EXTENDED ABSTRACTS

INTERNATIONAL HOSPITALITY & EDUCATION
INVENTION INNOVATION & DESIGN

INTERNATIONAL HOSPITALITY & EDUCATION INVENTION, INNOVATION & DESIGN

(IHEIID2023)

THEME:

NURTURING IDEAS, PROMOTING TALENTS & CELEBRATING KNOWELDGE

Published by

Faculty of Hotel and Tourism Management

Universiti Teknologi MARA Cawangan Terengganu

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SYNOPSIS

The Faculty of Hotel and Tourism Management proudly presents the International Hospitality & Education Invention, Innovation, and Design (IHEIID 2023) competition, along with a comprehensive book that showcases the remarkable work presented in this event. IHEIID 2023 is a prestigious competition that offers high school students, higher education scholars, and professionals a unique opportunity to exhibit their groundbreaking projects and ideas in the expansive realms of hospitality, education, gastronomy, food service, and tourism. The accompanying book for IHEIID 2023 is a collection of 49 extended abstracts submitted by participants from various categories, including school students, higher education scholars, and professionals. These abstracts represent the diversity and innovation of the projects and concepts presented in the competition. Each extended abstract is a snapshot of the ingenuity, creativity, and dedication of its respective author. Within the book's pages, readers will find a rich tapestry of ideas and insights, covering a wide range of topics and themes. From innovative educational approaches in the hospitality industry to cutting-edge gastronomic inventions, the book offers a unique glimpse into the future of these fields. IHEIID 2023 goes beyond just being a competition. It's a platform that nurtures and empowers individuals to push the boundaries of invention and innovation. The book is a testament to the collective effort and commitment of participants who have shared their visions and creations with a global audience.

PROF. Ts. DR MAZIDAH PUTEH
Rector,
Universiti Teknologi MARA
Cawangan Terengganu

MESSAGE FROM IHEIID 2023 PATRON

Assalamualaikum and greetings to everyone,

Alhamdulillah, praise be to Allah the Almighty and the Most Merciful for making this international hospitality and education invention, innovation, and design competition possible. It is my honour to address you as we embark on this new venture in academic-publishing. Scholars, researchers, professionals, and students from the hospitality and education fields have come together for the competition to exchange ideas and progress their ideas, discoveries, practices, and research projects. The amount of expertises and commitments that permeate these proceedings has humbled me.

With the theme '*Nurturing Ideas, Promoting Talents, and Celebrating Knowledge*', the competition has enabled the participants to synchronise perspectives from both the academics and practitioners and reflect both disciplinary expertise and persuasive originality.

Hence, I would like to express my utmost gratitude to the Faculty of Hotel and Tourism Management of Universiti Teknologi MARA Cawangan Terengganu, as well as the partner organising committees from Universitas Bunda Mulia, Indonesia, and Karaganda University of Kazpotrebsoyuz, Kazakhstan, for their commitments and diligence in making the IHEIID 2023 a success. I am truly excited for organising more competitions in the future.

Thank you.

DR ZATUL IFFAH MOHD FUZA
Head of Study Center,
Faculty of Hotel & Tourism Management,
Universiti Teknologi MARA
Cawangan Terengganu

MESSAGE FROM IHEIID 2023 CHAIRPERSON

بسم الله الرحمن الرحيم
Assalamualaikum W.B.T and Warm Greetings

Welcome to the 1st publication from IHEIID 2023. In this publication, we bring to you a collection of innovative projects and research that showcase the exceptional work being done by various dedicated professionals, academicians, and students. Their dedication to advancing knowledge and addressing pressing societal challenges is truly commendable. We live in a time where the world is evolving at an unprecedented pace, and it is crucial that we stay informed and adapt accordingly. Insights and understanding gained through research are indispensable in navigating this rapidly changing landscape. As the Advisor of the IHEIID 2023, we proud to present this publication as a testament to the expertise and excellence that flourishes within our community.

Furthermore, this publication also covers a wide range of other topics spanning from food innovations to sustainable solutions, reflecting the interdisciplinary nature of this competition. The collective knowledge and insights shared in this publication have the potential to reshape industries, transform communities, and contribute to a more sustainable and equitable future.

Once again, thank you for joining us at our IHEIID 2023, and my heartiest congratulations to all participants and our steering committee of IHEIID 2023. A special thank you also goes to the management team of Universiti Teknologi MARA Cawangan Terengganu, our co-host consists of Kazpotrebsoyuz University and Universitas Bunda Mulia. We hope that you found the IHEIID 2023 informative and enjoyable and that you were able to connect with others in our community. We value your support and look forward to seeing you at the next IHEIID.

Wassalamualaikum W.B.T and thank you.

MR. RAHMAN ADULLAH
Project Leader
International Hospitality & Education Invention, Innovation & Design (IHEIID) 2023

MESSAGE FROM IHEIID 2023 PROJECT LEADER

The Faculty of Hotel & Tourism, UiTM Terengganu 1st International Hospitality and Education Invention, Innovation and Design 2023 produces its extended abstracts from all the participant's projects consisting of schools, institutes of higher learning, academicians, and professionals is an achievement in more than one way. The invention, innovation, and design from all categories allow the ideas, and innovations to be more visible, reachable, and understood by the reading population. The committee truly appreciates the thoughts, efforts, and certainly, the extra mile taken in making all ideas and innovations a reality, especially at a time when ideas and innovation can be very challenging amidst fast information technology and knowledge dissemination in a truly fast-paced environment. Thus, this program hopes it will be a consistent platform for young innovators, hardworking scholars, bright minds, and learners to share their ideas, knowledge, and innovation with the right individuals, groups of people, and organizations that could help alleviate or bring the ideas into practice, betterment or considering different perspectives. I would like to congratulate and take this opportunity to appreciate the organizing committee and the participants for their involvement in a fruitful knowledge endeavor. I hope this will be the beginning of a new relationship between the university, schools, academicians, and professionals.

TABLE OF CONTENTS

CATEGORY A: SCHOOLS

CATEGORY B : HIGHER EDUCATION STUDENTS

CATEGORY C : PROFESSIONALS & ACADEMICIANS

INTERNATIONAL HOSPITALITY & EDUCATION
INVENTION INNOVATION & DESIGN

CATEGORY

A

SCHOOLS

REMOTE-CONTROLLED LAWN MOWER

*Nurul Muhammad 'Atif Nurul Ihsan[1], Muhammad Ihtisyam Amjad Mohd Rozali[2], Muhammad Arif Adali[3], Muhammad Hamzi Hasim[4] & Norliza Din[5]

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ABSTRACT

The development of tourism has been further accelerated by the emergence of accommodation such as homestays, resorts, and others. The small players in the tourism accommodations sector usually manage and clean their own places of residence. This costs them time and disrupts the process for customers onboarding. Based on this situation, we have come up with the idea of producing a remote-controlled lawn mower to lawn mowing in the accommodation. What is more interesting is the task of mowing can be handed over to children or husbands who manage the yard while mothers can clean the inside of the house. This will make the process of cleaning the house faster. In addition, fostering an attitude of responsibility in the children and making sure they have fun by doing the lawn mowing by themselves. This remote-controlled lawn mower can be carried anywhere easily as it weighs less than 3 Kilograms. The length is 38 Centimeters while the width is only 68 Centimeters. This lawn mower can reduce the risk of injury because it can be controlled by a remote control. In addition, this lawn mower can be controlled in a radius between 50 to 80 meters from the operator's place. This lawn mower is also environmentally friendly because it does not produce smoke, smell, or produce a loud noise.

Keywords: Lawn Mower; Clean; Cut; Yard; Remote Control

1. INTRODUCTION

The aspect of hospitality plays an important role, especially in areas that focus on customer convenience and comfort. In this regard, the field of tourism is no exception. The rapid development in the field of tourism also encourages the emergence of small players such as accommodation operators, laundry, food businesses, transport, and others.

For accommodation operators, most of them carry out cleaning work inside and outside the house. Therefore, this remote-controlled lawn mower product is aimed at homestay owners and individuals to make the work easier.

2. METHODS

The process of producing this product goes through different stages:

2.1 Problem Identification

Difficulties and high costs are faced by accommodation operators especially when it comes to cutting the grass on their respective premises. This problem can be solved when a remote-controlled lawn mower is created because it can be done by anyone including children.

2.2 Solving Problem Ideas

To get the best solution idea, a discussion session was held. As a result of brainstorming, the design team has proposed the production of a remote control that can be operated by adults as well as children**.**

2.3 Process of Producing Products and Components

2.3.1 Drawing Sketches and Choosing the Best One

The product production process started with sketching the product design and choosing the appropriate sketch.

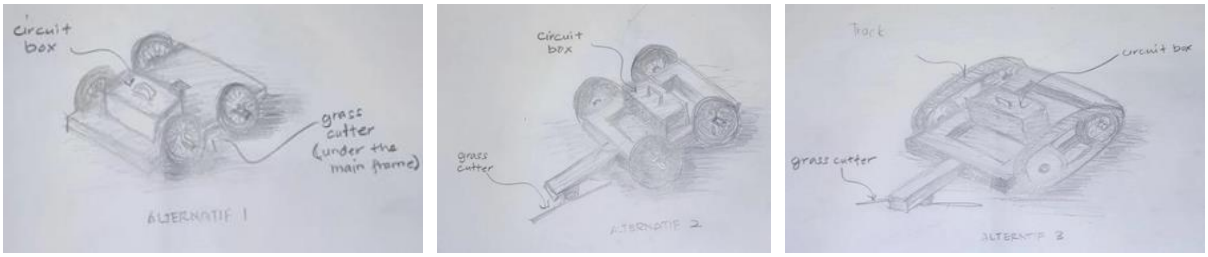

Figure 1. Drawing sketches process

2.3.2 Determining the Materials and The Product's Components

Table 1. Materials and Components

BIL	COMPONENT & MATERIAL	QTY	COST / UNIT [RM]	TOTAL / COST [RM]
1.	Brushed Motor	2	14.00	28.00
2.	Transmitter and receiver	1	90.00	90.00
3.	Electric speed controlled [brushed]	2	20.00	40.00
4.	Brushless Motor	1	25.00	25.00
5.	C-Channel	2 meters	2.00	4.00
6.	Electric speed controller [Brushless]	1	25.00	25.00
7.	Battery lion 7.4v 2500 mah	2	20.00	20.00
8.	Screw	Adequately	1.00	1.00
9.	Wire [18AWG]	1 meter	2.00	2.00
10.	3d Tire	4	7.00	28.00
	TOTAL			289.00

2.4 Testing and Assessment

Testing and evaluation have been done on the products produced. From the test that have been carried out, it seems:

1. This product can cut grass in open and narrow areas.
2. The speed of the cutting can be changed.
3. Remote control can fully control the movement of the product including tires and the cutting blade.
4. This product can be used on road surface and on grass.

2.5 Improvement

From the test conducted, the design team also made a slight modification to the product, especially the frame, to make sure the product can produce the maximum effect.

3. RESULTS AND DISCUSSION

As a result of examining and analyzing Lawnmower, several aspects could be affirmed:

3.1 Product Functions

Lawn mower is well designed equipment to save manpower and easy to handle. This product can be controlled within a radius of about 70m. The main feature, particularly the cutting blades built in, serves its purpose to cut the grass in the yard. The cutting blades were made from plastic. Although it is not capable of cutting saplings or hard-stemmed grass, the product was proven to function effectively as per the video in YouTube: https://youtu.be/FOBhv0ttwRc.

3.2 Product Materials

The main frame of the Lawn mower is made of Aluminium C-channel. Aluminium C-channel gives an optimal effect to the product's stability and smoothens the cutting process of the grass.

3.3 Fit and Friendly User

The cutting part of this Lawn mower is adjustable particularly it can be split up from its main frame. This allows this product to fit in or cut in narrow areas. Its modest size (35cm x 68cm) is user friendly and convenient to bring, carry and to shift from one place to another as well as to place into any vehicle.

4. CONCLUSION

The product produced was found to have achieved its goal of being a lawn mower that can be operated by adults and children. Tests performed on this product show that the cutting edge can be controlled separately with the tire. With this, the cutting blade can be stopped while the product is moving on the road and can be turned on when you want to do grass cutting work.

ACKNOWLEDGEMENT

In performing our report for "LAWN MOWER" project, we would like to express our greatest gratitude to several respected individuals.

Firstly, we would like to express our gratitude to Madam Norliza binti Din, our advisor as well as a teacher who supports us wholeheartedly, giving good guidelines and helpful in completing this project and in writing this report. Secondly, we would like to appreciate all our parents particularly Nurul Ihsan bin Abdul Majid who is always open to share ideas and valuable points of view to improve our lawn mower project.

Lastly, we would also like to expand our deepest gratitude to our classmates and school management (SMK Tengku Ampuan Intan) who have directly and indirectly helped us in completing this lawn mower project.

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FERTILIZED POT

Nur Hanim Umairah Alim[1], Nur Irdina Farisha Mohd Othman[2], Tengku Amirul Aiman Tengku Zainuddin[3], Azishazuani Md Zain[4], Nureen Emelda Mohd Rozaidi [5] & Awatif Rizqah Alias[6], & *Tengku Saudat Tengku Bakar[7]

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ABSTRACT

The Fertilized Pot is an innovative steel container made from recycled materials like egg containers, eggshells, yogurt, and additional ingredients such as distilled water. It was designed to decrease reliance on chemical fertilizers, which can have harmful effects on humans. This unique pot acts as a natural fertilizer dispenser, eliminating the need for users to manually apply fertilizers to their plants. The pot contains a blend of eggshells, eggs, yogurt, and egg containers, serving as an effective fertilizer for various plants. When watered, the fertilizer seeps into the soil, nourishing the plant. Based on the disposable technique, the pot naturally decomposes over time, merging with the surrounding soil. It is suitable for a wide range of plants, including vegetables, fruits, and ornamental plants.

Keywords: Plants; Recycled; Disposable; Fertilizer.

1. INTRODUCTION

The Fertilized Pot is specifically designed for planting various tree types. Crafted from eggshells, eggs, and yogurt, it contains a substantial amount of calcium carbonate, approximately 95% or around 2 grams. Calcium carbonate plays a crucial role in enhancing soil fertility. Eggshells, being calcium-rich, transform into calcium carbonate, promoting robust plant growth. Online research indicates that calcium derived from eggshells can mitigate soil acidity, creating an ideal environment for optimal plant development.

Furthermore, utilizing the Fertilized Pot addresses common issues like fungal diseases that frequently plague tree leaves, hindering plant growth and fertility. Simultaneously, it contributes to environmental preservation by reducing pollution. According to Balcony Garden Web, as of Wednesday (09/06/2021), this innovative pot acts as a deterrent against plant fungal diseases such as rot and fungus. Additionally, the yogurt content boosts soil microbe populations, further enhancing the yield of typical garden plants, vegetables, and fruits.

2. METHODS

2.1 Basic Ingredients

i) Egg container
ii) Eggshell
iii) Yogurt
iv) Starch
v) Distilled water

2.1 Steps

1. Soak egg containers in distilled water until they become soft and break down.
2. Grind eggshells, eggs, and yogurt until a smooth consistency is achieved.
3. Combine the finely ground ingredients with the softened egg container material.
4. Mix in starch and distilled water until a homogeneous blend is formed.
5. Cover the container's surface with a dark-colored material, such as cloth or black plastic.
6. Allow the mixture to ferment in a dark location for 3 days.
7. Shape the fermented mixture into the desired pot form.
8. Dry the pot thoroughly in moderate heat until it is completely dry.
9. The pot is now ready to be used for planting.

3. RESULTS AND DISCUSSION

3.1. Evidence of Effectiveness

After conducting a thorough study and observation over a span of three weeks, we observed a distinct difference in the growth rates of trees planted in the Fertilized Pots compared to those in regular pots. The trees in the Fertilized Pots exhibited a remarkable growth, measuring 0.7 inches taller than their counterparts in the standard pots. This substantial variation was evident in several key aspects:

Height ***Fertility*** ***Number of leaf fungi***

(Fertilized Pot) (Regular Pot)

Figure 1. Evidences of effectiveness

Tree (Fertilized pot)

The tree is taller, the leaves are greener, thicker and the amount of fungus is less on the leaves.

Tree (Regular pot)
Lower, yellowish leaves, more leaf fungus and more withered and less fresh.

3.2. Product Authenticity

Numerous liquid fertilizers incorporate eggshells and yogurt, but there is a distinctive lack of innovation when it comes to pots like the Fertilized Pot, created from yogurt and eggshells. We can confidently assert that the Fertilized Pot is our unique and pioneering product, with no comparable offerings found in Google search results.

3.3. Product Impact

Certainly, here is a summary of the benefits and features of the Fertilized Pot based on the provided information:

1. **Increased Tree Growth**: The use of Fertilized Pot results in a remarkable 90 percent increase in tree growth. Observations indicate that trees grown in Fertilized Pots grew by 7.0 inches, while those in normal pots only grew by 6.30 inches within 3-4 weeks. (Refer to the video link - https://youtu.be/vwll_9Dr9pw)
2. **Mildew and Fungus Prevention:** Fertilized Pot effectively reduces the growth of mildew or fungus on plant leaves, ensuring healthier plant growth.
3. **Reduction of Chemical Fertilizers**: By using Fertilized Pot, the reliance on harmful chemical fertilizers, which can deteriorate soil fertility in the long term, is significantly reduced.
4. **Natural and Safe:** Fertilized Pot is a natural and safe alternative for plant cultivation, providing a secure environment for both plants and users.
5. **Eco-friendly Impact:** It does not negatively impact plants, soil, or water ecosystems, ensuring a sustainable and eco-friendly approach to gardening.
6. **Dual Functionality:** Fertilized Pot serves a dual purpose as both a soil fertilizing agent and a pot, offering convenience and efficiency in gardening practices.

4. CONCLUSION

This innovative Fertilized Pot effectively turns previously worthless waste materials into valuable resources, offering substantial benefits to various segments of the community. It proves particularly advantageous for gardeners, housewives, plant enthusiasts, and individuals from all walks of life. Fertilized Pot is versatile, suitable for nurturing a wide range of tree plants, and plays a significant role in promoting environmental cleanliness.

ACKNOWLEDGEMENT

Gratitude is extended to the PIBG of SMK Tengku Intan Zaharah for their generous donation towards the production of this innovation. Special thanks are also due to the SEM teacher at the school, as well as our mentor teacher, Pn Tengku Saudat binti Tengku Bakar, for their invaluable ideas and assistance, which played a pivotal role in making the Fertilized Pot product a resounding success. Their support and guidance have been instrumental in this achievement.

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VANDOOR

Annur Raudah Mayuki[1], Siti Aliya Adriana Taj Arleen[2], Nur Raihanah Mardhiah Mohd Rezanee[3], Husna Imanina Zurodin[4], Muhammad Amsyar Baihaqi Mohd Borham[5], Ahmad Nazhif Fikri Mohd Fauzie[6], Ahmad Al Hadi Muizuddin Mat Lazim[7], *Tengku Saudat Tengku Bakar[8]

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ABSTRACT

Vandoor, also known as the Versatile Door Handle, is an innovative accessory designed to enable hands-free door opening. It is specifically attached to door handles, allowing users to open doors without using their hands, thus minimizing the risk of bacterial and viral transmission, including the highly contagious Covid-19 virus. This device was introduced in 2020, during the global Covid-19 pandemic, with the primary objective of curbing the virus's spread. Vandoor not only allows users to operate doors using their hands but also provides the option to open doors with their feet by pressing on the attached treadle. Extensive research revealed that doorknobs and door handles are high-risk areas for transmitting the Covid-19 virus through hand contact, underscoring the significance of hands-free solutions like Vandoor in promoting public health and safety.

Keywords: Hands-free; Bacterial; Doorknobs; Safety.

1. INTRODUCTION

Vandoor is a door accessory constructed from iron, designed for installation on both handle-type and knob-type door handles. This versatile device is adjustable, allowing it to be tailored to fit various doorknob sizes and heights. Its primary function is to serve as a barrier against the transmission of harmful bacteria commonly found on door handles. Moreover, Vandoor offers the added benefit of enabling users to swiftly and effortlessly open doors. This innovation is particularly advantageous for diverse groups, such as children, individuals with disabilities or limited hand mobility, as well as delivery personnel.

2. METHODS

2.1 Basic Materials

i. Stainless steel
ii. Wire or cable
iii. Antirust liquid and paint

2.2 Physical substances

i. Drill press (iron punch)
ii. Cutting machine
iii. Welding machine

Vandoor is manufactured using the aluminum welding technique at Bengkel BB Iron Works Sdn Bhd's processing workshop located in the Dungun district. Consultations were conducted with Mr. So Siong Nam, the Director of BB Iron Works Sdn Bhd, to finalize the suitable design. To enhance its durability, Vandoor is treated with an anti-rust liquid before undergoing the painting process. Additionally, we procured appropriate packaging boxes from DACC Print Expres, a company based in Dungun, under the supervision of Mr. Fakhrul Iswandy.

3. RESULTS AND DISCUSSION

3.1. How To Install Vandoor

3.1.1 For handle-type doors:

1. Attach Vandoor to the bottom of the door leaf.
2. Insert the cable into the round bar.
3. Affix it onto the door handle.
4. Adjust the cable wire to match the size and fit of the door at the bottom.
5. Secure the cable in place using a massager and tighten it with a screw.

Figure 1. The installation methods for Vandoor can be found on the packaging box.

Figure 2. Vandoor Components

3.1.2 Door Handle (Knob)

1. Attach Vandoor to the bottom of the door leaf.
2. Place the clamp around the doorknob.
3. Insert the cable into the clamp.
4. Adjust the cable wire to fit the size and suitability of the door at the bottom.
5. Secure the cable in the massager and tighten it with a screw.

3.2 Impact of Product

1. Assisting with door opening.
2. Preventing the spread of COVID-19 and harmful bacteria.
3. Aiding children in opening doors.
4. User-friendly for individuals with disabilities (limited limb mobility).
5. Facilitating the needs of delivery personnel.

4. CONCLUSION

The introduction of Vandoor accessories represents a novel solution designed to address the COVID-19 pandemic, which can be transmitted through contact with door handles. Vandoor stands as a symbol of our social responsibility and commitment to the safety and health of the global community.

ACKNOWLEDGEMENT

We extend our heartfelt gratitude to all individuals directly and indirectly involved in this innovation, including Mr. So Siew Nam, the Director of BB Iron Works Sdn Bhd, Mr. Fakhrul Iswandy from DACC Print Expres Dungun company, SMK Tengku Intan Zaharah Dungun's PIBG, our mentor teacher Ms. Tengku Saudat binti Tengku Bakar, and all the teachers who

contributed their ideas to this innovative endeavor. Your support and contributions have been invaluable in making this innovation a reality.

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SHUANGSI TABLE

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ABSTRACT

This innovative product is crafted from a variety of materials, such as cement, iron nails, iron wire, water tubes, wood, wood polish paint, waterproof glue, and even water pumps. A Lazy Susan or turntable is placed on the table to make food distribution easier for all guests. This product is particularly popular in traditional Chinese restaurants, and it was invented by an American-Chinese individual. The word "Shuangsi" comes from the Chinese phrase "Shuāng xī," which means "double happiness." This is because the Shuangsi table not only makes food distribution more efficient but can also help foster positive relationships with customers. This table is designed using Japanese and Chinese architectural concepts, and it uses water to move dishes. The noise generated by the flow of water can provide a sense of calm and tranquility to users. Additionally, this product can help reduce greenhouse gas emissions by allowing for the growth of plants such as clean bean sprouts, which are free from fungicides and insects and are rich in vitamins A, C, and calcium. Other decorative plants on the table can also help to beautify the surrounding area and lower the temperature.

Keywords: Lazy Susan; Food Distribution; Tranquility

1. INTRODUCTION

This table is designed using Japanese and Chinese architectural concepts, and it uses water to move dishes. This innovative product is crafted from a variety of materials, including cement, iron nails, iron wire, water tubes, wood, wood polish paint, waterproof glue, and even water pumps. The Shuangsi table not only makes food distribution more efficient but can also help foster positive relationships with customers. The noise generated by the flow of water can provide a sense of calm and tranquility to users. The table can also help to beautify the surrounding area.

2. METHODS

2.1 PRODUCT'S PRODUCTION METHOD

1. Before cutting, be sure to measure the wood to the correct size.
2. Once the wood is cut, it can then be fitted together to create a table.
3. Use wooden nails to secure the pieces of wood.
4. The centerpiece of the table will be a pool shape.
5. Wrap the iron wire around the iron nail.
6. Apply cement around the circumference of the wire to form a "crater."
7. Dry the table to allow the cement to dry.

8. Cover the cement with waterproof glue to prevent water leakage.
9. Dry the table again to dry the wet glue.
10. Apply wood polishing paint to the table.
11. Create holes in the table to connect the water tube to the pump.
12. Use glue to attach the water tube to the hole.
13. Dry the table again to allow the glue to dry.
14. Cover the table with wood that has holes in it.

2.2. USER GUIDE

1. Insert a water pump into a bucket filled with water.
2. Connect the electric water pump plug and turn on the switch.
3. Wait for the water to fill the table crater area.
4. Place your meal (according to the guidelines) on a lightweight plate.
5. Users can enjoy the meal.

3. RESULTS AND DISCUSSION

3.1. SALES TARGET

1. The elderly
2. Family
3. Hotel
4. Restaurant

3.2. PRODUCT'S IMPACT

1. This product utilizes a water flow mechanism that moves the dish with minimal energy consumption, making it a convenient time-saver.
2. It has the potential to enhance the aesthetic appeal of its surroundings.
3. This product can contribute to environmental sustainability by promoting the growth of plants like clean bean sprouts that are free from pesticides and insects. Additionally, the presence of plants such as those with high calcium content and vitamins A and C can help reduce ambient temperature.
4. The tranquil sound of the water flow produced by this product can serve as a calming therapy for the mind and soul.

3.3. PRODUCT'S GUIDELINE

The weight of the dish or container should be <110 grams for the movement of the plate on the water. There are several dishes that we recommend serving using this product:

1. Dessert
2. Meals (by mass specified

3.4. PRODUCT'S SELLING PRICE

After considering all production costs, our group has set the price for selling this product in the following sizes:

1. ‘Small size’ (135cm×85cm) = RM 1000 - RM 5000
2. ‘Wide size’ (200cm×120cm) = RM 5000 - RM 10,000

4. CONCLUSION

4.1. PRODUCT’S SALES POTENTIAL

The Shuangsi Table is an exceptional choice for engaging customers of all ages. Its design provides a sense of calm and tranquility, making it especially well-suited for those in the golden age group. The use of premium materials ensures that this table is both strong and long-lasting. While it may be a bit pricey, the cost is justified by the quality of the materials used. Extensive research and analysis were conducted prior to construction, resulting in a product that incorporates aesthetic elements that appeal to modern tastes. Based on these factors, the Shuangsi Table has tremendous potential for growth, both locally and globally.

4.2. PRODUCT’S FUTURE IMPROVEMENT

As our team progresses, we will dedicate time to continuously improve our product to its limits to enhance user experiences. For instance:

1. Additional chair sets following certain purchases.
2. Wider range of features, including but not limited to:
    - Dual-energy technology, solar and electrical batteries.
3. Additional size options for the product.

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EZ CHOPPY

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ABSTRACT

EZ Choppy or better known as a 2 in 1 cutting board, is a special product for cutting raw materials such as fruits and vegetables. The main purpose of this product is to make it easier to cut the ingredients that will be used for cooking. By using EZ Choppy, users can not only cut raw materials but also grate raw materials such as carrots. In addition, the hole punched on the side of the cutting board can also make it easier for the user to put the ingredients that have been cut into the plate. As a result of the research, we found that most people have limited storage space for cooking tools.

Keywords: Easy To Use; Save Space; Safe; Save Time.

1. INTRODUCTION

EZ Choppy is a cooking utensil that is made from wood. EZ Choppy can be used for a long period of time. In addition, it is stronger than the cutting boards that are available in the market because wooden cutting boards are more durable, stronger, and more beautiful from a physical point of view. It is also natural and easy to be composed after no longer be used. Various groups that get benefit from this product include housewives, public, food stall cooks and student living in dorms who likes to cook.

2. METHODS

1. **Basic Materials**:
    1. Plank wood
    2. Grater
    3. Glue
    4. Cylindrical wood
2. **Physical Materials**
    1. Saw
    2. Wood cutting machine.
    3. Ruler
    4. Sandpaper

3. **Procedure**
    1. Measure the size to make a hole on the cutting board.
    2. Install the grater on the hole that has been punched.
    3. Cut the cylindrical wood into four parts that is equal.
    4. Glue all four bases under the cutting board.

INSTALLATION METHOD

- Our products do not require any assembly; they are ready to be used.

Figure 1. Final product

PRODUCT IMPACT

1. Helps facilitate the work of cutting raw materials
2. Saves time to cut raw materials
3. Saves storage space
4. Save expenses or cost

3. CONCLUSION

EZ Choppy product is a new product created to facilitate the work of cutting raw materials especially for housewives. EZ choppy is also one of the signs of our responsibility and concern for housewives and the public. We also do not use shellac on products that will be sold because the shellac used on most woods contains chemicals that are not good to use on food related materials. We will look forward in the future to use shellac that is food graded, which is suitable to be used on cookware.

PRODUCT AUTHENTICITY

This product is not yet on the market and there is no similar product in google search. EZ Choppy is a combination of the original ideas of SMK TENGKU INTAN ZAHARAH'S student group with the help of advisor from product design experts who have experienced and potential in producing innovative products.

ACKNOWLEDGEMENT

Special appreciation to individuals who are directly and indirectly involved in making this innovative product a success. Among them, thanks to Mr. Syah who helped us to cut the wood according to the desired size and Mrs. Siti Hannah as our guidance teacher and all the teachers that were involved in making this product and project a success.

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BEE QUEEN

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ABSTRACT

Bee Queen soap is a medical soap that is used to treat skin problems without irritating the skin. It gives you a softer and smoother skin, can remove dead skin cells, reduce infection and acne as well as lighten the blemishes. It is made from natural ingredients, which can be used for face as a cleanser and body exfoliator. It is also travel friendly. Bee Queen on the other hand only contains ingredients that are natural and believed to be authentic, hence it is suitable for all skin types, including sensitive skin.

Keywords: Soften; Reduce and Exfoliating

1. INTRODUCTION

Bee Queen is a natural medicinal soap made from trigona honey. It can be used all over the face and body, and suitable for all skin types. Regular use of Bee Queen soap can leave your skin soft, remove dead skin, reduce irritation and acne, and even lighten blemishes. Its gentle formula is kind to your skin, be it sensitive skin, acne prone skin, dry skin etc.

2. METHODS

Basic raw ingredients used in this product including Trigona honey, soap base, essential oils, and aloe vera. As for physical materials including mould, pot and pans, ladle, gas stove, spoon, blender, kitchen knife, as well as cutting board. This product idea has been consulted through our mentor and after that, Bee Queen is produced through a process of double boiling and freezing in the laboratory of SMK Tengku Intan Zaharah. Bee Queen is placed into the mold for the freezing process. After that, the soap will be going through packaging and labelling processes.

2.1 Products Step-by-step Process

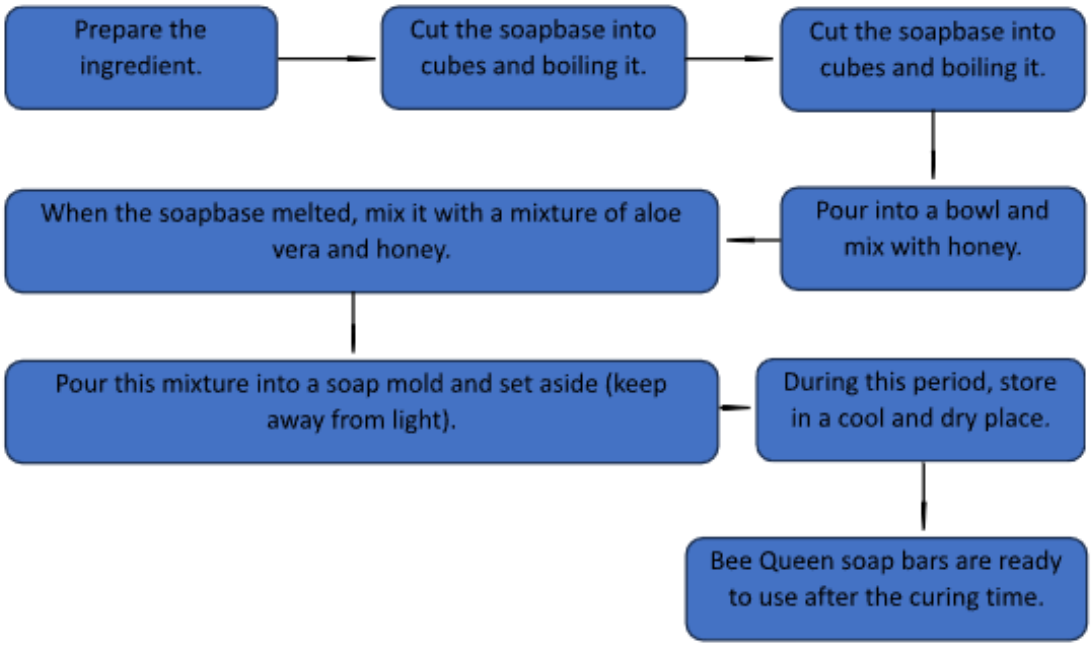

Figure 1. Illustration of step-by-step process of Bee Queen

3. RESULTS AND DISCUSSION

3.1. Product Impact

As the Bee Queen is made from selected natural ingredients, it makes this product can be used for both face and body especially for cleansing and exfoliation. Besides, it could help people who has skin problems, and the size of the soap is made for travel-friendly purposes.

4. CONCLUSION

In conclusion, this product is authentically and originally coming from the brilliant ideas of us. You will never find it anywhere. It is different from the ingredients used by the other markets because we are 100% using natural ingredients while the outside market use ingredients containing chemicals that can damage the skin, our soap can also treat people who have skin problems. We hope that this soap can give you a healthy and beautiful skin.

ACKNOWLEDGEMENT

Special thanks to individuals who are directly or indirectly involved, including Puan Tengku Saudat and the mentor teacher, Puan Nik Lini Murni, and all the teachers who contributed ideas in this innovation.

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PROFUMO PANDAN

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ABSTRACT

Profumo Pandan, a fragrance with various benefits and advantages. The main purpose of Profumo Pandan is to reduce paper waste and excessive production. When production processes increase, more trees are cut down. This tree-cutting action can harm the environment. From there, we got the idea to create the innovation of Profumo Pandan.

Keywords: Safe; Easy; Friendly

1. INTRODUCTION

PROFUMO PANDAN is a fragrance that uses natural and recycled materials. Its ingredients include pandan leaves. Pandan or also known as pandanus amaryllifolius, have a distinctive aroma. It will help to naturally repel insects such as rats and cockroaches. Pandan leaves also contain antimicrobial compound that can help combat the growth of harmful bacteria and fungi. It also contains a recycle paper. Recycle paper will help Lowering Carbon Emissions. The process of making new paper from raw wood materials can result in high carbon emissions. Recycling paper helps reduce the carbon emissions associated with producing new paper, contributing to efforts to combat climate change.

2. METHODS

1. The pandan leaves are cut into small pieces.
2. Tear the paper into small pieces.
3. Place the torn pieces of paper into the container containing the pandan leaves.
4. Put those ingredients into grinder.
5. Add a small amount of water.
6. Grind it until it becomes finely crushed.
7. The ground mixture should be sieved to remove any excess water.
8. Compact the ground mixture.
9. Let it dry in the sun.

3. RESULTS AND DISCUSSION

1. The pandan leaves are cut into small pieces.
2. Tear the paper into small pieces.
3. Place the torn pieces of paper into the container containing the pandan leaves.
4. Put those ingredients into grinder and add a small amount of water.
5. Grind it until it becomes finely crushed.
6. The ground mixture should be sieved to remove any excess water.
7. Compact the ground mixture.
8. Let it dry in the sun.

Figure 1. Processing of the Profumo Pandan

IMPACT OF THE PRODUCT

1. Reduce paper waste and excessive production.
2. Can save environment.
3. It will help to naturally repel insects such as rats and cockroaches.

4. CONCLUSION

Profumo Pandan fragrance innovation is a new product that we created to reduce paper waste and excessive paper production. This product is an eco-friendly innovation because if we no longer want to use it, we can plant it. Paper is one of the most easily biodegradable waste, typically taking between 2 to 6 weeks to decompose.

ACKNOWLEDGEMENT

There are many fragrances made from pandan, but there is no pandan fragrance that utilizes recycled materials like paper. We affirm that Profumo Pandan is our original product, the first of its kind, and cannot be found in a Google search.

APPRECIATION

Thank you to those who have collaborated and assisted us in creating this innovation.

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TREHAFE

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ABSTRACT

This study focuses on the development of the TreHafe Eczema Cream Product, which is believed to be free from alcohol and designed for treating and beautifying the skin while ensuring safety. The hypothesis of the experiment is that the eczema cream can effectively moisturize dry skin. The cream formulation involves the combination of various ingredients. Ingredient A consists of beeswax and shea butter, which are heated until melted and then cooled to 40 degrees centigrade. Ingredient B includes 1 drop of vitamin E, 3 drops of geranium, 5 drops of lavender, and 2 drops of chamomile or calendula, which are thoroughly mixed. Ingredient C incorporates 22g of sunflower oil, 10g of hemp seed oil, and 5g of calendula or chamomile (with ingredient A added to part C). Additionally, the cream can be enhanced by adding 5g of rosehip oil and 38.9g of sunflower oil. These modifications aim to improve the cream's effectiveness.

Keywords: Eczema; Vitamins; Voisturize; Safe

1. INTRODUCTION

Eczema is an infectious disease of the skin that is accompanied by swelling, itching and a red rash that sometimes looks like a watery burn. If prolonged it will cause itching. Eczema is often found on the face, the middle of the elbows and even the knees. The affected skin will become crusty. It is ideal to use in this country like Malaysia due to hot temperature which can easily cause the skin to become red, itchy, and exfoliating.

2. METHODS

2.1 Ingredients

1. 10 g shea butter (phase a)
2. 15 g beeswax (phase a)
3. 38.9 g sunflower oil (phase b)
4. 20 g hempseed oil (phase b)
5. 5 g rose hip oil (phase b)
6. 5 g calendula infused oil (phase b)
7. 5g gelenggang infused oil (phase b)
8. 0.5g lavender essential oil (phase c)
9. 0.3g geranium essential oil (phase c)
10. 0.2g chamomile essential oil (phase c)
11. 0.1g vitamin e (phase c)

2.2 Procedure

1. Heat the phase (a) until it melted,
2. Weight the phase (b),
3. Pour phase (a) into phase (b), then stir until it's combined,
4. Phase (c) is added one by one, stir it well.
5. Add the cream inti the mixture.

Figure 1: Stir until combined.

Figure 2: After placing all the essential oils, we will heat them temporarily, so that they will not harden.

Figure 3: After heating we will put vitamin E.

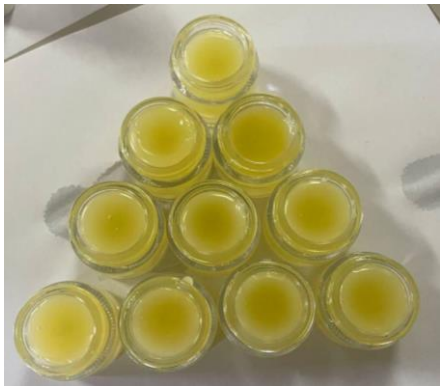

Figure 4: Eczema cream

3. RESULTS AND DISCUSSION

3.1. Result

We modified it with this lipstick shape cream. Lipstick shape cream can also be taken anywhere. In addition, it avoids more exposure to finger contact that contains harmful microbes than placed in the jar container in the market today. Besides, it can be used as a lip balm.

Figure 5: Lipstic shape cream.

Table 1: Formula treatment cream for eczema & sensitive skin

Content	Percent %
Sunflower oil	38.9
Hemp seed oil	20
Calendula infused oil	5
Rose hip oil	5
Gelenggang infused oil	5
Shea butter	10
Beeswax	15
Lavender essential oil	0.5
Geranium essential oil	0.3
Chamomile essential oil	0.2
Vitamin E	0.1

Table 2: Formula treatment cream for eczema & sensitive skin (100g)

Content	Weight (g)
Sunflower oil	38.9
Hemp seed oil	20
Calendula infused oil	5
Rose hip oil	5
Gelenggang infused oil	5
Shea butter	10
Beeswax	15
Lavender essential oil	0.5
Geranium essential oil	0.3
Chamomile essential oil	0.2
Vitamin E	0.1

4. CONCLUSION

We use eczema cream lipstic because easy to carry and easy to use at any time anywhere. The moist mist moisturizes and instantly soothes the skin. This technology use for skin caring suitable for all kind of skin. We believe it can be marketed, its because the eczema cream market they always use normal suitable for all skin types for women and men. Simple to use, pocket size. The mini size can put it in handbag, purse, school bag and even pockets and use it anytime though for a quick little hydration boost of your skin. It is cheaper than in the market and it has high quality.

ACKNOWLEDGEMENT

We cannot express enough grateful to our teachers for their continued support and encouragement Puan Baizura Norida Binti Mohamad Noor, Puan Nur Farhana Binti Mohammed Lazim and Puan Ruzita Binti Jusoh as well as our principal Encik Azahar Bin Ali who gave us the opportunity to do this innovation project which is Trehafe. Our completion of the research could not have been accomplished without the support of our team members, Nur Aisyah Batrisyia Binti Azmee, Muhammad Danial Hakimi Bin Mohd Latiff , Nurul Qurratuaini Bariah Binti Kharudin, Ahmad Thariq Al Habibi and Alya Maisarah Binti Ahmad Kamil.Thank you for allowing your time away to research, review and write .We offer our sincere appreciation for the learning opportunities provided and helped us a lot in finalizing this innovation project within the limited time frame. Thank you also to Universiti Teknologi Mara Cawangan Terengganu for giving us the opportunity to make this innovation.

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SPEUROS

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ABSTRACT

Facemist is a skincare product that provides rehydration and moisturization to the skin using soothing ingredients. It offers nourishment and a refreshing spritz, particularly beneficial when used outdoors. Facemists are spray-on skincare products designed for application on the face. They come in various types and generally provide an immediate boost of hydration, thanks to ingredients like water, vitamins, extracts, and essential oils. Some facemists offer additional skincare benefits such as oil control, stress relief, and anti-aging properties. Roses are utilized in our Facemist Speuros (Special-Nature-Rose) products because they support the body's natural collagen production, which is essential for healthy skin, nails, and hair. Roses possess anti-inflammatory and antibacterial properties that can help alleviate breakouts and calm skin conditions like eczema and rosacea. Our rose-based facemists are believed to be free from alcohol. The hypothesis behind this product is that roses contain vitamins A, C, and E, as well as calcium. In summary, Facemist is a skincare spray that delivers rehydration and moisturization to the skin. It utilizes roses to support collagen production and offers additional benefits such as anti-inflammatory and antibacterial properties.

Keywords: Facemist; Vitamins; Rose

1. INTRODUCTION

Face mist is a skincare product that rehydrates and moisturizes your skin with calming ingredients. It also provides with the necessary nourishment and a spritz of revitalisation, especially when outdoors. Just like it sounds, a face mist is a skin care product that use spray on your face. There are lots of different types out there, and for the most part they deliver an instant hit of hydration with ingredients like 95% water, vitamins, extracts, and essential oils. Some have additional skin care benefits like controlling excess oil, calming stressed skin and offering anti-aging properties. We use roses because it also supports the body's natural collagen production, our body's protein responsible for healthy skin, nails and hair loaded with antiinflammatory and antibacterial properties, roses can also help ease breakouts and calm skin conditions such as eczema and rosacea. Sip and glow on.

2. METHODS

2.1 Ingredient

1. 2 g Rose
2. 100 g Distilled Water
3. 2 g Glycerine
4. 1 g Liquid Germall Plus

Figure 1: Liquid Germall Plus

Figure 2: Glycerine

Figure 3: Distilled water

2.2 Procedure

1. Clean the Patel's of roses and put in a jar,
2. Boil the distilled water and pour into the Patel's jar,
3. Wait the colour comes out. Then, filter the solution,
4. Add 2 g Glycerine, stir well,
5. Add liquid Germall plus, stir well and put it into Nano mist spray.

Figure 4: Before the rose water is placed in the nano mist, the flower needs to be fermented for a few minutes to extract all the nutrients contained in the flower.

3. RESULTS AND DISCUSSION

3.1. Results and discussion

We use nano mist spray because increases the moisture of the skin without damaging any cosmetics. The moist mist moisturizes and instantly soothes the skin. This technology use for skin caring suitable for all kind of skin.

Figure 5: Innovation prototype

Table 1: formula of face mist in percent

Content	Percent %
Rose petal	32.68
Distilled water	65.36
Glycerine	1.31
Liquid Germal Plus	0.65

Table 2: formula of face mist in gram

Content	Weight (g)
Rose petal	50 (a)
Distilled water	100(b)
Glycerine	2 (c)
Liquid Germal Plus	1(d)

Equations

$$½b + a + 100c = d$$

We think it can be sold because the face mist market always uses regular spray. Ideal for quick recovery of skin vitally in the office, airplane, outdoor, home etc. Suitable for all skin types for women and men. USB charging, simple to use, pocket size. The mini size can put it in handbag, purse, school bag and even pockets and use it anytime though for a quick little hydration boost of your skin.

4. CONCLUSION

In conclusion, it is hoped that Facemist Speuros (Special-Nature-Rose), products innovation can provide many benefits, especially to those responsible for skin health. Among other things, it allows the skin health department to reduce the rate of skin diseases with this skin health is guaranteed.

ACKNOWLEDGEMENT

We cannot express enough grateful to our teachers for their continued support and encouragement Puan Baizura Norida Binti Mohamad Noor, Puan Nur Farhana Binti Mohammed Lazim and Puan Ruzita Binti Jusoh as well as our principal Encik Azahar Bin Ali who gave us the opportunity to do this innovation project which is Facemist Speuros (Special Nature Rose). Our completion of the research could not have been accomplished without the support of our team members, Nur Aisyah Batrisyia Binti Azmee, Muhammad Danial Hakimi Bin Mohd Latiff, Nurul Qurratuaini Bariah Binti Kharudin, Ahmad Thariq Al Habibi and Alya Maisarah Binti Ahmad Kamil. Thank you for allowing your time away to research, review and write. We offer our sincere appreciation for the learning opportunities provided and helped us a lot in finalizing this innovation project within the limited time frame. Thank you also to Universiti Teknologi Mara Cawangan Terengganu for giving us the opportunity to make this innovation.

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NON-HAZARDOUS AND COST- EFFECTIVE SHOE POLISH FOR HOTEL INDUSTRY

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ABSTRACT

The main aim for this study is to develop a shoe polish made of inflammable, natural based and non-toxic substances. Shoe polish is a waxy paste, cream, or liquid used to polish, shine, waterproof, and restore the appearance of leather shoes and boot. Modern shoe polish production employed a mixture of natural and synthetic materials that include wax; often used is carnauba wax, lanolin, naphtha, ethylene glycol, turpentine, oil soluble dyes, and gum Arabic. Petroleum based shoe wax and turpentine derived from plant are inflammable and should be disposed as hazardous waste. Grease and fat substances from animal derived such as lanolin and tallow, have been used as starting materials for shoe polish hundreds of years ago, and still in practiced. Beeswax is a natural wax produced by the bee which secretes it in liquid form through its special wax glands and used as a structural material in honeycombs that has useful applications such as candles, cosmetics, food industry, and in medicine manufacturing. We utilize the beeswax produced locally, from Malaysia. It is worth emphasizing that beeswax is considered a GRAS substance (generally recognized as safe) by the U.S. Food and Drug Administration. It is safe to conclude that this shoe polish formulation gives good result in chemical and physical stability. Thus, an addition of non-synthetic wax which is beeswax; and Tinospora Cordifolia (Bakawali) as antioxidant preservative in this non-toxic shoe polish formulation is highly suggested to be feasible, cost effective and safe to human especially in hotel industry.

Keywords: Shoe Polish; Beeswax; Tinospora Cordiofolia

1. INTRODUCTION

1.1 Definition of Term

The term ‘shoe polish’ will be understood as a waxy paste, cream, or liquid used domestically to polish, shine, waterproof, and restore the appearance of leather shoes/boots, thereby protecting the footwears against abrasion. Various types of parabens are the most common preservatives for shoe polish which is to prevent decay during storage and to prevent the buildup of moulds or funguses.

1.2 Problem Statement

Usually, the shoe polish produced is flammable, toxic and if mis used, it could stain skin. Petroleum based shoe wax and turpentine derived from plant are inflammable and should be disposed as hazardous waste. Products which are used and touch the human skin directly such as shoe polish, must be safe for use and be non-toxic in any respect.

1.3 Objective

To formulate safe formulation by using beeswax and natural non-paraben preservative.

1.4 Hypothesis

Natural wax derived from beeswax are safe to replace the traditional, synthetic, flammable, and toxic combination of waxy colloidal emulsion; a substance composed of a homogenizing liquids and solids together in the shoe polish formulation.

1.5 Past Research

A non-caking, hardened cream in form of shoe polish composition comprising in addition to a traditional base mixture of paraffin wax and turpentine oil, refined petroleum jelly, silicone oil, and optionally, camphor oil, silicone powder, and color ink. The composition may be usefully soaked into a shoe polish cloth consisting of a section of fabric material adapted for easy and non-messy application of the composition onto leather or imitation leather materials.

1.6 Project Background

Shoe polish usually made from ingredients including some or all of naphtha, lanolin, turpentine, wax (often carnauba wax), gum Arabic, and ethylene glycol. The polish should be resistant to abrasion, smooth, transparent, uniform in colour, be adhesive and thin. (2)

Most polishes depend on wax or oil for their polishing properties. Beeswax is produced when the bee which secretes it in liquid form through their special wax glands. When it encounters air, it solidifies into scales, which allows the formation of the honeycomb structure. Beeswax is considered a GRAS substance (generally recognized as safe) by the U.S. Food and Drug Administration. It is used for making candles, modelling, cosmetics, food industry and pharmaceutical too. The antimicrobial activity of beeswax and its effectiveness against bacteria as well as fungi has been documented in a scientific journal. (1) (3)

2. METHODS

The aim of this study was (a) to develop a laboratory method for applying beeswax to shoe polish, (b) to utilize the antimicrobial activity of Tinospora Cordifolia (Bakawali) as antioxidant preservative in shoe polish (c) to analyze the properties (chemical and physical) of the formulated shoe polish. The formulation of the shoe polish is carried out by mixing both the oil phase and the water phase at controlled temperature in the homogenizer to produce a smooth waxy cream. The formulated shoe polish is then being evaluated to test both chemical and physical properties as to conform its suitability for human skin.

2.1 Experimental

2.1.1 Formulation of shoe wax

i) Materials

Table 1. Chemicals, reagents, and apparatus.

Ingredient	Gram
(A)	
Oil	40.00
Stearic acid	5.25
Palmitic acid	1.75
Beeswax	24.0

Tween 80	7.13
Tween 20	2.37
(B)	
Distilled water	23.00
Vegetable glycerin	5.75
Maltodextrin	0.85
Paraben free preservative	0.85
Xanthangum	1.0
Tinospora Cordifolia (Bakawali)	0.5

Beeswax and the *Tinospora Cordifolia (Bakawali)* is collected from Department of Bioprocess Technology, Faculty of Biotechnology and Biomolecular Sciences, Universti Putra Malaysia. All other reagent/chemical used as analytical grade.

The shoe polish mainly consists of a combination of oils, solvent, and a beeswax. Problem to be solved by this innovation is to provide the shoe polish based on natural and non-toxic material, therefore is essential to understand the usage of each substance. The formulation of the shoe polish material is formed by preparing oil phase which is a combination of plant oils together with a long chain fatty acid of natural derived stearic acid and palmitic acid; surfactant and emulsifier of Tween 80 and Tween 20 and an amount of beeswax. Preparation of water phase contains of distilled water, vegetable glycerin as binder; Maltodextrin as thickener, Xanthan gum as thickener and stabilizer in the formulation; also, a paraben free preservative and the extract of *Tinospora Cordifolia (Bakawali)* as antioxidant preservative is further added.

Procedure of shoe polish

All the ingredients for the preparation of oil phase(A) were mixed in a beaker and heated at 70°C to dissolve all the substances. Then the ingredients for the preparation of water phase (B) were mixed in another empty beaker and heated at the same temperature like the oil phase. Both oil and water phase were mixed by pouring the water phase from the beaker into the beaker containing oil phase. The mixture was then mixed by using IKAUltra-TurraxT-25 Digital Homogenizer (Daigger Scientific Inc, Vernon Hills, Illinois) at 8000 rpm for 5 minutes to complete the process.

2.1.2 Analysis of the formulated shoe wax

a) Organoleptic test

b) pH test

3. RESULTS AND DISCUSSION

3.1. Result

Sample	pH of formulated shoe wax
Tinospora cordifolia	6.54

Evaluation of the formulated shoe polish

Examination of dosage stability was conducted at room temperature for organoleptic and pH test.

a) Organoleptic test

Observation is made in terms of shape, color and smell of the waxy cream produced. There is no significant change to shape, color and smell of the waxy cream dosage before and after the stability test.

b) pH test

This is a chemical test using pH meter and aims to analyze whether the waxy cream has the appropriate pH value and suitable to skin and it is conformed to skin pH value which is 4.5 -7.0.

3.2 Discussion

The chosen *Tinospora Cordifolia (Bakawali)* as antimicrobial agent and local beeswax compared to other bioactive product is due to promoting home, natural products of Malaysia. Meanwhile, the humectants or moisturizers chose is vegetable-based glycerin. Free paraben is used as preservative to give products a longer shelf life . Naturally the solvent must be non -toxic; distilled water is preferred which is free from trace elements, salts and microorganisms. It is found that from the result that the shoe polish formulation is good in chemical stability which conform to skin 's pH value and also physical stability such as appearance.

4. CONCLUSION

Shoe polish is used directly with human skin; therefore, its composition is prepared according to delicateness of skin and against irritation. This formulation is highly suggested to be feasible and safe to human with no side effects. Thus, a new addition of natural substance which is *Tinospora Cordifolia (Bakawali)* and local beeswax in non-toxic shoe polish is found to provide safe, easier application and economically feasible especially for school student living independently in boarding school.

4.1 Suggestion

However, further study must be carried out on the quantity optimization of the beeswax in the formulation as the need to produce the desired and cost effective of the shoe polish to be marketable.

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NONTOXIC BODY PAINT FOR SAFE APPLICATION IN CULTURAL & TOURISM SECTOR

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ABSTRACT

The aim for the preparation of non-synthetic colourant face paint for cultural and tourism sector is to develop washable and non-toxic paint for applying colours to human skin. It must be safe, washable, removable, non-staining to clothing and desirable with bright and exciting colours. Traditionally, coloured paint pigment is mainly based on acrylic paints with synthetic polymeric pigments that has strong adhesive power which led to complex cleaning process and irritant to human body skin. The utilization of algae as a source of natural colours is a result of growing knowledge of the negative effects of synthetic dyes. Algae contain a wide range of photosynthetic pigments such as chlorophyll, carotenoids, and phycobili-proteins, which exhibit colours ranging from green, blue, yellow, brown, and red. It has beneficial biological activities such as antioxidant, anti-microbial and most importantly the extracts are classified as non-toxic and approved as GRAS (Generally Recognized as Safe) by the Food and Drug (FDA) of United States of America. The formulation of body paint requires homogenizing of the oil phase which is formed by combining plant-based oils together with the water phase. The water phase comprises a mixture of distilled water, vegetable glycerin, Xanthan gum, a paraben free preservative and algae colourant. This body paint formulation resulted well in chemical stability which conforms to skin's pH value and physical stability such as appearance. It is suggested feasible for mass production and consumption within cultural and tourism sector by using local and natural sources.

Keywords: Face Paint; Algae; GRAS

1. INTRODUCTION

1.1 Definition of Term

The term "face paint" or "face painting" will be understood to be specifically for the use of a colourant applied to human skin. Most face paints, contain a preservative to prevent decay during storage, and to prevent the buildup of moulds or funguses. Various types of parabens are the most common preservatives for body paint.

1.2 Problem Statement

Usually, face paint produced is from synthetic colour pigment made of substances such as arsenic, cadmium, mercury, and lead. These can be toxic in large amounts and frequent uses. Other natural ingredients sometimes in cosmetics like rubber (latex) in face and body paints, cobalt, and nickel, have caused people to develop sensitivities. Products which are utilized as body paint or the like must, of course, be safe for use and be non-toxic in any respect.

1.3 Objective

To formulate safe formulation by using algae and natural non-paraben preservative.

1.4 Hypothesis

Natural colour pigment derived from plants are safe to replace the synthetic substances in coloured pigments of face paint.

1.5 Past Research

A washable non-toxic body paint material in solid form but need a moistened applicator activates the dry cake for use in body painting or other activities. This study worked on body paint which is formed using two different weight polyethylene glycol waxes together with stearic acid, calcium carbonate, talc, titanium dioxide, guar gum, a preservative, and a colourant. The material is formed by initially mixing dry granular form ingredients at room temperature. Once mixed, the material is subjected to a melt at approximately one hundred fifty degrees centigrade to form a paste which is poured within a mold to cool forming a dry cake.

1.6 Project Background

Design criteria includes comfort in application and wearing, durability over time, appearance, resistance to perspiration, ease of application and removal too. The face paint is nearly odorless, and it will not cause any health hazards such as skin irritation or due to possible ingestion of material. Logistic concerns such as capability of being used and stored in all climatic conditions without degrading, expendable item with no environmental hazard due to the disposal.

Most microalgae species are approved by the U.S. Food and Drug Administration (FDA) as GRAS (Generally Recognized as Safe) (1). Algae pigments are being used numerously as materials for industrial applications such as textile dyes, cosmetics, and pharmaceutical products (2).

2. METHODS

In this innovation, we provide a natural, non-toxic, body paint that is washable. The experimental step starts with the extraction of algae to provide the desired coloured pigments. The formulation of the face paint is then carried out by adding the derived coloured pigments from the respective species of algae. The body paint is odorless and contains algae pigments to give the paint a variety of colors and visual effects. The formulated face paint is then evaluated to test both chemical and physical properties as to conform its suitability for human skin.

The diagram below is an explanation in graphic of the sequence of the experiment works.

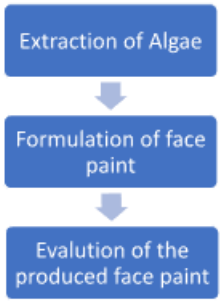

Diagram 1: Sequence of experiment works.

2.1 Experimental

2.1.1 Extraction of algal pigments

i. Materials

Chemicals, reagents, and apparatus

Chlorella vulgaris, Spirulina and Haematococcus are the only species of microalgae being studied for this project, were collected from Department of Bioprocess Technology, Faculty of Biotechnology and Biomolecular Sciences, Universti Putra Malaysia. All other reagent/chemical used as analytical grade.

ii. Method of extraction

SOXHLET EXTRACTION

The dried macroalgae powders were loaded into a separate thimble and treated for 5 cycles with three different solvents, namely acetone, methanol, and chloroform, at their boiling points. The extracted solvents were separated using a rotary evaporator.

2.1.2 Formulation of face paint

Ingredient	**Gram (g)**
(A)	
Oil (sunflower seed oil: coconut oil: medium triglycerides (4:3:3)	40.00
Stearic acid	5.25
Palmitic acid	1.75
Beewax	1.0
Tween 80	7.13
Tween 20	2.37
(B)	
Distilled water	35.00
Vegetable glycerin	5.00
Kojic acid	1.00
Maltodextrin	0.50
Paraben free preservative	0.50
Xanthan gum	3.0
Persicaria odorata (daun kesom)	0.5
Algae	2.0

Procedure for cream (face paint) development

For the face paint formulation, all the ingredients for the preparation of oil phase (A) were mixed in a beaker and heated at 70ºC to dissolve all the substances. Then the ingredients for the preparation of water phase (B) were mixed in another empty beaker and heated at same temperature as the oil phase. Both oil phase and water phase were mixed by pouring the water phase from the beaker into the beaker containing oil phase. The mixture was then mixed by using an IKA Ultra-Turrax T-25 Digital Homogenizer (Daigger Scientific Inc, Vernon Hills, Illinois) at 8000 rpm for 5 minutes to complete the process.

2.1.3 Analysis of the formulated face paint

a. Organoleptic test

Observation is made in terms of shape, colour, and smell of the cream.

b. pH test

Using the digital pH meter, the gel sample should be at skin's pH which is 4.5-6.5. All materials and methods that have been used in the work must be stated clearly and subtitles should be used when necessary.

3. RESULTS AND DISCUSSION

3.1. Result

Evaluation of the formulated face paint with algae pigment colourants as below:

Replication	pH cream
Sampel-1	5.39
Sampel-2	5.10
Sampel-3	5.09

1. Organoleptic test

Observation is made in terms of shape, color and smell of the paint produced at different concentration of algae extract. There is no significant change to shape, colour, and smell of the paint dosage before and after the stability test.

2. pH test

This is a chemical test and aims to analyze whether the paint has the appropriate pH value and suitable to skin. Decreasing pH value of face paint dosage on following days due to oxidation and hydrolysis but it is still conformed to skin pH value which is 4.5-6.5.

3.2 Discussion

The chosen algae extract as antimicrobial agent compared to other bioactive product is due to cheap cultivation of the algae as they do not require big space of land. Meanwhile, the humectants or moisturizers chose is glycerin; vegetable-based glycerin. Free paraben is used as preservative to give products a longer shelf life that can prevent the growth of mould and other harmful bacteria. Naturally the solvent must be non-alcoholic, as a practical matter, distilled water is preferred which is free from trace elements, salts, and microorganisms. It is determined that from the result that the paint formulation is good in chemical stability which conform to skin's pH value and physical stability such as appearance.

4. CONCLUSION

Face paint composition is prepared according to delicateness of skin and against irritation. Previous research done extensively has proved that algae have antimicrobial activity and wound healing effect, thus the extracts can be incorporated in face paint formulation with no side effects. A new addition of natural substance which is algae extracts as coloured pigments and *Persicaria odorata (daun kesom)* as preservative in non-toxic face paint is found to provide safe and cost effective for various industry.

4.1 Suggestion

However, further study must be carried out on the quantity optimization of the microalgae coloured pigments in the face paint as the need to produce the desired concentration of the colours.

ACKNOWLEDGEMENT

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INNOVATION OF MOTORCYCLE ANTI-THEFT DEVICE USING EMBEDDED SYSTEMS AND INTERNET OF THINGS (IoT) TECHNOLOGY

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ABSTRACT

Motorcycle theft cases in Malaysia is very significant increase with many cases reported every day. In most cases, motorcycle thieves will remove only the necessary motorcycle components while discarding the unnecessary parts. Therefore, a motorcycle anti-theft device (MATD) was innovated with the aim of preventing and reducing motorcycle theft cases. MATD was built by using the embedded system and internet of things (IoT) technology. It was driven by a microcontroller chip and other modules. MATD is equipped with the main function to turning ON and OFF the motorcycle engine using wi-fi. While the other functions are tracking and sending location, sending notification notices, and taking static photos. These functions are received by using the Telegram application on a smartphone. MATD is built using ESP32, NEO-6M, 4G LTE modem and ESP32 CAM modules. All these modules are integrated by using an Arduino IDE as a programming language. Basically, MATD will work when the user realizes his motorcycle is stolen. By using a smartphone, the motorcycle engine will be turned OFF immediately. At the same time, the user will receive a notification along with the latitude and longitude of the motorcycle's location. The location of the motorcycle can be tracked using the Google Maps application. The camera will record the face of the thief and deliver the image to the smartphone using the Telegram application.

Keyword: Motorcycle Theft; Motorcycle Anti-Theft Device; Embedded System; Internet of Things.

1. INTRODUCTION

In today's era of computing technology, embedded system technology is very popular in helping humans do tasks intelligently and automatically. Embedded systems are part of the "Internet of Things" (IoT) which combines electronic technology, semiconductor components and computing. This system consists of four parts namely processor, memory, input-output, and software. Devices produced through this technology can be used in various fields such as manufacturing, transportation, surveillance, and others.

1.1 Problem Statement

As many motorcycle manufacturing companies introduce fast and attractive models, motorcycle theft cases show an increase. Most motorcycle thieves will remove essential components and sell them on the black market. The price of motorcycle spare parts on the black market is cheaper than the price at a workshop or service centre. Therefore, a motorcycle anti-theft device or MATD was innovated with the aim of preventing and reducing motorcycle theft cases.

1.2 MATD Structure

MATD is built using embedded system technology and IoT driven by a microcontroller chip and several other modules. MATD operations are programmed using the Arduino IDE programming language because it is easy to maintain and modify. MATD is equipped with the main function of turning ON/OFF the motorcycle engine using wireless-fidelity or wi-fi. While other functions are tracking and sending location, sending notification notices, and taking static photos. These three functions are received by using the Telegram application on a smartphone. MATD is built using ESP32 module as microcontroller unit (MCU), NEO-6M module for global positioning system (GPS), 4G LTE module for wi-fi modem and ESP32 Cam module to take static photos.

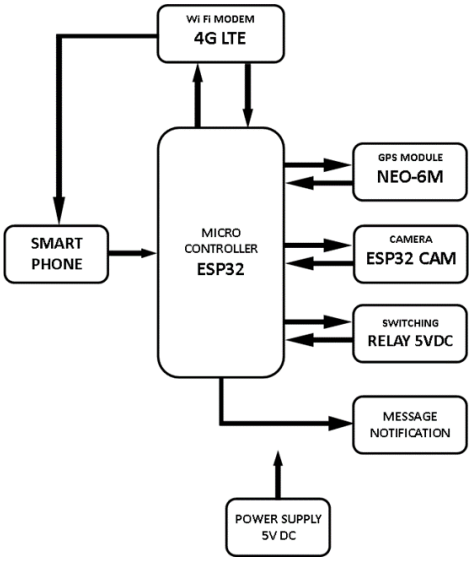

Figure 1. Motorcycle Anti-Theft Device (MATD) block diagram.

1.3 MATD Operational

Basically, MATD will work when the user realizes his motorcycle is stolen. By using a smartphone, the motorcycle engine will be turned OFF immediately. At the same time, the user will receive a notification along with the latitude and longitude of the motorcycle's location. The location of the motorcycle can be tracked using the Google Maps application. The camera will record the face of the thief and deliver the image to the smartphone using the Telegram application. All the actions implemented by this device will prevent the thief from fleeing the motorcycle and in addition to the recorded facial image can help the authorities catch the criminal. The motorcycle engine can be turn ON again by sending a command, also via smartphone.

1.4 Wiring and Installation

MATD installation on motorcycles is on the main ignition switch line. This ignition switch main line is cut and connected to the 5VDC relay. The relay will work as a switch to turn the motorcycle engine ON or OFF when receiving commands via the smartphone. The MATD and relay receive a 5VDC power supply from a power bank.

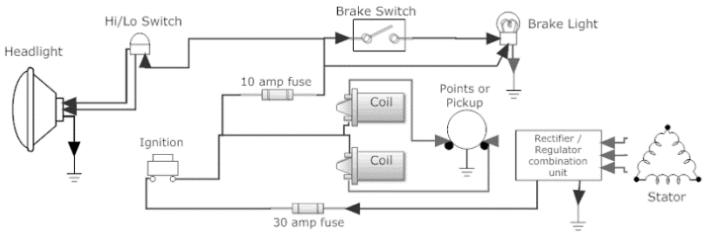

Figure 2: Basic circuit of motorcycle ignition switch wiring.
Source from: https://m.roadkillcustoms.com

2. METHODS

According to Kamus Dewan (2010), methodology means a system that includes methods and principles used in an activity, discipline and so on. Therefore, this chapter will explain how the project implementation and development process is carried out. It covers flow charts, Gantt charts, construction phases of the project model and programming, testing sessions and test-runs as well as construction cost estimates.

2.1 Design Process Model

Process design is an approach to breaking down a large project into manageable chunks. Architects, engineers, scientists, and designers use the design process to solve a variety of problems. In carrying out project development work, "The Design Process" module was used. This model contains six steps for designing work in solving a project or problem. Referring to the "Chicago Architect Centre" (2019), the six steps are:

2.1.1 Define the Problem.

Have a clear idea of the problem to be solved so that the solution can be determined easily.

2.1.2 Collect Information.

Collect sketches, take pictures, and collect data to start providing initial inspiration.

2.1.3 Brainstorm and Analysed Ideas.

Start sketching, creating, and learning to understand how all the data and information gathered can affect the design that will be produced.

2.1.4 Develop Solutions.

Take initial ideas and plan various solutions and produce small-scale designs.

2.1.5 Gather Feedback.

Present the idea to as many people as possible such as friends, teachers, professionals, etc. to provide insightful comments.

2.1.6 Improve.

Think about all the feedback received and decide if it can be used to improve the design to solve the problem.

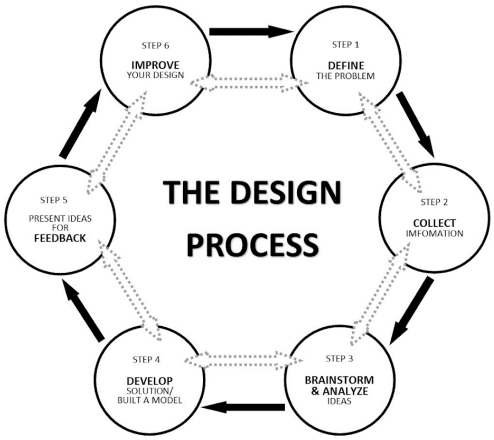

Figure 3: Sequence of the design process

2.2 Flowchart

According to Gilbreth & Gilbreth (1921), a flow chart is a type of diagram that represents the flow or work process. A flowchart can also be defined as a diagrammatic representation of an algorithm in which a step-by-step approach is used to complete a task. The steps of each work on the flow chart are shown through various box diagrams and the work instructions are shown by connecting each box with arrows. Briefly, the flow chart for building MATD products is divided into two processes, namely the process of building a MATD prototype and the process of developing a programming code for a microcontroller chip.

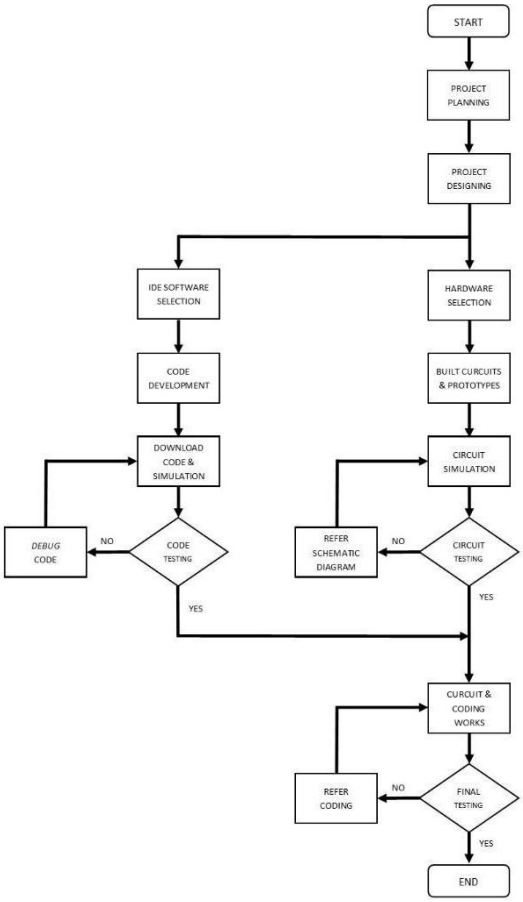

Figure 4: The flow chart of the MATD project.

3. RESULTS AND DISCUSSION

3.1. Product Testing Process

MATD products have undergone two types of tests, namely laboratory tests and test runs. Laboratory tests are performed throughout the development and construction process of MATD. This test is conducted to identify problems such as IoT module installation, circuit wiring and coding. For the test run, the MATD was installed on the motorcycle and its operational capabilities were directly tested. Among the operational abilities tested are ON and OFF the motorcycle engine, sending notification notices and location and capturing still images. Wi-fi and internet network capabilities are also tested.

3.2 Test Result

The test results obtained are very encouraging. During the laboratory tests, all the problems encountered were solved successfully. The most common problems encountered are coding and internet wi-fi capabilities. Meanwhile, the results of the test run show that all the features set on MATD work perfectly.

3.3 Discussion

Among the advantages of MATD is being able to turn ON/OFF the motorcycle engine at a long distance, capture still images clearly and send the latest longitude and latitude of the motorcycle's location. However, this MATD product also has a weakness, which is that all its functions depend on the internet network. In the future, this MATD product can be improved in terms of the use of IoT technology, sizing, coding, and waterproof casing. Additional features can also be included, such as sending photos directly to the authorities.

4. CONCLUSION

After going through a series of testing processes, it can be concluded that this MATD innovation project has been successfully implemented. All the set criteria have been successfully proven through the display shown on the screen of a smartphone or tablet. Therefore, to ensure that this product achieves its objective, it needs to undergo a trial process by authorities such as PDRM, JPJ and Puspakom.

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MARIAN NUTRI-POT

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ABSTRACT

Recovering economically from the Covid-19 pandemic while the world's population continues to grow is no easy feat. In addition, a lot of thought has gone into the production of food. Pollution reduction and going green are often on our minds. For this reason, food is produced in alternative, trustworthy, and Sustainable Development Goals SDG 12 ways that do not pollute the environment. The term of "Nutri-Pot" refers to a container filled with organic waste and fertilizers that are excellent for the environment and plants. All the nutrients that plants need for rapid growth are provided by this. In addition, in this way it is possible to reduce food waste, which is constantly increasing and is a major problem for everyone. The invention is so simple that it can be done by people of all ages including students. This invention can be a crucial tool to extend the life of natural resources and help many people around the world.

Keywords: Nutripot; Fertilizer; Agriculture

1. INTRODUCTION

The pandemic has significantly impacted global economies, with a projected 3.4% decline in GDP to 84.54 trillion US dollars in 2020. Food security has become a major concern, necessitating measures to accelerate organic crop growth. Fertilizers, often containing harmful chemicals, are being replaced with natural alternatives, reducing greenhouse gas emissions, and contributing to climate change.

This Marian Nutri-pot innovation includes 4 important components. The first component is Marian Organic Compost Fertilizer (Marian OrCof), Planting media, water based organic fertilizer (Marian OrF) and Marian Organic Pesticides (Marian OrPest). All these components are produced using hundred percent recycled and natural materials.

1.1. Objective

1. The goal of this project is to encourage students to engage in urban agriculture to maintain a healthier lifestyle.
2. Next, it is to encourage children to reuse waste and food scraps to make plant pots, organic fertilizer, and organic pesticides to reduce pollution. In the long run, teaching children to protect Mother Nature at a young age can be beneficial.

1.2 Technological Innovation

This discovery allows the production plants that are fresh and free of chemicals. The effect of this discovery are less pollution and good health quality for people.

This discovery can also facilitate the planting process, as it is self-watering and the materials to produce Marian Nutri-pot are easy and cheap to obtain.

Food waste, a byproduct of food decomposition, contains nutrients, carbohydrates, cellulose, protein fats, and inorganic salts, making it an ideal source of organic material and nutrient components for recycling.

1.3 Problem Statement

The issue of environmental pollution is one that newspapers mainly report on these days, and it is becoming more and more serious lately. There are many reasons or causes for this matter, among which are uncontrolled development and high population growth, especially in the cities, consuming more and more resources for life.

2. METHODS

The Marian Nutri-pot is a reusable pot made from recycled materials like plastic bottles and used jeans. It consists of three parts: the upper part for planting material, the lower part for fertilizer, and a self-watering part made from leftover jeans. The jeans absorb fertilizer water from the upper part, and a side channel at the bottom allows for easy watering without lifting the pot's top. This innovative design allows for efficient and sustainable fertilizer use.

This Marian Nutripot innovation includes 4 important components. The first component is Marian OrCof, Planting media, water based organic fertilizer and Marian Organic Pesticides. All these components are produced using one hundred percent recycled and natural materials.

Marian OrCof is an organic compost fertilizer made from soil, dry leaves, egg cartons, shredded wastepaper, and waste food. The ingredients are arranged in a specific order which is soil, dry leaves, egg cartons, shredded wastepaper and waste food and left to break down over time to produce organic compost fertilizer. The process ensures the nutrients are properly absorbed and utilized.

The second component is the Planting Media which consists of a mixture of Marian OrCof, coco peat and shredded paper. The measurements for producing planting media are 2 scoops(100gm) of Marian OrCof, 2 bowls of coco peat(200g) and 1 bowl of shredded paper(20g).

The third component of Marian Nutri-pot is water based organic fertilizer also known as Marian OrF. The production of water based organic fertilizer is a mixture of ingredients such as rice milk, stale rice, coffee ground, grass & eggs shell, and Aloe Vera.What is inside Marian OrCoF and OrF. Let’s see the measurement and nutrients consisted of:

The fourth component in Marian Nutri-pot is Marian Organic Pesticide. Marian Organic Pesticide is made by mixing garlic(100g), chili(50g), lemon grass(50g) Aloevera(100g). All these ingredients are finely ground with 500ml of water.

Table 1. The nutrients Contain in Marian OrCof and Marian Nutri-Pot

Marian OrCoF		Marian OrF	
Item/Waste Materials	Nutrient	Waste Food	Nutrients
Soil	Nitrogen, Potassium, Phosphorus, Calcium	Rice milk	Fiber, calcium, potassium
Dry leaves	Carbon, Nitrogen	Stale Rice	Fiber, calcium, potassium, acid folate, pantothenic acid, vitamin E.
Shredded Paper	Carbon, moisten soil, weed control,	Egg and Grass	Calcium, sulfur, sodium, nitrogen, phosphorus
Egg cartons	Carbon, nitrogen	Coffee grounds	Iron, boron, zinc, calcium
Waste Food	Protein, fibre, minerals,	Aloe vera	Amino acid, antioxidants, iron, magnesium, calcium

Table 2. The Measurement of Marian OrF and Marian OrPest

Marian OrF Measurement EM4 = 300g brown sugar + 1500ml plain water.	200ml Marian OrPest Extract + 50ml EM4 water + 300ml Plain water

3. RESULTS AND DISCUSSION

At SK Marian Convent IPOH, we learned how to reuse waste products for 18 months to promote healthy plant growth. Our innovative approach resulted in germinating seeds and fresher growth with organic fertilizer made from food waste and waste products.

3.1.

Table 1 shows The Growth of Mustard vegetable by height and Number of Leaves

Type of Water-based Fertilizer	**The Growth of Mustard Vegetable (Sawi) height / number of Leaves by days**							
	8 th Day		16 th Day		24 th Day		32 th Day	
Rice Milk	6cm	2 leaves	8cm	4 leaves	11cm	6 leaves	16cm	10 leaves
Stale Rice	5cm	2 leaves	8.5cm	4 leaves	12.5cm	6 leaves	15.5cm	10 leaves
Coffee Ground	6cm	2 leaves	7cm	4 leaves	11.5cm	6 leaves	16.5cm	10 leaves
Egg and Grass	5.5cm	2 leaves	8cm	4 leaves	12cm	6 leaves	15cm	10 leaves
Aloevera	5cm	2 leaves	6cm	4 leaves	12cm	6 leaves	15cm	10 leaves
5 in 1	6cm	2 leaves	6cm	4 leaves	14cm	6 leaves	15.5cm	10 leaves

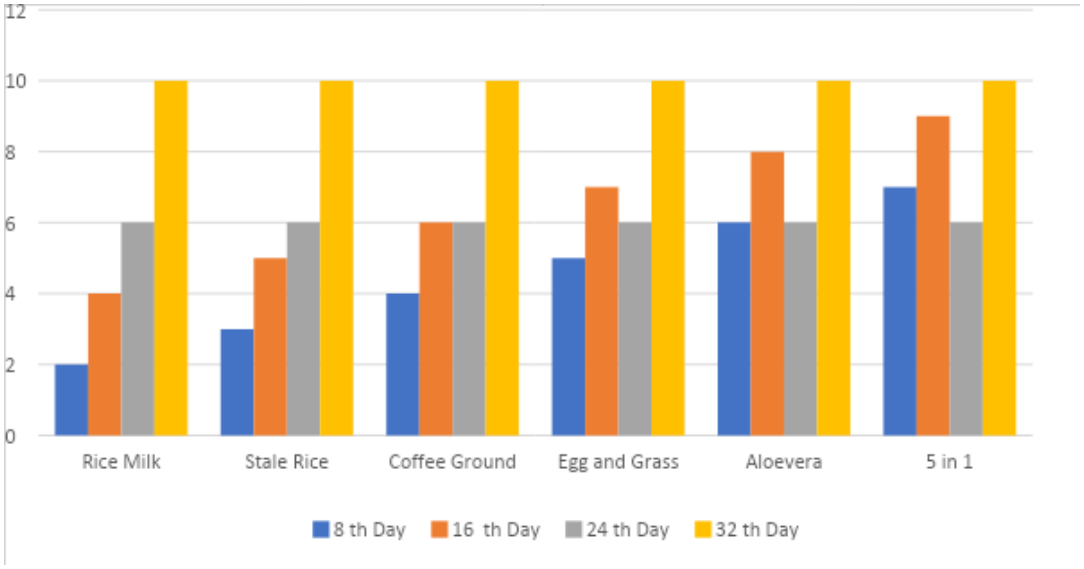

Figure 1: The growth of Mustard Vegetable by Height

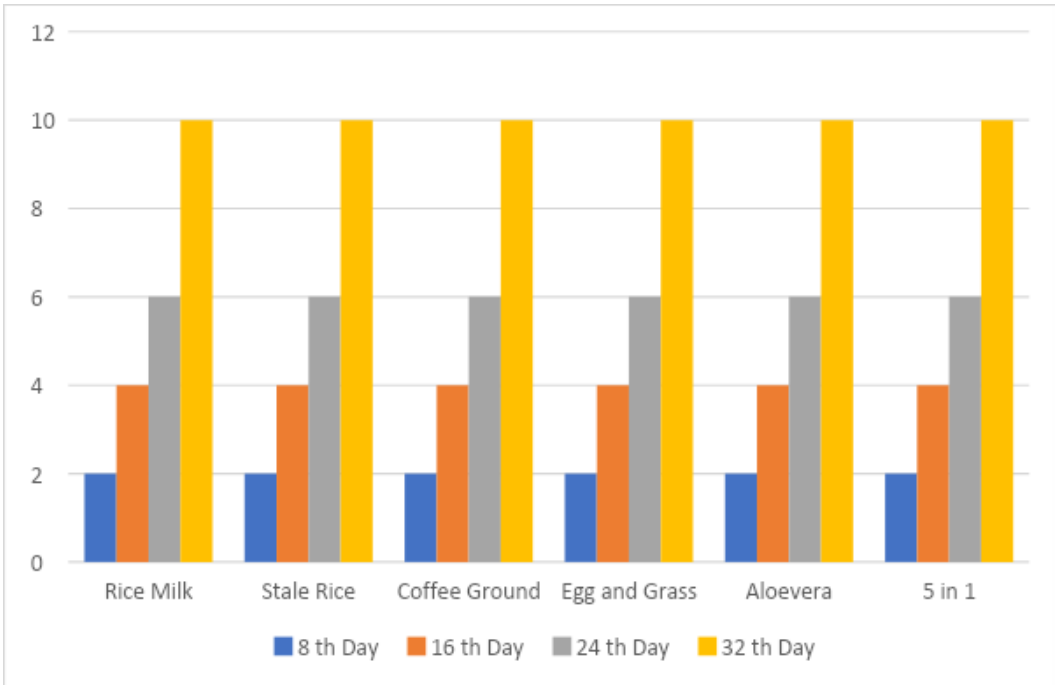

Figure 2: The growth of Mustard Vegetable by Number of Leave

4. CONCLUSION

The conclusion of this project is that it has taught us that waste can be quite useful in our daily lives. Most of the resources we used for our project were reused, and it worked out wonderfully. We should all reuse and recycle discarded materials or products for a variety of reasons, including protecting the environment and saving money. Recycling also helps reduce air pollution. Recycling impacts the future because it protects the environment. Recycling helps keep non-biodegradable materials, such as certain plastics that take up to 1000 years to decompose, out of landfills. This project has generally been a great success. Ultimately,

everyone should be aware that Marian Nutri-pot is based on the concept of urban agriculture to ensure a healthy life while protecting our environment from pollution.

ACKNOWLEDGEMENT

We would like to express my profound gratitude to our IHEIID **2023 Competition Committee**, and Mrs. Hindon Binti Wahid (**Head Mistress of SK MARIAN CONVENT IPOH)** for their contributions to the completion of our project titled **MARIAN NUTRI-POT**.
We would like to express our special thanks to our mentor Mrs. S. Rajeswary for her time and efforts she provided throughout the year. Your useful advice and suggestions were helpful to us during the project's completion. In this aspect, we were eternally grateful to you.
I would like to acknowledge that this project was completed entirely by our team and not by someone else.

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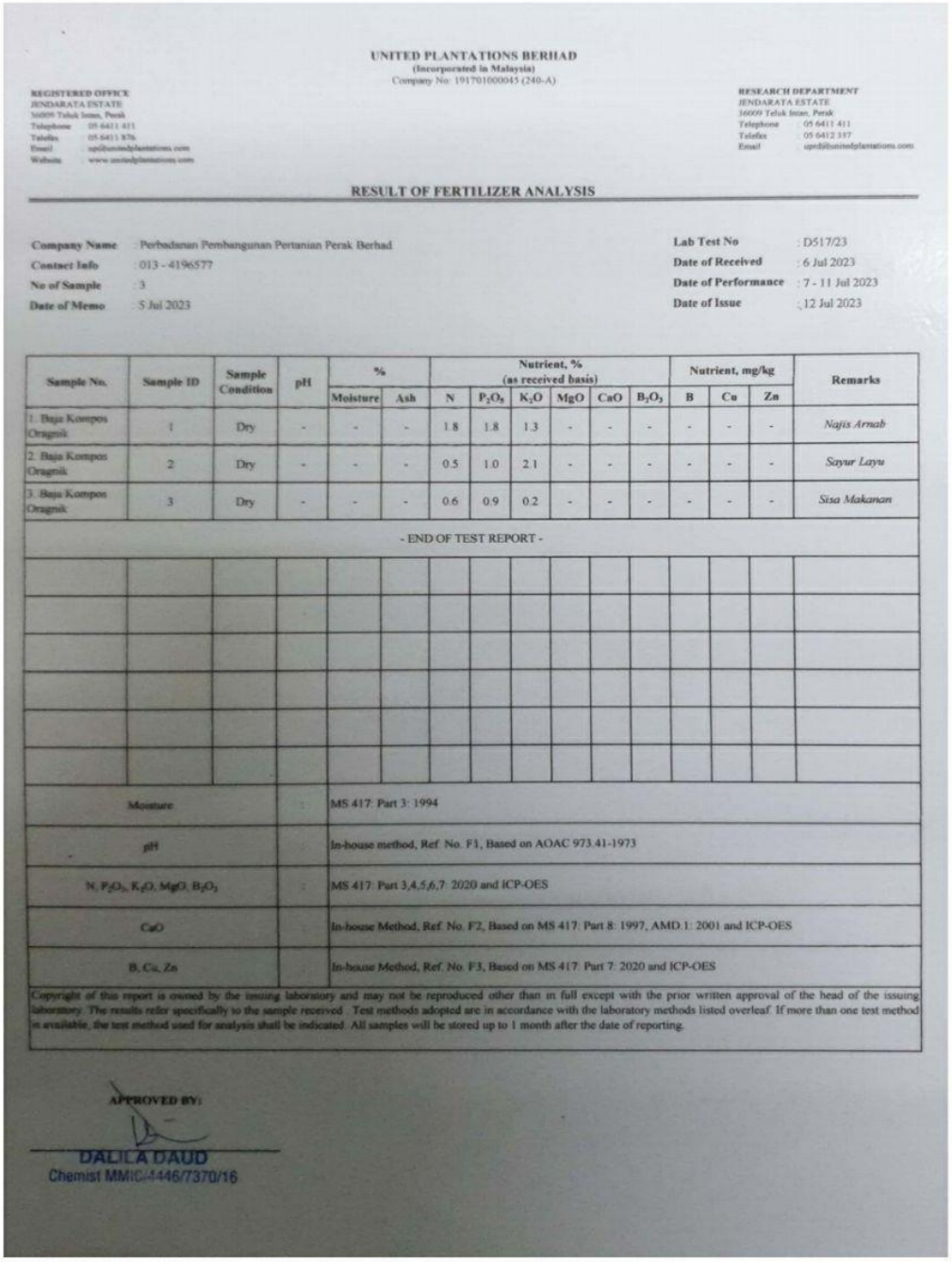

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RESULT OF FERTILIZER ANALYSIS

Company Name : Perbadanan Pembangunan Pertanian Perak Berhad
Contact Info : 013 - 4196577
No of Sample : 3
Date of Memo : 5 Jul 2023

Lab Test No : D517/23
Date of Received : 6 Jul 2023
Date of Performance : 7 - 11 Jul 2023
Date of Issue : 12 Jul 2023

Sample No.	Sample ID	Sample Condition	pH	%		Nutrient, % (as received basis)						Nutrient, mg/kg			Remarks
				Moisture	Ash	N	P_2O_5	K_2O	MgO	CaO	B_2O_3	B	Cu	Zn	
1. Baja Kompos Oragnik	1	Dry	-	-	-	1.8	1.8	1.3	-	-	-	-	-	-	*Najis Arnab*
2. Baja Kompos Oragnik	2	Dry	-	-	-	0.5	1.0	2.1	-	-	-	-	-	-	*Sayur Layu*
3. Baja Kompos Oragnik	3	Dry	-	-	-	0.6	0.9	0.2	-	-	-	-	-	-	*Sisa Makanan*
- END OF TEST REPORT -															

Moisture	:	MS 417: Part 3: 1994
pH	:	In-house method, Ref. No. F1, Based on AOAC 973.41-1973
N, P_2O_5, K_2O, MgO, B_2O_3	:	MS 417: Part 3,4,5,6,7: 2020 and ICP-OES
CaO	:	In-house Method, Ref. No. F2, Based on MS 417: Part 8: 1997, AMD.1: 2001 and ICP-OES
B, Cu, Zn	:	In-house Method, Ref. No. F3, Based on MS 417: Part 7: 2020 and ICP-OES

APPROVED BY:

DALILA DAUD
Chemist MMIC/1446/7370/16

Marian Or CoF Test Report

MY e -VOYAGE

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ABSTRACT

Tourism involves individuals visiting and staying in locations away from their usual residence for recreational or other purposes. It encompasses a wide range of activities, such as visiting popular tourist attractions, experiencing local cultures, engaging in outdoor pursuits, and staying in accommodations like hotels, resorts, and rental homes. To support the tourism industry, MY e-Voyage has been developed to leverage digital technologies and telecommunications. "MY" functions as a determiner describing ownership, while "e" refers to the use of information and communications technology in tourism-related fields. "Voyage" implies a purposeful and significant journey. The concept of "digital tourism" involves employing various digital tools and platforms, including mobile devices, to enhance the overall tourism experience for tourists and the industry itself. To collect data for the development of the MY e-Voyage application, a questionnaire was distributed to teachers at Sekolah Kebangsaan Paya Kemunting, Kedah Darulaman, PIBG heirs, and Kubang Pasu district education officials. The questionnaire served as a primary research tool to gather data from the target audience. The MY e-Voyage application enables communication between tourism management and tourists without requiring face-to-face interaction. By incorporating applications in the tourism field, the quality of tourism management can be systematically improved. The development of the MY e-Voyage application aligns with the Tourism Malaysia Marketing Plan 2022-2026, which considers the country's brand policy, market and travel trends, available resources, budget, network, trade and economic policies, travel formalities, technology expertise, manpower skills, and support from stakeholders, both domestically and internationally. By leveraging technology, the application aims to enhance tourism management and contribute to the overall success of the tourism industry.

Keywords: Tourism; My E-Voyage; Digital Technologies & Telecommunications; Application; Travel

1. INTRODUCTION

Tourism is a dynamic and evolving industry that has a profound impact on the global economy and the cultural exchange between people of different backgrounds. However, it also requires responsible practices to ensure the preservation of natural resources and the well-being of local communities. Tourism is the activity of people traveling to destinations outside their usual place of residence for leisure, recreation, or business purposes. It is a significant global industry that encompasses a wide range of experiences and services. Tourism in Malaysia is a significant

industry and plays a crucial role in the country's economy. Tourism in Malaysia emerged as vulnerable to regional and global events which act as a trigger for tourism crises, demanding a response in which various strategies are employed (Zahed, Ahmad & Henderson, 2012). Malaysia is known for its diverse culture, beautiful landscapes, vibrant cities, and rich history, making it a popular destination for travellers from around the world. There for, Malaysia is a multicultural country with a rich tapestry of different ethnicities, including Malays, Chinese, Indians, and indigenous groups. This diversity is reflected in its festivals, traditions, and cuisine. Visitors can experience various cultural festivals and explore places like Little India and Chinatown in major cities. Malaysia has consistently been a popular tourist destination, with millions of international visitors. In 2019, Malaysia recorded over 26 million tourist arrivals. Tourism has been a significant contributor to Malaysia's economy. In 2019, the country earned over USD 21 billion in tourism revenue. The top source markets for international tourists to Malaysia have traditionally included neighbouring countries such as Singapore, Indonesia, China, and Thailand. However, the country has been working to diversify its source markets by targeting long-haul markets in Europe and the Middle East.

However, tourism in digital applications has seen significant growth and innovation in recent years. The widespread adoption of smartphones has put powerful computing and communication tools in the hands of travellers. This has made it easier for tourists to access information, book services, and navigate unfamiliar destinations through mobile apps. The expansion of high-speed internet access, even in remote areas, has made it possible for tourists to use digital applications effectively during their travels. This connectivity allows for real-time updates, online booking, and access to information. By integrating these services into your "My e-Voyage" application, travellers can provide a comprehensive travel experience for your users, making it a valuable tool for planning and enjoying their journeys. Keep in mind that user experience and reliability are crucial factors in the success of a travel application. In the context of tourism, "e Voyage" could refer to a variety of digital or electronic initiatives, services, or tools designed to enhance the travel experience using technology. These might include mobile applications, websites, or digital platforms that offer features related to travel planning, booking, navigation, information, or any other aspect of the travel journey. Designing the "My e-Voyage" application involves several key steps to ensure a user-friendly and visually appealing travel app. For example, develop a responsive design to ensure the app works well on different devices and screen sizes, create a feedback system for users to report issues and make suggestions for improvements and allow users to download essential travel information, such as maps and guides, for offline use in areas with limited connectivity.

Integrating a diverse range of services in tourism application, not only improves the user experience but also presents significant business advantages. It can lead to increased user engagement, loyalty, and revenue generation while allowing your app to stay competitive and adaptable in the dynamic tourism industry. The tourism industry has embraced digital technology to meet the changing demands of modern travelers. It has not only improved efficiency and convenience but has also opened new avenues for marketing, data analysis, and sustainability. The ongoing integration of digital tools and technology is likely to continue shaping the future of travel and tourism.

2. METHODS

This study will use a quantitative approach through questionnaire instruments online and Multiple-choice questions to obtain information regarding the use of the My e Voyage application in tourism Digital applications and platforms have made travel planning and booking more accessible and convenient than ever before. Travelers can research, plan, and book their trips with just a few taps on their smartphones or clicks on their computers. A questionnaire was distributed to teachers at Sekolah Kebangsaan Paya Kemunting, Kedah Darulaman, PIBG heirs, and Kubang Pasu district education officials as part of the data collection process used to create the MY e-Voyage application. The use of the questionnaire method is deliberate as a primary research tool for researchers to gather data from a target audience. Questionnaires are a popular and effective method in research for collecting data from a sample of respondents.

2.1 Pre-Test the Questionnaire

Before administering the questionnaire to the target audience, conduct a pilot test with a small group to identify any issues with question clarity, flow, or length. It involves administering the questionnaire to a small group of participants to identify and address any issues with the questions, format, and overall survey design before conducting the actual survey. After participants have completed the questionnaire, conduct a follow-up discussion or interview to gather feedback. Ask open-ended questions about their experience, any difficulties they encountered, and their overall impression of the survey.

2.2 Multiple Choice Questions

Provide respondents with a list of options and ask them to choose one or more. These questions are designed for respondents to select one or more correct options from the list provided.

3. RESULTS AND DISCUSSION

3.1. Operating Model

Creating an operating model for the tourism industry involves defining the structure, processes, and systems that will ensure the efficient and effective operation of a tourism-related business or organization. Tourism industry is one the important contributor to Malaysia economy. Other than abundance of natural resources, Malaysia offers some of the incredible places for both local and international tourist. From beaches in Terengganu to tropical rainforest in Pahang, or even modern building like KL tower, these places promise different experiences which will not be lack of visitors. This can be proved with data provided by the Department of Statistics Malaysia (DOSM) where tourism industry contributed 15.9 percent of the Gross Domestic Product (GDP) and generated RM240.2 billion in Gross Value-Added Tourism Industries (GVATI) in 2019. In addition, the Ministry of Tourism, Arts and Culture (MOTAC) predicted an increase in tourist arrival to reach 9.2 million in 2022 since the past two years Malaysia has been tremendously challenged by the pandemic that has been affecting the world.

Extensive empirical research has been studies into the relationship between the tourism industry and economic growth. The outcomes of investigations indicate that there are differences between countries. According to previous studies, the importance that countries place on tourism is determined by factors such geopolitical locations, climates, historical

structures, travel regulations, and economic frameworks. Investments in the tourism industry also led to an increase in the number of tourists, and as a result, the foreign exchange helps the economic growth in the country (Gövdeli and Direkci, 2017).

The importance of the digital tourism economy is that it is one of the main entrances to the world of profit, so there are many websites for digital tourism on the Internet, which individuals visit in search of the tourist destinations they want to go to, and through these sites, individuals achieve a lot. financial benefits, income, and large returns, as well as real tourism investment projects in the field, this tourism website is considered an electronic tourism investment project as important for investors themselves, important for the economy, important for tourists themselves, and for the country in general (Pencarelli, 2020).

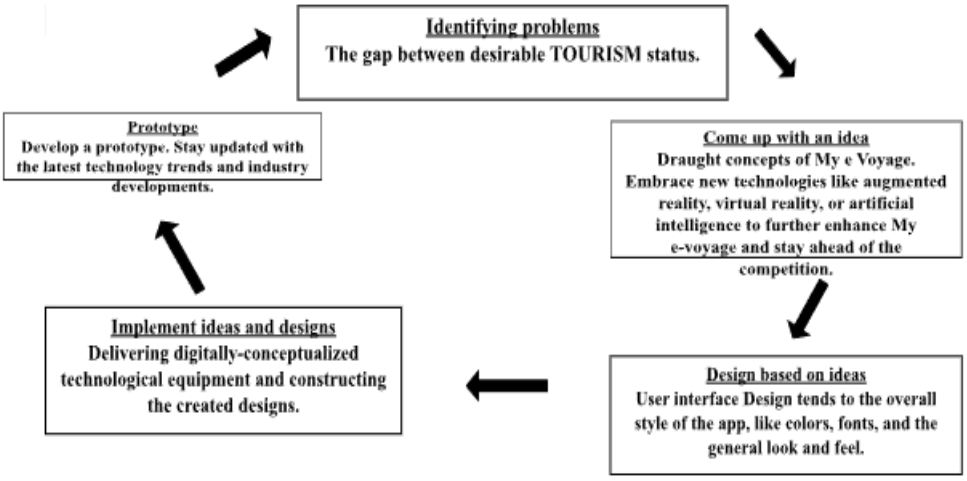

Figure 1. The flow chart above shows the My e Voyage application framework in the tourism industry.

Table 1. Details based on My e Voyage application usage.

Details	Frequency	Percentage %
Travel Planning and Booking	101	20.2
Navigation and Maps	177	35.4
Local Recommendations	92	18.4
Travel Itinerary Management	69	13.8
Augmented Reality (AR) Guides	65	13.0
Booking Updates and Alerts	28	5.6
Payment and Currency Conversion	68	13.8
Environmental Impact Information	40	8.0
Social Integration	7	1.4

Based on Table 1, 20.2% travelers use mobile apps and websites to plan their trips, search for accommodations, book flights, reserve rental cars, and purchase tickets for attractions. My "E-Voyage" application could provide an all-in-one platform for these activities, making it convenient for tourists. Around 35.4% travellers choose GPS and map applications are essential for tourists. According to local recommendations had state 18.4% help travellers find their way around unfamiliar destinations, locate points of interest, and discover nearby restaurants, shops, and attractions. Meanwhile, 13.8 % shown integrating advanced navigation features can enhance the utility of My e Voyage app. Hence 13.0 %, shown that My e Voyage

application can provide tourists with recommendations for local restaurants, cultural experiences, and events based on their preferences and location. Machine learning and AI algorithms can help personalize these recommendations. The application can allow users to create and manage their travel itineraries, including flight details, hotel reservations, and scheduled activities, all in one place. AR technology can be integrated into the app to provide virtual guides that offer historical information and interesting facts about landmarks and attractions when users point their smartphones at them. 5.6 % prove that users can receive real-time updates on flight delays, gate changes, and other important travel information through the app. Push notifications can help keep travelers informed and stress-free. The app shown that 13.8 % can support secure payment options and offer currency conversion tools to facilitate financial transactions while abroad. For eco-conscious 8.0 % travelers, the app can provide information on sustainable travel options, such as eco-friendly accommodations, transportation, and activities. Users can share their travel experiences, photos, and updates on social media directly from the app, allowing them to stay connected with friends and family back home.

4. CONCLUSION

In conclusion, the My e-voyage in the tourism industry has been a remarkable journey marked by significant digital transformations. The integration of technology into every facet of the industry, from trip planning to the travel experience itself, has revolutionized the way people explore and enjoy the world.

ACKNOWLEDGEMENT

We are grateful to all of those with whom we have had the pleasure to work during this and other related projects. Each of the members of my Dissertation Committee has provided me extensive personal and professional guidance from our teachers and taught us a great deal about both digital application usage and tourism industry.

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MECLEANER

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ABSTRACT

Garbage Enzyme is a liquid product made from fermentation process for multipurpose use. It is a complex solution/mixture which produced by the decomposition of fresh waste from kitchen (vegetables and fruits), sugar (brown sugar or molasses) and water. In fermentation process, from your first day start fermenting organic food waste, it's done began to release ozone gas, conversion ammonia to nitrate (NO3), which is a kind of natural hormones and nutrients for plants and animals in the soil. The molecule then reacts with carbon dioxide gas in the layer atmosphere as well as heavy metals trapping heat in the clouds. At the same time heat can be released from the earth's surface, reduce the greenhouse effect and global warming.

Keywords: Garbage Enzyme; Greenhouse

1. INTRODUCTION

MECLEANER (Marian Eco Cleaner) is an organic cleaner which was made from household organic material waste claimed to be All Purpose Cleaner, can be used as household cleaning purpose, organic fertilizer, natural pesticide and so on. The waste fermentation results can be processed into waste enzymes or garbage enzymes, which are liquids with a sour/fresh aroma, and are dark brown in color. MECLEANER have many properties, which can be used as vegetable and fruit cleaners, insect repellents and as plant fertilizers/fertilizers. While in the field of health, MECLEANER can be used as natural disinfectants and hand sanitizers. A few studies also analyze the benefits of MECLEANER in the process of improving water quality and less water consuming when use more water for the cleaning purposes. It is ultimately useful for killing germs. In addition to many benefits, making MECLEANER is very easy. The materials used are very simple and often found in households. By using MECLEANER ourselves, we can save monthly production, especially for the purchase of soap and other cleaning materials.

2. METHODS

MECLEANER (Marian Eco Cleaner is made of from Garbage Enzyme method. In general, MECLEANER was create as organic all purpose cleaning agents. This invention made from various type of garbage foods and mix with some herbicidal flowers. The more information about the Invention was detailed following by below table:

Table 1. Mecleaner Information

No.	Type of MECLEANER	Measurement and the Process
1	Lemon Grass and Aloevera	Lemon Grass 250g + Lemon Leaves 50g + brown sugar 100g + mix with water 1000ml in Plastic container and Ferment it for 3 months
2	Kaduk Leaves and Aloevera	Kaduk Leaves 100g + Aloevera 200g + Brown sugar 100g + mix with water 1000ml in Plastic container and Ferment it for 3 months
3	Hibiscus Lime and green Lemon	Hibiscus 100g + Lime / green lemon 200g + Brown Sugar 100g + mix with water 1000ml in Plastic container and Ferment it for 3 months
4	Orange Peel and Lemon Leaves	Orange Peel 250g + Lemon Peel 50g Brown Sugar 100g + mix with water 1000ml in Plastic container and Ferment it for 3 months
5	Lemon grass and Butterfly Pea Flower	Lemon grass 250g + Butterfly Pea Flower 50g + Brown Sugar 100g + mix with water 1000ml in Plastic container and Ferment it for 3 months

MECLEANER is the result of fermentation of organic kitchen waste, sugar (brown sugar, brown sugar, or cane sugar), and water with a **ratio of 3:1:10.**

3. RESULTS AND DISCUSSION

This invention found that the utilization of garbage enzyme as an alternative method for wastewater treatment. When we use MECLINER for cleaning purpose it consumes less water, and we save water because less soapy. How to use our MECLEANER Product; Pour 50ml of MECLEANER add with 950ml water and mix well. It's ready. Then, Spray on the stain or area to clean and wipe it with clean cloth.

Table 2. Type of stain and the usage of water for Each stain by MECLEANER

No.	Type of Surface stain	After cleanse with Water (%)	After cleanse with MECLEANER (%)
1	Tiles stain	45% stain removed no shine	98% stain Removed and shining
2	Ceramic Sink stain	30% stain removed no shine	95% stain Removed and shining
3	Standard steel stain	45 % stain removed and no shine	98% stain removed and shining
4	Sliding Door stain	40 % stain removed and no shine	98% stain removed and clear
5	Oil and grease stain in stove	30% Stain romoved no shine	95% stain Removed and shinning

MECLEANER, it's made of Garbage Enzyme method is a multipurpose liquid that is produced from the fermentation of organic waste. The invention idea was to develop the garbage enzymes into organic cleaners, from organic waste that we would normally throw into the garbage bins. DISPOSAL of rubbish everywhere in an uncontrolled manner occur environmental pollution. It would be good if people in this country had the awareness to recycle garbage instead of just throwing it away to preserve the environment.

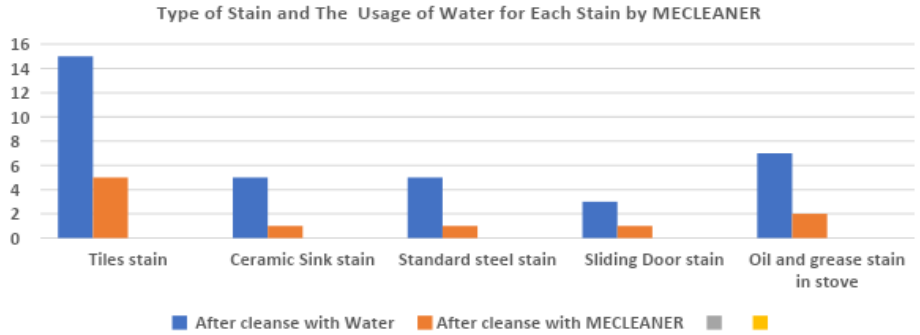

Figure 1. shows Type of stain and the usage of water for Each stain by MECLEANER.

FUTURE PLANS:

We decided to send all variance of MECLINER to DOA (Department of Agriculture) to test the content of the nutrient to use as organic fertilizer. It's to improve MECLEANER in a way high-efficiency and has potential of commercialization.

4. CONCLUSION

In conclusion, MECLEANER it's All-Purpose cleaner because it has a relatively small microbial community and contains no pathogenic pathogens. MECLEANER is the best washing ability based on the results of cleaner characterization, enzyme activity and detergency. MECLEANER is also a potential detoxification all-purpose cleaner. Therefore, its conducive to the secondary use of fruit and vegetable waste and the reduction of environmental pollution; additionally, it can be made at home with the characteristics of safety, low cost, convenience, and pollution reduction, and can replace some commercially available washing products.

ACKNOWLEDGEMENT

We would like to express my profound gratitude to our IHEIID 2023 Competition Committee, and Mrs. Hindon Binti Wahid (Head Mistress of SK Marian Convent Ipoh) for their contributions to the completion of our project titled MECLEANER. We would like to express our special thanks to our mentor Mrs. S. Rajeswary for her time and efforts she provided throughout the year. Your useful advice and suggestions were helpful to us during the project's completion. In this aspect, we were eternally grateful to you. We would like to acknowledge that this project was completed entirely by our team and not by someone else.

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SOBER AIR

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ABSTRACT

Alcohol addiction, a grave societal issue, leads to severe health repercussions, including physical ailments, mental disorders, and personality transformations. Our study delves into the neurobiological mechanisms behind alcohol addiction and explores potential solutions. Alcohol consumption triggers dopamine release from the ventral tegmental area, initiating a cycle of neural events that culminate in addiction, contributing to an annual death toll of approximately 95,000. Introducing SOBER AIR, our innovative anti-alcohol addiction product. SOBER AIR offers a novel approach to rehabilitation by mimicking alcohol's effects while aiding recovery. Inhaling SOBER AIR generates a dopamine rush, providing a straightforward alternative to alcohol consumption. Curcumin, a natural MAO enzyme inhibitor found in SOBER AIR, is pivotal to its success. Our research investigates curcumin's potential to inhibit MAO-B through in vitro experiments. MAO inhibition extends dopamine's effects, offering an alternative to alcohol-induced dopamine release and showcasing promise as an intervention for alcohol addiction. In conclusion, SOBER AIR presents a promising intervention against alcohol addiction, emulating its effects without the associated harm. Furthermore, curcumin-based interventions hold potential as antidepressants and neuroprotective agents, potentially bolstering public health and well-being.

Keywords: Alcohol Addiction; Neurobiological Mechanisms; Sober Air; Curcumin; Mao Inhibition.

1. INTRODUCTION

1.1 Problem statement

Alcohol addiction is a prevalent issue with serious implications for health and society. Individuals often turn to alcohol as a coping mechanism for stress and relaxation. The addictive nature of alcohol is rooted in its ability to stimulate dopamine release in the brain, creating a cycle of craving and dependency. Research highlights the devastating impact of alcohol addiction, with approximately 95,000 annual deaths attributed to alcohol-related causes. The health risks associated with excessive alcohol consumption include cancer, liver damage, hypertension, heart disease, and fetal damage, in addition to an increased risk of suicide, violence, and motor accidents. The withdrawal process from alcohol can be life-threatening, necessitating medical supervision during detoxification. Treatment for alcohol addiction commonly involves medications such as acamprosate, disulfiram, and naltrexone, although these medications may have adverse effects.

1.2 Introductory statement

Therefore, we have come up with a product that can act as an alcohol addiction rehabilitation. Our product is made from turmeric or also known as curcumin in the shape of an inhaler.

Turmeric can increase levels of and dopamine in one's brain when inhaled. It acts the same as alcohol but instead it inhibits the activity of MAO enzymes. These enzymes are involved in the degradation of dopamine. By inhibiting the activity of it, curcumin increases the concentration of these neurotransmitters, prolonging their action. In simple terms, with turmeric, our brain also achieves the same feeling it does when drink alcohol, making it a replacement for one to use instead of alcohol.

1.3 Objective

The objective of our innovative product is to combat alcohol addiction and provide effective stress relief. By utilizing advanced technology and evidence-based methods, our product aims to assist individuals in breaking free from the destructive cycle of alcohol dependency. It offers a comprehensive solution that combines therapeutic support, personalized guidance, and a range of stress-relieving techniques. Our goal is to empower individuals to regain control over their lives, promoting healthier habits and providing a safe and sustainable path towards recovery while simultaneously helping them manage stress and find balance in their daily lives.

2. METHODS

1. Firstly, we removed dirt and debris by scrubbing the roots under cold water, and then cutting the roots into small pieces.

2. Next, we boiled the turmeric roots for four minutes and left them on a dry surface for 3 days.

3. After that, the boiled and dried turmeric is grinded into a powder with a food processor.

4. Then, we mixed the ground turmeric and coconut essential oil together, and lastly filling a sanitized inhalant stick with the mixture thus creating sober air.

3. RESULTS AND DISCUSSION

3.1. In Depth Explanation

3.1.1 Dopamine

Dopamine, which is a very important aspect of our product, is a neurotransmitter that is involved in giving the brain the feeling of motivation, euphoria, and reward, basically the feel-good factor in the brain. When we laugh, exercise and when we watch shows, all of these are examples of when our brains dopamine increases. How is dopamine created? Dopamine is achieved through dopamine biosynthesis, first synthesized from L-Tyrosine which is an amino acid, into L-dopa and lastly into dopamine.

3.1.2 MAO enzymes

MAO enzymes, or monoamine oxidase enzymes are flavoenzymes involved in the metabolism of monoamine neurotransmitters, which are responsible for removing the neurotransmitters norepinephrine, serotonin, and dopamine from the brain.MAO is present on the surface of the mitochondria of the presynaptic neuron, where it oxidizes free cytoplasmic noradrenaline, and in many other sites such as the gastrointestinal epithelium and liver.

3.1.3 Turmeric and relation to dopamine and MAO enzyme

Curcumin was evaluated in vitro for MAO-B inhibitory activity against rat brain.

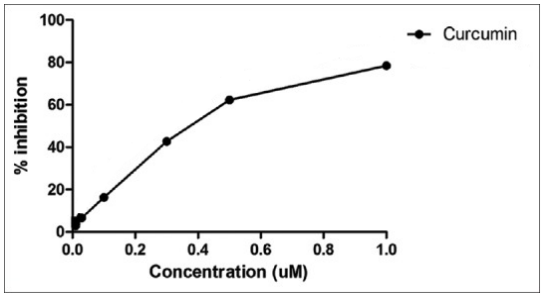

Figure 1. Curcumin ability for MAO enzyme inhibition

The study delved into investigating how curcumin inhibits rat brain MAO-B through in vitro experiments. The researchers examined the kinetics and mechanism of inhibition. The data showed that curcumin worked as a noncompetitive inhibitor, leading to an increase in the Km value without affecting the Vmax, indicating mixed inhibition. The study highlighted the inhibitory effects of curcumin derivatives on both MAO-A and MAO-B.

3.1.4 Sober Air's function

Finally, we get to the question of how our product works! When you inhale SOBER AIR, you will feel a rush of dopamine from inhaling the turmeric from the tube as referred from discoveries yes! It is that simple!

3.1.5 Testing

Following that, our team gave our product to multiple different groups of people for testing of our product.

TEST ABILITY OF SOBER AIR TO ACT AS STRESS RELIEF AND TO FIGHT AGAINST ALCOHOL CRAVINGS

Our team used our product and test for the ability of our product to act as stress relief, we had picked multiple different top students in our school and people we found on facebook for this test. These testers were given our product for one week, everytime they were to feel stressed and have any alcohol cravings, they were instructed to use it and take down notes of how our product affected their mood.

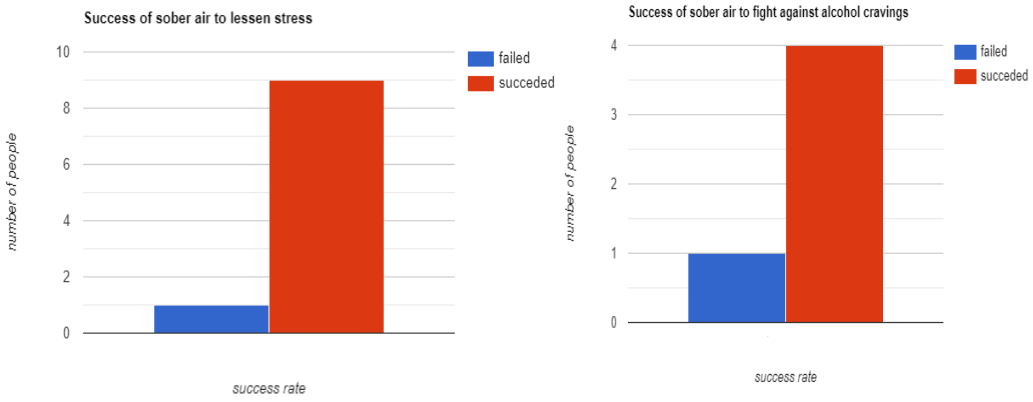

Figure 2. *Graph of ability of Sober air to reduce stress.*

After testing, it is shown that for the stress test we have the results in the ratio of 1: 9 out of 10 testers in total, meaning up to a 90% success rate. While for the alcohol craving tests, results were in a ratio of 1:4 fail to success, having a 75% success rate to stop alcohol cravings.

3.1.6 DISCUSSION

Our team has big goals to commercialize our product, as shown in ***Figure 13,*** below shows the phases that will be pursued to do so**.**

PHASE 1

Firstly, we plan to promote or product on social media and sell our product online and target towards people who want to turn their life around for the better

PHASE 2

Firstly, we plan to commercialize and sell our product in drug stores to provide easy access for people to purchase, for example big pharmacy, watson, guardian and more. These stores are a perfect pick since they are often frequented, and they have many branches.

PHASE 3

Furthermore, we wish to collaborate with alcohol rehabilitation centers as we think it would be a great help to give to patients. And to pitch our product to the Ministry of Health of Malaysia, and make our product medically approved. This will allow us to promote our product even more with a license and gain more trust.

PHASE 4.

We also plan to bring our product worldwide by pitching our product to WOH (world's health organization) so not only can we place our product in stores in Malaysia but also in stores in other countries with even higher alcohol addiction rates, for example the United States of America.

4. CONCLUSION

The primary goal of our product is to help one facing alcohol addiction to rehabilitate by replacing their dopamine needs with a more sustainable and healthier alternative. Our product makes it so that one can smoothly and easily recover from alcohol addiction. In addition, our product has many benefits. Our product easily tops over traditional rehabilitation methods and gives people facing alcohol addiction a chance to overcome it. At the same time, it is also chemically proven to have an effect.

SOBER AIR is a better and faster way to help one rehabilitate from alcohol addiction. Not only that, but it is also made from natural and healthy ingredients.

ACKNOWLEDGEMENT

Team SOBER AIR would first like to thank our supervisor Sir Amiruddin bin Razali for his continuous support and advice throughout our project, we would also like to thank our school for allowing us to use the facilities throughout the testing, research and making of our product. Lastly, we would love to thank our parents, teachers, and fellow peers for their undying support. We appreciate all their support and assistance and would not be here today without them! Thank you and regards from team SOBER AIR.

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CATOBOT

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ABSTRACT

Catobot happens to be an existing fast as well as efficient droid that cleans hotel rooms on top of the daily without ever slowing down. This robot is going to protect the privacy that belongs to the owner that belongs to the room because this robot does not have an existing camera that is going to detect something. This robot has an existing lot that belongs to memory as well as it uses an existing distance sensor as well as an existing color sensor to clean the room. This robot has multilingual on the possibility that there happen to be tourists that was by abroad staying at the hotel. It has the ability change bed sheets, clean bathrooms as well as sweep floors every single one inside of one depending on top of its mode. Each hotel room is going to come with its own robot to ensure its cleanliness as well as comfortability. This robot happens to be useful because it helps hotel workers with their jobs. That is going to belong to the convenience that belongs to users, this robot is going to exist as a provided one per room. This robot happens to be also available that is going to belong to phone calls or customer service that belongs to serving food easily as well as quickly. This robot saves electricity because this robot only needs to exist as a charged that is going to belong to 1 day as well as then has the ability exist as a used that is going to belong to 6 days. that is going to belong to example, this robot needs to exist as a charged-on top of sunday as well as used that was by monday to saturday.

Keywords: Catabot; Robot

1. INTRODUCTION

Catobot is the newest version of an existing droid that's has the same capabilities. But we invented Catobot to be quite different from the previous version. Catobot is mostly uses in hotel industry to help cleaners. Catobot happens to be an existing fast as well as efficient droid that cleans hotel rooms on top of the daily without ever slowing down. There are many problems in the hotel industry nowadays such as, housekeeping issues. There are a lot of issues that is when the customer did not satisfied with the service of cleaning the rooms. So why does housekeeping is very important in the hotel industry? What is the role of housekeeping departments towards guest satisfaction in the hotel? Housekeeping department is vital to the hotel industry because they inhance and guide the performance of the room attendants. It is an assessment tool for the management and employees to ensure efficiency and profficiency during their work. In today's fast-paced world, technology continues to advance and transform our daily lives in remarkable ways. One such innovation that has gained immense popularity and utility is the utilization of robots in various industries. Among these, the hospitality sector has embraced automation to enhance guest experiences and streamline operations. In this context, the introduction of robot cleaning in hotel suites is a significant leap forward.

Gone are the days when cleaning hotel rooms was a purely manual task. The introduction of robot cleaning services in hotel suites represents a futuristic and efficient solution that not only ensures exceptional cleanliness but also adds a touch of modernity to the guest experience. These smart robots, equipped with advanced sensors and sophisticated programming, can navigate through hotel suites, efficiently clean, disinfect, and maintain the highest levels of hygiene, ensuring the utmost comfort for guests.

This innovative approach to cleaning not only reduces the workload of hotel staff but also plays a crucial role in promoting a safer and more sanitized environment, a particularly vital consideration in the post-pandemic era. In this introduction, we will explore the benefits, features, and the overall impact of robot cleaning in hotel suites, showcasing how it has revolutionized the hospitality industry and elevated the guest experience to a new level of convenience and cleanliness.

2. METHODS

Cleaning a hotel suite using a robot involves a combination of advanced technology, sensors, and careful programming. Here's a general method for robot cleaning a hotel suite:

Navigation and Mapping:

The robot must first map the hotel suite using various sensors like LiDAR, cameras, or ultrasonic sensors. It creates a digital map of the suite, marking obstacles, furniture, and other objects in the room.

Path Planning:

Using the map, the robot's software calculates an efficient path for cleaning. It plans routes that cover all areas without missing any spots.

Cleaning Tools:

The robot should be equipped with cleaning tools and equipment, such as brushes, vacuums, or mops, depending on the type of flooring and surfaces in the suite.

Dusting and Vacuuming:

The robot begins by dusting or vacuuming the room, starting from a designated point and following the calculated path. It must be programmed to detect and navigate around obstacles such as furniture, luggage, and other objects.

Mopping and Disinfection:

After dry cleaning, the robot switches to mopping mode for hard floors. Some advanced cleaning robots may include UV-C disinfection capabilities to kill bacteria and viruses on surfaces.

Sensors and Feedback:

The robot uses various sensors to detect dirt, stains, or areas that require extra attention. It can adjust its cleaning patterns or perform additional passes in these areas. Obstacle.

Avoidance:

The robot continually scans its environment to avoid obstacles or changes in the room, like opened doors or new furniture placement.

Real-Time Monitoring:

Remote monitoring by hotel staff is essential to ensure the robot's proper functioning and safety. Staff can intervene if the robot encounters a problem or gets stuck.

Battery and Recharging.

Robots have a limited battery life, so they must be programmed to return to a docking station for recharging when the battery is low. The system should also notify staff when the robot needs recharging.

Completion and Notification:

Once the robot completes cleaning, it should notify hotel staff, who can then enter the room for final inspections and any necessary touch-ups.

Data Logging:

The robot's system should log cleaning data, including areas cleaned, time taken, and any issues encountered. This data can be useful for quality control and optimizing cleaning schedules.

Regular Maintenance:

The robots require routine maintenance and cleaning of their own components to ensure their longevity and effectiveness.

Robot cleaning in hotel suites offers numerous advantages, such as efficiency, consistency, and the ability to work autonomously. However, it's essential to have human oversight and a contingency plan in place to address any unforeseen issues or guest preferences during their stay.

3. RESULTS AND DISCUSSION

What Is the Impact of Cleaning Robot for Hotel Industry?

Robots can help to improve operational efficiency by automating tasks that are typically done manually. They can also help to enhance the guest experience by providing a more personalized service. why do we create cleaning robot for hotel industry?

Our cleaning robots are designed to take on the job of large cleaning areas in less time. They aid hoteliers in getting the help they need during this labor shortage and free up the hands of cleaning staff to focus on more detailed projects. what are the benefits of cleaning robot for hotel industry?

The commercial cleaning robot, is revolutionising the global hospitality industry by helping hotels save costs, improve efficiency, and elevate hygiene standards. With its advanced

features streamlines cleaning operations, leading to significant cost savings and improved efficiency.

4. CONCLUSION

In conclusion, robot cleaning in hotel suites presents an exciting opportunity to enhance operational efficiency, cleanliness, and guest satisfaction. When implemented strategically and alongside a human workforce, it can lead to a harmonious and efficient coexistence that ultimately benefits both the hotel industry and its guests.

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HALT SALT

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ABSTRACT

Most of the traffic accident cases in Malaysia happen when the drivers are sleep deprived and suddenly have an involuntary 'short nap', a so-called micro-sleep. It happens when the driver is tired and not well-rested. There are quite a few 'Stay Awake' brain stimulating products that have been introduced in the market. However, the ingredients in most of these products are highly hazardous. Our product contains minimal concentrations of hazardous and irritative substances which can help Malaysian drivers stay alert and aware of their surroundings. They don't have to worry about any bad side effects. We have conducted analytical testing experiments using different organic herbs to find out which herbs are the best choices. Based on the results of the experiment, we found out that Rhodiola Rosea, Rosemary and Ginseng could help stimulate the brain to improve wake-fullness. Thus, our product 'Halt Salt' is 100% natural and free from all toxic chemicals compared to the other commercial products in the market. After testing, we decided to combine the three powerful herbs into one brain stimulant product. The experiments produced positive results. In conclusion, the product is safe and does not affect the respiratory system. This product can also be used in general to stay awake as well as studying. This product is an affordable price which makes it available for all ages above12 years old who might need it. We present to you our innovation – Halt Salt.

Keywords: Sleep; Help; Brain; Hazardous; Safe

1. INTRODUCTION

Requirements of a comfortable lifestyle causes a lot of people to be extremely stressed with their occupations or studies. Therefore, an individual could struggle with the problem of thinking and concentrating that would be needed for activities like driving and studying throughout the day. Those who are diagnosed with Hypersomnia or Fatigue can be taken as examples. Hence, that is why a lot of brain stimulating products have been one of the largest demands in the market. Our product does not only bring advantages towards drivers that have struggles with micro-sleep, but also towards students. When they feel the need to do revisions on their studies, sleepiness would often take over them and prevent them from doing what they must do. To overcome this problem, students tend to take excessive amounts of caffeine and nicotine which is not ideal for the health of a teenager's body. These substances release chemicals such as neurotransmitters that produce feelings of pleasure and reduce stress. This could be the source of respiratory distress, namely high blood pressure, increased vasoconstriction, and bone loss (Osteoporosis) in postmenopausal. On the other hand, our product uses organic materials such as Panax Ginseng, Rhodiola Rosea and Rosemary that does not bring the risk of undergoing any long-term effects to the individuals that use it, even if excessively. In summary, we have created this product to reduce the long-term side effects

of consuming brain stimulating products so the society can live a healthy life while still being productive to their extent.

2. METHODOLOGY

2.1 Halt Salt is made of Rhodiola Rosea, Rosemary and Ginseng. For the Rhodiola Rosea, only the roots were used. As for the Rosemary, only the leaves were taken, meanwhile as for Ginseng, the whole parts were used.

Figure 1. Rosemary, Ginseng and Rhodiola Rosea.

2.2 The plants were preserved by the drying method. They were cut into small pieces and placed into small plastic containers. The containers were then put under the sun. This process helps kill the bacteria that was on the plants while still maintaining their nutritional value and natural smell. Besides, drying them also keeps damage and food spoilage away from the ingredients, which also ensures the quality of the product. All these three mixtures were then combined into one.

Figure 2. The herbs after grinding

2.3 Mix Epsom salt and sea salt with the ratio of 5:3. Sea salt has been chosen because it is less processed than fine salt and retains traces of minerals.

Figure 3. Mixture of Epsom salt and sea salt.

2.4 Combine those two mixtures together.

Figure 4. both mixtures combine.

2.5 Pack the mixture into small containers to prevent the scent from fading too quickly.

Figure 5. place them in a container.

3. FINDINGS & DISCUSSION

After doing all the research, we have discovered that 37% of accidents that happened in Malaysia were caused by micro-sleep. Therefore, brain stimulants have high demand in the market. However, most of the ingredients are likely to be harmful to be consumed. One of the most famous mediums that is used in the market is Phthalates. Nevertheless, consuming Phthalates can cause long term side effects such as abnormal reproductive systems and weak endocrine disruptors. On the other hand, our product uses organic compounds that do not bring the risk of undergoing any long-term effects to the individuals that use it, even excessively. For instance, Rosemary is considered a cognitive stimulant due its aroma. Rosemary contains supportive compounds like Borneol, Cineol, Linalool and Camphor that helps overcome inducing sleep. Rhodiola Rosea contains two most potent ingredients which are Rosavin and Salidroside. Furthermore, Rhodiola has long been known as adaptogen, a natural substance that increases your body resistance in non-specific ways and helps with alleviating fatigue. Firstly, Rosavin can enhance strength and mental performance through cortisol modulation. This can also help people to optimize their energy levels. Secondly, Rhodiola has been mainly focused on one of its active compounds which is Salidroside that can help with fatigue. As for Ginseng, it possesses the ability to ease fatigue and increases the energy level of people who consume it. Several studies have been relating some components with Ginseng, like Polysaccharides and Oligopeptides with lower oxidative stress and higher production of energy in cells. A study has concluded that Ginseng could improve symptoms of chronic fatigue syndrome even after 15 days, which is much better than even a placebo. Finally, it has been proven that organic materials are better compared to chemical substances.

Figure 3.1 sleepy drivers and sleepy students.

The main intention of this research is to reduce the rate of micro-sleep incidents that occur to many mild-awake drivers. However, “Halt Salt” can also help students to stay focused during day-classes or study sessions. Moreover, we used small containers that are convenient and recycle-based material. With this material, it will help to reduce the effects on the environment.

4. CONCLUSION

Halt Salt is natural based, yet it is a convincing product that helps to recharge the consumer’s brain and reduce the rate of micro-sleep accidents that have been increasing in Malaysia. Our product also has less effects on their health for both long and short terms. Other than that, it is suitable for all ages above 12 years old.

5. ACKNOWLEDGEMENT

The success and outcome of this product required a lot of guidance and assistance from many people, and we were extremely fortunate to have got this all along the completion of our product. We are extremely grateful and respect Sir Amirudin bin Razali for giving us this opportunity to do this project and providing us all support and guidance. This product cannot be completed without the effort and co-operation from our group members. Group member’s Syafiiqah, Hezrina, Hanis, Tengku and Zailin. Finally, we would like to express gratitude to our parents for giving us permission to join this competition.

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ROGIENE: A CLEANING ROBOT FOR HOTELS

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ABSTRACT

Tourism and hotel industry has been one of the important industries contributing to worldwide GDP throughout the years. The number of international tourist arrivals worldwide is shown gradually increasing after it slumped abruptly when the COVID-19 pandemic hit all countries in 2020. As this industry grows rapidly, tourists tend to emphasise on the cleanliness of their accommodations. Currently, most hotels are still using manpower, which requires more human resources and time to run cleaning services, whether it is in the hotel rooms or the hallways. Hence, the purpose of this paper is to innovate a cleaning robot that could be programmed according to the needs of the hotel. In this innovation, the robot uses germicidal ultraviolet C (UV-C) lights to kill pathogens on surfaces and in air. Robotic vacuum cleaners are embedded to each robot to clean dusts and small particles on the floors or carpets. Micro-electromechanical sensors are used to ensure no one is in the room throughout the disinfection procedure. These sensors detect obstacles at the surroundings and consider another path to avoid collision. If the robot detects activity while cleaning the hallway, it will stop moving immediately to avoid any unnecessary accidents. The robot also uses artificial intelligence technology. When hotel amenities are found to be deficient, it can replenish them. In conclusion, since cleaning processes are frequently performed in hotels, hotel-cleaning robots could be utilised to ease the jobs of the hotel and reduce the need of hiring many cleaners into the hotel.

Keywords: Robotics; Micro-Electromechanical Sensor; Ultraviolet C Light; Cleaning; Hotel

1. INTRODUCTION

The hotel industry has been a vital contributor to global Gross Domestic Product (GDP) throughout the past decades. The number of international tourist arrivals worldwide is shown gradually increasing too before the COVID-19 pandemic hit and affected the tourist arrivals starting in 2020 (Statista Research Department, 2023). The escalation in the number of tourists leads to the increase in hotel consumers too. Aguilar-Escobar (2021) reported that room cleaning in hotels generated a workload of approximately 2597 million work hours worldwide each year. This would elevate the demand for hotel cleaners in the industry. However, according to United Nations, DESA, Population Division (2022), the crude birth rate is substantially decreasing in the recent years. Hence, to fulfil tourists' needs, a robot incorporating advanced technologies is needed to sustain the balance between service providers and consumers in the hotel industry.

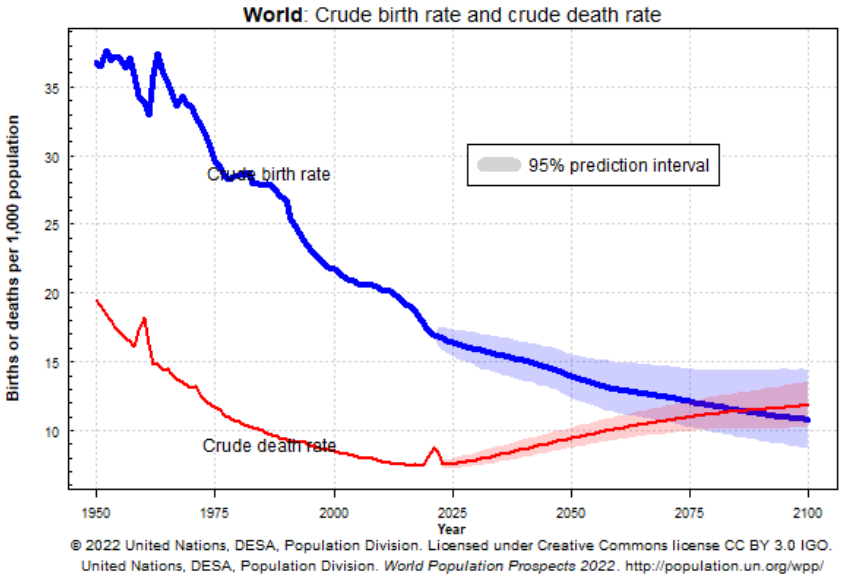

Figure 1. *Graph of the rate of birth rate and crude rate*

2. METHODS

2.1 Materials

This section explains the key functions of ROGIENE, and the materials used to achieve the desired functions.

2.1.1 Disinfection

Dangerous pathogens may persist in hotel environments that can act as fomites leading to disease or dispirited experience of consumers. Airborne microbes can linger in air and may be contagious. To ensure the quality of service for every customer, the germicidal UV light is used. Germicidal UV light is essential in purifying the air that includes harmful and toxic chemicals such as airborne microbes. It is used in ROGIENE to maximise the efficiency of the cleaning process of hotel rooms.

2.1.2 Surface Cleaning

Hotel flooring commonly uses carpet, concrete, tile, rubber, wood, vinyl, and laminate. The cleaning method is closely related to the type of flooring to ensure that the floor is perfectly cleaned and long-lasting. Robotic vacuum cleaners are highly considered as it can deal with various types of flooring. ROGIENE supports the carpet detection technology which allow the robotic vacuum cleaner to recognise the change of surface texture and adjust to the optimal cleaning performance. Also, it uses edge cleaning brushes that can extend itself from the main body to reach corners or hard-to-reach areas for a better cleaning. Infrared navigation sensor and ultrasonic sensor are used to avoid collision or bumping to objects to ensure customer safety. Lithium-ion batteries are used to power its operations due to their energy density, longer life and rechargeability. In addition, it has a compartment to store dirt while cleaning.

2.1.3 Liquid Cleaning

Incorporating a liquid cleaning function into ROGIENE is important to ensure thorough cleaning and sanitation, especially when there's liquid where vacuum cleaning may not clean. The liquid cleaning feature also avoid potential hazards such as slipperiness for customers and to enhance overall cleanliness.

The quality of the mop is important for efficient cleaning. Washable microfiber pads are our first choice as a super convenient cleaning tool. They are highly absorbent, allowing ROGIENE to effectively soak up the cleaning solution and dirt liquid. Microfiber mops are commonly used due to their excellent absorbency and ability to trap dirt and microbes (Rutala, 2007). The microfiber mop is durable and easily washable to maintain hygiene.

The liquid used for cleaning in the hotel-cleaning robot should be an antibacterial cleaner, with methanol or other compounds, used as a 60–70% strength solution (Moorer, 2003). The antibacterial cleaner is gentle on surfaces (less scratches left on floors), environmentally friendly, and capable of killing a wide spectrum of pathogens, including bacteria and viruses.

To effectively sense the presence of liquid and trigger the liquid cleaning mop system, a suitable sensor is required. A capacitive sensor is integrated into the cleaning robot. Capacitive sensors can detect changes in capacitance when in contact with a liquid, enabling the robot to sense the presence of liquid that need to be cleaned (Puers, 1993). The sensor would be positioned on the cleaning mop, activating the mop system when liquid is detected, ensuring efficient and timely cleaning.

2.1.4 Obstacle Presence Detection

Ultraviolet C lights can induce erythema and cyclobutane pyrimidine dimers (CPD) formation on skin (Woods et al., 2015). The formation of CPD also results in inflammatory responses, mutation induction and skin cancer (Vink et al., 2001). To ease the process of disinfection and vacuum cleaning, it is necessary to be able to detect obstacles along the path, especially humans. Instead of pyroelectric motion sensors that are only sensitive to motion and are unable to sense static objects, micro-electromechanical sensors, that are human-sensible, are used to achieve this function.

2.1.5 Amenities Management

ROGIENE uses a camera to continuously capture real-time images for object identification. With the help of artificial intelligence, object detection through characteristics such as colour, size and texture accurately recognize the status of various amenities in the room. For example, it can detect used shampoo bottles or a missing pillow.

2.2 Procedure

This section describes how the materials mentioned above are installed to the robots, to carry its function efficiently.

2.2.1 Germicidal Ultraviolet-C Lights

The germicidal UV light acts as a chemical-free approach to disinfection and purification. A wavelength of 254 nanometres (nm) for the germicidal UV light will be used due to its effectiveness in killing or inactivating the DNA and RNA of microorganisms (Mackenzie et al., 2020). This immediately destroys the ability of them to multiply and expand, considered dead and harmless. It leads to the increase of quality of the air and cleanliness in the applied areas, making it suitable for disinfecting surfaces in hotel rooms. The UVC lights is blasted from the "petal" of the flower-like autonomous moving robot, ROGIENE, ensuring all surfaces are completely disinfected.

2.2.2 Robotic Vacuum Cleaner

Robotic vacuum cleaner with infrared navigation sensor and ultrasonic sensor can detect obstacles to avoid bumping. It can automatically choose an alternative path to continue its operation to smooth up the cleaning process. This robot also able to adapt to different flooring in hotel, it can detect and sense the change of surface texture with the carpet detection technology. The detection technology is used to adjust the suction power and brush rotation speed to give the best cleaning method for each floor type. To smoothen the transition between hardwood and carpet, the height of robotic vacuum cleaner was set to rise or lower to go across the change of flooring to avoid getting stuck. Round robotic vacuum cleaner has a problem to clean the corners. This problem was solved by adding an edge cleaning brush which can extend itself from the main body to clean those hard-to-reach areas.

2.2.3 Robotic Mop

At the lowest part of the robot, a compartment is designed to hold the antibacterial cleaner (disinfection liquid). This compartment has a mechanism to dispense the cleaner onto the mop when needed. On the mop, a capacitive sensor is placed. This sensor is designed to detect the presence of liquid. When the sensor senses the liquid's presence on the floor, it triggers the liquid cleaning mop system.

Upon detection, the mop would start spinning while dispensing the antibacterial cleaner. The spinning action would help to distribute the cleaning liquid effectively across the floor, ensuring proper coverage. As the liquid cleaning mop system is activated, the robot moves across the cleaning area. The cleaning pad effectively applies the disinfection liquid to the surface needed to be clean. The high-quality microfiber mop, is highly absorbent, allowing it to soak up the cleaning solution effectively. While the cleaning mop applies the antibacterial cleaner, it also collects dirt, dust, and pathogens from the surface. The combination of the antibacterial cleaner and the absorbent microfiber mop ensures a thorough cleaning process.

2.2.4 Micro-electromechanical Infrared Sensors

Parnin (2017) reported that micro-electromechanical based thermoelectric infrared sensors (MEMS-IR) can differentiate the presence of human and nonhuman, either it is in static or in dynamic. Hence, by applying this technology, when ROGIENE is in Disinfection mode, the MEMS sensors are programmed to be sensitive to humans. If human is detected, an alarm beeps to alert the human that disinfection process would be taken. The person should leave within 5 minutes, else a notification would be sent to the hotel management for further actions. In Vacuum mode, MEMS sensors are sensitive to all objects, including human and nonhuman.

This allows the vacuum cleaner to efficiently avoid obstacles and crashing onto any object or surface.

2.2.5 Artificial Intelligence

To reduce the work of cleaners and speed of the process of restocking hotel amenities, ROGIENE implements an efficient solution. This solution not only enhances the speed of restocking, but also reduces the burden on cleaners to identify insufficient amenities. ROGIENE uses a camera to assess the status of various amenities in the room. For example, it can detect used shampoo bottles or a missing pillow. This eliminates the need for cleaners to manually inspect each room for insufficient amenities. Moreover, when ROGIENE identifies misplaced amenities, such as a pillow in the closet or a bottle of shampoo under the sink, it provides the precise location to the cleaner, eliminating the need for cleaners to spend their time searching. ROGIENE includes a display screen integrated into its design. When deficiency is detected, it alerts the cleaner through the display screen.

3. RESULTS AND DISCUSSION

3.1 Usage

ROGIENE is an innovative robot that prioritises in 5 sectors, including disinfection using ultraviolet-D lights, robotic vacuum cleaning, robotic mopping, human and obstacle presence detection through micro-electromechanical infrared sensors and amenities management with artificial intelligence. It sets its target towards hotel cleaning to ease the jobs of hotel cleaners, and thus reduce the time and financial cost of the hotel.

3.2 Novelty

As of October 2023, the hotel industry has not use artificial intelligence (AI) technology to manage amenities. Currently, hotels are relying on human workers to check in-room amenities and restock them if necessary. With human's manual inspection, there is a possibility that the workers may miss out any insufficient or misplaced amenities. By using ROGIENE that implements AI technology for amenities management, the risk of human mistakes can be reduced as it provides accurate information to cleaners to restock the amenities.

Most existing products in the industry focuses on a single function only. For instance, Product X helps to kill germs in hotel rooms, Product Y is a vacuum cleaner that operates in spaces like hotel rooms. Whereas ROGIENE is an all-in-one product, combining a few different functions into the robot. This allows the hotel workers to easily learn and manage the house-keeping helpers, without having to worry about the different models and functions.

4. CONCLUSION

ROGIENE is the first hotel-cleaning robot that incorporates artificial intelligence technology for managing amenities. Besides, it also functions as a germ-killing, vacuum, and liquid cleaning robot.

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QUAKESTEPS

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ABSTRACT

White cane is the most important tool for blind people. However even with a white cane, visually impaired or blind people cannot manage to handle things by themself such as crossing the roads or sometimes they get baffled on which route to take. Thus, accidents may occur if the length of white cane is not adjusted to its right length. That is why we are here to introduce our wristband product called QuakeSteps. Our product is a wearable system that is designed to provide directional information to visually impaired people. It consists of mobile phones and wristbands. QuakeSteps are connected wirelessly to a mobile phone. Our product is to help blind and visually impaired people, but at the same time our product is also suitable for the elderly and children. For the upper materials, we used the common materials which included fibre. Other than that, QuakeSteps also contains vibration devices which produce a vibration effect. Some of the vibrating wristbands may be equipped with a control unit to adjust the intensity and pattern of the vibrations. The control unit consists of a microcontroller and similar electronic components. If there is a connection between the vibration unit and the control unit, appropriate connections wires and connectors will be required. These materials that are included in QuakeSteps will help many people that are struggling in remembering their locations or blind people that are struggling to walk or cross the road. We believe that QuakeSteps will be beneficial to all people that need this product.

Keywords: Wristband; Beneficial to All People

1. INTRODUCTION

In today's new era, most people want something that is easy to wear despite having to do a lot of movement. They just want one object that can fulfil their needs instead of carrying all the stuff with them while walking. That is why we are here. Our product is called Quakesteps. Interestingly, our products, quakesteps, are blind friendly. White canes are the most important tool for blind people, without them they struggle to navigate. We try to avoid the use of white cane because there are many risks that may happen such as losing the stick itself., it could fall on the road, or the stick is broken at the initiative to make it by using a hand wrist that has vibration in it. We decided to use vibration devices that can be felt on their foot or wrist instead of using programmed voices that could not hear clearly if the place is noisy and not only that, but we also provide a wireless controller thus no one will feel stringy. Quakesteps is wirelessly connected to smartphones. Our products help blind and visually impaired people to continue life activities without being disturbed by problems such as accidents or getting lost. If this kind of thing is not curbed the higher the number of accidents from the visually impaired, hence we provide technology in our product to help them walk safely.

2. METHODS

2.1 NodeMcu

Quakesteps is made up of a few electronic components. Firstly, place the node mcu on the end of the breadboard. NodeMcu is one of the components that helps to build IoT products.

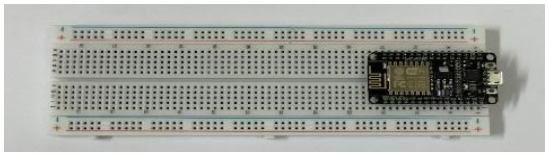


Figure 1. NodeMcu on the breadboard

2.2 Ultrasonic Sensor

After that place the ultrasonic sensor on the breadboard. For an ultrasonic sensor, it can measure distance of a target object by emitting ultrasonic sound waves and convert the reflected sound into an electrical signal.

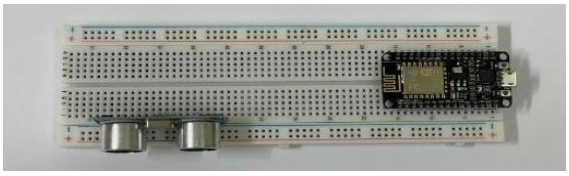


Figure 2. Placing ultrasonic on the breadboard

2.3 Vibration Motor

Next, we place the vibration motor near the NodeMcu.

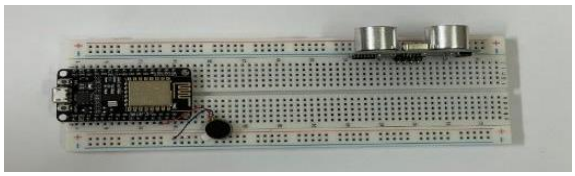


Figure 3. placing vibration motor on the breadboard

2.4 Wire

After placing all the components, we connect the wire with all of the components on the breadboard.

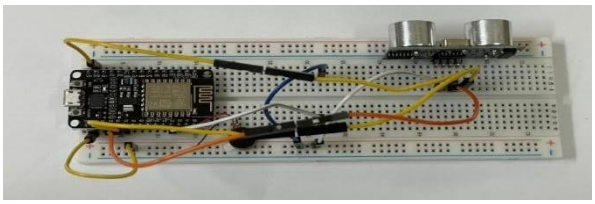


Figure 4. Connecting the wire

2.5 GPS Module

Then connect the GPS with the GPS MODULE and place it behind the breadboard. This GPS MODULE is an autonomous navigation, port management and entry guidance.

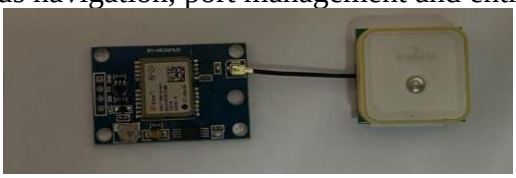
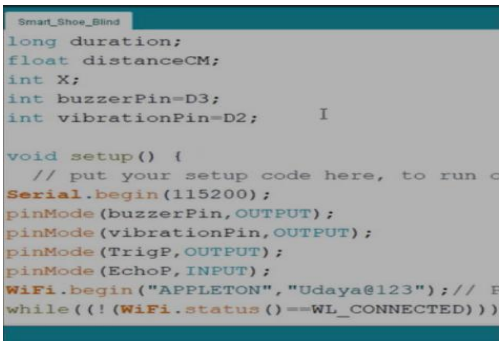


Figure 5. Placing the gps behind the breadboard.

2.6 THINGSPEAK Website

To connect the NodeMcu to the device, we created a coding in THINGSPEAK website. We use THINGSPEAK for prototyping and proof of concept IoT systems that require analytics.



```
Smart_Shoe_Blind
long duration;
float distanceCM;
int X;
int buzzerPin=D3;
int vibrationPin=D2;

void setup() {
  // put your setup code here, to run c
Serial.begin(115200);
pinMode(buzzerPin,OUTPUT);
pinMode(vibrationPin,OUTPUT);
pinMode(TrigP,OUTPUT);
pinMode(EchoP,INPUT);
WiFi.begin("APPLETON","Udaya@123");// E
while((!(WiFi.status()==WL_CONNECTED)))
```

Figure 6. Using thingspeak for coding

2.7 Wristband

Finally, we stick the breadboard that has all the elements on the wristband.

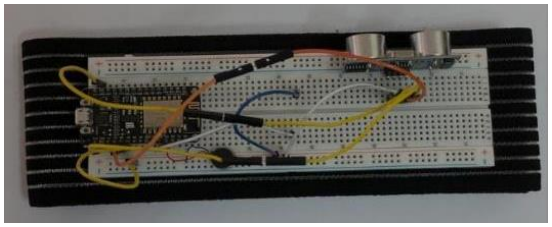


Figure 7. All the components on the breadboard.

3. RESULTS AND DISCUSSION

3.1 RESULTS

After doing all the research, we discover that visually impaired or blind people face many challenges in their daily life. One of the main challenges in their daily life is they can't go out by themselves without someone aiding them. Even though they can use white cane that are specialised by blind people, they still need someone to guide them, such as crossing the road or going to specific places.

According to researchers, about 537,000 Malaysians, or 1.6% of the total population, were registered as having a disability. Figure 8 shows that people who are blind or visually impaired had the third highest percentage. Studies indicate that Sabah and Sarawak had the highest

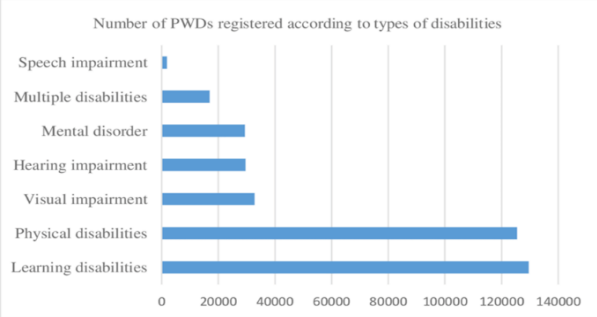


Figure 8. Shows that the number of PWDs

prevalence of visual impairment as these two regions had the poorest access to ophthalmological services. Health director general Tan Sri Dr Noor Hisham Abdullah has stated that the prevalence of blindness in Malaysia is 1.2% of the population and among the main causes are cataract (58.6%), diabetic retinopathy (10.4%) and glaucoma (6.6%).

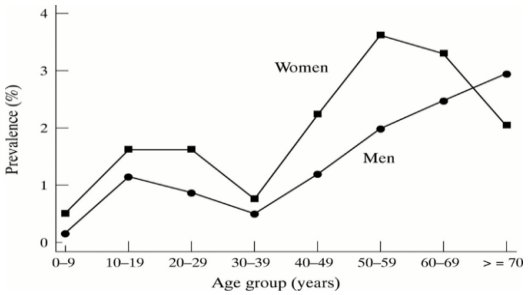


Figure 9. Age group statistic

Elderly Malaysians who were age 50 and above noted to have a higher proportion in difficulties in seeing compared to other groups of age. Older adults might face significance at a time when they may also be experiencing major life changes, such as general health limitations or the loss of a spouse, loss of independence and the ability to enjoy leisure activity are predominant concerns for older adults with a visual impairment. Other than that, older adults often have lower rates of workforce participation and productivity and higher rates of depression or anxiety.

Visually impaired or blind people have a higher risk of falls and fractures, and a greater likelihood of early entry into nursing or care homes. That is why white cane was invented to help them walk, however white cane can get stuck in cracks along the sidewalk and white cane cannot detect a speeding car or a silent vehicle when crossing an intersection.

Figure 10. Visually impaired or blind people use white cane to cross the road.

3.2 DISCUSSION

Although white cane is specialised for people who have sight problems, most people who are visually impaired or blind do not use white cane in their daily life. Most visually impaired people, especially young adults, do not want to be recognised as “blind or visually impaired” as they are afraid of what other people will look down on them. Even though they can use dogs as their guidance, dogs also can get sick, and they need to use their expense to buy food and toys for their dog. That comes into conclusion as we have discussed that our product is able to help a lot of people who have vision problems.

4. CONCLUSION

Quakesteps are useful for visually impaired people, blind people, elderly people etc. It can easily help them determine the direction and reach their destination. So that they won’t struggle to navigate around the place to find the way. As stated in our abstract, if our product is worth a high demand among citizens and is successful, we would like to expand and collaborate with some of Malaysia’s industry companies as Malaysian Technology Development Corporation and Malaysian Health Technology Assessment Section.

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INTERNATIONAL HOSPITALITY & EDUCATION
INVENTION INNOVATION & DESIGN

CATEGORY

B

HIGHER EDUCATION STUDENTS

A VOICE IN THE WILDERNESS: ECOTOURISM SELF-GUIDE APP "ECONAVIQUEST"

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ABSTRACT

As global awareness of environmental conservation and sustainable living continues to rise, so does the demand for responsible and eco-friendly travel experiences. In response to this growing interest, we introduce a groundbreaking ecotourism self-guide application—an "ECONAVIQUEST" designed to empower and educate travelers on responsible and sustainable travel practices. "ECONAVIQUEST" aims to promote responsible and sustainable travel experiences. It offers a comprehensive toolkit for travelers seeking immersive, eco-friendly journeys. Key features include interactive maps highlighting eco-sensitive destinations, in-depth guides to sustainable accommodations, and invaluable tips on minimizing environmental impact during travel. By providing users with real-time information and resources, "ECONAVIQUEST" becomes an indispensable companion for travelers who wish to explore the world responsibly. By making informed choices through this "ECONAVIQUEST, travelers can minimize their environmental footprint and become advocates for eco-conscious tourism. Using the "ECONAVIQUEST" is a seamless and intuitive experience. Travelers can effortlessly plan their eco-friendly adventures, access essential information, and make informed choices that align with their values. Our "ECONAVIQUEST" empowers travelers to reduce waste, conserve resources, and engage respectfully with local cultures and environments. In an era where travel and sustainability intersect, our mobile application "ECONAVIQUEST" serves as a beacon of responsible exploration. By embracing this technology, travelers can embark on journeys that enrich their lives while leaving a positive and lasting impact on the planet. "ECONAVIQUEST" is not just a guide; it is a call to action—a reminder that every traveller has the power to make a difference in the world, one eco-conscious adventure at a time.

Keywords: responsible, eco-friendly, sustainable, tourism, mobile application.

1. INTRODUCTION

In the realm of travel mobile applications, innovation pertains to the creation and deployment of fresh concepts, functionalities, technologies, or methods that improve and revolutionize how individuals use a mobile app to strategize, reserve, undergo, and communicate their travel adventures (Sharma, 2023). These inventive solutions are designed to enhance the accessibility, convenience, customization, and overall satisfaction of travelers, concurrently contributing to the broader advancement of the travel industry (Patel, 2023).

In the contemporary landscape, the advancement of travel mobile apps can play a substantial role in bolstering the ecotourism sector, nurturing practices that prioritize sustainability and fostering sustainable travel practices and promoting eco-friendly experiences (Shannon, 2023). Correspondingly, Ripka (2020) emphasized the increasing global consciousness surrounding environmental preservation and sustainable lifestyles, a trend paralleled by the growing desire for responsible and eco-friendly travel adventures.

To meet the requirements of solo travelers who are in pursuit of the latest trends, mobile travel app advancement should prioritize customization and security (Hemsworth, 2023). These independent explorers are in search of individualized suggestions, improved safety elements, and the chance to interact with fellow travelers who share their interests. Therefore, it becomes essential to provide AI-driven recommendations, real-time location sharing, and social networking functionalities within the app (Verma et al., 2022).

Technology has increasingly linked ecotourism to solo travelers. Numerous studies indicate that solo travelers are inclined to participate with ecotourism destinations to promote sustainability, responsible tourism, and eco-friendliness. The presence of mobile travel applications can significantly aid and guide solo travelers in selecting destinations that align with their preferences.

2. METHODS

In this chapter, we will delve into the methodology and procedures essential for gathering, preparing, and analyzing the project's details. The interpretative model was employed to frame the study through a quantitative approach, aiming to empower the researcher in discerning the perspectives of solo travelers regarding their usage patterns of mobile travel applications. To support this project, both primary and secondary data collection methods were utilized, as they are crucial in uncovering straightforward trends and incorporating the concept of mobile travel applications.

2.1 Primary Data (Google Survey Questionnaires)

Primary data signifies unprocessed information collected directly from its origin. It represents data that is firsthand and acquired by a researcher for a particular research endeavor (Zola & Hughes, 2021). Primary data is typically deemed more dependable and pertinent to a specific study since it has not been previously compiled or analyzed by external parties (Simelane, 2023). Since it serves as the primary data source, we administered questionnaires related to the mobile application. These questionnaires were designed with a clear structure to ensure that respondents fully comprehended the questions. They consisted of two sections: (i) Section A, which focused on demographic profiles, and (ii) Section B, which explored factors related to the features and usage of mobile applications during journeys. The objective of these questionnaires was to collect information regarding mobile applications. Ultimately, we successfully obtained responses from 80 participants. Through this sampling process, we concluded that this sample size is pivotal in elucidating the connection between this innovation and the genuine requirements of a mobile application for solo travelers during their journeys.

2.2 Secondary Data (E-journals, Websites, News and Magazines)

Secondary data pertains to information gathered and documented by individuals or entities for purposes unrelated to your present research or inquiry. Secondary data encompasses

information that has not been acquired directly from the primary source but has been previously handled, assessed, or made public by others (Longe, 2020). E-journals, websites, news outlets, and magazines serve as repositories of the most current research data and are instrumental in discerning finer distinctions among mechanisms, enabling an informed response to address challenges (Heath, 2023). The acquisition of secondary data provides us with insights into the advantages and global usage patterns of mobile applications among users.

3. RESULTS AND DISCUSSION

In this section, we delve into the findings derived from the collected data. Approximately 80 respondents completed the Google Survey questionnaires, and it took one week to accumulate a sufficient sample size for analysis.

3.1. Finding from Google Survey Questionnaires

Table 1. Demographic Survey Results

Items	Percentage
Gender - Female	70%
Age Group (21-30 years old)	55%
Race – Bumiputra Malaysia	78%
Marital Status - Single	86%
Level of Education – Postgraduate	92%
Employment – Employed	81%

3.2. Travel Mobile Application Innovation Product Survey: ECONAVIQUEST

Table 2. Product Survey Results

Items	Percentage
Frequency of Travel - Yes	87%
Purpose - Leisure	96%
Essential planner - Yes	85%
Usage of mobile data - Yes	93%
Concern for sustainable app - Yes	91%
Willingness to purchase - Yes	89%

Based on the findings, we highlighted several noteworthy conclusions that bear significance for the proposed ECONAVIQUEST travel mobile application. Firstly, respondents demonstrated awareness of and demand for a mobile application that does not rely on internet data, particularly when traveling abroad. Secondly, many respondents concurred that a travel mobile application could be a valuable tool during their journeys, aiding them in accessing information and planning itineraries tailored to their preferences and budget. ECONAVIQUEST, with its offerings encompassing accommodations, restaurants, attractions, and payment options, not only facilitates the solo travellers' experience but also elevates the quality of their travel experiences. Finally, a significant portion of the respondents expressed a willingness to purchase ECONAVIQUEST, indicating a viable opportunity for its development and market dissemination, particularly within the ecotourism industry.

To sum it up, ECONAVIQUEST presents a diverse array of features and advantages that can greatly enhance the travellers' experience. These capabilities streamline trip planning, improve navigation, deliver up-to-the-minute updates, and provide a variety of tools to enrich the overall journey. Nevertheless, it is crucial to note that the effectiveness of these applications may differ, underscoring the importance of selecting the most suitable ones tailored to travellers' unique travel requirements and destinations.

4. CONCLUSION

In summary, the creation of a cutting-edge mobile travel application designed to cater to travelers' requirements holds great promise for bolstering the ecotourism sector. With a meticulous focus on user preferences, sustainability measures, and responsible tourism principles, such an ECONAVIQUEST travel mobile application has the capacity not only to furnish travelers with invaluable information and support but also to advocate for eco-friendly travel decisions. By acting as a bridge between technology and ecotourism, this innovation has the potential to make substantial contributions towards conserving natural ecosystems and advocating responsible tourism practices. In the end, it stands to enhance the ecotourism experience for both travelers and the ecotourism destinations they visit.

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"SCENE SEEKER": A FILM-INDUCED TOURISM DESTINATION APPLICATION

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ABSTRACT

Film-induced tourism apps provide a wealth of experiences, allowing users to go on adventures that transport them into the heart of their favourite film storylines. These applications provide a unique blend of entertainment and adventure, allowing travellers to follow the paths of their favourite characters and immerse themselves in the cinematic delights that enthralled them on-screen. Whether strolling through the charming streets of Merlion Park as seen in "Crazy Rich Asian" or hiking to the breathtaking landscapes of New Zealand as seen in "The Lord of the Rings," these apps serve as virtual guides, providing essential information, itineraries, and booking services that turn cinematic dreams into reality. SceneSeeker is an application that allows user to visit any tourism destination where the on-set films shoot in that place. This application is a mobile or online application that encourages and supports tourism based on popular films and television series. Its main function provides travellers with facts, routes, and resources for visiting areas featured in films and TV shows. SceneSeeker assists travellers to observe locations made famous by their favourite films and television series, giving a one-of-a-kind and immersive travel experience. Furthermore, filming sites frequently have cultural and historical value, and this application may educate visitors about the background and history of these locals. The purpose of this research is to investigate the possible users, preferences, and knowledge of film-induced tourism applications in Malaysia. The survey of 150 respondents yielded important insights about the intersection of travel, movie, and technology. The survey indicates a prominent user group among young individuals aged 21-30, with a significant female representation. This demography is consistent with the global trend of tech-savvy youth enjoying travel-related apps, and it emphasises the significance of gender diversity in app creation.

Keywords: Film-induced tourism; Filming sites; Mobile application

1. INTRODUCTION

Film-induced tourism is an enthralling and transformational phenomenon that has effortlessly woven cinema's enchantment into the very essence of travel and tourism. It represents an intriguing nexus of art, culture, and adventure, where the allure of cinema transcends the silver screen to become a driving factor behind travellers' itineraries. Film-induced tourism, in its most basic form, is the act of travellers seeking out and visiting locations that have been widely featured in films, television programmes, or other kinds of visual media (Garcia, 2023). These locations, brought to life by a camera lens, transcend geographical bounds to become famous icons in the eyes of spectators. The rough splendour of New Zealand's landscapes in "The Lord of the Rings," the romantic charm of Paris in "Emily in Paris," or the captivating Hogwarts

Castle in the "Harry Potter" series all retain a magnetic attraction that drives wanderlust. The natural human need to connect with storylines and people that resonate with their emotions and ambitions drives film-induced tourism (George, 2021). Travellers who visit sites depicted in their favourite films or television series are looking for a deeper connection with the story and characters they like (Gerahty, 2019; Halim et al., 2021). These niche tourism activities provide a once-in-a-lifetime opportunity to walk in the footsteps of their film heroes, retrace the paths of famous adventures, or just soak in the atmosphere of a treasured imaginary universe (Grohl, 2021). The appeal of film-induced tourism has expanded enormously in recent years, due to technological improvements and the entertainment industry's global reach. As travellers utilise contemporary technologies like smartphone applications and augmented reality to improve their experiences, the barriers between fantasy and reality blur.

As storytelling bounds increase, so do travel possibilities, making film-induced tourism a dynamic and ever-evolving niche within the larger landscape of global tourism. Developing a film-inspired tourism application can provide several potentials for both developers and users (Dezuanni, 2020). This includes improving the local economy of places featured in films. It increases income for local businesses by drawing more travellers (Dominiguez-Azcue et al., 2021). It also promotes cultural exchange by bringing individuals from all backgrounds together to explore and appreciate different places and cultures (Liu et al., 2020). It improves global knowledge and can lead to cross-cultural interactions. Tourism boards, tourism agencies, and local businesses may benefit from the application as a valuable marketing tool. It might highlight filming sites and attractions, inviting people to come and explore these regions. Furthermore, from the standpoint of travellers, the application provides an enhanced and unforgettable tourism experience. It helps users to immerse themselves in the worlds of their favourite films, allowing them to feel a stronger connection to the storylines and characters they like.

"*SceneSeeker*," a game-changing *Film-Induced Tourism Destination Application*, emerges as a driving force in this fascinating transformation. Scene Seeker harnesses the cinematic enchantment that captivates hearts and minds, goes beyond traditional travel experiences to deliver an original voyage via the lens of the silver screen. It acts as an inventive guide, taking travellers on cinematic journeys that go beyond standard tourism. This programme perfectly merges the enchantment of movies with real-world places, using an application at its core to tell travellers which places they can visit that connect them to the film-industry. Travellers may walk into classic moments from their favourite films by superimposing film scenes onto the actual environment, providing memorable and immersive experiences that were previously exclusive to the silver screen. By acknowledging the potential of this application towards the tourism industry, this study will go deeper into the world of *SceneSeeker*, revealing the application's distinctive qualities, its potential to revolutionise film-induced tourism, and the existing prospects that abound in this dynamic and fast increasing sector. This study investigates the possible users, preferences, and knowledge of film-induced tourism applications in Malaysia Scene Seeker is more than just a travel app; it is a portal to a world where film and tourism collide, encouraging visitors to explore, discover, and rediscover the magic of cinema in the places where it all began.

2. METHODS

Before conducting the data collection, researcher aims to develop the objective of creating this application in the first place. As mentioned in the introduction section, there is an opportunity of developing film-induced tourism application to enhance the marketing process in certain

areas that are well-known in the silver screen. Primary data has been conducted concerning on the feedback of public towards the film-induced tourism application and opportunities that can be gained from the perspective of public.

2.1 Primary Data

Surveys were done by researchers to better understand traveller preferences associated with visiting film sites. This study influenced the application's general concept and design. According to Sileyew (2019), primary data collection is extremely beneficial for research and analysis if it is properly done and developed. Therefore, researchers developed three sections that are related to demographic profiles, film interests and film induced tourism experiences which are assessed among the respondents. These surveys can assist in identifying respondents who have a genuine interest in film-induced tourism and are more likely to engage with and benefit from an application like *SceneSeeker*. The survey has been disseminated through online (Google Form) among the targeted respondents around Malaysia. Throughout the data collection process, only 150 respondents have successfully answered the survey within the stipulated timeframe using the random sampling method.

3. RESULTS AND DISCUSSION

3.1. Findings

Based on the 150 respondents' responses gathered, Table 1 shows the overall findings from the surveys.

Table 1. Demographic Profile

Items	Percentage (%)
Age:	
21-30	79
31-40	15
40-51	6
Gender:	
Male	31
Female	69
Race:	
Malay	39
Indian	15
Chinese	14
Bumiputera	32

Table 1 shows that most of the respondents were aged from 21-30 (79%) and most were females (69%). Race was also assessed in this demographic profile as to study the preferences of each race in Malaysia. Findings revealed that most of the respondents were Malay (39%) followed by *Bumiputera* (Sabah/Sarawak) with 39 percents and 32 percents. This demographic profile leads to another section B concerned on the film interest among the respondents. Table 2 shows the findings.

Table 2. Film Interest

Item		Percentage (%)
Which film genres do you enjoy the most?	Action	7
	Adventures	9
	Comedy	15
	Sci-Fi	5
	Horror	11
	Romance	25
	Musical	2
	Historical	5
	Animation	7
	Documentary	2
	Biography	1
	Family	6
Do you actively follow film news, attend film festivals, or belong to film-related social groups?	Experimental	1
	Fantasy	4
	Yes	49
	No	51

Table 2 shows the findings whereas most of the respondents enjoyed film genres on romance (25%) and comedy (15%). However, only 49 percents actively participated in film news, attend film festivals, or belong to film social group while the rest were not active. This leads to another final assessment on the film induced tourism experiences among the respondents. Table 3 revealed the results.

Table 3. Film-Induced Tourism Experience

Item		Percentage (%)
Have you ever travelled to a location primarily because it was featured in a movie or TV show?	Yes	83
	No	17
Are you aware of or have you used any applications or websites related to film-induced tourism?	Yes	22
	No	78
Would you be interested in using an application that helps you explore film locations?	Yes	97
	No	3

Based on table above, it shows that most of respondents have travelled to a location because of movies or TV shows (83%). Nonetheless, not everyone has the access or aware of any application that is related to film-induced tourism whereas only 22 percent aware of it while 78 percent were not. When the survey asked whether the respondents would be interested in using an application to help them explore the location where the films being shot, most of the respondents were interested with 97 percent out of the 150 responses received.

3.2. Discussion

This study's demographic profile of respondents gives significant insights into the prospective users for film-induced tourism applications in Malaysia. Most respondents were between the ages of 21 and 30, indicating a strong interest in such applications among young individuals. This age group is frequently tech-savvy and adventurous, making them an ideal target audience for travel-related apps (Zhuang et al., 2021). Apart from that, the survey found that a sizable proportion of the responders were female. This gender distribution corresponds to the increasing trend of women actively participating in tourism and travel-related activities. Additionally, Balińska et al. (2021) stated that the larger number of females is consistent with research demonstrating that women frequently play a substantial role in travel and leisure activity decision-making. It emphasises the importance of film-induced tourism applications catering to a wide range of user groups. When the ethnic makeup of the respondents was examined, the survey discovered a large representation of Malays and Bumiputera from Sabah and Sarawak. Understanding different ethnic groups' preferences might be useful for adapting the content and features of such applications to unique cultural interests and sensitivities.

The survey outcomes offered information on the respondents' film genre preferences. Romance was the most popular genre, followed by comedy. According to these findings, users of film-induced tourism applications may be more interested in areas featured in romantic and funny films. This knowledge may be used by filmmakers and app developers to advertise places connected with certain genres. While a significant number of respondents reported an interest in film genres, a lower proportion actively engaged in film-related activities such as following film news, attending film festivals, or being a member of film social clubs. This shows that film-induced tourism applications may be able to increase user engagement by giving access to film-related material and events. The low level of participation in cinema-related activities, such as following film news and visiting film festivals, may be connected to niche tourism concepts. As a niche business, film tourism may need concerted efforts to engage and educate potential visitors about its attractions.

The findings also revealed that respondents had a significant desire to visit destinations depicted in films or TV shows, with 83 percent reporting that they had done so. This is consistent with the global trend of film-induced tourism, in which travellers seek out prominent film sites. Malaysia's diversified landscapes and thriving film industry provide a plethora of prospective locations for such travellers. Surprisingly, the survey found a significant portion respondent were unaware of any film-induced tourism applications. This indicates an opportunity for app developers and tourism organisations to spread the word about the presence and benefits of such apps. Increased awareness may result in increased adoption and usage among the target population. The poor understanding of film-induced tourism applications is consistent with technology adoption studies, which frequently exposes gaps in awareness before widespread acceptance occurs (Faqih, 2022). This highlights the importance of marketing and education efforts in promoting such applications.

The high level of interest exhibited by respondents in utilising an application to assist them research film locations is one of the most intriguing findings of this study. Such applications piqued the curiosity of 97 percent of respondents. This high level of interest implies a promising market for film-induced tourism applications in Malaysia. Users are eager to interact with technology that enhances their travel experiences by immersing them in the cinematic worlds they enjoy. Ultimately, the study's findings highlight the potential for film-induced tourism applications to prosper in Malaysia such as *SceneSeeker*, particularly among young individuals, women, and those interested in romance and comedy genres. While there is

presently little knowledge of such applications, the significant degree of curiosity shows a substantial desire for these creative tools to enhance cinematic travel experiences. To fully realise the potential of this expanding sector in the tourism industry, developers and stakeholders should work on boosting awareness, personalising content, and engaging people.

4. CONCLUSION

The study's findings confirm the potential and significance of film-induced tourism applications in Malaysia, particularly among young individuals, women, and those who enjoy romance and comedy genres. As technology continues to change travel experiences, developers and stakeholders have a chance to cater to this expanding industry by providing novel solutions that allow consumers to immerse themselves in the cinematic worlds they enjoy. The future of film-induced tourism applications in Malaysia and abroad seems promise by solving awareness gaps, personalising content, and engaging consumers. This study's findings are consistent with previous research on film genre preferences, technological use, and travel behaviour. These connections highlight the study's findings' significance and validity in the context of film-induced tourism research and user behaviour. Future research may build on these findings to improve our understanding of this specialised sector and its future potential in Malaysia.

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SauSa: THE DEVELOPMENT OF FROZEN FISH AND COCONUT SAUSAGE

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ABSTRACT

'Satar' is a traditional snack from the state of Terengganu, Malaysia. This snack is well-known for being wrapped in a banana leaf and shaped into a pyramid triangle, and it is commonly eaten during hi-tea. SauSa is an innovative product designed to enhance the original 'Satar' with a cylindrical shape. SauSa has a cylindrical shape, a tender texture, a cocktail size, and a smoky taste. It is made from a blend of boneless fish and coconut, marinated in spices. The simple steps used to produce this product start with blending and mixing the ingredients, stuffing and shaping, pre-boiling, followed by packaging and freezing. Plastic containers are used as packaging, which is suitable for frozen food. Three cooking methods for SauSa—boiling, frying, and grilling—were offered to a panel of 30 participants in the hedonic test. The panelists assessed the meal samples' appearance, tenderness, texture, flavor, juiciness, and overall acceptability. The variation that received the highest score across all attributes was the fried sample. With SauSa, consumers can quickly prepare the snack using a straightforward process that offers an unusual take on the traditional "Satar" with the flavor of sausage found in similar products on the market. This product holds commercial value for all age groups as it is a unique and flavorful snack that can be easily made at home."

Keywords: satar; snack; frozen; sausage; hedonic test.

1. INTRODUCTION

'Satar' is a dish made from flavorful boneless fish that has been marinated in spices, wrapped in banana leaves, and grilled over a roaring charcoal fire (Tourism of Terengganu, n.d.). The components of 'Satar' include chopped fish meat, shredded coconut, onion, chili, salt, and other seasonings. The mixture is then wrapped in banana leaves, shaped into a cone, skewered with a bamboo stick, and cooked on a grill. Today's ready-to-eat, and ready-to-cook food products hold a significant market share as they are direct substitutes for everyday meals (Temgire et al., 2021). Considering the growing demand for seafood products, the quality and shelf life of seafood are crucial. However, the quality of frozen fisheries products starts to decline steadily over time during frozen storage (Alsailawi et al., 2020). To extend the shelf life of many fruits and vegetables beyond that of refrigerated foods, frozen storage is commonly used. Several studies suggest that frozen storage may retain vitamins and minerals, and there is no significant change to the carbohydrate, protein, or fat content (Ellis, 2022). An issue arises from incidents where a child accidentally stabs themselves with skewers (Halifah,

2021). The solution offered by this product is to create a frozen snack that poses no harm to consumers.

2. MATERIALS AND METHODS

2.1 Materials

The materials for SauSa were sourced from both a lab assistant and market. Table 1 displays the percentage of the ingredients used in the production of SauSa.

Table 1: Formulation of SauSa

Ingredients	Percentage (%)
Mackerel	41.6
Grated coconut	34
Vietnam coriander	10.5
Onion	5.8
Sugar	3.7
Salt	3.7
Smoke oil	2
Chili	0.6
Garlic	0.5
Ginger	0.5

Variations:
1. Control- Boiling 10 minutes in a pot.
2. Variation 2- Grilling for 15 minutes on a pan.
3. Variation 3- Frying for 10 minutes in deep fry.

2.2 Methodology

a. Preparation of the Mixing Ingredients
Begin by removing the bones from the fish. Then, mix ingredients such as mackerel, ginger, onion, garlic, chilies, and Vietnamese coriander. Combine this mixture with grated coconut, salt, sugar, and smoked oil.

b. Stuffing
Stuffed the mixture inside the cow's intestines, ensuring to weigh and knot them.

c. Boiling
Boil the stuffed cow intestines in a pot for approximately 10 minutes.

d. Packaging
The packaging for SauSa consists of containers. Each piece weighs 50 grams, and each pack contains a total of 500 grams. The packaging for Satar sticks is both secure and decorative, designed for marketing purposes. This packaging also preserves the product's quality over an extended period.

e. Freezing
Place the product in a freezer set at -18 degrees Celsius.

f. Grilling
In a pan with a small amount of oil, grill the product for about 15 minutes until it turns a golden-brown color.

g. Frying
Deep fry the product at a temperature of 80 degrees Celsius for approximately 10 minutes. Ensure to flip the product upside down every 1 minute to prevent excessive browning.

2.3 Sensory Evaluation & Analysis

The purpose of the sensory evaluation is to assess customer acceptance of the product based on its appearance, tenderness, texture, flavor, juiciness, and overall appeal. The evaluation involves different variation of cooking methods: boiling, frying, and grilling. A panel of 30 panelists from diverse educational backgrounds participated in the sensory evaluation, and to avoid bias, the samples were labeled with unique three-digit codes. A total of 90 samples were used for the initial sensory assessment, all labeled with three-digit sample codes. While all samples share the same formulation, they vary based on the cooking method employed. Panelists were provided with plain water to cleanse their palate between evaluations. In this study, a nine-point hedonic scale was utilized to measure the panelists' level of acceptability towards the product.

3. RESULTS AND DISCUSSION

1. The Final Product

The final product after stuffing the mixture were shown in Figure 1. It has a coctail size with 50g of each nos. Figure 2 shows the three variations of cooking methods—boiling, grilling, and frying—the boiled SauSa exhibits a grey color. The fried SauSa displays a golden brown, while the grilled SauSa shares the same color as the boiled version, yet it develops burns on certain parts. Suggested packaging for frozen SauSa were shown in Figure 3 using plastic food tray.

Figure 1: Before boiling and freezing

Figure 2: After boiling, frying, and grilling

Figure 3: SauSa in Packaging

2. Sensory Evaluation

The sensory evaluation took place at Universiti Teknologi MARA Kampus Dungun, involving the participation of students and lecturers as panelists. Ratings were assigned on a scale of one to nine, where a score of nine indicated an extreme level of preference, and a score of one indicated an extreme level of dislike. The average score for each test was calculated to compare variations in formulations and cooking methods. The outcomes of the sensory evaluation are presented in Table 2.

Table 2: The sensory evaluation of SauSa

	Appearance	Tenderness	Texture	Flavor	Juiciness	Overall acceptance
Boiling	6.7	7	7	7	6.8	7
Grilling	6.4	6.7	7	7.1	6.4	7.1
Frying	6.8	7.4	7.3	7.4	7.3	7.5

Three cooking variations were employed: Boiling (control), Grilling, and Frying. Observing the appearance of SauSa, the results indicated that frying garnered the highest average score in comparison to the other variations. In terms of tenderness, texture, and juiciness of the SauSa, panelists exhibited a preference for the fried variant over the other cooking methods. As for flavor, the frying cooking method exhibited the highest level of acceptability, suggesting a greater preference for the flavor resulting from frying. Lastly, samples prepared through frying attained the highest mean scores in overall acceptability, followed by grilled and boiled samples, respectively.

4. CONCLUSION

Through experimentation with various innovative preparation methods for SauSa, efforts have been made to ensure its palatability and alignment with the preferences of a diverse consumer base. Moreover, the decision to freeze SauSa has been implemented to prolong its shelf life, facilitating its commercial viability. By employing uncomplicated and cost-effective techniques, a potential market for this product's sale is being established. Due to its bite-sized nature, this food item can be conveniently consumed in one go, leading to a distinct aroma and flavor profile. Ultimately, SauSa has demonstrated the capacity to uphold its quality over an extended duration.

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SAVORING SATAY KRUP KRAP: DEVELOPMENT AND SENSORY INSIGHTS

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ABSTRACT

Satay is one of the Malay dishes that made its way to Arab and Indonesia. It is a popular street snack which involves grilling marinated meat on bamboo skewers. This research introduces an innovative approach: using popia skin instead of bamboo skewers to create a unique product with a special cooking method for popia satay filling. It also focuses on developing a new way to prepare and maintain the popia skin with the filling inside. The main ingredients of the product were chicken, herbs, nuts, spice and popia skin. Three cooking methods for the chicken filling were employed including frying, baking, and steaming. After the production, sensory evaluations were conducted to ascertain consumer preferences on three different variations of sample. The sensory evaluation involved 30 panellists. The overall results indicated that the most preferred cooking method is baking represented by the color, flavor, and overall acceptance. This product's specialty lies in being a frozen food that can be enjoyed at any time and offers a satisfying crunchiness, distinct from traditional satay and more convenience without bamboo skewers. Additionally, it contributes to reducing waste disposal. In conclusion, Satay Krup Krap is a suitable choice for individuals of all generations and can be enjoyed on various occasions and festivals, particularly by those who are fond of satay.

Keywords: frozen food; popia skin; satay; sensory evaluation; snack

1. INTRODUCTION

Over the years Satay is one of the Malay dishes that made its way to Arab and Indonesia, but its origin has been widely agreed from Indonesian island of Java (Morais, 2017). Satay is a dish featuring meat that is typically marinated, threaded onto skewers, grilled, and often accompanied by a popular peanut sauce. Satay can be prepared using various styles of diced or sliced meats, including options like beef, chicken, and more. This study presents an innovative approach by replacing bamboo skewers with popia skin. The main objective of this product development was to create an innovative product with a distinct cooking technique for the popia satay filling including frying, baking, and steaming.

Spring rolls are a delicious appetizer or meal found in many Asian countries. These are usually made by wrapping a spring roll paper or other thin dough around a vegetable or meat filling (Huynh, 2015). Spring rolls typically exhibit a crunchy texture, combining the crispness with the tenderness of the chicken filling inside the popiah (Marvellina, 2023). Using an alternative cooking technique can introduce variety to the product, resulting in distinct flavors, textures, and tastes.

Therefore, this research also aimed to develop a novel method of preparing and keeping the popia skin intact with the filling inside. Apart from that, frying, baking, and steaming are different cooking techniques employed to transform the traditional satay concept, which typically involves skewering and grilling chicken. According to Remedios (2014), steaming is the best cooking technique to retain nutrients and minerals that are otherwise lost in the boiling or sauté process. Meanwhile, baked dishes offer fewer calories and are great for weight loss. This not only saves time but also helps preserve the natural vitamins to some extent, enhancing the overall appeal of the popiah with its flavorful taste. Hence, the specialty of Satay Krup Krap that consists of popiah skin rolled around chicken filling marinated with spices and served with peanut sauce, lies in being a frozen food that can be enjoyed at any time and offers a satisfying crunchiness, distinct from traditional satay and more convenience without bamboo skewers.

2. MATERIAL & METHODOLOGY

2.1 Material

The ingredients used in Satay Krup Krap are sourced from both a faculty and retail market. Table 1 and Table 2 shows the percentage of the ingredients used in the production of Satay Krup Krap.

Table 1: Sate Ayam Materials

Ingredient	Percentage (%)
Whole chicken	80.78
Sugar	8.08
Salt	1.45
Cumin	1.62
Fennel seed	1.62
Coriander seed	1.62
Red Onion	2.42
Lemongrass	2.42

Table 2: Kuah Kacang Materials

Ingredients	Percentage (%)
Peanut	51.23
Water	13.32
Dried chili	15.37
Shallot	2.87
Oil	8.20
Salt	1.84
Lemongrass	1.02
Gula melaka	3.07
Tamarind	2.05
Ginger	0.51
Lengkuas	0.51

Variations:

1) Control- Fried chicken marinated sate filling
2) Variation 1- Steamed chicken marinated sate filling
3) Variation 2- Baked chicken marinated sate filling

2.2 Method

1) Sauce making- Weighing accurately the ingredients and prepared peanut gravy for the Satay Krup Krap.
2) Make chicken satay filling - Mixed all the ingredients and marinate the chicken, then subject it to three distinct cooking methods: frying, baking, and steaming.
3) Assembling - Roll the chicken filling that already cooked with popiah skin until it shaped.

4) Packing - Place the rolled popiah in one container and the peanut sauce in a separate one.
5) Storing - Pack the neatly prepared popiah into the freezer, and it will be ready for consumption.

2.3 Sensory Evaluation

The purpose of the sensory evaluation was to gauge customer acceptance of the product, considering aspects such as color, flavor, taste, texture, and overall satisfaction. In this study, sensory assessments were conducted, focusing on different cooking methods. Three cooking variations, namely frying, steaming, and baking, were employed. A total of 30 panellists from varied educational backgrounds participated in the sensory evaluation. To minimize bias, the samples were labelled with unique three-digit sample codes. Ninety samples were presented for the sensory evaluation, and each three-digit code contained an equal quantity of chicken filling. The sensory evaluation took place at Universiti Teknologi MARA Cawangan Terengganu Kampus Dungun, with student participants serving as panels.

3. RESULTS AND DISCUSSION

3.1. Product Specification

Satay Krup Krap is a product crafted with meticulous manufacturing techniques. It encompasses various criteria, including color, taste, texture, flavor, and overall acceptance. Due to its nature as a frozen product, the packaging process for Satay Krup Krap is executed with great care.

Figure 1: Product before packaging

Figure 2: Product after packaging

3.2 Sensory Evaluation

In this study, a nine-point hedonic scale was employed to measure the acceptability of the product by the panellists. A score of nine indicated "like extremely," while a score of one signified "dislike extremely." The average score for each evaluation was used to compare the different cooking methods. The results of the sensory evaluations are presented in Figure 3.

Three different cooking methods were utilized in this study: frying, steaming, and baking. Regarding the color of the satay popia, the results revealed that Variation 2 achieved the highest mean score in comparison to the other variations, with the control receiving the lowest score. This difference can be attributed to the filling, which imparted a vibrant color to the satay.

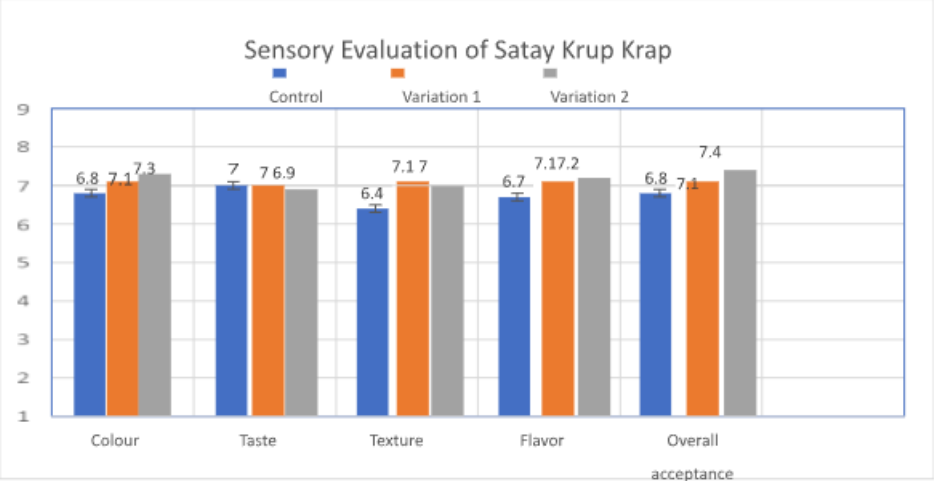

Figure 3: Mean Chart for Sensory Evaluation

In terms of taste, the panelists favored both the control and Variation 1. When it came to texture, Variation 1 exhibited the highest level of preference, likely due to the soft chicken filling it provided. In the case of flavor, the mean scores were 6.7 for the control, 7.1 for Variation 1, and 7.2 for Variation 2. These results indicate a strong preference for the flavor of Variation 2. Lastly, in overall acceptability, Variation 2 obtained the highest mean score, followed by the control and then Variation 1. Based on these findings, this study can conclude that Variation 2 scored the highest in terms of flavor, color, and overall acceptability.

4. CONCLUSION

In summary, it appears that the panelists preferred the Satay Krup Krap made with chicken, particularly in terms of flavor, aroma, and overall acceptance. Moreover, all participants unanimously agreed that the baked sample surpassed the fried and steamed samples in terms of all attributes. In alignment with the research objective, this study successfully demonstrated the preservation of popia skin while containing the filling within.

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CLASSIC BITE: RECIPE DEVELOPMENT AND SENSORY ASSESSMENT

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ABSTRACT

Kuih Siput is a classic Malaysian food that is well-known among the Malay community. This food is often found and consumed as one of the popular snacks during Hari Raya celebration. Classic Bite is purposefully designed to enhance a new taste of original kuih siput in a new variety of cheese flavours and salted egg flavours in the form of frozen food due to the product's restricted taste and availability. This frozen food has a spiral volute shape, crisp texture, sweet taste, and a brownish colour after being prepared. The product is made from soft flour, butter, and seasoning (curry powder, cheese powder and salted egg powder). A simple process to produce this product starts with mixing and kneading the dough, pressing, and shaping, pre-frying followed by packing and freezing. Plastic containers are used as packaging suitable for the frozen product. To assess the degree of consumer acceptance and satisfaction with the product, the hedonic test was conducted on 30 panelists by offering them three (3) different variations of Classic Bite flavour; curry powder (C), cheese powder (V1), and salted egg powder (V2). The panelists evaluate the colour, texture, crispiness, taste, flavour, and overall acceptance of the food sample. The most accepted variation is the cheese flavour sample with the highest score of attribute flavour, taste, and overall acceptance of the product. Consumers can simply enjoy the snack with a simple process, such as deep-frying or air-frying it whenever they like as Classic Bite has a different flavour from the other products on the market. This snack meal has strong commercial value for individuals of all ages, including children and adults, owing to its addictive taste and the ability to be consumed outside of festive occasions.

***Keywords**: Frozen food; Fried food; Hedonic test; Kuih siput; Snack*

1. INTRODUCTION

Snacking is frequently described as eating or drinking something in between meals, however there are some slight variations in this definition, with some studies defining certain times following meals (for example, 15 minutes) and others identifying the quantity of food consumed (Njike et al., 2016). Consumers frequently reject crispy products because of the loss of crispness caused by the adsorption of ambient moisture or by water mass transfer from nearby components (Saeleaw & Schleining, 2011). When a soft wheat variety produces cookies with a large diameter and a consistent surface cracking pattern, it is regarded as having good quality (Rakshit & Srivastav, 2022). Kosegarten et. al (2022) stated that food can be safely kept in the freezer indefinitely, but that does not mean it will always be in good condition. The flavor

and texture will be much better if you utilize the food within the ideal freezing timeframe. Freezing food is one of the simplest methods of food preservation (Leach, 2020). Objective and subjective testing are two categories for evaluating vaguely sensory information (Sharif et al., 2017.). In the first way, qualified evaluators determine a product's hedonic reaction; in the second method, customers participate in the evaluation process. The most practical and cost-effective way to determine the impact of changes in ingredients, manufacturing, packaging, or shelf life is through hedonic analysis (Sharif et al., 2017.). The problems take a long time to shape, only one flavour and only on Hari Raya Celebration. The solution of this product produces a variety of flavour, introducing this product as a snack that can be eaten anytime and making it frozen and saving time.

2. METHODS

2.1 Materials

Material of Classic Bite, soft flour as a main ingredient to make a dough and variation flavor was purchased in the shop. Table 1 shows the percentage of the ingredients used in making Classic Bite.

Table 1: Formulation of Crispiness Snail Frozen

Ingredients	Percentage (%)
Wheat flour	58%
Water	32.3%
Butter	7%
Curry powder/ Cheese powder/ Salted egg powder	2.3%
Salt	0.5%
Total	**100%**

Variations:
1. Control - basic ingredient with 10g curry powder.
2. Variation 1 - curry powder changed to 10g of cheese powder.
3. Variation 2 - curry powder changed to 10g of salted egg powder.

2.3 Methodology

a. Preparation of dough
Weigh all the ingredients and mix in the mixer until it becomes a dough.

b. Shaping the product
Press a small amount of dough on the special tools.

c. Pre-Frying
Fry in a deep pan at 180°C for about 1 minute. Fry it only half cooked.

d. Packing
Pack the product with 200 grams each pack in the plastic container with 10 grams of selected flavor.

e. Freezing

The packed product is kept at a temperature of -18°C in the freezer.

2.3 Sensory and analysis

The mission of the sensory assessment is to determine consumer acceptance of the product based on color, texture, crispiness, flavor, taste, and general acceptance. The samples of the sensory evaluation are control and two variations. The first variation is cheese, and the second variation is salted egg. During evaluation, 30 panelists evaluated this product with different background studies. Each sample is placed three digits of the number so that it is not converted. Sample Control (C) is based on a basic recipe of *kuih siput* which is curry flavored. Sample variation 1 (V1) is a basic recipe of *kuih siput* and curry powder are changed to cheese powder. Sample variation 2 (V2) is the basic recipe of *kuih siput* and curry powder are changed to salted egg powder. All the samples consist of the same amount of ingredients and only change for the powder flavor. The sensory evaluation type is hedonic scale. The scale from dislike extremely '1' to like extremely '9'.

3. RESULTS AND DISCUSSION

3.1 Product

This frozen snack has 3 flavours that have a different characteristic for every flavour. For curry powder (c), which has a brown color and basic taste like *kuih siput* and aroma of curry is strong. Next, cheese powder (V1) has an orange color and a little bit spicy taste because of the use of spicy cheese. Meanwhile, salted egg powder (V2) has a yellow color and salty taste. The frozen snack is in spiral volute shape.

3.2 Sensory test result

After the crispy frozen snail was ready, the sensory evaluation was done in UiTM Cawangan Terengganu Kampus Dungun as the lecturers and students were selected as the panellist to evaluate the product. Each sample has been labeled with a 3-digit number to distinguish each variation. There are 3 variations which are curry powder, cheese powder and salted egg. Each panel needs to be evaluated based on color, texture, crispiness, taste, flavour and overall acceptance. In this product, the researchers were using a 9-point hedonic scale to take the acceptance of this product and the data were analyzed using a microsoft Excel. Each score given shows the different value of each variation. Table 2 shows sensory evaluation results.

Table 2: Sensory Evaluation of Classic Bite

Characteristics	Curry powder (C)	Cheese powder (V1)	Salted egg (V2)
Color	6.9	7.9	7.1
Texture	7.2	7.2	7.4
Crispiness	7.6	7.3	7.5
Taste	6.9	7.5	7
Flavour	7	7.2	6.8
Overall acceptance	7.2	8	7.5

There are three variations used, 2.3% for each curry as control, cheese, and salted egg. Based on the chart, the highest mean score of color is cheese and the lowest mean score is curry as control. For the texture, the panelist is more likely to choose sample C of salted egg 7.4 while curry as control and cheese had the same mean score which is 7.2. Next, the crispiness that panels prefer is curry 7.6 and the lowest mean score is cheese, 7.3. The highest mean score for taste is cheese 7.5, while the lowest taste is curry powder 6.9 and cheese 7. The flavor that most panelists preferred is cheese 7.2, followed by samples A and C were 7 and 6.8. Lastly, for overall acceptance, the highest mean score is 8 for cheese as sample B, 7.5 for salted egg, and 7.2 for curry.

3.3 Packaging & Labelling

The Classic Bite is weighed and packed in proper packaging for convenience purposes. Figure 1 is an example of the packaging of Classic Bite as it must be made of freeze-safe materials of -18°C, BPA-free, microwavable, and eco-friendly. The label of Classic Bite acts as communication to the consumers by providing information on how to enjoy this snack as well as marketing purposes. Figure 2 shows the labelling of Classic Bite includes the ingredients, cooking, and storage instruction.

Figure 1: Packaging of Classic Bite.

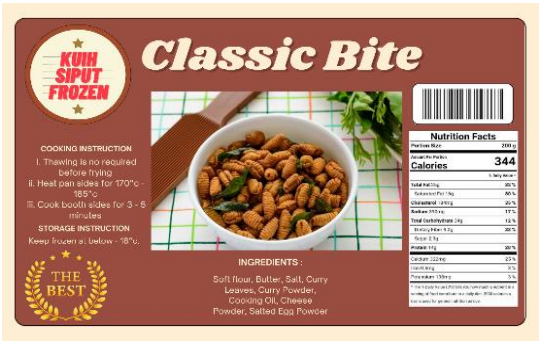

Figure 2: Labelling of Classic Bite

Figure 3: Classic Bite Cheese Flavour after frying.

CONCLUSION AND RECOMMENDATION

The sensory evaluation that has been done shows that the color, taste, flavour, and overall acceptability of *kuih siput* with cheese powder (Figure 3) were more accepted by the panelists compared to other flavours. Also, the availability of dough that has been formed and only needs to be fried makes it easier for customers. Therefore, the modification of this traditional food for the present can maintain it in the future. The suggestion for this product is that it should be the same size during the process so that this product gets a crunchy texture.

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A SENSORY EXPLORATION AND RECIPE DEVELOPMENT OF KELULUT HONEY ARENG ICE CREAM

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ABSTRACT

Kelulut Honey Areng Ice Cream is a novel frozen treat enriched with the sweetness of palm (Areng) sugar and the unique flavour of Kelulut honey. This product offers an alternative assortment of ingredients for creating confections, departing from traditional ice cream formulations. Honey Areng Ice Cream was a diary-based dessert melding three elements: a layer of Kelulut honey, a layer of Areng sugar, and a layer of Kelulut honey caramel. Kelulut honey and Areng sugar were combined and cooked over medium-high heat until thickened before adding them to a fluffy, beaten heavy cream. Kelulut honey caramel was then drizzled over the ice cream before freezing. The finished product was sealed in a suitable container and placed in the freezer to allow the ice cream to solidify and attain the appropriate consistency. A total of 60 panellists participated in the hedonic test, which assessed attributes: appearance, sweetness, sourness, flavour consciousness, and overall flavour. The panellists were offered three variations of Kelulut Honey Areng Ice Cream with various combinations: controlled (C), mixed (Variation 1), and layered (Variation 2). The controlled variation (C) was based on Areng sugar, whereas the mixed flavour (V1) contained an equal ratio of Kelulut honey and Areng sugar. The layered flavour (V2) contained alternating Kelulut honey and Areng sugar layers. The study discovered that (V2) received the highest score, making it the most preferred flavour among the variations. Therefore, Kelulut Honey Areng Ice Cream with layered flavour (V2) containing alternating Kelulut honey and Areng sugar layers holds substantial commercial value and market potential, enjoyed by individuals of all ages.

Keywords: Kelulut honey; Areng sugar; Milk-based food; Hedonic test: Ice cream

1. INTRODUCTION

Kelulut honey, also known as *Trigona* honey or stingless bee honey, is a type of honey produced by the stingless bees of the *Trigona* species (Aziz et al., 2018). The high concentration of antioxidants in *Kelulut* honey improves human health through its ability to counteract oxidative stress and lower the risk of chronic illnesses (Aziz et al., 2018). Meanwhile, *Areng* (palm) sugar is valued not only for its unique taste but also its nutritional composition. Frequently regarded as a more healthful substitute for refined sugar on account

of its reduced glycaemic index (GI), this sugar is rich in antioxidants, vitamins, and minerals such as potassium, calcium, iron, and magnesium (Wright, 2015).

Ice creams are frozen desserts enjoyed by people of all ages worldwide. Spence and Piqueras-Fiszman (2014) ascribe a substantial portion of the appeal to its sensory qualities. First, there are different satisfying flavours of ice cream, including sweet, creamy, and savoury (Hayes & Keast, 2012), available to accommodate various palates. The smooth and creamy texture of ice creams also creates a pleasant mouthfeel, adding to the overall sensory experience. Furthermore, the combination of richness and creaminess enhances the enjoyment of the dessert (Schlup et al., 2017). In addition, ice creams are often associated with positive emotions and indulgence; thus, they are commonly linked to celebrations, social gatherings, and special occasions, symbolising joy and happiness (Cardello et al., 2003). Accordingly, the current study aimed to create an interesting combination of sweet and sour flavours in ice cream, a frozen dairy product, using *Kelulut* honey and *Areng* sugar as the main ingredients.

In today's market, there is a scarcity of entrepreneurs engaged in the production of goods derived from *Kelulut* honey. Among the limited goods is a product from Orilin Resources, namely Orilin Chewable *Kelulut* Honey. However, in the ice confection category, there remains an absence of a product that highlights *Kelulut* honey as a flavour worthy of enjoying and tasting. Hence, to capitalise on the potential of the confectionery market, it is imperative to introduce a product that emphasises the distinctive qualities of *Kelulut* honey while incorporating *Areng* sugar to enhance its overall value. This mixture imparts sour and sweet flavours, which is unusual given that ice creams are often only sweet. Honey *Areng* Ice Cream is the latest innovation because it is yet to be available. So, it has potential market opportunities and could bring advantages to manufacturers. Therefore, this study was conducted to develop an ice cream based on *Kelulut* honey and *Areng* sugar.

2. MATERIAL & METHODS

2.1 Material

Table 1 shows the percentage of the ingredients used in making kelulut honey areng ice cream. The materials were sourced from faculty and retail market.

Table 1. Formulation of Honey Areng Ice cream

INGREDIENTS	PERCENTAGE		
	CONTROL	VARIATION 1	VARIATION 2
Whipping cream	57.27%	55.04%	44.17%
Full cream milk	27.01%	25.96%	40.11%
Kelulut honey	9.72%	13.24%	10.63%
Areng sugar	5.40%	5.19%	4.17%
Corn flour	0.60%	0.57%	0.92%

2.1.1 Variations

The current study employed a combination of *Kelulut* honey and *Areng* sugar. The controlled variation centres around the rich essence of *Areng* sugar. In Variation 1, a mixed combination, the *Kelulut* honey mixture was blended with the *Areng* sugar mixture, creating a harmonious fusion of flavours. Alternatively, Variation 2, a layered combination, incorporated a layered composition by combining the *Kelulut* honey mixture and the *Areng* sugar mixture through a layering procedure.

2.2 Method

2.2.1 Preparation of *Areng* sugar sauce

Corn flour, milk, and *Areng* sugar were combined until mixed well. The mixture was cooked over medium heat with constant stirring to avoid lumps until thickened. When thickened, the mixture was let to cool before being combined in a beaten heavy cream.

2.2.2 Preparation of *Kelulut* honey sauc

Corn flour, milk, and *Kelulut* honey were combined until mixed well. The mixture was cooked over medium heat with constant stirring to avoid lumps until thickened. When thickened, the mixture was let to cool before being combined in a beaten heavy cream.

2.2.3 Beating method

The mixer bowl and heavy cream were chilled in a chiller prior to beating the mixture until it reached a soft peak consistency. Two mixtures were created using beaten whipping cream, *Areng* sugar sauce, and *Kelulut* honey sauce.

2.2.4 Preparation of *Kelulut* honey caramel

Whipping cream and *Kelulut* honey were combined and cooked over medium heat with constant stirring until the mixture reached an internal temperature of 114 °C. Then, the mixture was removed from the heat and buttered before the mixture cooled.

2.2.5 Layering method

Kelulut honey and *Areng* sugar mixture were layered in a container one by one using a piping bag until it filled a quarter of the container. The layer was concealed and topped with a drizzle of *Kelulut* honey caramel.

2.2.6 Storage

Kelulut Honey *Areng* Ice Cream was sealed and packaged for distribution and marketing. The ice cream was then placed in a freezer.

2.3 Sensory Evaluation Consumer Acceptance

Consumer acceptance of *Kelulut* Honey *Areng* Ice Cream was determined using a sensory evaluation. A total of 60 panels consisting of students, lecturers, and staff from MARA

University of Technology Terengganu Branch, Dungun Campus, and outsiders participated in the evaluation. A three-digit code separated each of the three samples. The first sample, the controlled variation, was *Areng* sugar mixture with drizzled *Kelulut* honey caramel. The second sample was the mixed sample (Variation 1) consisting of the *Areng* sugar mixture with *Kelulut* honey and drizzled *Kelulut* honey caramel. Lastly, the layered sample (Variation 2) consisted of layers of *Areng* sugar mixture and *Kelulut* honey mixture with *Kelulut* honey drizzle caramel. Each panel judged the appearance, sweetness, sourness, honey awareness, and overall flavour. This evaluation used a nine-point hedonic scale from one (extremely dislike) to nine (extremely like). The mean score of each sample was used to compare the balance of *Kelulut* honey and *Areng* sugar flavours.

3. RESULTS AND DISCUSSION

3.1 Product Characteristic

Honey *Areng* Ice Cream was made with *Areng* sugar serving as the base, then layered with *Areng* sugar and *Kelulut* honey. A drizzle of *Kelulut* honey caramel was then placed on top of the ice cream. Figure 1 shows the image of the final product. The packaging of the product was suitable for communal use by the whole family. The product name, ingredients, and nutrition facts for each serving size were displayed on the outside of the packaging, particularly on the lid of the ice cream container. In addition, storage suggestions for storing ice cream and the product manufacturer made (see Figure 2).

Figure 1. The Image of the Product

Figure 2. The Dimension of Packaging

3.2 Results Sensory Evaluation

Table 2 displays the sensory results of the evaluation process for selecting the best *Kelulut* Honey *Areng* Ice Cream. Variation 2 received the highest ratings in most categories, while the controlled variation and Variation 1 received lower ratings in most areas. Regarding the ice cream appearance, Variation 2 received the highest rating with a score of 7.1, suggesting that it was the most visually pleasing variation. Variation 2 had two different colours demonstrating the visual layers of the ice cream. On the other hand, controlled variation and Variation 1 had one colour, making the panel less appealing to them.

Regarding the sweetness of the ice cream, most panels favoured Variation 2, with the highest score of 7.4. It was due to the delicate balance between *Kelulut* honey and *Areng* sugar. The panels enjoyed the overall flavour of Variation 2 but missed the taste of *Kelulut* honey in the

variation. Meanwhile, Variation 1 had a strong *Kelulut* honey flavour, but the concentration and strength of the flavour required improvement to balance *Areng* sugar. The higher water content in raw honey, as opposed to heated honey, is responsible for this phenomenon. The elevated water level in raw *Kelulut* honey provides favourable conditions for yeast growth, leading to the fermentation of sugars and the production of yeast, alcohol, carbon dioxide, and acetic acid (Amir et al., 2021). Due to the high acidity of *Kelulut* honey, it can keep the taste of *Areng* sugar ice cream from fading.

Table 2. Result of the Sensory Evaluation

	Appearance	**Sweetness**	**Sourness**	**Honey consciousness**	**Overall flavour**
Control	6.2	6.5	5.8	6.2	6.5
Variation 1	6.6	5.6	5.9	6.8	3.9
Variation 2	**7.1**	**7.4**	**6.8**	**7.4**	**8.4**

Regarding ice cream sourness, Variation 2 had a high score of 6.8 compared to controlled variation and Variation 1. Due to the sourness of *Kelulut* honey, Variation 2 complemented the sweetness of *Areng* sugar. *Kelulut* honey contains a high concentration of alkaloids and flavonoids, which give it a sour and acidic flavour (Zainin & Hassan, 2021). The sweetness of *Areng* sugar was overpowered in controlled variation that the sourness of honey acidity could not be detected. However, Variation 1 had lesser sour acidity due to the high taste of *Areng* sugar.

Next, compared to controlled variation and Variation 1, Variation 2 obtained the highest score for honey awareness, with a score of 7.4. The variation enhanced honey awareness without detracting from the flavour of *Areng* sugar. While the controlled variation had a higher *Areng* sugar content, the presence of *Kelulut* honey in the ice cream was less prominent, as was Variation 1. Finally, Variation 2 received the highest score of 8.4 for overall flavour. The variation received the highest score for its overall appearance, sweetness, sourness, and honey awareness. While the controlled variable scored 6.5, indicating a good overall flavour, Variation 1 received the lowest score of 3.9, indicating that it was less pleasurable compared to the other variables. These comparisons emphasise the advantages and disadvantages of each variation in terms of flavour and sensory features. Most panel members preferred layered *Kelulut* Honey *Areng* Ice Cream (Variation 2).

4. CONCLUSION

The research aimed to create a unique combination of sweet and sour ice cream flavours using *Areng* sugar and *Kelulut* honey, unlike the typical sweetness found in traditional ice creams. *Kelulut* Honey *Areng* Ice Cream is a unique confectionery made from *Kelulut* honey and *Areng* sugar. The ice cream offers an alternative sweet treat to traditional options. This dairy-based product combines three different mixtures: *Kelulut* honey layer, *Areng* sugar layer, and *Kelulut* honey caramel. As the latest ice cream innovation, *Kelulut* Honey *Areng* Ice Cream has potential market opportunities and benefits for manufacturers. Also, *Kelulut* honey and *Areng* sugar improve body health and the immune system, besides providing a good source of protein for all ages and genders. In short, *Kelulut* Honey *Areng* Ice Cream is a dessert that can be shared in large numbers, making it a valuable addition to the ice cream industry.

ACKNOWLEDGEMENT

It is a project funded by our faculty, which is an expression of appreciation to the Faculty of Hotel and Tourism Management of Universiti Teknologi MARA (UiTM) Terengganu Branch, Dungun Campus, and a big thank you to everyone involved during the time we completed this project. Not forgetting the lecturers and colleagues who helped make this product a success.

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INNOVATION IN A JAR: CRAFTING AND EVALUATING WATERMELON RIND HONEY JAM

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ABSTRACT

Watermelon Rind Honey Jam is a food innovation crafted from the often-overlooked white portion of a watermelon, known as rinds. The purpose of Watermelon Rind Honey Jam innovation is to create a sustainable approach to reducing food waste and increasing culinary diversity. This product offers a distinctive texture with cooked watermelon rind and a delightful blend of sweet and sour flavors. The Watermelon Rind Honey Jam is prepared through a series of steps. Initially, the watermelon skin is carefully peeled off. Subsequently, the watermelon rind is sliced into approximately 3 to 4 centimetres pieces. Following that, the rind is cooked in a solution containing honey and sugar until it thickens and transforms into a paste-like consistency. Lastly, the finished product is packaged in a 300g glass jar and sealed using a canning process. A sensory evaluation was conducted with 60 panelists, focusing on attributes such as appearance, viscosity, sweetness, aroma, and overall flavor. Three variations of Watermelon Rind Honey Jam were presented to the panelists: Control (C) with a 50% honey and 50% sugar composition, Variation 1 (V1) with a 60% honey and 40% sugar composition, and Variation 2 (V2) with a 70% honey and 30% sugar composition. The results revealed that Variation 1 (V1) received the highest score of appearance, sweetness, and aroma, making it the most favoured option. Watermelon Rind Jam is a honey-infused product that serves as an excellent source of carbohydrates, delivering fast energy. Moreover, it represents an innovative jam option that pairs wonderfully with a variety of choices, including bread, pancakes, and cake fillings. Furthermore, its convenient packaging makes it a portable snack for on-the-go enjoyment.

Keywords: Honey-based food; Jam; Sensory evaluation; Watermelon rind.

1. INTRODUCTION

Watermelon rind honey jam, a delicious and rare culinary concoction, has gained popularity in recent years as a novel and sustainable method of reducing food waste. Watermelon rinds, which was previously disregarded and eliminated is now being converted into an appealing and versatile preserve that appeals to both culinary enthusiasts and sustainability consumers. The watermelon skin potential can be utilized to be processed into several food products with high economic value (Widodo, 2018). The U.S. Department of Agriculture (USDA) claims that watermelon is nutrient-rich, with 1 cup of diced, fresh watermelon containing significant amounts of vitamin B6, lycopene, antioxidants, amino acids, and 21% of the daily value for vitamin C and 18% of the daily value for vitamin A.

According to the Ministry of Food Processing Industries (2020) jam is a product created by boiling fruit pulp with enough sugar to a sufficiently thick consistency that is hard enough to keep the fruit tissues in place. Awulachew (2021) state when jam is made properly, the results are far more enjoyable. The diversify of *Kelulut* honey in this product will enhance more natural taste thus also reducing using artificial sweeteners as well as the perfect consistency of fruit jam. Traditional jams and confiture are widely used in dairy, pastry, and confectionery items as well as being consumed frequently for breakfast (Igualetal.,2014). Similarly, the usage of this innovative product can be diversified, just like any other fruit jams.

This lengthy abstract delves into the interesting world of watermelon rind jam, diving into its origins, preparation methods, flavour profiles, and the broader implications it has for sustainable gastronomy and food waste reduction. This study explores the vivid and innovative world of watermelon rind jam, where tradition and creativity meet in a wonderful mix.

2. METHODS

Watermelon rind honey jam production methods begins with careful selection of good quality of watermelon fruits and preparation. The rind should be firm and free of stiff white pith, and any leftover pink flesh should be removed. The rind is then diced or sliced into uniform pieces before cooked. The type of sugar used, which can range from granulated to brown to natural sweeteners such as honey, is critical in flavour creation.

2.1 Cooking process

In a large saucepan, place the diced watermelon rind. Add in sugar and honey according to the recipe. Typically, the weight ratio is 1:1 (e.g., 1 kg of rind to 1 kg of sugar), but in the final product, for the sweeteners, 50% honey and 50% sugar were used. A dash of lemon juice was added to the recipe to add acidity and flavour to the jam. This will help balance out the sweetness. Simmer the watermelon rind and sugar mixture gently over medium heat. Stir occasionally to let the sugar dissolve and prevent it from sticking at the bottom of the pan. The sugar and honey will absorb moisture from the rind, resulting in the formation of a syrup.

Reduce the heat into a slow simmer until the sugar has been completely dissolved. Continue simmering the mixture until it has reduced and thickened. Depending on the size of the rind pieces and the desired consistency, the process will consume from 30 minutes to 1.5 hours. When the jam has reached the desired thickness and consistency, it is done and let it cool to room temperature.

2.2 Canning Process

For preserving and packaging, we used canning method for watermelon rind honey jam. First, in a large pot, put water and heat until boil. Once boiling, using a tong, place opened jars and lids into the boiling water for 15 minutes. After that, bring out the jars and lids and place them on a clean tray for a while. Then, while wearing a glove, put cooked watermelon rind honey jam in the jars for 60g each. Close the jar tightly with lid. Then put back the sealed jars in the boiling water for another 15 minutes.

2.3 The Consumer Acceptance Test

The aim of the sensory evaluation is to identify the acceptance of customers towards the product based on certain attributes which are appearance, viscosity, sweetness, aroma, and overall

flavor of the product. Watermelon rind jam sensory properties had been evaluated with the hedonic test. In this sensory test, there were 60 panellists who were students, lecturers, and other staff for tasting the sample. A hedonic 9 scale was used affixed with “extremely dislike” to “extremely like”. There are 3 variations of watermelon rind jam that are prepared for panellists to identify the most preferable variations which are the appearance, viscosity, sweetness, aroma, and overall flavor of the product. To avoid misunderstandings, the panellists were instructed to carefully read the instructions written on a score card provided. The results of each score card have been recorded and entered Microsoft Excel to generate the mean score, as well as a chart indicating which variations of product the panels preferred.

3. RESULTS AND DISCUSSION

3.1. Texture, Consistency and Flavour Profile

The heating procedure transformed watermelon rind from its original crisp and moderately bitter state into a sweet and delicate jam. The rind softened and took on a delightful chewiness while preserving its shape due to careful boiling and the sugar infusion. Watermelon rind jam had a unique and interesting flavour traits. When coupled with sugar and alternative flavourings such as lemon juice and spices, the natural sweetness of the watermelon rind formed a well-balanced taste. The ultimate product was a balanced blend of sweet and acidic flavours, with mild undertones of any spices or herbs that were included. The overall flavour was like watermelon, but with a concentrated, jam-like richness.

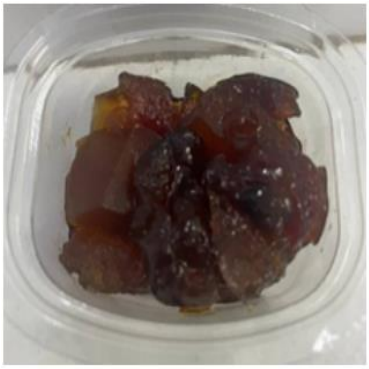

Figure 1. Watermelon rind honey jam

Figure 2. Final product packaging

3.3 Versatility & Sustainability

The versatility of watermelon rind jam was evident in its potential applications. It was delicious spread on toast, a glaze for grilled meats, a dessert topping, or a condiment to compliment diverse cuisines. This versatility demonstrated watermelon rind jam's suitability in both sweet and savoury culinary endeavours. The procedure of making watermelon rind jam represented sustainability and reduced food waste. This jam-making method adheres to the idea of reducing waste and maximising resource utility by repurposing an often-discarded section of the watermelon. It also stimulates the investigation of alternate food supplies as well as a more careful approach to ingredient selection in the kitchen.

3.4 Consumer Acceptance

They are three variation of product samples being presented to the sensory panellists. Control represents 50 percent honey use, variation 1 represents 60 percent honey use and variation 3 presents 70 percent honey use. Table 1 shows the result from sensory evaluations conducted.

Table 1: Result of sensory evaluation

	Appearance	Aroma	Sweetness	Viscosity	Overall Flavor
Control	6.8	6.5	6.5	7	7.1
Variation 1	7	6.6	6.7	6.9	7.1
Variation 2	6.8	6.6	6.6	6.8	6.9

Control was the majority highest rated in terms of viscosity while variation 1 got the highest mean score in terms of appearance and sweetness. Variation 2 was equally high with variation 1 in terms of aroma. For overall result, control is equally high as variation 1. Theresult showed that 60% of honey was more preferred while the panels preferred variation1 in terms of product sweetness. It is because the product tastes were balance between the sweet from stingless honey and the sugar used in the jam. In addition, the appearance is slightly dark texture just like strawberry jam color which makes the product appearance rank higher from panel preferences.

4. CONCLUSION

In conclusion, watermelon rind honey jam exemplifies the transformational power of culinary inventiveness and the long-term potential of even the most disregarded items. Its flavor, adaptability, and cultural significance make it an intriguing topic for contemporary gastronomy, as well as a brilliant example of how ingenuity in the kitchen can result in both delicious flavors and a more sustainable future. Additionally, it is also an innovation jam product that can be eaten with multiple variations either with bread, pancake, and filling of cake. Besides, Watermelon Rind Jam also is easy to bring anywhere on any occasion with the convenient packaging.

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DUMPLING WITH WASTE INGREDIENT FILLING: JACKFRUIT STRAW DENDENG FILLING

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ABSTRACT

The availability of various frozen dumpling forms and fillings in today's market has allowed consumers to enjoy a wide range of frozen products. However, many of the dumplings and their fillings in the market seem to be similar, as they are typically made with common ingredients and edible fillings before undergoing the steaming or frying process. This dumpling stands out because its filling is crafted from waste ingredients known as jackfruit straw, combined with a mixture of traditional Chinese and Malay flavors. The goal of this innovative product is to diversify and enrich the use of waste ingredients, utilizing treated jackfruit straw cooked in dendeng paste as a filling for dumplings. Jackfruit Straw Dendeng Filling can be effectively marketed, as it is cost-effective and easy to prepare due to the use of more affordable raw materials compared to existing dumplings in the market. This affordability makes it suitable for mass production. Another reason for developing this product is to enhance its taste and shelf life through proper treatment of waste ingredients using food-grade preservatives and appropriate cooking methods. Before producing the dumplings, the treated jackfruit straw filling must be prepared, followed by cooling for a few hours. The ingredients for the dumpling dough are accurately weighed before the mixing, cooking, and filling process. The results of a consumer preference test conducted with 30 untrained participants using a 7-point scale, ranging from extremely dislike to extremely like, and involving three different samples (V1, V2, & V3) across seven attributes (aroma, texture, appearance, flavor, filling thickness, combination of skin and filling, and overall acceptability) indicate that the majority of the panelists preferred V2 (frying jackfruit straw) with an average score of 4.9, followed by V3 with an average score of 4.8 (baking jackfruit straw), and lastly V1 with an average score of 4.7 (frying jackfruit straw with flour).

Keywords: Waste ingredient; Dumpling filling; Jackfruit straw

1. INTRODUCTION

Dumplings are delectable bite-sized dishes made with flavorful ingredients and can be prepared through frying, boiling, or steaming (Chinese Education Tours, 2022). While ground pork is the most popular filling, other options include beef, chicken, shrimp, or fish (Chinese Education Tours, 2022). Dumplings are generally considered healthy due to their use of whole ingredients that provide various micronutrients. However, their macronutrient balance can be off, as most of the calories come from fat and carbohydrates, resulting in a dish with relatively few calories.

One significant focus of this study is jackfruit straw. Often, the food industry and vendors discard jackfruit straws as waste, contributing to environmental issues (Akter & Haque, 2019). These discarded parts of the jackfruit (Artocarpus heterophyllus) have the potential to be

repurposed as a bio-based film when combined with starch, reducing waste, and minimizing environmental impact (Gorris & Peppelenbos, 1992). The straw and seeds are typically overlooked, with only the fruit being utilized.

The primary objective of this study is to develop a healthy food product that utilizes jackfruit straws, a resource many are unaware of. This research explores the incorporation of jackfruit straws into dumplings and jerky, which can significantly reduce unintentional jackfruit waste. The resulting products, such as jerky dumplings, have the potential to succeed in the domestic market, benefiting both consumers and producers. The dough remains unchanged, with the jackfruit straw replacing the typical meat filling, resulting in a high-fiber product. Utilizing jackfruit waste in the creation of jerky dumplings offers a low-cost and environmentally friendly food option (Butterkicap Team, 2017).

2. METHODS

2.1 Materials

The primary ingredients used in Dumpling Dendeng are sourced from the local market and include jackfruit straw as the main ingredient, along with flour, sweet soy sauce, tomatoes, and dried chilies. These ingredients are crucial in achieving the unique flavor and texture of Dumpling Dendeng. For a detailed breakdown of the percentage of each ingredient used in the preparation of Dumplings Dendeng, please refer to Table 1.

Table 1: Formulation of Dumpling Dendeng

Ingredients	Percentage (%)
Soft flour	12.58
Bestari flour	19.65
Jackfruit straw	19.65
Onion	6.29
Shallots	9.43
Garlic	3.14
Ginger	1.57
Chillies paste	4.72
Lemongrass	3.14
Galangal	7.86
Tomato	7.08
Sweet soy sauce	4.87
Total	**100**

Variations:
1. Control - frying jackfruit straw without flour.
2. Variations 1 - baked jackfruit straw.
3. Variations 2 - frying jackfruit straw with flour.

2.2 Methodology

a. **Dough Preparation:** Begin by accurately weighing the ingredients, and then proceed to make the dough.
b. **Dendeng Preparation:** Cook all the dendeng ingredients according to the recipe, and as a final step, incorporate the treated jackfruit straw.
c. **Dumpling Wrapping:** Take a piece of dumpling skin and place 7 grams of jackfruit straw jerky onto it. Carefully wrap the dumpling with the skin.
d. **Cooking:** Steam the dumplings for approximately 20 minutes.
e. **Packing & Storage:** Place the Dumpling Dendeng into a container and store it in the freezer. Your delicious dumplings are now ready to be consumed.

2.3 Sensory & Analysis

The purpose of sensory evaluation is to gauge customer acceptance based on aroma, texture, appearance, flavor, filling thickness, skin-filling combination, and overall acceptability. In this study, sensory evaluation was conducted with three cooking method variations: frying without flour, frying with flour, and baking. Thirty panelists from diverse backgrounds participated, and samples were coded with three-digit sample codes to prevent bias. A total of 90 samples were evaluated, labeled as Sample A (frying without flour), Sample B (baking), and Sample C (frying with flour), each provided to the same 30 panelists.

3. RESULTS AND DISCUSSION

3.1. Product Specification

Dumpling Dendeng is a product crafted through advanced manufacturing processes. It undergoes a comprehensive evaluation based on multiple criteria, encompassing aroma, texture, appearance, flavor, filling thickness, the harmony of skin and filling, and overall acceptability. Due to its nature as a frozen food, Dumpling Dendeng follows a precise and thorough packaging procedure to ensure quality and longevity.

Figure 1. The Packaging for Dumpling Dendeng

3.2 Sensory Test Result

At Universiti Teknologi MARA Dungun, a panel of students was convened to conduct sensory evaluations. Each panelist received three samples, each identified by a unique three-digit code.

The panelists were tasked with assessing various aspects, including aroma, texture, appearance, flavor, filling thickness, the synergy between the skin and filling, and overall acceptability.

For this study, a seven-point hedonic scale was employed to measure the panelists' acceptability of the product, with a score of seven indicating excellent acceptability and one reflecting the least acceptability. To compare variations in formulations and cooking methods, the mean score for each test was used. The results of the sensory evaluations can be found in Table 2.

Table 2: Sensory result of method cooking

Characteristics	Control	Variation 1	Variation 2
Aroma	4	5	5
Texture	4.6	5	5
Appearance	4.6	5.1	5.2
Flavor	4.8	4.9	4.7
Thickness of filling	5.1	5.3	5.1
Combination of skins and filling	4.7	5	5
Overall acceptability	4.7	4.9	4.8

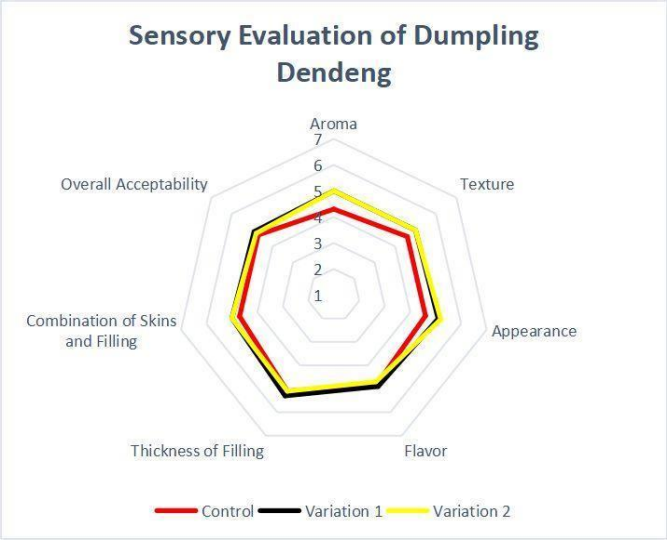

Figure 2: Sensory evaluation of Dumpling Dendeng

Sensory evaluation results showed significant differences between the three methods. In terms of color, the mean score for fried without flour is 4 while baked and fried with flour is 5. As for texture, the mean score for fried without flour is 4.6 while for baked and fried with flour, the mean score is 5. Next, for appearance, the mean score for fried without flour is 4.6 while for baked is 5.1, and fried with flour is 5.2. For taste, the mean score for frying without flour is 4.8, while for baking and frying with flour it is 4.9 and 4.7. Next, the filling thickness for frying without flour and frying with flour, the mean score is 5.1, while for baking, the mean score is 5.3. For the combination of skin and filling, the mean score for frying without flour is 4.7, while for baking and frying with flour is 5. Finally, overall acceptance, the mean score for frying without flour is 4.7 while for baking and frying with flour is 4.9 flour is 4.8. Overall acceptance shows that baking is preferred to frying with and without flour. In conclusion, baked jerky scored higher overall than other samples for all the characteristics. As a result, baking jerky is chosen to get consumer acceptance.

4. CONCLUSION

The panel showed a preference for the baked jackfruit straw jerky. The use of jackfruit straw not only minimizes waste disposal costs but also serves as a sustainable source of raw materials. Furthermore, those who enjoy spicy foods will find the spicy Dumpling Dendeng products appealing. In achieving the study's objectives, the combination of jackfruit straw jerky with dumpling skin successfully recreates the desired flavor.

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DIVERSIFY THE USAGE OF SECOND-CLASS PROTEIN INGREDIENT IN FOOD PRODUCTS: LENTIL POPIAH FRIED LONTONG

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ABSTRACT

This innovative product, known as "Lentil Popiah Fried Lontong", stands out from existing products in the market. Its primary purpose is to diversify and enrich the use of second-class protein sources, specifically lentils, in preparing popiah skin. Another objective of producing this product is to promote and market it as ready-to-eat food. It is pre-cooked and easy to prepare, taking less than 1 minute to reheat using a microwave oven, pan-frying, or deep-frying methods. The production of this product begins with the preparation of popiah skin using two treated lentil powder batters: yellow lentil and red lentil. The batter is cooked in a non-stick pan. Then, the popiah filling process follows, where a mixture of vegetables, dried shrimp, fermented soy, and seasonings are sautéed in a pan. The well-blended cooked mixture is then filled and folded into the treated homemade popiah skins. Finally, the popiah is pre-fried for a few minutes, tossed, and packed in vacuum packaging. This product can be marketed and is expected to meet customer needs and wants, as it has a longer shelf life due to intensive treatment, especially with the popiah skin and vacuum packaging. A paired comparison test was conducted with 30 panels using Microsoft Excel 2016 to determine the most preferred product, using the least and most indicators. Six attributes were evaluated: appearance, crispiness, oil uptake, flavor, color, and overall acceptance. The test results show that most of the panels preferred Variation 2 (V2) fried lontong with yellow lentil popiah skin, with 17 panels, compared to Variation 1 (V1) fried lontong with red lentil popiah skin, which had 13 panels.

Keywords: popiah skins; ready-to-eat food; fried lontong

1. INTRODUCTION

According to Masril Mat Rosdi (2018), the term "popiah" comes from Fujian Chinese. In the Teochew dialect, they call 'bobea', or known as local pizza which uses a thin flour (pastry) crust. In the market, there is an abundance of different types of popiah that have been sold using ready-made popiah skin. In Chinese recipes, popiah rolls are filled with sliced cabbage and other vegetables inside a thin pastry roll (Masril, 2018). In areas such as eastern China's Zhejiang and northern China, poppies are usually eaten during the Spring Festival in China (Masril, 2018), hence the name known as 'spring roll' in English.

In recent times, the primary focus of young consumers has shifted toward the purchase of ready-to-eat (RTE) and ready-to-cook (RTC) food products. This has led to an increased demand for RTE and RTC items due to their convenience (Temgire et al., 2021). At present, there is a noticeable lack of diversity in ready-to-eat spring roll offerings within supermarkets. Consequently, there is a growing need for fresh market introductions. As a response, the researchers have developed a solution by innovating the flavor and texture of spring roll wrappers through the substitution of the original flour with lentil flour. Furthermore, the researcher has expanded the range of ready-to-eat and ready-to-cook spring roll varieties available in supermarkets.

Ensuring the proper treatment and accurate ingredient proportions in crafting lentil spring rolls is of paramount importance. Lentils are rich in proteins that play a vital role in muscle and bone development and repair (Betterhealth, 2020). Additionally, the inclusion of fiber in the diet can effectively lower blood pressure and enhance levels of HDL (good) cholesterol (Robinson & Robert, 2020). Simultaneously, an adequate intake of potassium has been linked to a reduced risk of stroke (Cervoni et al., 2021), while iron contributes to the efficient storage and utilization of oxygen in our muscles and body (MedlinePlus, 2021).

2. METHODS

Table 1: Formulation of Lentil Pops

Ingredient	Red lentil (%)	Yellow lentil (%)
Red lentil	17.45	-
Yellow lentil	-	14.97
Minced beef	8.72	8.98
Fishcake	6.98	7.19
Dried shrimps' powder	8.72	8.98
Tempe	4.36	4.49
Onion	3.20	3.29
Garlic	2.91	2.99
Tomato sauce	2.38	2.46
Belacan	0.29	0.30
Dried chili paste	23.26	25.46
Carrot	1.74	1.80
Cabbage	6.98	7.19
Suhoon	2.91	2.99
Sweet soy sauce	2.38	2.46
Oyster sauce	3.14	3.23
Salt	1.13	1.80
Sugar	3.40	3.50
TOTAL	**100**	**100**

Variations:

1) Variation 1 - using red lentil
2) Variation 2 - using yellow lentil

2.1 Methodology

a) Baking lentil

Lentils were toasted in the oven for 15 minutes at 110 C.

b) Mixing lentil

Red and yellow lentils were ground in the thermomixer at a pressure of 10 for 1 minute for each lentil. Then the lentils were mixed with flour and salt. After that, add cold water and thoroughly stir until no lumps remain.

c) Cook popiah dough

A heavy cast iron griddle is heated to a moderate temperature. Apply a piece of oiled cloth to the surface and lightly rub it. A thin round shape of the necessary size can be created by taking a handful of the soft dough and lightly and swiftly rubbing it across the pan. Cook the dough for a short period, just long enough for the popia skin to simply peel off the pan.

d) Sautéing

The stir-fry items should be cooked in hot oil until aromatic. The lontong ingredients are then added and cooked. If necessary, add seasoning if needed.

e) Shaping

After the lontong ingredients have been cooked, place the item in the popiah skin with the appropriate amount. The popiah skin is attached to an egg.

f) Packaging

When the lentil pops are done, place them in a rectangular or airtight container. In an airtight container, store the lentil pops (red lentils and yellow lentils).

g) Freezing

Lentil pops (red lentils and yellow lentils) can be frozen until solid and can be kept in the freezer for up to 6 months.

2.2 Sensory & Analysis

The sensory evaluation aims to identify the acceptance of customers towards the product based on its colour, appearance, first bite, oil uptake, flavour, and overall acceptance. In this study, the variation is based on the colour of the lentil that was used. Two variations were used which were red lentils and yellow lentils. During the sensory evaluation, 30 panellists from different backgrounds of the study were involved and the samples were coded with a three-digit code to avoid bias. The samples were labelled using three-digit numbers and were given to 30 panellists for sensory evaluation.

3. RESULT & DISCUSSION

3.1 Sensory Test Result

The sensory evaluation was performed at Universiti Teknologi MARA Dungun and students and lecturers were invited as panels. Each panel was given two samples, and each sample was labelled with a three-digit code. The panel needs to evaluate the colour, appearance, crispiness, oil uptake, flavour, and overall acceptability. In this study, a paired preference test was used to measure panellists' acceptability of the product. The score was rated as most or less. The mean score of each test was used to compare the differences between formulations. Table 2 presents the results of the sensory evaluations.

Table 2: Preliminary sensory result

Characteristics	Red lentil	Yellow lentil
Color	15	15
Appearance	17	13
Crispiness	14	16
Oil uptake	12	18
Flavor	13	17
Overall acceptance	14	16

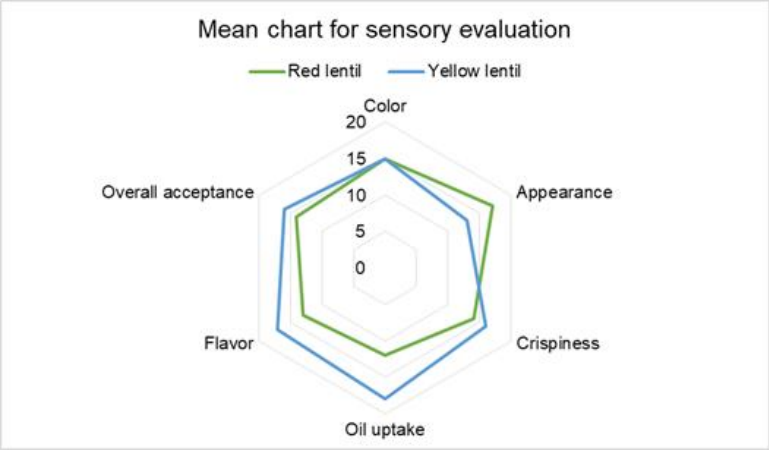

Figure 1: Sensory evaluation of the product attributes

Two variations are used: red lentils and yellow lentils. The results show that both samples received equal preferences with 15 panels based on the colour of the popiah. For their crispiness, the panellists preferred Variation 2 (yellow lentil). For appearance, popia with red lentils (V1) shows the highest level of preference. For oil intake, variation 2 (V2) yellow lentils show the highest level of preference. For flavour, the highest means of the popiah was variation 2 the yellow lentils. It shows that the taste of yellow lentils is much preferred among the panellists. Finally, in overall acceptability, yellow lentils received higher preferences with 16 compared to red lentils with only 14.

4. CONCLUSION

According to the result received, popiah made from yellow lentils received more preference compared to red lentils as it has better crispiness, oil uptake, and flavour compared to red lentils. As variation 2; frozen lentil popiah lontong with yellow lentil skins received the highest score for overall acceptability compared to red lentils, therefore this red lentil skin popiah has been chosen to be the final product to be marketed.

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PULUT RENDANG ROLL

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ABSTRACT

Pulut Rendang Roll represents a novel addition to Malay traditional cuisine, particularly renowned during Malay celebrations like Hari Raya. This research endeavor seeks to elevate the Pulut Rendang experience by introducing a tantalizing crispiness while ensuring broad consumer appeal. To achieve this, researchers ingeniously employ spring rolls to encase glutinous rice and rendang, conducting meticulous experiments to ensure compatibility. Both glutinous rice and rendang hold universal appeal across age groups and occasions, underscoring the market potential of this product. Given the substantial demand for rendang, Pulut Rendang Roll aligns perfectly with local preferences. For consumer convenience, it's available in both frozen and ready-to-eat forms. In its frozen state, it retains a pristine white appearance, while the ready-to-eat version boasts a rich brown color and an elegant log-like shape with the filling at its core. The primary ingredients include glutinous rice, chicken breast, minced beef, and spring rolls pastry. The production process involves steaming glutinous rice to achieve its sticky consistency, preparing rendang through sautéing, simmering, and boiling, and finally, packaging and freezing the product. Sensory evaluation encompasses a comprehensive assessment based on color, crispiness, stickiness, softness, creaminess, tenderness, saltiness, spice richness, and overall acceptability. This evaluation employs a hedonic scale ranging from 1 (lowest intensity) to 9 (highest intensity). Two variations exist, V1 (chicken rendang) and V2 (beef rendang), which were evaluated by 30 untrained panelists. The results reveal a preference for V1, with a mean score of 8.43, compared to V2, which scored 8.20. Pulut Rendang Roll distinguishes itself from conventional Malay kuih by offering a unique fusion of traditional flavors in a snackable format, making it a standout addition to consumer culinary experience.

Keywords: Traditional food; Frozen; Glutinous rice; Rendang; Food innovation

1. INTRODUCTION

Traditional food can be categorized into dishes or snacks. In Malaysia, there is a rich variety of traditional foods, including Malay, Chinese, and Indian cuisine. While there are both resemblances and differences, Malay heritage varies from north to south. In essence, Malay heritage cuisine draws inspiration from a mix of cultures, such as Arab, Indian, Chinese, Siamese, Javanese, Minangkabau, and others. Some examples of distinctive or signature foods from different regions of Malaysia include beef rendang, *laksa*, *nasi lemak*, and *tapai*. Notably, Malay food is known for its spiciness (Raji, 2017)

Rendang's origins can be traced back to Sumatra, particularly the Minangkabau culture. Rendang has been a staple dish among the Minang population for generations and is now enjoyed at traditional festivals and in everyday meals, making it a part of Malaysian cuisine. Some traditional dishes require a long and intricate cooking process, which is why innovation is necessary to enhance convenience for consumers. The Pulut Rendang Roll is an innovative combination of Malay traditional elements, including spring rolls, glutinous rice, and rendang. This unique fusion offers consumers a novel and delightful taste experience.

Pulut Rendang Roll has been designed to be a frozen food. Frozen food can guarantee the shelf life of the food. Some small businesses have developed this type of food to be frozen. MARDI researcher, Dr Chua Hun Pin, said that his party had recently succeeded in a study to produce a new packaging for roasted glutinous rice (Pulut Panggang) that allows it to stay fresh for six to eight months (Harun, 2019). This will prove that Pulut Rendang Roll can also be produced in frozen condition. Many foods can be successfully frozen to preserve them for a very long time and increase their shelf life. It includes bringing the product's temperature down, usually to -18 °C or lower. When energy is withdrawn from food by cooling below the freezing point, the physical state of the food substance is altered. Simply said, the severe cold slows down chemical changes that alter food quality or cause it to decay as well as the growth of microbes (Food Technology, n.d). Food innovation has rapidly progressed that almost traditional food can be found in a new face. The creation and commoditization of innovative food products, procedures, and services constitutes food innovation. Food and beverage industries are looking for ways to create compelling, affordable, innovative, and distinctive healthful, nutrient-dense solutions that are also sustainable. The invention of food is needed to satisfy the consumers' need for convenience, youth, better diet, less stress, perfect taste, and variation (Winger & Wall, 2013).

2. METHODS

2.1 Material

Glutinous rice, chicken breast, minced beef, coconut milk, lemongrass, onion, shallot, garlic, chili paste, tamarind paste, palm sugar, turmeric leaf, ginger, galangal, turmeric, cabbage, carrot, spring roll pastry, cooking oil, *kerisik*, sugar and salt.

2.2 Glutinous Rice

Soak the glutinous rice in water for half an hour and strain the water before steaming it for about 15-20 minutes. In another pan, mix the coconut milk with sugar and salt then simmer it for about 5 minutes. After 20 minutes, pick up the half cooked sticky rice and mix it with coconut milk mixture. Then steam again for about 15-20 minutes until cooked.

2.3 Chicken and Beef Rendang

Blend the shallot, red onion, garlic, ginger, galangal, turmeric, and lemongrass together. Heat the cooking oil, then saute the blended ingredients. Add chili paste and saute till oil splits and add tamarind paste. After that, add the chicken or beef and simmer it until half cooked and season it. Pour the coconut milk and *kerisik* and cook until tender and turn dark brown. Add turmeric leaf and ready to serve.

2.4 Stir-fried vegetables

Chop carrot and cabbage into appropriate size and stir-fry it to insert with chicken and beef filling.

2.5 Sensory Evaluation

Sensory evaluation tests were carried out by 30 untrained panelists with different backgrounds from Universiti Teknologi MARA (UiTM) Cawangan Terengganu, Dungun Campus. Each of them is served with two different variations which are variation 1 ('Pulut Rendang Roll' with chicken rendang filling) and variation 2 ('Pulut Rendang Roll' with beef rendang filling). Sensory testing procedures used are hedonic scale rating tests where samples are tested to determine their acceptability or preference. A 9-point hedonic scale with a scale of 1 indicated (dislike extremely) and a scale of 9 indicated (like extremely) was used by the panelists to rate the samples. Then, the results are analyzed by comparing the mean score value of the acceptability characteristics between the two variations.

3. RESULTS AND DISCUSSION

3.1. Final Product

Figure 1. The Packaging of Frozen Pulut Rendang Roll

Figure 2. The Final Product After Frying

3.2. Result of Sensory Evaluation

Table 1. The Sensory Evaluation Results of Pulut Rendang Roll

Characteristics	Variation 1	Variation 2
Colour (Spring Roll Pastry)	7.93	8.27
Crispiness (Spring Roll Pastry)	7.17	7.53
Stickiness (Glutinous Rice)	7.73	7.4
Softness (Glutinous Rice)	7.87	7.57
Creaminess (Glutinous Rice)	7.47	7.37
Colour (Rendang)	7.83	7.93
Tenderness (Rendang)	7.93	7.9
Saltiness (Rendang)	7.87	7.67
Rich in spices (Rendang)	7.7	7.5
Overall Acceptability	8.43	8.2

According to the results, most of the panel members assigned the highest score to Variation 1, known as 'Pulut Rendang Roll' with chicken rendang filling. Variation 1 demonstrated the highest overall acceptability, with a mean score of 8.43. Variation 2, featuring 'Pulut Rendang Roll' with beef rendang filling, also received a commendable overall acceptability mean score of 8.20. Each variation has its own set of advantages and disadvantages. Notably, when evaluating the color attribute of the spring roll pastry, Variation 2 received a higher mean score of 8.27 compared to Variation 1, which scored 7.93. This difference is attributed to factors such as frying oil temperature and frying duration for both variations. Variation 2's spring roll pastry was fried more consistently than Variation 1.

In terms of the crispness of the spring roll pastry, Variation 2 received a higher mean score of 7.53, surpassing Variation 1's mean score of 7.17. Moving on to the stickiness, softness, and creaminess of the glutinous rice, Variation 1 outperformed Variation 2, despite both variations using the same glutinous rice that had been prepared once. This discrepancy in results is due to the different taste evaluations by the panel members. For the tenderness of the rendang, chicken rendang achieved a mean score of 7.93, slightly edging out beef rendang with a score of 7.90. This is because the chicken was hand-chopped, resulting in a coarser texture, while the beef was machine-chopped, creating a finer texture. Consequently, the panel members perceived the texture of the chicken more distinctly when bitten.

Regarding the rendang's taste, specifically the level of saltiness and richness in spices, Variation 1 garnered a higher mean score than Variation 2. Despite using the same recipe for the rendang, differing taste perceptions among the panel members led to distinct mean score results. In summary, the evaluation of various attributes indicates that Variation 1 achieved a higher overall acceptance mean score due to its superior taste and combination compared to Variation 2.

Pulut Rendang Roll variation 1 is the first in Malaysia, which has a uniqueness that involves three interesting combinations of elements which are spring roll pastry, glutinous rice and *rendang*. It is presented in frozen form which can last 2 to 6 months when stored in the freezer at the appropriate temperature. This long shelf life makes it very suitable to be introduced to the whole world as a traditional food that has been improved into an interesting combination. Pulut Rendang Roll is prepared by frying if people want to eat it. This product uses less preservatives making this product suitable for consumption by all ages from children to the elderly. In addition to having protein, carbohydrates and some fat, this product also contains vegetables that support healthy eating by adding nutritional value of vitamins from vegetables such as cabbage and carrots. Pulut Rendang Roll with chicken *rendang* filling is predicted to have a high demand in Malaysia because it is very suitable to be used as a dish during breakfast and afternoon tea. The restaurant owners who sell breakfast food can also sell Pulut Rendang Roll with chicken *rendang* filling that has been fried to customers to introduce this unique food to customers.

4. CONCLUSION

Even though there are many spring roll products in the market, the main objective of this innovation is that the filling is made to be appropriate for everyone and appealing to a much larger range of demographics especially children and picky eaters. By combining spring roll pastry, glutinous rice, and rendang to one special dish, researchers can create a product that is different and unique from the one in the market. Other than that, Pulut Rendang Roll can also be frozen to prolong its shelf life so that consumers can enjoy its taste anytime and anywhere

they want. Moreover, Pulut Rendang Roll could be marketed to a broad variety of consumers inside of Malaysia since it resonates to local preferences and is made from ingredients that are easily accessible in Malaysia.

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INNOVATION PRODUCT: VEGETARIAN RENDANG ONIGIRI

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ABSTRACT

The objective is to apply modern culinary concepts to enhance traditional dishes. The goal is to create convenient innovations by merging traditional Malay and Japanese cuisine to produce novel products. Secondly, researchers aim to introduce a new category of food and assess its sensory appeal. This study examines how convenience impacts Malaysians' food consumption and how a diverse range of meals can address the issue of balanced nutrition in the modern age. The focal point will be the combination of jackfruit rendang and onigiri, resulting in a delightful fusion. Jackfruit serves as a vegan substitute for meat and chicken in rendang onigiri. Onigiri is white rice molded into triangles and wrapped in nori (dried edible seaweed). The vegan rendang filling complements both cuisines. Its concept revolves around creating an innovative food product inspired by traditional cuisine, with substantial market potential. This product can be marketed to diverse demographics, as it emphasizes the creation of compact, well-rounded, and healthy meals using familiar ingredients. To evaluate its sensory attributes, researchers conducted a study with 30 untrained panelists, employing a hedonic scale affective test. Five attributes were assessed: appearance, texture, flavor, juiciness, and overall acceptability. The samples were categorized into three variations (V1, V2, & V3). The product with the highest mean score was V3 (with corn as an added ingredient), achieving an average mean score of 8.20.

Keywords: Substitute; Fusion; Convenience; Rendang; Onigiri

1. INTRODUCTION

Convenient foods are described as food items that should be accessible to consumers easily to reduce time and effort in food making. Based on the previous research, individuals require convenience in the preparation of food to lessen the amount of time and mental strain required (Nakano & Washizu, 2020). Integrating the idea of traditional foods into convenience foods are made to sustain the food of the past and introduce the culture into modern innovations. It does away with the labor-intensive, time-consuming, and inconvenient methods that have traditionally been used to prepare meals. The rapidly evolving lifestyle trends have caused shifts in consumer behavior, most notably in their eating routines. As a result of the interaction of several nations' culinary traditions, a new trend known as fusion cuisine has developed as a combination style of cooking (Akyürek, 2019). Fusion cuisine is done by combining 2 different food items into one, which become the parameter for this research. Fusion cuisine is a type of international cookery that is distinctive, original, and forward-thinking. It is predicated on the

concept of purposefully combining the culinary styles and ingredients of a few various cultures inside a single dish (Akyürek, 2019).

A food is a meat alternative if its structure is comparable to the meat, but its composition is different (Hamid, Tsia, Okit, Xin, Cien, Harn, Patrick, Samirin, Azizi, Irfanian & Yee, 2020). Young jackfruit is being considered due to its composition and texture that can be substituted meat.

Developing convenience food innovations are made to combat the idea that convenient food is negative in general, where it was pointed out that using convenience foods to save time on meal preparation leads to a decrease in the quality of one's diet, which in turn has a negative impact on one's health (Nakano & Washizu, 2020). Creating the product with the fillings that are healthy can change people's perspective on the consumption of convenient foods. The notion of adjusting the filling is not particularly unusual in the market, as demonstrated by the food product that is being suggested, which is known as "vegetarian rendang onigiri." As a result, the product that will center on a new variant for the filling of the onigiri. By doing so, seize the opportunity to create new items derived from both traditional and ethnic foods. This development aims to create new goods based on traditional foods that emphasize convenience and have a positive impact on society by promoting lost classic dishes.

2. METHODS

2.1 Materials

Young jackfruit, coconut milk, onion, *kerisik*, ginger, chili paste, galangal, lemon grass, bird eye chili and garlic. Japanese short rice, seaweed, Japanese rice vinegar and corn were obtained from local suppliers while seasonings are obtained from the kitchen of Faculty of Hotel and Tourism Management, UiTM Cawangan Terengganu, Dungun Campus.

Table 1. List of Ingredients for Rendang

Ingredients	Weight (Gram)	Percentage (%)
	Jackfruit Rendang	
Young jackfruit	32.57	32.6
Lemongrass	19.80	19.8
Coconut milk	26.05	26.1
Salt	0.33	0.3
Sugar	0.33	0.3
Garlic	1.04	1.0
Oil	2.93	2.9
Shallots	6.51	6.5
Onion	3.26	3.9
Ginger	0.98	1.0
Bird eye chili	5.21	5.2
Turmeric	0.2	0.2
Star anise	0.01	0.01
Coriander powder	0.4	0.4
Cloves	0.4	0.4
TOTAL	**100**	**100**

Table 2. List of Ingredients for Onigiri

Ingredients	Weight (Gram)	Percentage (%)
	Onigiri	
Japanese short grain rice	400	31.1
Japanese rice vinegar	113	8.8
Salt	6	0.5
Sugar	45	3.5
Nori seaweed	24	1.9
Filling rendang jackfruit	100	7.8
TOTAL	**688**	**100**

2.3 Methods

A. Jackfruit Rendang

Blend shallots, ginger, lemongrass, chili, garlic, and if needed, water into a paste. Fry cloves, star anise, and paste in 3 tablespoon of oil for 7 minutes over low heat. Coconut milk, jackfruit, lemongrass, sugar, and salt are later added. Cover the pan and simmer for at least an hour until the liquid is reduced and the jackfruit is soft.

B. Japanese Short Rice

Rinse the rice five times in cold water and drain well in a fine-mesh strainer. Add rice and cold water to a rice cooker and follow the directions.

C. Onigiri

Put the rice and rendang in separate bowl. Mix the rice with rice vinegar and put rendang jackfruit as filling. Shape the rice in a rectangle and make sure the filling is fully covered. Wrap the onigiri with nori seaweed.

D. Variation

The product is created with 3 different variations:

a. Control (V1) - Prepared the basic recipe for vegetarian onigiri rendang.
b. White rice (V2) - the Japanese short rice is replaced with white rice.
c. Corn (V3) - Corn kernel is added to the Japanese short rice.

E. Score Card

Score card is used for collecting surveys from untrained panelists on their preferences based on 5 attributes, such as appearance, texture, flavor, juiciness, and overall acceptability. Untrained panelists (n=30) will mark the score with the scale of 1 (extremely dislike) to 9 (extremely like).

3. RESULTS AND DISCUSSION

3.1. Final Product

Below is the packaging for the final product, consisting of the front, bottom, and back view. For the back, it includes the nutrient value and bottom for open instruction of the packaging. The dimension for the packaging is 22.8 cm x 14.5 cm.

Figure 1. Packaging for The Final Product

3.2 Result of Sensory Evaluation

The sensory evaluation (affective test) was conducted on 30 untrained panelists consisting of students and staffs of Universiti Teknologi Mara Cawangan Terengganu, Dungun Campus. 5 attributes were being examined, which are the appearance, texture, flavor, juiciness, and overall acceptability. The products are labeled V1; the control using Japanese short rice, V2; replacing Japanese short rice with white rice and V3; using Japanese short rice with added corn. Note that the final product is shaped as a sushi roll instead of onigiri to ease the panelist to taste the samples.

Table 3. The Average Mean Score of Sensory Evaluation Results

Attributes	**Product Variations**		
	V1	***V2***	***V3***
Appearance	7.30	7.67	7.53
Texture	7.43	9.00	7.97
Flavour	9.00	6.87	7.43
Juiciness	6.87	7.43	7.47
Overall acceptability	7.20	8.10	8.20

Based on the result, a preference (affective) test is considered as subjective facts and varies from each panelist. For appearance, the highest average mean score is for V2 with 7.67 while the lowest is V1, 7.30. For texture, the highest is 9.00, also for V2. In terms of flavor, V1 has the highest score at 9.00 while V2 the lowest at 6.87. For juiciness, V3 is considered as the highest at 7.47 average mean score. Finally, for overall acceptability, V3 has the highest mean score with 8.20, V2 at 8.10 while V1 has the lowest at 7.20.

Based on the result, it can be concluded that the added ingredient which is corn does have an impact toward the juiciness and overall acceptability of the product. Swapna, Jadesha & Mahadevu, (2020) stated that sweet corn has 5-6% sugar, 10-11% starch, 3% water-soluble polysaccharides, 70% water, modest protein, vitamin (yellow varieties), and potassium. The nutritive properties of corn also play a huge role in the decision to add corn as an ingredient. Sweet corn is comparable to high-priced vegetables like cauliflower, cabbage, and french beans in fiber and cholesterol levels (Swapna et al., 2020). Having young jackfruit as a substitute for meat is also considered a success as the flavor and texture aspect on the attribute are averaging high. This showed that based on previous research, it was originally thought that byproducts of jackfruit would serve as the primary component in the manufacture of a nutritious alternative to meat (Hamid et al., 2020).

4. CONCLUSION

Even though the concept has already been used by other businesses that provide onigiri with different types of fillings; however, the primary concept behind this innovation is that the filling is designed to appeal to a much wider range of demographics and is appropriate for everyone. The name of the product, vegetarian rendang onigiri, gives away the fact that the onigiri are stuffed with a plant-based filling that adherents to a vegetarian diet. The stuffing is additionally influenced by rendang, which is a well-known traditional dish in Malaysia.

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We extend our sincere appreciation to the entire team behind Vegetarian Rendang Onigiri for their exceptional contribution. This remarkable food product represents a harmonious blend of creativity, expertise, and dedication. Special thanks to our dedicated supervisors, Madam Khazainah Khalid, Sir Mushaireen Musa and Madam Jazira Anuar for their unwavering guidance and support throughout this journey. The leadership and mentorship have been invaluable. Vegetarian Rendang Onigiri is a testament to what can be achieved when a passionate team collaborates to redefine the culinary landscape.

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RED BEAN KERIA

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ABSTRACT

In Malaysia, kuih is a famous traditional Malay sweet snack or dessert, typically made from rice flour, coconut milk, and various additional ingredients, creating bite-sized treats. One well-known variety is kuih keria, recognized for its doughnut-shaped form and sugar coating. The aim of this research is to introduce a new flavor to keria by substituting sweet potatoes with red beans. From a broader perspective, the inclusion of red beans in cooking offers numerous health benefits. The resulting product is Crunchy Red Bean Keria coated with Palm Sugar. The Red Bean Keria uses red beans as the primary ingredient, providing a rich source of plant-based protein, fiber, and various vitamins and minerals. Additionally, the use of potato flour in this gluten-free product makes it suitable for individuals with gluten sensitivities. These ingredients are combined with almond nibs and seasoning before being shaped into doughnuts and fried. The packaging utilizes boxes. Various types of flour, including all-purpose flour, potato flour, and a combination of both, are used in the production process. To determine acceptability and preference, sensory evaluations involving 30 panelists were conducted. These evaluations focused on six characteristics: appearance, sweetness, tenderness, chewiness, crunchiness, and overall acceptability. Hedonic scales were employed for sensory evaluations, as they provide a straightforward method for measuring consumer preference for a product. The results indicated that Variation 1 scored the highest in all these characteristics.

Keywords: Keria; Red beans; Palm sugar; Flour; Sensory evaluation

1. INTRODUCTION

Historical accounts demonstrate how kuih keria originated in the 15th century under the Malacca Sultanate and has since spread to a wide range of Southeast Asian nations and civilizations. Kuih keria are Malaysian deep-fried doughnuts that are made from sweet potatoes (TasteAtlas, n.d.). Every ingredient used in this product contains beneficial nutrient. Red beans provide protein, fiber, folate, iron, potassium, and magnesium while containing little or no total fat, trans-fat, sodium, and cholesterol (Crawford, 2022). Therefore, palm sugar contains a dietary fiber called inulin, which is known to keep a check on blood sugar levels, and low amount of fructose, a type of sugar human body quickly converts into triglyceride - a form of fat (Borah, 2017). In addition, the main function of flour in baking is to build structure and when the proteins found in wheat flour are hydrated, they interact with each other forming what is known as gluten (Baker Bettie, 2018). At the end of the product, sensory evaluation is an important tool for food manufacturers, as it helps them to understand how consumers perceive their products and identify areas for improvement. The sensory components have the potential

to drive the appeal of a food product, illustrate appeal and quality or meet the preferences and desires of key demographics (Cote, 2020).

2. METHODS

2.1 Materials

The following Table 1 shows the ingredients of Red Bean Keria.

Table 1. Formulation of Red Bean Keria

Ingredients	Measurement	Percentage (%)
	DOUGH	
Red Bean	300	55.91
Potato flour	80	14.91
Almond nips	18	3.35
Salt	1.5	0.28
Water	28.3	5.27
Sugar	14.3	2.66
Baking powder	1.5	0.28
	COATING	
Palm Sugar	25	4.66
Water	68	12.67
TOTAL	536.6	100

Variation:
1. Control - Use All-purpose flour.
2. Variation 1 - Use Potato flour.
3. Variation 2 - Use mixed flour which is All purpose flour and Potato flour.

2.2 Methods

a. Preparation of the dough
Weight accurately all the ingredients and mix to form a dough.

b. Shaping
Shape the dough like a donut and make a hole in the middle using a little finger. Each dough will measure approximately 31 grams.

c. Frying
Deep fry the dough with temperature 170°C about 5 minutes. Check every 1 minute to prevent over browning by turning the keria upside down. After the keria turns brown, remove them to the other bowl and let the keria rest a few minutes to excess the leftover oil.

d. Coating
Weight the palm sugar and water, then melt them until it bubbles using another pan. Turn off the heat and put the keria into the pan. Make sure all the surface of keria is covered.

e. Storing

Before Red Bean Keria is packed, the keria needs to rest for a few minutes to allow the sugar coating to dry, achieving a crispy texture on the outside. Red Bean Keria should be consumed as soon as possible to maintain the product's quality.

3. RESULTS AND DISCUSSION

3.1. Final Product

Figure 1. The Final Products

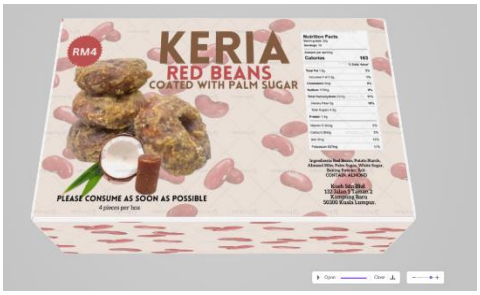

Figure 2. The Packaging of Red Bean Keria

Red Bean Keria is a fried snack from a combination of red beans, potato flour, almond nibs, white sugar, baking powder and salt for the dough. It was coated with palm sugar to enhance the sweetness, crunchiness, and taste of the product. Red Bean Keria is one of the snack selections as it comes from nutritious red beans and flour as main ingredients. Red beans nutrition can boost the quality of diet, improving overall health, aiding weight loss and maintenance, keeping blood sugar steady and lowering the risk of certain cancers (Braverman, 2019). Besides, red beans are high in protein and fiber that contribute to a balanced diet and improve digestive health. Fiber helps regulate digestion and keeps feeling full for longer, while protein is essential for building and repairing tissues. The texture of Red Bean Keria is tender, chewy, and crunchy with a little taste of sweetness from the coating which is palm sugar. The vibrant color of brown will attract many people, especially teenagers, to enjoy this snack. Besides, the characteristics of vegetarian, vegan-friendly, no artificial preservatives, and no artificial colors are the main reasons why this product may be enjoyed by all people. But it contains almonds that are not suitable for allergies. This Red Bean Keria is ready-to-eat food that needs to be consumed right away.

3.2 Result of Sensory Evaluation

The sensory evaluation was carried out at Universiti Teknologi MARA Cawangan Terengganu, Dungun Campus, and 30 panels of students and lecturers were invited. Each panel received three samples, each labeled with a three-digit code. The appearance, sweetness, tenderness, chewiness, crunchiness, and overall acceptability must all be evaluated by the panel. The panelists' approval of the product was measured using a six-point hedonic scale in this study. A score of six was regarded as highly as, while a score of one was rated as highly dislike. The mean score of each test was used to compare the differences in flour types. The sensory evaluation findings are shown in Table 2 and Figure 3.

Table 2. Result of Sensory Evaluation

	Appearance	Sweetness	Tenderness	Chewiness	Crunchiness	Overall Acceptability
Control	7	6.43	5.77	6.4	6.27	7
Variation 1	7.27	6.77	6.6	6.57	6.8	7.2
Variation 2	7	6.7	6.1	6.07	6.37	6.63

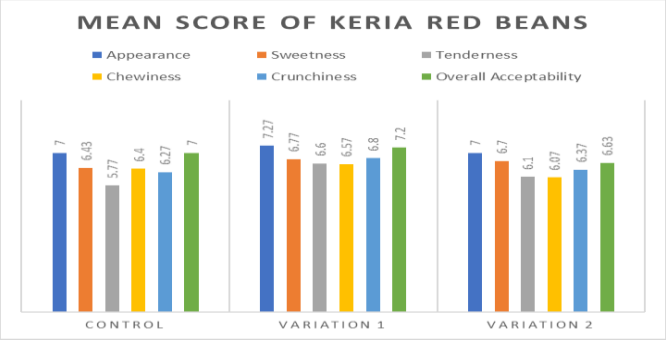

Figure 3. Mean Score of Red Bean Keria

Sensory evaluation comes in three variations. Each variation uses the same ingredients and recipe but uses a different type of flour. The type of flour used to control variation is potato starch. The type of flour used in variation 1 is all-purpose flour. Finally, variation 2 uses a mix of potato starch and all-purpose flour in the same amount for the recipe. Figure 3 shows that variation 1 achieved the best score for all characteristics including appearance, sweetness, tenderness, chewiness, crunchiness, and overall acceptability. The second largest variation is variation 2, which differs little from control.

4. CONCLUSION

The Keria's new appearance has been successfully modified. Red beans can now be utilized more frequently in cooking. This product is an excellent choice for those with gluten-sensitive digestive tracts, as it is gluten-free. Additionally, Red Bean Keria is offered in inexpensive, reusable, and recyclable packaging. Its attractive packaging makes it suitable for both gifts and souvenirs. Drawing inspiration from readily available ingredients in Malaysia, and catering to local tastes, Red Bean Keria can be marketed to a wide spectrum of consumers, both within and outside of Malaysia.

ACKNOWLEDGEMENT

This project was compulsory for the HTF525 subject (Principle of Food Science and Technology) which required students to propose and produce innovative products during the fourth semester. All ingredients, equipment and facilities were provided by faculty to the students. Special thanks to the supervisors; Madam Khazainah Khalid and Sir Mushaireen Musa for their support and knowledge as well as to our Faculty of Hotel and Tourism Management, UiTM Cawangan Terengganu, Dungun Campus.

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UTILIZATION OF WASTE INGREDIENTS IN PIZZA MAKING

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ABSTRACT

Banana skins are the outer covering of the banana fruit. They are utilized as food for animals and in the production of several biochemical products. Proper treatment of waste ingredients, such as banana skins, enables them to be used in the creation of food products. The primary purpose of a product known as "Banana Skinz Pizza" is to diversify and enrich the use of waste ingredients in rendang topping. The marketing and commercialization of this new frozen pizza could increase the value of local waste ingredients by incorporating them into the topping. "Banana Skinz Pizza" is produced to meet the current demand. Consumers can enjoy similar products like "Rendang Ayam" throughout the year by simply reheating the pizza with traditionally treated homemade banana skin rendang topping or consuming it as is. This product can be cost-effective, easy to prepare, and suitable for mass production. Simplifying the preparation method and extending the shelf life were key motivations behind its development. The use of treated methods and food-grade preservatives can enhance the taste and shelf life of the product. Before producing the pizza, a treated homemade rendang paste must be prepared. Ingredients are weighed accurately before mixing, cooking, and the topping process. The topping is evenly spread on the homemade pizza dough and pre-baked for several minutes before being sealed in a vacuum pack. "Banana Skinz Pizza" is convenient and can be prepared in various ways, including pan-frying, grilling, steaming, or reheating in an oven in less than one minute. Findings from a paired comparison test (n = 30) using a 7-point scale with two different samples (V1 & V2) comprising six attributes (appearance, aroma, crispiness, mouthfeel, flavor, and overall acceptance) indicate that "Banana Skinz Pizza" with oil and rendang topping was preferred by 16 panels compared to V2 (Banana Skinz Pizza with oil, coulis, and rendang), which was preferred by 14 panels.

Keywords: Utilization; Waste ingredients; Rendang topping; Pizza

1. INTRODUCTION

The inspiration for the Banana Skinz Rendang Pizza topping is a result of the blending of Western and Asian culinary traditions. In historical context, pizza, which originated in Naples,

Italy, was a type of flatbread adorned with various toppings. It was particularly favored by lower-income individuals for all their meals (Helstocky, 2008). The foundational elements of traditional pizza included tomatoes, mozzarella, and basil (Helstocky, 2008). On the other hand, Rendang, rooted in the term 'Merandang' or 'Randang,' which means 'slowly,' hails from West Sumatra (Amelia, 2022). It is characterized by its use of coconut milk, beef, or buffalo (Amelia, 2022).

Malaysian cuisine has evolved through the assimilation and transformation of various cultures and immigrant influences from the past (Naili et al., 2018). This blending has resulted in the creation of a distinctive and flavorful cuisine (Naili, et al., 2018). The global assimilation and transformation of food are explained within the context of food globalization, leading to the emergence of food neoculturism among global citizens. This is evident in the acceptance of international foods like pizza, which now includes toppings such as sambal and rendang in Malaysia, as offered by Pizza Hut (Naili, et al., 2018). Food glocalization plays a crucial role in enabling people worldwide to embrace new and diverse culinary experiences (Naili, et al., 2018).

However, according to Muhammad (2013), traditional food preparation using conventional methods can be labor-intensive and time-consuming. To adapt to modern demands, many traditional recipes have been modified in terms of ingredients, equipment, and cooking techniques to reduce preparation time and extend product shelf life (Muhammad, 2013). The rising urban population and the prevalence of dual-income families have increased the demand for convenient, healthy, and affordable food products (Muhammad, 2013).

Convenience foods, particularly frozen options, have become readily available in hypermarkets and supermarkets, replacing traditional cooking methods with quicker and more hassle-free alternatives. The changing lifestyle trends have significantly impacted consumer eating habits (Ismah, et al., 2012). In contemporary Malaysia, there is a preference for unique and modern flavors to cater to evolving tastes. Interestingly, food waste, which includes discarded ingredients, is being harnessed to create innovative food products due to limited raw materials and rising prices. Banana skins, typically considered waste, are now repurposed as the primary ingredient in rendang paste. Banana skins are a rich source of phenolic compounds and antioxidants, which contribute to heart disease and cancer prevention (Someya, 2002). This all-encompassing, easy-to-prepare product aims to meet customer demands efficiently, considering aspects such as time, physical effort, and mental effort involved in food preparation and consumption (Someya, 2002).

In conclusion, the goal of this innovative product is to utilize food waste and produce a unique and convenient offering known as Banana Skinz Rendang Pizza. Additionally, it seeks to streamline the preparation of pizza and toppings by offering a frozen and convenient alternative."

2. METHODS

2.1 Materials

Banana skins were sourced from local suppliers, while other community-sourced ingredients were procured from the Oriental Kitchen at the Faculty of Hotel and Tourism Management, Universiti Teknologi Mara Terengganu Branch, Dungun Campus. In the topping preparation process, two variations were employed:

Variation 1: Direct baking with oil and rendang.
Variation 2: Direct baking with oil, tomato puree, and rendang.

2.2 Methodology

The process for creating banana skinz pizza topping is as follows:

a) Begin by treating the banana skins with brine water, allowing them to soak overnight.
b) Next, prepare the pizza dough using a lean dough recipe. Knead the dough until it attains elasticity and then let it ferment for 45 minutes.
c) For making the rendang, assemble all the necessary ingredients. Blend these ingredients and proceed to sauté star anise, cinnamon, and cardamom until they release their fragrant aromas. Combine this mixture with the other remaining ingredients, then bring the mixture to a boil and let it simmer for 30 minutes.
d) After the dough has fermented, punch it to release any trapped carbon dioxide. Roll the dough out and cut it into rounds, each approximately 0.3 cm in thickness. Then, use a fork to prick the dough and place the topping and mozzarella cheese on the surface of the flattened dough. Prebake the pizza at 180 degrees Celsius.
e) Once the pizza has cooled, seal them in a vacuum pack and store them in a freezer at temperatures ranging from -18 to -20°C to extend their shelf life.

2.3 Score card

A scorecard was devised using a pair comparison test as a tool to gauge consumer preferences between two different variations:

1. Variation 1: Directly baked with oil and rendang.
2. Variation 2: Directly baked with oil, tomato puree, and rendang.

For the sensory evaluation, thirty panelists with diverse educational backgrounds were enlisted. To eliminate bias, the samples were assigned three-digit sample codes. The panelists were provided with an explanation of the survey's objective. After tasting each product sample, they were given a scorecard to record their preferences based on six product attributes, which included appearance, aroma, crispiness, mouthfeel, flavors, and overall acceptability.

3. RESULTS AND DISCUSSION

Sensory evaluation was conducted using a pair comparison test for Banana Skinz pizza topping with two distinct variations:

1. Variation 1: Directly baked with oil and rendang.
2. Variation 2: Directly baked with oil, tomato coulis, and rendang.

Six attributes were assessed for each variation, encompassing appearance, aroma, crispiness, mouthfeel, flavors, and overall acceptability. In Figure 2, the data reveals that in terms of overall acceptability, most panels favored Variation 1, the banana skinz pizza with oil and rendang topping, with 16 panels choosing it over Variation 2, the banana skinz pizza with oil, coulis, and rendang topping, which was preferred by 14 panels. This preference for Variation 1 can be attributed to its authentic taste and distinctive rendang flavor and aroma, as noted by Fadly in 2020, in contrast to Variation 2, which combines the taste and aroma of the tomato coulis, resulting in a somewhat sour profile.

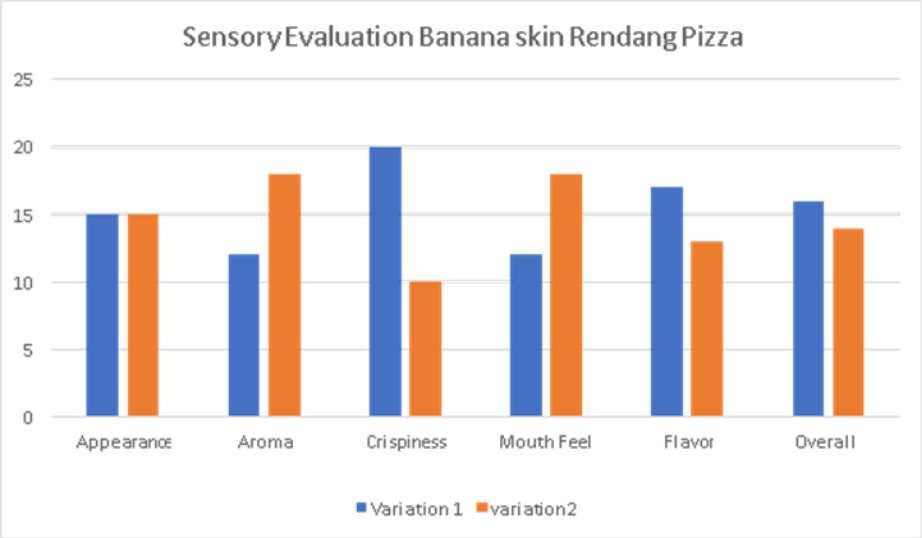

Figure 1. Result of sensory evaluation

3.1 Product Characteristic

Figure 2. Packaging of banana skinz pizza topping

The product that was manufactured is a ready-to-eat food, which means it is pre-cooked and can be quickly reheated using a microwave oven in under 1 minute, or it can be consumed as is. To maintain its freshness and quality, the vacuum packaging method was selected. This method involves removing the air from the packaging before sealing it, which helps prevent the growth of bacteria and microbes, ultimately extending the shelf life of the product (Gorris & Peppelenbos, 1992).

It was observed that the appearance, crunchiness, taste, and overall acceptability of the banana skinz rendang pizza with olive oil and rendang was preferred by the panelists. The use of banana waste such as banana skinz can minimize the cost of waste disposal and raw materials.

In addition, Banana Skin Rendang Pizza can provide a great source of protein to people with insufficient protein intake. Since little attempt has been taken to develop banana skin waste in Malaysia, it is necessary to formulate and produce food items such as banana skinz pizza from unused banana peel/ skins waste.

4. CONCLUSION

A well-defined methodology and specially treated ingredients have been employed to incorporate product waste, such as banana skins, into the rendang paste formulation. This innovative approach of utilizing local product waste in the form of rendang paste and marketing it as a pizza topping set it apart and makes it unique when compared to existing products in the market.

The cost-effective and streamlining methods used in its preparation not only enhance the rendang's taste but also contribute to extending its shelf life. Further research can be undertaken to delve into the physicochemical properties and proximate analysis of the product. This deeper analysis will allow for a comparison of the actual nutrient content of Banana Skinz Rendang Pizza with other pizza toppings available in the market. Such comparative studies provide valuable insights into the nutritional value of the product and its positioning within the market landscape.

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This project was a mandatory component of the HTF525 subject, "Principle of Food Science and Technology," which required students to propose and create innovative products during the fourth semester. The faculty provided all the necessary ingredients, equipment, and facilities to support the students in their endeavors.

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INTERNATIONAL HOSPITALITY & EDUCATION
INVENTION INNOVATION & DESIGN

CATEGORY

C

PROFESSIONALS & ACADEMICIANS

ROOM DIVISION OPERATION OASIS

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ABSTRACT

Grooming the hotel students to be the hoteliers who work at the front desk or reception area is challenging. They will be the initial point of contact for guests and will have a critical role in delivering exceptional customer service. To be industry-ready, hotel students need to be exposed to a lot of knowledge and skill sets within the limited semester weeks. Hence, the objective of this project is to develop a teaching and learning (T&L) hub in supporting personalized and self-directed learning. The web application had been developed as hub that provides notes, collective of standard operating procedure (SOP) videos, simulation activities, and adaptive learning technologies that cater to individual learning styles and preferences, enabling users to explore their interests and acquire knowledge at their own pace. This hub also facilitates internship and career opportunities by providing integrated links which support university students in their career pathway. Students may have free access to the hub web application through the QR code provided by the lecturers in any T&L platform. The hub web application which had been named RDO Oasis has the potential to be commercialized as a non-profitable web application as it will be continuously beneficial to hotel management students by helping them to access room division operation T&L materials and develop the necessary skills for a successful transition into the workforce.

Keywords: Room division operation; Hoteliers; Industry-ready; Teaching and learning; Web application.

1. INTRODUCTION

The development of new applications for educational technology has resulted in an increase in the amount of time spent online (Palumbo, 2022). The educational experience has been fundamentally altered because of the widespread adoption of digital technology in places where it had previously been carried out manually (Raten, & Jones. 2021). Even now endemic, the transition to teaching via distant means has not been reversed. As a direct consequence of this, management educators have begun including new and developing technologies as an integral component of the learning process (Raten, 2023). The comfort level of students with online teaching formats has been shown to be on the rise, primarily attributed to their extensive engagement with technology (Hogdal, et. al., 2021). In the context of hospitality industry is dynamic and constantly evolving requiring hoteliers to be adaptable and able to handle unexpected situations, changing guest preferences, and industry trends. Besides excellent

communication and customer service skills, hoteliers also should be adept at quickly and effectively resolving problems or complaints that guests may have. They should be resourceful and have the creative thinking in find solutions that satisfy guests and maintain the reputation of the hotel. Furthermore, teaching the room division in courses traditionally is very time-constrained due to 7 out of 14 weeks to train students for front office topics. Students need to master the basic skills of front office tasks before they start interning in the hotel industry.

Commonly, hotels and resorts need Property Management Systems (PMS) for successful property management. PMS provide reservations, check-ins, check-outs, billing, and guest communication for hotels and resorts (Rabea et al., 2018). Hotel management students need PMS exposure to prepare for the tech-driven economy (Aujero-Blanza, et. al., (2023). Although PMS simulations used in university courses can offer students practical experience in the industry, the high cost of annual subscriptions for PMS usage can be burdensome for the university. Furthermore, the need to renew licenses during the semester may cause delays and disrupt class activities.

Therefore, this web application had been developed as hub also known RDO Oasis that provides notes, collective of standard operating procedure (SOP) videos, simulation activities, and adaptive learning technologies that cater to individual learning styles and preferences, enabling users to explore their interests and acquire knowledge at their own pace. This RDO oasis is a simulation created based on basic requirements of PMS which are significant in the hotel industry. For that reason, adopting the requirement of PMS through simulation in RDO Oasis, keeps students abreast of technology advances, preparing them for the changing hotel industry besides creating a user-friendly application in empowers students to self -guide to the simulation activities. Additionally, these simulations can teach critical thinking and decision-making as well as meet the requirement for comprehensive communication, teamwork, and customer service training through developing soft skills.

2. METHODS

RDO Oasis is a web application developed from web-based platform by customizing to the notes, collective of standard operating procedure (SOP) videos, simulation activities, and Artificial Inteligence (AI). Hence, this RDO Oasis had been integrated with the Microsoft Excel for Property Management System (PMS) information that guide student to practice the basic knowledge of reservation and registration for individual guest.In order to investigate the effectiveness RDO Oasis, questionnaire using the google forms had been distributed to the 52 students that undertake the Room Division Operations (HTH212) course for semester October 2022 – February 2023 and March – July 2023. They are students of Diploma in Hotel Management in UiTM Terengganu.

3. RESULT AND DISCUSSION

3.1. Novelty

This integrated web application combines five (5) elements of Room Division that consist of Mock RDO Hotel, reservation, front desk, cashiering, and night audit. The interesting and novelthy about this RDO Oasis is the simulation of reservation (include room availability, reservation form, simulation script and demonstration by AI), front desk (include room status, guest registration card, simulation script and demonstration AI), cashiering and night audit (include notes, SOP videos and simulation AI) as shown in figure 1 and figure 2.

Figure 1. *Front page of RDO Oasis with website view and mobile view*

Figure 2. *Interface of RDO Oasis application*

3.2. Users' Feedback Analysis

The findings of the survey as shown in figure 3, reveal that the RDO Oasis is functional for the students to search for valid information regarding the reservation, registration, cashiering, and night audit. RDO Oasis also is a user-friendly and interactive display web-application that might help the students to access information and simulation activities.

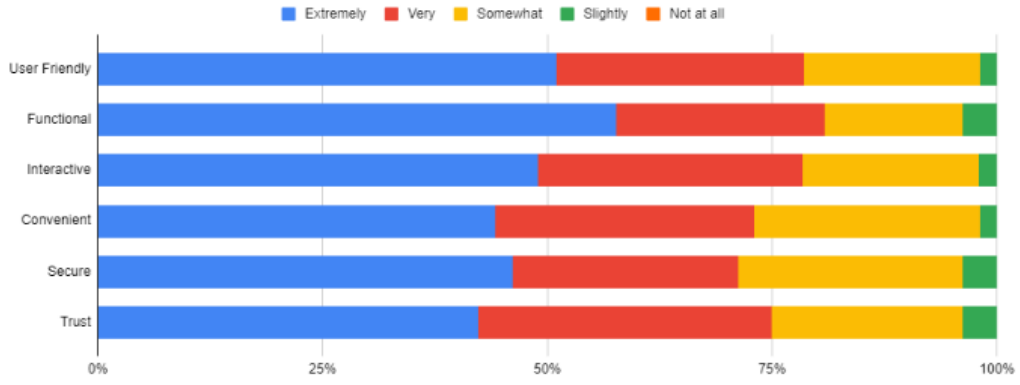

Figure 3. *Responses to the survey of RDO Oasis web-application*

4. CONCLUSION

In conclusion, RDO Oasis become one of the Teaching and learning (T&L) hubs and plays a crucial role in supporting the education and professional preparedness of hotel management students. This T&L web application caters the different learning styles, offering a wide range of materials such as notes, SOP videos, simulations, and adaptive learning technology. This diverse set of resources ensures that students can effectively grasp and apply their knowledge. Moreover, the accessibility of RDO Oasis allows a larger number of students to benefit from its resources and opportunities, fostering inclusivity and equal access to educational resources. With its comprehensive offerings and commitment to student success, RDO Oasis has the potential to serve as a centralized hub for teaching and learning in the hospitality field. Overall, RDO Oasis may help empower hospitality students with self-directed learning and equip them with the relevant skills and knowledge required by future employers.

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NABEEZ TABLET AS NOVEL NUTRACEUTICAL FROM SUNNAH FOOD

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ABSTRACT

This research presents the development of Nabeez Tablets, a novel nutraceutical innovation derived from the traditional Islamic drink made by soaking dates or raisins overnight. Currently, there is limited research concerning the interaction of phytochemicals and nutrition in the mixture of sunnah food. The primary objective of this study is to optimize the nutritional composition and antioxidant activity of Nabeez while preserving its cultural significance and offering a modern on-the-go solution. The formulation process involved obtaining the best formulation through three variants (902, 835, and 276). The next step was to utilize UV-C light treatment on raw materials such as raisins and dates to enhance the tablets' antioxidant content, surpassing the health benefits of the traditional Nabeez drink. This technological innovation transforms the liquid Nabeez into effervescent tablets through novel manufacturing processes, resulting in a fizzy and dissolvable tablet when added to water. The results indicated that formulation 902 was chosen as the best option, with ANOVA-Test results showing P-values greater than 0.05, indicating a significant difference between samples. Additionally, the Total Phenolic Content (TPC) and 2,2-Diphenyl-1-picrylhydrazyl (DPPH) tests were conducted for the finalized formulation, consisting of Nabeez juice (23.8%), maltodextrin (23.8%), Vitamin C powder (23.75%), Sodium Carbonate (23.74%), grape flavor (3.54%), aspartame (1.11%), and caramel color (0.26%). Consequently, the Nabeez Tablets offer a convenient and easy-to-consume option with the potential for significant health and nutritional impact. They also raise awareness of traditional Islamic foods, providing consumers with a new option to consider for their dietary needs. Beyond their nutritional benefits, the tablets hold cultural and religious significance, being rooted in Sunnah practices and fostering cultural continuity. Additionally, with the growing consumer interest in traditional Islamic foods and practices, the Nabeez Tablets may find appeal among detox drink enthusiasts, expanding the options for dietary needs and promoting Sunnah food practices.

Keywords: Nabeez Tablet, Effervescent Tablets, Antioxidant, UV-C

1. INTRODUCTION

In recent years, there has been a growing interest in exploring traditional foods for their potential health benefits and cultural significance. Nabeez, a traditional Islamic drink made by soaking dates or raisins overnight, has long been revered for its high antioxidant content and potential therapeutic properties. As researchers and consumers seek more convenient and innovative ways to harness the nutritional potential of traditional foods, the concept of transforming Nabeez into effervescent tablets has emerged as a promising solution.

The Nabeez drink, an established Sunnah beverage known for its detoxification properties (Muzaifa, Lubis, & Arifullah, 2019), warrants noteworthy attention. Its significance lies not only in its considerable nutritional value but also in its capacity to provide enduring vitality, particularly during the holy month of Ramadan. Notably, Fibonacci (2020) highlights the unique attribute of this Nabeez drink, primarily its substantial antioxidant content. This unique beverage is the outcome of immersing dates or raisins, which are left to soak overnight before consumption (Fauziyah et al., 2022). The traditional preparation method of this beverage is time-intensive, and in the present era, consumers exhibit a preference for more conveniently accessible beverage options. Consequently, research has been undertaken to formulate an optimized version of the Nabeez drink, innovatively transformed into tablet form, enhancing its accessibility for users at any time. Importantly, the distinctiveness of the Nabeez drink is further underscored by its significant antioxidant content (Fibonacci, 2020), a feature primarily attributed to its key constituents, raisins, and dates.

The production process of the Nabeez drink primarily centers on the principal raw material, which comprises raisins or Vitis vinifera L. The choice of Golden Raisins, as opposed to other varieties, is underpinned by their noteworthy natural sugar content, exceeding 60% (Alexandra et al., 2020), as well as their abundance of fiber and phytochemicals, notably phenolic compounds. A comprehensive comparative analysis of the nutritional constituents present in Golden Raisins in contrast to other raisin varieties is presented in Table 1.

Table 1. Value Content for Raisins

Raisin	Moisture	Protein	Total Lipid	Carbohydrate	Total Sugar	Fiber
	Value per g/100g					
Golden Raisins	14.90	3.23	0.20	80.02	65.70	3.30
Zante Currant	17.60	3.43	0.22	76.98	62.28	4.4
Corinthian Currant	NR3	2.5	0.4	77.5	NR3	6.7

(Schuster, Wang, Hawkins, & Painter, 2017)

In the manufacturing of Nabeez drinks, another pivotal raw material is the utilization of dates, specifically the Phoenix dactylifera L variety. In this innovation, Ajwa dates have been selected for their inclusion. Dates, as a dietary component, hold a special significance in Islamic tradition and are frequently referenced in the Quran and Hadith. Ajwa dates are characterized by their elevated carbohydrate content, reaching up to 80%, but exhibit a comparatively lower protein content, comprising only 2-3% of their composition (Parvez, R., Gautam, A., & Vyakhaya, 2022). A comprehensive overview of the nutritional profiles of various date types was stated in Table 2.

Table 2. Value Content for Dates

	Moisture	Protein	Total Lipid	Total Sugars	Ash
	Value per g/100g				
Ajwa	22.8	2.91	0.47	74.3	3.43
Medjool	21.32	1.81	0.39	66.47	1.74
Deglet Noor	13.5	1.71	0.40	86.42	1.78

(Aljaloud, S., et al., 2020)

This study encompasses an essential process aimed at augmenting both antioxidant content and phenolic content through the application of UVC radiation. This enhancement is designed to

enable consumers to partake in beverages that offer optimal nutritional value. The significance of elevating antioxidant and phenolic content in food products lies in their capacity to assist individuals in counteracting free radicals within the body (Haida, Z., & Mansor, H., 2019). Free radicals have the potential to inflict harm upon normal cells, proteins, and lipids (Thorat et al., 2013). Furthermore, these antioxidant compounds play a crucial role in fortifying the body's immune system (Fibonacci, A., 2020).

2. METHODS

2.1 Pre-Treatment of Dates and Raisins

The pre-treatment process involves subjecting dates and raisins to UV-C radiation. Initially, samples are cut into small pieces measuring 0.5cm X 0.5cm. These samples are then exposed to UV-C rays using a UV lamp emitting radiation at a rate of 254nm (Shen et al., 2013). The distance between the sample and the UV lamp is set at 22 cm. The samples are subjected to UV light for varying durations: 0 seconds as a reference point, while other samples are exposed for durations of 60 seconds, 120 seconds, 180 seconds, 240 seconds, and 300 seconds.

2.2 Extraction Process

In the research process, 20.0g sample was obtained from each part, and subsequently, this sample was combined with 40.0 ml of distilled water and ground (Rivera-Pastrana, Gardea, Yahia, Martínez-Téllez, & González-Aguilar, 2013). Following this, 0.1g sub-sample was taken from each of the prepared samples. This 0.1g sub-sample was then mixed with 5ml of methanol and 100.0ml of distilled water. The extraction process was executed by mixing the ingredients on a 'hot plate' for a duration of 1 hour. Subsequently, this mixture was stored in a Scott Bottle, which was carefully wrapped in an aluminium foil, in preparation for the subsequent analysis.

2.3 Phenolic Compound Content Study (Total Phenolic Content (TPC)

The Phenolic Compound Content Study includes the analysis of Total Phenolic Content (TPC) in which 2.0ml of a 10% Folin-Ciocalteu reagent (FCR) is combined with 1.0ml of the sample extract, following the procedure outlined (Alothman, Bhat, and Karim, 2009). This mixture is allowed to stand for 5 minutes before 2.0ml of 7.5% w/v sodium carbonate solution is added. Subsequently, the mixture is placed in a dark environment for 30 minutes. The next step involves measurement using a UV Spectrometer (UV-Vis) with the wavelength set at 765nm. In addition, Gallic acid is used in the calibration process at various concentrations, including 0.05 mg/ml, 0.15 mg/ml, 0.20 mg/ml, and 0.25 mg/ml. This is done to create a reference standard for the quantification of the phenolic compound content in the sample.

2.4 Antioxidant Activity

The subsequent step involves assessing the antioxidant content. This procedure commences with the preparation of a DPPH (2,2-Diphenyl-1-picrylhydrazyl) solution, achieved by adding 0.1ml of DPPH, equivalent to 39.4mg, to 1000.0ml of 99% methanol. Following this, sample dilutions were prepared at concentrations of 1.0mg/ml, 0.8mg/ml, 0.6mg/ml, 0.4mg/ml, and 0.2mg/ml. These dilutions were created by mixing 10.0ml of distilled water with the respective amount of the sample.

Each sample was then combined with 4.0ml of the DPPH reagent and 2.0ml of methanol. The resulting mixture was thoroughly mixed and placed in a dark container for a duration of 30 minutes, in accordance with the method described (Abd El-Rahman and Al-Mulhem, 2017). Subsequently, this mixture was subjected to assessment of its absorption rate using a UV Spectrometer set at 517nm. This analysis is conducted to determine the antioxidant activity of the samples.

2.5 Nabeez Tablet Process

The process of creating Nabeez tablet drink begins with the extraction of Nabeez juice from a mixture of raisins and dates, as documented (Siti and Siti, 2018). This Nabeez juice is subsequently combined with maltodextrin in a 1:1 ratio to produce Nabeez puree. The Nabeez puree is then subjected to a freeze-drying technique to transform it into a powdered form. All dry ingredients, including the Nabeez powder, vitamin C powder, sodium carbonate, grape flavor, aspartame, and caramel color, are meticulously blended before undergoing the tablet formation process, carried out using a Rimek Compression Machine (Figure 1).

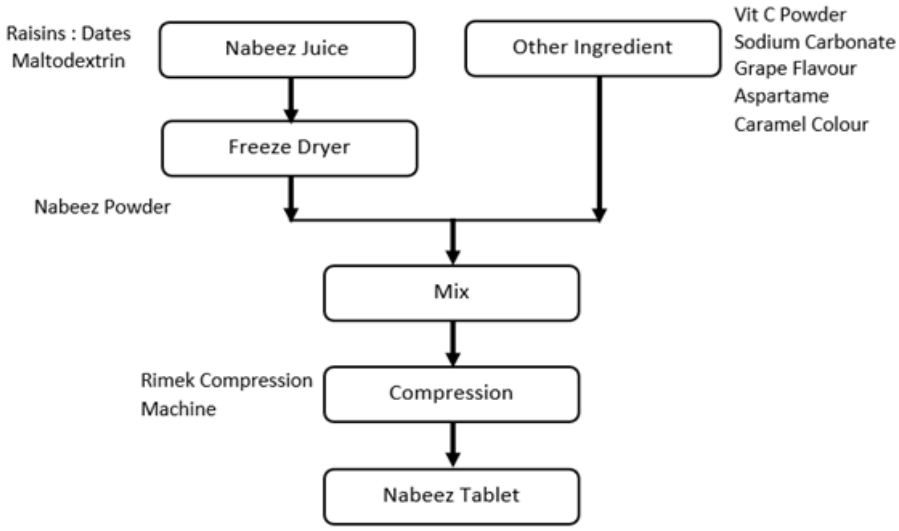

Figure 1. *The process of producing Nabeez Tablet*

2.6 Sensory Evaluation

The sensory evaluation process for the Nabeez tablets involves dissolving the produced tablets and conducting the assessment. In this stage, three optimal formulations, which are a result of blending dates and raisins, are employed for the sensory evaluation. A trained panel of evaluators undergoes preparatory training, including product familiarization sessions, conducted multiple times before they are presented with actual samples (Silva, A.Y.S.L, Binduhewa, A.M.C.U., and Subodinee, A.A.M., 2014).

To eliminate bias, the Nabeez drink samples are coded with three distinct identifiers, specifically 276, 835, and 902 (Sharif, M.M., Butt, M.S., Sharif, H.R., and Nasir, M., 2017). This random coding ensures objectivity in the assessment process. To ensure the thoroughness of the sensory evaluation, a total of 30 trained panelists, following the methodology outlined participate in the evaluation process (Parvez, R., Gautam, A. & Vyakhaya., 2022).

The panelists engage in a taste test and select the preferred sample. For recording purposes, each panelist completes a Scoring Test and Hedonic Test form, utilizing a 5-point scale where 1 indicates strong dislike and 5 represents strong liking, as per the framework proposed (Zhi, R., Zhao, L., & Shi, J., 2016). This standardized system facilitates the documentation of results following the completion of the sensory evaluation process. The attributes assessed by the panelists were sweetness, carbonation, mouthfeel, astringency, metallicity, aftertaste, and overall taste.

2.7 Statistics

All data will analyze by the Statistical Package for the Social Sciences (SPSS) through ANOVA-Test.

3. RESULTS AND DISCUSSION

The study aimed to optimize the antioxidant content of Nabeez for enhanced consumer convenience. To achieve this objective, three formulations were selected based on the evaluation of DPPH (2,2-Diphenyl-1-picrylhydrazyl) and TPC (Total Phenolic Content) in the mixture of dates and raisins. Table 3 illustrates the selected variables derived from the main ingredients: Dates (Ajwa Date) and Raisins (Golden Raisin), which are presented as percentages.

Table 3. Antioxidant Activity of Nabeez Formulation

AJWA DATE	GOLDEN RAISIN	DPPH	TPC
0	100	64.34%	1.2934
25	75	79.71%	1.7454
33.33	66.67	48.63%	1.6195
50	50	73.62%	1.8583
66.67	33.33	43.17%	1.4999
75	25	23.52%	0.8835
100	0	32.44%	0.6448

The three selected formulations for further optimization are as follows:

i. dates 25% and Raisins 75% (902)
ii. dates 50% and Raisins 50% (835)
iii. dates 33.33% and Raisins 66.67% (276)

These formulations were chosen based on their promising DPPH values and TPC levels, and they represent potential candidates for enhancing the antioxidant content of Nabeez while ensuring consumer acceptability and convenience. In the sensory evaluation of the three selected formulations, a taste test was conducted, considering seven predetermined attributes: sweetness, carbonation, mouthfeel, astringency, metallic taste, aftertaste, and overall flavor.

Statistical analysis was carried out using the ANOVA (Analysis of Variance) test to determine whether there were significant differences between the samples. When P-values are greater than 0.05, it indicates that there is a significant distinction between the tested samples. The results, as presented in Table 4, demonstrate that Tukey's HSD (Honestly Significant Difference) analysis revealed significant differences between the products evaluated. Notably, the findings highlight a noteworthy preference for the 902 sample across all attributes assessed.

This suggests that the formulation with the composition of Dates 25% and Raisins 75% (902) performed significantly better in terms of sensory attributes when compared to the other formulations, and it appears to be the most favored choice among the tested samples.

Table 4. Tukey's HSD result for sensory scores of flavored Nabeez Drinks

ATTRIBUTES	276	835	902
Sweetness	3.90±0.273a	4.15±0.292b	4.59±0.132c
Carbonated	3.98±0.266a	4.20±0.300b	4.50±0.175c
Mouthfeel	3.94±0.280a	4.22±0.317b	4.55±0.161c
Astringent	3.92±0.291a	4.15±0.334b	4.51±0.174c
Metallic	3.90±0.287a	4.18±0.311b	4.50±0.171c
Aftertaste	3.95±0.287a	4.22±0.291b	4.49±0.172c
Overall flavour	3.92±0.292a	4.15±0.341b	4.56±0.159c

The transformation of Nabeez into effervescent tablets represents an innovative manufacturing process that yields fizzy and readily dissolvable tablets when introduced to water. This technological breakthrough not only provides a convenient and portable option for modern consumers but also respects the cultural heritage of Nabeez as a traditional Islamic beverage. Nabeez Tablets offer an adaptable solution for on-the-go consumption, effectively catering to health-conscious individuals with fast-paced lifestyles.

Beyond its nutritional implications, this research explores the cultural and religious significance of Nabeez. Rooted in Sunnah practices, Nabeez holds profound cultural importance for specific communities and individuals seeking products with religious connections. The preservation of Nabeez's cultural heritage through its transformation into tablets reinforces its relevance and continuity in contemporary times.

Furthermore, this research delves into the potential market and industry impact of Nabeez Tablets. With a growing interest among consumers in traditional Islamic foods and practices, the unique combination of technological innovation, enhanced nutritional content, and cultural significance may attract detox drink enthusiasts and health-conscious individuals in search of alternative sources of antioxidants. This not only fulfills a dietary need but also caters to a desire for products that connect with cultural and religious traditions, making Nabeez Tablets a compelling offering in the marketplace.

4. CONCLUSION

In conclusion, the development of Nabeez Tablet represents a remarkable integration of ancient wisdom and modern technology. Through optimizing its nutritional content and retaining its cultural significance, Nabeez Tablets provide a unique opportunity to embrace time-honored traditions in a contemporary and accessible manner. The potential health benefits, combined with the cultural and religious significance, make Nabeez Tablet a promising contribution to the nutraceutical industry, catering to diverse consumer preferences and fostering awareness of traditional Islamic foods and practices.

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THE DEVELOPMENT OF KOMBUCHA FLAKE

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ABSTRACT

The extensive use of Haw flakes, an imported product from China, in the preparation of 'asam manis' cake has sparked worries regarding the reliance of Malaysians on this ingredient and its safety in the baking process. Muslim bakers are encouraged to explore alternative options until the specific ingredients and manufacturing practices of Haw flakes are better understood and transparently communicated. To address this issue, we developed an alternative option using Kombucha flakes, which offer a similar tangy and sweet-sour taste as Haw flakes. To create Kombucha flakes, three different formulations were formulated: F1 (kombucha tea 72.4%, pineapple powder 2.87%), F2 (kombucha tea 74.4%, pineapple powder 0.87%), and F3 (kombucha tea 70.4%, pineapple powder 4.87%). We conducted sensory evaluations to determine the best formulation of Kombucha flakes, using hedonic and scoring tests. The highest mean score was obtained from Formulation 2 (F2), with an overall acceptance score of 3.26±1.601a. Comparing the sensory evaluation results of 'asam-manis' layer cake using Kombucha flakes and Haw flakes, respondents favoured Kombucha flakes, with similar attributes except for color. Proximate Analysis revealed that 100 grams of Kombucha Flake contain 365 calories, 0.2 grams of fat, 90.3 grams of carbohydrates, 0.67 grams of protein, and 9.7 grams of vitamin C. Regarding shelf-life analysis, we monitored the pH value of Kombucha flakes from day-0 (pH 6.5) to day-21 (pH 5.36), showing an increase in acidity from 0.351% to 0.82% during the storage period. The pH value and acidity analysis revealed that Kombucha flakes became less sticky, darker, harder in texture, and more acidic throughout the storage duration. With the favourable shelf-life properties and nutritional content observed, we believe that the Kombucha flakes produced in this study have the potential to serve as a viable substitute for Haw flakes in cake production.

Keywords: kombucha; kombucha flake; haw flake, shelf life

1. INTRODUCTION

Bakers or home-bakers in Malaysia commonly utilized haw flakes to create the sweet-tangy flavour during baking the cakes known as 'asam-manis cake' or 'asam-masin cake'. However, the main ingredients in baking the cakes are generally flakes, which are an imported commodity from China known as 'Haw flakes'. Haw flakes are a type of processed food that is derived from the hawthorn berry. The pale and dark pink candy is often shaped into two-millimetre-thick discs and packaged in cylindrical stacks.

Figure 1. *Haw flakes that commercially available in Malaysia.*

Nowadays, expanding consumer demands and halal awareness are deeply ingrained in the culture of Malaysian Muslim communities, particularly in terms of the source of end products for everyday consumption and use. The goal of this study is to create flakes made from Kombucha tea, which has a fizzy, sour, and tangy taste like Haw flakes. Dutta and Paul (2019) from their studies mentioned that kombucha tea tastes like sweet sparkling apple cider, with prolonged fermentation showed vinegar-acidic flavour to the sparkling beverages. Bioactive compound found in kombucha such as polysaccharides, phenolic compound, acid amino, vitamins and mineral come from tea and microorganisms (Antolak *et al*., 2021). The reasoning behind this innovation was by converting kombucha drink into kombucha flakes, it may become a halal substitute as well as a food product that would attract the younger generation to consume kombucha. Kombucha tea offers the same flavour and advantages as other fermented beverages such as yogurt, Yakult, cultured buttermilk, and kefir because it includes bacteria that are good to the human digestive system.

1.1 Kombucha Tea as An Antimicrobial and Antioxidant Source

The main ingredients in making kombucha tea is tea leaf which is rich in catechins-teaflavins and thearubigin. The polyphenols found in tea contribute to the antioxidant activity of kombucha (Jakubczyk *et al.,* 2020), which is increased by a longer fermentation time (Kitwetcharoen *et al.,* 2023).). From their studies, Jayabanlan *et al.,* (2014) reported that kombucha tea contained 7 g/L of acetic acid and had antimicrobial effect against numerous microorganisms such as *Agrobacterium tumefaciens, Bacillus cereus, Salmonella choleaesuis, Styphylococcus aureus* and many more. Acetic acid produced in kombucha tea, was suggested to be the major antimicrobial agents, as well as bacteriocins and phenolic compound (Bakkith *et al.,* 2012). The benefits when consuming kombucha tea are it contains Vitamin C that act as antioxidant and its acidity will kill harmful bacteria and help fight several diseases and substances that fight free radicals or reactive molecule that can damage the cell. Kombucha flakes produced from kombucha tea in this study could become a halalan toiyyiban product and the only option from using Haw flakes in making *asam-manis* cakes in Malaysia.

2. METHODS

2.1 Preparations of Kombucha Flakes

Kombucha tea is manufactured and fermented at Politeknik Tun Syed Nasir Syed Ismail's Food Processing Laboratory (C15). The fermentation of sugared tea with SCOBY is used to create the beverage (Leal *et al.,* 2018). In this work, we used the approach from Leal *et al*. (2018) with a small modification, preparing 5g of tea leaves per liter of water and sugar as a substrate for fermenting bacteria at roughly 50g per liter of water. After boiling for 10 minutes, the water is mixed with sugar and swirled until fully dissolved. The tea leaves are then added and brewed for a few minutes before being filtered. Finally, we added 10% w/v kombucha culture to the mixture and placed it in a sterile container. We then shut the jar with a sterile cloth and ferment

it for 10-14 days at room temperature. It is critical that all operations for manufacturing kombucha tea be carried out in an aseptic manner, and that all instruments used in the process be sterilized. To prevent acetic acid overproduction in kombucha, the pH of the drinks must be monitored and stopped when it reaches pH 4.2 (Kovacevic *et al.*, 2014).

Figure 2. *Kombucha tea produced in the lab.*

The fermentation of the kombucha tea was kept aseptic. We incubate the kombucha tea for 7-14 days at 28 ± 1 °C. We created a duplicate of the fermentation tank and collected the samples after the stipulated duration of fermentation. According to Malbasa *et al*. (2011), the concentration of vitamin B2 was 8.3 mg/100 mL on the tenth day of fermentation, however Leal *et al.* (2014) discovered that the concentration of vitamin C increased, reaching 28.98 mg/L on the tenth day of fermentation. The Food and Drug Administration (FDA) recommends fermentation of kombucha for ten days (Kitwetcharoen *et al.*, 2023). Therefore, to acquire the highest vitamin C content in our kombucha flakes, we harvest the kombucha tea on the ninth day of fermentation. On the tenth day of fermentation, the flakes were created using kombucha tea.

2.2 Analysis of Kombucha Flakes

2.2.1 Sensory Evaluation

Sensory evaluation is a scientific method of product evaluation using the five senses consisting of the mouth as a taste appraiser, the nose as an aroma appraiser, and the eyes as a colour and appearance evaluator. In this study, 60 panellists randomly selected from PTSN population were active students and staffs at Politeknik Tun Syed Nasir Syed Ismail. Sensory evaluation was conducted using 5-scale Hedonic Test and 5-scale Scoring Test. From the Scoring Test, it aimed to analyse the organoleptic characteristic of kombucha flakes. Meanwhile, Hedonic Test is to determine the consumer acceptance and best formulation.

There are 5 determined characteristics of product produced which are adhesiveness to teeth, aroma, sourness, sweetness, and overall acceptance in scoring test that represented in 7 Likert scale and the level of liking from extremely like with scale 1 and extremely dislike with scale 9. Another sensory evaluation has been done was between kombucha flakes compared to Haw flakes that commercially available in the market. Sensory evaluation was conducted on Kombucha flakes and Haw Flakes samples using 7 Hedonic Test scales, which is score 1 for dislike very much and score 7 for like very much. The Hedonic Test is to measure the panel's level of liking for the sample. The results obtained were analyzed by using ‘One-Way Analysis of Variance (ANOVA) with the aid of ‘Statistical Package for Social Science (SPSS Version 17).

3. RESULTS AND DISCUSSION

3.1. Development of Kombucha Flakes

Table 1 shows three formulations to produce Kombucha Flakes by percentage. Therefore, there are three samples prepared which are two independent variables (kombucha water and pineapple powder) for sensory evaluation of kombucha flakes.

Table 1. The formulation of Kombucha Flakes in percentage

INGREDIENTS	Formulation 1 (F1)	Formulation 2 (F2)	Formulation 3 (F3)
Kombucha Water	70.4	72.4	74.4
Pineapple Powder	4.87	2.87	0.87
Pectin	1.17	1.17	1.17
Citric Acid	0.41	0.41	0.41
Brown Sugar	20.28	20.28	20.28
Corn Starch	2.87	2.87	2.87

3.2 Sensory Evaluation of Kombucha Flakes

3.2.1 Sensory Evaluation of Kombucha Flakes Between Formulations

Table 2. Scoring Test Result of Sample Kombucha Flakes

ATTRIBUTES	F1	F2	F3	P VALUE
Adhesiveness to teeth	4.44 ± 1.638^{b}	3.08 ± 1.676^{a}	3.21 ± 1.331^{a}	0.000
Aroma	3.64 ± 1.342^{a}	3.11 ± 1.450^{a}	3.23 ± 1.216^{a}	0.078
Sourness	3.56 ± 1.775^{b}	2.69 ± 1.361^{a}	2.98 ± 1.408^{a}	0.007
Sweetness	4.11 ± 1.462^{a}	4.48 ± 1.386^{a}	4.20 ± 1.352^{a}	0.331
Overall acceptance	3.00 ± 1.549^{a}	3.56 ± 1.566^{a}	3.56 ± 1.638^{a}	0.084

From the Table 2 above, it can be concluded that, in terms of adhesiveness to teeth between the three samples, there was no significant difference between F2 and F3, but there was significant different between F2 and F3 with F1. In terms of aroma attributes, it can be concluded here, there was no significant difference between the three samples. As for the sourness attributes, there was no significant difference between F2 and F3, but there was significant difference between F2 & F3 with F1. As for the sweetness attribute, there was also no significant difference between the three samples. While for overall acceptance showed there was no significant difference between the three samples. From the results, it can be concluded that, in terms of attributes, panel can have recognized the attribute difference in terms of adhesiveness to teeth and sourness, where F1 have more adhesiveness to teeth ability and sourer than F2 and F3.

Table 3. Hedonic Test Result of Sample Kombucha Flakes

ATTRIBUTES	F1	F2	F3	SIGNIFICANCE
Adhesiveness to teeth	2.70±1.442[a]	3.57±1.617[b]	3.46±1.298[b]	0.002
Aroma	3.36±1.623[a]	3.72±1.485[a]	3.33±1.274[a]	0.262
Sourness	3.26±1.548[a]	3.51±1.660[a]	3.43±1.565[a]	0.686
Sweetness	3.05±1.309[a]	3.49±1.545[a]	3.39±1.498[a]	0.213
Overall acceptance	2.80±1.492[a]	3.26±1.601[a]	3.26±1.482[a]	0.162

The Table 3 depicted, in terms of adhesiveness to teeth between the three samples, there was no significant difference of panelist liking between F2 and F3, but there was significant different between F2 and F3 with F1. In terms of aroma, sourness, and sweetness attributes, it can be concluded here, that there was no significant difference between the three samples. While for overall acceptance showed there was no significant difference between the three samples. From the results, it can be concluded that, in terms of degree of liking between the five attributes, panel less like the adhesiveness to teeth of F3. But for other attributes, there was no significant difference for other four attributes. From the Hedonic and Scoring Test of Kombucha Flakes between three formulations, it can be concluded that panelist prefer kombucha flake that had less adhesiveness to teeth and had less sourness. While the best formulation was obtained from the highest mean score between three formulations. From the Hedonic Test result in Table 3.2.2, it can be concluded that the best formulation was obtained from Formulation 2 (F2).

3.2.2 Sensory Evaluation of *Asam Manis* Cake Using Kombucha Flakes and Haw Flakes

Figure 3. *Slices of asam-manis cake using difference flakes; kombucha flakes (left) and Haw flakes (right)*

Figure 4. *The application of kombucha flakes in the asam-manis cake (left) compared to haw flakes (right)*

Sensory evaluation was conducted on Kombucha flakes and Haw Flakes samples using 7 Hedonic Test scales, which is score 1 for dislike very much and score 7 for like very much. The Hedonic Test is to measure the panel's level of liking for the sample. There are 2 types of flakes, which are for sample code 353, Kombucha Flakes and for sample code 975, Haw Flakes. Several attributes were analyzed on the sample in the sensory assessment which are sweetness, sourness, color, adhesiveness to teeth and overall acceptance.

Table 4. Result hedonic scale for Cake Masam Manis Using Kombucha Flakes and Haw Flakes

Attributes	Sample 1 (353) Cake Masam Manis Using Kombucha Flakes	Sample 2 (975) Cake Masam Manis Using Haw Flakes	Sig. (2-tailed) P-Value
Sweetness	6.20 ± 0.997	6.03 ± 1.033	0.509
Sourness	5.80 ± 0.887	6.07 ± 1.258	0.374
Colour	5.90 ± 0.803	6.43 ± 0.728	0.003
Adhesiveness to teeth	5.37 ± 0.850	5.80 ± 1.031	0.010
Overall acceptance	6.00 ± 0.830	6.20 ± 0.847	0.405

Data were analyzed using T-Test. From the result data in Table 3.2.3, it indicates the mean score and the P-value for each sample and attribute. For P-values greater than 0.05, indicates no significant difference between samples, while for P-values less than 0.05, indicates there's significant difference between samples. From the table above, it can be concluded that, in terms of sweetness, sourness and adhesiveness to teeth attributes between the two samples, there is no significant difference. As for the color attributes, there was a significant difference between the two samples, where the panel preferred the color of Haw Flakes. While for overall acceptance showed no significant difference between the two samples. From the results, it can be concluded that Kombucha Flake is accepted among the respondents because it gets a mean score above 5 and there is no significant difference for all of attributes of Haw Flakes except colour.

4. CONCLUSION

Three formulations have been developed in producing kombucha flakes, which are F1 (using kombucha tea 72.4% and pineapple powder 2.87%), F2 (using kombucha tea 74.4% and pineapple powder 0.87%) and F3 (using kombucha tea 70.4% and pineapple powder 4.87%). The sensory evaluation was done to determine the consumer acceptance and the best formulations to produce kombucha flakes, using hedonic and scoring test. Since kombucha flakes can become substitute to the used of Haw flakes in making *asam-manis* cake, it is recommended to apply the used of kombucha flakes in making tablet or soluble table to enhance and improve the usability of kombucha as fermented beverages.

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SOURSOP LEAVES STEVIA TEA

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ABSTRACT

The growing global attention towards the qualities of soursop highlights the importance of utilizing the by-products of its production chain. The soursop-by-products contain valuable phytochemicals and other characteristics that make them suitable for industrial purposes. Moreover, this product not only helps to decrease environmental harm but also generates revenue. In recent years, there has been little research focusing not only on soursop flesh but also on its leaves because of their potential impact on combating cancer cells within the body. Soursop leaves have historically been used in traditional medicine to make a tea infusion. This infusion is believed to have anticancer, analgesic, and antispasmodic properties. Additionally, soursop leaves are sold globally for therapeutic reasons and can be combined with other herbs in herbal mixtures. In Malaysia, there is less product derived from soursop leaves. The flesh is eaten, and the leaves are dumped in the dustbin. Therefore, this product has been developed to curb waste sustainability and provide a convenient way of drinking healthy tea on the go. The Soursop Leaves Tea is different from other products in the market because it has been added with stevia to replace the sweetness of white sugar. It eases customers in preparing the tea on the go because they only must soak the Soursop Leaves Tea with stevia leaf extract in hot water, and it is ready for customers to sit back and enjoy. There are soursop teas available, but not instant tea. The instant soursop leaves tea with stevia formula was inspired by the unique and genuine soursop leaf characteristics from a special selection of natural old soursop leaf extracts. Studies have shown that old leaves have higher flavonoid levels than young leaves. Flavonoids are known for their health benefits, having properties that inhibit oxidation, reduce inflammation, prevent gene mutations, and oppose cancer development. The Soursop Leaves Tea also contains no added preservatives, artificial colors, or flavors.

Keywords: soursop; sustainability; wastes; leaves; revenue

1. INTRODUCTION

Soursop (Annona muricata L) is a medicinal plant found in nature that belongs to the Annonaceae family. This plant offers numerous benefits for human health, serving as a fruit with essential nutrients and functioning as a traditional medicine ingredient with multiple advantages (Makuasa & Ningsih, 2020; Zahara, & Nina, 2023; Kuka et al., 2023). The most intriguing aspect of the soursop plant for research is its leaves Hasmila, Natsir, & Soekamto, 2019).

These leaves have gained considerable interest in both traditional and modern medicine due to their numerous health benefits. This is mainly attributed to the abundance of active compounds

found in soursop leaves, including alkaloids, terpenoids, flavonoids, tannins, saponins, acetogenins, and more (Tambun, Alexander, & Ginting, 2021). In addition, the extract of soursop leaf has been found to contain many bioactive compounds such as various phenolic compounds that are beneficial for anticancer, antidiabetic, and many other health benefits (Cornelia, 2019).

Furthermore, soursop leaves are sold globally for therapeutic reasons and can be combined with other herbs in herbal mixtures. In Malaysia, there is less product derived from soursop leaves. The flesh is eaten, and the leaves are dumped in the dustbin. Therefore, to protect our environment and minimize pollution, soursop leaves have been developed into tea.

1.1 Problem statement

Tea is the most popular drink worldwide (Zhang & Mine, 2019), just behind water, making it a significant global food item (De-Heer, 2011). Tea is commonly consumed for its medicinal and energizing effects (Zhang & Mine, 2019). Despite the numerous health benefits and growing popularity of soursop leaves tea, there is a lack of convenient, high-quality, and easily accessible options in the market. Existing soursop leaves tea products often have issues such as inconsistent flavor profiles, long preparation times, limited availability, and an absence of packaging innovation. This results in a gap in the market for soursop leaves tea product that addresses these challenges and provides a convenient and enjoyable experience for consumers.

Furthermore, many consumers are increasingly concerned about their sugar intake and are seeking healthier alternatives to traditional sweeteners. However, the option for soursop leaves tea with low or no added sugar are limited. This leaves a significant opportunity to develop a product that combines the health benefits of soursop leaves tea with the natural sweetness of stevia, providing a guilt-free and enjoyable alternative for health-conscious individuals.

The problem statement, therefore, is to create a soursop leaves tea with stevia product that offers consistent flavor, quick preparation, wide availability, and innovative packaging. This product should also cater to the growing demand for low or no-added-sugar alternatives, meeting the needs of health-conscious consumers conveniently and satisfyingly.

2. METHODS

Figure 1. Soursop leaves tea step-by-step.

1. Gather fresh soursop leaves and stevia leaves. Make sure they are clean and free of any dirt or contaminants. Rinse the soursop and stevia leaves under cold water to remove any dirt or debris. Thinly slice the leaves.
2. Pull the dehydrator tray out and place the leaves inside. Set the dehydrator to about 57º C and then slide the tray into the dehydrator. Then, leave the leaves inside for 12 to 24 hours until they are fully dry. Once the time is up, let the leaves cool completely before attempting to handle them.
3. Blend both leaves and strain to get a smooth texture.
4. Put into the teabag with a ratio of 1 soursop leaf to ½ stevia leaves.
5. Then, store the teabag in an airtight container.

3. RESULTS AND DISCUSSION

3.1. Hedonic Test

A hedonic test is a test of a person's preferred level of a product ingested, and it is also known as a sensory test (Su et al., 2021). This product has been through a hedonic test. One of the most dependable consumer acceptance assessments for food products is the hedonic test (Triandini & Wangiyana, 2022). The hedonic test of Soursop Leaves Tea product uses a 5-point scale to determine the score given by the panelist. The 5-point hedonic scale was "like very much (5), like (4), like slightly (3), dislike (2), and dislike very much (1)". The hedonic test was conducted on 30 panelists with a range of 18 – 50 years of age. 4 level parameters are measured: color, taste, aroma, and texture. The result is tabulated in Table 1.

Table 1. Consumer Acceptance Result

	Aroma	Texture	Taste	Flavor
like very much (5)	25%	12.5%	37.5%	5%
like (4)	60%	87.5%	62.5%	95%
like slightly (3)	15	0	0	0
dislike (2)	0	0	0	0
dislike very much (1)	0	0	0	0
	100	100	100	100

From the Table 1, it can be concluded that most of the panellists prefer "like (4)" for the tea. The results show that the tea can be marketable.

3.2. Usefulness

This product is rich in antioxidants and contains powerful bioactive compounds that can support a healthy immune system and aid in digestion. It also contains the natural sweetness of stevia, derived from the stevia plant, which perfectly complements the earthy flavor of soursop leaves, transforming your cup of tea into a delightful and guilt-free indulgence for diabetic people. Each tea bag is packed with handpicked soursop leaves and premium stevia. Besides that, this product is sourced from natural ingredients, free from artificial additives or preservatives. furthermore, this instant tea has stevia added, much more convenient when the customer just soaks and drinks. They do not need to bring sugar and the airtight packaging can be reused.

Figure 2. The airtight packaging is convenient for later use.

3.3. Market Potential

a. Increasing demand for herbal teas.
   There has been a growing interest in herbal teas due to their perceived health benefits and natural ingredients. Soursop leaves tea has gained popularity for its potential anti-inflammatory and antioxidant properties.
b. Stevia is a natural sweetener.
   As concerns over the health risks of sugar and artificial sweeteners increase, consumers are seeking healthier alternatives. Stevia has gained acceptance as a sugar substitute in various food and beverage products.
c. Unique flavor profile.
   Soursop leaves have a distinct flavor that appeals to some consumers. The combination of the soursop leaves' flavor and the natural sweetness provided by stevia can make for an appealing tea option for those looking for a unique taste.
d. Niche market.
   The market for soursop leaves tea with stevia may be considered niche due to the specific target audience it appeals to. Those interested in herbal teas and seeking healthier alternatives to traditional tea options may be more likely to try and purchase this product.

Overall, the combination of soursop leaves with stevia tea presents a marketable product with potential health benefits, natural and organic appeal, unique flavor, and suitability for diabetic consumers. By positioning and marketing, effectively, this tea can attract a wide range of consumers and capitalize on current market trends.

4. CONCLUSION

In conclusion, the innovation of a Soursop leaves tea with stevia products holds immense potential to cater to the increasing demand for natural and healthy alternatives in the beverage market. By combining the rich flavor and numerous health benefits of soursop leaves with the natural sweetness of stevia, this product offers a refreshing and guilt-free beverage option. With its antioxidant properties, potential anti-cancer effects, and ability to promote overall well-being, the Soursop leaves tea with stevia stands as a promising addition to the market. Its unique blend of flavors and health benefits make it an excellent choice for individuals seeking a delicious and nutritious beverage choice. Embracing this innovative tea product has the potential to revolutionize the way we enjoy our daily cup of tea, promoting wellness and sustainability in the process.

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PLANT- BASE REVOLUTION: SEITAN AS PROMISING MEAT SUBSTITUDE - "THE MAKING OF SEITAN SERUNDING"

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ABSTRACT

The global movement toward a plant-based diet and lifestyle, known as the Plant-Based Revolution, has gained substantial traction in recent years due to its potential benefits for personal health, environmental sustainability, and animal welfare. However, despite the growing awareness and availability of plant-based options, there are several obstacles that prevent its unanimous acceptance among varied consumer groups. One prominent challenge revolves around the fact that many meat substitute products available in the market today fail to mimic the authentic taste and texture of real meat. Because of that, producing meat substitutes that convincingly mimic the qualities of real meat can be key in persuading a more extensive demographic to shift towards plant-based options. Here is where the idea of having Seitan-based products as meat substitutes transpired. Seitan is generated by separating the protein from wheat flour dough through a continual washing process until a chewy mass or proteinaceous gluten is formed. Despite being made from wheat, Seitan has nothing in common with bread and flour. When cooked, it surprisingly takes on the appearance and consistency of meat. The fact that Seitan is made from flour and has a bland taste makes it easy to infuse flavors to mimic the taste of meat. Furthermore, wheat flour, the primary ingredient in Seitan, is widely available and affordable. Due to its meat-like texture, ability to absorb flavors, and cost-effectiveness make it an excellent choice for meat substitutes, especially in traditional Malaysian dishes, renowned for its intricate spice use and rich in flavors. The artful crafting of "Seitan Serunding," a play on the traditional Malaysian dish typically made with meat or fish, showcases how plant-based ingredients (Seitan) can be transformed into culturally significant meals. This process involves meticulously seasoning and cooking Seitan until it mimics the taste and texture of the original dish, offering a bridge between familiar flavors and the benefits of a plant-based lifestyle.

Keywords: Meat substituted, Plant-base, Seitan, Serunding

1. INTRODUCTION

During a rapidly evolving global food landscape, a profound transformation is underway, known as the Plant-Based Revolution. This movement has garnered substantial attention and momentum in recent years, driven by a growing awareness of its potential benefits in terms of personal health, environmental sustainability, and the ethical treatment of animals (Ketnawa &

Rawdkuen, 2023; Cichońska & Ziarno, 2021). While the Plant-Based Revolution is indeed making remarkable strides, it is not without its challenges, and one key obstacle stands out prominently on the path to wider acceptance. The fundamental challenge confronting the Plant-Based Revolution is the need for meat substitute products that authentically replicate real meat's taste and texture (Moss et al., 2023; Pasqualone, 2022). The desire to replicate the sensory experience of consuming meat remains critical for many consumers (Ohlau & Risius, 2022; Pintado & Pando, 2020). This quest for a true meat alternative holds the potential to persuade a broader and more diverse demographic to transition to plant-based options. In addressing this challenge, a promising solution known as "Seitan," is now garnering attention as a promising alternative. Seitan, an ingenious creation derived from the protein in wheat flour dough through a meticulously executed washing process, undergoes a transformation that allows it to replicate a chewy, meat-like consistency upon cooking (Bakhsh et al., 2021; Mala et al., 2010; Petrovna, 2003).

Despite its wheat-based origins, Seitan bears no resemblance to conventional bread or flour, and its neutral flavour profile makes it an ideal substrate for infusing a wide array of flavours, effectively recreating the essence of meat (Joshi & Kumar, 2015; Mistry et al., 2020). Moreover, the primary ingredient in Seitan, wheat flour, is both widely accessible and cost-effective, making it a practical choice for crafting meat substitutes (Martin et al., 2023). This introduction of Seitan into the world of traditional Malaysian cuisine, celebrated for its intricate spice utilization and flavorful dishes, has given rise to the creation of "Seitan Serunding." This innovative dish represents a transformation of a cherished Malaysian classic, traditionally prepared with meat or fish, into a plant-based alternative. By artfully seasoning and cooking Seitan, the "Seitan Serunding" preparation process successfully replicates the taste and texture of the original dish, thereby bridging the gap between familiar flavours and the benefits of a plant-based lifestyle. This study delves into the essence of the Plant-Based Revolution, examining the emergence of Seitan as a promising meat substitute. It underscores the culinary evolution within traditional Malaysian cuisine, represented by the creation of "Seitan Serunding." By investigating the potential of Seitan as a convincing meat substitute and its cultural significance within the context of traditional Malaysian dishes, this study sheds light on the ongoing shift towards plant-based dietary options and its far-reaching impacts on personal health, the environment, and animal welfare.

2. METHODS

2.1 The creation of Seitan Serunding

To undertake this study focused on creating a Seitan-based product, it is crucial to comprehensively grasp the precise process involved in preparing Seitan. The foundation of this endeavor is built upon the idea of modifying a Seitan recipe that was adapted from the Seitan Society Facebook group, a vibrant community of enthusiasts who generously share their wealth of knowledge and insights. Choosing to modify a recipe from the Seitan Society community highlights the commitment to tapping into the collective wisdom and experiences of those dedicated to the development of Seitan. The adapted recipe provides us with detailed guidance, outlining a series of specific steps and considerations. The table below presents an outline of the steps and considerations involved in the methodology for crafting our Seitan-based product.

The process of kneading & Washing (remove excess starch)

Seasoning and resting (Allowing to absorb flavour)

Shaping the dough (create fibrous texture)

Seitan cooking process (Steaming)

Shredded Seitan (Ready to use as a substitute for meat)

Ingredients used for Seitan Serunding

Seitan Serunding cooking Process

Consistently stirred (up to 2 hours

Ready-to-eat Seitan Serunding

Figure 1. *Steps and considerations involved in preparing Seitan Serunding*

2.2 Sensory evaluation

The initial and vital step in a thorough Seitan Serunding sensory evaluation process is choosing the right sensory panelists. Undoubtedly, the heart of this evaluation hinges on selecting panelists for their keen sensory skills. These panelists must possess an inherent ability to perceive and differentiate delicate variations in taste, texture, aroma, appearance, and overall acceptability. As a result of these considerations, experienced culinary and gastronomy experts will be selected as panelists for this study. Experts are known for their wealth of academic and practical knowledge, making them well-equipped to effectively grasp sensory evaluation's complexities. These individuals play a crucial role in providing insights that can lead to the refinement and perfection of this traditional Malaysian dish. The selected panelists employ meticulously crafted and standardized sensory evaluation forms, incorporating a seven-point scale, to ensure the reliability and consistency of their evaluations. These evaluation forms are precisely designed to facilitate a systematic and comprehensive examination of the Seitan Serunding's sensory attributes. Within the controlled environment, panelists utilize these forms as essential evaluation tools, ensuring that the process remains methodical and free from bias. The seven-point scale allows for a nuanced assessment, adding depth and precision to their evaluations.

3. RESULTS AND DISCUSSION

Table 1: Overall result for sensory evaluation by experts

Attributes/ Pannelist	*Flavour*	*Texture*	*Appearance*	*Aroma*	*Overall Acceptance*	*%*
1	5	5	6	5	6	77
2	5	6	7	4	6	80
3	6	6	6	5	6	83
4	5	6	6	5	6	80
5	6	7	5	5	6	83
6	5	5	5	6	6	77
7	5	6	6	5	6	80

When considering the overall acceptability, the average acceptance percentage was approximately above 75 %, showing that the dish is generally well-liked. These preliminary sensory evaluation results suggest that Seitan Serunding exhibits strong potential to be accepted by the public. Further refinements and adjustments based on these scores can lead to an even more appealing and satisfying final product. The acceptance of Seitan Serunding by over 75% of sensory evaluators indicates its potential popularity among a wider audience. This preliminary endorsement from informed, experienced assessors suggests Seitan Serunding could be appreciated in a broader food culture. The fact that culinary experts found it acceptable highlights its culinary value and adaptability. This sets the stage for Seitan Serunding to be adopted not only as a favorite Malaysian staple, but also as a flavorful alternative in a more extensive culinary world, where tastes, textures, and cultural elements collaborate to create dishes that captivate food lovers globally. This early approval kick-starts Seitan Serunding's culinary venture, suggesting an encouraging route for this traditional recipe to achieve international acclaim for its robust flavors and cultural relevance.

4. CONCLUSION

In conclusion, Seitan Serunding represents a bridge between the tastes we know and the advantages of a plant-based diet. As the Plant-Based Revolution continues to transform our culinary world, Seitan stands out as a key player in promoting a more sustainable and ethically sound approach to eating, poised to capture the hearts of food enthusiasts globally. In addition, it's worth noting that the academic significance of this study goes beyond the culinary realm. The documented success and acceptance of Seitan Serunding serve as valuable reference points in the ever-expanding body of academic literature on plant-based dietary choices and culinary innovation. This study not only contributes to our understanding of the practical applications of plant-based alternatives but also underscores their potential to create a positive impact on personal health, environmental sustainability, and ethical considerations.

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SPICY BANANA STEM CHIPS: A SUSTAINABLE CHOICE

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ABSTRACT

Spicy Banana Stem Chips represent a distinctive local snack innovation when compared to existing chips available in the market. This unique snack is primarily crafted from upcycled ingredients, specifically banana stem fiber and prawn skins. The primary goals of this product are to diversify the use of these otherwise wasted resources, the banana stem fiber and prawn skins, while simultaneously elevating the snack's nutritional value and visual appeal. The production process commences with the preparation of treated banana stems and prawn skins. The banana stem is carefully fried, blended, and combined with a delectable prawn skin powder, known as 'sambal sira.' This product offers marketability, cost-effectiveness, an extended shelf life, and easy marketing, thanks to its convenient zip-locked pouch packaging. To assess the product, a sensory and customer preference test was conducted involving 42 untrained panelists. The samples were evaluated based on six key attributes: appearance, color, texture, oil content, flavor, and overall acceptance. The results of the paired comparison test clearly indicate that most panelists favored this innovative product.

Keywords: Banana stem; chips; sustainable choice

1. INTRODUCTION

Banana stem waste is a significant agricultural concern in Malaysia, primarily stemming from its underutilization and the limited awareness of its diverse potential applications (Zaini et al., 2023). This often-overlooked part of the banana plant is a valuable resource, rich in dietary fiber and essential nutrients, including vitamins and minerals. Its nutritional profile makes it beneficial for digestion and blood sugar control. Despite its potential, the commercialization and widespread utilization of banana stems in Malaysia are limited, with traditional culinary practices primarily focusing on banana fruits, banana inflorescence, and banana leaves (Castillo et al., 2023). To address this issue, there is a pressing need to raise awareness among both farmers and consumers about the economic and nutritional benefits of banana stems.

Likewise, the waste of prawn skin presents a significant challenge within the seafood processing and culinary industries, characterized by its frequent underutilization and disposal due to limited awareness of its diverse potential uses and the absence of efficient processing methods. This is especially concerning given the rich nutritional content of prawn skin, which

includes valuable protein and healthy fats that could be harnessed for various applications. Furthermore, the improper disposal of prawn skins can lead to adverse environmental consequences, contributing to pollution and greenhouse gas emissions.

As a response to these challenges, researchers and innovators are working on innovative solutions, one of which is the creation of a snack called "Spicy Banana Stem Chips," which incorporates both banana stem waste and prawn skin waste, thereby contributing to the reduction of food waste and the development of new and exciting culinary products.

2. METHODS

2.1. Banana stem fiber

To prepare the banana stem fiber, begin by cutting the entire stem fiber and carefully removing the outer layers. Peel the inner layer into manageable pieces. Thoroughly wash the pieces and proceed to cut them into smaller, uniform sizes, roughly measuring about 1 inch by 3 inches (width by length). It's essential to remove all outer layers of the stem. Next, soak the cut banana stem fiber in water and change the water every 10 minutes for several cycles to ensure that the residual rubber from the banana stem is entirely removed. During the last soak, add a pinch of salt to prevent the banana stem from developing bruises. After soaking for 10 to 15 minutes, drain the fiber thoroughly, ensuring there is no residual water to prevent lumps when mixing with flour. Now, cut the drained banana stem fiber into smaller pieces, approximately 1cm by 2cm, or adjust the size according to your preference. In a separate bowl, combine 100g of rice flour, 16g of tapioca flour, and 1 tsp of salt. Coat the banana stem fiber pieces with this flour mixture and fry them until they turn a delightful golden brown. Once fried, allow them to drain and cool.

2.2. Prawn skin powder

To prepare prawn skin powder, begin by cleaning the prawns and carefully removing their skins. Then, create a saltwater solution and soak the prawn skins in it for approximately 1 hour. After this soaking period, strain the prawn skins and arrange them on a tray to be placed in the oven for drying. Once the prawn skins have thoroughly dried, transfer them to a dry blender and process them until they transform into a fine powder with a distinct flavor. This prawn skin powder can be used as a flavorful seasoning or ingredient in various dishes, adding a unique taste to your culinary creations.

2.3. Crispy tempeh slices

To prepare crispy tempeh slices, start by thinly slicing the tempeh. Season the slices with a pinch of salt and turmeric powder, ensuring an even coating. Next, heat oil in a deep fryer or a deep pan. Once the oil is hot, carefully add the seasoned tempeh slices and fry them until they turn a beautiful golden brown and become crispy. After frying, remove the crispy tempeh slices from the hot oil and place them on a paper towel to drain any excess oil. Allow them to cool to room temperature. As they cool, the oil can be toasted, which enhances the flavor. Once the oil has cooled, it can be strained or used for cooking in dishes that benefit from a hint of the toasted oil's flavor. Enjoy your homemade crispy tempeh slices as a delicious snack or addition to various dishes.

2.4. Sweet and spicy coating sambal sira

To create this dish, start by boiling dried chilies for approximately 30 minutes, then strain them to remove excess moisture. Next, transfer the boiled and strained chilies into a blender along with tamarind juice. In a cooking pot, heat some cooking oil, and add the blended mixture, referred to as sambal sira, along with sugar, salt, and prawn skin powder. Stir the ingredients thoroughly and cook until the mixture thickens to your desired consistency. Finally, introduce the banana stem fiber and curry leaves into the pot, ensuring they are well coated with the sambal sira mixture.

3. RESULTS AND DISCUSSION

A total of 42 respondents participated in the sensory test, with 69% of the respondents being female and 31 being male. Additionally, 50% of the respondents fell within the age range of 18 to 30 years, while the remaining 50% were 31 years old and above (refer to figure 1).

The results revealed that, on average, the respondents held a favorable opinion of the product, giving it an average rating of 4.00 out of 5.00 across all tested product characteristics. Notably, the highest-rated characteristic was color, receiving a score of 4.83, followed by crispiness at 4.71, taste and appearance at 4.67, aroma at 4.48, shape at 4.36, and sweetness at 4.07 (refer to table 1 and figure 2).

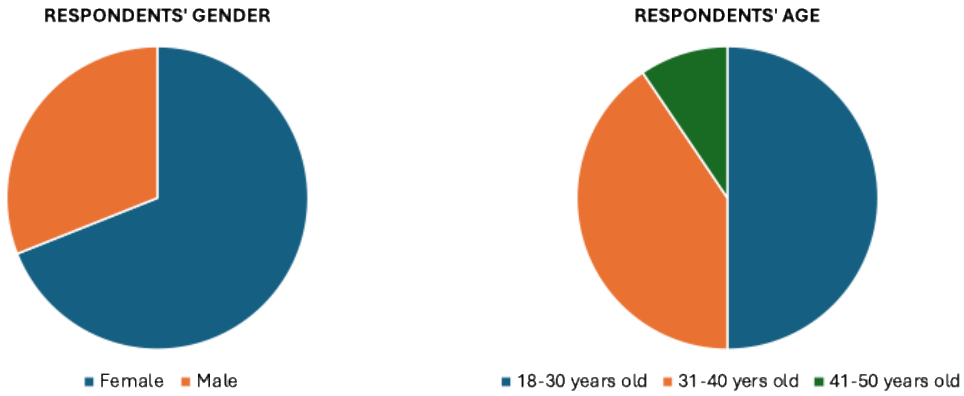

Figure 1. *Demographic profile of respondent*

Table 1. Mean score of the sensory analysis

Appearance	Aroma	Taste	Sweetness	Crispiness	Spiciness	Colour	Shape
4.67	4.48	4.67	4.07	4.71	4.64	4.83	4.36

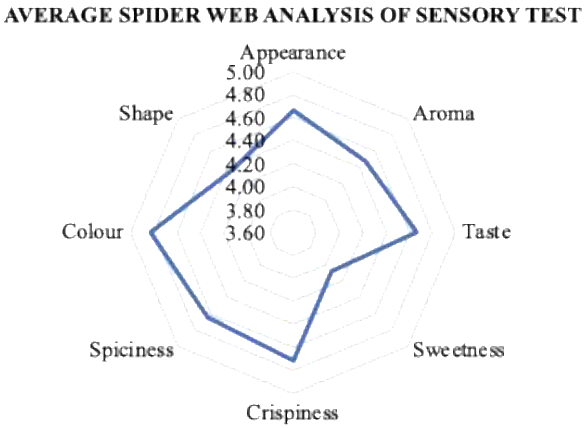

Figure 2. *Average spider web analysis of sensory test*

The analysis further investigates respondents' feelings about the overall product (refer to figure 3). In summary, 90.4% of respondents have a positive inclination towards purchasing the product. Among them, 21.4% would buy the product very often, followed by 40.5% who like the product and would purchase it now and then. Lastly, 38.1% would buy the product if it is available but would not go out of their way to acquire it. However, 9.6% of the respondents have a negative perception of the product and would only consider buying it if they were compelled to do so.

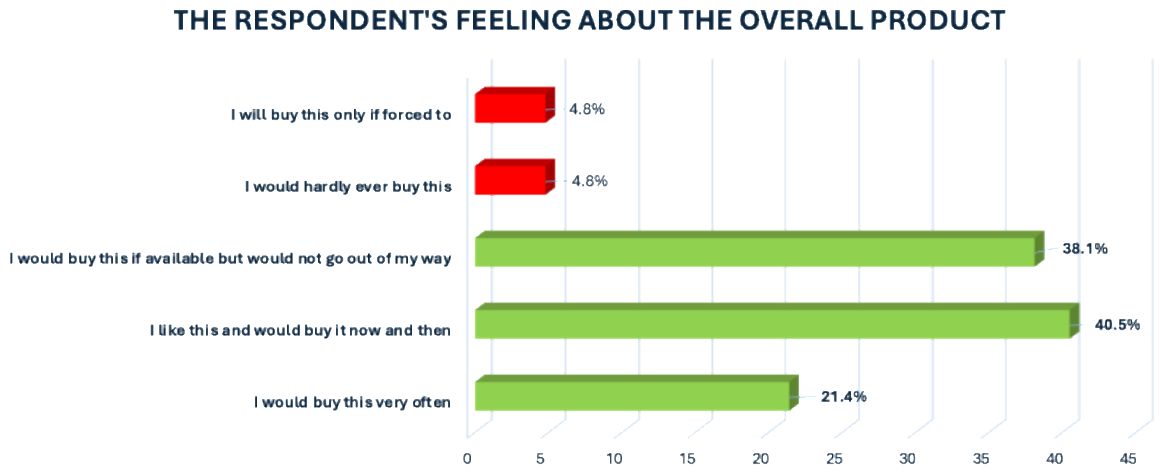

Figure 3. *The respondent's feeling about the overall product*

4. CONCLUSION

The production of products like spicy banana crisp chips focuses on utilizing often-neglected resources, such as product waste. An effective methodology and carefully selected ingredients play a crucial role in creating a delightful and crunchy taste, while also making use of product residues for a snack that appeals to all generations. One key source of product waste that we leverage is banana stalks. By combining them with flavors derived from shrimp's skins, a combination seldom explored, we have developed an innovative approach to repurpose local product waste. This diversification allows us to market and commercialize a unique and distinctive product in the industry. Furthermore, the spicy banana crisp chips boast an impressive shelf life, thanks to their inherently crisp texture. This quality ensures that the

product remains fresh and appealing for an extended period, making it a sustainable and enjoyable choice for consumers.

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NAMAZU (SUB-UNAGI)

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ABSTRACT

Namazu, also known as catfish in Japanese, presents a sustainable and cost-effective alternative to eel in the food service industry. This innovation tackles the ecological concerns surrounding eel consumption while delivering a delightful culinary experience. By marinating and grilling catfish with a sweet sauce and caramel, Namazu closely replicates the sought-after taste of eel, capitalizing on the catfish's versatile flavour and texture. Notably, the firm texture of catfish and its low cost make it a suitable substitute for eel. The innovation boasts several standout features, including sustainability, health benefits, and cultural fusion. Catfish can be responsibly farmed, making it an environmentally conscious seafood choice. It offers lean protein and essential nutrients, appealing to health-conscious diets. Namazu combines culinary heritage with sustainable practices, making it an attractive option for consumers seeking unique flavours and ethical choices. Moreover, the accessible sourcing and affordability of catfish position this innovation to reshape the culinary landscape. Collaboration with chefs, restaurants, and home cooks drives adoption and maximizes marketability. This collaborative effort offers a fusion of tradition, sustainability, and innovation, appealing to many consumers. As consumers become increasingly aware of the origins of their food, Namazu provides a solution that satisfies both taste preferences and ethical considerations. In summary, Namazu introduces a promising gastronomic evolution in the food service industry. Its cost-effectiveness, high availability, and marketability make it an excellent substitute for eel. With its emphasis on sustainability, health benefits, and cultural fusion, Namazu appeals to environmentally conscious and flavour-seeking audiences. By offering a solution that balances palates and principles, Namazu has the potential to revolutionize the culinary landscape and cater to consumers' evolving preferences.

Keywords: Namazu (Catfish); Sustainability; Cost-effectiveness; Culinary fusion; Marketability

1. INTRODUCTION

Eel, particularly the renowned Japanese eel or "unagi," holds a captivating culinary heritage that spans over a millennium, primarily in Japan. The commercialization of eel in Japan took root during the Edo period, with dedicated eel farms ensuring a steady supply to meet the high demand. Renowned for its distinctive flavour, eel plays a pivotal role in iconic Japanese dishes like unadon and unagi sushi. However, in Malaysia, the consumption of eel faces formidable challenges due to issues surrounding its size, scarcity, high demand, and cost, necessitating the pursuit of innovative solutions. Fortunately, Malaysia enjoys an abundance of catfish, which presents a promising alternative to eel. Leveraging the affordability and availability of catfish,

it becomes possible to recreate the captivating culinary experience associated with eel at a lower cost and with enhanced sustainability, effectively addressing the demands of the food service industry. By marinating and grilling catfish with a sweet sauce and caramel, the innovative solution, known as Namazu (sub-unagi), tackles these issues while delivering a delightful culinary experience, appealing to consumers seeking both tradition and ethical choices. This culinary innovation addresses ecological concerns associated with eel consumption. It offers a delightful fusion of tradition, sustainability, and innovation, poised to reshape the culinary landscape and appeal to various consumers.

2. METHODOLOGY

The methodology in this production is divided into two types. The methodology for production flow and sensory evaluation. As outlined earlier, the methodology for preparing catfish as a substitute for eel in gastronomic dishes remains the same. The selection, cleaning, marinating, grilling, glazing, and preservation techniques can be applied to catfish sourced in Malaysia. The key distinction lies in the accessibility and affordability of catfish in the local market. By utilizing locally sourced catfish, the cost of production can be significantly reduced, making it more economically viable for the foodservice industry.

2.1 Namazu (sub-unagi) production flow

The methodology for preparing the Namazu starts with the selection of catfish. Fresh catfish that is suitable for culinary purposes have been chosen. Catfish with firm flesh and a mild flavour, as these characteristics make it a suitable substitute for eel. The catfish was thoroughly cleaned by removing any scales, bones, and internal organs. Then, the fish was rinsed under cold water to ensure it was impurities-free. Paper towels were used to pat dry the catfish.

A marination paste is prepared using ingredients that will help replicate the sweet and savoury flavours associated with eel. It includes a mixture of soy sauce and other desired seasonings. The catfish was marinated evenly. Next, marinate the catfish for 30 minutes to 1 hour to ensure the flavours penetrate the flesh. The catfish is grilled by preheating a grill to medium-high heat. The catfish is removed from the marinade, allowing any excess marinade to drip off. The catfish is placed on the preheated grill and cooked for a few minutes on each side until it is cooked through and has developed a slightly charred exterior. The catfish is basted with the remaining marinade during the grilling process. After grilling, the catfish is brushed with a sweet sauce, such as a glaze made from soy sauce, honey, mirin, and other desired ingredients. The glaze is applied generously to the catfish, ensuring it is evenly coated. This step imparts a delicious sweetness and adds a glossy finish to the catfish.

To preserve the flavour and quality of the grilled and glazed catfish, it should be vacuum-packed. The catfish is placed in vacuum-sealed bags, removing as much air as possible to prevent oxidation and freezer burn. Alternatively, suitable containers that provide an airtight seal can be used. Depending on the desired storage conditions and shelf life, the catfish can then be chilled or frozen. When ready to serve the grilled catfish, it can be easily reheated using a microwave or an air fryer. For microwave reheating, the vacuum-sealed catfish is placed in a microwave-safe dish and heated on a medium setting until it reaches the desired temperature. In an air fryer, the catfish is placed in the basket and reheated at a moderate temperature for a few minutes until warmed. Once reheated, the catfish is ready to be served as a substitute for eel in various gastronomic dishes, such as sushi, sashimi, or grilled.

2.2 Namazu (sub-unagi) sensory evaluation

During the initial phases of product development, sensory testing can be employed to identify the crucial sensory attributes that significantly impact the overall acceptability of the product (Sharif et al. (2017). Sensory evaluation plays a significant role in product quality control and marketing. The evaluation included size elements, namely (1) appearance, (2) aroma, (3) texture, (4) flavour, (5) acceptance, and (6) purchase intention. The instrument was adapted from a previous empirical study. The instrument was adapted from the sensory evaluation tool of previous empirical scholars (Singh-Ackbarali & Maharaj, 2014). The study instrument used the five-Likert scale, as presented in Table 1.

Table 1. Likert scale used in the study.

Likert-scale	Description
5	very much dislike
4	dislike
3	neither like nor dislike
2	like
1	very much like

3. RESULTS AND DISCUSSION

During the initial phases of product development, sensory testing can be employed to identify the crucial sensory attributes that significantly impact the overall acceptability of the product (Sharif et al. (2017). Sensory evaluation plays a significant role in product quality control and marketing. The evaluation included six (6) elements, namely (1) appearance, (2) aroma, (3) texture, (4) flavour, (5) acceptance and (6) purchase intention. The instrument was adapted from a previous empirical study. The instrument was adapted from a sensory evaluation tool of previous empirical scholars (Singh-Ackbarali & Maharaj, 2014).

3.1 Sensory evaluation Analysis

The result of the analysis is presented in Table 2. Fourthly, panellists were involved in sensory evaluation. The panellists were given instructions in very clear and short.

Table 2. The mean score of the sensory evaluation, acceptance, and purchase intention

	Dislike a lot	Dislike a little	Neither like nor dislike	Like a little	Like a lot
Appearance	2.4	7.3	26.8	39	24.4
Aroma	0	2.4	36.6	43.9	17.1
Texture	4.9	24.4	26.8	31.7	12.2
Flavour	2.4	14.6	26.8	31.7	24.4
Acceptance	0	17.1	29.3	34.1	19.5
Purchase Intention	4.9	22	24.4	31.7	17.1

Based on the analysis, 39 percent prefer “like a little” the appearance of the Nazuma because it has a charred exterior. For aroma, 43.9 percent chose “like” due to smoke infusion. 31.7 percent vote for “like a little” for texture, flavour, and purchase intention, and about 34.1 percent also “like a little” for the acceptance level of the product.

4. CONCLUSION

Using catfish as a substitute for eel in gastronomic dishes represents a novel approach, particularly in the Malaysian context. While eel is traditionally valued for its taste and texture, its scarcity and high cost make it challenging for many consumers to access and enjoy. On the other hand, catfish is readily available and more affordable in Malaysia, making it an attractive alternative. This innovation capitalizes on the local abundance of catfish, providing a sustainable option replicating the desirable flavors and culinary experience of eel consumption.

The marketability of catfish as a substitute for eel is particularly compelling in Malaysia due to its abundance and affordability. By leveraging these characteristics, catfish-based dishes, such as the Namazu alternative, can cater to a more extensive consumer base, including those who were previously unable to experience the taste of eel due to its high price. The cost-effectiveness of catfish allows for competitive pricing in the food service industry, making it an attractive option for restaurants, sushi bars, and other culinary establishments.

Furthermore, using locally sourced catfish promotes sustainability in the seafood industry. Overfishing and habitat degradation associated with eel harvesting can be mitigated by shifting the focus to catfish, which is more abundant and can be responsibly farmed. It aligns with growing consumer preferences for sustainable and environmentally friendly food choices.
Collaboration with local catfish farmers and suppliers can further enhance marketability. By establishing partnerships, the food service industry can ensure a steady supply of high-quality catfish at competitive prices. This collaboration supports local businesses, fosters a sense of community, and promotes the use of locally sourced ingredients.

In summary, leveraging the availability and affordability of catfish in Malaysia provides a unique opportunity to address the challenges associated with eel consumption in the foodservice industry. By adopting the methodology outlined earlier and emphasizing the local abundance of catfish, the Namazu alternative can offer a sustainable and cost-effective solution replicating the taste and culinary experience of eel dishes. The marketability of catfish as a substitute for eel is amplified by its accessibility, affordability, and alignment with sustainability goals, making it an appealing choice for both businesses and consumers in Malaysia.

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EFFICIENT STUDENT MONITORING SOLUTION (SMS) FOR WORK-BASED LEARNING (WBL) COORDINATORS

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ABSTRACT

Work-Based Learning (WBL) programs play a pivotal role in bridging the gap between classroom education and real-world experience. The success of these programs depends on efficient coordination and problem resolution mechanisms. An innovative Student Monitoring Solution (SMS) designed specifically for WBL Coordinators is crucial to solve issues related to the monitoring of students' performance. The primary focus on providing an effortless and efficient means for coordinators to monitor and address issues or reports concerning WBL students integrates seamlessly the SMS with Google Sites for record tracking and reporting. This pioneering system empowers coordinators to swiftly track critical issues and reports submitted by lecturers in charge, ensuring they are promptly alerted to problems and take immediate action. The SMS represents a paradigm shift in WBL program coordination, offering a user-friendly platform that fosters transparency, data-driven decision-making, and seamless communication among stakeholders. The system has been innovatively integrated with Google Sites platform, simplifying the process of monitoring, and evaluating students and processing feedback from employers. Once the ML uploads the data to the proposed system, WBL coordinators will be automatically notified via email based on a severity scale that represents the degree of issues faced by students at their industrial training organizations. Consequently, WBL coordinators will take necessary actions promptly. This innovation has the potential to enhance the management of not only the Faculty of Hotel and Tourism Management but also other faculties at UiTM throughout the nation. The Student Monitoring Solution (SMS) for WBL Coordinators is a testament to innovation in education management. Harnessing the capabilities of Google Sites and streamlining the tracking process, this system empowers coordinators to proactively manage the WBL experience. It promotes transparency, swift issue resolution, and data-driven decision-making, ultimately contributing to the overall success of Work-Based Learning programs.

Keywords: Student monitoring; Industry practitioners; Internship students; Work-Based learning, UiTM Terengganu

1. INTRODUCTION

The necessity of collaboration between educational institutions and business sectors in Work-Based Learning (WBL) arises from the structural imperative of WBL programs. This imperative dictate that students must be enrolled in academic institutions for theoretical learning while concurrently engaging in industry experiences to transform academic input into practical knowledge (Ramli, *et al.*, 2023).

Aligned with the objectives outlined in the Pelan Pembangunan Pendidikan Malaysia (PPPM) 2015–2025 (Pendidikan Tinggi), WBL in Malaysia embodies a pedagogical paradigm that collaborates harmoniously with the business community (Malaysian Qualification Agency, 2015). Facilitating novel learning prospects within professional settings, universities and business consortia converge in a specialized WBL class at HEP (Boud & Solomon, 2001; Sobiechowska & Maisch, 2006). Upon program completion, students seamlessly transition into full-time employment, with workplace activities intricately woven into the curriculum to address the imperatives of continuous employee education and organizational objectives.

The initiation of WBL stemmed from the recognition of inadequacies in graduates' knowledge, skills, and attitudes relative to employer expectations, as highlighted by the Ministry of Education in 2018. WBL is perceived as a catalyst for augmenting students' learning and industry experiences, evidenced by the enhancement of soft skills, fostering a positive work culture, refining social skills, promoting team spirit, and cultivating other competencies crucial for meeting employers' demands (Malaysian Qualifications Agency, 2015). This perspective is substantiated by the findings of Munjanganja et al. in 2010.

It is a policy of many universities to make it compulsory for their students to undergo industrial or practical training as part of their academic program. Generally, the purpose of industrial training attachments is to provide students with the opportunity to apply the knowledge and skills they have acquired in the classroom to real-world situations. Among the benefits that students may gain during their industrial training are as follows:

1. Ability to attain a certain level of mastery in their field of study.
2. A chance to acquire the latest techniques, skills, and methodologies that may not be available during normal lectures.
3. Obtain hands-on experience and knowledge of real job scenarios that will help prepare them for entering the job market.
4. Develop leadership ability and responsibility to execute and perform specific tasks, jobs, or projects.
5. Help students explore their interest in a particular career before joining any industry or organization.
6. Understand the theories learned during normal lectures with more detailed and hands-on skills within a real job situation.

These benefits are deemed important as they will equip the students with a holistic education from their respective universities and their place of internship. A holistic education approach would equip the students with both theoretical and practical knowledge to help them become the future holistic workforce of the country. A holistically knowledgeable workforce would contribute to a strong and productive country (Mkulu, 2020).

The current policy of FPHP is to make it compulsory for final-year students to undergo WBL or practical training at various hotel organizations. These students are required to engage in practical training with the objective of gaining insights and experiences into the "real-life" situations and challenges of the working world. To ensure that students derive the full benefits of their industrial training, lecturers at UiTM campuses from the FHTM are appointed to monitor and evaluate the effectiveness of the WBL program. Both students and employers are given the opportunity to provide their comments, suggestions, and recommendations on the operations of the industrial training.

The coordination and management of WBL operations pose numerous challenges for coordinators. The current WBL coordination system has become a source of overwhelming workload for coordinators, hindering timely problem resolution. To address this issue, a new system is imperative to streamline the assessment process, facilitating efficient evaluation of reports and prompt response to emerging challenges. One of the challenges faced by coordinators is related to workplace issues and student performance during WBL. The proposed system aims to automatically notify WBL Coordinators of monitoring lecturers' reports, empowering them to take necessary actions to address and rectify workplace-related issues promptly.

Additionally, the issue of late information from Monitoring Lecturers *(Pensyarah Pemantau)* further complicates the coordination process. Coordinators rely on Monitoring Lecturers for crucial student performance and problem information. The new system is envisioned to mitigate this challenge by implementing reminders for lecturers to submit reports according to the schedules set by coordinators. Furthermore, the meticulous documentation and reporting demands on coordinators add to the complexity of their responsibilities. This includes maintaining detailed records of industrial training and addressing student feedback, concerns, and suggestions. The proposed system is poised to enhance these aspects, ensuring improved future programs through meticulous attention to detail and efficient handling of documentation.

Thus, the objective of this study is to mitigate risks and streamline paperwork management for the Work-Based Learning (WBL) coordinator, focusing on student issues within the two pilot programs: the Diploma in Hotel Management and Culinary Art Management in the Faculty of Hotel & Tourism Management at UiTM Terengganu. Consequently, the Student Monitoring Solution (SMS) process flow was developed to aid the WBL Coordinator.

2. METHODS

In the pursuit of enhancing operational efficiency and facilitating seamless communication in the WBL framework, a comprehensive technological approach has been adopted. The implementation involves several key components; firstly, the development of a Google Site serves as a centralized platform for information dissemination and collaborative interaction. This Google Site serves as a hub for accessing various resources and updates related to the WBL program. The conceptual design of this project is illustrated in Figure 1 below.

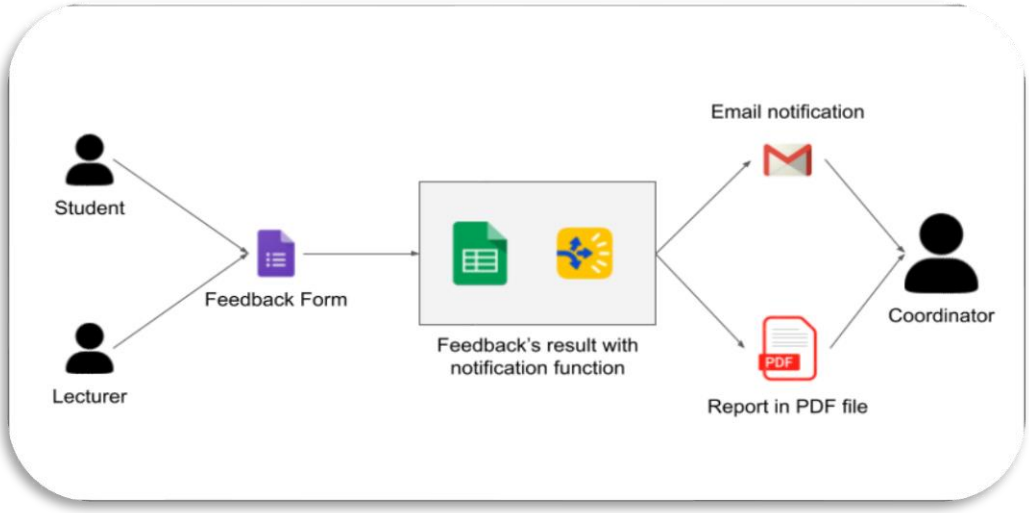

Figure 1. *Student Monitoring Solution (SMS) Conceptual Diagram*

To streamline the feedback process from both students and industry partners, a Google Form has been meticulously designed. This form serves as a structured feedback mechanism, allowing for the systematic collection of information pertaining to student experiences and industry feedback. The utilization of Google Sheets as a database ensures the systematic storage and organization of data collected through feedback forms. This database plays a pivotal role in data management, enabling efficient retrieval and analysis of information relevant to the WBL program.

Incorporating the AutoCrat extension into the system facilitates the automation of notifications. This app is integrated with Google Sheets to push timely notifications to designated recipients via Gmail. This automated process ensures that stakeholders are promptly informed of critical updates and developments within the WBL framework. Lastly, Gmail serves as the primary platform for email notifications. The integration of Gmail complements the overall communication strategy, providing a reliable channel for disseminating important information, updates, and notifications to the concerned parties involved in the WBL program. This comprehensive technological framework aims to optimize communication, data management, and overall efficiency within the WBL ecosystem.

3. RESULTS AND DISCUSSION

The primary objective of the system is to facilitate seamless tracking and prompt resolution of issues and monitoring reports related to WBL students. The Student Monitoring Solution (SMS) for WBL Coordinators represents an innovative technological approach to enhance WBL programs' effectiveness. It introduces a streamlined process for both students and responsible lecturers to report issues and challenges encountered during the WBL experience. The system incorporates various features and tools designed to ensure user-friendliness and quick response times.

Noteworthy system features include its user-friendly interface, providing WBL Coordinators with an intuitive platform for easy navigation and access to pertinent information. It also offers an efficient issue-tracking mechanism, enabling lecturers to promptly report problems and ensuring that coordinators are informed in real time. The system's rapid response capabilities involve instant notifications and alerts to coordinators when critical issues are reported, allowing for immediate action. Moreover, the SMS generates detailed reports, offering coordinators valuable insights into the nature and frequency of reported issues. This data can be leveraged to identify trends and make informed decisions, contributing to the continuous improvement of the overall WBL experience. Additionally, the system incorporates communication tools, including messaging and email integration, fostering seamless communication among coordinators, students, and lecturers.

In conclusion, the SMS for WBL Coordinators presents an innovative solution to address the challenges associated with monitoring and responding to issues within WBL programs. By harnessing technology and providing an efficient problem resolution system, this solution empowers coordinators to proactively manage and enhance the WBL experience for students, thereby contributing to the overall success of the program.

4. CONCLUSION

In conclusion, the current WBL coordination system faces significant challenges that impede the effective monitoring and assessment of students during their WBL phase. The overwhelming workload on coordinators, coupled with issues related to workplace dynamics and late information from monitoring lecturers *(Pensyarah Pemantau)*, necessitates the development of an innovative solution. The proposed Student Monitoring Solution (SMS) for WBL Coordinators emerges as a comprehensive approach to address these challenges and enhance the overall quality of the WBL program. The identified challenges, including overwhelming workload, workplace issues affecting students' performance, late information from monitoring lecturers, and the meticulous documentation and reporting demands on coordinators, underscore the pressing need for a streamlined system. The SMS is designed to mitigate these challenges by providing a user-friendly interface, efficient issue tracking, rapid response mechanisms, detailed reporting features, and communication tools. The proposed database system, utilizing the Google Site platform, therefore simplifies the monitoring and evaluation process while efficiently processing information and feedback from employers. The system's innovative features, including automatic notifications, ensure that coordinators can manage and address issues effectively.

In summary, the Student Monitoring Solution (SMS) for WBL Coordinators demonstrates the potential to revolutionize the management of WBL or industrial training programs, not only within the FPHP but also across other faculties nationwide. The proposed innovation holds promise for minimizing challenges, improving efficiency, and enhancing the overall quality of the WBL experience for both students and stakeholders involved in the program.

ACKNOWLEDGEMENT

This study is unfunded research, and we would like to express our gratitude to our colleagues from the Faculty of Hotel and Tourism Management, Faculty of Business Management, and the College of Computing, Informatics & Mathematics of UiTM Cawangan Terengganu, who provided insights and expertise that greatly assisted the research.

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ACCEPTANCE OF MUSLIM TRAVELLERS TOWARDS "7 IN 1 IBADAH KIT" AS MUSLIM FRIENDLY PRODUCT

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ABSTRACT

Traveling was not just for entertainment; it was also an act of Ibadah for Muslims. As a Muslim, providing Ibadah equipment was important when traveling. nevertheless, many activities were restricted because of the spread of COVID-19 in the year 2020, including prayers in public venues such as surau and mosques. The management of mosques, surau, and business premises owners would not provide prayer rugs and telekung at the time. In other situations, according to real experience, they had bad experiences and felt disappointed with the condition of the praying cloth provided. Ibadah prayer equipment became too difficult to carry because there was no facility to combine all this prayer equipment in one bag that was easy to carry anywhere. The analysis has been done to identify suitable equipment and suitable design for the ibadah kit, as well as the acceptance of the Ibadah Kit among travelers. The Likert Scale was used as the quantitative instrument. Several 100 respondents were selected, and descriptive analysis was used for analyses collected using Statistical Package for Social Science (SPSS). Results showed that respondents strongly agreed on the suitable equipment and design for the ibadah kit such as telekung, sarong, kopiah, sprinkle water, qibla compass, tayammum dust, prayer guidebook and socks which came in 2 colors. In conclusion, this research emphasizes the significance of religious practices for Muslims while traveling, the difficulties caused by the epidemic and the enthusiastic response to the creation of a thorough Ibadah kit to deal with these difficulties. As a result, 7 in 1 Ibadah kit was accepted optimistically.

Keywords: traveler, ibadah, tourism.

1. INTRODUCTION

For every Muslim traveller who reaches a place in the hope of receiving the benefits and blessing of Allah S.W.T., doing is an act of Ibadah. Islam therefore encourages its ummah to visit new places and acknowledge the magnificence of Allah S.W.T., creation. (Haliza, 2018). The trend in tourism at that point was islamic tourism by Muslims. They bought both food and merchandise at halal and hygienic areas. It was not limited to but not only in Malaysia. This would boost Islamic tourism even more and possibly raise the awareness of this Islamic tourism in an improved manner. (Diyana, 2019).

Muslim travelers were becoming more frequent and that the amount of Islamic tourism has increased. It would be easier for Muslim tourists to perform ibadah while traveling when they visited countries with a Muslim population, but when they went to non-Muslim countries, it

might be more challenging to prepare the necessary tools to perform ibadah and to find a prayer mat. Unless a Muslim traveler was bringing equipment for prayer when visiting a non-Muslim nation. However, there was an analogous problem in Islamic nations as well, which was the absence of ablution facilities with access to clean water as well as the lack of complete prayer amenities while going outside of urban areas. Mstar, (2018).

According to Farrah (2016), this prayer kit is going to be marketed as a wonderful, innovative CSR strategy where a business will give a corporate gift to a society as part of their social responsibility. When it comes to covering the aurat and conducting Ibadah solat in a very comfortable manner in a public prayer room for Muslims, especially women, would find it difficult. A quick review on their actual experiences had shown that most of them had adverse responses and were dissatisfied with the quality of the "telekung" prayer cloths that were offered. As a result, the researcher offered a novel strategy for developing Muslim-friendly items that would include all the necessary ibadah prayer supplies into a single bag. Simultaneously seek to determine consumer acceptance towards muslim travelers towards "7 in 1 worship kit" as muslim friendly product.

2. METHODS

Researchers has used quantitative research design. As set of questionnaires using Liker Scale was used to determine the acceptance towards muslim travelers towards "7 in 1 Ibadah kit" as muslim friendly product.

Table 1. Questionnaire to determine consumer acceptance towards Muslim travellers towards "7 in 1 Ibadah kit" as Muslim friendly product.

Item evaluated	Strongly Disagree (1)	Disagree (2)	Not Sure (3)	Agree (4)	Strongly Agree (5)
• Suitable color of the bag • Sprate the distribution of prayer equipment • This product able to be supporting you in performing prayers while travelling. • Solve the problem lack of water for Wudu' when traveling. • Product can help to solve the problem of finding the direction of Qibla while travelling • Product can help to solve the problem of prayer rooms that do not provide telekung/Sarong • Product help in resolving the issue of prayer rooms that do not maintain and provide prayer mats.					

Research was done to determine respondent acceptance towards on the suitable equipment and design for the ibadah kit such as telekung, sarong, kopiah, sprinkle water, qibla compass, tayammum dust, prayer guidebook and socks which came in 2 colors.

3. RESULTS AND DISCUSSION

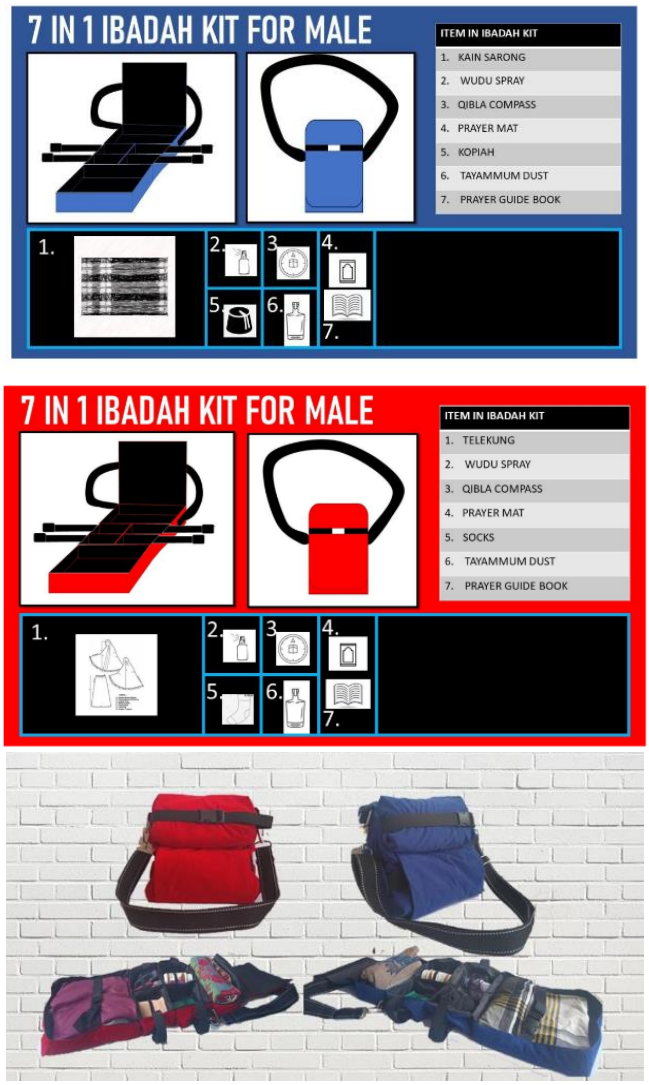

Figure 1. *The final product of the '7 in 1 Ibadah kit'*

Table 2. Interpretation of acceptance towards Muslim travellers towards "7 in 1 Ibadah kit" as Muslim friendly product

Item evaluated	Strongly Disagree (1)	Disagree (2)	Not Sure (3)	Agree (4)	Strongly Agree (5)
• Suitable color of the bag	-	-	-	20%	80%
• Sprate the distribution of prayer equipment	-	-	-	24%	76%
• This product able to be supporting you in performing prayers while travelling.	-	-	-	35%	65%
• Solve the problem lack of water for Wudu' when traveling.	-	-	-	12%	88%
• Product can help to solve the problem of finding the direction of Qibla while travelling	-	-	-	17%	83%
• Product can help to solve the problem of prayer rooms that do not provide telekung/Sarong	-	-	2%	11%	87%

• Product help in resolving the issue of prayer rooms that do not maintain and provide prayer mats.	-	-	2%	12%	86%

More 80% of respondent strongly agreed that colour and the function to solving the problem in term of lacking water for wudu' finding direction of Qibla and provide prayer mats. Overall respondents' acceptance of this product is high. Various things had been identified and became an option to improved and increase the quality of the "7 in 1 ibadah kit". That some of the suggestions for improvement made include reduces weight of the bag, making it easier to carried, used of patterned fabric to make this 7 in 1 Ibadah Kit gear bag more unique and attractive.

4. CONCLUSION

In conclusion, this research emphasizes the significance of religious practices for Muslims while traveling, the difficulties caused by the epidemic and the enthusiastic response to the creation of a thorough Ibadah kit to deal with these difficulties. As a result, 7 in 1 Ibadah kit was accepted optimistically.

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ASYNCHRONOUS LEARNING THROUGH BREAD MAKING MICRO CREDENTIAL

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ABSTRACT

The Bread Making Micro-Credential (MC) course aims to provide learners with comprehensive knowledge and practical skills necessary to master bread making. Learners will gain the expertise to produce an array of flavorful and visually appealing breads through various bread recipes, techniques, and ingredients provided in this course. This course combines theoretical instruction and hands-on practice, enabling learners to comprehend the science behind bread making, develop essential baking skills, and troubleshoot common bread making challenges. Through interactive exercises and assessments, learners will actively master shaping basic dough, proofing, and baking to achieve optimal textures and flavors. The advent of this micro-credential has brought about a notable shift in participant approaches to education. This MC is a valuable tool for learners seeking flexible and self-directed learning. For those desiring a personalized learning experience, the Bread Making MC offers an ideal option, enabling learners to access course materials at their own pace and convenience. Upon successful completion, learners will receive a certificate demonstrating their competence in this specialized bread making.

Keywords: micro credential; hands-on; flexible; bread making; self-directed

1. INTRODUCTION

Traditional classroom education may not align well with the needs and preferences of the younger generation (Gen Y), making online education, including internet-based and distance learning, an increasingly vital component of the modern education system (Narayanan & Selvanathan, 2017). Many platforms offer online education through Massive Open Online Courses (MOOCs) and Micro-Credentials (MC), providing a multitude of benefits for the younger generation.

Brown et al. (2021) emphasize that Micro-Credentials have been garnering worldwide recognition and widespread acceptance. Over the past few years, micro-credentials have become increasingly popular, a trend that has accelerated even further due to the sudden shift to emergency remote teaching brought on by the pandemic (Kumar et al., 2022). The popularity and desire for micro-credentials in higher education institutions are increasing. Although micro-credentials are still in development, they can be viewed as brief learning experiences with digital credentials to demonstrate what has been learned. These digital credentials showcase the skills and knowledge acquired and indicate whether they were gained through formal or informal learning activities (Kiiskilä, Hanafy, & Pirkkalainen, 2022). Additionally,

micro-credentials that incorporate proof can aid in personalized learning, clarify learners' abilities, and foster more inclusive approaches to assessment and credentialing (Reed, 2023).

In teaching and learning, online learning environments are becoming more common than ever (Bonk & Zhang, 2006; Er, Özden, & Arifoglu, 2009; Skylar, 2009). According to Hrastinski (2008), Er et al. (2009), Simonson, Smaldino, Albright, & Zvacek (2012), synchronous and asynchronous learning technologies are the two most used forms of online learning.

The Bread Making Micro-Credential (MC) course aims to provide learners with comprehensive knowledge and practical skills necessary to master bread making. Throughout the course, participants start by covering the fundamentals of bread making, including understanding the different types of bread and their ingredients. As per the module conducted by Abdul Latip et al. in 2023, participants in the course will embark on a fascinating journey into the scientific intricacies of yeast fermentation, the art of kneading techniques, and the mastery of proper proofing methods. This immersive exploration provides them with a robust foundation upon which to build their expertise.

Moreover, the course empowers learners with the essential skills to skillfully shape and score dough, perfect the art of bread baking, and adeptly troubleshoot common issues that might surface during the bread-making process. Interactive video lessons are also provided to guide learners, demonstrating the techniques, and offering valuable tips and tricks. They can also participate in hands-on exercises and practice their skills in the comfort of their own kitchens. To enhance their learning experience, developers have included additional resources such as printable recipe cards, a bread making handbook, and a community forum to connect with fellow bread enthusiasts, share their creations, and seek advice from an expert instructor.

To assist in creating their identities as educators, academic professionals should shift their emphasis from content competence to the practice of teaching and assessment through pedagogical growth (McCune, 2018). The influences and interactions between environmental features and factors in higher education are sources of inspiration for pedagogical improvement (Myllykoski-Laine et al., 2023). The process of making subject-matter specialists in a field more contextualized and effective teachers beyond the lessons learned from their own teaching experiences and teaching communities is known as pedagogical development (McCune, 2018; Myllykoski-Laine et al., 2023).

The course instructors are seasoned bakers with years of experience in both professional and home baking. They will guide learners through each lesson, providing step-by-step instructions and sharing pro tips and tricks to help them succeed. By the end of this micro-credential course, learners will have the knowledge to produce delectable baked goods and receive a recognized certification that can open doors to new opportunities in the baking industry. Beyond theory, learners are empowered to shape and score dough with finesse, transform it into mouthwatering loaves, and troubleshoot common issues that may arise during the baking process. Interactive video lessons serve as invaluable companions, showcasing techniques and offering expert tips and tricks. Furthermore, hands-on exercises empower learners to practice their newfound skills right in the comfort of their own kitchens.

Educational institutions have worked incredibly hard, and instructors have developed online courses that are accessible to students over the Internet. Many institutions have initiated the "virtual semester," in which a variety of classes are offered online in an organized fashion. To complete tasks online, faculty members need a way to measure their interactions with students, as they are continuously modifying their instruction based on student responses and performance. While there are many ways to add social presence to an online course, such as through text-based communications, instructor or peer feedback, and class discussions, using

instructor-generated videos is a more recent and understudied method for doing so (Borup, West & Graham, 2014; West, Jay, Armstrong & Borup, 2017).

Online learning aims to be an exemplary substitute for the conventional face-to-face option rather than a static archive of assignments and course materials (Richards, H, 2021). Both engagement and scaffolding are necessary for high-quality training in online forums. Since online learning has been widely accessible for over a decade, there is evidence to draw from years of professional development, knowledge sharing among educators, and learning experiences with students through town squares, radio programs, print courses, correspondence learning, television education, distance education, executive education, and ultimately, web-based, and online platforms (Perry & Pilati, 2011). In addition, Swan and Ice (2001) stated online asynchronous discussions for improving student learning.

To enhance the learning experience, the course developers have thoughtfully integrated supplementary resources, including printable recipe cards, a comprehensive bread making handbook, and a vibrant community forum. This forum not only enables learners to connect with fellow bread enthusiasts but also serves as a hub for sharing culinary creations and seeking advice from an experienced instructor. The course instructors, seasoned bakers with years of experience spanning professional and home baking, serve as guides throughout each lesson. Their instruction is detailed, replete with step-by-step guidance, and enriched by the sharing of insider tips and tricks. Upon completing this Micro-Credential course, learners emerge not only with the knowledge to craft delectable baked goods but also with a recognized certification that can unlock new opportunities within the baking industry.

2. METHODOLOGY

The Bread Making Micro-Credential (MC) employs a comprehensive methodology designed to provide learners with a well-structured and immersive educational experience. This approach encompasses theoretical knowledge, practical demonstrations, expert guidance, and a wealth of resources, all aimed at nurturing and honing the art of bread making. The course commences with a foundational introduction to bread making, elucidating the fundamental concepts, ingredient essentials, and requisite equipment. Subsequently, it unfolds a meticulously crafted learning journey, presenting a step-by-step progression through various types of bread, starting with the rudimentary bread recipe, and gradually advancing to more intricate techniques and recipes. These step-by-step guides are presented through a blend of engaging video demonstrations and in-depth written instructions, complemented by illustrative imagery. Additionally, instructional video demonstrations offer a visual tour of the entire bread-making process, from ingredient mixing to shaping and baking the loaf, facilitating a deeper understanding of the involved techniques.

An interactive dimension is also woven into the course, allowing learners to engage with both the instructor and their peers. This platform fosters dynamic interaction through discussion forums and dedicated Q&A sessions, providing a space for learners to seek clarification, exchange insights, and share their experiences. To further enrich the learning journey, the course offers a plethora of additional resources, including recipes, troubleshooting guides, invaluable tips and tricks, and a curated selection of recommended readings and videos. These resources serve as invaluable companions, enhancing the depth and breadth of the learning experience.

Furthermore, the course employs summative assessments in the form of tests, ensuring a comprehensive evaluation of the learner's grasp of the material. Upon successful completion

of the course requirements, learners are awarded a certificate of accomplishment, recognizing their newfound expertise in the art of bread making.

Enrolling in UiTM's Micro-Credential Courses is a strategic pathway for individuals seeking specialized knowledge and skill development. This educational journey comprises three essential steps, offering a flexible and tailored learning experience. The first step commences with joining a Micro-Credential Course, where learners explore a specific skill or field. These courses are designed to provide focused, hands-on training, enabling students to gain an in-depth understanding of the subject matter. By enrolling in a Micro-Credential Course, individuals initiate a targeted exploration of their chosen domain, setting the stage for skill enhancement and knowledge acquisition.

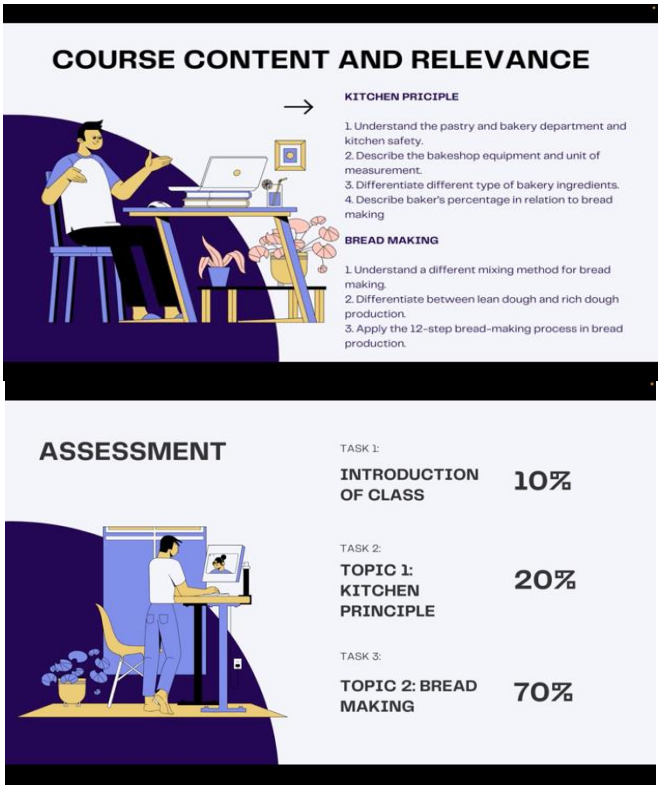

Figure 1. *Course content and assessment*

To enroll in UiTM's Micro-Credential Courses, start by registering on the ufuture platform if you're not already affiliated with UiTM. If you're a UiTM student, please choose UiTM and log in using your iStudent Portal Account. The second step involves progressing through the courses within the Micro-Credential Program. Upon enrollment, students gain access to the entire program curriculum, granting them the freedom to customize their learning journey according to their pace and preferences. This flexibility enables learners to choose courses that align with their objectives and can be accommodated within their schedules, guaranteeing an adaptable and personalized educational experience.

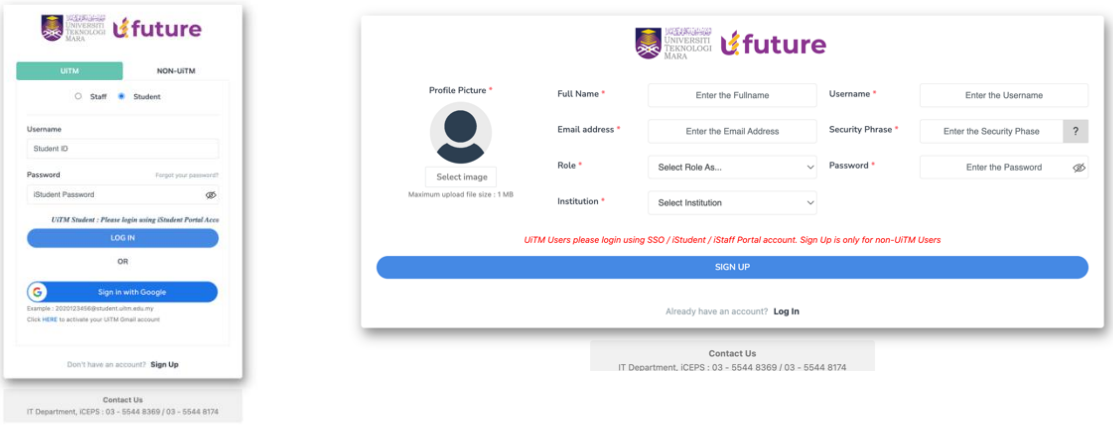

Figure 2. *Enroll as UiTM students and Non UiTM*

Figure 3. *Introductory interface*

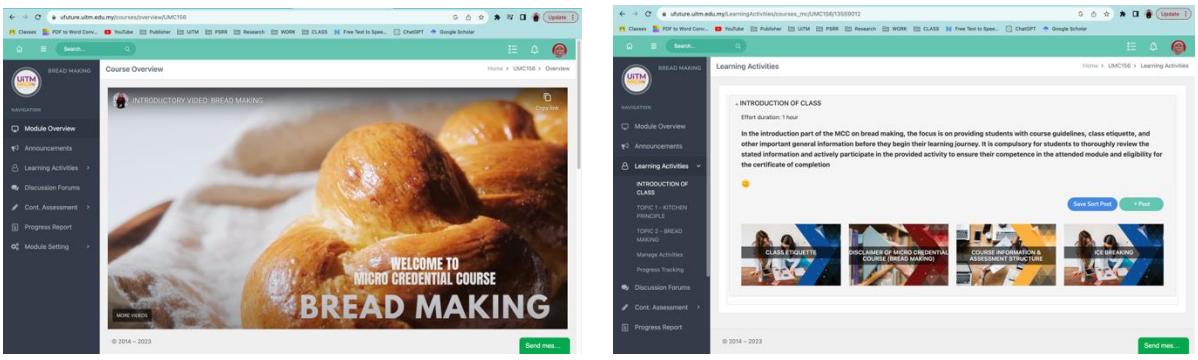

Figure 4. *Module overview and learning activities.*

Figure 5. *Engagement interactivity and certificate of completion*

The final step involves earning a Digital Certificate upon successful completion of all courses within the Micro-Credential Program. This certificate serves as tangible proof of the dedication and proficiency acquired during the learning journey. Recognized in both educational and professional contexts, it enhances one's employability and career advancement prospects.

In conclusion, UiTM's Micro-Credential Courses offer a structured and adaptable approach for individuals to specialize in specific skills and knowledge areas. By participating in this educational journey, students can efficiently enhance their qualifications, distinguish themselves in the competitive job market, and pursue rewarding careers in their chosen domains. The combination of a focused course, a flexible learning pathway, and the acquisition of a Digital Certificate equips learners with specialized expertise, preparing them for success in today's evolving job market.

Learners can access and evaluate the Bread Making Micro-Credential (MC) course at the following link: https://ufuture.uitm.edu.my/micro-credential/course_detail.php?course=UMC156

3. CONCLUSION

At every level of society, institutions have been profoundly impacted by the world's transition into the information era, where technology plays a central role. The impact on educational institutions has been particularly significant as administrators, teachers, and policymakers have worked to harness the potential of technological tools. One evolving paradigm in this context is the use of distance learning in the classroom, with a particular focus on the development of asynchronous learning networks. The demographics of college students are changing, with more mature students balancing their academic obligations with careers and family

responsibilities, replacing the traditional full-time, early twenties student. This shift has led colleges to offer more courses asynchronously.

In conclusion, this online breadmaking course has provided a comprehensive and practical guide for individuals interested in making bread. Throughout the course, learners have covered essential topics such as understanding ingredients, basic techniques, and troubleshooting common issues. By following the step-by-step instructions and demonstrations in each module, learners have gained the knowledge and skills needed to successfully bake various types of bread.

Furthermore, this course has emphasized the importance of practice and experimentation in breadmaking. This approach has allowed participants to develop a unique style and confidence in the kitchen by encouraging them to try different recipes, flavors, and shaping techniques. Additionally, the course has provided valuable tips for adapting recipes to meet dietary restrictions and preferences, ensuring that individuals with various needs can enjoy the process of breadmaking.

Moreover, the online format of this course has offered flexibility and accessibility, enabling learners to study at their own pace and from the comfort of their homes. The availability of supplementary materials, such as downloadable recipes and video tutorials, has enhanced the learning experience and allowed learners to revisit the content whenever needed.

Overall, this online breadmaking course has provided a solid foundation for beginners and a refresher for experienced bakers. Combining theoretical knowledge with practical demonstrations gives learners the confidence and skills to produce delicious homemade bread, whether for personal enjoyment or for business purposes. Whether learners are looking to explore a new hobby, enhance their culinary skills, or experience the satisfaction of creating their bread, this course has successfully met these objectives.

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DODOL NIGELLA SATIVA (DONS)

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ABSTRACT

Dodol Nigella Sativa (DONS) is a food innovation product inspired from Dodol a traditional sweet delicacy in Malaysia and Indonesia. It focusses on Dodol flavour enrichment and enhancement with Nigella Sativa (a scientific name for Habbatus Sauda). Besides Nigella Sativa, DONS other ingredients comprise of Almond and Passion Fruit. This innovation is hoped to benefit community with the health benefits that they possessed besides adding product varieties to the market. Local as well as international community can benefit from this product through the production, selling and income generation activities. Collaborated with other international inventor, DONS has high potential for commercialization value and developed as dodol diversification product. This is in line with UiTM 2025 Strategic Plans vision besides aiming to achieve SDG3 Good Health & Wellbeing and SDG17 Strengthen the means of implementation and revitalize the global partnerships for sustainable development. DONS highlight the unique taste, strength and benefits each ingredients have. For instance, Habbatus-Sauda and Passion Fruit are rich with nutrients consist of Vitamin A, Vitamin C, potassium, carotenoids, and polyphenolics. DONS product mixture was blended with Habbatus-Sauda, almond and passion fruit by several ratios. The mixtures were then subjected for respondents' perception based on sensory tests. Based on the results, majority respondents prefer DONS over plain/original Dodol with Nigella Sativa, Almond Dodol with Nigella Sativa, or Passion Fruit Dodol with Nigella Sativa. DONS were developed at Food Innovation Laboratory Faculty of Hotel & Tourism Management, UiTM Terengganu from September 2022 till August 2023. Interestingly, besides the attractive and ease-to-eat packaging, DONS would probably lead to customers convenience in enjoying the product. This product is best for promoting traditional delicacies by inserting new elements and ingredients.

Keywords: Almond, Dodol, Food Innovation, Nigella Sativa (Habbatus Sauda), Passion Fruit

1. INTRODUCTION

Malaysia exhibits a diverse amalgamation of cultures, encompassing individuals from various backgrounds, nationalities, beliefs, cultures, and culinary traditions comprising on several heritage food (Ismail, Ab. Karim, Che Ishak, Arsyad, Karnjamapratum & Sirison, 2021). It was reported that in 2020, the population of Malaysia was recorded to be 29.7 million individuals. The majority ethnic group in Malaysia was found to be the Malays, comprising 69.9% of the

population. Following the Malays, the Chinese constituted 22.6% of the population, while the Indians accounted for 6.8%. The remaining 1% of the population was comprised of various other ethnic groups (Department of Statistics, 2019-2020). These ethnic groups come together to create a harmonious way of life, resulting in a rich diversity of cultural practices and traditions covering on several traditional food including desserts. This is facilitated by the processes of sharing, exchanging, and assimilating.

As highlighted, the diverse range of Malay traditional desserts serves as evidence of the cultural and culinary legacy of the Malay people (Kamaruzaman, Ab Karim, Che Ishak, Arshad, 2020). Dodol, a confectionary item, is widely recognized in Malaysia as a sweet delicacy. It is crafted by combining glutinous rice flour, sugar, and coconut milk (Dewan, 1998). Dodol is recognized as a confectionery that commonly employs same components, albeit it is referred to by several names in different regions (Zahid, Wahid, Ahamad, Moey, Ramli, Sarip, 2012). Interestingly, Dodol is a widely favoured dessert characterized by its sweetness and sticky texture, with its origins tracing back to Indonesia. The preparation of this dish involves the utilization of a limited number of basic constituents, with coconut milk and palm sugar serving as the primary ingredients. Through a process of reduction, the mixture is transformed into a condensed texture reminiscent of caramel. Dodol possesses a distinctive consistency characterized by a combination of chewiness and stickiness. It is commonly infused with a diverse range of flavors, including durian, pandan, and jackfruit. However, there has been a notable lack of scholarly focus on the significance of traditional Malay kuih or dessert within a broader cultural context (Kamaruzaman et al, 2020), as in this study emphasizing Dodol. Interestingly, inventors incorporate Nigella Sativa, Almond, and Passion Fruit with Dodol and term it as DONS.

Habbatus Sauda or scientifically known as Nigella Sativa, also referred to as black cumin, black seed, or black caraway, is a flowering plant that originates from the southwestern Asian, Mediterranean, and North African regions. This plant is classified under the botanical family Ranunculaceae and is renowned for its small black seeds, which have been utilized for ages due to their culinary, medicinal, and fragrant attributes. The utilization of Black Seed is highly valued within society due to its diverse methods of processing and packaging. Initially, it is noteworthy to mention that Nigella sativa, a constituent commonly found in herbal remedies, typically available in the form of capsules, whole seeds, or oil. The primary objective of this study is to examine the Dodol product development by incorporating Habbatus Sauda, Almond and Passion Fruit as key ingredients in the composition. Inventors incorporating DONS for several reasons. Firstly, it offers customer a healthier traditional snack food, the combination of Dodol with Almond, Passion Fruit. DONS highlight the unique taste, strength and benefits each ingredients have. For instance, Habbatus-Sauda and Passion Fruit are rich with nutrients consist of Vitamin A, Vitamin C, potassium, carotenoids and polyphenolics (Istiqomah, 2022). Uniquely, Dodol product was enriched and enhanced with Nigella Sativa, Almond, and Passion Fruit. Preserving food heritage as Dodol is part of traditional Malaysia & Indonesia sweet delicacies. DONS offer varieties for Dodol products in the market.

2. METHODS

Dodol Nigella Sativa (DONS) was initiated in September 2022 and born in August 2023 with the first production of 15 kg at Food Innovation Laboratory, Faculty of Hotel & Tourism Management, UiTM Terengganu.

2.1 The Process and Timeline

Initially, inventors started the product development through brainstorming ideas, conducting research on the product, collecting data, and studying the demand. This process took place September-December 2022. Next, the product drafting, materials and recipe design was conducted in January-April 2023. The production of DONS was conducted in May-August 2023 with the process of finalizing the product, laboratory & product testing. DONS was ready in usage with product completed and patent applied in September 2023.

2.4 Simplified Process of DONS

DONS involved four (4) primary steps to produce it as listed in Figure 1 below. Firstly, inventors prepare Ingredients A (brown sugar, granulated sugar & water) in a bowl mixture. The ingredients are cooked on heat. Passion fruit is added. It was cooked until well mixed and dissolved. The mixture is let to cool. Next, inventors prepare Ingredients B (glutinous flour, tapioca flour and coconut milk) in another bowl mixture. Add accordingly. Cooked the ingredients until it well mixed and dissolved. In conjunction with that, inventors proceed with next step that is: The cooled ingredients A are sieved and added into ingredients B. Lastly, for the last step 4: Add and mix Almond and Habbatus-sauda in small ratio (15mg). The mixture is stirred constantly for maximum four (4) hours until well cooked.

3. RESULTS AND DISCUSSION

3.1. Sensory Test Evaluation of DONS

Inventors conducted market survey for DONS and approached 35 respondents to taste DONS and evaluate the product. Majority respondents preferred Product B: 15 mg Nigella Sativa, Almond, Passion fruit per 500 grams premix Dodol.

Figure 1. *Illustrations of Dons making processes (Mixed with Habbatus Suda, Almond & Passion Fruit)*

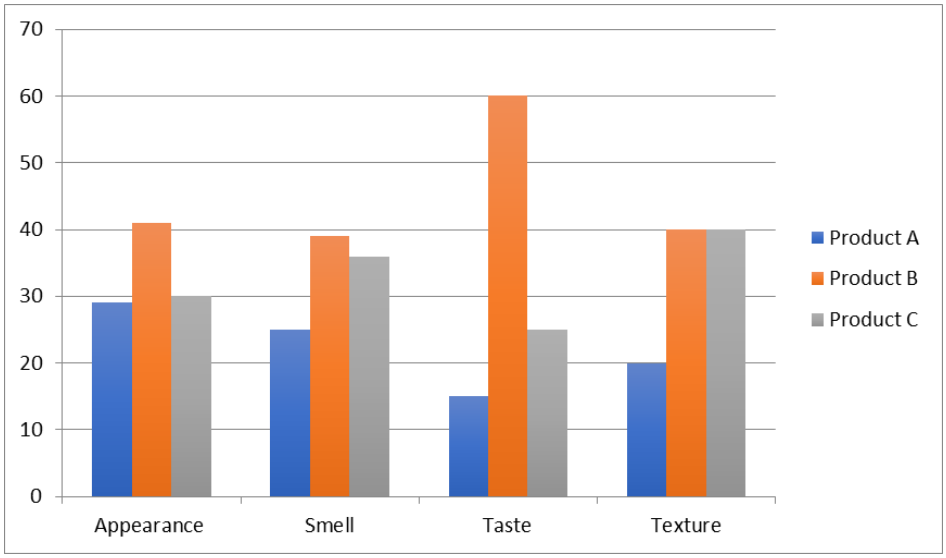

Figure 2. *DONS Sensory Evaluation Graph*

All numbers above are expressed as a percentage of the total respondents (*N*) 35. Strength of Nigella Sativa, Almond, Passion fruit for every 500-gram *Dodol* premix comprise of Product A: 0 mg Nigella Sativa, Almond, Passion fruit per 500-grams *Dodol* premix, Product B: 15 mg Nigella Sativa, Almond, Passion fruit per 500-gram *Dodol* premix and Product C: 30 mg Nigella Sativa, Almond, Passion fruit per 500-gram *Dodol* premix. Findings indicated that three added ingredients diversify and enhance the taste of the *dodol*. The chewy and crunchy combination will bring out texture for the mouth feel. The practical size of DONS contributed to its light weight and can be eaten anywhere or everywhere.

4. CONCLUSION

Inventors postulated that DONS has high commercialization potential by creating job opportunity/ employment for local people and supporting SDG3/SDG17. Inventors approached several restaurateurs in Dungun and Selangor to sell the product. It can expand the economic base and contribute to the increase of added value of *dodol*. This is in line with UiTM 2025 Strategic Plans vision besides aiming to achieve SDG3 Good Health & Wellbeing and SDG17 Strengthen the means of implementation and revitalize the global partnerships for sustainable development. IIn conjunction with that, DONS offer opportunities for local and international market as well as product existence. Future research can be expanded with other types of *Dodol* such as Pandan and *Durian* flavor, to examine the product acceptance with incorporations of Habbatus Sauda, Almond and Passion Fruit.

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BEAN-TO-BEAUTY (B2B) COFFEE SCRUB

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ABSTRACT

Bean-to-beauty (B2B) Coffee Scrub is an innovation product inspired from coffee waste in Barista Lab, Faculty of Hotel & Tourism Management, UiTM Terengganu. Classified as skin care and body beauty products, this innovation focus on coffee waste mixed with coconut oil, grape seed oil, honey, salt, brown sugar and Habbatus Sauda. Incorporating Habbatus Sauda enriched and enhance the product further with the health benefits it acquires including anti-inflammatory and antioxidant properties. The product is ground and mix finely to create a uniform scrub and to distribute its properties evenly. B2B Coffee Scrub aims to utilize and maximizing coffee waste usage, convert waste to income generation activities, adding to another hospitality innovation product available in the market and offer a safe, toxic free, healthier, and affordable beauty product. B2B Coffee Scrub served several functions such as exfoliation by removing dead skin cells and leaving users skin feeling smoother and looking brighter. Moreover, temporary tightening purpose, as caffeine in coffee believed to have tightening effect on skin which can make it appear firmer and more toned. In conjunction with that, improved circulation as it can stimulate blood flow, potentially giving user's skin a healthier appearance. B2B Coffee Scrub has been submitted for laboratory testing services at Centre for Natural and Physical Laboratory Management Universiti Kebangsaan Malaysia, to ensure the product is safe and covered those with specific skin concerns or conditions. Inventors were concerned and cautious with the sensitive or allergies of certain substances that B2B Coffee Scrub might possess. Interestingly, the coffee waste usage can be seen as an excellent way for a sustainable and eco-friendly approach besides cost-effective. It's a novel way to repurpose the coffee grounds that would otherwise be discarded. The coffee waste can still have some exfoliating properties and contain residual caffeine and antioxidants. The product can be seen benefiting universities, students, lecturers, and local communities. Generally, this innovation is in line with UiTM vision under 2025 Strategic Plan besides complying to SDG11 Sustainable Cities and Communities through waste reduction that contribute to creating sustainable and resilient cities and communities and SDG12 Responsible Consumption and Production that emphasized on waste reduction and environmentally conscious.

Keywords: Coffee waste, Coffee scrub, Habbatus Sauda

1. INTRODUCTION

The coffee industry in Malaysia can be seen consistently growing, with the country actively striving to position itself as a prominent coffee producer and exporter. Although Malaysia is not conventionally recognized for its coffee production, there has been a notable emergence of coffee cultivation in several locations of the country in recent times. It is customary for community members to convene on a regular basis to engage in discussions pertaining to various subjects in coffee shops (Chiu Yiong Lim, Lim, Leong & Zaidi Yusran, 2022). In contemporary times, Western coffee conglomerates, such as Starbucks, have significant success in Malaysia due to their provision of aesthetically pleasing and technologically advanced services (Rahardjo, Hasbullah & Taqi, 2019). Nevertheless, the development of coffee shops and this coffee culture has led to coffee waste.

In hospitality industry, food waste is indeed a serious problem that is linked to a slew of other worldwide environmental and socioeconomic issues (Segrè et al. 2014; Filimonau, Krivcova & Pettit, 2019). Coffee waste can be classified as food waste. Despite significant geographical and sectoral disparities in its distribution, food waste is equally prevalent in hospitality and emerging economies, emphasizing the political importance and urgency of its mitigation. Hospitality food waste is a major source of concern (Pirani & Arafat 2014). Several efforts had been done to address food waste, the problem persists, necessitating improved scientific understanding, increased public awareness, and increased political attention (WRAP 2017). Initial endeavor to assess the scale of the food waste problem within coffee establishments and investigate the strategies employed by coffee shop managers to mitigate this issue, using direct observation and firsthand investigation were being conducted by Filimonau et al (2019). Authors address the lack of research on food waste management specifically in the setting of coffee shops (Filimonau et al, 2019). Most of the waste were dumped after every shift/ operation. Inspired to provide insights into this important subject further, inventors invent Bean-to-beauty (B2B) Coffee Scrub.

It is an innovation product derived from coffee waste through Barista classes in Barista Lab, Faculty of Hotel & Tourism Management, UiTM Terengganu. Inventors focus on coffee waste mixed with Habbatus Sauda & other igredients such as coconut oil, grape seed oil, honey, salt, and brown sugar. It is a skin care and body beauty products from coffee waste. By incorporating Habbatus Sauda, it enriched and enhance the product further with the health benefits it acquires including anti-flammatory and antioxidant properties. With the focus to maximize coffee waste usage, this innovation product has high potentials to be converted to income generation activities for the faculty and university. Moreover, in terms of environment saving, this product can be transformed from coffee waste into an exemplary product helping the environment in a long run. It contributes to university practicing SDG11 Sustainable Cities & Communities and SDG12 Respnsible Consumption and Production where waste reduction can be achieved. In addition, the innovation contributes to adding another hospitality products where it offers safe, toxic free, healthier, and affordable beauty products.

There are several benefits B2B Coffee Scrub can offer such as exfoliation function by removing dead skin cells and leaving users skin feeling smother and looking brighter. Moreover, it can offer temporary tightening purposes as caffeine in coffee believed to have tightening effect on skin which can make it appear firmer and more toned. Next, it can improve circulation through stimulating blood flow that potentially giving user's skin a healthier appearance. The incorporation of Habbatus Sauda gives an added enrichment and enhancement. The health benefits include anti-flammatory and antioxidant properties. The product was ground and mix finely to create a uniform scrub.

2. METHODS

B2B Coffee Scrub was created in Barista Lab, Faculty of Hotel & Tourism Management with several attempts made by inventors before the product was finalized. It comprises of seven (7) main ingredients as listed below:

- Coffee Waste
- Brown Sugar
- Coconut Oil
- Grape Seed Oil
- Salt
- Honey
- Habbatus Sauda

2.1 The Process

There are four (4) simplified steps involved in the process of creating B2B Coffee Scrub namely:

1. Ingredients A was prepared. It consists of coffee waste gathered from all Barista classes.
2. Next, Ingredients B was prepared. It consists of Coconut Oil, Grape Seed Oil, Honey, Salt, and Brown Sugar.
3. Ingredients C was prepared. It comprises of Habbatus Sauda or scientifically known as Nigella Sativa. Ingredients C was ground finely to create a uniform scrub.
4. All Ingredients (A, B and C) were mixed finely to distribute its properties evenly for thirty minutes. The enhance outcome helped nourish and clean the body. To secure product formulation, an application for intellectual property (Literacy) has been made via PRIME system, pending approval by BITCOM (as of October 2023) to be submitted to MyIPO. Moreover, B2B Coffee Scrub was submitted for laboratory testing at Centre for Natural and Physical Laboratory Management Universities Kebangsaan Malaysia, to ensure the product is safe and covered those with skin concerns or conditions. Inventors were concerned and cautious with the sensitive or allergies of certain substances that B2B Coffee Scrub might possess.
   The product can be viewed as in Figure 1 below:

Figure 1. *B2B Coffee Scrub*

3. RESULTS AND DISCUSSION

3.1. Novelty

Interestingly, the coffee waste usage can be seen as an excellent way for a sustainable and eco-friendly approach besides cost-effective. It's a novel way to repurpose the coffee grounds that would otherwise be discarded. The coffee waste can still have some exfoliating properties and contain residual caffeine and antioxidants, added with Habbatus Sauda benefits. Thus, the novelty of B2B Coffee Scrub is through maximizing coffee waste usage and incorporating Habbatus Sauda. The product can be seen benefiting universities, students, lecturers, and local communities. Generally, this innovation is in line with UiTM vision under 2025 Strategic Plan besides complying to SDG11 Sustainable Cities and Communities through waste reduction that contribute to creating sustainable and resilient cities and communities and SDG12 Responsible Consumption and Production that emphasized on waste reduction and environmentally conscious.

4. CONCLUSION

The coffee industry in Malaysia has received substantial support from the government, as seen by its implementation of many programmes, research endeavours, and initiatives that are specifically designed to bolster coffee cultivation and facilitate the exportation of Malaysian coffee goods. Coffee tourism is experiencing growth in Malaysia, alongside the country's coffee production sector. Coffee farms and cafes provide opportunities for individuals to participate in excursions and engage in experiences centered around the cultivation, processing, and brewing of coffee. The exportation of Malaysian coffee to diverse nations exhibits promising prospects for the expansion of international markets, particularly as the quality of Malaysian coffee continues to enhance. Thus, it is noteworthy to acknowledge that B2B Coffee Scrub is grabbing the opportunity from the growth of coffee production in Malaysia. Inventing hospitality product from coffee waste and incorporating Habbatus Sauda is indeed a commendable effort.

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A TRAINING MANUAL for WORK-BASED LEARNING (ATRAM for WBL) STUDENTS AND INDUSTRY PRACTITIONERS

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ABSTRACT

ATRAM for WBL students and practitioners is an educational tool that focus on the utilization of training modules and guidelines for students and industry practitioners during students' work-based learning attachment in the industry. With the assistance of this innovation, it will facilitate student's experiences in the industry to gain insight into a personnel role of assigned department, thus developing and enhancing their technical, knowledge and employability skills. Students get the opportunity to put theory in to practice within a real-world setting in hotel industry as well as build networks by connecting and working with professionals in industry. ATRAM for WBL is available in three (3) version to cater to three (3) main subjects and departments comprise of Front Office, Housekeeping and Food & Beverage Management. The sub-departments of each department are being highlighted in ATRAM for WBL. For instance, in Housekeeping, a logical order of hotel housekeeping operations such as room cleaning, laundry operation and public area are being tabled out to guide students in the completion of their WBL attachment. This module also includes several rubrics based on assignments given, to allow industry practitioners as trainers to rate students' performance during the 10-week attachment, cater to Diploma in Hotel Management students from the Faculty of Hotel & Tourism Management, Universiti Teknologi Mara. This innovation can be seen contributing to another hospitality education innovation, in line with Malaysia Education Blueprint 2015-2025, to enable more personalized learning to meet the objectives of holistic, talented, and balanced graduates. In a long run, ATRAM for WBL promote lifelong learning that enable students to meet the changing skill needs of a high-income economy besides enhancing upskilling opportunities.

Keywords: A Training Manual, Industry practitioners, Modules, Students, Work-based learning

1. INTRODUCTION

The post-pandemic period has observed a significant impact on numerous industries and sectors globally, including the education sector. A report published by UNESCO in 2020 reveals that 90% students from various education level (primary, secondary, and private/public university) globally were affected due to the closure of schools and universities in March 2020 (UNESCO, 2020). Owing to limited understanding of the characteristics of the COVID-19 virus and the prevailing uncertainties pertaining to its duration and impacts, most nations initially paid scant attention to the possibility of transitioning secondary and higher education courses to online

platforms. The continuous and widespread transmission of the virus has resulted in the implementation of stringent isolation protocols, leading to the postponement of educational activities in schools and public as well as private universities worldwide. The COVID-19 pandemic has compelled schools and public/private universities to temporarily shut down, resulting in minimal consideration for transitioning educational courses from traditional face-to-face instruction to online platforms (Choi, Robb, Mifli & Zainuddin, 2021). This was exacerbated by the fact that most governments prioritised efforts to combat and mitigate the effects of the virus, as well as stimulate their national economies to ensure economic stability within their individual countries. As the learning practises of numerous university courses and courses have been impacted by the pandemic (Bao, 2020), there was a growing momentum surrounding the topic of resuming educational establishments using several approaches (Jowsey et al., 2020). Governments worldwide initiated efforts to evaluate the most effective approaches for facilitating the educational progression of scholars (WHO, 2020). Nevertheless, the ongoing epidemic has led to increased attention on higher education, particularly in the field of hotels and tourism industry as evidenced by recent research (O'Connor, 2021). Inspired from the current scenario with the focus to enhance quality education, inventors invent A Training Manual (ATRAM) for Work-based learning (WBL) students and practitioners. This innovation is an educational tool that focus on the utilization of training modules and guidelines for students and industry practitioners during students' work-based learning attachment in the hotel industry.

With the innovation of ATRAM for WBL, students specifically Diploma Hotel Management get the opportunity to put theory in to practice within a real-world setting in hotel industry as well as build networks by connecting and working with professionals in industry. Moreover, ATRAM for WBL can assist students as guidance and reference for them in the hotel industry. It is available in three (3) version to cater to three (3) main subjects and departments comprise of Front Office, Housekeeping and Food & Beverage Management. The sub-departments of each department are being highlighted in ATRAM for WBL. For instance, in Housekeeping, a logical order of hotel housekeeping operations such as room cleaning, laundry operation and public area are being tabled out to guide students in the completion of their WBL attachment. Inventors believed that with ATRAM for WBL, students will gain insight into a personnel role of assigned department, thus developing and enhancing their technical, knowledge and employability skills. Interestingly, this module also assists industry players as it includes several rubrics based on assignments given, to allow industry practitioners as trainers to rate students' performance during the 10-week attachment, cater to Diploma in Hotel Management students from the Faculty of Hotel & Tourism Management, Universiti Teknologi Mara. This innovation can be seen contributing to another hospitality education innovation, in line with Malaysia Education Blueprint 2015-2025, to enable more personalized learning to meet the objectives of holistic, talented, and balanced graduates. In a long run, ATRAM for WBL promote lifelong learning that enable students to meet the changing skill needs of a high-income economy besides enhancing upskilling opportunities.

2. METHODS

ATRAM for WBL was developed in year 2020 covering four (4) subjects module comprising of Front Office Management, Housekeeping, Food & Beverage Management and Hospitality Sales & Marketing.

2.1 The Process

There are six (6) main steps involved in the process of developing ATRAM for WBL as listed below.

1. Assessment Needs Analysis - All vital information from Hotel Managers and students were gathered during lecturer's Industrial Training visitations to hotels. On top of that, the round-table discussions conducted between academicians and stakeholders such as industry panels were helpful in assessing needs analysis to enhance the quality of the curriculum design.
2. Content Development (Objectives, Design & Format)- Based on the assessment needs analysis, several meetings and discussions were conducted face-to-face involving Hotel Department lecturers from several campuses (Puncak Alam, Pulau Pinang and Sabah). The meetings were held in UiTM Terengganu Dungun campus as the Hotel Management department is the focal person for HM110 Diploma in Hotel Management program. ATRAM for WBL were initiated.
3. Writing & Editing- The writing and editing process of the module involved several lecturers as the authors/ module developers and proofreaders to ensure the module has zero defect and maintain the quality standard of publications (please refer Figure 1 below).
4. Review Feedback - Next, editorial board team of the module provide feedback with regards to the module. Editorial board members consist of senior lecturers and Assistant Professors from UiTM Selangor Puncak Alam campus. With their vast knowledge and expertise, feedback provided were very useful to enhance the quality of the module.
5. Finalization- The cover design of the module was finalized. This module was published by Abu Khalil Printing in Klang while printed by e-Print Solution Sdn Bhd. Kuala Lumpur.
6. Monitoring & Evaluation- ATRAM for WBL is ready to be distributed to students.

Figure 1. *Brainstorming, discussion, and development process of ATRAM for WBL*

3. RESULTS AND DISCUSSION

3.1. Commercialization Potential

Now in the year 2023, ATRAM for WBL is being utilized in several UiTM campuses besides Terengganu such as in Penang and Sabah (please refer Figure 2). This innovation served as a benchmark for other public and private universities locally. Inventors can offer consultation services (chargeable) to assess competitors needs analysis and content development.

3.2. Students Feedback

Students were approached to gauge their feedback with regards to ATRAM for WBL. Majority of the respondents agreed that this ATRAM for WBL offer a methodical and organised approach in presenting vital information for their WBL industrial attachment. This pedagogical

approach facilitates students' comprehension of Front Office, Housekeeping, Food & Beverage, and Sales & Marketing matter by presenting it in a coherent and systematic manner, hence enhancing students' ability to comprehend intricate ideas. One student postulated that "This ATRAM for WBL is really helpful and lecturers who created this it really gives attention to detail". It is helpful for their WBL industrial attachment exploration. In conjunction with that, this module allows students to comprehend the content at their own preferred pace. The provision of flexibility in learning enables students to acquire knowledge at a pace that aligns with their unique requirements and inclinations, thereby fostering a more profound comprehension of the subject matter. One of the respondents highlighted that, "I had a fantastic experience during my WBL attachment. This ATRAM for WBL has made the process easy because everything is provided in this manual."

It is interesting to discover that this module serves as a valuable tool for students seeking professional growth and engaging in continuous learning throughout their lives. The versatility of ATRAM for WBL allow students for their applicability across diverse educational and training contexts, as they can effectively address a broad spectrum of hotel management subjects and their abilities. It is imperative to acknowledge that the efficacy of ATRAM for WBL is contingent upon various elements, including the quality of content, instructional design, and level of student engagement. Inventors believed that this innovation were appropriately developed and implemented and serve as a valuable instrument in facilitating students' acquisition of knowledge and skills.

Figure 2. *ATRAM for WBL*

4. CONCLUSION

As hotel business prioritise the cultivation of fundamental skills, including customer service, communication, time management and problem-solving, these skills can be acquired by students through industrial training. ATRAM for WBL served as a guideline and reference module due to its offer a systematic approach for disseminating information on comprehensive understanding of hotels operation. Standardisation is a crucial aspect of ensuring consistent adherence to established procedures and regulations across hotel employees and trainees, encompassing individuals ranging from front desk personnel to cleaning. ATRAM for WBL play a pivotal role in achieving this objective. The maintenance of a high level of service quality is contingent upon the adherence to this consistency.

ACKNOWLEDGEMENT

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EVENT ORGANIZER KIT (EVOK) FOR UNIVERSITY STUDENTS AND ACADEMICIANS

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ABSTRACT

In today's fast-paced world, event organizers face unique challenges in orchestrating successful gatherings that leave a lasting impact. EVENT ORGANIZER KIT (EVOK) for university students and academicians is designed specifically for university students and academicians targeting enhancing students' skill development which is valuable for future careers. This innovation served as a guideline and guidance for university students that can empower them to plan and execute successful events while also fostering skills and knowledge in event management. EVOK is an educational tool developed focusing on excellent learning opportunities for students from Business Management as well as hotel and tourism Management fields. It combines resources, tools, and software (apps) that cater to customized learning and the unique needs of students doing event planning and management. EVOK software or apps is a comprehensive, user-friendly digital toolkit tailored to students' event planning. It includes guidelines and templates for event planning, checklists, documentation needed, marketing, and budgeting that facilitate students' understanding of the event planning process (students need to plan, manage, and execute) thus creating effective event strategies. With the budgeting tools provided in EVOK, students can manage their event finances and track expenses. Meanwhile, the checklists provided offer comprehensive event planning checklists to ensure students do not overlook all vital details during the planning and execution stages. The documentation needed for students includes an application letter to access university resources such as borrowing audio-visual equipment. Interestingly, EVOK can benefit academicians as well since they can use the apps for organizing and managing classroom events, seminars, or workshops related to their academic subject to better manage and deliver educational content. The collaborating efforts between two (2) faculties indicate that EVOK has commercialization value for university students and academicians albeit in different ways compared to the commercial use in the broader event planning industry. The innovation of EVOK in the long run, contributes to SDG4 Quality Education as it supports the goal of ensuring quality education by enhancing students' skills and knowledge in event planning and management. Moreover, SDG9 Industry, Innovation, and Infrastructure can be achieved as EVOK provides access to event management software and technology tools, assisting students as event organizers adopt more efficient and sustainable practices.

Keywords: Academicians, Apps, Event Organizer Kit, Students

1. INTRODUCTION

Event management subjects are one of the subjects that are taught to students. In Malaysia, event management is still a field little studied, despite being an important contributor to the economy. This is although event management education through its various academic programs from private and public institutions, is slowly being shaped (Bouchon et al., 2015). Malaysian event management education is quite diverse, most probably because of its relatively recent character as a field of teaching. Both public universities and private higher learning institutions are involved in event management courses.

In UiTM Terengganu, event management is one of the subjects offered to students in the Faculty of Hotel and Tourism Management and Faculty of Business Management in their study plan. The codes of Event Management are as follows:

Table 1. Subject offered for Event Management

Faculty	Code	Code Name
Faculty of Hotel Management	HTF280	Event Management for Foodservice Professionals
	HTH558	Professional Etiquettes for Hoteliers
	HTT251	Meeting, incentive, convention, and event
Faculty of Business Management	OBM310	Event Management
	OPM555	Service Operations Management
	OPM633	Sustainable Operations Management

Students from the Faculty of Business & Management and Hotel & Tourism Management are required to conduct events in completing their courses. The same lecturers committed to advising every batch of students. Since the cycle of such events keeps on repeating, one-stop centre documents storage was regarded important to document lecturers explicit, implicit, and tacit knowledge. Therefore, this project is conducted by introducing EVENT ORGANIZER KIT (EVOK) for university students and academicians designed specifically for university students and academicians targeting enhancing students' skill development which is valuable for future careers.

EVOK is an educational tool developed focusing on excellent learning opportunities for students from Business Management as well as the Hotel and Tourism Management field. The objectives of this project are:

- To provide a guideline in terms of planning, organizing, leading, and controlling students who are going to organize events.
- To document explicit, implicit, and tacit knowledge of experienced lecturers in advising multiple events so that it becomes a tangible reference.
- To assist lecturers in organizing & managing classroom events, seminars, or workshops related to their academic subject to better manage and deliver educational content.

The benefits of this project are for students and lecturers as it provides a comprehensive, user-friendly & digital toolkit. This application includes guidelines and templates for event planning, checklists, documentation needed, marketing, and budgeting that facilitate students' understanding of the event planning process. It also combines resources, tools, and software

(apps) that cater to customized learning and the unique needs of students doing event planning and management. Hence this application through digitalization will help lecturers teach the subjects efficiently and students create the events smoothly. This is in line with the overall process of digital transformation that has resulted in a notable increase in innovation within the meeting sector, particularly in the form of digital technologies. The utilisation of digital tools and apps in the event business is rooted in the recent advancements in technology and digital development (Hagen, 2021). Taking advantage of the current scenario, EVOK has been developed which in a long run will benefit students and academicians.

2. METHODS

This project employs the design thinking process adapted from Brown (2008). The research design is as follows:

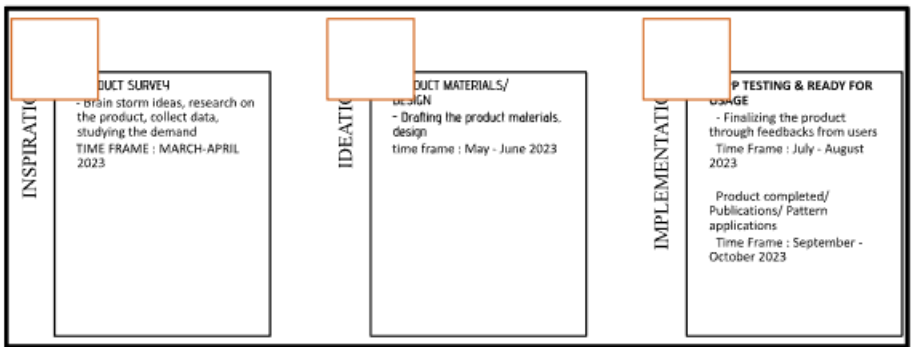

Figure 1. *Design Thinking Process (Adapted from Brown 2018)*

There are three stages employed in this project adapted from (Brown, 2008) design thinking strategy namely: a) inspiration, b) ideation c) implementation. The inspiration process includes identifying the problems and creating a product survey. This process includes brainstorming ideas among the group, doing research on the products, and making market surveys. The process starts within 2 months from March – April 2023.

The second process is the ideation process. This process includes creating products, materials, and designs. The process includes drafting the product materials and design organizing information and valuable ideas and creating the prototypes. It also includes designing the application at the initial stages.

The third process is the implementation. This process includes app testing and ready for usage. At this stage, the app is finalized through feedback from users from pilot use. The process starts from July – August 2023. Finally, the application is completed and ready for usage. It includes process pattern applications provides publication on this application and creates marketing towards the usage of this app.

3. RESULTS AND DISCUSSION

3.1. EVOK Features

There are 11 features in EVOK as illustrated in figure 2. It has templates that need to be filled up by the students to organize an event. The process is in ascending order which will help

students organize the events effectively and will help lecturers monitor the students' events efficiently.

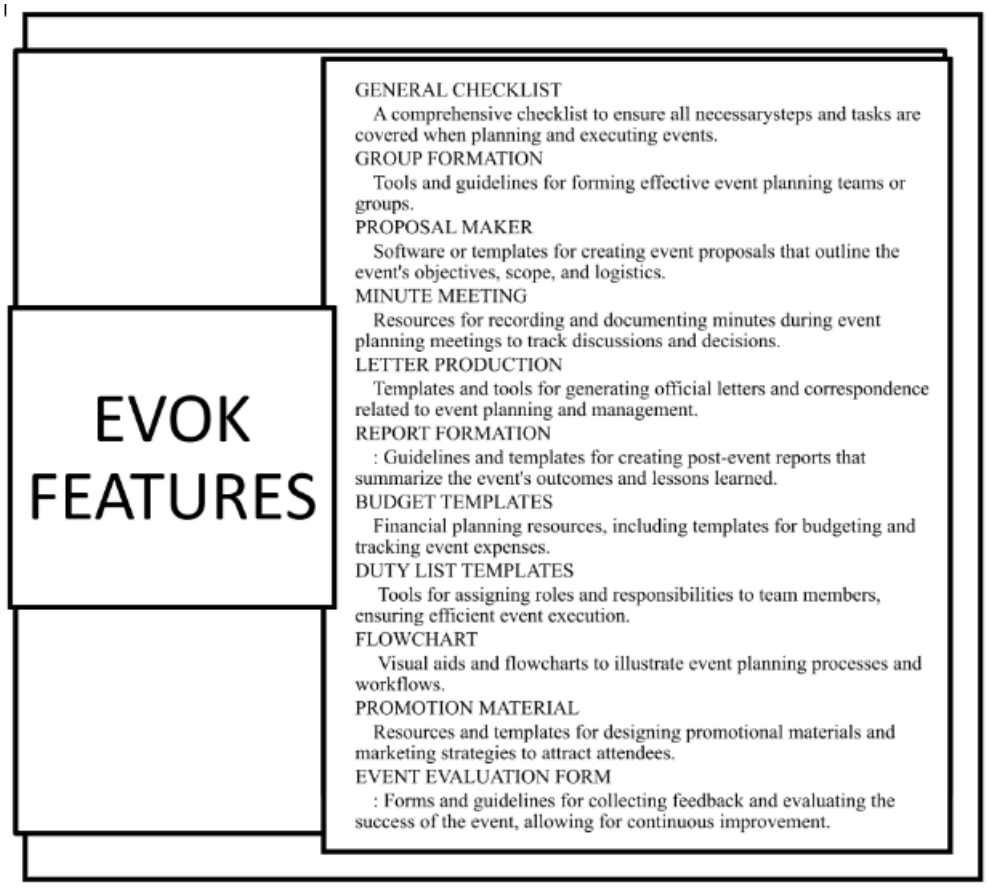

Figure 2. *EVOK features*

3.2 Discussion

The first objective of this project is to guide & assist students with a comprehensive event planning list. Hence, the checklists provided in this app offer comprehensive event planning checklists to ensure students do not overlook all vital details during the planning and execution stages. Moreover, with the budgeting tools provided in EVOK, students can manage their event finances and track expenses. This will help in guiding and assisting students as well as lecturers in guiding students in organizing the events. In the event industry, technology is more than just the latest trend that will play a significant role in future upcoming events and the event planners will unavoidably need to have a thorough understanding and up-to-date knowledge of the wide range of options available to work with and to create the desired effect (Sherlock & O'connor, 2015). Therefore, the usage of mobile apps for education in event planning is also essential. The mobile app can make the event management process more efficient (Mehrotra & Lobo, 2020).

The second objective is to document the explicit, implicit, and tacit knowledge of experienced lecturers in advising multiple events so that it becomes a tangible reference. Hence, this app provided the documentation needed for students including application letters to access university resources such as borrowing audio-visual equipment. Other documented materials can be accessed from this app for the convenience of students to organize their events.

The third objective is to assist lecturers in organizing & managing classroom events, seminars, or workshops related to their academic subject to better manage and deliver educational content. Through the application, EVOK can benefit academicians as well since they can use the apps for organizing and managing classroom events, seminars, or workshops related to their academic subject to better manage and deliver educational content. EVOK can served as guidelines to conduct physical meetings, exclusively online meetings/virtual meetings, or hybrid meetings (Hagen, 2021).

4. CONCLUSION

EVOK is a comprehensive tool for students and lecturers in organizing events and subjects. It Provides benefits in terms of time and resource management. EVOK software or apps is a comprehensive, user-friendly digital toolkit tailored to students' event planning it includes guidelines and templates for event planning, checklists, documentation needed, marketing, and budgeting that facilitate student's understanding of event planning process (students need to plan, manage, and execute) thus creating effective event strategies. EVOK also is an educational tool developed focusing on excellent learning opportunities for students in Business Management as well as the Hotel and Tourism Management field. It combines resources, tools, and software (apps) that cater to customized learning and the unique needs of students doing event planning and management.

The collaborating efforts between two (2) faculties specifically Faculty of Business Management and Faculty of Hotel and Tourism Management, indicate that EVOK has commercialization value for university students and academicians albeit in different ways compared to the commercial use in the broader event planning industry. Future planning for this project includes AI tools that will help students simplify their event management process. Other than that, research on the potential of this app is valuable to ensure the sustainability of this project. The acceptance and intention to use this application among the students and lecturers will help to identify the values of this project. EVOK has the potential to help and guide the students and lecturers in teaching, learning, and organizing events managementsubjects.

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GEOCA: THE INTEGRATION OF 360 GOOGLE EARTH INTO TEACHING AND LEARNING APPS

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ABSTRACT

Interactive teaching and learning are widely used by higher education lecturers to engage students in hybrid teaching of both classroom and virtual sessions. As the teaching and learning norms gradually shifts from a teacher-centred to creative interactive tools, students who stumble to memorize elaborating factual ideas and score poorly in knowledge and comprehension assessments, specifically for the subject course related to Geography and Culture, are expected to do well with the assistance from Geography and Culture Applications (GeoCA) interactive tools. Henceforth, this paper aims to introduce new teaching methods through innovating interactive learning information by integrating 360 Google Earth into GeoCA as a substitute platform for smart teaching and learning. Through a quantitative method, a set of questionnaires was distributed using purposive sampling as an instrument to measure the effectiveness of integrating 360 Google Earth view into GeoCA among secondary and tertiary students who had previously taken the subject course Geography and Culture. Results revealed that most respondents are passionate to explore the GeoCA educational web that had been upgraded with integration of 360 Google Earth. Most students also agree that the app would be of great assistance for memorizing and the contents are easy to digest making majority of respondents overall much satisfied with the upgraded feature. With the integration and synergy of both interactive teaching and new learning tools, students' experiential learning periods promise a more exciting session. This app is also user-friendly to broader audience including lifelong learners, educators, and anyone interested in increasing their knowledge on facts of the world.

Keywords: Interactive; Teaching; Learning; Geography; Culture

1. INTRODUCTION

To meet the evolving needs of today's students while adapting to the changing landscape of education, many lecturers and educators are transitioning from traditional teaching and learning approaches to embracing a more diversified method. Some practices include technology integration and adaptive learning. This shift is driven by the recognition that one-size-fits-all teaching approaches may not adequately meet the needs of today's diverse student population and that a more multifaceted approach better prepares students for both the challenges and opportunities of the 21st century.

Learning subjects that are heavily based on theories and can be either abstract or complex. As mentioned by Bender (2023), maintaining focus can be a challenge for students, especially in theoretical subjects. Hence, Xhemajli (2016) suggested interactive tasks as a plausibility for students to adapt towards diverse learning styles, access digital and information age, instilling lifelong learning, adapting to technology and engage in active learning. Through active participation, students would be able to grasp concepts more effectively, retain information longer, and develop critical thinking and problem-solving skills. In agreement, Giorgdze and Dgebuadze (2017) highlighted that interactive teaching approaches foster a learner-centric environment where students actively participate, take ownership of their learning, and acquire valuable skills that extend beyond the classroom. Thus, this statement has become the leading basis to the development of Geography and Culture App (GeoCA) teaching and learning applications with the purpose to stimulate a more effective and fulfilling educational experience.

GeoCA is a smart educational web app initially developed for Geography and Culture in Tourism course for higher education. This unique learning platform is a powerful education tool for lecturers to foster students' geographical interests, engaging activities, and facilitating geographical knowledge (Davis, 2019). The contents were divided into digestible chunks, visual aids were integrated, and interactive learning tools were applied to capture learner’s attention. In accordance with Fuza, Isa, Abd Shattar, Ismail, Abu Bakar, and Abd Patah (2019), implementing innovative strategies and interventions is essential to seize attention. Popular interactive methods utilised in GeoCA includes problem-solving activities, gamification, and 360 view. The 360-degree Google Earth is the latest new feature integrated in GeoCA. This immersive technology is an excellent idea for visualizing and experiencing world destinations without the necessity of physically travelling there, making learning process more engaging and interactive.

2. METHODS

To test the content effectiveness of 360 Google Earth and GeoCA web integration, feedback via survey online were utilised as a piloting media.

2.1 Online Survey

Online survey is a convenient and effective means of gathering feedback from respondents, which can be invaluable in improving geography education. In this study, the main research objective is to investigate the integration effectiveness of GeoCA. A set of closed-ended questions with rating scales from one (1) to five (5) quantifiable feedback were distributed through Google Form user-friendly interface platform to attained users’ level of satisfaction.

Purposive sampling from secondary and tertiary level institutions were essentials to test the integration effectiveness based on learners' experience learning subjects on Geography and Culture. The survey was administered at the end of the subject course to attain feedback on 360 experiences. As anonymity was rest assured to encourage honest feedback, a total number of 73 response were worthy for further analysis.

2.1 Data Analysis

In determining the successful rate of the integration feature, a set of feedback survey consisting of four primary characteristics were questioned. These characteristics derived from important inquiries utilised in the past to gauge level of consumers satisfaction. A five (5) Likert-scale survey response of Strongly Agree (5), Agree (4), Neutral (3), Disagree (2) and Strongly Disagree (1) were used. Respondents were first instructed to complete all access in GeoCA site, and later complete the feedback survey. After data cleaning, all useful responses are further analysed using automatic summaries, and percentage descriptive statistic were produced to summarize responses and demonstrate success rate of 360 view and GeoCA web integration.

3. RESULTS AND DISCUSSION

3.1. Respondent's Profile

As visualized in Figure 1 and Figure 2, most respondents are students (97.3%) aged 18 or older (76.7%). The respondents' group was exclusively targeted towards students at secondary and tertiary educational institutions who are studying topics connected to culture and geography.

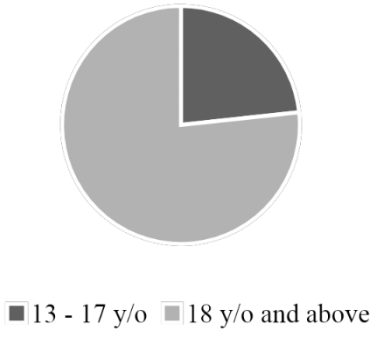

Figure 1. *Age group*

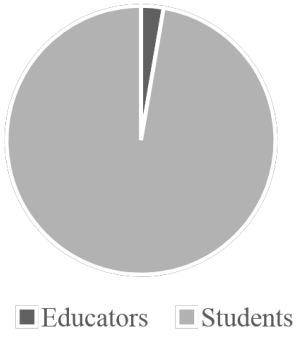

Figure 2. *Occupation*

3.2. Respondent's Perceptions

Respondents' attitudes regarding GeoCA new interface were further researched and addressed as summarized in Table 1.

Table 1. Respondents attitude towards 360 Google Earth and GeoCA integration

Perceptions	Result	Percentage
Engage understanding	Strongly agree	47.9
	Agree	47.9
	Neutral	2.7
	Disagree	1.4
	Strongly disagree	0.0
Increase memorization	Strongly agree	48.0
	Agree	46.0
	Neutral	3.0
	Disagree	3.0
	Strongly disagree	0.0
Perceive usefulness	Strongly agree	51.4
	Agree	47.2
	Neutral	1.4
	Disagree	0.0
	Strongly disagree	0.0
Overall satisfaction	Very satisfied	45.2
	Satisfied	38.4
	Neutral	16.4
	Dissatisfied	0.0
	Very dissatisfied	0.0

From the survey analysed, 95.8% respondents agreed that the integration between 360 Google Earth and GeoCA website engage students understanding with the material developed for the course. 96% respondents also agreed that the integration tool developed also assist in memorizing contents. These finding is like Ahmad, Zain, Rani and Fuza (2022) that reported 360 Google Earth is an interesting tool where the student could discover the destination attraction virtually and enhance their learning experience.

Furthermore, 98.6% respondents reported that the integration in question is of beneficial for the objectives of their knowledge and education. High satisfaction level of over 86% respondents further indicates that this integration has been well-received, suggesting that the platform is fulfilling a need and meeting expectations. This finding is supported by Rosendahl & Wagner (2023), in which they identified 360-degree visuals have a great deal of promise for presenting theory and practise through observation or reflection, boosting motivation and interest, generating genuine and realistic learning experiences, and encouraging interactive and immersive learning processes.

4. CONCLUSION

The integration of 360 Google Earth and GeoCA is anticipated to aid learners experience in effective comprehension and retention of factual geographical and cultural materials. The integration innovation is also relevance to studying topics on geography and culture, providing a dynamic tool to explore and deepen understanding. The high level of user satisfaction is a positive sign that the innovation is on the right track and can provide a valuable learning medium for broader audience including lifelong learners, educators, and anyone interested in increasing their knowledge on facts of the world. Continuing gathering feedback and making improvements is important to ensure that the platform remains relevant and effective for its users.

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NASI DAGANG NAKHODA

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ABSTRACT

Nasi Dagang is a bowl of traditional, authentic, and aromatic rice with its fish gravy meal from the state of Terengganu cooked and packed as Meal Ready to Eat (MRTE). It has a shelf life of over two years without refrigeration, chiller, or specialized container. It is prepared by local people using local ingredients and preparation techniques. People from many states and countries can enjoy it without the need to prepare them by themselves or travel to Terengganu or Malaysia to enjoy this authentic meal. The product (Nasi Dagang Nakhoda) uses retort machines that the industry already uses in Malaysia. The Food product has gone through Proximate Testing and Microbes testing to ensure the nutritional value and the safety of its content are safe and consumable.

Keywords: retort pouches, shelf life, Meal Ready to eat, Proximate Testing, Microbes Testing

1. INTRODUCTION

There has been a noteworthy shift in developing countries over the previous few decades, with many people consuming ready-to-eat (RTE) foods (Almualla et al., 2010). Malaysia is a developing country; thus, the RTE food sector in Malaysia is experiencing substantial growth and is significantly impacting the country's overall food industry GDP (Baskaran et al., 2017). In addition, 6Wresearch (2023) predicts that the Malaysian ready-to-eat food market will experience growth between 2020 and 2026. The market is expected to expand due to increasing demand for convenient food options and higher disposable incomes among consumers. In addition, lifestyle changes have caused significant differences in the purchasing intentions of people. Lifestyle changes are especially true for urban residents who lead stressful lives and rely heavily on external sources for their needs. As a result, ready-to-eat food has become a significant focus for urban residents, with multiple factors influencing their intentions to purchase it (Baskaran et al., 2017). RTE or MRTE (Meal Ready to Eat) is a meal that is already cooked and packaged, which can be eaten without much effort or heating prior to consumption. (Laguna et al., 2020). The components of these foods are thoroughly cleaned, cooked, processed, frozen, and then packaged in containers for immediate consumption. Therefore, Traditional Terengganu's Nasi Dagang, with the brand name Nakhoda, is the product being innovated for immediate consumption.

Nasi Dagang is a dish with a long history in rural communities. It is made by blending regular and glutinous rice and coconut milk to create a delightful flavor. Traditionally, it is served with tuna curry and vegetable pickles.

Nasi Dagang is a traditional food prepared by local people using local ingredients and preparation techniques. People from many states and countries can enjoy it without the need to prepare them by themselves to enjoy this authentic meal. However, Nasi Dagang requires a long hour of preparation and is difficult to prepare, especially for the younger generation. The youngest generation is opting for ready-to-eat food over traditional meals due to global modernization, advances in food technology, and a lack of time (Shariff et al., 2017). Therefore, to make Nasi Dagang more accessible and popular, technological advancements are necessary to simplify its serving process, and this method can prevent this traditional food from fading within households and communities. Furthermore, Nasi Dagang Nakhoda has undergone a thermalization process to kill microorganisms to prolong the food shelf life and avoid spoilage.

2. METHODOLOGY

Meal Ready to Eat in Retort Pouches use a thermal sterilization process to prolong the shelf life of Nasi Dagang up to 2 years. The food could be heated and consumed well within two years. This recipe and formulation are different from other brand names and cooking approaches.

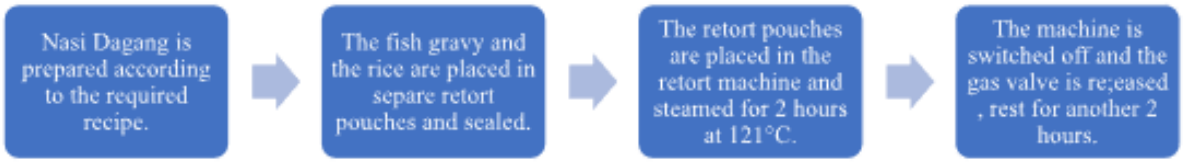

Figure 1. *Production flow*

3. RESULTS

Retort pouches are used to pack the food, and heat of certain degrees is penetrated through the pouches in an enclosed container for a certain period. Retort pouches will attract consumers to buy this MRTE. Maryam (2022) said product packaging strongly influences consumers' decision-making. Besides that, this MRTE has an impressive two-year shelf life without requiring refrigeration, chiller, or specialized containers. The most remarkable aspect of this culinary masterpiece is that it can be safely stored at room temperature for an extended period, making it a versatile and long-lasting meal option for those who enjoy its flavors. By merging traditional flavors with advanced food technology, the meal's shelf life has been extended while maintaining the essence and taste of Terengganu's culinary legacy. This meal is now readily available for consumption for years to come.

Figure 2. *Retort Pouches*

4. MARKET POTENTIAL

This product has tremendous potential and is versatile enough to appeal to multiple markets. Its broad consumer base includes local and international tourists and travelers who want to take a piece of the region's culinary heritage with them, enjoying the flavors of their journey long after returning home. Additionally, it caters to the modern lifestyle of individuals seeking a quick and hassle-free meal option while on the go, whether for a busy day at the office or a fast-paced city adventure. Backpackers and campers going on rugged outdoor expeditions in remote and challenging settings find this product a reliable source of nourishment. But it does not stop there – even homemakers find it a practical solution for convenient and time-saving meal preparation. Its versatility, adaptability, and capability to address the distinct needs of such a wide-ranging audience make it a precious and accessible offering in the marketplace.

This product stands out due to the unique combination of its convenience, portability, and extended shelf life. It provides a quick meal option for modern consumers who lead busy lives and are always on the go. The convenience factor makes it a game-changer, allowing it to be enjoyed anytime, anywhere, making it the ideal solution for travelers, backpackers, and anyone who needs an easy and delicious meal on the go. Furthermore, its impressive shelf life opens new opportunities for nationwide market expansion, as it can be distributed nationwide without refrigeration or specialized storage conditions. Notably, the 'Nasi Dagang' concept in retort pouches is still relatively new in Malaysia, adding a fresh and exciting dimension to the culinary scene. With its convenience and extended shelf life, it is poised to capture the imagination of consumers.

5. CONCLUSION

The traditional food from the state of Terengganu has excellent potential for commercialization due to its authentic taste in the region. The dish is made by locals using indigenous ingredients and traditional preparation techniques, making it appealing to a broad audience from different states and countries. The food's exceptional shelf-stable nature makes it even more attractive commercially since it does not require additional refrigeration or chilling devices during distribution. It is widely available across borders, making it an ideal option for travelers, tourists, campers, adventurers, and sports enthusiasts searching for nourishing and convenient sustenance while on the go. It also serves as a reliable choice for emergency food, further

increasing its market potential and offering a versatile solution for various consumer needs. The commercially prepared versions closely resemble the homemade ones, and the processing essentially replicates the traditional methods.

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