direction (back and forth, sideways, and rotates at the same position).
- Made of high-quality ABS and rubber materials for smooth running and better gripping.
- Compatible with TT motor.
- Diameter: Approx., 48mm/ 1.9inc
- Materials: ABS, rubber

iv. L298N Motor Driver

L298N is a particular class of motor driver IC that has the ability to regulate the speed and rotational direction of a DC motor or stepper motor. capable of producing 50 volts of output power for stepper and dc motors. A dual-channel H-Bridge motor driver called the L298N can power two DC motors simultaneously. That makes it perfect for creating two-wheel robot platforms because it can individually drive up to two motors. Three- pin 3.5mm-pitch screw terminals provide power to the L298N motor driver module. It has pins for a 5V logic power supply, ground, and a motor power supply (Vs) (Vss). The motor's direction of rotation can be changed using the direction control pins. These pins in the L298N IC really regulate the switches of the H-Bridge circuit. For each channel, the module features two direction control pins. Motor A's spinning direction is controlled by the IN1 and IN2 pins, and motor B's is by the IN3 and IN4 pins.

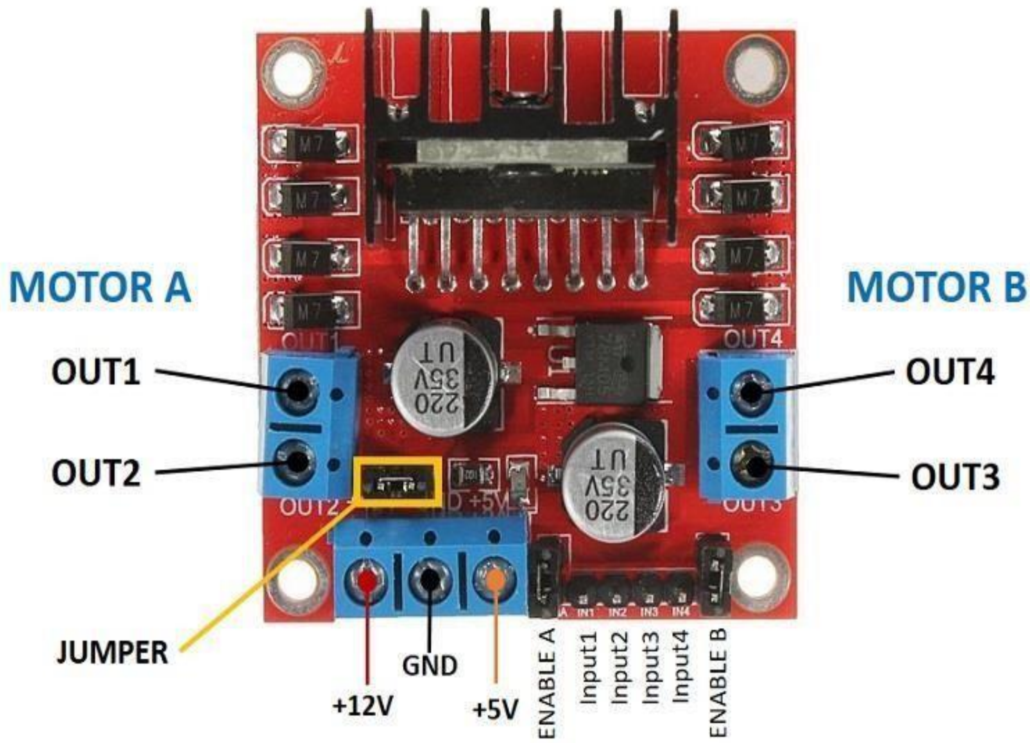

Figure 14: L298N Motor Driver

v. Dc TT Motor

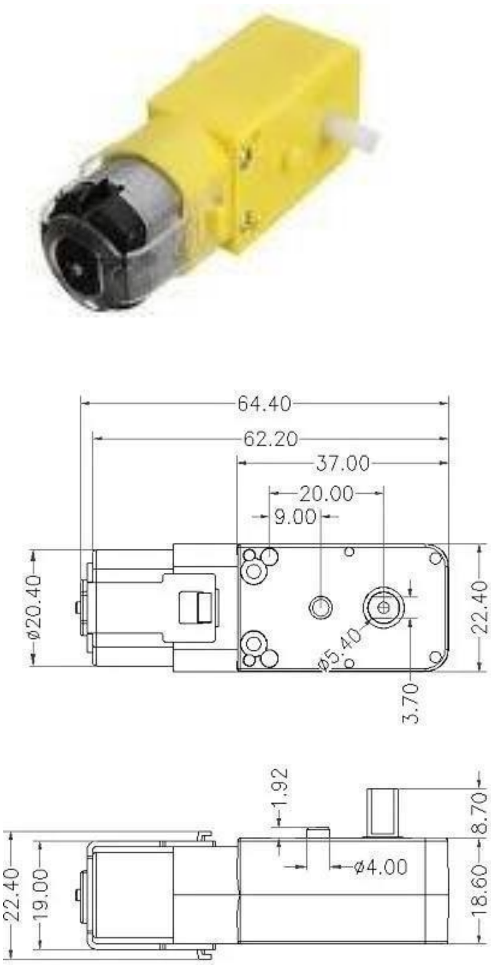

Figure 15: DC TT Motor

This is popular geared DC motor commonly used for making your own mobile robots, as well as mechanisms that require constant rotation, This motor can be powered with power source as low as 2V and up to recommended voltage of 6V, maximum voltage level you can input is 12V.

Operating voltage: 3 – 12V
Gear ratio: 1:48
Weight: 26g
Overall length: 70mm
Shaft diameter: 5mm
No-load speed: 90?10% @ 3V / 200?10% @ 6V

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vi. Servo Motor

A motor type that can rotate very precisely is a servo motor. A control circuit that the motor is made of provides feedback on the motor shaft's present location. It is only composed of a basic motor that drives a servo mechanism. In most cases, servo motors have a gear arrangement that enables us to produce very high torque servo motors in compact and lightweight devices.

Figure 16: Servo Motor

- Servo Motor Working Mechanism:
- Controlled device
- Output sensor
- Feedback system

In a closed-loop system, motion and the shaft's ultimate position are controlled by a positive feedback mechanism. Using a comparison between the output signal

vii. Step Down Module LM2596

The step-down (buck) switching regulators in the LM2596 series of regulators are monolithic integrated circuits that can drive a 3-A load with excellent line and load regulation. This device is offered with adjustable output, and it is internally compensated to reduce the amount of external parts and streamline power supply design. Specifications of Converter Step Down Module LM2596

- Conversion efficiency: 92% (highest)
- Switching frequency: 150KHz
- Load Regulation: ±0.5%
- Dynamic Response speed: 5% 200us
- Rectifier: Non-Synchronous Rectification

Figure 17: Step down Module LM2596

c. Project Software

Figure 18: Interface of project software

The simulating circuit with Proteus Arduino in this project. The next piece of software we use to program the Arduino Uno is Arduino software. Fritzing can build a circuit before we start prototyping. This software can assist us in simulating the circuit and ensuring that current flows through all of the components. This is also to ensure that all of the components are capable of performing as expected. Because we can test in the software before trying on the prototype, this software can also help us protect our components from overvoltage. After completing the coding, it can be checked for errors using Arduino software before being converted into the fritzing to run the program. After the coding has been converted into software, this software can be used to check whether the component is working or not. This can help you save time when troubleshooting a problem, whether it's a coding issue or a circuit issue.

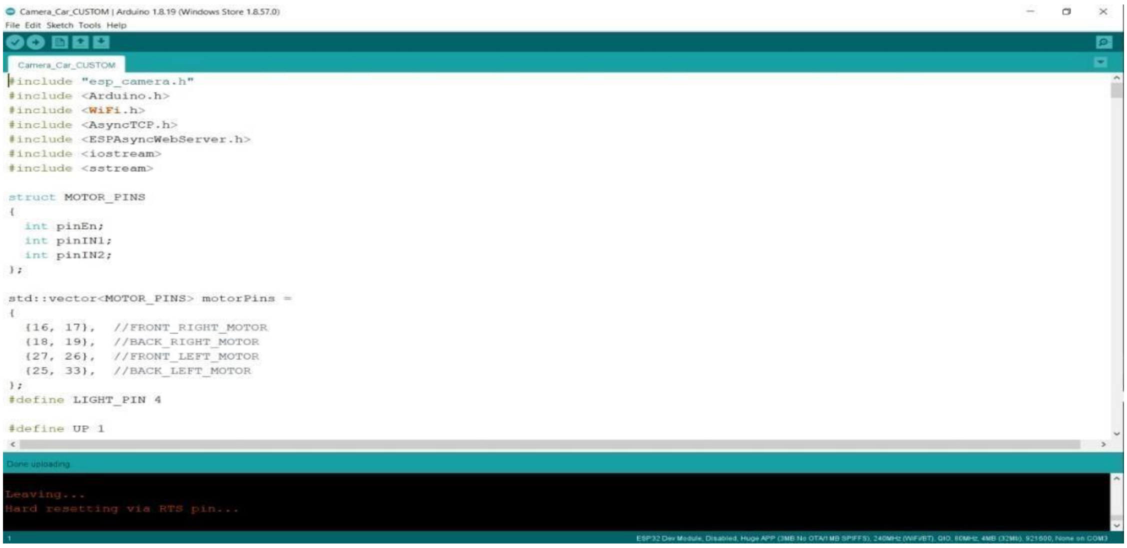


Figure 19: Interface of project software

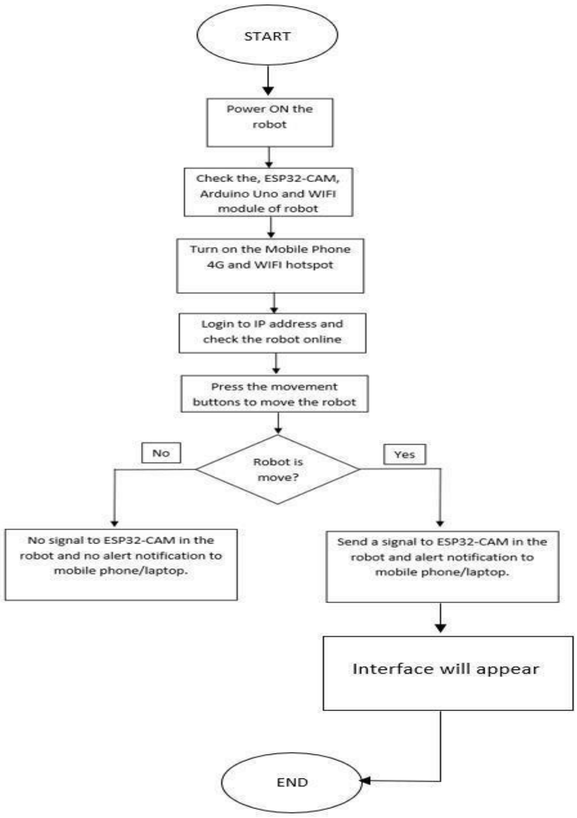


Figure 20: Flowchart of the system

From the flowchart of the system shown in Figure 20, when the energy source has the flowing power, the robot will be on. After that, the ESP32-CAM will be processed by the Arduino Uno. WI-FI module of robot enable capture real time video surveillance of rescue operation and which controlled by smartphone or laptop. From the test, the monitor is able to capture real time image and also detect the battery remaining power which saves the management cost. Login to IP address and check the robot online. Then, press the cursor to move the robot. Prototype Development is drafted as shown in Figure 21.

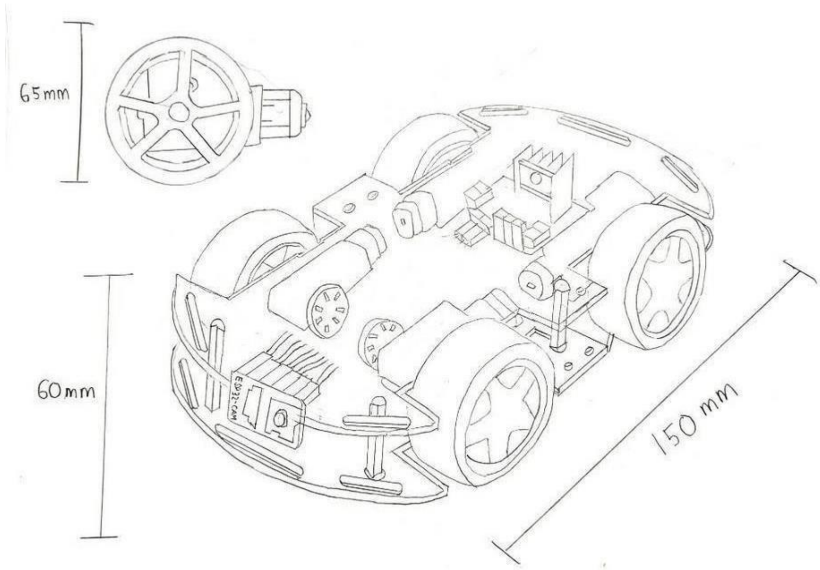
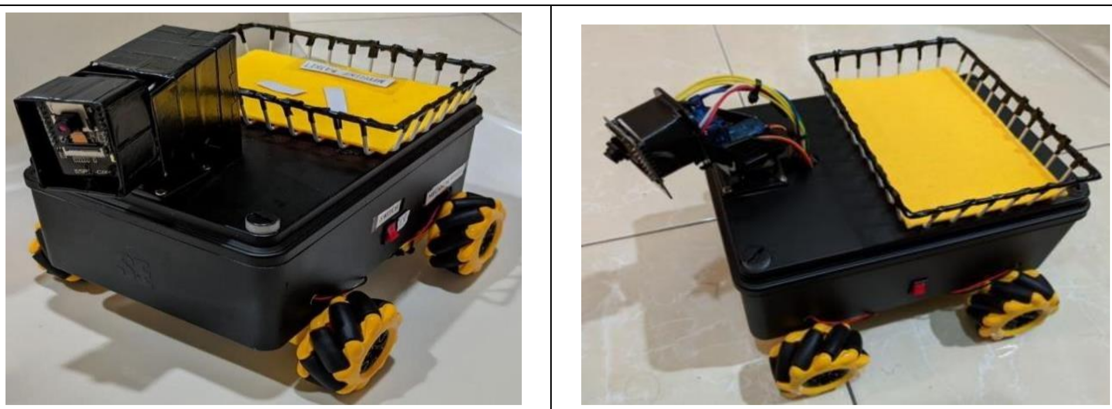


Figure 21: Project prototype with measurement

The robots as shown in Figure 22 (a) and (b) are used in search and rescue operations in order to minimize personal risk while rescuing as many injured people as possible from beneath the rubble. Electronic components including the batteries, cameras, and motors are all carried by the main body to record live video by using the ESP32-CAM which is mounted on the front of the body. The mechanical wheels are crucial to the success of this design. The robot can go forward and backward by spinning all of its wheels in the same way, and it can turn by rotating one side's wheels in the opposite direction of the other. A mecanum drive, however, is unique in that it can go in any direction, including sideways.



(a) (b)

Figure 22: Show the mechanical project 85% complete

4.0 RESULT AND DISCUSSION

In general, this project is particularly suitable for use in areas that require rescue system features. Apparently, the police station, the brigade station and the town office. This project can provide tools that generate data to assist rescuers in these tasks. This rescue robot clearly plays the role of collecting data and rescue functions with accurate and effective information.

4.1 Results and Analysis

Figure 23 shows the connection Wi-Fi from the device. The user must connect the Wi-Fi first to get a signal from ESP32-CAM. Figure 24 shows the output interface in local network. The result and analysis section contains the circuit and coding results, as well as part of the project's analysis that contribute to its success. It also has a simulation result that shows the percentage of air quality using an Arduino UNO application.

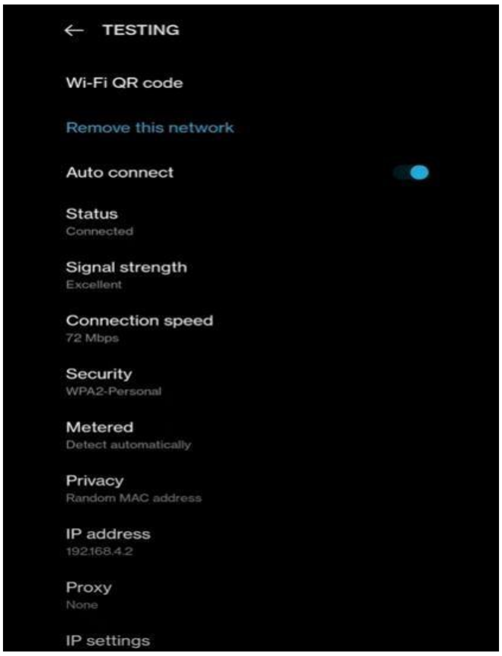


Figure 23: Connect the device's Wi-Fi

Figure 24: Interface in local network

Evaluation table of measurements based on the time of method access. The comparison results is shown in Table 1.

Table 1: Comparison of prototype development methods.

No.	Method	Time taken (s)
1	Obstacle	55
2	Wireless voice control	50
3	Ultrasonic sensor	55
4	Ball tracking	54
5	Gesture signals	55

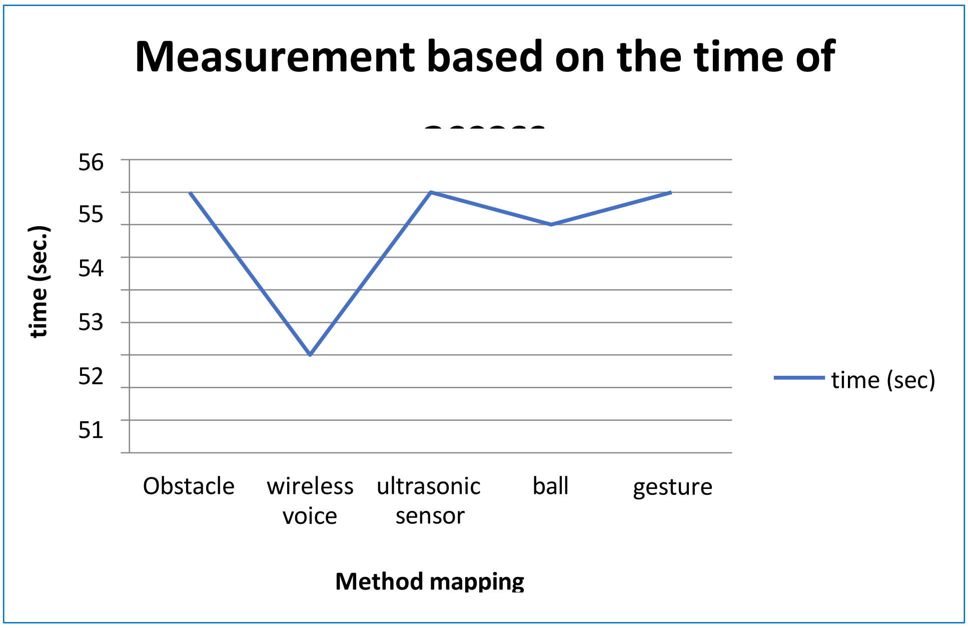


Figure 25 : Graph of measurement based on the time of access for the prototype used.

The graph in Figure 25, shows the readings obtained during the test. Observation results from the 5 methods tested within 1 minute, the target to find the object or victim in the rescue activity was successfully detected. In general, the proposed method gives the best results. Observations provide results that are close to 100% detectable and discoverable.

4.2 Discussion

When turning on the switch, connect the device's Wi-Fi and put the IP address (192.168.4.1) in the local network. An interface will appear and the robot ready to use. As set up in coding, the output will show the display (ESP32-CAM), movement button, speed, light, Pan, and Tilt. The movement button can control the robot up, down, right, left, and spin 360' degrees. Speed and light can be adjusted the speediness and brightness. Besides, Pan and Tilt is adjustable for the camera. It will work well for turning to the right and to the left in 180' degrees.

5.0 CONCLUSION

Based on the findings and objectives of the study, recommendations were made and the objectives were successfully achieved. At the end of this project, some important conclusions can be elaborated and some recommendations have been identified to be highlighted for the purpose of improvement. The idea for a new type of rescue robot and its mechanical design form the core of this Robot is made to rescue victims after a disaster and replace human rescue teams. Autonomously provides useful information to rescuers. Basically, humans need to be present to evaluate the accuracy and implications of the data provided. Unstable structures can be easily searched by robots, and team members can collect data from robots from a safer distance. A variety of lighting and camera equipment are examples of modern equipment. The use of the video camera attached to the gadget is as a search camera that can be inserted into cracks and holes to find any evidence of the victim.

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IOT Parking System Using Blynk Application

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Abstract This project main focus is to utilize wireless technologies to create an IoT system that enables people to check available parking spaces trough phone app. This can be done using an app called Blynk and a Wi-Fi module to make a connection to phone trough Wi-Fi and send IR sensor output to phone app so data can be sent into phone and show parking status. The app will display the parking layout and total number of available parking spaces left. The hardware used in the project is ESP32 and IR sensor. ESP32 is a Wi-Fi module to send and receive data meanwhile IR sensor will detect object perceived as car.

Kata Kunci: IoT, Wi-Fi, Blynk, NodeMCU ESP32, sensor

1.0 INTRODUCTION

An IoT Based Parking Management System Using App is a system with combination of software and hardware which will be used to help people finding any free parking space more easily. This system used a sensor to detect free space and send the signal using a piece of hardware called ESP32 which then will update the app of any free parking space location. Meanwhile, the application provides an effective means of finding desired parking space as the app will show the total number of free parking space and parking space layout. The system is easy to use and reduces the time needed for parking. By using this system people can park their car faster without wasting any time finding parking slot, so the parking fees will be less compared to without using the IoT Based Parking Management System. By using the IoT Based Parking Management System on any touristy places and shopping mall, people can avoid wasting their time and money finding their desired location to do their shopping or hang out. Hence the system is developed to provide people an easy and quick way for finding a parking spaces.

This project is user-friendly, easy to install and requires minimum effort. The hardware only needs a microcontroller like sensors, and node MCU module. When the sensor detects an empty parking, it will detect which parking is empty and update it into the app. User just check their phone, log in into the apps and check the parking status.

2.0 LITERATURE REVIEW

IoT parking system refer to a system that use internet connection to share data into mobile phone app to update the parking status. This will help people to find parking space more easily and quicker without having to spend much time finding parking space. In this chapter, we will review other project that have similarities with my project. There is a lot of smart parking system are used among them there are IoT Based Smart Parking System. This project aims to develop a Smart Parking system consists of an onsite deployment of an IoT module that is used to monitor and signalize the state of availability of each single parking space. A mobile application is also provided that allows a user to check the availability of parking space and book a parking slot accordingly. This project is developed by integrated IR sensor with a microcontroller and connect it with ESP32. This combination of hardware then wirelessly connected to a software that manage the parking fees payment and showing parking vacancy status (ElakyaR et al., 2019).

Smart Parking System using IoT are built to minimize user's time and efficiency as well as the overall cost of the fuel burnt in search of the parking space. This project is included IR sensor. This sensor will detect the empty parking space and update it to app and user can check the parking availability. The user receives messages through the SMS module while cars enter and exits the parking area using RFID card. The messages sent by the SMS module are managed by the cloud. As soon as the IR sensor detects the car, the status of the cloud will be updated from 0 to 1 and when the car leaves the parking area the status of the car will be updated from 0 to 1 (R.Subash et al., 2019).

According to the IoT-Based Car's Parking Monitoring System, they developed parking system is a system that is able to calculate and detect the presence of cars in the parking area. The data obtained in the parking area will be sent to the cloud database. The data will be used by Android application to inform the users where parking space they should go to. The first process is payment at the entrance, where at the entrance gate will be placed RFID reader and controller with (LCD). Car driver needs to have RFID card that has a function as e-money. The car driver only needs to tap the card on the scanner and data in the card will be sent to the local server and cloud then the gate will open. The second process is getting into the parking slot. In each of the parking slots will be installed car detection sensors and additional sensors on the parking marker to keep the car park tidiness. Each slot has a unique address for the parking lot mapping process. If a car is detected at a specific slot address, then the system will send the latest data to the cloud for updating. The third process is getting out of the parking slot. This process is almost the same as the second process. If the sensor detects the car exits a certain parking slot, then the system will update the existing data in the cloud according to the slot address under changing conditions (Albertus Ega Dwiputra et al., 2018).

Other than, the next project is IoT Based Smart Parking System is aimed to create a system that helps people with personal vehicles to find for parking easily at selected areas. Both software and hardware platform have been developed in this system. The system works primarily on the detection of object in parking slots through sensors that are mounted on every parking slot which facilitates the information. Then this is then processed by microcontroller which helps to serve as a medium of communication between those peripherals or devices. The final stage would be when user uses their smart phones to retrieve the slot occupancy in selected areas prior to reservation (Tejas Pund et al., 2018). Finally, the next project reference is IoT Based Smart Parking System using ESP32 is to design, develop and build an IoT based Smart Parking System using ESP32 with growing quality of good Cities. Someone will manage the devices put in in his home or workplace from any place within the world by simply checking a Smartphone or any net connected devices. Smart Parking System consists of Two Servo Motors, One Ultrasonic Sensor, Two IR Sensor and One 16x2 LCD. Here, ESP32 will control the entire process and send the parking status information to Google Firebase through Internet so that it can be checked from anywhere in the world through internet. Two IR sensors are used at the entry and the exit gate to check the presence of vehicle and process automatically close or open the gate.

IR Sensors are used to detect presence of any object by transmitting and receiving the IR rays. Two servo motors will act as the entry and the exit barrier and they rotate to open or close the exit way. Smart Parking System reduces the time to locate a vehicle in parking areas and hence it reduces fuel consumption. It also eliminates the unnecessary travelling of vehicles across the filled parking slots in a city. Finally, an 10 Ultrasonic sensor is used to detect if the parking slot is occupied or available and send the information to ESP 32. (Mehala Chandran et al., 2019).

3.0 RESEARCH METHODOLOGY

A NodeMCU ESP32 microcontroller is used in the development of this system with a link to the Blynk application that requires an authentication token every time it is used. The ESP32 is a wire0tap module that connects to any internet connection. The Blynk application on a smartphone is connected via Wi-Fi or any internet service provider (ISP) used. The programming of this system uses the Arduino IDE loaded into the ESP32.

3.1 Application Design

In designing the IoT parking system using Blynk application, in this study used IR sensors, NodeMCU ESP32 as a microcontroller, any Android devices, Blynk and object (mini vehicle) are shown in Figure 1. Sensors are connected to NodeMCU ESP32. NodeMCU ESP32 is connected wirelessly to the Wi-Fi. After connecting to the internet, the homeowner can control and monitor the condition of parking system through an Android device (smartphone or tab) with the Blynk application. Blynk application as a data center and display the parking status.

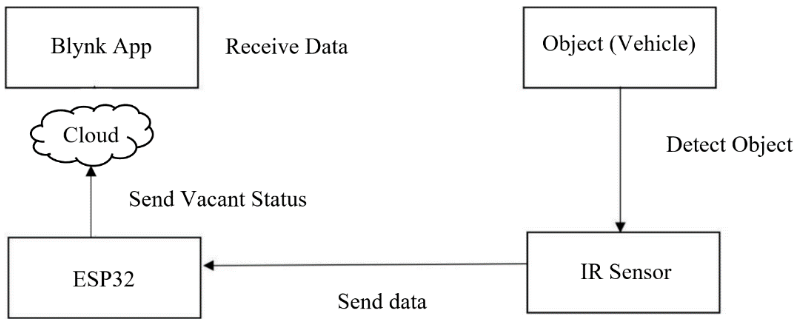


Figure 1: Block Diagram

3.2 Flowchart of The Project

Figure2 shows the process of the whole system. It is showing the way the system work and how it updates the data.

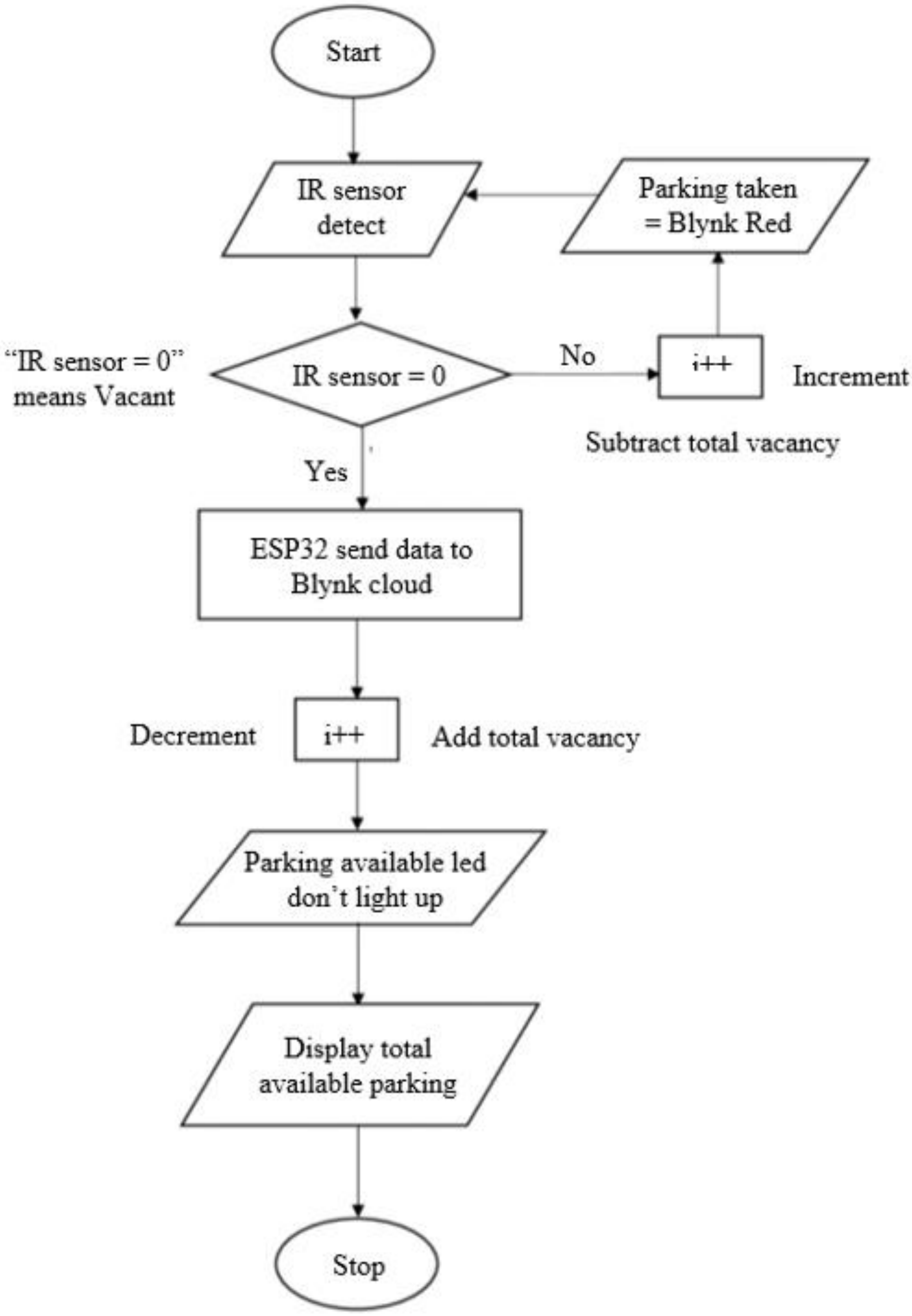


Figure 2: Flowchart

3.3 Schematic Circuit

Figure 3 shows the overall circuit diagram of IoT Parking System Using Blynk Application.

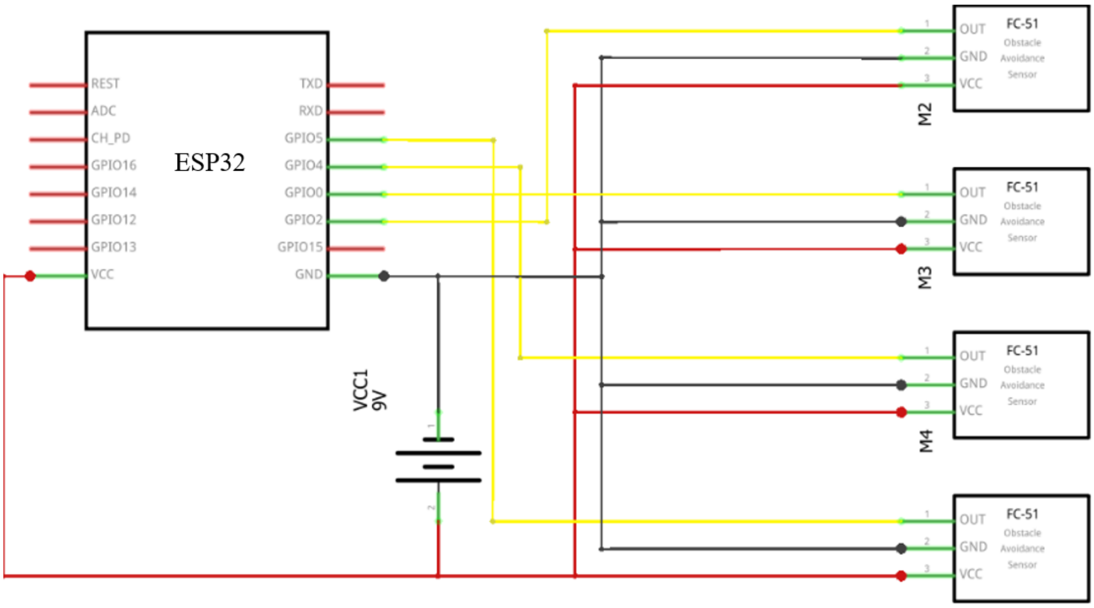


Figure 3: Schematic Diagram

3.4 Prototype layout

The parking system is designed to be cheap and viable. There are only 2 hardware involved that is ESP32 and IR sensor. These two modules are widely available and cheap. The ESP32 price is around RM25 meanwhile IR sensor is only RM15. This project includes three sections of the whole prototype design. Refer to the Figure 4 the first section is the IR sensor section, Wi-Fi module section, and software section. In this project, it will be installed on a mini parking lots resemblance for an example as a prototype. The IR sensor will be connected to ESP32 Wi-Fi module. So, when IR sensor detect empty space, it will send signal to update parking status via ESP32 in the phone app. Then we can login into the software which is an app called Blynk to monitor the parking status. In the software, we can check where empty parking is and also show the total amount of parking available.

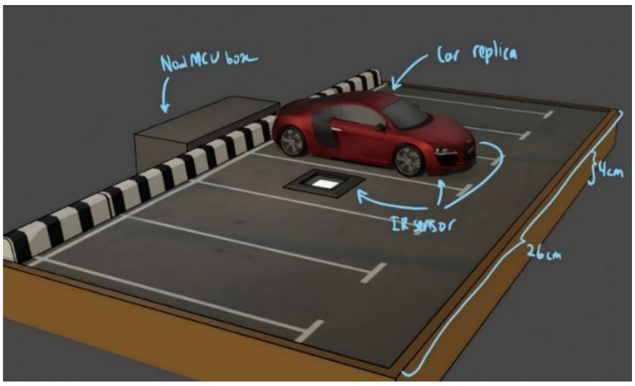


Figure 4: Prototype layout

4.0 RESULT AND ANALYSIS

Finally, the circuit function as it supposed to and this project demonstrates the function of the IoT Parking Using Blynk Application. To begin, the IR sensor detects any object perceived as vehicle. Then data send to ESP32, which will upload it into Blynk cloud to update the parking interface in Blynk app. Meanwhile the Blynk app show the number of total empty parking and also show LED template arranged accordingly to the parking location. So, if vehicle enter "Parking 1", led template for Parking 1 will turn red, and if the vehicle goes out of the parking the led will turn off while the total parking will always update the total number. Table 4.1 shows the LED with different IR sensor detection. The led on and led off readings are based on if the led on indicates there is a vehicle in the parking loT. Whereas if the led off indicates no vehicle in the parking lot.

Table 4.1: Analysis LED with different IR sensor detection

Blynk Display	Parking 1	Parking 2	Parking 3	Parking 4	Total Free Slot	Parking left
LED condition	off	off	off	off	4	4 parking left
	on	off	off	off	3	3 parking left
	on	on	off	off	2	2 parking left
	on	on	on	off	1	1 parking left
	on	on	on	on	0	0 parking left

4.1 Prototype design

Based on Figure 5 and Figure 6 shows the in front and top view of project. The IR sensor determine the distance in the parking area. The sensor will notify the object and send it to NodeMCU ESP32. NodeMCU ESP32 will send the data to Blynk servers which will further displayed to Blynk app.

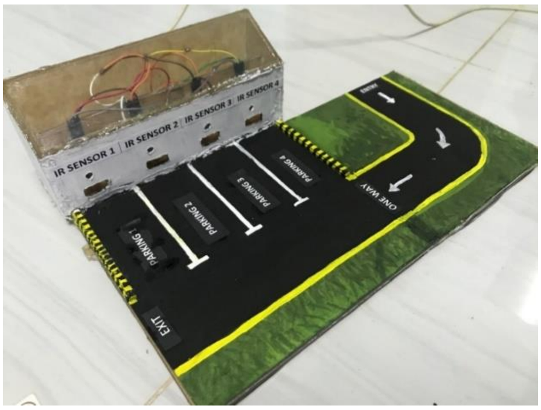


Figure 5: In front view

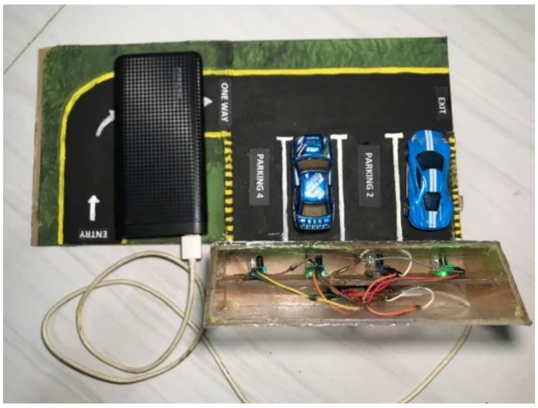
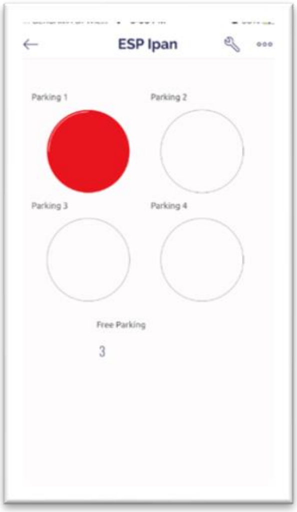
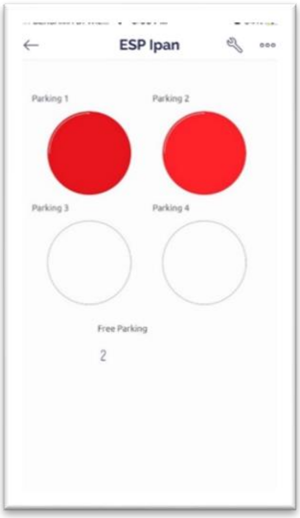
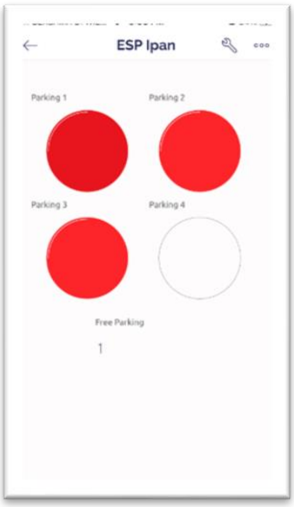
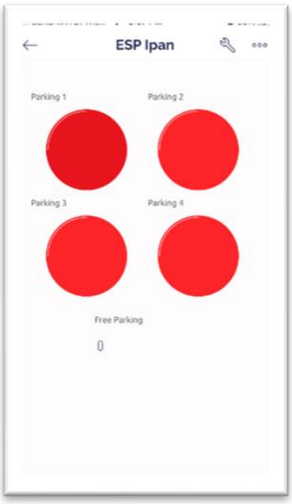


Figure 6: Top View

This project will able to display empty parking location and total empty parking. Table 4.2 shows the total empty parking slot from Blynk application status display. It uses IR sensor to detect vehicle and need ESP32 to make connection to phone trough Wi-Fi. If any of the parking occupied, led in Blynk app will turn red while total number will be updated.

Table 4.2 Empty parking slot from Blynk application status display

	
Parked 1 out of 4	Parked 2 out of 4
	
Parked 2 out of 4	Parked 4 out of 4

This project will able to display empty parking location and total empty parking. It uses IR sensor to detect vehicle and need ESP32 to make connection to phone trough Wi-Fi. If any of the parking occupied, led in Blynk app will turn red while total number will be updated.

5.0 CONCLUSION

The process of completing a carefully planned project as well in fact it is quite difficult because after facing various obstacles and problems only then can it be achieved even if it is not as successful as desired. The Project “IOT Parking System Using Blynk Application” is the result of my observation of how IKEA parking guiding system used in it parking lot. This project are change in the implementation of the system with a new methods and applications of Internet of Things so it can be utilized as well as beneficial to everyone. Maybe one day, this project can be marketed and applied into any large mall or apartment. In future, the researcher want add a safely feature and billing system so the project system design could be more functional.

ACKNOWLEDGEMENTS

The writer would like to thank the contributor of this project Mr. Ahmad Nur Irfan Bin Zaini for being committed to making this project a success. This project is belived to benefit the local community Merlimau Polytechnic and it is also hoped that this project can be part of the new technology available in the market.

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Mehala Chandran, Nur Fadila Mahrom, Thennarasan Sabapathy, Muzammil Jusoh, Mohd Nasrun Osman, Mohd Najib Yasin, N.A.M Hambali, R.Jamaluddin, N.Ali, Yasmin Abdul Wahab (2019). IoT Based Smart Parking System. International Conference Computer Science and Engineering

Development of an Arduino Based Universal Electronics Components Tester

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Abstract. The Electronics Components Tester using Arduino Uno is a project that involves the use of an Arduino Uno board and other electronic components to create a device that can test the functionality of various electronic components such as resistors, capacitors, diodes and transistors. The tester is built using a combination of hardware and software, and it is capable of measuring the resistance, capacitance, and forward voltage drop of different components. The software is written in Arduino programming language, and it includes LCD screen that displays the test results. This project provides a low-cost and efficient solution for testing electronic components, making it suitable for both hobbyists and professionals in the electronics industry.

Kata Kunci: Arduino Uno, Electronic Tester, Industry

1.0 INTRODUCTION

Today's electronics devices are made up of many different types of components. Some, suchas resistors and capacitors, are simple and passive, while others, such as advanced central processing unit (CPU) chips, are highly complex and can contain over 20 billion transistors.Moreover, an electronic component is any basic discrete device or physical entity in an electronic system used to influence electrons or their associated fields. According to (Sapkota, 2018), electronics components like resistor, capacitor, diode, especially transistor have the different configuration so, they must be tested by a particular kind of testers which involves more complicated, and time involved in it will also be more.

There are several drawbacks of using multimeter for testing a buck of electronic components. By using a multimeter to test components may take some time, especially if need to test multiple points or perform multiple tests to fully diagnose a problem. Furthermore, it may need to switch between different modes (such as voltage, current, and resistance) in order to perform different tests. This can add to the overall time required tocomplete the testing (Anuar et al., 2018). Multimeters introduce measurement errors due to factors such as lead resistance, input impedance, and temperature as well. These errors can accumulate over time and cause inaccurate readings. In addition, multimeter incapableto measure the poles of each of these components so students must learn more about whichpoles are the components (Lestari, 2019).

Thus, here’s a Universal Electronics Components Tester to overcome such problems. This project aims to design and implement an electronic components tester using the Arduino Uno microcontroller. (Geasa, 2021) reported that Arduino Uno is a low-cost microcontroller board that can be easily programmed and used to develop Universal Electronic Components tester. Compared to commercial testers, it can be much more cost-effective. Besides, (Kurniati, Rezki, 2016) mentioned that Arduino can be programmed to test a wide range of electronic components, such as resistors, capacitors, diodes and transistor. The tester is capable of identifying and measuring various electronic components, such as resistors, capacitors, and diodes, and transistor by displaying their values on an LCD screen. Moreover, it capable to recognize terminal base, emitter and collector also the type of the transistor either NPN or PNP as well. This makes it a versatile tool that can be used for a variety of electronics projects.

2.0 METHODOLOGY

This section includes a very comprehensive plan implemented. A step -by -step procedure is done so that the project can be completed within the stipulated time. This project covers two mains of elements: hardware development and software development. Figure 1 below shows the flow chart of the process developing the project.

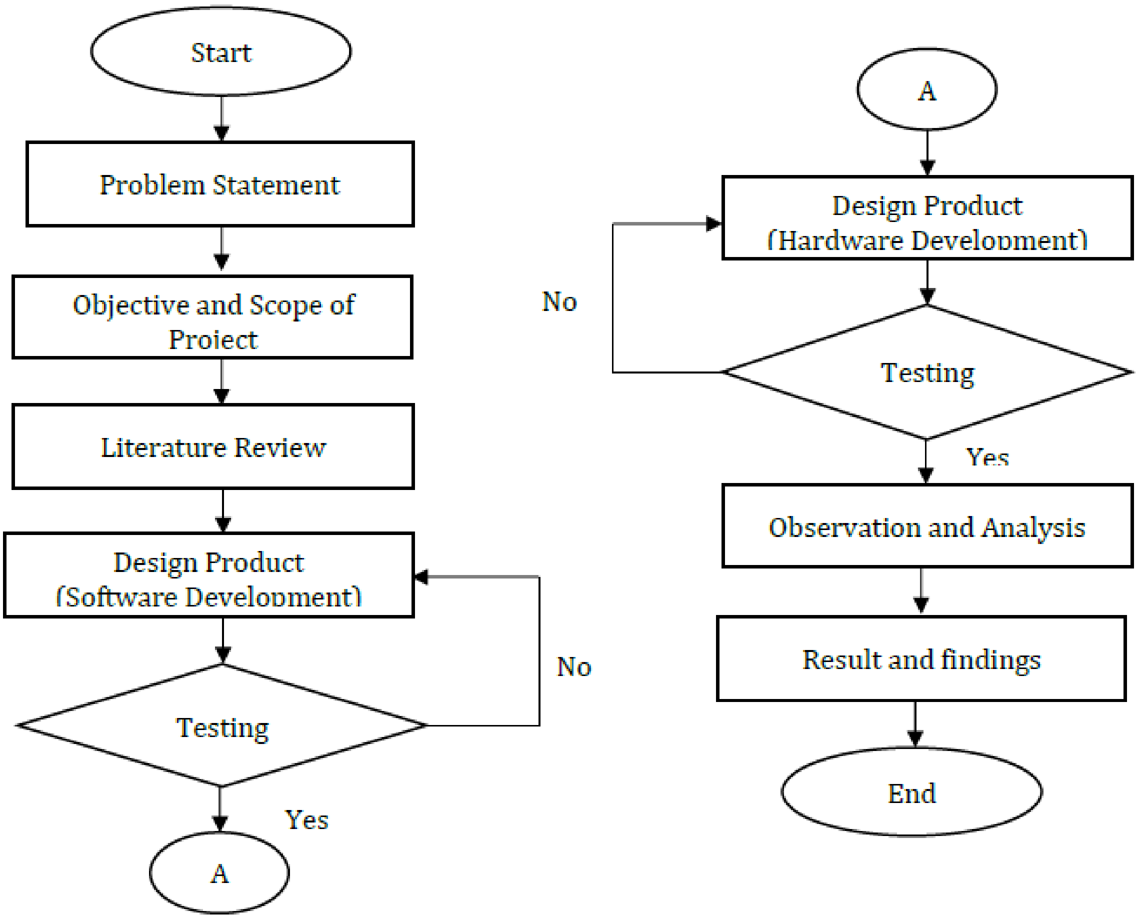

Figure 1: Flow chart of project methodology

2.1 Hardware Development

Developing a hardware of Universal Electronics Component Tester involves designing and building a system that can accurately and reliably test various electronic components such as resistors, capacitors, diodes, transistors, and integrated circuits. Figure 2 shows the hardware block diagram of the project.

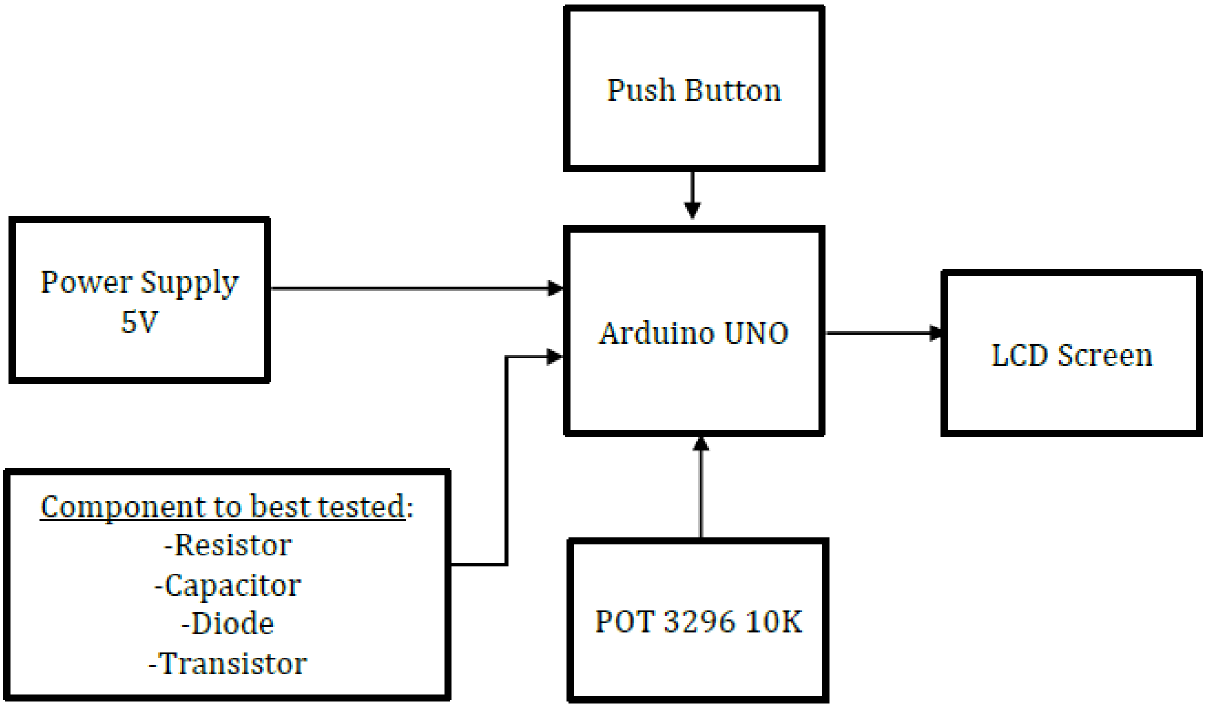

Figure 2: General Block Diagram of the Project

2.1.1 Arduino Uno

Arduino Uno board is a microcontroller board based on the ATmega328 that are used in developing the project. It has 14 digital input/output pins. 6 analog inputs, a USB connection, power jack, an in-circuit serial programming (ICSP) header and reset button.It is simply connected to a computer with a USB cable or powered with alternating current (AC)-to- direct current (DC) adapter or battery to get started. The Arduino Uno is used to measure various parameters of the components and display the results on a Display Module (LCD Display).

Figure 3: Arduino Uno Board

2.1.2 Potentiometer

POT 3296 10K are used in constructing hardware for the project. The 10K ohm Variable Trim Pot is also known as a preset potentiometer used for adjustment, calibration, and tuning in circuits. potentiometer is used to adjust the voltage or current being applied to the component being tested. The potentiometer allows to fine-tune the amount ofvoltage or current being applied to the component being tested, which is important for accurately measuring its properties. Overall, the potentiometer plays a critical role in anelectronics component tester, allowing for precise control of the voltage and current being applied to the component being tested, which is essential for accuratemeasurements and identifying any issues with the component.

Figure 4: Potentiometer

2.1.3 Liquid Crystal Display (LCD)

A 16X2 LCD is an electronic device is used to display data and messages it includes 16 Columns & 2 Rows so that it can display 32 characters (16 × 2 = 32) in total and each character will be made with 5 × 8 (40) Pixel Dots. So, the number of pixels in this LCD can becalculated as 32 x 40 instead of 1280 pixels.

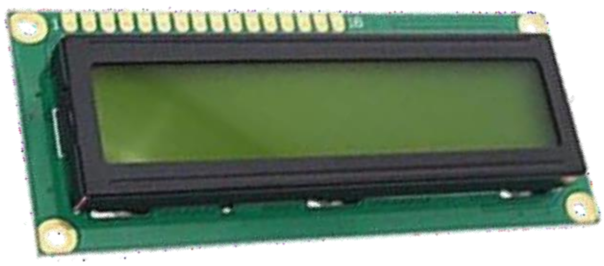

Figure 5: LCD Display

2.2 Software Development

Circuit Construction in Proteus Software where schematic representation of the circuit was made, representing the variouscomponents and connections as shown in Figure 6. The electric circuit connections were tested using Proteus Software Ver 8.0 and then transferred to a breadboard. Proteus Arduino can run the circuit process while using it. Proteus can help to simulatethe circuit and make sure the project runs as desired. With this, it can ensure that all installed components can run as expected.

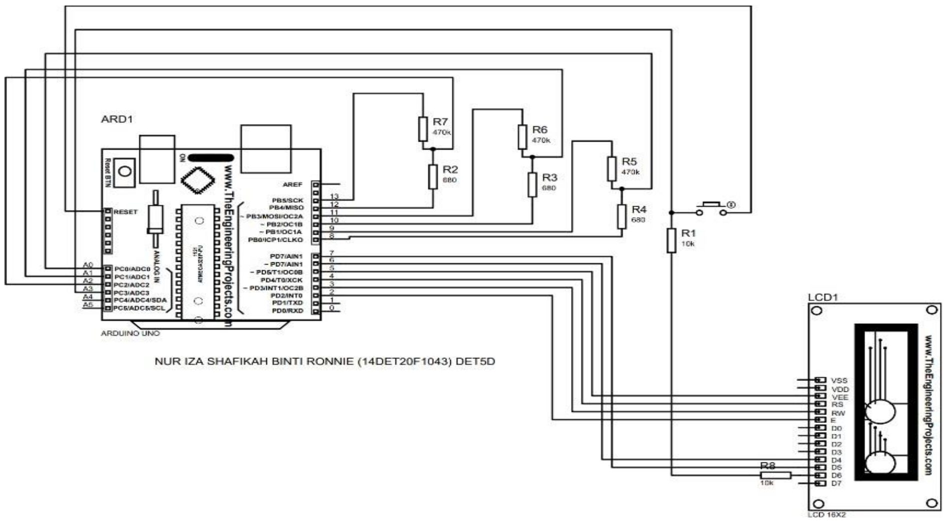

Figure 6: Circuit Diagram of Universal Electronics Component Tester

2.2.2 Arduino IDE

The project was developed by an Arduino program that needed to connect with 5V supply using an Arduino USB cable. The Arduino Software (IDE) makes it easy to write code and upload it to the board offline. This software can be used with any Arduino board. The program written will be analyzed and run in the Arduino IDE to identify and detect if there has been any failure in programming.

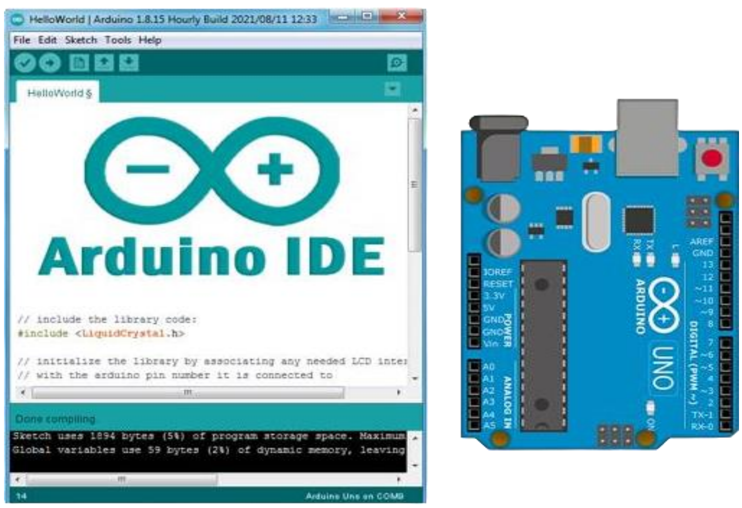

Figure 7: Arduino IDE Interface

3.0 RESULT AND ANALYSIS

The software part and hardware part are working together in order to obtain the result. The flow chart as in Figure 8 below shows the steps to use the Universal Electronic Component Tester. In the end, the value reading will be displayed clearly on the LCD if the component legs are placed correctly on the port provided. If the component is not placed correctly, the value reading will not be displayed and it will be ERROR displayed on the LCD. The user needs to repeat the steps again.

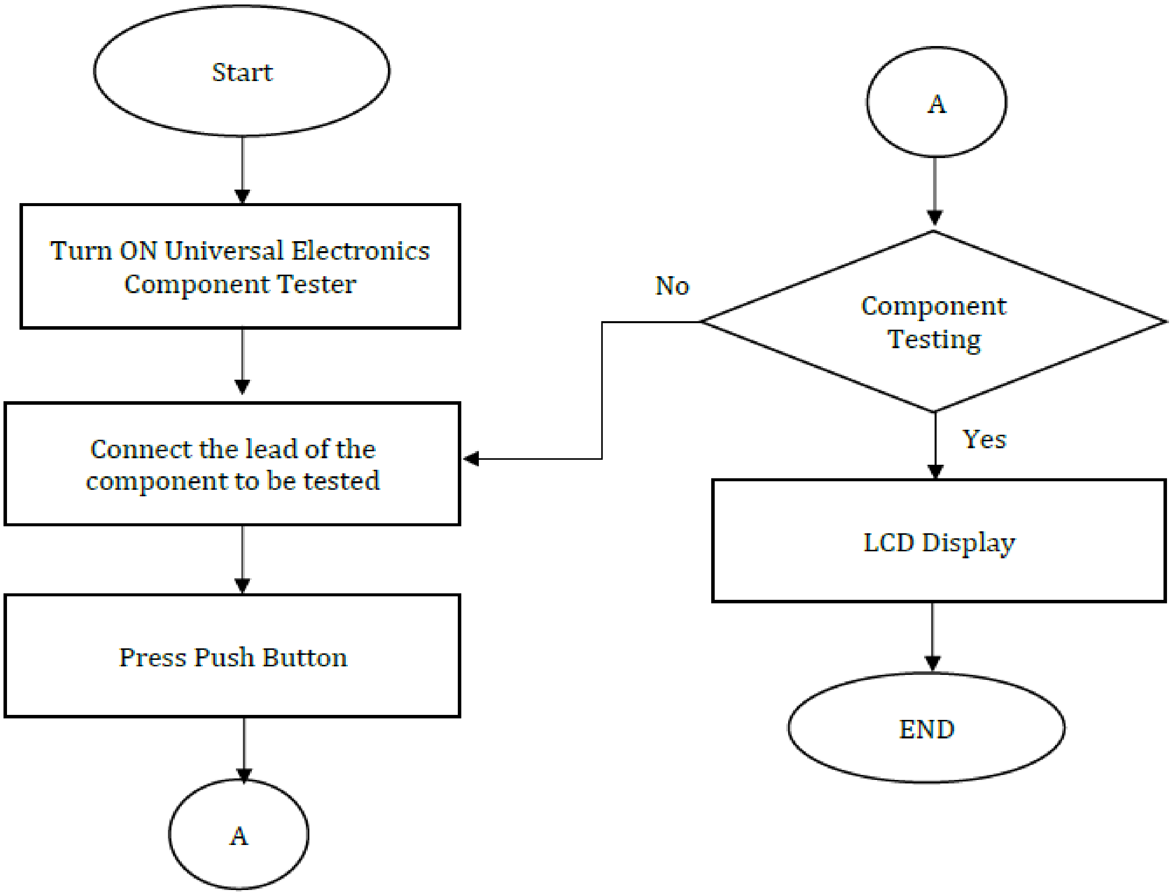

Figure 8 : System Flowchart

3.1 Prototype

Before producing the actual prototype, design of the prototype needs to sketch out, including the dimensions, shape, and layout of the case. There are several factors to be considered such as accessibility, user interface, and any specific requirements related to the project. Figure 9 and 10 show the sketching diagram of the project. While, Figure 11 and 12 show the prototype of this project. The diagram shows the prototype Universal Electronic Component Tester that has been produced. The prototype of this project uses a medium-sized black plastic container where all the circuits are placed in the container to protect the circuit and guarantee the safety of the user. A push button is placed on the outside of the container to facilitate the reset operation and also LCD Display to display the value of the components tested to the user.

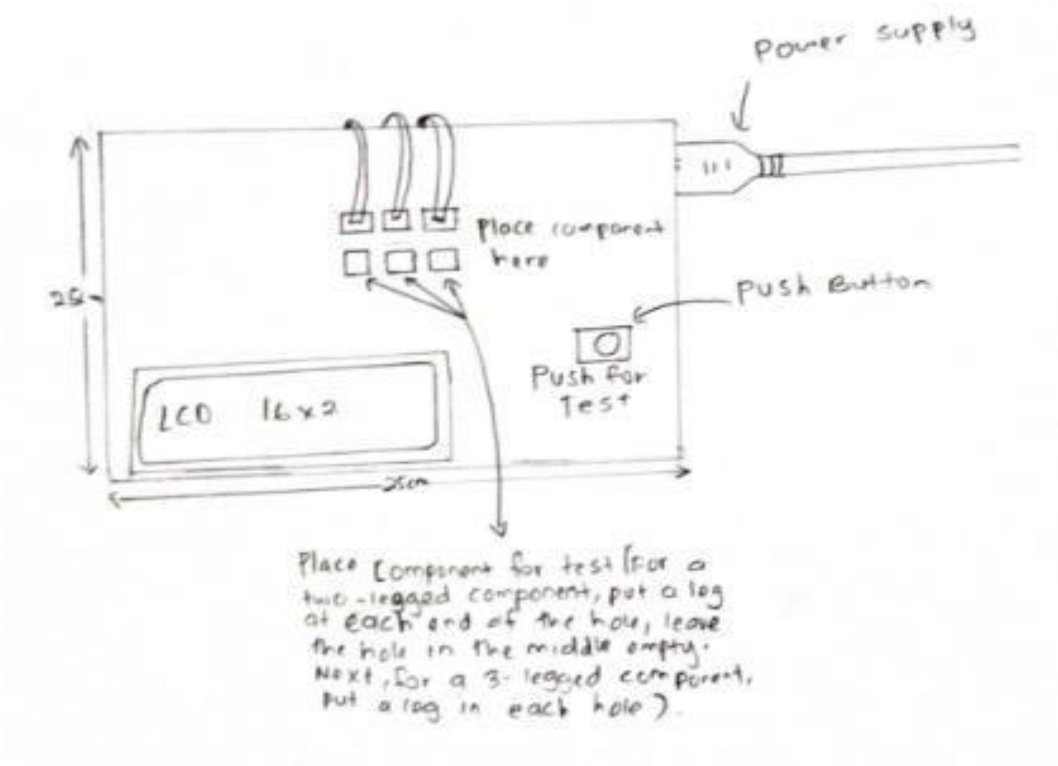

Figure 9: Sketching Diagram (Top View)

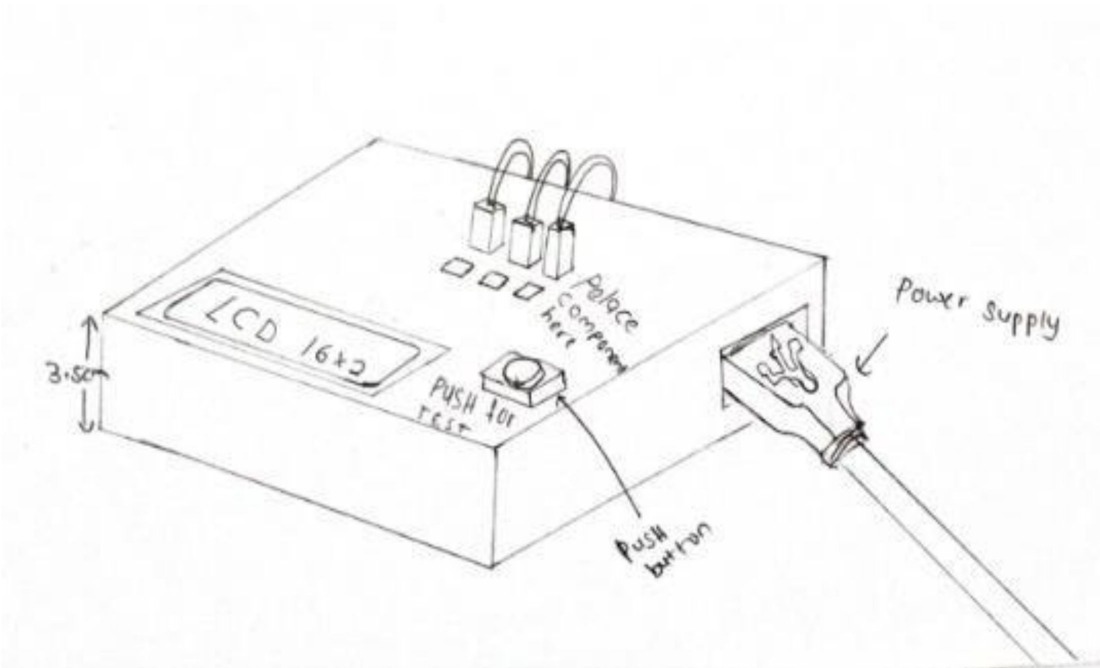

Figure 10: Sketching Diagram (Side View)

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Figure 11: Prototype Model

Figure 12: Prototype Model (Inside)

3.2 Data Analysis

The Universal Electronics Components Tester was tested with a variety of electronic components, including resistors, capacitors, transistor and diodes. The results obtained were highly accurate and reliable, with a maximum error of less than 5% for resistors and capacitors. The diode testing function also provided accurate results, with the forward and reverse voltage drop values being within the expected range for all tested diodes. Table 3.1 below show the result tested for several small range components. The result shows the comparison reading between Universal Electronics Tester versus conventional multimeter.

Table 3.1: Comparison measured value between Universal Electronic Component Tester versus Multimeter

Components	Actual Value	Universal Tester	Multimeter
Resistor	2kΩ	1.998kΩ	1.8kΩ
	10kΩ	10.1kΩ	10kΩ
	1kΩ	1.1kΩ	980Ω
Capacitor	100nF	9862pF	Unable to test
Transistor (2N3094)	-	Able to recognize terminals base, collector, and emitter	Must meet measurement procedure for transistor to test
		NPN type	
Transistor (BC557)	-	Able to recognize terminals base, collector, and emitter	Must meet measurement procedure for transistor to test
		PNP type	
LED		Able to measure forward bias voltage drop	Unable to measure forward bias voltage drop

4.0 CONCLUSION

The development of Universal Electronic Components Tester using Arduino has been presented. It can be concluded that this project s easy to use, affordable, and provides highly accurate and reliable results. The tester is suitable for both hobbyists and professionals and can be easily customized to meet specific testing requirements. The future work for this project includes adding support for more components and integrating wireless communication for data transfer.

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Development of Moveable Solar Generator with Voltage Indicator

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Abstract The increasing demand for clean and sustainable energy solutions has fueled the development of portable solar generators as efficient sources of electricity. This paper presents the design and development of a movable solar generator equipped with a built-in voltage indicator. The generator is intended to provide reliable power for various applications, particularly in remote locations and during outdoor activities. The voltage indicator offers real-time monitoring of the system's electrical output and aids users in optimizing energy utilization. The system comprises solar photovoltaic panels, a charge controller, a battery storage unit, an inverter, and a voltage indicator module. The integrated voltage indicator plays as system performance. It displays the real-time voltage output of the solar generator, providing users with information for system maintenance. The development process involved hardware design. The hardware selection, including solar panels, charge controller, and reliable battery were carefully selected for efficiency and durability. The voltage indicator was offering a clear and intuitive display of voltage data. Some tests were conducted to evaluate the solar generator's performance across different lightingconditions and load scenarios. The results demonstrated that the system effectively harnessed solar energy and provided consistent and stable power output. With the result of this moveable solar generator, many outdoor activities can be performed because electrical energy sources can be generated from this product perfectly.

Keyword: movable, solar generator, voltage indicator

1.0 INTRODUCTION

Solar power stands out as a significant contributor to the clean energy landscape. Harnessing solar energy through photovoltaic panels has gained widespread attention due to its environmental benefits and potential to address energy challenges. One practical application of solar power is the creation of portable solar generators, which offer a flexible and eco-friendly source of electricity in various settings, ranging from outdoor activities to emergency power backup. This will allow users to easily transport and set up the generator in various environments.

This project focuses on the design and development of a Moveable Solar Generator equipped with a Voltage Indicator. The generator aims to provide a convenient, lightweight, and efficient solution for individuals and small-scale operations that require electricity on the go. Additionally, the Voltage Indicator can enable users to monitor the output voltage of the generator in real-time. This information not only helps users manage their energy consumption effectively but also ensures the safety and stability of connected devices.To provide a consistent power supply even when sunlight is not available, the generator will be equipped with a battery storage system. Intelligent battery management will be implemented to ensure optimal charging and discharging cycles, extending the lifespan of the battery. The generator will feature an intuitive user interface that provides real-time information about the solar energy input, battery status, and output voltage. This ensures that users can easily understand and manage the generator's operations as well as the Moveable Solar Generator with Voltage Indicator represents a step towards sustainable and adaptable energy solutions.

The installation of the voltage indicator enhances usability and safety, making the generator suitable for both recreational and also emergency conditions.

2.0 LITERATURE REVIEW

In many regions of the world, renewable energy is becoming increasingly important in the provision of social services such as drinking water and electricity. Because it is free, solar energy has attracted special attention among the numerous renewable energy sources. Solar energy is at the heart of many renewable energy sources. Since it is abundant and renewable, solar energy is a good alternative energy source (Muhammad Nur Razin Hayadin, 2022). Solar panels convert sunlight directly into electricity through a process called the photovoltaic effect. Solar panels allow the direct conversion of solar energy into usable electrical energy without the use of moving parts or intricate mechanical processes for the photovoltaic effect. The design of the solar panel, the semiconductor material used, the angle and orientation in relation to the sun, and the solar radiation are all variables that affect efficiency.

2.1 Portable Solar Generator

The portable solar generator is an electricity generation system that can be used to connect electricity load. Since it is a sustainable energy sources, it is a good alternative. Due to their portability, they are ideal and highly helpful if there is no electricity in the neighborhood or if a power outage occurs at home. (Khairil Yusri Bin Mohd Yusoff, 2013). A portable power system refers to a compact and self-contained system for generating, storing, and distributing electrical energy in a mobile or off-grid environment. These systems are commonly used in various applications when access to a reliable power source is limited or unavailable. Portable power systems are versatile and can serve a wide range of purposes, including outdoor adventures, emergency situations, remote worksites, and more.

2.2 Voltage Indicators and Monitoring System for Portable Solar Generator

Voltage indicators play a crucial role in helping users monitor the status of a solar generator by providing real-time information about the system's electrical performance. Solar generators use photovoltaic panels to produce electricity from sunlight which is stored in batteries for later use. Voltage indicators help users track various aspects of the generator's status:

i. Battery Charge Level: Voltage indicators can display the voltage level of the batteries in the solar generator. This allows the user to measure the amount of energy stored in the batteries. A higher voltage indicates a more fully charged battery, while a lower voltage signifies lower charge levels.

ii. Charging Status: Solar generators are designed to recharge their batteries using solar panels. Voltage indicators can show whether the solar panels are successfully charging the batteries by displaying an increasing voltage over time. This indicates that the system is receiving energy from the sun and converting it into stored electricity.

iii. Load Monitoring: Voltage indicators help users keep track of the load being drawn from the batteries. As electrical devices are connected and turned on, they draw power from the batteries, causing the voltage to decrease. Users can use the voltage indicator to monitor how their energy consumption affects the battery's voltage level.

iv. System Health: Abnormal voltage readings can signal potential issues with the solar generator system, such as a malfunctioning solar panel, a faulty battery, or a damaged component. If the voltage falls outside the expected range, users can identify and address problems before they lead to more significant system failures.

3.0 RESEARCH METHODOLOGY

The development of a movable solar generator with a voltage indicator involves a combination of hardware design and research processes. The process selection of components such as solar panels, batteries, voltage indicators, inverter units, and any other necessary electronic components is very important in the hardware design.
The process of build a prototype of a movable solar generator involves assembling the selected components, an enclosure is created and the voltage indicator is installed. There will be two types of sources to charge the battery which are the solar panel as the main source and the AC supply as the backup source. All these operations will be controlled by the switch, only when it ON position the battery will be charged.

3.1 Block diagram

The solar charge controller is fundamentally a voltage or current controller to charge the battery and keep electric cells from overcharging while the inverter converts direct current (DC) electricity, which is what a solar panel generates, to alternating current (AC). The output voltage can be read and measured at the voltage indicator at the top of this moveable generator prototype. The overall design of the moveable generator by using solar shown in Figure 3.1 below.

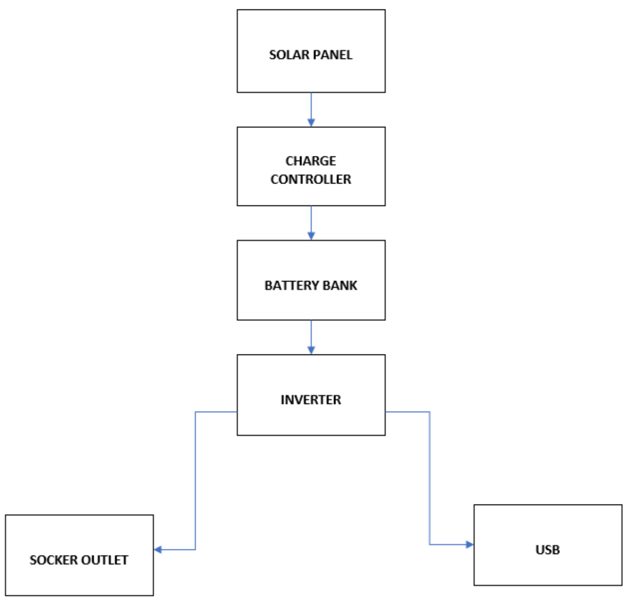

Figure 3.1: Block Diagram of Moveable Solar Generator with Voltage Indicator

The block diagram of the Moveable Solar Generator with Voltage Indicator show the overall process of this project. The solar panels are connected to the charge controller. This connection ensures that the energy from the panels is properly regulated before it reaches the battery bank. The charge controller then connected to the battery bank to monitor the battery voltage and controls the charging process to prevent overcharging or damage to the batteries. The battery bank is connected to the inverter. The stored energy in the batteries is converted to usable AC power by the inverter. The inverter is connected to power outlets. This project use USB charging modules to provide USB output and also AC socket outlets.

3.2 Circuit Connection

Figure 3.2 shows the overall circuit of this project. This circuit start with solar panels mounted on the top of the solar generator. The positive terminal of the solar panels is connected to the positive input of the charge controller and the negative terminal to the negative input of the charge controller. The charge controller regulates the flow of energy from the solar panels to the battery bank to prevent overcharging. The battery bank then stores the energy generated by the solar panels. It supplies power to the inverter, which converts DC power to AC power. The positive and negative terminals of the battery are connected to the corresponding terminals of the inverter. The positive and negative terminals of the voltage indicator are connected to the positive and negative terminals of the battery bank. This allows the voltage indicator to display the current and voltage level of the battery bank.

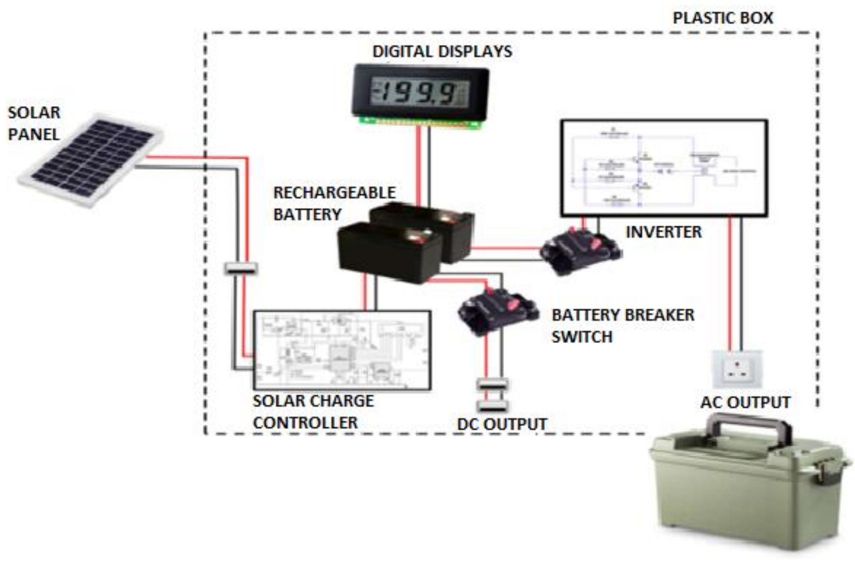

Figure 3.2: Overall Circuit Connection

This project prototype has two uses for switches. Solar panels will draw current when the first switch is turned ON in order to fully charge the battery. The voltage value of the battery will be shown on the voltage indicator. Switch off the first switch once the battery is full and unplug the solar panel from the power supply. When the second switch was turned on, the voltage indicator will show the output voltage. The displays should be as the same value at volt display.

4.0 RESULT AND ANALYSIS

The development of a movable solar generator with a voltage indicator aims to provide a portable and sustainable energy solution This section will explain the results and analysis of the developed movable solar generator, theoretically based on data collection from voltage indicator by manual reading based on the output and turning on the direct current load with charging handphone, including its performance and usability.

4.1 Result

4.1.1 Hardware Development

Figure 4.1, shows the hardware installation for the movable solar generator. For hardware development, several core components are used to develop this project. The solar charge controller is the main component of this system. Next is the 12V solar panel was used to supply the power from light energy to electrical energy for the system. The 12V rechargeable sealed lithium ion battery is for storage of the power for the 12V DC load. The inverter used to convert the DC power stored in the batteries into AC power, while the voltage indicator provides information about the current voltage level of the battery bank. All the hardware equipment then was installed in the plastic bullet box. This particular style of box was chosen since it is both sturdy and lightweight when all the parts are included in it. This box made of durable plastic, water-resistant and is made to be portable. Lastly, the load for the test USB port to charging the phone with the efficiency of the voltage. Figure 4.1 shows the hardware development.

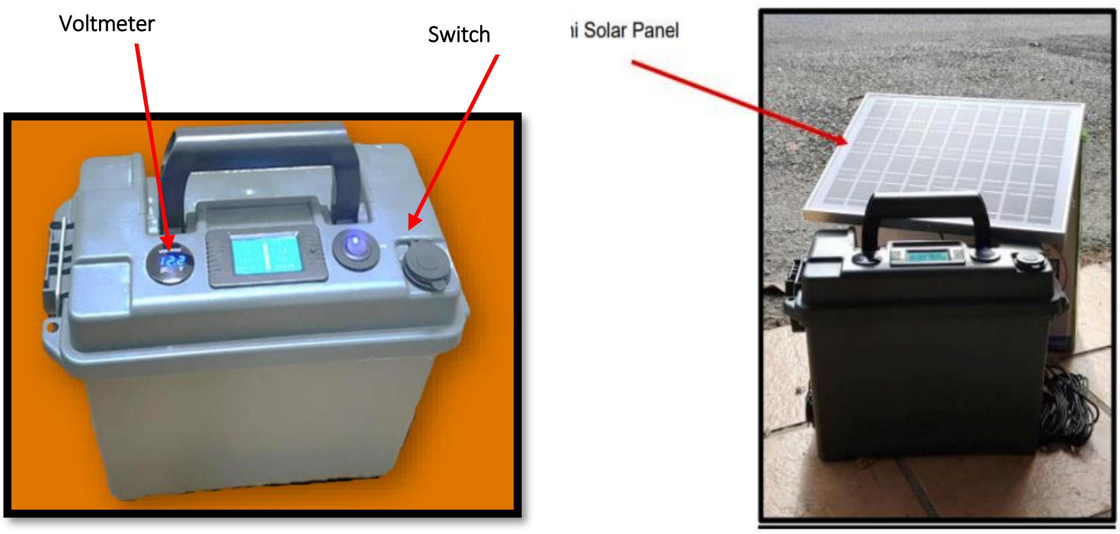

Figure 4.1: Hardware Development

4.1.2 Solar Panel Efficiency

The efficiency of the solar panels was measured through their ability to convert sunlight into electricity. A few experiments were carried out using various lighting setups, including spotlight lighting and direct sunlight. Two separate experiments for lighting conditions are shown in Figures 4.2 (a) and 4.2(b).

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Figure 4.2 (a): Test on direct sunlight

Figure 4.2 (b): Test on spotlight lamp

4.1.3 Voltage Indicator Accuracy

The voltage indicator's accuracy was tested by comparing its readings with calibrated voltage measurement equipment. The results showed that the voltage indicator provided measurements indicating the system's voltage level. The inclusion of a voltage indicator simplifies user interactions with the generator. Users can easily monitor the system's voltage status, enabling informed decisions about energy consumption and storage. In addition to voltage measurement, this indicator also can show the measurement of current, power, energy, battery capacity, resistance, and running time of this movable solar generator. Alongside voltage, monitoring the current being produced or used by the solar panels or batteries can give a clearer picture of the power being consumed. Monitoring the state of charge of the battery can help to prevent over-discharging or overcharging which can damage batteries. Figure 4.3 below shows the calibration process of voltage and current measurement while Figure 4.4 shows the readings on the voltage indicator or multi-function battery meter.

Figure 4.3: Calibration process of voltage and current measurement

Figure 4.4: Readings on voltage indicator or multi-function battery meter

Data collection from the reading's measurement show in the Table 1 below:

Table 1: Data collection from the reading's measurement

Measurements	Data Collected
Voltage	12.1 V
Current	78mA
20.Power	0.94W
Energy	255Wh
Capacity	29.3Ah
Resistance (External)	155Ω
Running Time	20.59 in

4.1.4 Load for the system

For the proposed system, the load has been applied to this system which is the charging phone to ensure its functionality and performance. The overall process for testing the load system is show in Figure 4.5 below.

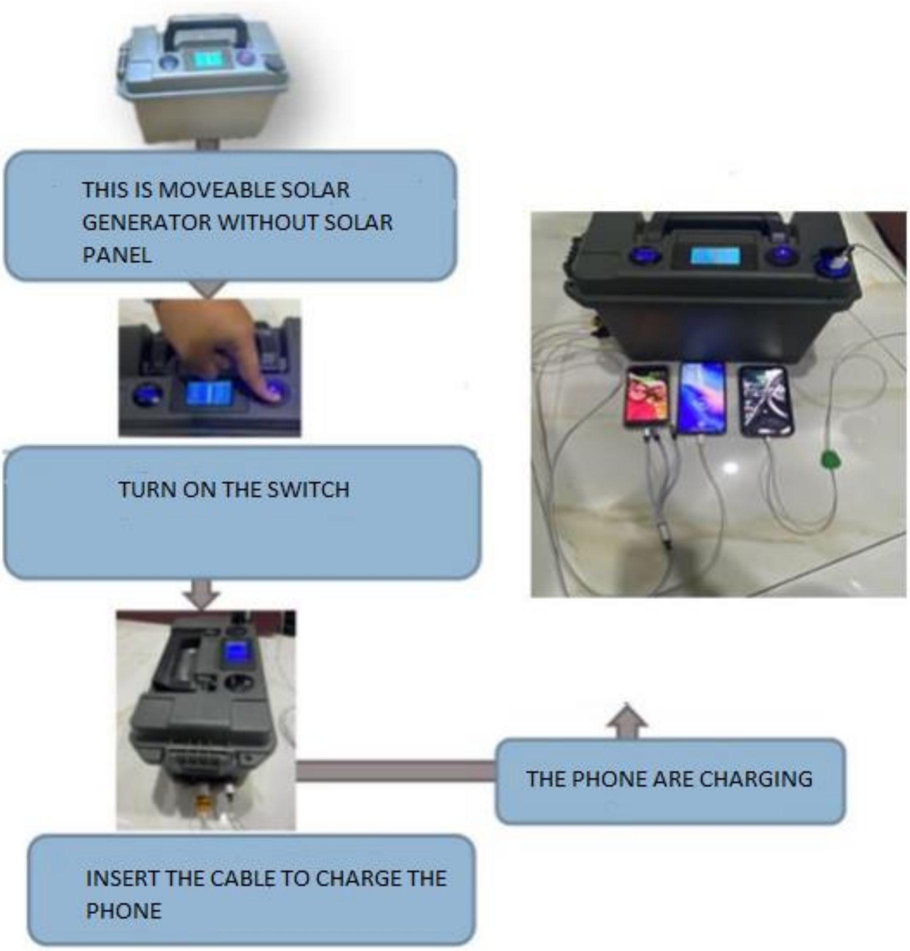

Figure 4.5: Overall process for testing the load system

After the battery is fully charged by using solar, connect device (e.g., smartphone, tablet) to the USB port on the solar generator. The battery provides power to the inverter and then inverter converts the DC power from the battery into AC power suitable for electronic devices. The converted AC power is then supplied to the USB port, which acts as a standard wall outlet. While the device is charging, the voltage indicator was showing a slight drop in voltage due to the power being drawn from the battery. The voltage indicator provides real-time feedback on the battery's charge level while under load. The voltage indicator might show a decrease in voltage as the battery discharges, indicating that it's time to recharge the generator when sunlight is available.

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5.0 CONCLUSION

As a conclusion, the development and implementation of a movable solar generator with a voltage indicator present several notable advantages and considerations. The combination of a portable solar generator with a voltage indicator offers a versatile and eco-friendly power solution that can be used in various applications. Its ease of movement and setup facilitate usage in various scenarios, such as outdoor events, camping trips, emergency situations, and remote areas with limited access to grid electricity. Further refinement based on user feedback and technological advancements could lead to even more efficient and accessible movable solar generators in the future.

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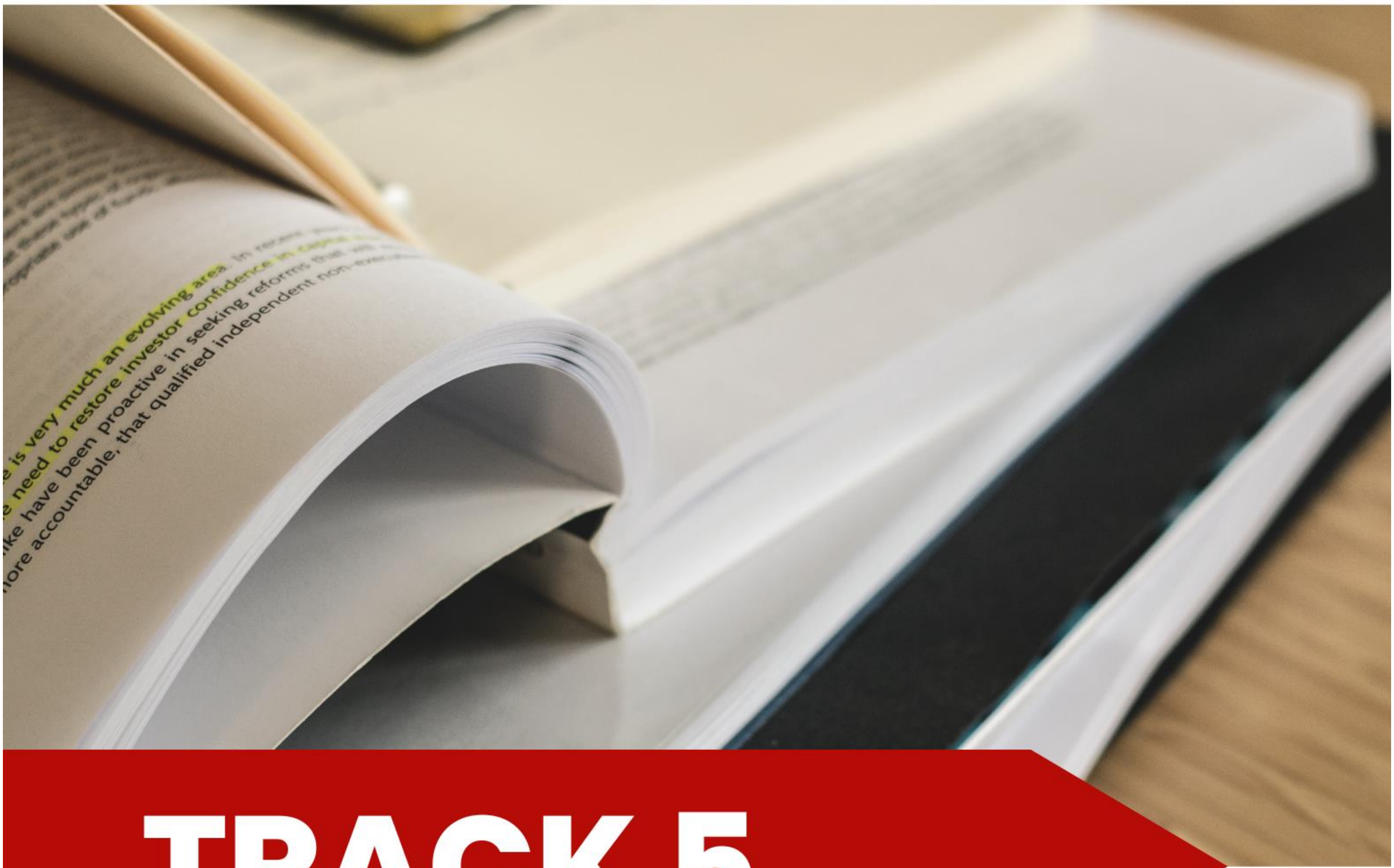

TRACK 5

OTHERS

Tahap Kebolehgunaan Platform Semakan Hari Berkursus Staf (SHaBaS) di Politeknik Merlimau

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Abstrak. Semasa negara menjalankan Perintah Kawalan Pergerakan (PKP), pengurusan latihan yang efektif adalah solusi yang praktikal bagi meningkatkan kemampuan pekerja. Pada masa tersebut, semua organisasi sektor awam berusaha meningkatkan latihan dalam talian walaupun menghadapi pelbagai cabaran. Tidak hanya pelaksanaan latihan yang menjadi cabaran, tetapi pemantauan latihan juga mengalami kesulitan pada masa itu. Di Politeknik Merlimau Melaka (PMM), Unit Latihan dan Pendidikan Lanjutan (ULPL) menghadapi kekangan kerana hanya Pegawai Latihan dan Pendidikan Lanjutan (PLPL) yang diberikan akses kepada laporan statistik kehadiran hari berkursus dalam sistem pangkatan data berpusat yang diselia oleh ibu pejabat. Sistem ini juga tidak dapat memenuhi keperluan pengguna merujuk kepada keperluan pengguna dari segi akses, keterbacaan, atau penggunaan maklumat dan media yang efektif. Berdasarkan keperluan ini, Platform Semakan Hari Berkursus Staf (SHaBaS) telah dibangunkan dengan tujuan memudahkan penyelaras latihan dan pihak pengurusan dalam akses, penggunaan maklumat, dan media yang efektif. Melalui platform ini, mereka dapat melaporkan, merancang, dan melaksanakan pemantauan hari berkursus secara sistematik. Kajian ini bertujuan untuk melihat tahap kebolehgunaan platform SHaBaS di PMM dari perspektif rekabentuk isi kandungan dan multimedia. Kaedah tinjauan secara kuantitatif digunakan dalam reka bentuk kajian, dengan menggunakan borang soal selidik berskala likert lima mata. Seramai 40 responden yang terdiri daripada kumpulan pengurusan PMM, Penyelaras Latihan Staf Jabatan (PLSJ), dan PLPL Politeknik Malaysia dipilih untuk menyertai kajian. Data kajian dianalisis untuk mendapatkan skor minimum. Hasil dapatan kajian menunjukkan bahawa platform SHaBaS yang telah dibangunkan mempunyai tahap kebolehgunaan yang tinggi dari segi reka bentuk isi kandungan dan multimedia. Kesimpulannya, kumpulan sasaran pengguna dapat mengakses data yang membolehkan mereka melaporkan, merancang, dan melaksanakan pemantauan hari berkursus secara sistematik.

Kata kunci: Perintah Kawalan Pergerakan (PKP), Pengurusan latihan, Platform Semakan Hari Berkursus Staf (SHaBaS), Tahap kebolehgunaan, Multimedia

1.0 PENGENALAN

Kursus atau dikenali juga sebagai latihan adalah merujuk kepada program atau aktiviti yang dirancang untuk meningkatkan pengetahuan, kemahiran, dan kompetensi para pekerja dalam melaksanakan tugas dengan lebih efektif dan efisien. Bagi meningkatkan kekuatan sumber manusia sesebuah organisasi khususnya dalam membentuk prestasi kerja yang optimis, latihan di tempat kerja merupakan satu keperluan utama yang wajib dirancang dan dilaksanakan dengan sebaiknya. Oleh disebabkan itu, Saban tahun Jabatan Perkhidmatan Awam (JPA) telah menetapkan jumlah sasaran hari berkursus yang wajib dicapai bagi setiap setiap penjawat awam bagi memastikan mereka memiliki kompetensi yang diperlukan untuk melaksanakan tanggungjawab mereka dengan lebih baik. Ini disokong oleh kajian Ismail, M.A (2019) menyatakan pensyarah lebih kompeten dan mampu melahirkan pelajar yang berkualiti setelah mereka kembali daripada menghadiri latihan dalam perkhidmatan. Ketika negara melaksanakan Perintah Kawalan Pergerakan (PKP) akibat daripada penularan wabak penyakit Covid-19 yang sukar dibendung, pengurusan latihan yang efektif adalah solusi yang praktikal bagi meningkatkan kompetensi dan kemampuan pekerja dalam melaksanakan tugas ketika kerajaan

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mengimplementasikan bekerja dari rumah (BDR). Pada ketika itu, seluruh kementerian di bawah sektor awam berusaha meningkatkan latihan secara dalam talian kepada semua warga penjawat awam walaupun menghadapi pelbagai cabaran. Bukan sahaja pelaksanaan dan perancangan latihan yang melalui pelbagai cabaran untuk melaksanakan latihan, tetapi pengurusan dan pemantauan latihan juga mengalami kesulitan yang sama pada ketika itu. Menurut kajian Lamsah, M.S. et al, (2021), pengurusan latihan menghadapi cabaran yang pelbagai dalam menguruskan dan mengendalikan latihan ketika fasa PKP dilaksanakan. Sistem sokongan seperti platform atau aplikasi dalam talian yang membantu dalam menghasilkan data berkaitan kehadiran hari berkusus dianggap alternatif dalam mengurangkan bebanan dalam proses pengurusan dan pemantauan latihan.

Di Politeknik Merlimau Melaka (PMM), pengurusan latihan diselaraskan oleh Unit Latihan dan Pendidikan Lanjutan (ULPL) yang diketuai oleh Pegawai Latihan dan Pendidikan lanjutan (PLPL) dengan bantuan staf sokongan serta penyelaras latihan staf (PLS) yang dilantik oleh jabatan atau unit masing - masing. PLPL dan PLS menghadapi kekangan dalam memantau latihan staf PMM ketika tempoh pelaksanaan BDR dilaksanakan. Walaupun terdapat sistem pangkalan data berpusat yang dikendalikan oleh Ibu pejabat dan digunapakai secara meluas, namun sistem ini mempunyai kekangan kerana ia sebuah sistem yang dibangunkan dengan beberapa objektif utama yang perlu dicapai dan tidak dibangunkan khusus untuk pemantauan latihan staf semata – mata. Oleh yang demikian, sistem ini diangggap tidak memenuhi keperluan kumpulan pengguna yang mempunyai objektif untuk memantau kehadiran berkursus staf setiap jabatan mahupun unit secara lebih mudah. Kenyataan ini disokong oleh Yusof, M. (2015) bahawa sistem yang tidak selari dengan keperluan dan cara kerja kumpulan pengguna juga dianggap tidak mesra pengguna meskipun ia telah digunapakai secara meluas dalam sistem organisasi tersebut. Laporan statistik kehadiran hari berkursus dalam sistem pengkalan data ini hanya memaparkan keseluruhan staf dengan bilangan hari berkursus yang dihadiri sahaja dan hanya boleh diakses oleh PLPL. PLPL untuk mendapatkan laporan statistik kehadiran hari berkursus dan mereka terpaksa menyediakan analisis pelaporan secara manual berdasarkan keperluan yang diperlukan oleh pihak pengurusan yang terdiri daripada pengurusan tertinggi, ketua - ketua jabatan dan ketua - ketua unit yang pelbagai. Sistem yang dapat memberikan maklumat pelaporan yang terkini dengan paparan data yang lebih mudah difahami diperlukan oleh kumpulan pengurusan dalam membantu ULPL memantau status pencapaian KPI hari berkursus staf PMM.

Berdasarkan kepada isu dan keperluan ini, kumpulan pembangun platform terdiri daripada PLPL telah membangunkan sebuah Platform Semakan Hari Berkursus Staf (SHaBaS) dengan mengambilkira keperluan pengurusan dan PLSJ daripada aspek aksesibiliti, penggunaan maklumat, dan media yang efektif. Melalui platform ini, PLS dan kumpulan pengurusan dapat melihat pelaporan statistik hari berkursus staf mengikut keperluan jabatan atau unit masing - masing dan memudahkan mereka dalam merancang serta melaksanakan pemantauan hari berkursus secara lebih sistematik. Oleh yang demikian, kajian ini bertujuan untuk melihat sejauh mana tahap kebolehgunaan platform SHaBaS di PMM dari aspek rekabentuk isi kandungan dan multimedia agar ia memenuhi keperluan kumpulan pengguna yang disasarkan.

2.0 SOROTAN LITERATUR

Kajian ini dijalankan bagi mengenalpasti tahap kebolehgunaan platform SHaBaS di PMM terhadap kumpulan fokus pengguna. Dalam konteks kajian lepas, terdapat beberapa perkara perlu difahami dalam usaha membuat tinjauan dan penilaian sebuah sistem maklumat. Menurut Schneider, R. M. et al., (2002), Penilaian sistem merupakan satu keperluan untuk menilai prestasi dan kejayaan sesebuah sistem bagi mengenalpasti keperluan pembangunan dan kebolehgunaan sistem tersebut.

Kajian Wan Sulaiman, W.N.A et al., (2020) menyatakan terdapat banyak kajian terdahulu yang telah dijalankan menyentuh faktor-faktor kebolehgunaan sesebuah sistem bagi memastikan rekabentuk paparan antara muka mempunyai ciri-ciri kebolehgunaan. Secara umumnya definisi dan konsep kebolehgunaan adalah untuk melihat sejauh mana sistem yang dibangunkan itu mudah untuk digunakan. Kebolehgunaan sistem maklumat merujuk kepada kemudahan, kecekapan, dan kepuasan pengguna ketika menggunakan sistem tersebut. Kebolehgunaan bermaksud sesebuah sistem atau produk berupaya memenuhi keperluan dan spesifikasi pengguna secara berkesan dan efektif (Wan Sulaiman, W.N.A et al., 2020). Kelemahan pada reka bentuk paparan dan kandungan akan menyebabkan penggunaan tidak berkesan dan efektif.

Kebolehgunaan sistem melibatkan aspek paparan antara muka yang mudah diguna dan fungsi yang berkesan dan cekap. Masalah utama sistem berlaku apabila fungsi bantuan, dokumentasi yang sangat terhad dan kelemahan pada paparan sistem (Yusof, M et al., 2020). Bagi memastikan kebolehgunaan tercapai, elemen kebolehgunaan perlu dipastikan wujud pada rekabentuk sistem. Justeru itu, elemen kebolehgunaan bagi platform SHaBaS adalah merujuk kepada penggunaan maklumat dan media yang efektif pada paparan antara muka yang bertujuan untuk meningkatkan keberkesanan sistem terhadap pengguna.

3.0 METODOLOGI KAJIAN

Kajian ini dijalankan dengan menggunakan pendekatan kuantitatif dan proses pengumpulan data adalah melalui pengedaran soal selidik secara dalam talian (Google Form) yang menggunakan skala likert 5 sebagai pengukuran data. Proses analisis data pula menggunakan perisian IBM SPSS Statistics versi 25.0 bagi mendapatkan nilai skor min bagi menjawab persoalan kajian. Soal selidik bagi kajian ini diadaptasi daripada tiga kajian terdahulu iaitu Kebolehgunaan IQ Stick Game Terhadap Pelajar Masalah Pembelajaran Dalam Mata Pelajaran Kemahiran Hidup (Amiruddin et al., 2017), Pembangunan Permainan Kebaboom: Kajian Kebolehgunaan Dan Kepuasan Pengguna (Bakar et al., 2020) dan Penggunaan Aplikasi Web 2.0 Dalam Proses Pengajaran Dan Pembelajaran Kursus Mata Pelajaran Umum (Mpu) Di Politeknik (Fikrudin et al., 2019). Populasi bagi kajian ini adalah kakitangan PPPT DH yang terdiri daripada Kumpulan Pengurusan, Penyelaras Latihan Staf Jabatan dan Pegawai Latihan dan Pendidikan Lanjutan yang bertugas di Politeknik Merlimau, Politeknik Sultan Abdul Halim Shah, Politeknik Kuching Sarawak, Politeknik Mersing dan Politeknik Tuanku Syed Sirajudin. Seramai 40 orang responden yang dipilih secara rawak untuk menjawab instrumen yang telah ditetapkan. Tiada penetapan bilangan responden dilakukan memandangkan responden boleh terdiri daripada satu hingga tujuh orang yang menepati kriteria (Ghazali & Sufean, 2016).

Terdapat 16 item soalan kajian yang dibahagikan kepada tiga aspek iaitu demografi, kebolehgunaan aspek isi kandungan dan kebolehgunaan aspek multimedia. Responden diberikan penerangan ringkas sebelum menjawab soalan tersebut dengan menggunakan aplikasi whatsapp.

4.0 KEPUTUSAN KAJIAN DAN ANALISIS

Jadual 1 menunjukkan demografi responden yang terdiri daripada 40 orang kakitangan PPPT DH iaitu 15 orang lelaki dan 25 orang perempuan daripada lima buah politeknik.

Jadual 1. Statistik Deskriptif Demografi Responden

Lelaki	Perempuan	Jumlah
15	25	40

Jadual 2 menunjukkan dapatan analisis kajian berkenaan item kebolehgunaan platform SHaBaS terhadap aspek reka bentuk isi kandungan. Secara keseluruhannya analisis mendapati nilai purata skor min iaitu 4.55. Nilai 4.65 adalah tahap skor yang paling tinggi manakala nilai min bagi kesemua item adalah berada pada aras yang tinggi iaitu nilai M > 3.33. Berdasarkan nilai min yang paling tinggi iaitu item 7, responden bersetuju bahawa isi kandungan dalam platform ini dapat membantu mereka dalam mendapatkan maklumat mengenai kehadiran berkursus bagi staf di bawah penyeliaan mereka dan sekali gus dapat memudahkan proses pencarian maklumat mengenai jumlah kehadiran staf. Bagi item ke 4 pula, nilai min adalah 4.47 yang mengambil kira mengenai susun atur platform yang kemas dan mesra pengguna. Faktor ini menyebabkan pengguna mudah untuk mengendalikan platform dengan cepat dan berkesan.

Jadual 2. Kebolehgunaan platform SHaBaS terhadap aspek reka bentuk isi kandungan

No.	Item	Skor Min	Interpretasi
1	Kandungan dalam platform SHaBaS mudah difahami.	4.52	Tinggi
2	Bahasa dalam platform SHaBaS mudah difahami.	4.57	Tinggi
3	Kandungan dalam platform SHaBaS menepati keperluan pengguna.	4.50	Tinggi
4	Susunan Kandungan dalam platform SHaBaS adalah teratur dan kemas.	4.47	Tinggi
5	Susunan Kandungan dalam platform SHaBaS mengikut keutamaan penyampaian maklumat.	4.57	Tinggi
6	Kedudukan Kandungan dalam platform SHaBaS adalah sesuai.	4.57	Tinggi
7	Kandungan yang terdapat dalam platform SHaBaS membantu pengguna memantau kehadiran berkursus staf	4.65	Tinggi
Purata Keseluruhan		**4.53**	**Tinggi**

Jadual 3 menunjukkan dapatan analisis kajian berkenaan item kebolehgunaan platform SHaBaS terhadap aspek reka bentuk multimedia. Secara keseluruhannya, nilai purata min keseluruhannya adalah 4.53. Nilai 4.70 pada item 4 merupakan nilai min yang paling tinggi jika dibandingkan dengan item yang lain. Item tersebut adalah paparan font yang sesuai di gunakan dalam platform SHaBaS ini. Paparan fon ini adalah termasuk dengan jenis, warna dan saiz fon yang dipilih sesuai dengan paparan dan rekabentuk platform yang dibangunkan ini. Keadaan ini menyebabkan peningkatan motivasi pengguna untuk menggunakan platform ini secara konsisten. Bagi item 1 dan item 6, skor min adalah 4.55 yang merupakan skor yang paling rendah walaupun mempunyai nilai yang tinggi. Item 1 dan item 6 merupakan kriteria yang penting untuk pembangunan sesuatu platform yang dapat menarik perhatian pengguna. Ini adalah kerana, jika reka bentuk antara muka menarik dan sesuai dengan platform yang dibangunkan, ini adalah satu ciri yang boleh menarik minat dan perhatian pengguna untuk menggunakan platform dengan baik. Begitu juga dengan pemilihan warna yang sesuai berdasarkan kepada warna fon yang akan digunakan. Secara keseluruhannya jadual 4, menunjukkan purata keseluruhan bagi tahap kebolehgunaan platform SHaBaS di Politeknik Merlimau terhadap aspek reka bentuk isi kandungan dan multimedia.

Jadual 3. Kebolehgunaan platform SHaBaS terhadap aspek reka bentuk multimedia

No.	Item	Skor Min	Interpretasi
1	Reka bentuk antara muka SHaBaS menarik.	4.55	Tinggi
2	Susunan pada paparan antara muka SHaBaS tidak padat.	4.67	Tinggi
3	Jenis teks pada paparan antara muka SHaBaS jelas dan sesuai.	4.60	Tinggi
4	Saiz fon pada paparan antara muka SHaBaS sesuai.	4.70	Tinggi
5	Kedudukan teks adalah sesuai pada setiap paparan antara muka SHaBaS.	4.60	Tinggi
6	Warna latar belakang yang menarik dan sesuai.	4.55	Tinggi
7	Peralihan paparan berfungsi dengan baik	4.57	Tinggi
8	Navigasi dipautkan ke kandungan yang betul	4.47	Tinggi
9	Warna tulisan yang sesuai	4.5	Tinggi
Purata Keseluruhannya		**4.58**	**Tinggi**

Jadual 4 Analisis Keseluruhan kebolehgunaan Platform SHaBaS

No.	Item	Skor Min	Interpretasi
1	Reka bentuk Isi Kandungan	4.53	Tinggi
2	Reka bentuk Multimedia	4.58	Tinggi
Purata Keseluruhan		**4.56**	**Tinggi**

Berdasarkan analisis data responden mendapati pembangunan platform SHaBaS ini dapat membantu pengguna dalam menguruskan maklumat yang berkaitan dengan jumlah hari berkursus dengan baik dan berkesan. Ini dapat dilihat daripada analisis min bagi kedua-dua aspek iaitu aspek reka bentuk isi kandungan dan aspek reka bentuk multimedia yang bernilai 4.56. Reka bentuk isi kandungan penting bagi pengguna memahami dengan lebih mudah mengenai penggunakan platform SHaBaS dengan lebih cepat dan tepat. Seterusnya pengguna dapat menguruskan maklumat berkenaan dengan latihan staf dapat diuruskan dengan lebih cepat dan efisyen. Melalui isi kandungan yang baik juga, pengguna dapat mengakses maklumat bilangan hari berkursus dengan mudah dan cepat kerana item isi kandungan yang ada dalam platform ini menepati keperluan pengguna.

Aspek reka bentuk multimedia yang baik juga memainkan peranan penting untuk membantu pengguna dalam penggunaan platform SHaBaS ini dengan lebih cepat dan teratur. Tanpa sokongan daripada reka bentuk multimedia yang baik, pengguna akan berasa kesukaran dalam penggunaan sesuatu sistem atau platform kerana kurangnya daya tarikan dan bantuan dari segi konsep multimedia tersebut. Susun atur menu yang baik dan teratur pada paparan platform ini juga membantu pengguna memahami penggunaan platform ini dengan lebih jelas dan cepat sekaligus meningkatkan kebolehgunaan platform ini.

5.0 PERBINCANGAN

Secara keseluruhannya, keputusan dapatan kajian menunjukkan nilai kebolehgunaan platform SHaBaS yang tinggi dalam dari aspek kandungan dan rekabentuk multimedia serta dapat digunapakai oleh kumpulan sasaran dalam membuat perancangan dan pemantuan latihan staf di Politeknik Merlimau.

Platform SHaBaS berada pada tahap kebolehgunaan yang tinggi kerana direka bentuk dengan memasukkan isi kandungan yang mudah difahami dan menepati keperluan pengguna. Pembinaan sesebuah platform yang bermutu seharusnya memiliki rekabentuk maklumat yang baik (Mohamad, N et al, 2017). Reka bentuk antaramuka yang penuh boleh menyebabkan pengguna dihujani dengan maklumat yang banyak sekaligus. Terlalu banyak maklumat yang perlu dianalisis akan menyebabkan bebanan kepada otak kerana ia mempunyai had pemprosesan dan pengguna akan mudah berputus asa seterusnya berhenti daripada menggunakannya apabila mengalami beban kognitif (Mohamad, M 2021). Platform SHaBaS juga dibangunkan dengan isi kandungan yang disusun mengikut keutamaan dan kemas. Menurut Mohamad, M (2021) Tidak memasukkan elemen antaramuka yang tidak perlu bagi mengelakkan *Cluttering* atau antaramuka yang penuh keselerakan akan meningkatkan kefahaman penggunaan terhadap kaedah penggunaannya. Sesebuah sistem atau platform harus memasukkan maklumat yang ringkas, padat dan mudah difahami oleh pengguna (Mohamad, N et al, 2017). Penggunaan teks yang terlalu banyak tidak digalakkan kerana teks tidak dapat mempamerkan maklumat dengan menarik.

Manakala merujuk kepada kebolehgunaan dari aspek multimedia pula, platform SHaBaS boleh dikategorikan sebagai platform yang mesra kepada pengguna. Persembahan hasil rekabentuk daripada multimedia yang bersifat dinamik, membolehkan sesuatu platform yang telah dibangunkan itu digunakan mengikut kehendak dan keperluan pengguna (Mohamad, N et al, 2017). Multimedia juga dapat mengubah corak komunikasi antara satu sama lain di mana mampu mewujudkan situasi komunikasi yang mana penyampaian dan penerimaan mesej dapat dilaksanakan dengan lebih efektif dan mudah difahami. Platform SHaBaS berjaya memperoleh kebolehgunaan yang tinggi daripada aspek multimedia kerana saiz font, jenis dan kedudukan teks yang sesuai. Pemilihan teks dan saiz yang sesuai sangat penting untuk memudahkan pengguna membaca isi kandungan platform tanpa membosankan pengguna (Mohamad, N et al, 2017).

6.0 RUMUSAN

Keseluruhan daripada dapatan ini, dapat disimpulkan bahawa platform SHaBaS telah berjaya dibuktikan mempunyai tahap kebolehgunaan yang tinggi dan mesra pengguna merujuk kepada platform atau aplikasi dalam talian yang memenuhi keperluan pengguna dari segi akses, keterbacaan, atau penggunaan maklumat dan media yang efektif. Platform SHaBaS memudahkan penyelaras latihan dan pihak pengurusan dalam akses, penggunaan maklumat, dan media yang efektif. Melalui platform ini, mereka dengan mudah dapat mengakses data yang membolehkan mereka melaporkan, merancang, dan melaksanakan pemantauan hari berkursus secara sistematik.

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Kajian perkembangan Islam di Negeri Melaka melalui Pemetaan Masjid Warisan menggunakan kaedah GIS

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Abstrak. Masjid warisan merupakan masjid yang telah berusia lebih dari 50 tahun dan mempunyai ciri asal yang masih di kekalkan. Sebayak 57 buah masjid telah diwartakan sebagai masjid warisan di Melaka oleh Pihak Perbadanan Muzium Melaka (PERZIM). Kajian ini dibuat bagi memetakan lokasi masjid-masjid warisan menggunakan kaedah Geografi Informasi Sistem (GIS). Semua maklumat lokasi (spatial) dan pengkalan data masjid (attribute) akan diwujudkan dan dipaparkan dalam satu laman sesawang. Data masjid yang telah disusun menggunakan kaedah GIS boleh dianalisa lebih mendalam terutamanya berkaitan perkembangan islam di Melaka. Selain itu, pembinaan laman sesawang menggunakan kaedah GIS ini juga dapat meningkatkan industri Pelancongan di Melaka.

Kata Kunci: Masjid Warisan,GIS

1.0 PENGENALAN

Masjid warisan merupakan masjid yang berusia lebih 50 tahun, yang masih mengekalkan ciri-ciri asal dimana masjid tersebut berbentuk segi empat sama, berbumbung 3 tingkat dengan 4 batang tiang menampung puncak mahkota. Bahan binaan masjid juga masih mengekalkan bahan asal seperti tanah liat dan kayu.Sebanyak 57 buah masjid warisan di negeri Melaka telah diwartakan di bawah Enakmen Pemuliharaan dan Pemugaran Warisan Budaya Tahun 1988 oleh PERZIM seperti yang ditunjukkan dalam rajah 1. Semua masjid yang telah diwartakan berusia diantara 64 sehingga 400 tahun.
Pemetaan lokasi masjid warisan ini penting bagi mengetahui lokasi-lokasi awal penyebaran islam di Melaka. Mohd Razlan Ahmad (2021) menyatakan bahawa pembinaan masjid pada masa tersebuat adalah sebagai tempat penyatuan umat islam dan pusat penyebaran ilmu. Pemetaan masjid warisan menggunakan kaedah GIS memudahkan semua maklumat disimpan dalam bentuk digital dan lebih banyak analisa spatial yang boleh dilakukan. Dalam kajian yang dibuat bagi pemetaan 525 masjid lama di Turki mendapati, pemetaan masjid lama mampu menunjukkan sejarah bagaimana sesuatu bandar atau tempat itu berkembang (Irem Ayhan, 2010).

1.1 Penyataan Masalah

Kajian ini dibuat kerana tiadanya satu pengkalan data masjid-masjid lama yang diwujudkan dalam format GIS. Kebanyakkan data yang ada dibuat secara berasingan dimana data berkaitan masjid disimpan dalam bentuk Microsoft Excel sahaja. Dari itu adalah perlu satu pengkalan data bersepadu diwujudkan bagi memudahkan Analisa yang pelbagai dibuat pada masa akan datang. Laman sesawang sedia ada hanya memaparkan gambar-gambar masjid beserta maklumat ringkas sahaja. Pelabagai kajian yang dibuat berkaiatan masjid warisan juga tidak dikumpul secara sistematik dan bersepadu.

Antara kajian yang pernah dibuat adalah pemetaan mahkota atap masjid warisan Negeri Melaka, semakan arah kiblat masjid warisan dan pemuliharaan masjid warisan. Semua maklumat ini adalah perlu bagi kajian-kajian pada masa akan datang agar warisan dapat terus dipelihara dan semua rekod dapat dianalisa dengan lebih baik.

1.	Masjid Al Ehsan Limbongan	18.	Masjid Kampung Chin Chin	37.	Masjid Pernu
2.	Masjid Alai	19.	Masjid Kampung Hulu	38.	Masjid Pokok Asam
3.	Masjid An Nur Peringgit	20.	Masjid Kampung Sebatu	39.	Masjid Ramuan Cina Besar
4.	Masjid Ar-Razak	21.	Masjid Kampung Sempang	40.	Masjid Selandar
5.	Masjid Ayer Barok	22.	Masjid Kampung Tehel	41.	Masjid Semabok
6.	Masjid Bakar Batu	23.	Masjid Kelemak	42.	Masjid Serkam Pantai
7.	Masjid Baru Nyalas	24.	Masjid Klebang Besar	43.	Masjid Simpang Empat
8.	Masjid Batu Gajah	25.	Masjid Kuala Linggi	44.	Masjid Sungai Petai
9.	Masjid Batu Rim	26.	Masjid Londang	45.	Masjid Tabuh Naning
10.	Masjid Bukit Baru	27.	Masjid Lubok China	46.	Masjid Tambak
11.	Masjid Bukit Bayan	28.	Masjid Lubuk Redan	47.	Masjid Tangga Batu Pekan
12.	Masjid Bukit Cina	29.	Masjid Melekek Luar	48.	Masjid Tanjung Kling
13.	Masjid Bukit Darat	30.	Masjid Parit Melana	49.	Masjid Telok Mas
14.	Masjid Bukit Gedung	31.	Masjid Pasir Putih	50.	Masjid Tengkera
15.	Masjid Bukit Piatu	32.	Masjid Paya Datuk	51.	Masjid Tok Janggut
16.	Masjid Duyong	33.	Masjid Paya Rumput, Rumbia	52.	Masjid Ulu Duyong
17.	Masjid Kampung Brisu	34.	Masjid Paya Rumput,Sungai Udang	53.	Masjid Umbai
		35.	Masjid Pekan Masjid Tanah	54.	Masjid An Nur Banda Hilir
		36.	Masjid Pekan Sungai Rambai	55.	Masjid Kampung Kling
				56.	Masjid Pengkalan Rama
				57.	Masjid Tangga Batu Kechil

Rajah1: Lokasi 57 Masjid Warisan di Melaka

1.2 Skop Kajian

Kajian ini dibuat bagi membuat pemetaan lokasi bagi 57 Masjid Warisan yang telah diwartakan oleh PERZIM seperti yang ditunujukkan dalam rajah 2. Semua maklumat-maklumat berkaitan dengan masjid-masjid lama dikumpulkan dalam satu pengkalan data. Antara maklumat yang dikumpulkan adalah tahun pembinaan, lokasi, daerah, nama masjid, reka bentuk, gambar-gambar masjid, arah kiblat masjid. Perisian yang digunakan dalam pembangunan aplikasi ini ialah perisian QGis bagi data spatial, Microsoft Excel bagi data attribute dan google sites bagi pembangunan laman sesawang.

Rajah 2: Lokasi keseluruhan masjid warisan di Melaka

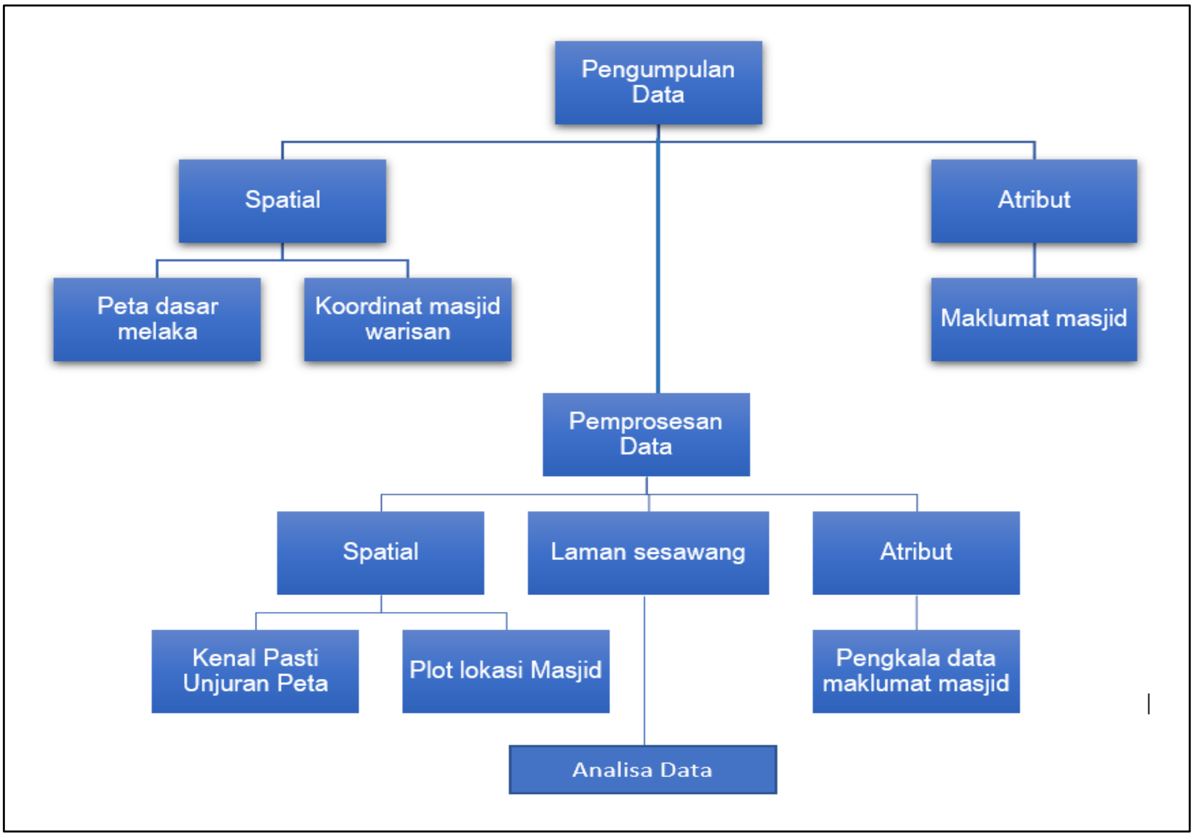
1.3 Kepentingan kajian

Kajian ini perlu bagi memastikan semua data-data penting berkaitan masjid warisan dapat disimpan dengan sistematik dan berkesan. Selain itu, data tersebut dapat dikongsi dengan orang awam bagi meningkatkan kefahaman orang awam berkaitan budaya dan sejarah sesuatu tempat. Ia juga dapat menarik minat pelancong mengatahui lebih banyak berkaitan sejarah dan warisan Malaysia. Penyediaan laman sesawang menggunakan kaedah GIS bagi kawasan bersejarah juga mampu meningkatkan industri pelanconagan di sesuatu kawasan. (Reda Alkot Mohamed, 2021).

Penyusunan data yang selaras dan sistematik dapat menarik lebih ramai pengkaji untuk terus menghasilkan kajian-kajian berimpak tinggi berkaitan sejarah dan warisan terutamanya di Negeri Melaka

2.0 METODOLOGI KAJIAN

Secara keseluruhan, kajian ini menumpukan kepada kaedah pembentukan pengkalan data atau data atribut menggunakan perisian Microsoft Excel . Data spatial dan data atribut digabungkan menggunakan perisian QGis. Data yang telah siap diproses dimasukkan kedalam perisian QGis Cloud bagi membolehkan data dipaparkan didalam laman sesawang Masjid warisan yang telah dibina. (Erstayudha Hayyu Nurrizqi,Choirul Mubarok, Didit Satriono, 2017) menyatakan dalam pengendalian data spatial, QGIS boleh digunakan sebagai salah satu perisian dalam penghasilan maklumat GIS. Hasil daripada QGIS boleh dipaparkan dalam bentuk jadual dan digabungkan dengan data spatial kawasanyang dikaji. Analisa data menggunakan QGIS boleh dibuat sama ada bagi Analisa spatial atau pun Analisa data atribut.



Rajah 3: Carta alir kajian

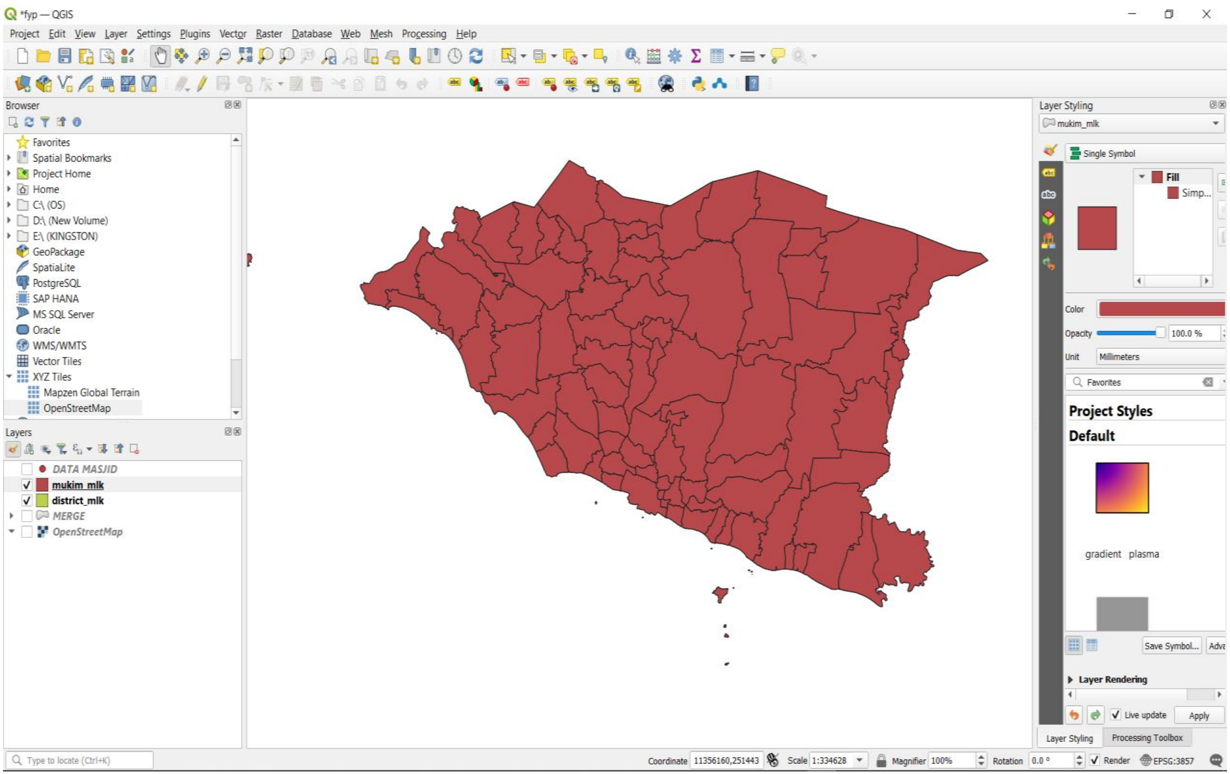
2.1 Pemprosesan Data GIS

DATA MASJID (2) — Features Total: 57, Filtered: 57, Selected: 0

	Name	Y	X	NEGERI	DAERAH	MUKIM	ALAMAT	Tahun	CODE	Kiblat	igious Building Us:	information	website
1	Masjid Al Ehsan...	2.206316667	102.2194722	Melaka	Melaka Tengah	Klebang	Jalan Klebang, ...	1890	BF0010	NULL	Mosque	Masjid ini dibin...	https://sites.go...
2	Masjid Alai	2.179479519	102.3052892	Melaka	Melaka Tengah	Alai	Jalan Alai / Kan...	1890	BF0010	292.524	Mosque	Masjid ini telah ...	https://sites.go...
3	Masjid An Nur ...	2.188966884	102.2601977	Melaka	Melaka Tengah	Bandar Melaka	Jalan Paramesw...	1620	BF0010	292.5254	Mosque	Masjid Annur B...	https://sites.go...
4	Masjid An Nur P...	2.220169485	102.2586863	Melaka	Melaka Tengah	Peringgit	Jalan Solok Pant...	1756	BF0010	292.5203	Mosque	Masjid asal Peri...	https://sites.go...
5	Masjid Ar-Razak	2.231829998	102.242515	Melaka	Alor Gajah	Masjid Tanah	Jalan Bakti, Ka...	1916	BF0010	NULL	Mosque	Pengasas pemb...	https://sites.go...
6	Masjid Ayer Bar...	2.310324739	102.4280087	Melaka	Jasin	Jasin	77000 Jasin, Ma...	1917	BF0010	292.4735	Mosque	Masjid ini dibin...	https://sites.go...
7	Masjid Bakar Ba...	2.217632036	102.2412026	Melaka	Melaka Tengah	Bachang	Km 2.4, Jalan Tu...	1890	BF0010	NULL	Mosque	Masjid ini telah ...	https://sites.go...
8	Masjid Baru Ny...	2.398096	102.496548	Melaka	Jasin	Asahan	Km 49, Kampun...	1934	BF0010	292.4411	Mosque	Masjid Baru Ny...	https://sites.go...
9	Masjid Batu Gaj...	2.1471387	102.4607371	Melaka	Jasin	Merlimau	Kg. Batu Gajah, ...	1950	BF0010	NULL	Mosque	Masjid Batu Gaj...	https://sites.go...
10	Masjid Batu Rim	2.311050896	102.4403895	Melaka	Jasin	Rim	NULL	1934	BF0010	NULL	Mosque	Masjid ini asaln...	https://sites.go...
11	Masjid Bukit Baru	2.218113044	102.2746375	Melaka	Melaka Tengah	Bukit Baru	Jalan Bukit Baru...	1918	BF0010	NULL	Mosque	Masjid ini terlet...	https://sites.go...
12	Masjid Bukit Ba...	2.222126324	102.3037932	Melaka	Melaka Tengah	Bukit Bayan	NULL	1900	BF0010	292.5128	Mosque	Masjid ini di bin...	https://sites.go...
13	Masjid Bukit Cina	2.199147666	102.254903	Melaka	Melaka Tengah	Peringgit	Jalan Munsyi Ab...	1650	BF0010	292.524	Mosque	Masjid Bukit Cin...	https://sites.go...
14	Masjid Bukit Da...	2.231093257	102.1554559	Melaka	Melaka Tengah	Tanjung Kling	76400 Tanjung ...	1900	BF0010	NULL	Mosque	Masjid Bukit Da...	https://sites.go...
15	Masjid Bukit Ge...	2.226740317	102.1570872	Melaka	Melaka Tengah	Tanjung Kling	Km. 12, Melaka,...	1900	BF0010	NULL	Mosque	Masjid Ini terlet...	https://sites.go...
16	Masjid Bukit Piatu	2.207178675	102.2738388	Melaka	Melaka Tengah	Bukit Piatu	Kilometer 4, Bu...	1939	BF0010	NULL	Mosque	Pada asalnya m...	https://sites.go...
17	Masjid Duyong	2.200067	102.2938232	Melaka	Melaka Tengah	Duyong	Jalan Semabok ...	1896	BF0010	NULL	Mosque	Masjid Duyung ...	https://sites.go...
18	Masjid Kampun...	2.432879988	102.13617	Melaka	Jasin	Brisu	Masjid Kg. Beris...	1926	BF0010	NULL	Mosque	Pengasas kepad...	https://sites.go...
19	Masjid Kampun...	2.291302357	102.4836137	Melaka	Jasin	Jasin	Taman Kenanga...	1941	BF0010	292.4728	Mosque	Lokasinya terlet...	https://sites.go...
20	Masjid Kampun...	2.199267436	102.2475461	Melaka	Melaka Tengah	Bandar Melaka	Jalan Kampung ...	1720	BF0010	292.5245	Mosque	Masjid ini terlet...	https://sites.go...
21	Masjid Kampun...	2.1968588	102.2475144	Melaka	Melaka Tengah	Bandar Melaka	Masjid Kampun...	1748	BF0010	292.5249	Mosque	Masjid ini di bin...	https://sites.go...
22	Masjid Kampun...	2.123430593	102.4681881	Melaka	Jasin	Sungai Rambai	Km 28, Sebatu, ...	1901	BF0010	292.5202	Mosque	Masjid ini terlet...	https://sites.go...
23	Masjid Kampun...	2.1448271	102.4076111	Melaka	Jasin	Merlimau	Masjid Sempan...	1875	BF0010	292.5224	Mosque	Lokasinya terlet...	https://sites.go...
24	Masjid Kampun...	2.241542799	102.3432077	Melaka	Melaka Tengah	Bemban	Masjid Tehel, K...	1923	BF0010	NULL	Mosque	Lokasinya terlet...	https://sites.go...
25	Masjid Kelemak	2.3731705	102.2073379	Melaka	Alor Gajah	Kelemak	Masjid Kelemak...	1800	BF0010	NULL	Mosque	Masjid di Kele...	https://sites.go...
26	Masjid Klebang...	2.216555351	102.20393	Melaka	Melaka Tengah	Klebang	Jalan Klebang B...	1924	BF0010	292.5247	Mosque	Pengasas masji...	https://sites.go...

Show All Features

Rajah 4 : Atribut Masjid Warisan Negeri Melaka



Rajah 5: Peta Dasar Negeri Melaka (Data Spatial)

3.0 KEPUTUSAN KAJIAN DAN ANALISIS

Melaka telah berkembang sebagai pusat perdagangan yang maju pada kurun ke-15 dan 16. Ia juga menjadi faktor perkembangan islam di Melaka kerana kebanyakkan pendakwah yang datang dari Tanah Arab merupakan pedagang. Aniq Musyrif Muhamad Rosdi (2022) menyatakan bahawa lokasi Pelabuhan Melaka yang strategik membantu penyebaran dan perkembangan islam di Melaka. Pendakwah-pendakwah islam juga boleh melakukan aktiviti perdagangan kerana lokasi pelabuhan yang terletak dijalan perdagangan Timur dan barat. Ini terbukti berdasarkan lokasi masjid warisan yang telah dipetakan dalam rajah 6 dibawah, dapat dilihat bahawa pembinaan masjid-masjid awal telah dibina dikawasan persisiran pantai yang merupakan pusat ekonomi Melaka sebelum kurun ke 20.

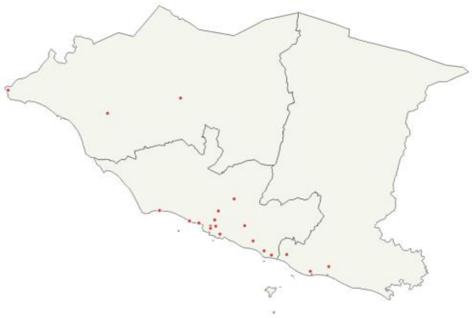
Rajah 6: Lokasi Masjid warisan yang telah dibina sebelum tahun1900

Berdasarkan rajah 7 dibawah dapat dilihat bahawa, penyebaran islam mula berkembang dikawasan seluruh Negeri Melaka selepas kurun ke 20. Ini Terbukti dengan pembinaan masjid-masjid baru selepas tahun 1900 tidak lagi tertumpu di kawasan persisiran pantai malah telah berkembang ke tempat-tempat lain di negeri Melaka.

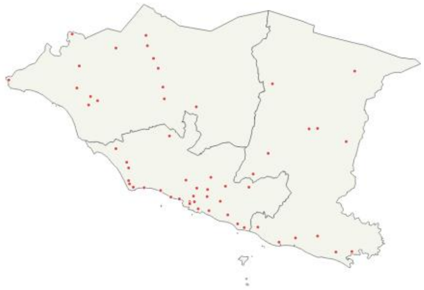
Rajah 7: Lokasi masjid warisan yang dibina selepas tahun 1900

Masjid Warisan yang dibina sebelum 1800

Masjid Warisan yang dibina sebelum 1850



Masjid Warisan yang dibina sebelum 1900



Masjid Warisan yang dibina selepas tahun 1900

Rajah 8: Pola pembinaan masjid sebelum tahun 1800 sehingga selepas tahun 1900

Merujuk kepada Jadual 1 dibawah, didapati bahawa semakin banyak masjid yang telah dibina selepas tahun 1900. Ini menunjukkan bahawa, penyebaran agama islam semakin berkembang selepas kurun ke 20. Walaubagaimana pun masih banyak masjid-masjid lama yang berusia lebih 100 tahun tidak diwartakan sebagai masjid warisan. Sekiranyanya semua masjid-masjid ini dipetakan secara sistematik, satu pola perkembangan islam dari kurun ke 15 hingga kurun ke 20 pasti boleh dibuat bagi melihat perkembangan islam berdasarkan pembinaan masjid di satu-satu kawasan seperti yang ditunjukkan dalam rajah 8.

Jadual 1 : Jumlah masjid warisan yang dibina sebelum dan selepas tahun 1900 Kajian

Tahun pembinaan	Jumlah masjid
Sebelum Tahun 1900	20 Masjid
Selepas Tahun 1900	37 Masid

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Rajah 9 : Masjid warisan yang terdapat di kawasan Melaka Tengah

Rajah 9 menunjukkan sebanyak 29 buah masjid warisan yang berada di daearah Melaka Tengah. Masjid-masjid tersebut berusia diantara 85 sehingga 400 tahun. Jika dikaji dari sejarah kedatangan islam di Melaka, Penyebaran islam berlaku apabila Parameswara memeluk islam dan diikuti oleh rakyat Melaka. Melaka Tengah merupakan pusat pemerintahan Melaka sehingga sekarang. Jika dilihat dari data, jelas menunjukkan bahawa pembinaan masjid warisan sebelum kurun ke19 tertumpu dikawasan pemerintahan dan laluan pedagangan.

3.1 Laman sesawang masjid warisan melaka

Satu laman sesawang berkaitan data masjid-masjid warisan di Melaka telah dibangunkan. Laman sesawang dibangunkan bagi memudahkan orang awam mendapatkan maklumat berkaitan masjid warisan serta mengetahui lokasi 57 buah masjid tersebut. Rajah dibawah menunjukkan paparan bagi laman sesawang yang telah dibangunkan. Bagi berkaitan lokasi dan maklumat masjid warisan telah dibangunkan menggunakan *google site* dan perisian *QGIS online.* Perisian QGIS online membolehkan semua data yang telah dimasukkan dipaparkan secara atas talian. Semua maklumat tambahan boleh dikemaskini dari masa ke semasa.

Rajah 10: Laman sesawang masjid warisan Negeri Melaka.

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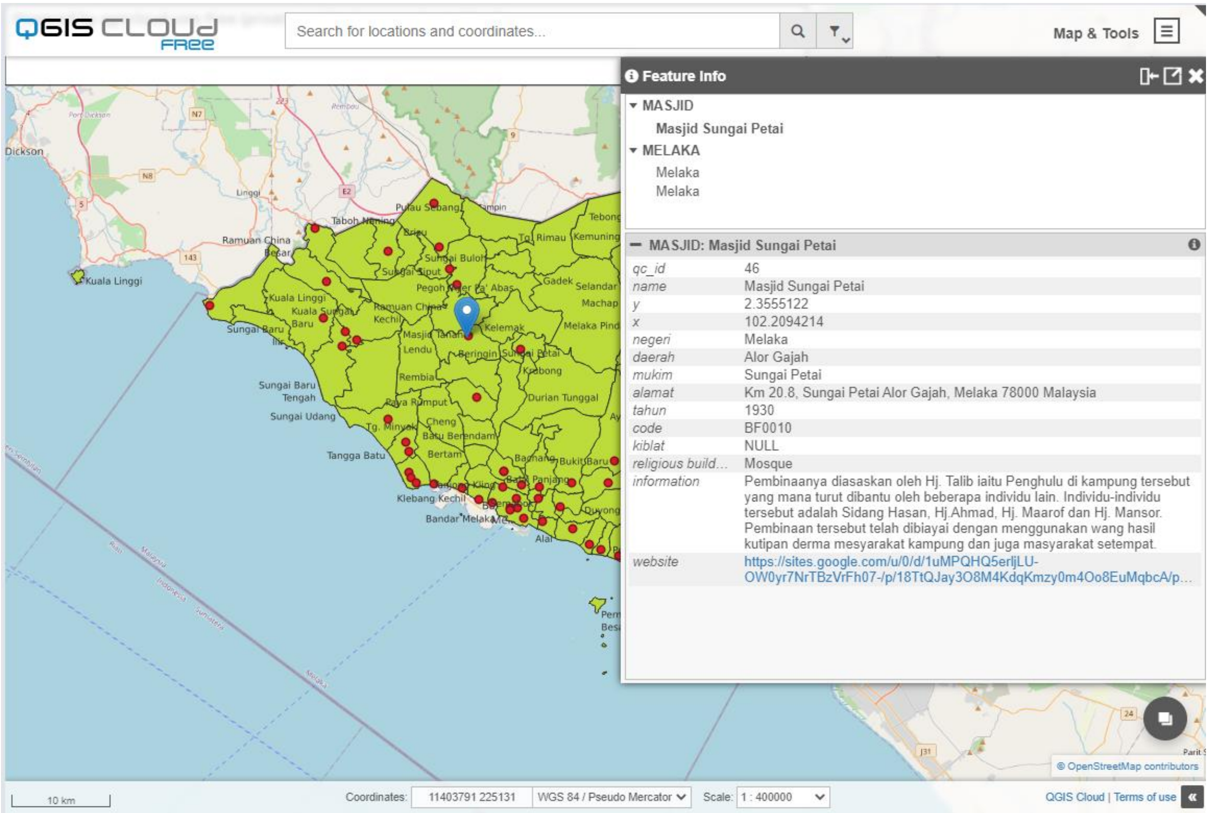

Rajah 11: Paparan data spatial dan attribute dalam laman sesawang yang telah dibina

4.0 KESIMPULAN

Pemetaan menggunakan teknologi GIS bukan sahaja data membantu penyimpanan data yang lebih efektif dalam bentuk spatial dan attribute, malah lebih banyak analisa akan dapat dibuat. Pengguna juga dapat mengoleh data yang ada mengikut analisa yang diperlukan.

Pemetaan Masjid-masjid warisan negeri Melaka dapat menunjuk secara ringkas pola pekembangan islam di Melaka. Perkembangan islam telah mula berkembang ke daerah-daerah lain bermula dari kurun ke 20 berdasarkan jumlah dan loaksi masjid-masjid baru yang dibina. Daerah Melaka Tengah dilihat sebagai tempat terawal perkembangan islam di Melaka dimana banyak masjid-masjid lama telah dibina dikawasan tersebut. Dasar penyebaran islam bermula dari istana kepada rakyat jelata dapat dilihat dengan jelas apabila penumpuan kawasan pembinaan masjid adalah dikawasan kota lama pentadbiran Melayu Melaka.

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Automatik Bumbung Dengan Pengesan Air Hujan

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Abstrak Air yang berlebihan pada tanaman menyebabkan sebahagian besar nutrien hilang. Kesannya, daun berubah warna kekuningan yang menandakan tanaman tersebut kurang unsur nitrogen. Langkah terbaik bagi mengelakkan tanaman rosak disebabkan air hujan berterusan adalah dengan membuat bumbung pengesan air hujan yang dapat melindungi tanaman tersebut. Objektif projek ini adalah untuk menghasilkan satu prototaip automatik bumbung dengan pengesan air hujan. Kaedah penghasilan adalah menggunakan kaedah kimpalan bagi penghasilan rangka bumbung dan pengesan air hujan pula menggunakan pengaturcaraan kod Arduino Uno. Hasil projek telah menunjukkan bumbung telah terbuka secara automatik selepas mengesan kehadiran air hujan selepas 1 saat. Prototaip bumbung yang berukuran 0.45 meter berjaya ditutup sepenuhnya selepas 2 hingga 3 saat sahaja. Kesimpulannya, konsep ini dapat memastikan sesuatu tanaman dapat terhalang daripada menerima air hujan yang berlebihan.

Kata Kunci Tanaman, Bumbung Automatik, Pengesan Hujan

1.0 PENGENALAN

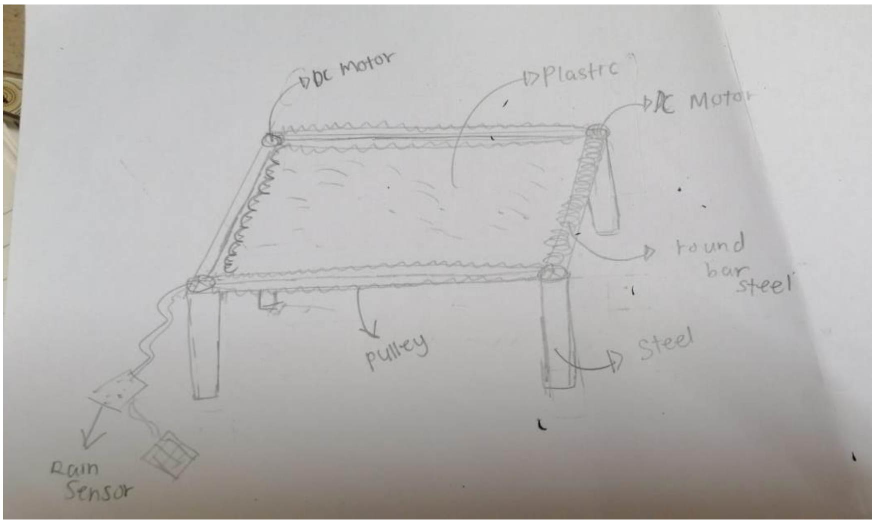
Unsur-unsur semula jadi yang berkaitan dengan aktiviti harian seperti hujan dan cahaya matahari mempunyai kesan positif dan negatif terhadap kehidupan dan harta benda. Matahari memancarkan tenaga ultraviolet yang merupakan sumber vitamin D, menghalang pertumbuhan kanser dan juga digunakan semasa fotosintesis dalam tumbuhan. Air pula adalah keperluan asas dalam kehidupan kita (2019). Air hujan adalah lebih baik untuk tanaman berbanding air paip kerana ia bebas daripada kandungan garam, mineral dan bahan kimia lain seperti klorin. Air hujan membekalkan nitrogen yang penting dalam pembentukan klorofil pada daun untuk menjalankan proses fotosintesis bagi menghasilkan makanan sendiri. Walau bagaimanapun, air hujan yang berterusan pada tanaman akan menyebabkan tanaman rosak. Azuan Abdullah (2019) menyatakan bahawa media tanaman yang mempunyai kuantiti air yang banyak akan menyebabkan pengudaraan akar jadi kurang sempurna. Jika berterusan, tanaman boleh mati. Seterusnya, air yang berlebihan pada tanaman menyebabkan sebahagian besar nutrien hilang. Kesannya, daun berubah warna kekuningan yang menandakan tanaman tersebut kurang unsur nitrogen. Langkah terbaik bagi mengelakkan tanaman rosak disebabkan air hujan berterusan adalah dengan membuat bumbung pengesan air hujan yang dapat melindungi tanaman tersebut. Berdasarkan kajian awal yang telah dilaksanakan dengan menemubual seorang pekebun dan pemilik tapak semaian di FFS Nursery, Negeri Sembilan. Hasil daripada temubual yang telah dibuat di FFS Nursery, pemilik tersebut mengatakan bahawa terdapat beberapa jenis tanaman yang tidak memerlukan air hujan yang banyak seperti tanaman keladi dan cili. Tanaman tersebut amat sensitif terhadap air yang banyak kerana ia akan menyebabkan akar dan daun berkulat serta kesuburannya terbantut. Selain itu, ia boleh membawa kesan kepada daun pokok menjadi rosak akibat ditimpa hujan yang lebat di mana daun adalah komponen utama dalam memastikan kesuburan sesuatu tanaman.

Oleh itu, dalam menyelesaikan masalah tersebut, maka satu produk iaitu Bumbung Automatik Pengesan Air Hujan telah dihasilkan. Antara objektif penghasilan produk ini adalah mereka bentuk gambar rajah produk menggunakan lukisan berbantu komputer iaitu perisian Autodesk Inventor, membuat kerja-kerja fabrikasi logam dalam penghasilan rangka produk, menghasilan pengaturcaraan daripada kod Arduino Uno yang dapat mengesan air hujan selepas terdedah kepada kehadiran air dan bumbung dibuka secara automatik selepas mengesan kehadiran air hujan.

Skop bagi penghasilan produk ini adalah untuk digunakan kepada pengusaha tanaman dan pemilik tapak semaian pokok yang ingin memastikan tanaman-tanaman mereka terlindung daripada terdedah kepada air hujan yang banyak.

2.0 METODOLOGI KAJIAN

Selepas mengumpulkan maklumat daripada pengguna yang berpotensi menggunakan produk dan menganalisis maklumat yang diperoleh, maklumat dan keperluan pelanggan boleh diubah menjadi kriteria khusus dalam spesifikasi rekabentuk produk. Butiran atau spesifi-kasi yang dipilih oleh pelanggan dikumpulkan, ditafsirkan dan dianalisis, sebelum diubah menjadi spesifikasi reka-bentuk produk. Dengan semua maklumat, keputusan yang tepat boleh dibuat dengan memilih kaedah dan reka bentuk yang tepat dan menerapkannya dalam membangunkan rekabentuk produk baru. Rekabentuk konseptual yang terbaik juga boleh dibuat kerana terdapat banyak rekabentuk yang boleh diperolehi daripada penghasilan idea ini. Penghasilan idea adalah proses pemikiran dan lakaran yang berdasarkan penyelidikan dan maklumat. Rajah 1 menunjukkan lakaran bagi rangka produk ini.



Rajah 1: Lakaran rangka produk

2.1 Rekabentuk menggunakan Perisian CAD (Autodesk Inventor)

Seterusnya lakaran diterjemahkan kepada lukisan berbantu komputer menggunakan perisian Autodesk Inventor versi tahun 2020. Lukisan tersebut lengkap beserta ukuran bagi produk prototaip ini seperti dalam Rajah 2(a) dan 2 (b). Ukuran ini berdasarkan kepada keluasan tanah di FFS Nursery iaitu 90-meter persegi, produk bumbung pengesan air hujan ini menggunakan keluasan tanah sebanyak 90-meter persegi sahaja bagi proses tanaman. Pada reka bentuk produk tersebut mengikut kelebaran sebanyak 7.7 meter, panjang sebanyak 11.7-meter dan tinggi sebanyak 7.72 meter.

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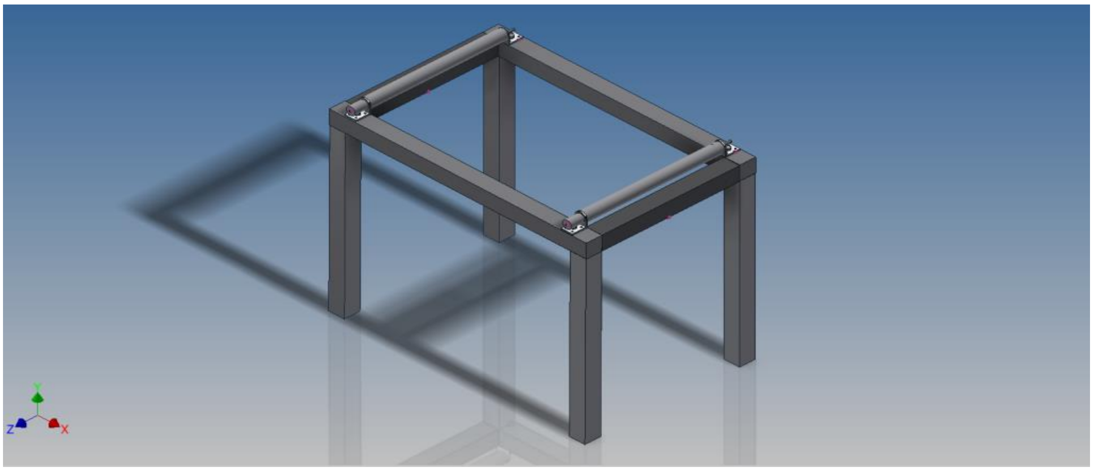
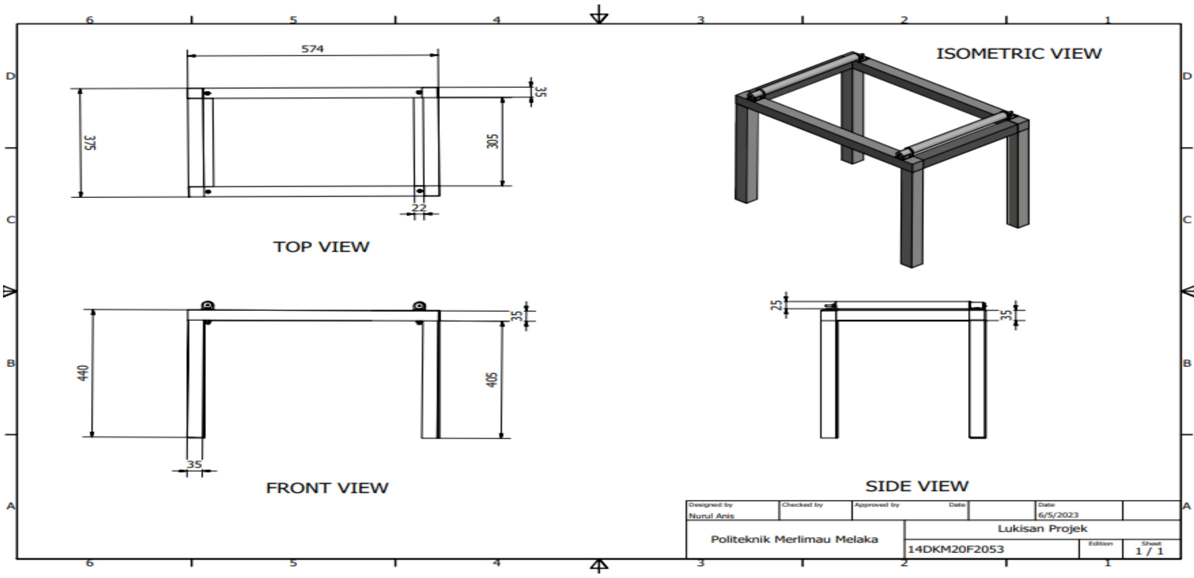
Prototaip pula, ukuran yang dibuat adalah mengikut kelebaran sebanyak 0.375-meter dan panjang sebanyak 0.574-meter juga tinggi sebanyak 0.44 meter. Rajah 2 (a) dan 2(b) menunjukkan bingkai produk ini berdasarkan ukuran prototaip.



Rajah 2 (a): Lukisan 3 dimensi bagi produk



Rajah 2 (b): Lukisan 2 dimensi bagi produk

2.2 Bilangan Bahan (Bill of Material) dan Kos

Bagi bahan utama yang digunakan adalah daripada bahan keluli lembut untuk membuat rangka utama bagi mesin ini. Jadual 1 menunjukkan perincian bilangan bahan yang digunakan serta kos dalam penghasi-lan mesin ini.

Jadual 1: Bahan yang digunakan dan kos bagi bahan

NO.	NAMA BAHAN	HARGA SEUNIT	HARGA KESELURUHAN
1.	Square mild steel	RM13.50 per 3ft/0.9m (5 unit)	RM 67.50
2.	L-shaped brackets	RM 3.66 per unit (4 unit)	RM 14.64
3.	SUS304-Bolt screw and nut	RM 0.64 a piece (20 unit)	RM 12.80
4.	DC motor (DC 12V 14RPM 2 Wires)	RM 7.61 per unit (2 unit)	RM 15.22
5.	PVC pipe	RM 4 per 4ft/1.2m	RM 4.00
6.	UV Plastic	1 Feet	RM 12.92
7.	Bearing	RM 4 per 4 unit (4 unit)	RM 4.00
8.	Shaft coupling	RM 4 per unit (2 unit)	RM 8.00
9.	Rain sensor	RM 8 per set	RM 8.00
10.	Breadboard	RM 3.75 per unit	RM 3.75
11.	Arduino Uno	RM 26.50 per set	RM 26.50
12.	L298N Motor Driver	RM 6.9 per unit	RM 6.90
13.	Adapter	RM 20 per unit	RM 20.00
14.	Breadboard signal jumper wire	RM 4.40 per set (2 set)	RM 8.80
15.	Box case electronic components	RM 6 per unit	RM 6.00
16.	Soldering set	RM 18 per set	RM 18.00
17.	Black and Red cable wire	RM 3 per 5 meter	RM 3.00
18.	Elastic Band Mask Rope	RM 4.21 per 10 meter	RM 4.21
JUMLAH			**RM 244.24**

2.3 Proses Fabrikasi Produk

Dalam proses fabrikasi, ia melibatkan beberapa langkah kerja dalam menghasilkan automatik bumbung ini. Rajah 3(a) menunjukkan gambar besi diukur menggunakan sesiku T dan dipotong dengan menggunakan gergaji lengkung halus. Kemudian, rajah 3(b) menunjukkan gambar proses kimpalan dilaksanakan untuk menggabungkan bahagian-bahagian besi yang telah dipotong itu. Seterusnya gambar 3(c) menunjukkan rangka bumbung yang telah siap dikimpal. menggunakan kaedah kimpalan arka. Selepas itu, rajah 3(d) menunjukkan proses pengecatan logam menggunakan semburan cat. Pada rajah 3(e), proses menebuk lubang dibuat bagi bolt dan nut. Selain itu, rajah 3(f) menunjukkan proses pemasangan komponen mekanikal pada roller. Akhir sekali, rajah 3 (g) menunjukkan rangka yang sudah siap dipasang bersama bumbung dan komponen-komponen.

Rajah 3(a) Proses pemotongan besi

Rajah 3 (b) Proses kimpalan bagi mencantumkan

Rajah 3 (c) Rangka bumbung yang telah siap

Rajah 3 (d) Proses kemasan rangka

Rajah 3 (e) Proses menebuk

Rajah 3 (f) proses pemasangan komponen mekanikal pada *roller*

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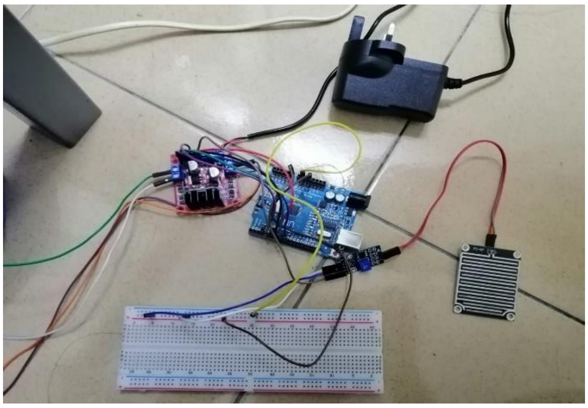
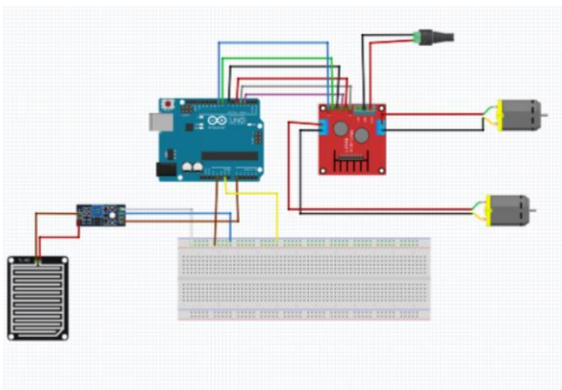
Rajah 3 (g) Rangka yang sudah siap dipasang bersama bumbung dan komponen-komponen.elektronik

2.4 Pengaturcaraan kod Arduino Uno

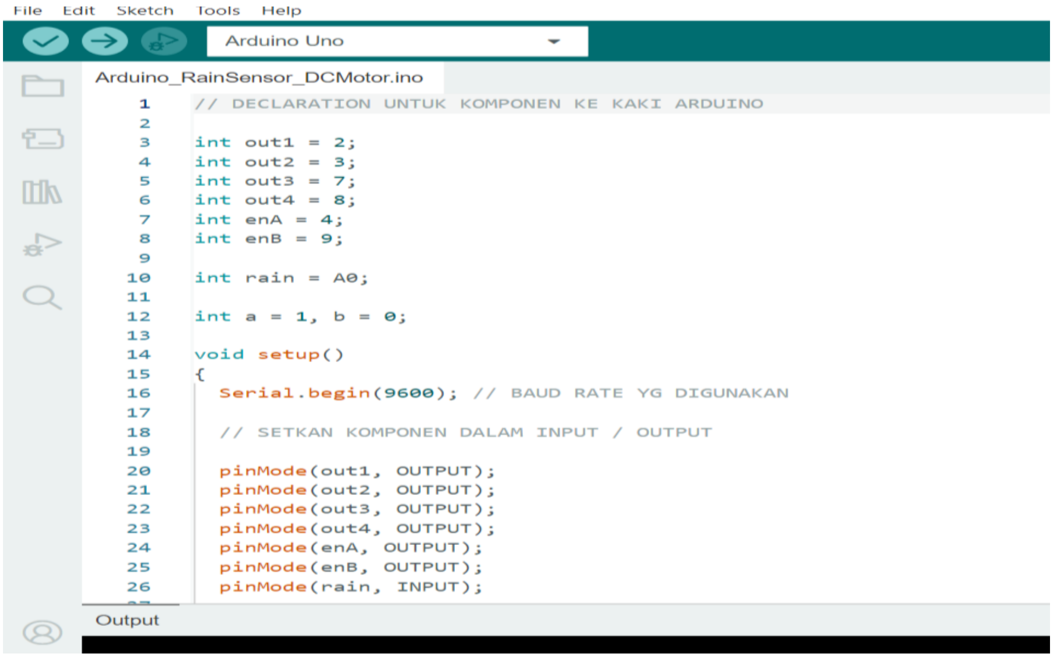
Bagi memastikan objektif produk tercapai iaitu memastikan bumbung tertutup secara automatik dengan kehadiran air hujan, maka satu program yang menggunakan litar komponen dan kod Arduino Uno dihasilkan. Bagi menghasilkan program ini, ia memerlukan beberapa komponen seperti Arduino Uno, Motor Driver L298N, Breadboard, Rain Sensor, Adapter dan Jumper Wire. Rajah 4(a) menunjukkan gambar litar komponen dan Rajah 4(b) menunjukkan gambar litar menggunakan perisian Fritzing. Rajah 4(c) pula menunjukkan pengaturcaraan yang telah diprogramkan hasil daripada penyambungan litar melalui perisian Arduino Ide.



Rajah 4(a) Litar komponen



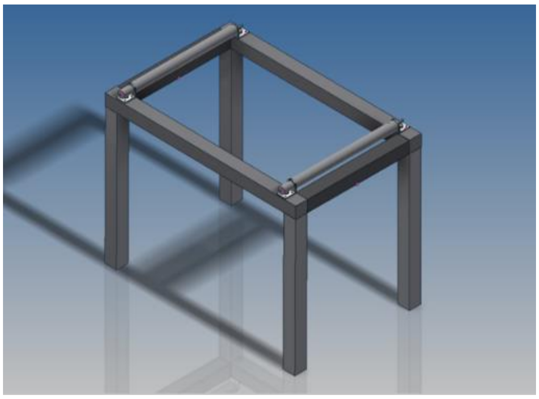
Rajah 4(b) Skematik litar menggunakan perisian Fritzing



Rajah 4(c) : Pengaturcaraan menggunakan Arduino Ide

2.5 Produk akhir

Bagi memastikan satu produk yang lengkap, gabungan antara bingkai bumbung dan juga litar komponen perlu dilaksanakan. Rajah 5(a) menunjukkan produk menggunakan lukisan berbantu komputer manakala Rajah 5(b) menunjukkan produk sebenar yang sudah lengkap.



Rajah 5(a) Lukisan berbantu komputer

Rajah 5(b) Produk sebenar

3. KEPUTUSAN KAJIAN DAN ANALISIS

3.1 Analisis Keupayaan Produk

Bagi pengujian produk, ia dilaksanakan sebanyak tiga kali. Pengesan air hujan telah didedahkan dengan air dan bumbung dibiarkan terbuka secara automatik. Berikut Jadual 2 menunjukkan masa yang diambil oleh pengesan air hujan untuk bertindakbalas dan masa untuk bumbung tertutup sepenuhnya apabila mengesan kehadiran air.

Jadual 2: Analisis terhadap Keupayaan Produk

Masa (s)	Percubaan 1	Percubaan 2	Percubaan 3
Masa yang diambil untuk pengesan air hujan bertindak dengan kehadiran air	1 saat	1 saat	0 saat
Masa yang diambil oleh bumbung untuk tutup sepenuhnya selepas mengesan kehadiran air bagi panjang 0.46 m	3 saat	2 saat	2 saat

Daripada keputusan analisis tersebut, menunjukkan bahawa keupayaan produk ini dapat mengesan kehadiran dalam masa kurang daripada 1 saat dan dapat membuka keseluruhan bumbung dalam masa kurang 8 saat dengan ukuran produk ini yang mempunyai panjang iaitu 0.46 meter. Oleh itu, bagi keadaan bumbung sebenar yang perlu digunakan di tapak semaian di FFS Nursery, ia akan mengambil masa sebanyak 684.5 saat atau 11 minit berdasarkan kepada panjang tapak semaian adalah 90-meter persegi.

4.0 KESIMPULAN

Kesimpulannya,setiap produk yang dibuat pasti ada ciri-cirinya yang sendiri sama ada ia memberi impak positif atau negatif. Penambahbaikan yang dibuat pada reka bentuk,saiz dan isu produk pasti akan ada kelemahannya jika tidak dikawal dengan baik. Kelemahan yang didapati dari produk tersebut haruslah dititikberatkan supaya ia berfungsi dan dapat memanfaatkan pengguna daripada sebarang kerosakan dan ketidakpuasan. Selepas itu,pemilihan jenis bahan juga amat penting kerana aspek ini yang menentukan setiap kualiti produk sama ada baik,memuaskan atau tidak menepati ciri. Pemasangan komponen terutama litar komponen juga penting untuk menghasilkan produk yang menggunakannya seperti bumbung dengan pengesan air hujan agar pengesan tersebut berfungsi dan sejurus itu memudahkan dalam mendapat keuntungan yang baik dan mengelakkan kerugian.

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Persepsi Terhadap Etika Peperiksaan Akhir dalam Kalangan Pelajar Politeknik Merlimau

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Abstrak. Sistem politeknik di Malaysia menetapkan peperiksaan sebagai salah satu mekanisma yang digunakan dalam proses pentaksiran mengikut tetapan kalendar akademik setiap semester. Ia merupakan elemen yang diperlukan untuk pengukuran keberkesanan dalam proses pembelajaran dan pengajaran. Etika dalam peperiksaan merupakan tatacara kelakuan yang disarankan untuk mematuhi peraturan peperiksaan yang telah ditetapkan. Beberapa peraturan dan arahan menduduki peperiksaan akhir merangkumi sahsiah rupa diri dan peraturan di dewan atau bilik peperiksaan perlu dipatuhi agar wujud keseragaman dalam pengendalian pengurusan peperiksaan. Pematuhan etika yang telah digariskan ini perlu dipatuhi dalam pengurusan peperiksaan agar hasil penilaian yang dibuat berkesan, konsisten dan dipercayai. Kajian ini bertujuan melihat persepsi pelajar Politeknik Merlimau terhadap terhadap etika peperiksaan akhir. Responden penelitian ini melibatkan 725 orang pelajar. Data kajian yang dianalisa didapati melalui borang soal selidik atas talian yang mengandungi 16 item. Kajian ini bertujuan mengenal pasti tahap kesediaan pelajar menghadapi peperiksaan akhir dan mengenal pasti pemahaman pelajar berkenaan etika dalam menduduki peperiksaan akhir. Kebolehpercayaan soal selidik ini diuji pada nilai Alfa Cronbach 0.94. Perisisan Statistical Package for Social Science (SPSS) digunakan untuk menganalisa data-data yang diperolehi. Kesimpulannya, dapatan hasil kajian menunjukkan pelajar bersedia menghadapi peperiksaan akhir dan mereka memahami berkenaan etika dalam menduduki peperiksaan akhir.

Kata kunci: Peperiksaan Akhir, tahap kesediaan, etika, pelajar Politeknik Merlimau

1.0 PENGENALAN

Sistem pembelajaran Politeknik di Malaysia menggunakan Penilaian Kerja Kursus dan Peperiksaan Akhir sebagai medium pentaksiran utama untuk menilai pencapaian pelajar. Peperiksaan Akhir merupakan penilaian yang dinilai secara berasingan dengan Penilaian Kerja Kursus yang mana ia menyumbang kepada keputusan penilaian keseluruhan. Penilaian Kerja Kursus pula merupakan penilaian sumatif secara teori atau amali yang dilaksanakan dalam bentuk aktiviti pengujian dan pengukuran seperti kuiz, tugasan dan ujian. Kaedah peperiksaan pula merupakan penilaian yang terdiri daripada beberapa set soalan yang dilaksanakan dalam tempoh tertentu mengikut syarat-syarat yang telah ditetapkan (Miller et al., 2009). Hasil pencapaian pelajar ini seterusnya dapat diukur melalui pelaksanaan peperiksaan akhir. Peperiksaan akhir menginterpretasikan pencapaian pelajar berorientasikan hasil dalam bentuk data numerik yang lebih jelas melalui skor dan gred. Menerusi pelaksanaan peperiksaan, pensyarah dapat mengetahui tahap pencapaian pelajar berdasarkan nilai skor dan gred yang diperolehi. Seterusnya, pensyarah dapat melihat pendekatan yang lebih berimpak tinggi dalam mempertingkatkan lagi mutu dan kualiti pengajaran dan pembelajaran yang dijalankan.

Peperiksaan merupakan kayu ukur kepada kecemerlangan setiap pelajar. Ia juga berperanan dalam memacu hala tuju kerjaya dan masa depan pelajar. Kecemerlangan akademik merupakan impian semua pelajar dengan harapan mendapat peluang yang cerah di masa hadapan. Kecemerlangan atau kejayaan amat berkait rapat dengan etika yang baik. Setiap orang mempunyai nilai dan sikap tersendiri yang disebut sebagai etika. Tindakan yang baik lahir daripada sikap individu yang mempunyai etika yang baik (Mohd Janib, 1994). Namun begitu, disebalik kecemerlangan pensyarah mengajar dan pelajar yang tekun belajar, masih ada isu dan laporan kes kesalahan melanggar etika dalam mematuhi peraturan-peraturan yang telah ditetapkan semasa menduduki peperiksaan akhir. Pelajar yang didapati ingkar atau melanggar arahan dan dibuktikan kesalahan setelah melalui beberapa proses siasatan boleh dikenakan hukuman seperti amaran atau markah penilaian dimansuhkan. Hukuman mansuh markah peperiksaan akhir bagi semua kursus pula dikenakan bagi pelajar yang telah dibuktikan meniru, cuba meniru atau memberi tiru (Buku Arahan-Arahan Peperiksaan Dan Kaedah Penilaian (Diploma) Edisi 6, Jun 2019) Lembaga Peperiksaan dan Penganugerahan Sijil Diploma Politeknik.

Meniru adalah perbuatan menipu dan tidak jujur di mana hal ini adalah tidak selaras dengan konsep nilai, sikap, etika dan profesionalisme. Pelajar menganggap perbuatan meniru sebagai ikutan atau 'trend' dan mengambil mudah akan hukuman yang dikenakan. Perbuatan meniru bertentangan dengan matlamat politeknik untuk melahirkan graduan yang memiliki sahsiah tinggi. Situasi pelajar meniru ketika peperiksaan, ibarat kudis pada badan yang perlu dirawat supaya tidak melarat. Keadaan ini menggambarkan biarpun jumlah kes kesalahan itu kecil, namun ia membabitkan isu etika yang tidak boleh dibiarkan dan harus dicegah supaya tidak merebak sehingga menjadi serius. Penipuan ketika menjawab peperikssan mencetuskan dua isu negatif iaitu menunjukkan sikap tidak jujur dan menyaksikan pencapaian akademik yang bukan mengikut kemampuan sebenar.

2.0 SOROTAN KAJIAN

Pentaksiran dalam bentuk peperiksaan akhir amat penting bagi memastikan pelajar dinilai dengan baik dan keputusannya adalah berdasarkan prestasi pembelajaran mereka. Seseorang pelajar dapat dikenalpasti kekurangan dan kelebihan pada dirinya melalui peperiksaan (Noraini Ahmad, 2003). Perkembangan prestasi dan penambahbaikan proses pengajaran dan pembelajaran dapat dilihat melalui pelaksanaan ujian dan peperiksaan (Abu Bakar Nordin & Bhasah Abu Bakar, 2008).

Setiap pelajar mengalami tekanan atau kebimbangan untuk mendapatkan keputusan yang baik dalam peperiksaan dan tahap tekanan atau kebimbangan mereka adalah berbeza. Sebahagian antara mereka yang berjaya menangani tekanan ini tetapi ada sebahagian mereka tidak dapat menanganinya. Komponen kognitif dan emosi merupakan komponen faktor kebimbangan menghadapi peperiksaan. Komponen kognitif terarah kepada berfikir secara negatif yang boleh mengganggu pencapaian mutu dan hasil seperti takut gagal atau hilang fokus ketika menduduki peperiksaan manakala komponen emosi lebih kepada rangsangan emosi dan fizikal seperti berpeluh atau jantung berdegup laju (Ghazali Yusri, 2010). Perkara ini amat mengganggu keupayaan pelajar yang akan menduduki peperiksaan.

Kurang keyakinan diri, tidak mengulangkaji pelajaran secukupnya tetapi pada masa sama mahu memperoleh keputusan cemerlang, menjadi punca utama pelajar mengambil langkah berani dengan membawa nota ringkas dan membawa telefon bimbit dengan niat meniru ke dalam dewan peperiksaan. Walaupun isu pelajar meniru adalah kecil, namun masih terdapat rekod pada setiap semester yang menunjukkan adanya kes meniru dan ia mencetuskan idea pengkaji untuk mengenalpasti persepsi terhadap etika peperiksaan di kalangan pelajar Politeknik Merlimau.

2.1. Objektif Kajian

Kajian ini secara umumnya bertujuan mengenal pasti persepsi terhadap etika peperiksaan akhir dalam kalangan pelajar Politeknik Merlimau. Kajian ini secara khususnya pula dilaksanakan adalah berdasarkan objektif berikut:

a. Mengenal pasti tahap kesediaan pelajar menghadapi peperiksaan akhir.
b. Mengenal pasti pemahaman pelajar berkenaan etika dalam peperiksaan akhir.

3.0 METODOLOGI KAJIAN

Responden kajian ini merupakan pelajar yang menghadiri Program Kempen Tiru Sifar. Program ini dilaksanakan dalam tempoh dua minggu sebelum peperiksaan dijalankan. Seramai 725 responden ini terdiri daripada pelajar semester satu hingga semester lima yang berlatar belakang pelbagai program pengajian merangkumi jabatan Kejuruteraan Awam, Kejuruteraan Mekanikal, Kejuruteraan Elektrik dan Perdagangan. Instrumen kajian dijalankan melalui soal selidik secara atas talian. Pernyataan soal selidik pula merangkumi tiga bahagian. Bahagian A mengenai demografi responden yang melibatkan jantina, program dan semester pengajian. Manakala bahagian B merangkumi pembolehubah yang dikaji iaitu mengetahui tahap kesediaan pelajar menghadapi peperiksaan akhir dan bahagian C berkenaan pemahaman pelajar berkenaan etika dalam peperiksaan akhir. Tahap persetujuan reponden diukur dengan menggunakan Skala Likert Lima Mata. Data diperolehi, dikumpul dan dianalisis untuk mendapatkan kekerapan, peratusan, min, sisihan piawai dan skor min menggunakan perisian Statistical Package for Social Sciences (SPSS) 25.

Bagi menentukan kebolehpercayaan item soal selidik pula, analisis kebolehpercayaan 16 item pada nilai 0.94 ditentukan melalui kaedah Alpha Cronbach. Keseluruhannya, nilai bagi soal selidik ini adalah baik. Melalui Alpha Cronbach juga penentuan kebolehpercayaan item soal selidik diperolehi dengan nilai sekurang-kurangnya 0.7 (Sekaran dan Bougie, 2013). Jadual 1 menunjukkan nilai pekali kebolehpercayaan bagi setiap tahap adalah baik iaitu kesediaan pelajar adalah 0.95 manakala pemahaman pelajar pula adalah 0.87.

Jadual 1: Nilai pekali kebolehpercayaan item

Tahap	Jumlah Item	Alpha Cronbach
Kesedian pelajar	11	0.947
Pemahaman pelajar	5	0.864
Min Keseluruhan	16	0.944

Analisis data melihat min dan sisihan piawai digunakan untuk menginterpretasikan tahap kesediaan pelajar menghadapi peperiksaan akhir dan pemahaman pelajar berkenaan etika dalam peperiksaan akhir. Objektif kajian pula ditentukan dengan menggunakan skala skor min seperti Jadual 2. Nilai min di antara 1.00 hingga 2.33 adalah pada tahap rendah, skor pada nilai min 2.34 hingga 3.67 adalah pada tahap sederhana manakala 3.68 hingga 5.00 menunjukkan skor min pada tahap tinggi menurut Landell (1977). Paparan data diinterpretasi pada Jadual 2 berikut:

Jadual 2: Skala Interpretasi Tahap

Skor Min	Tahap Skor Min
1.00 hingga 2.33	Rendah
2.34 hingga 3.67	Sederhana
3.68 hingga 5.00	Tinggi

4.0 KEPUTUSAN KAJIAN DAN ANALISIS

Melalui instrumen soal selidik, data dianalisis secara deskriptif bagi melihat peratus taburan responden. Dapatan ini dipaparkan dalam bentuk jadual bagi memudahkan pemahaman serta huraian maklumat.

Jadual 3: Demografi Responden

Demografi		Kekerapan	Peratus (%)
Jantina	Lelaki	274	37.8
	Perempuan	451	62.2
Jabatan	JKA	278	38.3
	JKE	20	2.8
	JKM	40	5.5
	JP	387	53.4
Semester	Semester 1	189	26.1
	Semester 2	163	22.5
	Semester 3	175	24.1
	Semester 4	100	13.8
	Semester 5	96	13.2
Program	DKA	260	35.9
	DSB	18	2.5
	DET	20	2.7
	DEM	19	2.6
	DKM	16	2.2
	DTP	5	0.7
	DAT	52	7.2
	DPM	169	23.3
	DPR	166	22.9
Jumlah		725	100

Daripada 725 responden kajian, seramai 274 orang responden (37.8%) adalah terdiri daripada pelajar lelaki manakala 451 orang responden (62.2%) terdiri daripada pelajar perempuan. Daripada empat jabatan yang menyertai Program Kempen Tiru Sifar seramai 278 orang responden dari Jabatan Kejuruteraan Awam (38.3%), 20 orang responden dari Jabatan Kejuruteraan Elektrik (2.8%), 40 orang responden dari Jabatan Kejuruteraan Mekanikal (5.5%) dan 387 orang responden dari Jabatan Perdagangan (53.4%). Oleh itu, boleh dikategorikan jabatan Perdagangan merupakan majoriti responden. Dapatan taburan semester pengajian, pelajar semester satu menyumbang responden paling ramai iaitu 189 orang (26.1%). Manakala pelajar dari semester lima merupakan responden yang paling sedikit iaitu 96 orang (13.2%) daripada responden kajian. Daripada demografi mengikut program pula seramai 260 (35.9%) majoriti daripada kalangan pelajar program DKA manakala seramai 5 (0.7%) minoriti daripada kalangan pelajar program DTP.

4.1 Tahap Kesediaan Pelajar Menghadapi Peperiksaan Akhir

Jadual 4 menunjukkan dapatan purata nilai min dan sisihan piawai tahap kesediaan pelajar menghadapi peperiksaan akhir adalah masing-masing 4.34 dan 0.66 iaitu mewakili interpretasi skor min tahap tinggi. Nilai min bagi kategori paling tinggi iaitu 4.51 menyatakan pelajar meminta ibu ayah mendoakan kejayaan sebelum menduduki peperiksaan. Dapatan kajian ini diperkukuhkan bahawa doa, usaha dan tawakal yang seiring dengan persediaan yang cukup akan membuahkan hasil yang baik menurut Abdul Munir Ismail (2016). Seterusnya, nilaian skor min tinggi diikuti dengan pernyataan semakan jadual peperiksaan adalah penting bagi memastikan masa belajar yang cukup dan maksud peperiksaan akhir itu sendiri iaitu penilaian yang dijalankan pada waktu yang ditentukan di akhir semester mengikut pearturan yang ditetapkan dengan nilaian min masing-masing 4.49 dan 4.48.

Manakala skor min paling rendah adalah 3.91 iaitu pelajar suka mengulangkaji di saat-saat akhir kerana mudah baginya mengingatinya kembali ketika menduduki peperiksaan. Hasil ini menyokong Siti Hawa Munji (1987) dalam kajian menyatakan peratusan pelajar yang belajar pada waktu malam sebelum peperiksaan adalah sedikit. Kebanyakan mereka tidak mendisiplinkan diri dengan jadual yang dirancang walaupun pada awalnya mereka menyediakan jadual ulangkaji tersebut untuk mentukan kesesuaian masa ulangkaji mereka. Nilaian skor min seterusnya diikuti pula dengan kaedah belajar secara berkumpulan adalah lebih baik daripada belajar sendirian dan pelajar menghadkan penglibatan dalam media sosial, sukan dan aktiviti selain daripada pembelajaran untuk memberikan tumpuan yang sepenuhnya dengan nilaian min masing-masing 4.04 dan 4.14.

Jadual 4: Min dan Sisihan Piawai bagi tahap kesediaan pelajar menghadapi peperiksaan akhir

No	Item	Min	Sisihan Piawai	Skor Min
1	Maksud peperiksaan akhir ialah penilaian yang dijalankan pada waktu yang ditentukan di akhir semester mengikut peraturan yang ditetapkan.	4.48	0.74	Sederhana
2	Saya bersedia apabila mengetahui kursus yang saya daftar perlu menduduki Peperiksaan Akhir.	4.44	0.73	Tinggi
3	Pihak politeknik atau Penasihat Akademik memberitahu tarikh Peperiksaan Akhir sekurang-kurangnya 2 (dua) minggu sebelum Peperiksaan Akhir dijalankan.	4.44	0.76	Tinggi
4	Bagi memastikan masa belajar yang cukup, penting bagi saya menyemak jadual peperiksaan.	4.49	0.74	Tinggi
5	Saya suka mengulangkaji di saat-saat akhir kerana mudah bagi saya mengingatinya kembali ketika menduduki peperiksaan.	3.91	1.06	Tinggi
6	Saya lebih suka belajar secara berkumpulan daripada belajar sendirian.	4.04	0.97	Tinggi

7	Penjagaan pemakanan dan kesihatan amat penting sebelum menghadapi peperiksaan.	4.43	0.75	Tinggi
8	Saya menghadkan penglibatan saya dalam media sosial, sukan dan aktiviti selain daripada pembelajaran untuk memberikan tumpuan yang sepenuhnya.	4.14	0.86	Tinggi
9	Penggunaan nota ringkas, carta alir dan gambarajah sangat membantu untuk mengingat dengan cepat.	4.39	0.75	Tinggi
10	Persiapan awal seperti menyediakan alat tulis, kalkulator dan slip pendaftaran amat membantu melancarkan perjalanan peperiksaan.	4.46	0.73	Tinggi
11	Saya selalu meminta ibu ayah mendoakan kejayaan saya sebelum menduduki peperiksaan.	4.51	0.73	Tinggi
Purata Skor Min dan Sisihan Piawai Keseluruhan		4.34	0.66	Tinggi

4.2 Pemahaman Pelajar Berkenaan Etika Dalam Peperiksaan Akhir

Hasil dapatan analisis berdasarkan Jadual 5 pula menunjukkan purata nilai min dan sisihan piawai tahap pemahaman pelajar berkenaan etika dalam peperiksaan akhir juga pada tahap tinggi dengan masing-masing 4.24 dan 0.75. Fahaman pelajar berkenaan meniru, cubaan meniru dan memberi tiru adalah pelanggaran peraturan arahan peperiksaan dan penyelewengan akademik menyumbang nilai min tertinggi iaitu 4.50. Ini disokong oleh Nur Hafizah Yusoff (2019) dalam kajiannya menyatakan pelajar sedar tindakan meniru adalah menyalahi etika ketika peperiksaan. Manakala skor min paling rendah adalah 3.69 iaitu pelajar mengambil maklum dengan situasi salah laku rakan yang lain. Disini pengkaji melihat pelajar tidak mahu terlibat dengan unsur penipuan atau sah laku semasa peperiksaan dan ianya adalah respon yang positif.

Jadual 5: Min dan Sisihan Piawai bagi pemahaman pelajar berkenaan etika dalam peperiksaan akhir

No	Item	Min	Sisihan Piawai	Skor Min
1	Meniru, cubaan meniru dan memberi tiru adalah pelanggaran peraturan arahan peperiksaan dan penyelewengan akademik.	4.50	0.82	Tinggi
2	Saya memahami Perkara 16.0 Penyelewengan Akademik dan Perkara 17.0 Pelanggaran Peraturan dan Arahan Peperiksaan iaitu amaran atau dibatalkan markah penilaian bagi kursus berkenaan atau dimansuhkan markah peperiksaan akhir bagi semua kursus sekiranya disabitkan dengan kesalahan meniru.	4.27	0.87	Ti nggi

3	Hukuman amaran atau dibatalkan markah penilaian bagi kursus berkenaan atau dimansuhkan markah peperiksaan akhir bagi semua kursus sekiranya disabitkan dengan kesalahan menir yang dikenakan kepada pelajar adalah wajar.	4.31	0.87	Tinggi
4	Saya perlu mengambil maklum dengan situasi salah laku rakan saya.	3.69	1.18	Tinggi
5	Saya merasakan etika peperiksaan perlu dipatuhi dan ia merupakan tanggungjawab semua individu.	4.43	0.83	Tinggi
Purata Skor Min dan Sisihan Piawai Keseluruhan		4.24	0.75	Tinggi

5.0 KESIMPULAN

Etika yang baik perlu ada, dihayati dan ditunjukkan melalui tingkah laku seharian, bukan hanya pada waktu, ketika dan tertentu sahaja. Etika semasa peperiksaan amatlah penting bagi pelajar diukur melalui tindakan baik atau buruk. Secara kesimpulannya, dapat dirumuskan bahawa menerusi kajian ini pelajar politeknik Merlimau mempunyai kesediaan dan pemahaman terhadap peperiksaan akhir. Justeru, bagi mengekalkan nilai etika yang baik, taklimat kesedaran, tips menghadapi peperiksaan dan bengkel motivasi haruslah diadakan. Taklimat ini juga diberikan seawal kemasukan pelajar di politeknik iaitu pada minggu haluan siswa. Program kempen tiru sifar juga merupakan program yang memberi kesedaran kepada pelajar mengenai pentingnya kesan hukuman meniru semasa peperiksaan.

Meneliti hasil dapatan kajian dapatlah dicadangkan supaya etika kesedaran dalam peperiksaan ini juga diterapkan sepanjang pelaksanaan penilaian seperti kuiz dan ujian. Ini kerana penilaian tersebut juga merupakan penilaian yang dilaksanakan secara individu. Perkara ini perlu diberi perhatian kerana pelajar ini merupakan generasi pewaris dimasa akan datang. Pelajar perlu menyedari bahawa etika yang baik merupakan kewajipan dalam diri sendiri. Pelajar yang beretika baik akan memastikan rakannya melaksanakan perkara yang baik yang memberi faedah kepada rakannya yang lain.

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