



JOHOR 2024

INNOVATE FOR SUSTAINABILITY. SHAPING A BRIGHTER FUTURE.



UTM SEBUAH UNIVERSITI



UNIVERSITI TEKNOLOGI MARA



6th DIGITALISED INTERNATIONAL INVENTION, INNOVATION & DESIGN 2024

UNIVERSITI TEKNOLOGI MARA
CAWANGAN JOHOR



Innovate for Sustainability
Shaping a Brighter Future



URMIA UNIVERSITY



UNIVERSITI TEKNOLOGI MALAYSIA MELAKA



UniKL
UNIVERSITI KUALA LUMPUR

6th DIGITALISED INTERNATIONAL INVENTION, INNOVATION & DESIGN 2024

**Innovate for Sustainability Shaping
a Brighter Future**



Bahagian Penyelidikan, Jaringan Industri & Alumni (BPJIA)
Universiti Teknologi MARA
Cawangan Johor

2024

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Universiti Teknologi MARA
Cawangan Johor



PREFACE

In the name of Allah, the Almighty, who grants us enlightenment, truth, and knowledge, we extend our deepest gratitude to Him and to Prophet Muhammad (peace be upon him) for guiding us along the straight path. We are thankful for the divine guidance and strength that inspired us to write this e-book.

This e-book is a report and collection of extended abstracts submitted to the 6th Digitalised International Invention, Innovation, and Design (DIID) Johor 2024. The event took place from June 8, 2024, to July 23, 2024, showcasing an impressive total of 92 innovative projects.

The submissions explore a diverse array of issues within the realms of Science and Technology as well as Social Science. Participants came from both international and local universities, government agencies, and primary and secondary schools, reflecting a commitment to fostering collaboration and learning across all levels of education.

Our hope is that this e-book serves not only as a record of the participants' efforts but also as a source of inspiration and cherished memories for everyone involved. By promoting the culture of innovation and creativity at the national level, we aspire to ignite new ideas that lead to meaningful advancements and product commercialization, driving progress for future generations.



FOREWARD 1: VC UiTM



Assalamualaikum Warahmatullahi Wabarakatuh. Salam Sejahtera. Salam Malaysia MADANI.

Alhamdulillah, with Allah's grace and blessings, we are able to gather for the 6th Digitalised International Invention, Innovation, and Design Competition (DIID) Johor 2024.

I am pleased to welcome all attendees, including our esteemed international guests and participants. It is an honor to address such a gathering of brilliant minds. Congratulations to UiTM Johor Branch, its partners, and all those who played key roles in making this event a success.

Throughout this competition, we have witnessed how innovation can transform challenges into opportunities. The creative ideas, designs, and inventions showcased here demonstrate the potential to improve our world and enhance lives.

Innovation is more than just creating something new; it's about making things better to sustain our world. This culture of innovation drives progress, pushing us to question the status quo and seek new solutions. However, it thrives on collaboration, curiosity, and a commitment to excellence.

UiTM fosters this culture of innovation among its students and faculty, encouraging ideas that not only serve academic purposes but also benefit communities and have the potential for commercialization. Competitions like DIID 2024 are crucial as they nurture new ideas that contribute to human capital and economic development, particularly in addressing sustainability challenges.

In closing, let us carry forward the spirit of innovation seen here, embedding creativity and problem-solving in our daily lives to shape a brighter, more sustainable future for all.

Thank you.

Professor Datuk Dr Shahrin Sahib @ Sahibuddin
Vice-Chancellor
Universiti Teknologi MARA

FOREWARD 2: RECTOR UiTM JOHOR



Assalamualaikum Warahmatullahi Wabarakatuh.

I'm delighted to welcome you to this event, celebrating our shared passion for invention and innovation. This year's theme, "Innovate for Sustainability: Shaping a Brighter Future," has sparked creativity and responsibility in all of us.

On behalf of the organizing committee for the 6th Digitalized International Invention, Innovation & Design Competition Johor 2024, I sincerely thank you for attending this closing ceremony. We are especially grateful to YBhg. Prof Datuk Dr. Shahrin bin Sahib, Vice-Chancellor of Universiti Teknologi MARA, for officiating today.

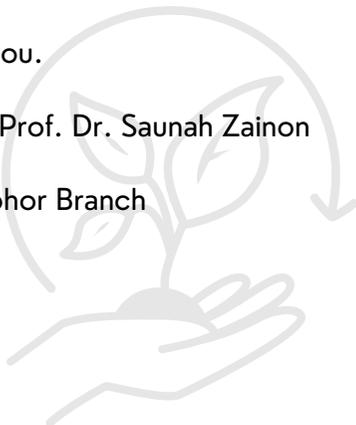
Congratulations to the organizing teams from UiTM Johor Branch and our co-organizer, Universitas Lampung, Indonesia, for their outstanding work. With over a decade of experience in hosting innovation competitions, UiTM Johor Branch has consistently shown its commitment to fostering creativity. Johor Digital IID, now in its 6th year, was one of the first to transition to a digital format, setting a new standard for such events.

Digitalization has transformed how we share knowledge and collaborate globally. Competitions like Johor DIID 2024 enhance academic networking, allowing researchers to connect and innovate, regardless of their location, thereby speeding up progress in innovation and academia.

I extend my deepest thanks to everyone involved, especially our co-organizers and collaborators, for their support. I look forward to seeing you at next year's IID competition as we continue to nurture individuals who will help achieve our nation's goals.

Thank you.

Assoc. Prof. Dr. Saunah Zainon
Rector
UiTM Johor Branch



FOREWARD 3: DEPUTY RECTOR BPJIA UiTM JOHOR



Assalamualaikum Warahmatullahi Wabarakatuh.

I'm thrilled to welcome everyone to this event, where passion for invention and innovation are collaboratively celebrated. My gratitude goes to the management of UiTM and UiTM Johor Branch for the continuous patronage and encouragement, and to the organizing committee for the dedication and perseverance in ensuring the seamless and successful execution of this program. This event provides a valuable platform for showcasing creative and innovative ideas, helping to elevate them to new levels. I hope it continues to fulfill

its objectives for many years and editions to come.

Incorporating innovation into our academic culture is essential for creating a dynamic and progressive educational environment. Innovation fuels progress, pushing students and educators to think critically, solve problems creatively, and adapt to the ever-evolving global landscape. By embedding innovation in academic practices, we prepare students to become leaders capable of addressing real-world challenges with fresh solutions. This not only enhances the educational experience but also fosters a culture of continuous improvement and excellence. Prioritizing innovation in academia ensures that institutions remain relevant and competitive, producing both academics and graduates who are not only knowledgeable but also ready to make meaningful contributions to society.

Thank you once again for your outstanding support. I look forward to seeing you at next year's competition as we continue to develop individuals who will help achieve our nation's aspirations.

Thank you.

Dr. Faridah Najuna Misman
 Deputy Rector of Research and Industrial Linkages
 UiTM Johor Branch

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TABLE OF CONTENT

eISBN	i
PREFACE	ii
FOREWORD 1: VC UITM	iii
FOREWORD 2: RECTOR	iv
FOREWORD 3: DEPUTY RECTOR BPJIA UiTM JOHOR	v
EDITORIAL BOARD	vi
TABLE OF CONTENT	vii
SECTION 1: INTRODUCTION	1
SECTION 2: THE LIST OF WINNER	8
SECTION 3: THE LIST OF PROJECTS	24
• CATEGORY A (PROFESSIONAL)	26
• CATEGORY B (TERTIARY)	183
• CATEGORY C (SCHOOL)	337
SECTION 4: THE ANNOUNCEMENT CEREMONY	486
ORGANISING COMMITTEE	493
COLLABORATORS	496
SPONSOR	497



SECTION 1

INTRODUCTION





Welcome to UiTM Johor where we can experience Greenation@UiTM of global priorities on SDGs towards a better future.



Lampung University's Green Metric encourages the participation of the entire community to collaborate and contribute in building a sustainable campus community through improving functions in the fields of education, research and community service to create a sustainable green campus that focuses on environmental sustainability.

Overview of 6th Digitalised International Invention, Innovation & Design

UiTM Cawangan Johor started organizing innovation competitions in 2012. The main objective of the event is to involve all faculties and branch campuses to promote participation in innovation competitions at the university level. As a starter, the innovation competitions were organized at the UiTM Cawangan Johor level to comply with requirements from RIBU.

Despite everything, in 2014, we witnessed a transformation when the Innovation Unit, BPJI&A UiTM Cawangan Johor, started to organize the Johor innovation competition, International Invention, Innovation & Design (IIID), at the international level at Dewan Sri Temenggong (DST), UiTM Cawangan Johor.

As UiTM Cawangan Johor Kampus Pasir Gudang started its campus on May 1st, 2014, therefore, beginning in 2015, IIID UiTM Cawangan Johor was jointly organized between two campuses of Johor and successfully handled in Johor Bahru. With the new location of the event and due to its successful promotion, the response received at IIID 2015 was overwhelming.

In 2017, UiTM Cawangan Johor organized the event with great flourish. History has been written as UiTM Cawangan Johor successfully became the first organizer of the digitalized IIID competition in 2018, and the name of the competition was changed to Digitalised IIID (DIIID) Johor 2018.

The digitalized IIID competition continued with digital in 2019 for the 2nd DIIID 2019, 3rd DIIID 2020 in 2020, 4th DIIID 2021 in 2021, and 5th DIIID 2022 in 2022.

The immense response from the participants uplifted the confidence of the committee members of the competition, hence putting together the 6th DIIID 2024 with a hybrid approach (digitalized and face-to-face) in partnership with the University of Lampung, Indonesia.

Vision

To become a Centre of Excellence for Research, Consultation, Industrial Linkage, Community and Alumni and Innovation Commercialisation

Mission

To provide knowledge, expertise, research development and innovations through linkages and collaboration with industries to achieve accreditation from an innovative cultural environment.

Theme

The theme for the 6th Digitalised International Invention, Innovation, and Design (DIIID) Johor 2024 is Innovate for Sustainability: Shaping a Brighter Future.

Objectives

The objectives of the 6th Digitalised International Invention, Innovation, and Design (DIIID) can be seen as follows:

1. To support the university's main agenda in upholding the digital university.
2. To promote innovative and creative cultures among professionals, HLI students and school students from all works of life.
3. To highlight new research findings and inventions in Science, ICT, School Science, Management and Business.
4. To generate designs and inventions that can be commercialised nationally and internationally.

Category

The 6th DIIID 2024 comprises three categories: Category 1 (Science and Technology), Category 2 (Social Science), and Category 3 (Local and International Schools). It still maintains three types of competitions for each category: invention, innovation, and design.

1. Invention: A new idea that has never been produced before, including the composition, equipment, or process.
2. Innovation: New or improved products/services/processes of new organizational methods in business practices.
3. Design: New design, visual result, artwork, and other product designs.

Category 1 and 2 is divided into two levels:

1. Level A: Professionals such as lecturers, teachers, industry, or the public.
2. Level B: Tertiary, such as universities, polytechnics, colleges, or matriculations.

Category 3 can be divided into two levels:

1. Primary Schools.
2. Secondary Schools.

Judging Criteria

The appointed panel of judges was responsible for evaluating the competition projects to determine the winners of the awards. They are responsible in assessing the following criteria:

1. Novelty.
To ensure the originality of the product.
2. Commercial value.
To ensure the IP ownership steps are taken as well as the marketability of the products.
3. Social Responsibility.
The practicality and usage of the product for the benefit of the community.
4. Overall design, display, and packaging of the product.
The product's attractiveness in terms of its name, colour, practicality, user-friendliness, packaging, etc.
5. Video presentation of the product.
A brief, clear, and concise 3-minute video presentation of the product.

Here is the summary of the total projects that participated in the 6th DIIID 2024.

Table 1: Summary of the total projects in the 6th DIIID 2024

	CATEGORY	LEVEL	TOTAL PROJECTS
LOCAL	Science & Technology (S&T)	Professional Tertiary	15 8
	Social Science (S&S)	Professional Tertiary	8 1
INTERNATIONAL	Science & Technology (S&T)	Professional Tertiary	4 9
	Social Science (S&S)	Professional Tertiary	2 10
SCHOOL	Secondary		22
	Primary		13
		TOTAL	92



Table 2: The list of both local and international representatives of universities, schools, and governments participating in the 6th DIIRD Johor 2024.

Local Universities (Except UiTM)	UiTM	International Universities	Schools
<p>UniKL MITEC, UniKL MIIT, UTeM, UKM, Politeknik Sultan Hj. Ahmad Shah</p>	<p>UiTM Kampus Segamat, UiTM Pasir Gudang, UiTM Shah Alam, UiTM Permatang Pauh, UiTM Sungai Buloh, UiTM Puncak Alam, UiTM Pulau Pinang, UiTM Sarawak, UiTM Pahang, UiTM Seri Iskandar</p>	<p>Lampung University, Urmia University, Perbanas Institute, Universitas Teknokrat Indonesia, Universitas Negeri Padang, Universitas Jambi, Universitas Negeri Semarang, Universitas Sumatera Utara</p>	<p>Sek. Keb. Pauh, SMJK Jit Sin, PPD Baling, SK Putrajaya Presint 8 (1), SJKT Saraswathy, SJKT Somasundram, SJKT Bestari Jaya, SK Paya Jakas, SJKC Keng Koon, Sekolah Rendah Islam Tahfiz Sains & Teknologi, SMK Dato' Ahmad Maher, SMA It Ar Raihan, SMK Gemereh, SMK Panchor, SMK St Paul, MRSM Kuala Berang, Sekolah Menengah Kebangsaan Hosba, Kolej Permata Insan, SMK Kampung Nangka, MRSM Kuala Berang, Kolej Vokasional Ampangan, MRSM Muadzam Shah, SM Sains Tapah, MRSM Tun Ghazali Shafie</p>



SECTION 2

THE WINNER OF THE 6th DIIID JOHOR 2024



Award	Amount	Receivables
MERIT OF DISTINCTION AWARD	1	RM3,000.00 Certificate
Professional S&T (A1) Best of the Best Award	1	RM1,000.00 Certificate
Professional S&S (B1) Best of the Best Award	1	RM1,000.00 Certificate
Tertiary S&T (A2) Best of the Best Award	1	RM1,000.00 Certificate
Tertiary S&S (B2) Best of the Best Award	1	RM1,000.00 Certificate
Primary School (C1&E1) Best of the Best Award	1	RM200.00 Certificate
Secondary School (C2&E2) Best of the Best Award	1	RM200.00 Certificate

MEDALS

CATEGORY A, B, C & D

Gold Awards for Invention, Innovation & Design

Silver Awards for Invention, Innovation & Design

Bronze Awards for Invention, Innovation & Design

MERIT OF DISTINCTION

Product ID	Innovation/ Product Tittle	Institution / Universiti
PID30231	Agri Drone – Deep Learning Models For Crop Leaf Disease Detection On Real-Time Drone Monitoring	Universiti Kuala Lumpur, Malaysian Institute of Industrial Technology (UniKL MITEC)

BEST OF THE BEST: PROFESIONAL (SCIENCE TECHNOLOGY)

Product ID	Innovation/ Product Tittle	Institution / Universiti
PID30231	Agri Drone – Deep Learning Models For Crop Leaf Disease Detection On Real-Time Drone Monitoring	Universiti Kuala Lumpur, Malaysian Institute of Industrial Technology (UniKL MITEC)

BEST OF THE BEST: PROFESIONAL (SCIENCE SOCIAL)

Product ID	Innovation/ Product Tittle	Institution / Universiti
PID30102	Sang Kancil AR Painting: Bridging Tradition to Technology	Universiti Teknologi MARA (UiTM) Shah Alam

BEST OF THE BEST: TERTIARY (SCIENCE TECHNOLOGY)

Product ID	Innovation/ Product Tittle	Institution / Universiti
PID30091	An Innovation of Ultra Z-Blade Turbine (U-ZBT) for Pico-Hydro System	Universiti Teknikal Malaysia Melaka (UTeM)

BEST OF THE BEST: TERTIARY (SCIENCE SOCIAL)

Product ID	Innovation/ Product Tittle	Institution / Universiti
PID25092	Bubur Biji Telang (BUBILANG): Butterfly Pea Seed Infusion in Porridge For Stunting Prevention in Indonesia	University of Lampung

BEST OF THE BEST: SCHOOL (PRIMARY)

Product ID	Innovation/ Product Tittle	Institution / Universiti
PID10221	Minecraft Smart Sifir	SK Pauh

BEST OF THE BEST: SCHOOL (SECONDARY)

Product ID	Innovation/ Product Tittle	Institution / Universiti
PID10352	MonitoRing	SMJK Jit Sin



CATEGORY PROFESIONAL: SCIENCE TECHNOLOGY

Product ID	Innovation/ Product Tittle	Institution / University	Medal
PID30211	AquiSpec: Leading the Way in Aquilaria Oil Identification with K-NN Algorithm	Universiti Teknologi MARA (UiTM) Shah Alam	GOLD
PID30231	Agri Drone – Deep Learning Models For Crop Leaf Disease Detection On Real-Time Drone Monitoring	Universiti Kuala Lumpur, Malaysian Institute of Industrial Technology (UniKL MITEC)	GOLD
PID30111	Enhancing Lung Lesion Localization in CT- scans: A novel approach using statistical analysis	Universiti Teknologi MARA (UiTM), Pulau Pinang (PP)	GOLD
PID30032	Energy Consumption Prediction In Educational Building Using Long Short Term Memory Baseline Energy Model	Electrical Engineering Studies, Universiti Teknologi MARA (UiTM), Johor (PG)	GOLD
PID30181	Hydrogen Fuel Cell Electric Vehicle	Universiti Kuala Lumpur, Malaysian Institute of Industrial Technology (UniKL MITEC)	GOLD
PID30191	Development of Sensor-based System for Assessment of Surgical Skill using EEG and IOT Approach	Universiti Kuala Lumpur, Malaysian Institute of Industrial Technology (UniKL MITEC)	SILVER

CATEGORY PROFESIONAL: SCIENCE TECHNOLOGY

Product ID	Innovation/ Product Tittle	Institution / University	Medal
PID30022	A Medical Mobile Clinic Bus Project For Communities In Johor	Universiti Teknologi MARA (UiTM), Selangor (SB)	SILVER
PID20031	Plasma Device Developed for Germination and Growth of Seeds	Urmia University	SILVER
PID20101	Development and Analytical Evaluation of an Innovative Self-Centering Viscoelastic Damper with Disk Spring	Urmia University	SILVER
PID30051	Real-time Data Analysis in Waste Management System via Thingspeak Database Channel for a Smart Dustbin	Universiti Teknologi MARA (UiTM), Johor (PG)	SILVER
PID30141	Flexible Strain Sensor of Multi-wall Carbon Nanotube (MWCNT) Composite For Motion Monitoring	Universiti Teknologi MARA (UiTM), Johor (PG)	SILVER
PID30241	S3PTIS	PPD BALING	BRONZE

CATEGORY PROFESIONAL: SCIENCE TECHNOLOGY

Product ID	Innovation/ Product Title	Institution / University	Medal
PID30271	IoT Integrated Advanced Inventory Management System	Electrical Engineering Studies, Universiti Teknologi MARA (UiTM), Johor (PG)	BRONZE
PID30151	Analysis Simulation Data Time Series of Tourism Using Pre-processing Method And SVM Model	Universiti Kuala Lumpur, Malaysian Institute of Industrial Technology (UniKL MITEC)	BRONZE
PID30251	B Genki Medium : The Future of Orchid Propagation	Universiti Teknologi MARA (UiTM), Selangor (PA)	BRONZE
PID30171	Waiter Robot Based On Artificial Intelligent	Universiti Kuala Lumpur, Malaysian Institute of Industrial Technology (UniKL MITEC)	BRONZE
PID20081	Plasma Infection Cleaner	Urmia University	BRONZE
PID30121	Smart Lawn Mower	Universiti Teknologi MARA (UiTM) , Pulau Pinang	BRONZE
PID20041	Pests controlled by Low Frequency electromagnetic system	Urmia University	BRONZE

CATEGORY PROFESIONAL: SCIENCE SOCIAL

Product ID	Innovation/ Product Tittle	Institution / University	Medal
PID30012	iKE Apps	Universiti Kebangsaan Malaysia	GOLD
PID30202	RehabServE Value Chain	Universiti Teknologi MARA (UiTM) Sarawak	GOLD
PID30102	Sang Kancil AR Painting: Bridging Tradition to Technology.	Universiti Teknologi MARA (UiTM) Shah Alam	GOLD
PID30132	Mobile Payment Readiness (MPR)	Universiti Teknologi MARA (UiTM) Pahang	SILVER
PID30042	PID30042: Z-SOLVE Bridging Local Issues through SDGs Podcasts	Universiti Teknologi MARA (UiTM) Shah Alam	SILVER
PID30162	Crafting Clarity: Innovating Effective Problem Statements in Research	Fakulti Pengurusan Hotel dan Pelancongan	SILVER
PID30222	Liveable Community Smart App (myLiveable)	Universiti Teknologi MARA (UiTM), Perak (SI)	BRONZE
PID35012	HMPStore: An Online Merchandise and Souvenir Store of Perbanas Institute	Perbanas Institute	BRONZE
PID30062	Handpolo Game	Urmia University	BRONZE
PID30072	Promoting Knowledge Sharing: Peer-Led Learning in the Classroom	Universiti Teknologi MARA (UiTM) , Johor	BRONZE

CATEGORY TERTIARY: SCIENCE TECHNOLOGY

Product ID	Innovation/ Product Title	Institution / University	Medal
PID30091	An Innovation of Ultra Z-blade Turbine (U-zbt) For Pico-hydro System	Universiti Teknikal Malaysia Melaka (UTeM)	GOLD
PID20211	Design And Development of A Micro Underwater Remotely Operated Vehicle (Rov) For Monitoring Application	Universiti Teknikal Malaysia Melaka (UTeM)	GOLD
PID25102	Implementation of Smart Irrigation Based on Ai and Lot To Increase Water Use Efficiency In South Lampung Farmer Group Chili Plantations	Universitas Teknokrat Indonesia	GOLD
PID20061	Delami Marina Turtle Conservation Center	Politeknik Sultan Haji Ahmad Shah	GOLD
PID29062	Ar Osil: Development of Interactive Learning Media Based on Augmented Reality In Understanding Osi Layer Material	Universitas Negeri Padang	GOLD
PID20111	Development of Home Energy Management System V2h Technology	Universiti Teknologi MARA (UiTM) Shah Alam	SILVER
PID25042	Global Fin : Financial Planner Application To Achieve Individual Financial Stability	Faculty of Economics and Business, University of Lampung	SILVER

CATEGORY TERTIARY: SCIENCE TECHNOLOGY

Product ID	Innovation/ Product Tittle	Institution / University	Medal
PID20191	Unmanned Underwater Remotely Operated Vehicle (Rov) For Underwater Inspection	Universiti Teknikal Malaysia Melaka (UTeM)	SILVER
PID25112	Plastibam: How Two Household Wastes Transform Into Sustainable Finishing Materials	University of Lampung	SILVER
PID25142	Parking Availability Monitoring System Using A Microcontroller Based on Android	University of Lampung	SILVER
PID30081	Increasing The Rate and Efficiency of Gold production in the cyanide method by using anionic surfactants	Faculty of Chemistry, Urmia University	BRONZE
PID20201	Integrated Sensory System of Air Quality And Temperature For Unmanned Aerial Vehicle (Uav)".	Underwater Technology Research Lab, Robotics Industrial Automation Research Group, Faculty of Technology and Electrical Engineering, Universiti Teknikal Malaysia Melaka	BRONZE

CATEGORY TERTIARY: SCIENCE TECHNOLOGY

Product ID	Innovation/ Product Title	Institution / University	Medal
PID20011	Enhancing Wireless Communication Systems Via Guard Interval Design: An Approach To 5g Modelling	Wireless Communication Technology Group (WiCOT), School of Electrical Engineering, College of Engineering, Universiti Teknologi MARA.	BRONZE
PID29072	ZENCARE (Zero-Stress Emotional Care Hub): Smart Innovation for Child and Adolescent Mental Health Monitoring and Therapy in the Age of Technology	Universitas Negeri Padang	BRONZE
PID25152	World of Ai: Media Specialization Using Artificial Intelligence	Digital Business Study Program, Faculty Of Economics And Business, University Jambi	BRONZE
PID20141	HAVEN	Politeknik Sultan Haji Ahmad Shah	BRONZE
PID25122	Boarding House Mapping Application Geographic Information System: Effort Helping Student in Finding Boarding House	University of Lampung	BRONZE

CATEGORY TERTIARY: SCIENCE SOSIAL

Product ID	Innovation/ Product Title	Institution / University	Medal
PID25032	AGROW : Empowering Farmers and Consumers Alike through Innovative Features for Mutual Benefit	University of Lampung.	GOLD
PID29082	Eco-Island: Tourism Development Strategy in Karimunjawa Based on Eco Enzyme in Realizing SDGs	Universitas Negeri Semarang, Indonesia	GOLD
PID25092	Bubur Biji Telang (BUBILANG): Butterfly Pea Seed Infusion in Porridge For Stunting Prevention in Indonesia	University of Lampung.	GOLD
PID25012	Coin Counter: Mobile Game Innovation as a Learning Platform for Students to Improve Financial Literacy	University of Lampung.	SILVER
PID25052	Fooling: An Integration of lot-Based Food Waste Management System To Realize A Circular Economy In Bandar Lampung	University of Lampung.	SILVER
PID25162	Unlocking Potential : Skillful Work For Prisoners	Universitas Jambi	SILVER

CATEGORY TERTIARY: SCIENCE SOSIAL

Product ID	Innovation/ Product Tittle	Institution / University	Medal
PID29052	Tanjung Putus EcoTourism Empowerment	University of Lampung	SILVER
PID25072	Xelypops: Xylitol Erythritol Lollipop An Innovative Solution to Prevent Malnutrition and Caries	Universitas Sumatera Utara	BRONZE
PID29042	Lubuk Alung Local Wisdom Sourced Asam Kandis Herbal Drink as an Antioxidant in Maintaining Endurance for Office Workers	Universitas Negeri Padang	BRONZE
PID20222	Non-Credit Exchange Program as a Tool to Enhance Awareness Level on SDGs Among University Students	Faculty of Electrical Technology and Engineering, Universiti Teknikal Malaysia Melaka	BRONZE
PID25132	Empower Youth Community and Local Culture through the Pentahelix Model at Krui	University of Lampung.	BRONZE

CATEGORY SCHOOL: SECONDARY

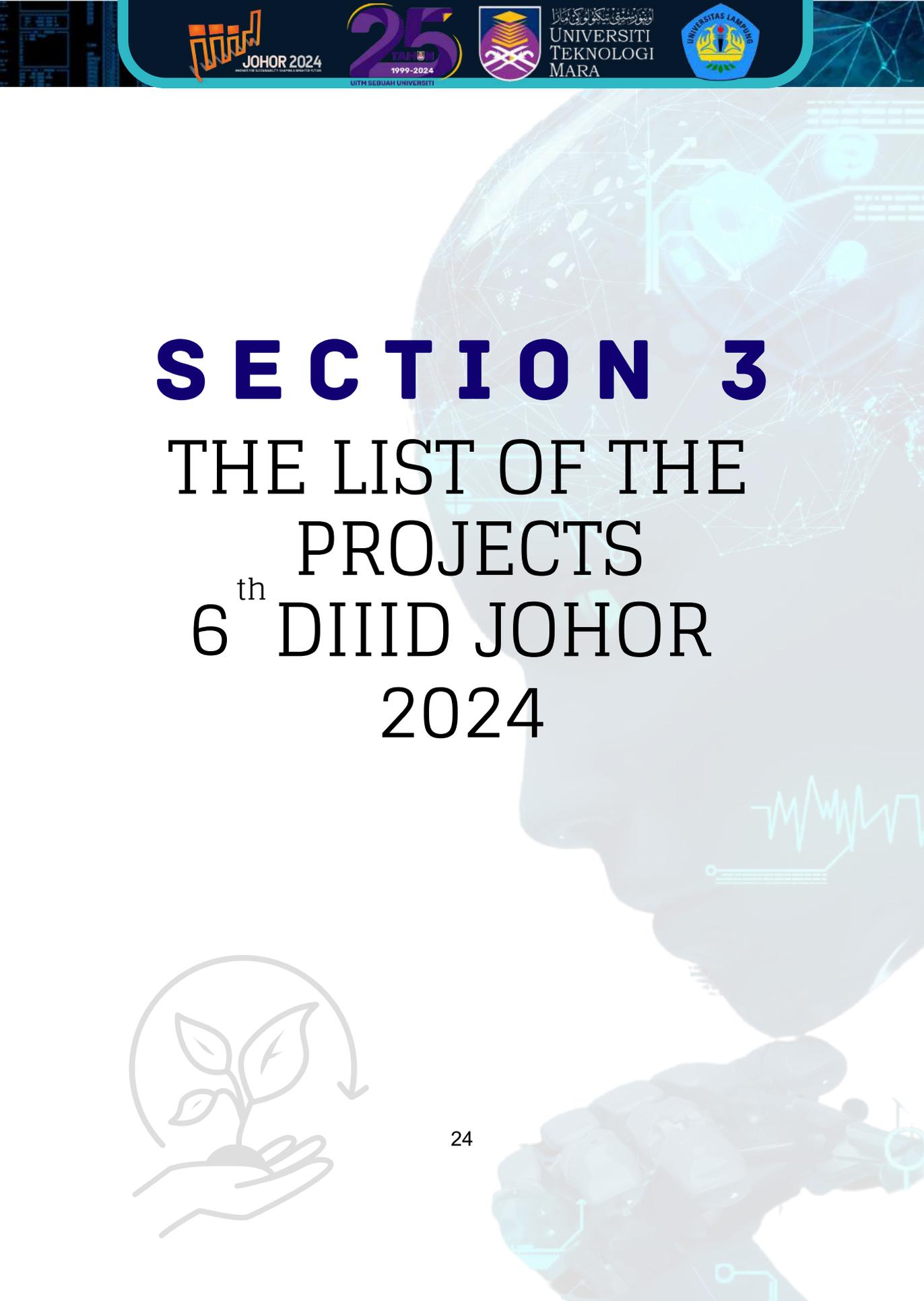
Product ID	Innovation/ Product Tittle	Institution / University	Medal
PID10352	MonitoRing	SMJK Jit Sin	GOLD
PID10032	RenewMask	SMJK Jit Sin	GOLD
PID10062	Maherian Ice Cream	SMK Dato' Ahmad Maher	GOLD
PID15012	From Classroom to Career: POW (Powering Our World) Innovative Approach to Job Creation	SMA IT Ar Raihan	GOLD
PID10252	EGNA 2.0: Baja Semulajadi	SMK Gemereh	GOLD
PID10112	AAA MEOW	SMK Panchor	GOLD
PID10132	Smart Flood Detection System (SFDS)	SMK St Paul	SILVER
PID10152	E-KOMIK: Meneroka Keajaiban Sains	MRSM Kuala Berang	SILVER
PID10182	HUSKATS	SMK Hosba	SILVER
PID10052	SustainaCrop	Kolej Permata Insan	SILVER
PID10332	EKO-HIDRO	SMK Kampung Nangka	SILVER
PID10142	Time Trek: Platform Interaktif Sejarah	MRSM Kuala Berang	SILVER
PID10242	OxyPulse Alert System	SMJK Jit Sin	SILVER

CATEGORY SCHOOL: SECONDARY

Product ID	Innovation/ Product Title	Institution / University	Medal
PID10102	Absorber Spring Opener	Kolej Vokasional Ampangan	BRONZE
PID10172	Automatic Gimmick Launcher	MRSM Muadzam Shah	BRONZE
PID10372	Mosrepel	SM Sains Tapah	BRONZE
PID10192	Matrik Board	SMK Gemereh	BRONZE
PID10202	Shield	SMK Hosba	BRONZE
PID10162	The Polygon Pirates and The Treasure Of Triangles	Mrsm Kuala Berang	BRONZE
PID10262	SoCuut	Mrsm Muadzam Shah	BRONZE
PID10072	Gerobok Rezeki RFID Vending Machine (G- VEM)	Kolej Vokasional Ampangan Seremban	BRONZE
PID10012	EZ COOKER	Mrsm Tun Ghazali Shafie	BRONZE
PID10022	TRI HOUSE	Mrsm Tun Ghazali Shafie	BRONZE

CATEGORY SCHOOL : PRIMARY

Product ID	Innovation/ Product Tittle	Institution / University	Medal
PID10041	Natural Green Cooling System	SK Putrajaya Presint 8 (1)	GOLD
PID10221	Minecraft Smart Sifir	SK Pauh	GOLD
PID10231	My Bunduler	SK Pauh	GOLD
PID10281	Ai E Library	SJKT Saraswathy	SILVER
PID10271	Anti Sleep Save Your Life	SJKT Somasundram	SILVER
PID10081	Bombeja Playing Kit	SJKT Bestari Jaya	SILVER
PID10291	Bestari lot Farm	SJKT Somasundram	SILVER
PID10341	Fast And Easy Board 2.0	SK Paya Jakas	SILVER
PID10091	Bombeja Number Sense	SJKT Bestari Jaya	BRONZE
PID10311	Smart Solar Refrigerator (Ssr)	SJKT Somasundram	BRONZE
PID10121	Save The Earth, Feed The World	SJKT Keng Koon	BRONZE
PID10301	Noise Free Classroom	SJKT Saraswathy	BRONZE
PID10361	Aktivitiku: A Fun Daily Routine Schedule for Kids	Sekolah Rendah Islam Tahfiz Sains & Teknologi	BRONZE



SECTION 3

THE LIST OF THE PROJECTS 6th DIIID JOHOR 2024



CATEGORIES

CATEGORY A: Professional Level (Lecturers/Teachers/Industry/Public)

Level A1: Science & Technology

Level A2: Social Science

Types: 1. Invention 2. Innovation 3. Design

CATEGORY B: Tertiary level (Universities/Polytechnics/Colleges/Matriculations)

Level B1: Science & Technology

Level B2: Social Science

Types: 1. Invention 2. Innovation 3. Design

CATEGORY C: School

Level C1: Primary Schools

Level C2: Secondary Schools

Types: 1. Invention 2. Innovation 3. Design



SECTION 3

THE LIST OF THE PROJECTS 6th DIIID JOHOR 2024

**CATEGORY A
PROFESSIONAL**



PID30012

iKE Apps

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ABSTRACT

Aligning with the Sustainable Development Goals and Malaysia's MADANI initiative, the iKE Apps stand as a pioneering innovation aimed at enhancing workplace emotional well-being. This comes at a critical juncture, given the rising incidence of anxiety and depression attributed to the increasing pressures of the modern work environment. Employing Kansei Engineering and the KJ method, this app captures both macro- and micro-level emotional events, providing a nuanced understanding of factors influencing employees' emotional experiences. The tool encompasses four main components: positive experiences, negative experiences, positive emotions, and negative emotions, offering a comprehensive and insightful measurement approach. Designed for accessibility, iKE Apps stands out with a user-friendly interface, overcoming a common limitation of existing tools. Its integration of Kansei-based work event measurement tools contributes to a deeper understanding and quantification of emotional dynamics at work. Beyond its innovative measurement capabilities, iKE Apps serves a dual purpose. Researchers gain profound insights into workplace emotional experiences, while practitioners leverage the app for targeted interventions, enhancing employee well-being and performance. This multidimensional instrument is tailored for various organisational roles, providing real-time data on the emotional well-being of the workforce. Positioned as a versatile tool, iKE Apps contributes to fostering a vibrant, engaged, and highly productive workplace atmosphere.

KEYWORDS: Emotional well-being, mobile applications, positive experiences, negative experiences, emotions

PRODUCT DESCRIPTION

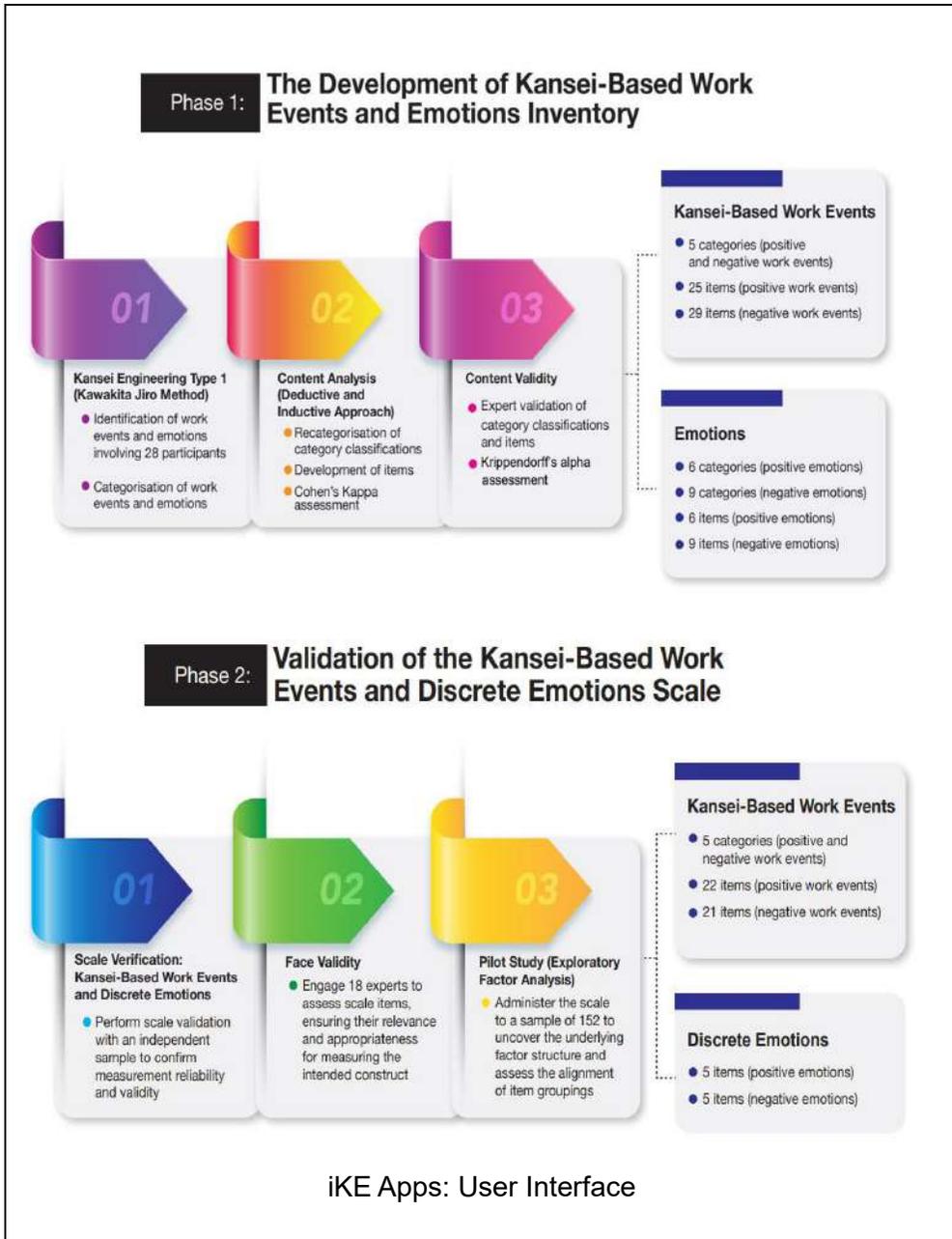
The iKE Apps is a groundbreaking solution addressing workplace emotional well-being amid rising anxiety and depression due to mounting work pressures (United Nations, 2022; Manaf et al., 2021). Its primary objective is to provide a comprehensive platform for meticulously recording and analysing employees' emotional states, pinpointing specific triggers. Developed through the Kansei Engineering approach via the Kawakita Jiro method, this innovative app captures both macro- and micro-level emotional events, offering nuanced insights into factors influencing employees' emotional experiences (Ibrahim et al., 2023).

The app serves as a multidimensional and comprehensive measurement tool, encompassing positive and negative experiences and emotions. This tool overcomes existing limitations, empowering individuals to actively monitor their emotional landscape, while management gains insights into the collective emotional state of all employees on a monthly basis. iKE Apps extends to real-time data access on workforce emotional well-being, creating a foundation for a vibrant, engaged, and highly productive workplace through targeted interventions. The user interface is designed for accessibility, ensuring ease of use for individuals across various roles. This enhances the overall user experience, making emotional monitoring and analysis more accessible and impactful.

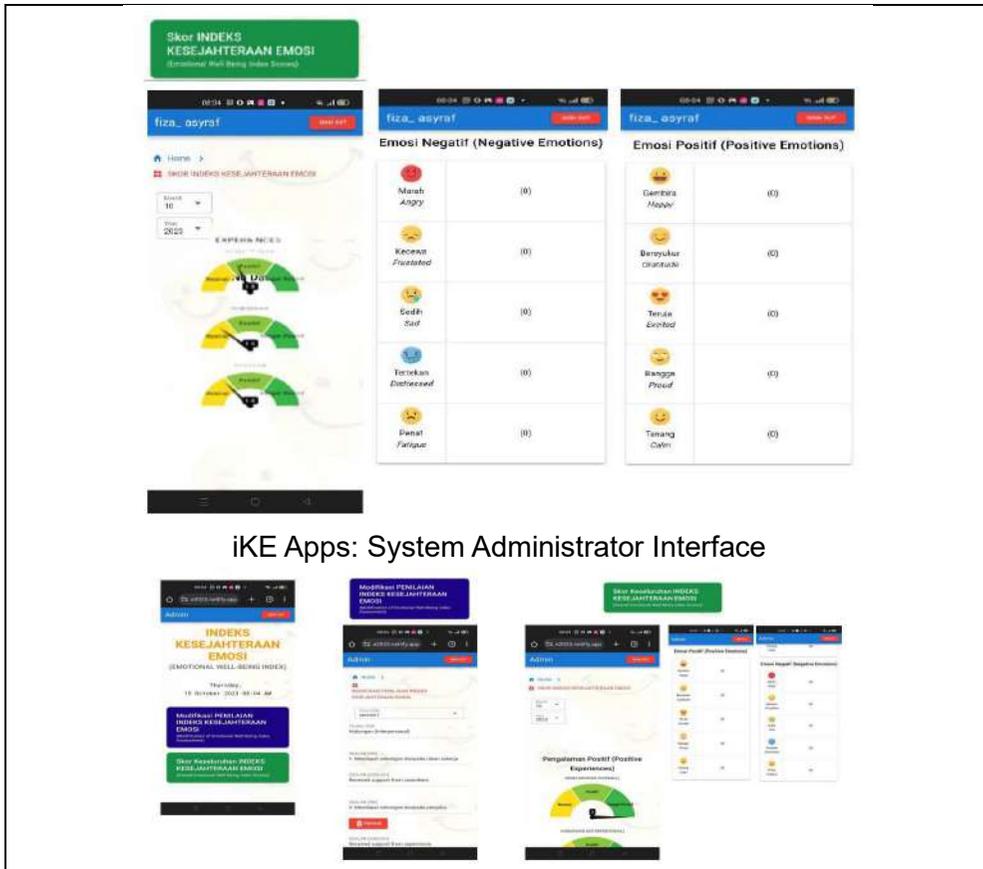
Key advantages include its foundation in a qualitative and insightful approach, setting it apart from conventional methods. The user-friendly design overcomes a common limitation in existing tools, and the integration of Kansei-based work event measurement tools offers a fresh perspective, contributing to a deeper understanding of emotional dynamics at work. iKE Apps offers numerous benefits, empowering management to identify specific improvement areas, implement targeted actions, and enhance workplace well-being. As a pioneering instrument, it combines scientific rigour with practical utility, contributing to a healthier workplace environment. Ultimately, the app's dual applicability for both researchers and practitioners distinguishes it as a versatile tool, allowing researchers insights into workplace emotional experiences, while practitioners leverage it for targeted interventions, improving employee well-being and performance.

**PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/
SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS**

Comprehensive Instrument Development: Integrating Qualitative and Quantitative Approaches for Analysing Workplace Emotional Experiences







iKE Apps: System Administrator Interface

NOVELTY AND UNIQUENESS

The proposed iKE Apps for employees distinguishes itself through several key features. Firstly, it captures both macro- and micro-level emotional events, providing a comprehensive and nuanced measurement tool. Individuals can actively monitor their emotional landscape, while simultaneously, management has the capability to observe the collective emotional landscape of all employees. Secondly, rooted in Kansei Engineering and the Kawakita Jiro method, it ensures insightful and qualitative comprehension of workplace emotional dynamics, differentiating it from conventional measurement methods. Thirdly, the integration of Kansei-based work event measurement tools adds a fresh perspective (i.e., dimensions of work events). Fourthly, prioritising user-friendliness addresses a common limitation in existing tools, enhancing accessibility. Lastly, its dual applicability for both researchers and practitioners sets it apart, offering a versatile tool for understanding and improving workplace emotional experiences.

BENEFIT TO MANKIND

The iKE Apps measurement is pivotal, identifying both macro and micro work experiences for a nuanced understanding of emotional causes. Empowering researchers and practitioners, it facilitates targeted strategies for improved employee well-being and performance. By prioritising emotional needs, iKE Apps fosters a healthier work environment, positively influencing organisational culture. This emphasis on workplace emotional well-being extends its positive impact into personal relationships, elevating overall individual life quality. In essence, iKE Apps serves as a transformative tool, addressing immediate concerns and contributing to holistic well-being in both professional and personal spheres.

COMMERCIALIZATION POTENTIAL

iKE Apps holds strong commercialization potential, addressing global emotional well-being concerns (United Nations, 2022). The increasing awareness of mental health issues and their impact on productivity creates significant market demand. Distinguished by its Kansei Engineering approach, iKE Apps offers precision and user engagement beyond existing tools. Global public and private agencies can leverage it to enhance employee well-being, tackle mental health challenges, and improve performance and productivity. Human resource consulting firms can seamlessly integrate iKE Apps, instilling client confidence in workplace well-being consulting. Researchers gain reliable data for their studies, reinforcing iKE Apps' position. A strategic intellectual property plan further fortifies its market position, positioning iKE Apps to meet the urgent need for innovative workplace mental health solutions.



SENARAI PERLINDUNGAN HARTA INTELEK

== Permohonan Baru Harta Intelek ==

BIL	NO. FAIL	TARIKH MOHON	PRODUK/TAJUK REKACIPTA	PEMOHON	PERLINDUNGAN YANG DIPICU	STATUS
1	UKM IKB 800-4/1/5504	02/11/2023	iKE Apps	K007954 ZAFIR KHAN BIN MOHAMMED MAKHBUL	<input checked="" type="checkbox"/> Hakcipta	JawatanKueso Kerje Perlindungan Harta Intelek (Sedang Diproses)



Borang Pendaftaran Reka Cipta

UKMP/Per Pemohon & Nama	1	K007954 - Zafri Khan Bin Mohamad Makbul
Tarikh Permohonan	1	02 November 2023
No. Fail	1	UKM IKB 800-4/1/5504
Nama Produk/Tajuk Reka cipta	1	iKE Apps

CONCLUSION

The philosophy and methodology of the iKE Apps instrument underscore the vital integration of organisational behaviour, well-being, and environmental considerations. This harmonious integration has the potential to give rise to a novel organisational paradigm that is not only more sustainable and competitive but also expedites the realisation of Malaysia MADANI's objectives. A suggested strategy involves placing a heightened emphasis on emotional well-being within the human resource development framework. The empowerment of human resources, achieved through a strategic focus on retaining top talent within the organisation, stands out as a key strategy for effectively navigating uncertainties in this era of change. The desired talent embodies individuals capable of adapting to change, maintaining a positive outlook, and willingly embracing greater and more critical responsibilities, aligning seamlessly with the agenda set forth by Malaysia MADANI (Ministry of Economy, 2023).

ACKNOWLEDGEMENT (*OPTIONAL)

In this section, give credit and express gratitude to individuals, organizations, and entities that contributed to the development and success of your project.

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PID30022

Medical mobile clinic bus project for communities in Johor

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ABSTRACT

This idea began on the 18th of January 2020, with a meeting between the Noah Foundation, and the Faculty of Medicine (FoM) UiTM to design a bus that can function as a medical mobile clinic (Ariffin, 2022). The design concept is to simulate a doctor's consultation room with a private consultation and treatment area with sufficient equipment required for a successful consultation and treatment of common illnesses. The aim is to bring this medical mobile clinic to rural and lower-income communities and to provide a safe space where patients can feel comfortable seeking medical consultation, diagnosis, and treatment. This concept was presented to a TMS bus company that built this vision upon a TMS3 minibus with roof-top air conditioning and standard accessories and equipment mounted onto a HINO XZU72R-HKFRL1 chassis. Inside the bus, there are two sections. The front seats the driver, and there is a procedural area with a treatment couch. The back is for a doctor's consultation with an examination couch. The mobile clinic is equipped with the latest medical technology, including an ECG machine, a nebulizer, sonicaid, blood pressure machines, and a defibrillator. The clinic has entered its second operational year, providing healthcare services to rural areas among communities in Johor.

KEYWORDS: Medical Mobile Clinic, Health Services, Health Professionals, Community, Patient-centred Care.

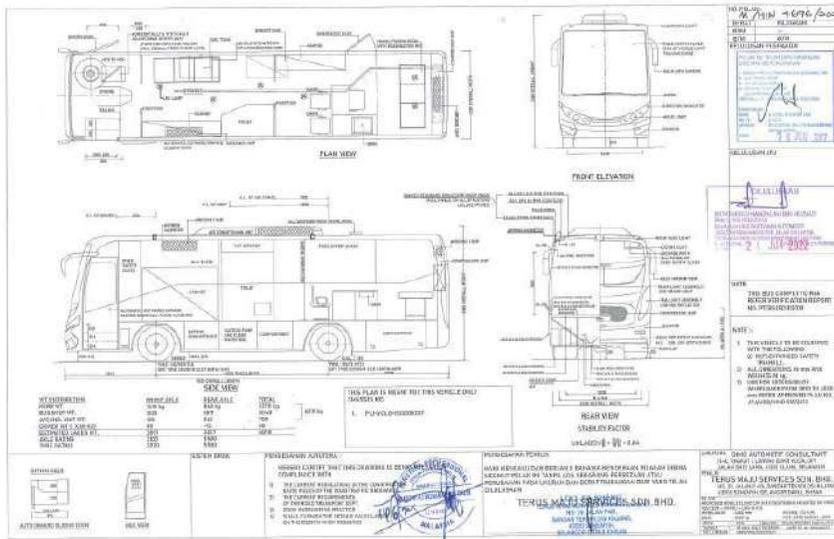
PRODUCT DESCRIPTION

The medical mobile clinic was officiated with a handover ceremony to FoM UiTM on the 27th August 2022 and has since been operational. The objective is to bring healthcare services to the community. It aims to provide specialist services to diagnose and treat illnesses, educate the community,

and improve health-seeking behaviour. It is known that patients fear seeking medical treatment (Taber, 2015), and reasons for avoiding hospitals include long waiting times, a lack of communication, and busy staff (Rapport, 2019). Therefore, the medical mobile clinic is unique in that it brings healthcare professionals and services to the community as a 'one-stop' centre with minimal waiting and travelling time, with dedicated staff willing to explain and provide counselling. The approach towards patients is personalised and patient-centred care (Khatri, 2023). The FoM (UiTM) team is comprised of experienced specialists, nurses, pharmacists, and auxiliary police that provide health screening and medical treatment to any person of all ages in need of medical care, including chronic diseases, minor ailments, and acute emergencies. The doctors identify and assess the patient's specific health issues and address the individual patient's needs. The healthcare staff takes time to explain to the patient the required treatment to ensure the patient understands. Treatment can be given directly inside the bus, such as wound dressing, acute asthma, and cardiac assessment. Common medications can be prescribed and dispensed, and if needed, a referral can be made to a nearby hospital. The medical mobile clinic receives a grant from the Noah Foundation and the Johor state government office to cater for clinical equipment, medications, and service expenses. The medical mobile clinic has been touring the state of Johor, and feedback from users has been positive and satisfactory. The FoM (UiTM) team works closely with local leaders to organise the medical mobile clinic programme each month and collaborates with Johor State Health Department (JKNJ).

**A PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/
SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS**

In this section, we include a schematic diagram of the bus design with photos of the outside and inside of the medical mobile clinic, along with photos of the services provided by the medical mobile clinic team.



Schematic diagrams of the medical mobile bus

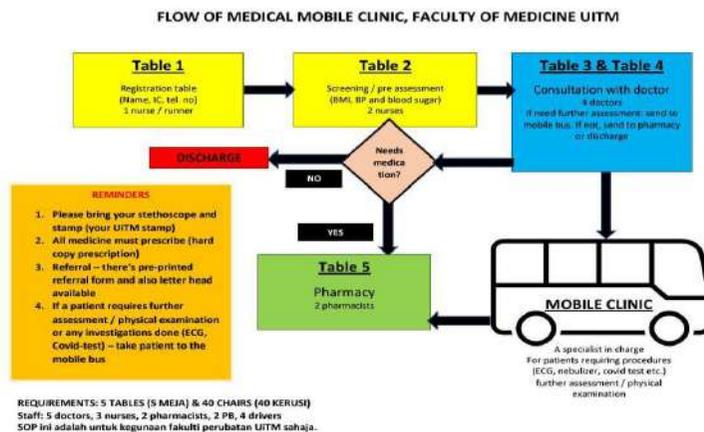


Photos of the medical mobile clinic

 <p>Structure of the mobile clinic in progress</p>	 <p>The medical mobile clinic from the left side</p>
 <p>The medical mobile clinic from the right side</p>	 <p>The doctor's consultation room with an examination couch</p>
 <p>A consultation with a patient inside the medical mobile clinic</p>	 <p>A specialist (doctor) giving a child nebulizer treatment for acute asthma at the treatment area.</p>



The medical mobile clinic healthcare team is comprised of specialists, medical officers, staff nurses, pharmacists, and auxiliary police to ensure the programme proceeds smoothly, safely, and enjoyably.



Above is the patient flow for the medical mobile clinic

NOVELTY AND UNIQUENESS

This is a unique, fully functional medical mobile clinic that brings healthcare services to the communities in Johor. It is also used by the Johor District Health Authorities (JKNJ) to provide additional services to all 56 DUNS. It provides a safe, private, and confidential space for consultation, physical examination, and treatment. It makes healthcare accessible and breaks the barrier to the health-seeking behaviours of patients by providing a comfortable environment within the community and close to the patients' homes.

BENEFIT TO MANKIND

Healthy individuals have a better quality of life. They can work, enjoy time with family, and contribute to society. Therefore, access to and improvement in health are vital. In our one-year mobile clinic experience, we identified patients who have chronic diseases but are uncontrolled and non-compliant with treatment. Empowering these patients with knowledge and understanding will improve their quality of life, reducing complications such as heart attacks and strokes and leading to better life quality. This project focuses on UN SDG3 (good health and well-being) and SDG10 (reduce inequality). This programme brings communities together and is often part of a 'gotong-royong' event. It is a continuous and sustainable 10-year project.

COMMERCIALIZATION POTENTIAL

The cost of bus construction is RM514,800.00 and was donated by the Noah Foundation for the intended purpose. Noah Foundation provides a one-off grant payment of RM25,000 for medical equipment and an annual budget of RM25,000 for medications and disposables as part of corporate social responsibility (CSR). The clinic receives its yearly operational costs from the community engagement project grant from the Johor state government office. The bus design has the potential to be copyrighted or patented.

CONCLUSION

The result of the one-year operation has received good feedback from users, with various requests for the medical mobile clinic to provide services in other communities in Johor. The ability of the medical mobile clinic to provide a one-stop centre for consultation, diagnosis, and treatment has revolutionised the concept of bringing healthcare to the people. Hence, this project has been expanded by the Johor State Health Department (JKNJ), which will be using the bus for outreach health services to 56 DUNS in Johor. The project has earned a 3-star rating in MyRA.

ACKNOWLEDGEMENT (*OPTIONAL)

The authors would like to acknowledge our sponsors, the Noah Foundation and the state government office, for their continuous support of this programme. Also, thank you to the Dean of FoM, Associate Professor Dr Fazah Akhtar Hanapiah, and all of our committee members, Professor Dr Mohd Zamrin Dimon, the pioneer of this project, and Associate Professor Dr Mariam Mohamed, Dr Mazapuspavina Md Yasin, Dr Hayatul Najaa

Miptah, Dr Zahir Izuan Azhar, Dr Nurhuda Ismail, and all the doctors, nurses, and pharmacists who have contributed physically to making this programme a success.

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PID30032

Energy Consumption Prediction in Educational Building Using Long Short Term Memory Baseline Energy Model

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ABSTRACT

The baseline energy model is a model that correlates the energy consumption of a building with its independent variables. It serves as a tool to predict energy consumption, enabling building owners to plan energy conservation activities. Currently, the multiple linear regression (MLR) model is widely used for baseline energy modelling due to its simplicity and ease of application. However, certain drawbacks may arise due to the non-linear relationship between energy consumption and its independent variables, which the MLR model may not accurately represent. Therefore, the main innovation in this work is the development of a baseline energy model in an educational building using artificial intelligence techniques, specifically the Long Short-Term Memory (LSTM) model. The energy consumption of an educational building will be measured, and the respective independent variable data will be collected during the lecture week. Baseline energy models will be developed using both the MLR and LSTM models. Energy consumption predictions will be made using both models. A comparison will be made between the two models, with the LSTM baseline energy model demonstrating higher accuracy compared to the MLR model. It is evident that certain non-linearities that exist have been successfully modelled using the LSTM technique.

KEYWORDS: baseline energy model, energy consumption, non-linear, multiple linear regression, Long Short-Term Memory.

PRODUCT DESCRIPTION

In general, a baseline energy model is a model that correlates energy consumption as an output with its respective independent variables as the input. The independent variables are selected based on their impact on energy consumption in the building, such as occupancies. Through a baseline energy model, building owners can predict energy consumption to quantify any energy savings from energy efficiency activities. Thus, the accuracy of predicted energy consumption through a baseline energy model is vital to ensure accurate quantification of energy savings.

Currently, the multiple linear regression (MLR) model is widely used in developing baseline energy models. MLR is known for its simplicity and deterministic nature. A deterministic model experiences either an increase or decrease in value depending on the independent variable since it has a direct relationship between the output and input. However, this nature of the MLR model makes it challenging to account for non-linear relationships between input and output, leading to decreased accuracy in predicted consumption.

Therefore, the intention of this work is to develop a baseline energy model using an artificial intelligence technique known as Long Short-Term Memory (LSTM) modelling. This approach represents an innovation in using MLR modelling. In this innovation, LSTM will serve as the new baseline energy model, correlating energy consumption and independent variables in educational buildings. The advantage that LSTM offers as a baseline energy model is its use of a learning algorithm to understand the relationship between output and input, thereby improving prediction accuracy. The LSTM model excels at handling non-linear and linear relationships simultaneously, enhancing the accuracy of energy consumption predictions compared to the MLR baseline energy model.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

Summary of the Innovation in a Block Diagram

The summary of the baseline energy model relationship and objective is shown in Figure 1.

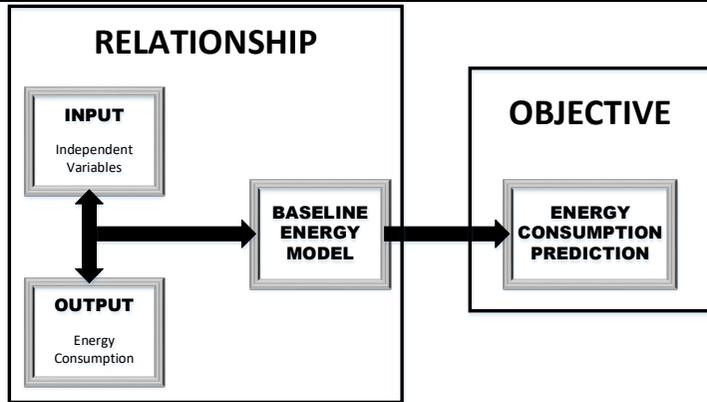


Figure 1. The Summary of Baseline Energy Model Relationship and Objective

In Figure 2, the Multiple Linear Regression (MLR) model was utilised as a baseline energy model to correlate energy consumption with the respective independent variables, thereby predicting energy consumption.

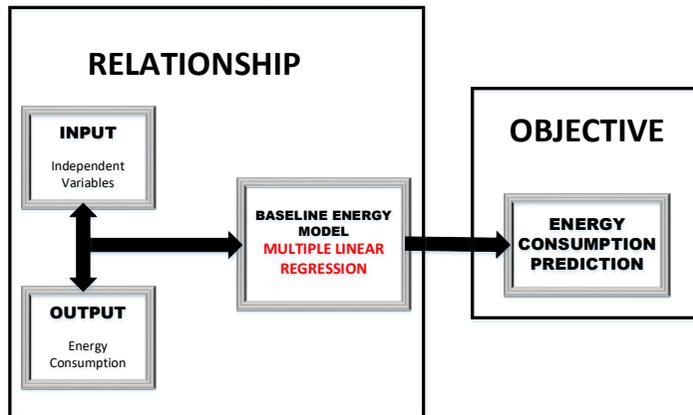


Figure 2. Multiple Linear Regression Model as a Baseline Energy Model

Figure 3 illustrates the innovation of this work, where Long Short-Term Memory (LSTM) was employed for baseline energy modelling with the objective of predicting energy consumption.

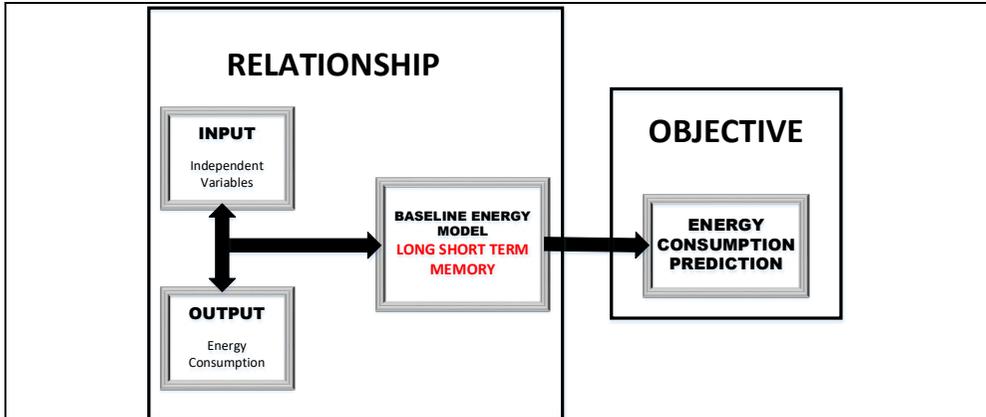


Figure 3. Long Short-Term Memory Baseline Energy Model as the Innovation in Modelling Technique

Methodology of the Innovation

The innovation project began by selecting an educational building as a case study, depicted in Figure 4. The chosen building is the Electrical Engineering Studies Building at UiTM Johor's Pasir Gudang campus. Energy consumption was measured during a lecture week.



Figure 4. The Electrical Engineering Studies Building

The independent variables of the LSTM baseline energy model will be divided into two categories: occupants in the building and outdoor temperature, as illustrated in Figure 5.

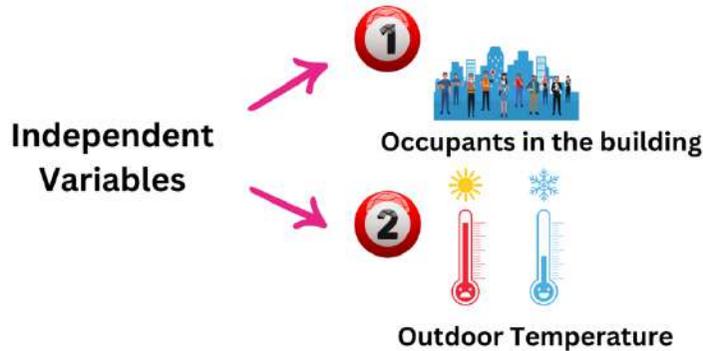


Figure 5. Independent Variables

The occupants in the building were further segmented into five different categories, as shown in Figure 6.

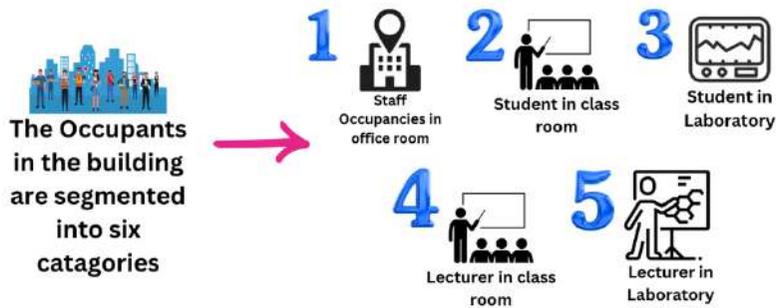


Figure 6. The Segmented occupants in the building

In total, there will be six independent variables, as shown in Figure 7, where outdoor temperature was added to the segmented occupants. These independent variables will serve as the input for the LSTM baseline energy model.

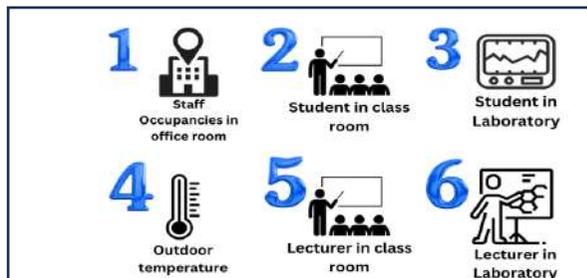


Figure 7. The Independent Variables of the Baseline Energy Model

The innovation experimentation flowchart is depicted in Figure 8. Within this figure, two baseline energy models will be developed using the MLR and LSTM models. The LSTM baseline energy model represents the innovative section that was introduced as an upgrade to the existing MLR baseline energy model. A comparison will be made by evaluating the energy consumption predictions from both baseline energy models.

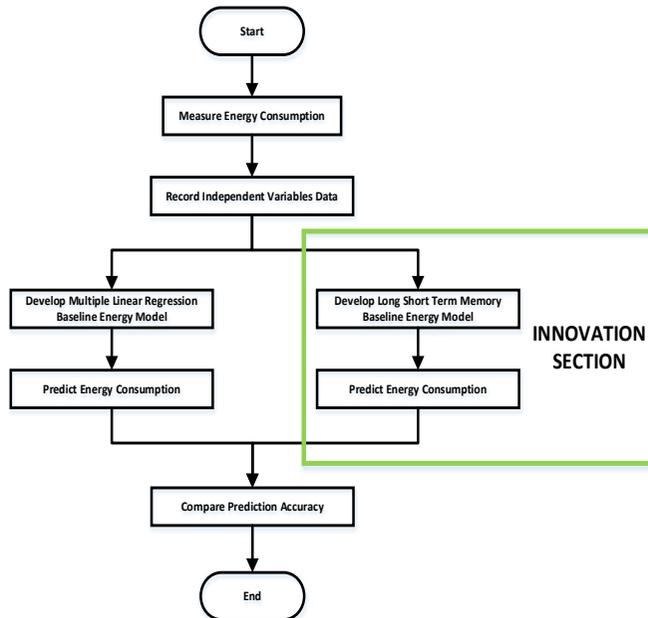


Figure 8. Flowchart of the Innovation Experimentation

Innovation Results

The innovation results are presented in Table 1. Within Table 1, the prediction results are depicted for both baseline energy models. Three statistical errors were measured to assess the accuracy of the baseline energy models. It is evident from the results that the LSTM baseline energy model has lower statistical errors compared to the MLR model. This indicates that the LSTM baseline energy model holds a significant advantage in terms of model and prediction accuracy.

Table 1. Innovation Results Comparison between MLR Model and LSTM model

Baseline Energy Model	Mean Square Error (MSE) (kWh)	Root Mean Square Error (RMSE) (kWh)	Mean Absolute Percentage Error (MAPE)
MLR model	259.45	16.10	0.41
LSTM Model	56.49	7.52	0.15

NOVELTY AND UNIQUENESS

The novelty and uniqueness of this innovation lie in the utilisation of the LSTM model. The MLR model is widely recognised as a typical model used for developing baseline energy models, and standards (ORGANIZATION, 2012) have been established using the MLR model. Previous work has employed the MLR model for estimating and predicting energy consumption (Mohammed, Alshibani, Alshamrani, & Hassanain, 2021). However, LSTM provides a superior approach compared to the MLR model due to its deep learning nature, which facilitates a faster learning rate with its learning algorithm capable of addressing non-linear behaviour, a limitation of MLR.

BENEFIT TO MANKIND

Energy consumption prediction is crucial for quantifying the energy savings resulting from energy conservation activities. Energy savings are determined by subtracting the measured energy consumption after implementing energy conservation measures from the predicted energy consumption. The importance of energy consumption prediction in the energy-saving quantification process lies in its ability to represent energy consumption without any energy conservation activities. Inaccurate predictions can compromise the calculation of energy savings, raising doubts about the effectiveness of energy conservation activities. Therefore, the LSTM baseline energy model offers significant benefits and impacts by ensuring the success of any energy conservation activities conducted.

COMMERCIALIZATION POTENTIAL

The LSTM model, developed as a baseline energy model, can be effectively applied to educational buildings that share similar characteristics. Specifically, in this innovative work, the educational building comprises classrooms, lecture rooms, and laboratories. Moreover, theoretically, the LSTM baseline energy model can be applied to

educational buildings with a similar climate. This feasibility arises from the fact that the LSTM baseline energy model was developed using outdoor temperature as an independent variable, particularly within the equatorial region. This suggests that the developed LSTM baseline energy model is a universal model suitable for educational buildings of the same type and within the same climate region.

The government of Malaysia has introduced the National Energy Efficiency Action Plan (NEEAP) as its policy to promote energy efficiency as an energy conservation activity. In support of the NEEAP, the LSTM baseline energy model can be widely used by building owners to assess the success of energy savings resulting from the energy efficiency activities conducted by them.

CONCLUSION

In conclusion, the innovation introduced in this work has successfully predicted energy consumption through the development of a baseline energy model using the LSTM method. Educational buildings were used as case studies, with independent variables recorded and energy consumption measured. Two baseline energy models were developed using the MLR model and the LSTM model. Energy consumption was predicted using both models and compared. The LSTM baseline energy model showed lower prediction errors in comparison. Educational buildings with similar characteristics and located in the same climate zone can benefit from the LSTM baseline energy model, highlighting the commercialization potential of this innovative work.

ACKNOWLEDGEMENT (*OPTIONAL)

The authors would like to express their gratitude to the research grant MYRA 600-RMC 5/3/GPM (049/2022) for the financial support along conducting this innovation.

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PID30042

Z-SOLVE: Bridging Local Issues through SDGs Podcasts

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ABSTRACT

In today's sea full of podcasts, finding one podcast that truly matters and uphold ethical standards is crucial. This study introduces an innovative podcast series focusing on sustainable development goals, offering ethical and impactful discussions amidst the podcasting frenzy. Instead of raising awareness, this series hosts roundtable discussions with experts to tackle local issues and propose viable solutions. Driven by Malaysia's technological advancements and societal challenges, it empowers Generation Z to engage in meaningful conversations through podcasts. Aligned with the SDG17 Partnership for the Goals, the series is committed to global sustainability efforts. Tailored for peer audiences, it aims to inform and educate on the wide-ranging impacts of local challenges. The success of the series is evident through its noticeable impacts and growing visibility within the community. Furthermore, its commercial potential lies in the scalability and applicability of the proposed solutions. By leveraging sponsorships, advertisements, and strategic partnerships, the series is able to generate revenue while continuing to drive positive changes. Amidst countless podcasts, its ethical stance sets it apart, making it a beacon of integrity and relevance in the digital landscape.

KEYWORDS: Podcast, GenZ, SDG, Ethical, Local issue

PRODUCT DESCRIPTION

The term "podcast" has evolved significantly over time. Initially, it was referred to digital audio files distributed via Really Simple Syndication (RSS), downloadable internet radio broadcasts, or audio programmes aired on traditional radio Morra(2020). However, Morris and Patterson (2015) emphasise that podcasting is more than a technology. It encompasses unique practices and cultural meanings associated with its creation,

organisation, and consumption. This distinction sets podcasting apart as a distinct form of audio media.

The innovative RealiTEA Podcast serves as a dynamic platform for University students, offering them a voice in critical conversations despite limited resources. Through engaging discussions led by a panel of experts, the RealiTEA Podcast aims to draw attention to pressing issues and advocate for policy changes, particularly concerning the representation of the younger generation in Malaysia. Central to its mission is the alignment with the United Nations' 17 Sustainable Development Goals (SDGs), wherein each episode delves into specific SDGs, examining their targets and objectives.

For instance, the latest season of RealiTEA Podcast explores SDG10: Reduced Inequalities, featuring esteemed guests such as a Senator from the Dewan Negara and the Chairman of BERNAMA. This episode addresses mobility challenges in less privileged areas and the accessibility of Universities to mobility-challenged students. Additionally, discussions on SDG7: Affordable and Green Energy feature experts discussing the readiness of electric cars in Malaysia and their potential impacts in fostering a green climate in significant cities.

Moreover, topics on SDG3: Good Health and Well-being are explored on the RealiTEA Podcast, including mental health and women empowerment. Notably, the podcast hosts esteemed guests like Miss Silver State USA 2022 and a prominent psychologist, elucidating the significance of personal and professional development in fostering well-being. These discussions are a reflection of RealiTEA Podcast's commitment in exercising sustainability practices and promoting holistic content creation.

With its insightful discourse, the RealiTEA Podcast provides a valuable platform for dialogue, education, and advocacy, empowering listeners and participants to enact positive change. RealiTEA Podcast embodies a transformative force in driving societal progress and fostering a brighter, more inclusive future through its innovative approach and alignment with global sustainability goals.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

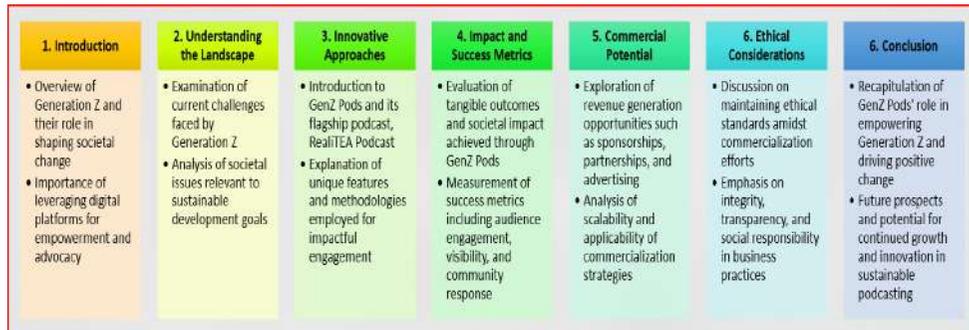


Figure 1. Empowering Generation Z through Sustainable Podcasting Framework

Episode Title	Plays
Combating Contemporary Hardships: How Poor is Poor?	128
Equal Rights Equal Fights. Right?	97
Treasured Forest; Our Responsibility to Protect Them.	90
We Were Colonized By the British Once! Why Can't We Speak Orang Puth Properly?	87
Episode 11 - Gatekeeping Education: How Fair Do Students Receive Similar Quality of Education? (SDG 4: Quality Education)	76
Domestic Violence Against Women: Covid-19 is Not the Only Battle That is Going ON.	76
The Plastics: How Should We Lessen Our Usage (and ultimately stop altogether)?	73
Runaway Ready: The Real Cost of Fast Fashion	71
Hungry (or Hangry) University Students Should Not be in our To Do list Here! Why!	70
Single Parenting and Child Mortality in Malaysia: The Ship That Never Knew the Calm Sea.	66
Episode 16 - "GASP!" Can Women Really Lead? "SHOCKER" (SDG 8: Decent Work & Economic Growth)	65
Readiness in Futuristic Learning: Are We Equipped with the Necessary Tools?	65
Poverty and Prophylactic: Conversations That We Should Have More Of (For Good Reasons!)	63
Corporate Social Responsibilities Today: Global Partnering for the Greater Good.	60
Turn Up the VOLUME in Volunteering!	58
Thalassemia: What You Should Know!	58
Women with HIV/AIDS: The Pursuit of Happiness	55
Online Distance Learning (ODL), The 3-Way Battle of Concentration Effectiveness and Accessibility.	54
Episode 12 - Addressing Misogyny in the Workplace (SDG 5: Gender Equality)	51
Vaccination: To or To NOT? (and WHY this is EVEN a question in the first place)	49

Figure 2. Top 20 Plays of the RealTEA Podcast

Geo	Average of Percent of Plays
Malaysia	0.94
United States	0.02
Singapore	0.004304161
United Kingdom	0.004304161
Indonesia	0.004017217
Philippines	0.003156385
Canada	0.002582496
Australia	0.002582496
India	0.002295552
Turkey	0.002008608
Netherlands	0.00143472
Sweden	0.001147776
Germany	0.001147776
Ireland	0.000860832
Italy	0.000860832
Mexico	0.000860832
Jordan	0.000573888
Switzerland	0.000573888
United Arab Emirates	0.000573888
Belgium	0.000573888
Brazil	0.000573888
Poland	0.000286944
Norway	0.000286944
Portugal	0.000286944
Nigeria	0.000286944
Finland	0.000286944
Denmark	0.000286944
Guatemala	0.000286944
Spain	0.000286944
Japan	0.000286944
South Africa	0.000286944

Figure 3. Country that plays the RealiTEA Podcast

Besides that, the RealiTEA Podcast project has received its copyright and is registered under the Pendaftaran Harta Intelek Malaysia (MyIPO). Reference: 600-BITCOM (IP. 5/2/6/3/CP).

NOVELTY AND UNIQUENESS

The RealiTEA Podcast emerges as a beacon of novelty and uniqueness in the vast ocean of digital content. Unlike conventional podcasts, it transcends mere awareness-raising efforts by orchestrating profound roundtable discussions, delving into local issues, and proposing actionable solutions. Powered by Malaysia's technological advancements and societal challenges, it empowers Generation Z to partake in meaningful dialogues, amplifying their voices in pursuing sustainable development goals.

Aligned with the SDG17 Partnership for the Goals, the RealiTEA Podcast informs and educates its audience on the far-reaching impacts of local challenges. Its success is palpable, evident through its tangible impact and

burgeoning visibility within communities. Moreover, its commercial potential lies in its scalability and applicability, paving the way for sponsorships, advertisements, and strategic partnerships to fuel its positive impact further.

Amidst the podcasting frenzy, RealiTEA Podcast's ethical stance sets it apart, positioning it as a paragon of integrity and relevance in the digital landscape. Each episode weaves together diverse perspectives, tackling pressing issues such as reduced inequalities, affordable and green energy, and good health and well-being. Through its innovative approach and steadfast commitment to sustainability, RealiTEA Podcast emerges as a transformative force, igniting conversations and catalysing change towards a brighter, more inclusive future.

BENEFIT TO MANKIND

The RealiTEA Podcast catalyses benefitting humanity, offering a platform for meaningful dialogue and actionable solutions. Its unique approach goes beyond conventional awareness-raising efforts, empowering Generation Z to address local issues and contribute to sustainable development goals. Aligned with SDG17, the podcast educates audiences on the wide-ranging impacts of societal challenges, driving tangible change and garnering increasing visibility. With commercial potential, it opens avenues for sponsorships and partnerships to amplify its positive influence. Ethically grounded, the podcast stands out amidst the digital landscape, tackling pressing issues and fostering a brighter, inclusive future through innovation and sustainability commitment.

COMMERCIALISATION POTENTIAL

The RealiTEA Podcast serves as a pivotal agent for societal advancement and exhibits considerable potential for commercialisation. Its innovative methodology and alignment with SDG17 provide a fertile ground for attracting lucrative sponsorships and forging strategic partnerships. By addressing pertinent societal challenges and offering actionable solutions, the podcast presents an appealing platform for businesses to engage with their target demographics in an ethically sound manner. In addition, leveraging its burgeoning visibility and impact, the podcast is poised to generate substantial revenue streams while driving positive societal change. Its commitment to sustainability further enhances its appeal to socially conscious investors and consumers, solidifying its position as a profitable venture with enduring societal impact.

CONCLUSION

In conclusion, GenZ Pods represents a significant milestone in leveraging digital platforms to empower the younger generation and address pressing societal issues. Through innovative approaches like the RealITEA Podcast, it fosters meaningful dialogue, educates on sustainability, and advocates for positive change. Its alignment with the United Nations' Sustainable Development Goals underscores its commitment to global progress. Moreover, GenZ Pods' commercial potential indicates its viability as a sustainable venture, capable of both driving revenue and catalysing societal transformation. As it continues to evolve and expand its reach, GenZ Pods stands as a beacon of innovation, ethics, and impact in the digital landscape, poised to shape a brighter future for future generations.

ACKNOWLEDGEMENT

We want to extend our heartfelt gratitude to all those who have contributed to the development and success of GenZ Pods. Special thanks are due to the dedicated team members, experts, and partners whose expertise and collaboration have played an instrumental role in bringing our innovative initiatives to fruition. Additionally, we wish to express our appreciation to the listeners and supporters who have embraced our podcasts and shared in our mission of driving positive change. Your ongoing encouragement and engagement inspire us to continue advancing our efforts in empowering Generation Z and fostering a more sustainable future for all.

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PID30062

Handpolo Game

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ABSTRACT

This invention is a game that has been created and suggested by a university professor and his colleagues in sport sciences. These professors were in charge of the Swimming Association of IR of Iran. There was a gap between sports for all competitions and championship sports. So, since there was no game in sports for all competitions, the creators of this game were motivated to design a new game to add to these competitions. This game is a mixture of a ball game and a water game, which entails some specifications such as playing time, number of players, field of the game, rules, and referee number, without similarities with other games and sports played inside and outside water. This game is played in shallow waters and a field of 10ms X 12.5ms and 100 cm depth, with 4 players per team for young people and 12ms in 16.5ms with 100 to 120 cm and 5 players per team for adults.

KEYWORDS: handpolo, tupsu, swimming, game

PRODUCT DESCRIPTION

The Handpolo game was designed for the first time by Prof. Seyyed Mohammad Kashef and his colleagues, Dr. Akbar Nouri and Dr. Behzad Hosseini from Urmia University in Iran, and it was performed in 2021 in the Olympiad and public sports competitions of the country's universities for women and men. Handpolo is a sport that can be played by all people in shallow water at a height of about 100 cm. This game, which is called tupsu in the local language, is played by two teams of eight people, four of whom are the main players inside the water and four are outside, and it is performed in two halves, each for 15 minutes. The game's simple rules make it possible for all beginners (women and men, minors and adults) to

play handpolo. To play a handpolo game, facilities such as balls, hats in different colours for teams, and two gates of 100 x 200 cm are needed.

**PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/
SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS**



NOVELTY AND UNIQUENESS

This game has made it possible for people who like to do exercise in water without risk of drowning (due to a lack of swimming skills) and play a ball-oriented game to play this game as an alternative for similar games such as waterpolo (in water) or handball (outside water). Another feature of this game is that although it has simple rules, which make it easy to play for beginners, players with competitive targets and higher physical fitness can take it as a real competition.

BENEFIT TO MANKIND

Nowadays, more people need some time for both pleasure and physical exercise for health. Handpolo opens the opportunity for such individuals to experience both fun and exercise. On the other hand, beginners can enjoy the game without any physical injuries or specific facilities. Therefore, it is beneficial both physically and spiritually for mankind.

COMMERCIALIZATION POTENTIAL

This sport can produce financial profits and directly generate a turnover of 2,520,796,000 dollars in five years with a gentle growth slope. Additionally, a significant number of individuals will participate as coaches or trainers in this game, with one trainer for every 15 players, undergoing training and receiving cards. This will also add to the economy's share. This estimate is based on the development of sports with the support of NGOs, population composition, the level of sports facilities, the amount of gross national

income that can be made for other countries, and the amount of government support.

CONCLUSION

This game is a great chance for all individuals looking to fill their leisure time with both physical and entertaining activities. It not only gives them vitality but also generates happiness among them. Therefore, if introduced properly to the world, it can be among some popular money-making sports such as futsal and basketball around the world.

ACKNOWLEDGEMENT (*OPTIONAL)

Different parties were involved and supportive in introducing and maintaining this sport, including the Ministry of Sport and Youth, the Sports for All Federation, the Ministry of Research and Technology, and the Arad Institute of Higher Education.

PID30072

Promoting Knowledge Sharing: Peer-Led Learning in the Classroom

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ABSTRACT

Peer-led learning is a dynamic and effective method for promoting knowledge sharing and enhancing the overall learning experience in the classroom. It encourages active participation, empowers students to take ownership of their learning, and builds valuable communication and leadership skills. Various learning methods have been adapted by academicians to attain students' attention and ensure that the latter will gain knowledge and experience from their lecturers. Lecturers must be creative in their teaching. Peer-led learning is an educational approach where students assume roles as educators. It has not been widely used, although it is an effective method to enhance knowledge sharing and engagement in the classroom. The key elements that contributed to its success were active participation, collaborative learning, and the development of leadership and communication skills among students. Peer-led learning outcomes include improved academic performance, enhanced critical thinking, and increased confidence among students. Additionally, it addresses the challenges and considerations for educators when implementing this approach, offering insights into strategies for successful integration. In a rapidly evolving educational landscape, peer-led learning emerges as a valuable tool to foster a dynamic and student-centred learning environment that promotes active knowledge sharing, peer support, and deeper comprehension of subject matter.

KEYWORDS: peer-led learning, knowledge sharing, educational approach, creative teaching, classroom

PRODUCT DESCRIPTION

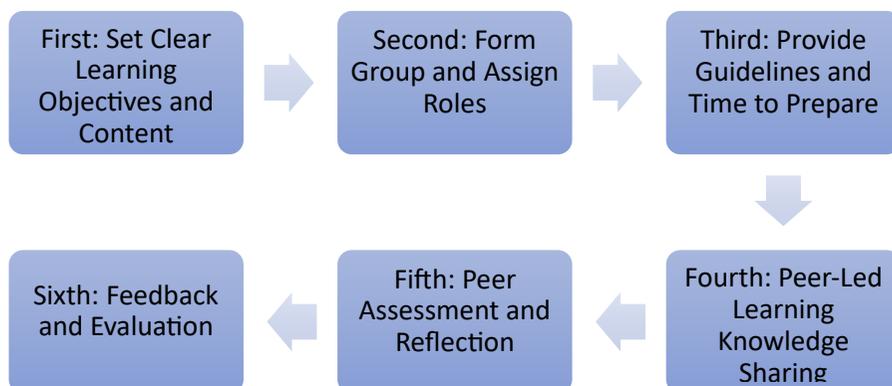
Peer-led learning in the classroom is like a teamwork approach to education where students help each other learn. Instead of listening to the lecturer solely, a peer-led learning approach encourages students to teach and learn from each other. This method makes learning more enjoyable and engaging.

The main goal of peer-led learning is to create a friendly environment where everyone shares what they know and learns from each other. When students explain things to their peers, they use simple language that everyone can understand, which helps everyone learn better. Before students present it to their classmates, they do research and really understand the topic. This makes them more confident and prouder of what they have learned.

The idea is not just to memorise facts but to develop important skills like talking to others, thinking critically, and working together. Peer-led learning also encourages asking questions and exploring different ideas. In the end, peer-led learning is not just about getting good grades but also about understanding and enjoying what you have been learning while also becoming better at working with others and asking questions.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

Implementing peer-led learning in the classroom involves several steps to ensure its effectiveness. The structured approach to introducing peer-led learning are as follows:



NOVELTY AND UNIQUENESS

The novelty of peer-led learning lies in its ability to transform classrooms into dynamic, interactive spaces, aligning with modern educational principles of active engagement, critical thinking, and communication. By shifting focus from teachers to students, it fosters ownership of learning, with students presenting entire topics rather than sections. This approach allows for tailored teaching to suit diverse learning styles, aided by peers' relatability and mutual understanding. Collaboration is central; promoting teamwork and communication skills is vital for both academic and professional success. Through peer-led discussions, students hone verbal and written communication, enriching their educational journey with collaborative learning experiences.

BENEFIT TO MANKIND

Peer-led learning offers numerous benefits to mankind. Firstly, it fosters collaboration and teamwork skills, preparing individuals for success in both academic and professional environments. By encouraging active participation and engagement, it enhances intellectual capacity and the retention of knowledge. Additionally, peer-led learning promotes empathy and understanding among individuals, fostering stronger social connections and community cohesion. It also fosters leadership qualities and communication skills as students take on teaching roles. Furthermore, this approach democratizes education, making it more accessible and inclusive. Overall, peer-led learning contributes to the holistic development of individuals and facilitates the growth of a more knowledgeable, empathetic, and interconnected society.

COMMERCIALIZATION POTENTIAL

The university is a non-profit organisation, and most of the learning and academic innovations are not for commercialization purposes. However, the university can monetize the knowledge with the right topics and audiences. With the largest number of students registered, UiTM has the advantage of reaching wide audiences all over Malaysia. A peer tutoring service can be offered that connects peer tutors (usually more advanced students) with those seeking assistance. For example, engineering students who must take management subjects may take up the offer of peer-led teaching to assist them in learning the topic. Provide a professional development programme for educators who are interested in

integrating peer-led learning into their teaching practices. A fee for workshops, webinars, or certification programmes could be applied.

CONCLUSION

In conclusion, Peer-led Learning is a game-changer in education, moving away from the typical teacher-centered style. It boosts student involvement, understanding, and crucial life skills like thinking things through, talking well, teamwork, and being a leader. It creates a friendly, open vibe in class, getting students ready to take part in the real world. Plus, it gives students the confidence to help each other out, teaching them skills they will need not just in the university but also in their jobs and everyday life. Peer-led learning is not just another way of teaching; it is a good way to make learning awesome for everyone.

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PID30102

Sang Kancil AR Painting: Bridging Tradition to Technology

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ABSTRACT

Folktales, like mythology and other types of oral literature, can be considered living organisms. It develops and evolves. It can be modified to a specific audience and adjusted to meet the teller's objectives. Unlike other forms of oral literature, folktales do not fade after they are written down (Christina A. M., 2023). Moreover, it represents human behaviour and culture. Malays utilise folktales to educate, advise, and satirise (Zuriati M.S., et al, 2023). However, the lack of digital preservation of intangible cultural heritage necessitates greater efforts to keep the heritage from disappearing and becoming extinct (Wan Malini W. I., Nor Azan M. Z., et al. 2018). This visual art developed with the adaptation of Sang Kancil Stories; a traditional literary script created by Dewan Bahasa dan Pustaka in 2015. Chang's (2008) autoethnography method shaped the production of the artwork. The artist conserved folktales by adding visual appeal and fresh perspectives to Sang Kancil Stories. The transmission mechanism's innovation of re-storying folktales through the visual arts increased value by including Augmented Reality presentations without modifying the story. The new form of presenting folktales enhances cultural knowledge, awareness of oral tradition, diversity of educational methods, and social participation, in line with UNESCO's goals of safeguarding intangible heritage. Furthermore, this product is consistent with the first fundamental principle of Dasar Kebudayaan Negara (DAKEN) 2021, which states that Malaysia's national culture needs to have its roots in the indigenous cultures of the region.

KEYWORDS: Folktale, Innovation, Visual Art, Safeguarding, Augmented Reality

PRODUCT DESCRIPTION

This visual art innovation is created in the form of a painting that combines conventional techniques in fine art with digital technology. It can be viewed directly or through an Augmented Reality application (Artivive), offering an innovative perspective on the appreciation of Malay folktales that are increasingly being forgotten by the current generation. This artistic endeavour of painting serves not only as static viewing/decoration/therapy but also as a representative of information, conveying contemporary and historical data/stories, as well as educational purposes for audiences. Furthermore, painting is an art product with a high market value and investment potential.

The 'Sang Kancil' paintings are an adaption of a Malay folktale that has gained popularity through animation and illustrated books. However, there is minimal presence through paintings. Hence, this storytelling through painting is an attempt that has had a variety of effects on the audience, in addition to the Augmented Reality application on the audience's mobile phone, a device that almost everyone in society has regardless of age. So Sang Kancil's painting serves both as an exquisite visual work and an Augmented Reality delivery to draw the audience's attention to observe, engage with, understand the meaning, and most importantly, as an aesthetic and valuable product.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

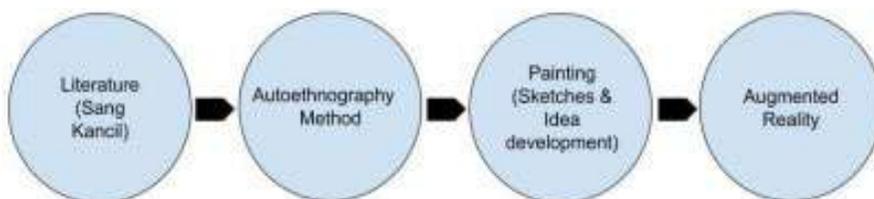


Chart 1: Flow chart for the Sang Kancil Painting process

**Download Artivive apps and scan this painting for augmented reality*



Title: *Sang Kancil dan Rabbit I*, Media: Mixed on canvas, Size: 121 cm x 121 cm, Year: 2023



Title: *Sang Kancil dan Rabbit II*, Media: Mixed on canvas, Size: 121 cm x 121 cm, Year: 2023



Title: *Siakap, Buaya dan Sikap Manusia*, Media: Charcoal, acrylic on canvas, Size: 138 cm x 100 cm, Year: 2023

NOVELTY AND UNIQUENESS

- A creation in visual versions to preserve the stories of Sang Kancil.
- A documentation of an intangible heritage in aesthetic form with the application of digital technology.
- Develop collections dedicated to folktales related to storytelling traditions from a different/new perspective.
- Painting with Augmented Reality experiences that bring folktales to life, allowing users to engage with the stories in immersive ways.

BENEFIT TO MANKIND

- Encourage collaborations between older and younger generations to share and preserve folktales.
- Able to contribute to organising exhibitions in any galleries that highlight the significance of folktales within cultural heritage.
- An establishment of digital/visual repositories where folktales can be stored, categorised, and accessed by artists, art lovers, researchers, and the public.
- Open the opportunity to conduct art workshops where students can learn the art of storytelling and understand the cultural context of folktales through visual.

COMMERCIALIZATION POTENTIAL

This innovation adds value to a piece of art, both in terms of its aesthetic worth and its monetary value. In addition to this, it is of great importance for the preservation of Malay folktales, which are an intangible heritage that must be conserved and revitalised. Apart from the original painting, serial prints can also be commercialised for commercial purposes. One of the paintings was sold to a property developer and displayed in one of their showhouses. Additionally, the paintings were exhibited in a few galleries, such as Prima Gallery, Bangsar, KL City Art Gallery, CMTHub Gallery, Hom Art Trans Gallery, and others.

CONCLUSION

The preservation of folktales is a multi-pronged endeavour that necessitates documentation, education, community engagement, technological innovation, and cultural acknowledgement. Through the utilisation of both conventional and contemporary approaches, we can guarantee that these significant narratives will be remembered and cherished by future generations. This innovative painting was produced to

bolster the direction of the preservation of Malay folktales and contribute to the glory of the Malaysian art scene.

ACKNOWLEDGEMENT (*OPTIONAL)

In this section, give credit and express gratitude to individuals, organizations, and entities that contributed to the development and success of your project.

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PD30111

Enhancing Lung Lesion Localization in CT-scans: A Novel Approach Using FE_CXY and Statistical Analysis

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ABSTRACT

Intelligence algorithm systems rely on a large dataset to effectively extract significant features that can recognise patterns for classification purposes and are extensively utilised to assist physicians in the diagnosis of lung cancer. Extracting valuable features from the available dataset is crucial, especially in cases where additional real data may not be readily accessible. In this context, we propose a novel method called Feature Extraction Based on Centroid (FE_CXY) for lesion localisation, utilising a statistical approach. The approach begins with a segmentation process that employs image processing techniques to extract features of interest, which is the data centroid. This extracted data is then used to compute statistical measurements, revealing hidden patterns that contribute to distinguishing between lesion and non-lesion locations. The method's efficiency is reflected in the development of robust models with improved performance in localising lung lesions. The study's statistical findings strongly indicate that FE_CXY plays a crucial role as an important feature for detecting lesion localisation supported by a student's t-test, which identifies a statistically significant difference in the patterns between lesion and non-lesion localisation ($p < 0.05$). By incorporating this method into lung cancer detection systems, we anticipate improved accuracy and efficacy, thereby benefiting early diagnosis and treatment planning.

KEYWORDS: Lung Cancer, Feature Extraction, Lesion Localization, Diagnosis, Statistical Approach

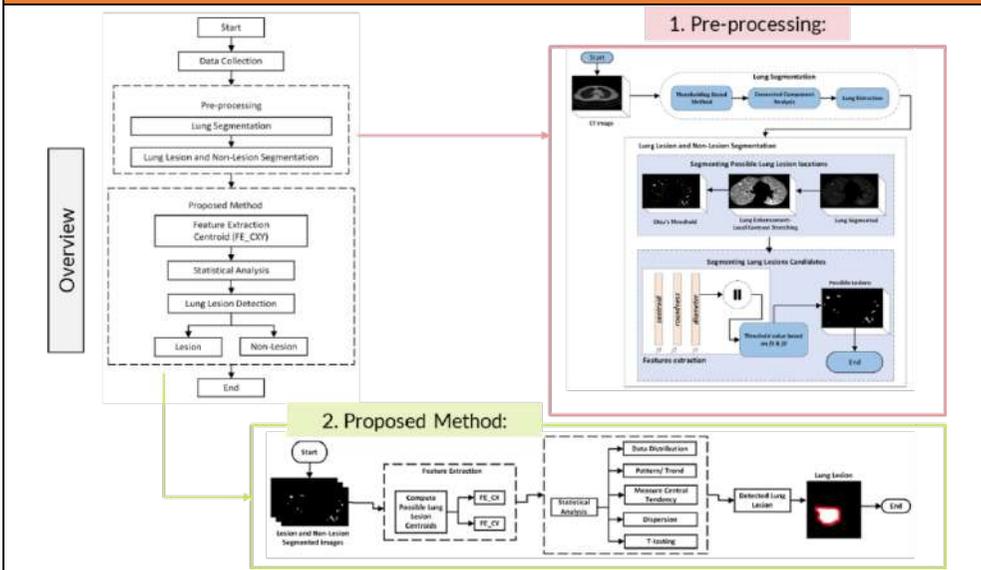
PRODUCT DESCRIPTION

Our cutting-edge Computer-Aided Diagnosis (CAD) system revolutionises CT scan analysis, leveraging advanced machine learning and deep learning techniques to streamline screening, diagnosis, and prognosis processes. Designed to address the challenges of complex medical data, it enhances radiologist efficiency and improves patient outcomes by reducing manual examination time and minimising human error. The system's core features include automated lesion detection and a two-step segmentation process that isolates the lungs from the background and distinguishes between lesion and non-lesion areas. By computing statistical measurements through feature extraction (FE_CXY), it reveals hidden patterns critical for accurate lesion identification.

With high accuracy and real-time analysis capabilities, our CAD system provides quick, reliable results, integrating seamlessly into existing radiology workflows via an intuitive dashboard. Visualisation tools offer clear, actionable insights, supporting radiologists in making informed decisions. The innovative focus on strong informative features, coupled with detailed statistical benchmarking, enhances diagnostic performance and reduces the likelihood of suboptimal patterns.

Targeted primarily at radiologists and healthcare institutions, this system is ideal for early cancer detection, routine screening, and ongoing patient monitoring. It significantly impacts treatment success and patient survival rates by facilitating early lesion identification. Additionally, the CAD system reduces the risk of misdiagnosis caused by eye fatigue, increases diagnostic efficiency, and improves overall patient outcomes. With its state-of-the-art deep learning algorithms and high sensitivity and specificity in lesion detection, our CAD system stands at the forefront of medical imaging technology, offering a transformative solution for cancer screening and diagnosis.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



NOVELTY AND UNIQUENESS

This project introduces a novel method using statistical analysis to identify informative features for lesion localization in lung CT images. Through detailed statistical analysis, FE_CXY values for lesions exhibit consistent trends within slices, while non-lesions show noticeable fluctuations. These fluctuations are indicative of movement, likely attributable to non-lesions, which can be vessels or the bronchioles, which have elongated and cylindrical shapes. These findings highlight FE_CXY's potential as an effective alternative for lesion detection systems. By enhancing the accuracy of lesion localization, this innovative approach significantly advances medical diagnostics, utilising informative features and machine learning classifiers to improve medical imaging applications.

BENEFIT TO MANKIND

This product focuses on developing CAD systems that provide valuable insights for medical practitioners and radiologists. By enhancing the screening, diagnosis, and prognosis processes with faster and uninterrupted analysis, it aims to significantly improve patient care. Most importantly, this innovative system has the potential to increase survival rates for cancer patients and reduce the number of cancer-related deaths, making a profound impact on global health.

COMMERCIALIZATION POTENTIAL

The developed algorithm shows promise as a new digital health system, improving diagnosis quality, especially in Radiology Departments. With a growing global population, the demand for precise diagnostics is increasing. Continuous research and development refine algorithms, ensuring competitiveness and broadening application areas. We plan to offer CAD software through subscription or licensing with regular updates and support, aiming for premium prices for advanced CAD solutions. Collaboration with medical entities for system integration is also on the agenda. Our team's ongoing R&D efforts have led to five copyrights and two innovation medals, highlighting our dedication to excellence.

CONCLUSION

In summary, this approach harnesses FE_CXY to detect lesion localization, supported by statistical analysis to unveil concealed insights. The findings underscore FE_CXY's potential as an alternative feature, notably enhancing detection accuracy. Continuous research and development refine algorithms, bolstering their efficacy and expanding their application realms. These models offer valuable second opinions, aiding medical professionals in the precise interpretation of medical modalities. Furthermore, this innovative system holds promise for elevating cancer patient survival rates and reducing cancer-related mortality, marking a significant stride in healthcare advancement.

ACKNOWLEDGEMENT (*OPTIONAL)

This research work is financially supported by the Ministry of Higher Education Grant Scheme (FRGS), "A New Motion-based Optical Flow Lung Cancer Detection Method for Lung Nodule Segmentation on Lung CT-Scan Images" (Ref: FRGS/1/2021/TK0/UITM/02/58). Ethics approval is obtained from Universiti Sains Malaysia (USM/JEPeM/21110721). The authors would like to express their gratitude to members of the Advanced Control System and Computing Research Group (ACSCRG), Advanced Rehabilitation Engineering in Diagnostic and Monitoring Research Group (AREDiM), Integrative Pharmacogenomics Institute (iPROMISE), and Centre for Electrical Engineering Studies, Universiti Teknologi MARA, Cawangan Pulau Pinang, for their assistance and guidance during the fieldwork. Finally, the authors are grateful to Universiti Teknologi MARA, Cawangan Pulau Pinang, for their immense administrative and financial support.

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PD30121

Smart Lawn Mower

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ABSTRACT

This project presents a smart lawn mower machine leveraging IoT technology for conducive usage and Blynk-based control. Nowadays, a machine that can help the users do a daily chore is very important because it can help the users in a lot of aspects. By using the smart lawn mower, it will help the users reduce the time it takes to take care of their lawn. In addition, using a smart lawn mower can lead to a reduction in noise and carbon pollution compared to traditional lawn mowers. The development of smart lawn mowers will be focused on how to reduce the time spent taking care of the lawn and the pollution when using the lawn mowers. The machine will come with smart features such as weather monitoring and a rain alarm that will be controlled by the Blynk app. Finally, the usage of smart lawn mowers will become more helpful compared to traditional lawn mowers because they can provide a lot of advantages to the users.

KEYWORDS: Smart lawn mower, IoT technology, Blynk, Pollution reduction, Time-saving

PRODUCT DESCRIPTION

The Smart Lawn Mower represents a revolutionary leap forward in lawn care technology, offering homeowners and property managers a comprehensive solution to the tedious task of outdoor maintenance. By seamlessly integrating IoT technology and advanced sensors, this autonomous mower redefines traditional lawn care practices. Designed with convenience and efficiency in mind, it navigates and mows designated areas autonomously, freeing users from manual labor. Equipped with sophisticated obstacle detection sensors and a weather monitoring system,

it ensures safe and efficient operation while optimising scheduling and resource management. The user-friendly mobile application enhances the experience, enabling remote control and monitoring with ease. What sets the Smart Lawn Mower apart is its dedication to environmental sustainability, minimising carbon emissions and noise pollution while reducing physical exertion for users. Ideal for a variety of applications, from residential lawns to commercial properties and sports fields, its advanced features ensure optimal performance in any environment. Experience the future of lawn care with the Smart Lawn Mower, where convenience, efficiency, and sustainability converge to create a greener, smarter outdoor environment, liberating users from manual labour and promoting a balanced lifestyle.

**PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/
SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS**

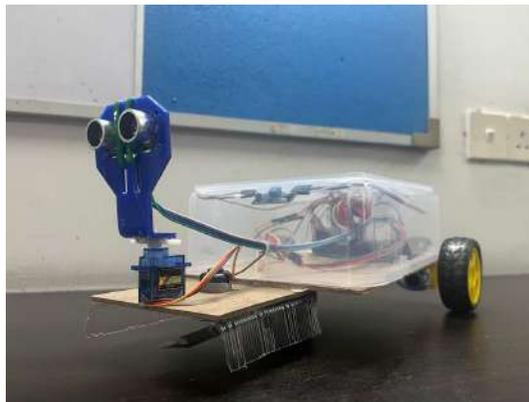


Figure 1. Prototype of Smart Lawn Mower



Figure 2. Schematic diagram of Smart Lawn Mower

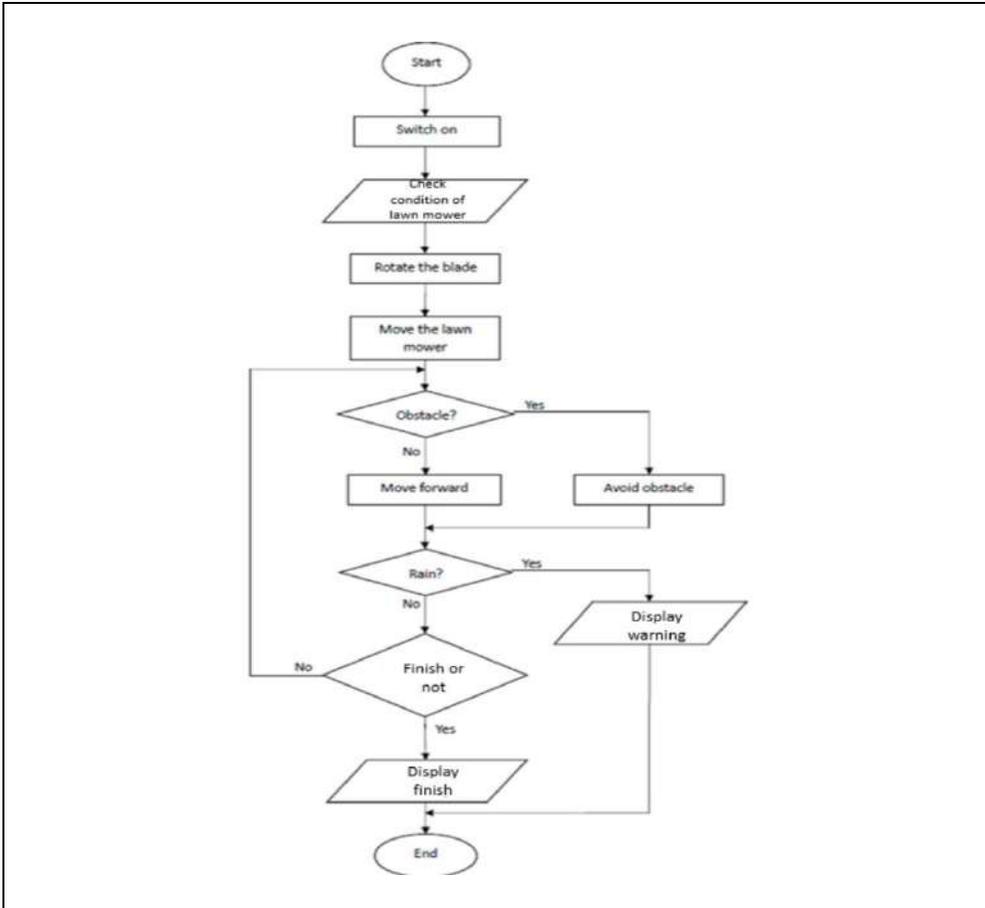


Figure 3. Flowchart of the system

Based on Figure 2, the ESP32 serves as the main controller for overseeing all machine activities. Three inputs are incorporated into the project: an ultrasonic sensor, a rain sensor, and a power button. These inputs guide the operation of the DC motor, which is responsible for propelling the machine's wheels and blade. Additionally, the machine is equipped with smart features such as weather forecasting, rain alerts, and a power button for controlling its IoT functionality, all of which are accessible via the Blynk app on a smartphone. In operation, the user places the machine on the lawn and activates it using the power button. Subsequently, the DC motor engages, propelling the wheels and blade. The ultrasonic sensor, integrated into the machine, scans the surrounding area for obstacles, ensuring smooth operation and grass cutting. The smart lawn mower adheres to pre-set boundaries within the designated area. With the ESP32,

users can monitor weather conditions and receive notifications upon completion of the assigned task. Users can also direct the machine to return to its base by pressing the home button. In the event of rain during operation, users receive weather notifications and can instruct the lawn mower to return to its base using the home button, halting its operation.



Figure 4. Blynk Interface in the Blynk Application Viewed through Handphone

Figure 4 shows the Blynk interface for the lawn mower controller. The Switch and Switchhome are used to turn on and off the lawn mower. The place and the weather condition are used to indicate the weather information extracted from the weather website. There is also a gauge that shows the status of the rain between values 0 and 1.

NOVELTY AND UNIQUENESS

This innovation project introduces a novel approach to lawn care by leveraging IoT technology and advanced sensor systems to develop a smart lawn mower. Unlike traditional gas-powered mowers, this autonomous mower integrates features such as obstacle detection,

weather monitoring, and remote control via a mobile app. By prioritising efficiency, environmental sustainability, and user convenience, this project offers a unique solution to address the challenges of modern lawn maintenance, setting it apart from conventional methods.

BENEFIT TO MANKIND

The implementation of smart lawnmowers offers numerous benefits to mankind across various dimensions. Firstly, they significantly enhance safety by reducing the risk of accidents associated with manual lawn mowing, thus promoting physical well-being. Secondly, these smart devices contribute to improved air quality by emitting fewer pollutants, thereby mitigating respiratory issues and allergies while fostering environmental sustainability. Additionally, the reduction in noise pollution enhances the quality of life by creating a more peaceful environment. Furthermore, the adoption of smart lawnmowers aligns with cultural values related to environmental stewardship and community pride, while also contributing to a healthier planet and promoting a better work-life balance.

COMMERCIALIZATION POTENTIAL

The commercialization potential of the smart lawn mower project is significant, given the growing demand for efficient lawn maintenance solutions and the increasing adoption of IoT technology. With a focus on reducing manual labour, enhancing user convenience, and promoting environmental sustainability, the smart lawn mower addresses key market needs. Its competitive advantage lies in its autonomous operation, advanced sensor technology, and user-friendly interface via the mobile app. A scalable business model, coupled with cost-effective production methods and potential regulatory compliance, ensures favourable profit margins. Additionally, a robust intellectual property strategy can safeguard innovations and support market differentiation, fostering long-term success in the lawn care industry.

CONCLUSION

In conclusion, the proposed project aims to achieve a holistic solution for efficient lawn maintenance by developing a self-propelled lawn mower integrated with advanced sensors and smart technology, complemented by a user-friendly mobile app. This comprehensive approach will not only provide users with the convenience of autonomous lawn care but also the ability to remotely monitor and control the device. Additionally, the project focuses on optimising energy efficiency and cutting performance, ensuring

that the smart lawn mower operates sustainably while delivering excellent results. By addressing these objectives, the project aspires to revolutionise lawn care practices, making them more accessible, eco-friendly, and hassle-free for homeowners, ultimately contributing to a more convenient and environmentally conscious future.

ACKNOWLEDGEMENT (*OPTIONAL)

The head project member acknowledges the supervision of Dr. Siti Noraini as our main supervisor and Dr. Alhan Farhanah as our co-supervisor in conducting this project and the team members in making sure the project is successfully constructed and tested.

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PD30132

Evaluating mobile payment readiness (MPR) among students in tertiary education

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ABSTRACT

Mobile payments are now a handy and effective means to make transactions because of the financial landscape's revolutionary transformation brought about by the quick development of mobile technology. The purpose of this study is to evaluate tertiary education students' acceptance and preparedness for mobile payment systems. These students, who grew up in a digital age, are an important group to consider when predicting the direction that mobile payment systems will take. According to preliminary data, students have a generally good attitude towards mobile payments and a high degree of smartphone adoption. But there are still issues with data privacy and transaction security, which may prevent adoption from becoming widely used. A number of important elements, including perceived security variables and technology familiarity (personal and behavioural factors), influence mobile payment readiness. This score has a wide range of implications, including providing useful information to financial institutions, tech companies, and lawmakers in the field of education. Stakeholders may better adjust their tactics to improve the user experience, address security issues, and ultimately increase the uptake of mobile payment solutions in the student demographic by understanding the factors that drive and hinder the adoption of mobile payments.

KEYWORDS: Mobile Payment, Tertiary Education, Student Adoption, Security Concerns, Technological Readiness.

PRODUCT DESCRIPTION

Mobile Payment Preparedness (MPR), a cutting-edge analytical score sheet, evaluates and improves user preparedness to accept mobile payment options. With a primary focus on higher education students, MPR offers a thorough assessment of the factors that influence the adoption of mobile payments, along with tailored insights and practical suggestions to enhance students' preparedness for digital finance. This customized score sheet provides specific information on personal, behavioral, and security issues, generating easy-to-understand score sheets that highlight strengths and areas for improvement. The overall result provides a readiness score ranging from 1 to 100, along with detailed breakdowns for each assessment category. Furthermore, MPR is an easy-to-use spreadsheet interface with a mobile-friendly, intuitive design for convenient access and usage. It enables users to finish tests quickly and get feedback right away.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



NOVELTY AND UNIQUENESS

This comprehensive approach ensures a better understanding of users' preparedness and provides a more accurate readiness score.

1. Incorporating mobile payment readiness scores into financial literacy programmes and orientation sessions promotes targeted interventions that can considerably increase students' digital financial literacy levels.
2. MPR adds value to educational institutions by offering benchmarking capabilities. Institutions can compare their students' readiness scores to

get insight into their performance and suggest areas for institutional development.

3. MPR's customisable reporting function enables different stakeholders to obtain information that is suited to their needs. Whether for individual students, educators, or institutional administrators, the ability to generate specialised reports increases the tool's utility and relevance.

BENEFIT TO MANKIND

MPR significantly contributes to improving financial literacy among tertiary education students. By providing clear and actionable insights into their mobile payment readiness, it empowers students with the knowledge and confidence to engage with digital financial tools. This enhanced financial literacy is crucial for making informed financial decisions in an increasingly digital economy.

Through its role in promoting digital inclusion by identifying and addressing barriers to mobile payment adoption, the tool ensures that all students, regardless of socio-economic background, have the opportunity to participate in the digital financial ecosystem. This inclusivity helps bridge the digital divide, fostering a more equitable society. MPR prepares students to confidently engage with digital financial services, thereby enhancing their ability to participate in and benefit from the modern economy. This can lead to increased economic activity and growth.

COMMERCIALIZATION POTENTIAL

With the increasing reliance on digital transactions and the proliferation of mobile payment systems, there is a growing demand for tools that can enhance digital financial literacy. Educational institutions, financial organisations, and governments are all potential markets for MPR. Moreover, universities can integrate MPR into their curricula to improve students' financial literacy. Offering this tool as part of financial education observation programmes can be a unique selling point for institutions aiming to attract tech-savvy students and parents concerned about financial preparedness. It also encourages lifelong learning and improvement in financial literacy. As users gain confidence and competence in using mobile payments, they are better equipped to adapt to future financial technologies and innovations.

CONCLUSION

MPR distinguishes itself by employing a multidimensional approach that meticulously examines not only the technical proficiency in mobile payments, but also the psychological, behavioural, and security factors that impact preparedness. Beyond financial readiness, MPR contributes to overall digital literacy. As students become proficient in using mobile technologies for payments, they also develop broader digital skills that are essential in today's tech-driven world. Improving mobile payment readiness helps individuals make secure and informed financial decisions, reducing their vulnerability to fraud and financial exploitation (De Luna et al., 2019). This is especially important for young adults who are just beginning to navigate the complexities of personal finance (Purohit et al., 2022).

ACKNOWLEDGEMENT (*OPTIONAL)

This innovative project is a testament to our collective effort, expertise, and passion for advancing financial literacy and digital inclusion. Thank you to each member who provided invaluable feedback and support throughout the development process.

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PID30141

Flexible Strain Sensor of Multi-wall Carbon Nanotube (MWCNT) Composite For Motion Monitoring

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ABSTRACT

Flexible strain sensors have gained significant attention in research for their impressive stretchability and sensitivity, making them ideal for applications in monitoring human movement. Despite the potential benefits, the development of such sensors presents challenges, particularly in achieving the essential characteristics of high flexibility and sensitivity needed for wearable electronics. In this work, a conductive mixture was prepared by dissolving multi-walled carbon nanotube powder in a blend of isopropanol and deionized water. To improve the adhesion of Multiwall Carbon Nanotube (MWCNT) to the Ecoflex substrate, a surface treatment process was performed. This treatment was observed to boost the conductivity of the samples when compared to those without treatment. Specifically, samples undergoing acetone surface treatment exhibited enhanced sensitivity and flexibility. The sensors treated with acetone demonstrated the highest sensitivity among the MWCNT/Ecoflex composites with increased elasticity, requiring less force to induce strain. The greatest gauge factor, indicative of sensitivity, was recorded for the MWCNT/Ecoflex sensors with toluene treatment, almost 19 times higher than that of the original samples. Meanwhile, the maximum sensitivity reported for the MWCNT/Ecoflex strain sensor was 106. The application of surface treatments thus significantly elevates the stretchability and sensitivity of the sensors, enabling their potential for flexible sensory applications.

KEYWORDS: Strain sensor, MWCNT, Ecoflex.

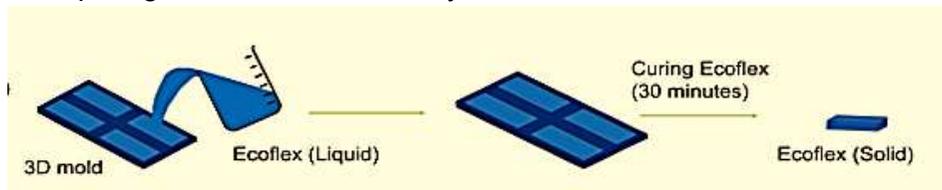
PRODUCT DESCRIPTION

The Flexible Strain Sensor, leveraging a cutting-edge composite of Multi-Wall Carbon Nanotube, is an innovative device engineered for precise motion monitoring. This sensor is designed to seamlessly integrate into wearable electronics due to its exceptional flexibility and high sensitivity, making it perfect for real-time human motion tracking and health monitoring systems (Yue et al., 2022; Kouediatouka et al., 2023; Del et al., 2023; Xue et al., 2022; Chen et al., 2023). Crafted with a composite material that incorporates MWCNT within a flexible polymer matrix, the sensor boasts a conductive network that allows it to detect minute changes in strain with high fidelity. The flexibility of the sensor ensures that it conforms comfortably to bodily movements, maintaining consistent performance even when stretched. The key feature of this Flexible Strain Sensor is its ability to provide accurate readings over a wide range of motions without compromising the user's comfort. The application of MWCNT endows the sensor with superior electrical conductivity and mechanical durability, which are critical for the long-term reliability of wearable sensors.

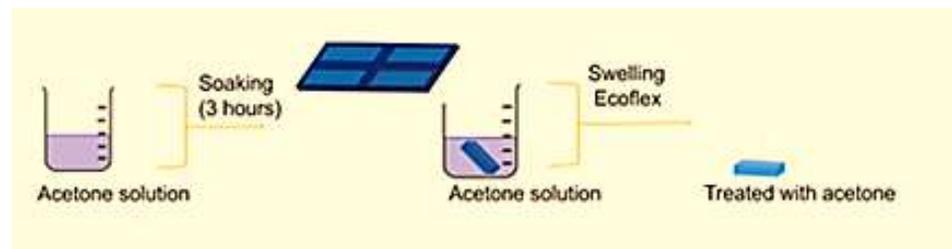
PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

The methods used in preparing the samples are summarised as follows:

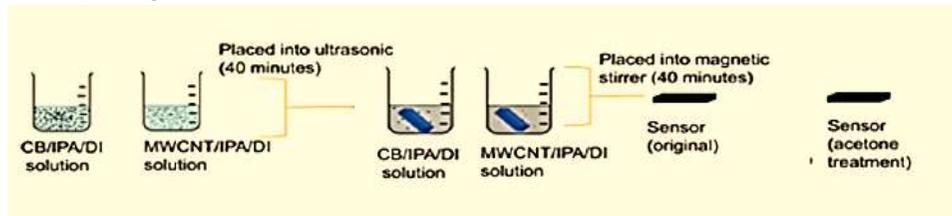
1. Preparing substrate of sensor layer



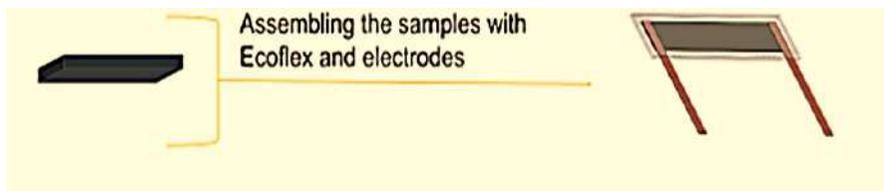
2. Preparing treatment solution



3. Preparing conductive solution



4. Preparing final prototype of wearable strain sensor



5. Final prototype



NOVELTY AND UNIQUENESS

The novelty and uniqueness of the flexible strain sensor utilising MWCNT Composite for motion monitoring lie in its advanced material design and application-specific innovations. The incorporation of MWCNTs into a flexible substrate like ecoflex creates a unique composite that exhibits superior sensitivity and durability compared to conventional materials used in strain sensors. The sensor maintains a low profile, conducive to integration into clothing or direct application on the skin, offering users a non-invasive and comfortable monitoring experience. This flexible strain sensor presents a unique combination of stretchability and sensitivity, offering significant improvements over existing technologies for motion monitoring.

BENEFIT TO MANKIND

The Flexible Strain Sensor using Multi-wall Carbon Nanotube Composite for motion monitoring offers transformative benefits to humanity. It provides accurate health monitoring, enabling early detection and improved

management of medical conditions. In rehabilitation, it allows for precise movement tracking, enhancing recovery processes. For athletes, it supports performance optimisation and injury prevention. It enhances elderly care through activity monitoring and fosters independence and safety. Additionally, it advances human-computer interaction, contributing to more immersive tech applications.

COMMERCIALIZATION POTENTIAL

The flexible strain sensor crafted with Multi-wall Carbon Nanotube Composite possesses significant commercialization potential due to its versatility across various industries. Key markets include healthcare for robot hand movement, sports technology for athlete performance tracking, and rehabilitation, where precise movement analysis is crucial. Opportunities also exist in occupational safety, contributing to the reduction of workplace injuries through ergonomic assessments. The burgeoning fields of smart clothing, immersive gaming, virtual reality, and responsive prosthetics also stand to benefit from the sensor's advanced capabilities. Its adaptability, combined with the current trend towards wearable and IoT devices, positions it well for market success.

CONCLUSION

The flexible strain sensor using Multi-wall Carbon Nanotube Composite has demonstrated significant advances in motion tracking, showcasing exceptional sensitivity and operational flexibility. Its success highlights the potential for improved human movement analysis across various sectors, such as healthcare, sports, and workplace ergonomics. The sensor's integration into wearable technology could revolutionise personal health monitoring and athletic training. Future recommendations include refining the sensor's design for mass production, improving data analytics for user interfaces, and expanding its application scope. Continued R&D will also be essential for enhancing precision and reliability, solidifying its role in the future of motion detection and analysis technologies.

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PID30151

Analysis Simulation Data Time Series of Tourism Using Pre-Processing Method and SVM Model

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ABSTRACT

Simulation is only useful when it is reliable. From the time series data perspective, this means real world effects can be reproduced sufficiently. We performed a set of 20 tourist arrival data simulations in Brunei and Thailand that tested all combinations of wavelet support vector machine (WSVM), and empirical mode decomposition with wavelet support vector machine (EMD-WSVM). The simulation dataset used in this study were generated from the best SARIMA model of each of the real data. We compare these time series data to those generated from a set of baseline simulations using SARIMA (3,1,3) (3,1,1) [12] for Brunei and SARIMA (3,2,3) (1,1,1) [12] for Thailand based on three different statistical techniques that have previously been used to determine the performance of all measurements. We found that the proposed method of pre-processing data approach using the decomposition ensemble model and wavelet method can enhance the forecasting accuracy of the SVM model when applied to tourist arrivals data for both countries.

KEYWORDS: Empirical Mode Decomposition With Wavelet Support Vector Machine (EMD-WSVM), Wavelet Support Vector Machine (WSVM), Support Vector Machine (SVM)

PRODUCT DESCRIPTION

Proposed EMD-WSVM Model

Time series of tourist arrivals are known for its presence of non- stationary and non- linearity in the data. Despite being capable of handling nonlinearity, the SVM model fails to handle non-stationarity for short term problems (Fan & Tang, 2013).

A combination of EMD, wavelet and the SVM model will provide an effective way to improve the prediction accuracy for nonlinear and non-stationary time series. Figure 1 and Figure 2 display the architecture of the hybrid wavelet and hybrid EMD. Based on this, it influenced the implementation procedure for simulation tourist arrival prediction using hybrid EMD-WSVM model. It comprises three stages, which are illustrated by a flowchart of general stages involved in the model as shown in Figure 3.

The following Figure 3 describes the above procedure, EMD-WSVM forecasting method that involves three stages:

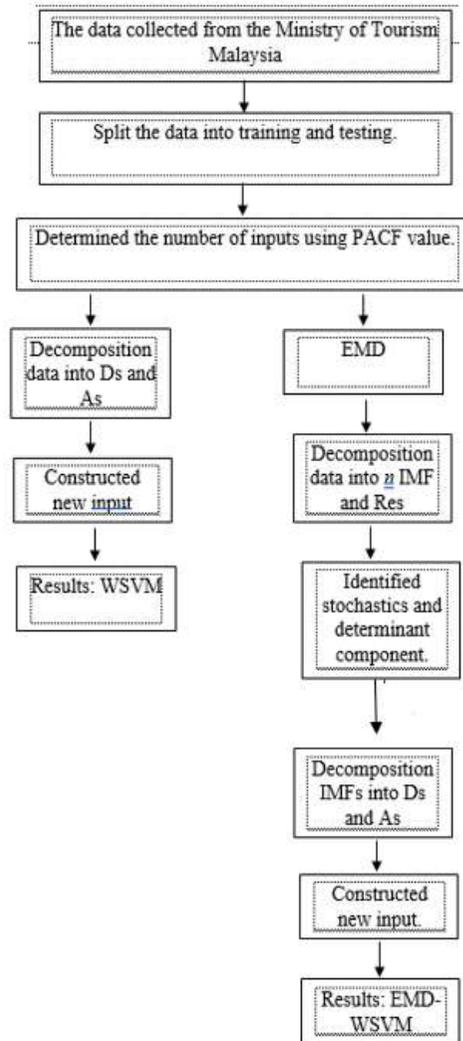
(a) Stage I – Decomposition EMD. Simulation data tourist arrivals data time series were decomposed into n -IMF components and one residue, using EMD technique. The extracted IMF components represent a range of high to low frequencies, and reveal various periodic patterns of tourist arrivals where each IMF component represents the local characteristic time scale by itself (Shabri, 2015a). Then, the IMF and residual are identified as stochastics or deterministic components based on deterministic components otherwise stochastics (Aamir and Shabri, 2018). The average mutual information (AMI) plot is also used for visual stochastic and deterministic components. The stochastic components are dealt individually and all deterministic IMFs are summed to make another component.

(b) Stage II – Decomposition Wavelet. In stage two, the IMF stochastics and deterministic component decomposed into Discrete Wavelet Transformation (DWT). DWT was chosen to be used due to its simplicity and ability to compute results faster (Pandhiani & Shabri, 2015). In the wavelet analysis two, the original signal time series is broken into low frequency which is presented by a scale of approximate mode and the two resolution levels of high frequency.

(c) Stage III – Forecasting Stage. In stage three, the SVM forecasting technique was employed on the chosen signals. The new dataset is further input into the SVM forecasting technique model accordingly and compared with single model SVM using several performance measurements.

**PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/
SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS**

METHODOLOGY



The idea to develop model EMD-WSVM

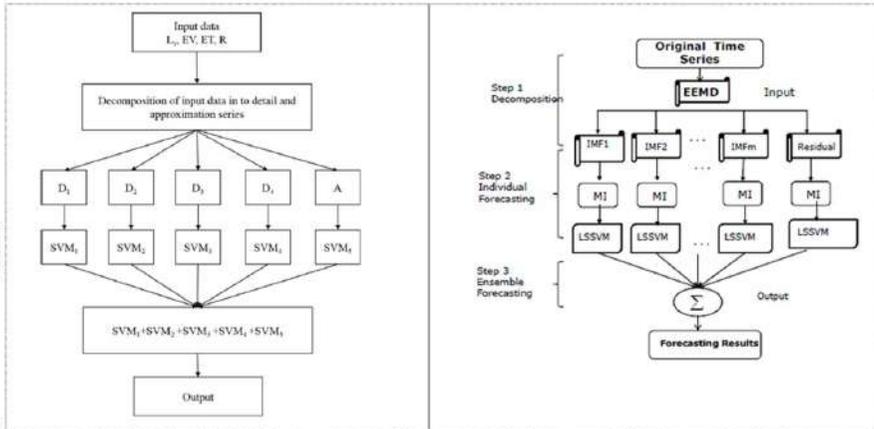


Figure 1 Architecture of hybrid wavelet support vector machine (WA-SVM) model (Yadav and Eliza, 2017).

Figure 2 The hybrid EEMD-LSSVM model (Shabri, 2016)

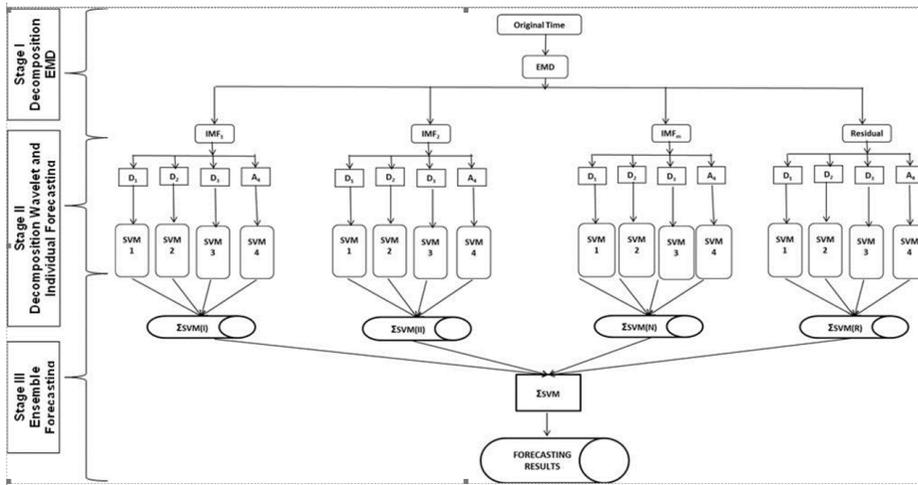


Figure 3. A flow chart of new hybrid EMD-WSVM model

NOVELTY AND UNIQUENESS

BENEFIT TO MANKIND

This research is expected to contribute towards the need of producing an optimal architecture of the model, which is more flexible than before, as well as to improve the model's prediction accuracy. The obtained results are expected to demonstrate higher accuracy and superb predictive capability in comparison to some previous models available in the literature.

Predicting the future of tourist arrivals from Brunei and Thailand countries is very important where heavy tourist arrivals can cause problems such as burden for sightseeing spots, airports, and hotels. The study reviews the effectiveness of the proposed model as an alternative tool in forecasting. This research attempts to study the suitability of the data decomposition technique of EMD and wavelet method where the original data are decomposed into several signals. The decomposition data and the newly obtained data are used to forecast the future value of the Brunei and Thailand countries tourist arrivals.

As this study will provide the information of the future tourist arrivals from Brunei and Thailand countries based on past time series data, it is required for the proposed model of EMD-WSVM to forecast the monthly Brunei and Thailand countries tourist arrivals to Malaysia in order to produce a better result. This will provide a better understanding of the trend of tourist arrivals from Brunei and Thailand to Malaysia.

COMMERCIALIZATION POTENTIAL

EMD_WSVM model an effective tool for tourist arrivals time series forecasting.

EMD_WSVM model can use for STATISTICIAN DEPARTMENT AND TOURISM MINISTRY DEPARTMENT.

CONCLUSION

A simulation has been conducted to measure how much EMD reduces the complexity of WSVM model. The simulation results show that model EMD-WSVM reduced the complexity of WSVM model for Singapore and Indonesia countries.

The results also indicated that EMD-WSVM model proven as an efficient and robust model due to its superior performance compared WSVM model for all real dataset and simulation data.

ACKNOWLEDGEMENT (*OPTIONAL)

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PID30171

Waiter Robot Based on Artificial Intelligence

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ABSTRACT

This research presents a smart waiter robot based on an artificial intelligence system by using Deep Neural Network (DNN). The method was used to measure the accuracy of the performance system when the robot responds to the human voice besides to control the movement of the robot using hand gesture movement. The system was trained by DNN with multiple input and output layers. This system was developed by deploying Raspberry PI4, Arduino Nano, and RF modules. Significant validation system performance was achieved when the system performance obtained accuracy of almost 100% with 0.00583 loss. This feature can be used to promote advanced technology for the food and beverage industry.

KEYWORDS: Artificial Intelligent, Deep Neural Network, waiter robot, raspberry PI4, Arduino

PRODUCT DESCRIPTION

The main objective of this work is to optimise and predict the response of a human's voice so that the robot could receive accurate information from the user and respond back with low latency (high response). The functional waiter bot system used in this work is exercised using AI based on Deep Neural network. The robot will receive the order from customers; subsequently, the instruction will be optimised using the DNN model, which is available in Python (loaded on a Raspberry board) to improve the accuracy and performance response of the human voice. The four hidden layers are used to compare between the trained and untrained voice data. Arduino was used as the software development for the waiter bot system. Meanwhile, the performance optimisation is performed using Python.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

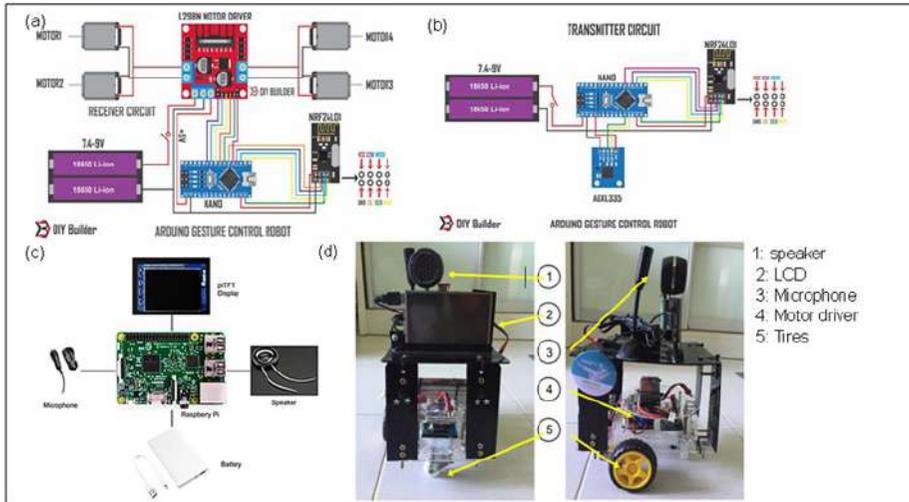


Figure 1. Schematic diagram for (a) receiver circuitry, (b) transmitter circuitry, (c) Raspberry Pi interface and (d) final prototype design.

NOVELTY AND UNIQUENESS

- The robot responds accurately to the human/customer voice.
- The accuracy of robot's performance is enhanced using Deep Neural Network (DNN).
- Communication system that supports elder-friendly technology.

BENEFIT TO MANKIND

Can execute several tasks, from taking the order, serving food and drinks, responding to the customer's voice, and producing the final bill to the customer.

Chef and cashier can directly access the order list using HTTP in seconds. This feature can be used to promote modern technology in the food and beverage business.

COMMERCIALIZATION POTENTIAL

- Increase marketing by promoting unique services.
- Gain customers by providing satisfactory services.
- Reduce the overhead cost by significantly decreasing the amount of work for individual waiter staff.

CONCLUSION

A waiter bot was successfully designed and functions as desired. The robot's performance responses were trained using a Deep Neural Network with 40 inputs and 8 batches size per step. The results demonstrated that DNN could increase the robot's performance response. Significant validation system performance was reached when the system achieved an accuracy of around 100% with a loss of 0.00583. Overall, the robot's movement and speed are stable, and the data between expected and observed values are nearly identical, with only a 1% difference.

ACKNOWLEDGEMENT (*OPTIONAL)

This work is supported by the Fundamental Research Grant Scheme (FRGS/1/2018/TK04/UNIKL/02/7) under the Ministry of Higher Education Malaysia (MOHE).

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PID30181

Hydrogen Fuel Cell Electric Vehicle

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ABSTRACT

The current energy source for a typical transportation vehicle is mainly non-renewable energy such as fossil fuel. The combustion of fossil fuel in the engine produces carbon emissions into the air. This is called greenhouse gas (GHG) emission. High amounts of GHG in the atmosphere will result in an advanced greenhouse effect that will result in higher global temperature every oncoming year. The solution to reduce GHG released into the atmosphere is by reducing the usage of combustion engine vehicles on the road. Therefore, an electric vehicle (EV) is the ideal type of transportation as it emits zero-carbon emission. However, a typical EV is too expensive, takes too long to recharge and relies on lithium ion for the battery structure where lithium is a non-renewable source and can deplete in the future. Hence, a hydrogen fuel cell is a device that exploits the energy transfused between oxygen and hydrogen molecules into water and electrochemical energy that could directly be connected to a load for power consumption. Since oxygen and hydrogen are renewable and abundant resources on earth, this project focuses on the study of utilizing a hydrogen fuel cell as an energy source for a clean and hybrid transportation vehicle. Furthermore, this project developed a remote control (RC) car that uses the hydrogen fuel cell technology as a hybrid to drive the motor of the car by supplying hydrogen and oxygen to the fuel cell. By accomplishing the development of this prototype, it simulated the possibility of using hydrogen fuel cell technology to power a real hybrid passenger vehicle achievable in real life applications.

KEYWORDS: Renewable energy, Automation, Hydrogen Fuel Cell, Remote Control Car

PRODUCT DESCRIPTION

The main contributor to carbon emission worldwide is the transportation sector due to the fuel combustion that is used to power the engines of vehicles. This sector has proven to be the highest contributor to the greenhouse effect in scales of metric tons globally and this reading will only increase annually. In addition, the vigorous demand for natural energy sources such as fossil fuel to power every-day transportation vehicles will result in various issues for short-term and long-term periods such as sea pollution from oil rig leakages and the depletion of the natural energy source mentioned.

A solution to this issue is to use a plug-in electric vehicle (EV) that emits minimal or non-carbon footprint value. This particular project is to introduce an alternative sustainable power source for a vehicle which is the hydrogen fuel cell hybrid technology which eliminates the need of using harmful energy sources such as fossil fuel and toxic materials like battery acid in a vehicle. Therefore, the prototype which was named Hydrogen Fuel Cell Electric Vehicle was developed.

The prototype used remote control for transmitting the direction signals to itself. The syringe is used for collecting the hydrogen gas from the depository and refuelling the hydrogen into the prototype. The mobile device is used for IoT controlling and monitoring the status of the prototype.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

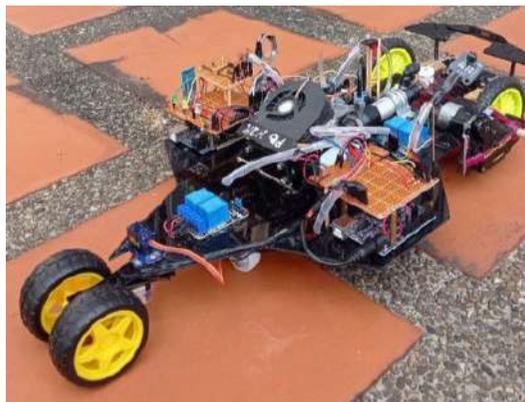


Figure 1. Hydrogen Fuel Cell Electric Vehicle prototype



Figure 2. External apparatus

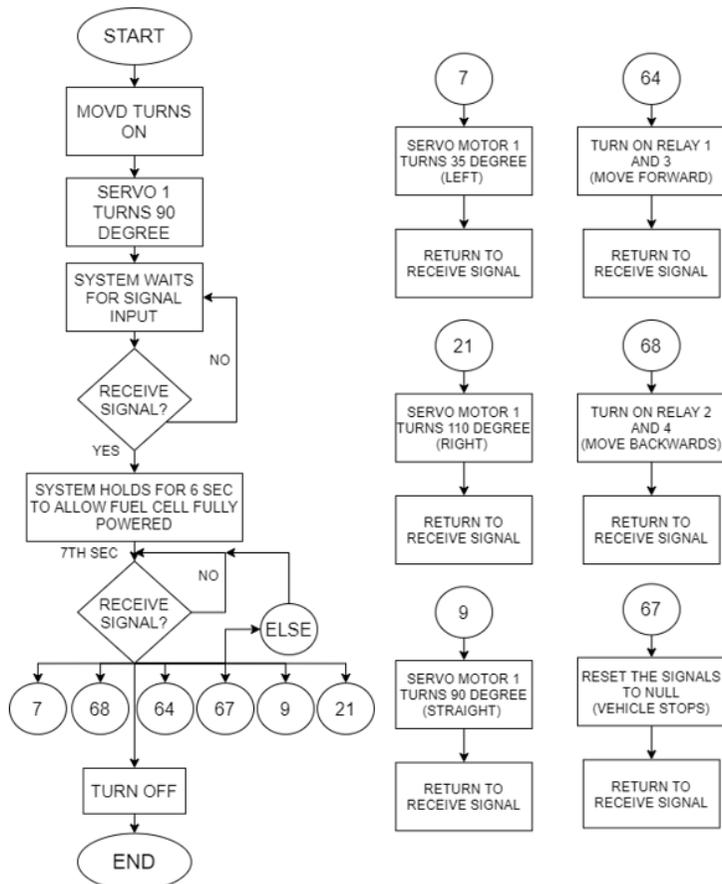


Figure 3. Moving driver system flowchart

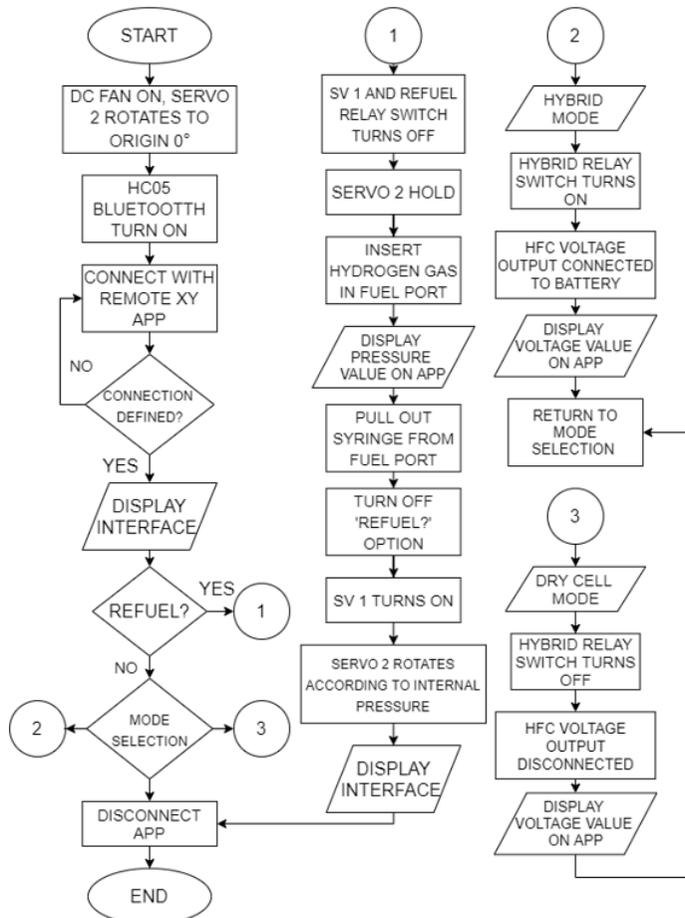


Figure 4. Communication driver system flowchart

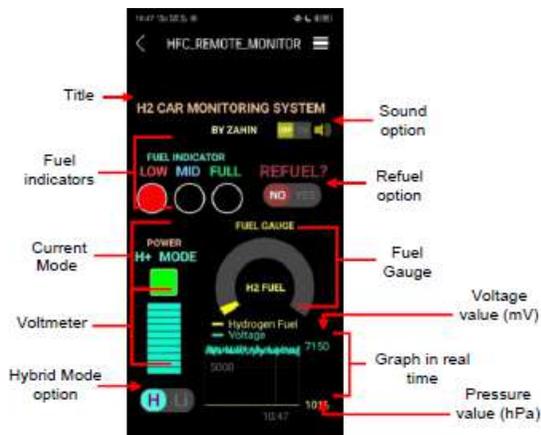


Figure 5: Remote control of the prototype

Table 1. System Condition Status for the prototype

Description of Condition	App Status
<p><u>Condition 1</u> When the hydrogen pressure is below 1260 hPa, the indicator will turn on LED Red indicating low fuel. It will also turn on the warning alarm if users select the turn on sound.</p>	
<p><u>Condition 2</u> When the pressure is more than 1260 hPa and below 1500 hPa, the indicator will turn blue for medium fuel</p>	
<p><u>Condition 3</u> When the pressure is more than 1500 hPa, the indicator will turn green showing that the fuel is full.</p>	
<p><u>Condition 4</u> At the start of the program, the Hybrid mode will always turn on. This is relative to the objective. However, when users select the battery mode, it will turn off the relay switch and change to battery powered only. The app will also display the current mode based on the users' selections.</p>	
<p><u>Condition 5</u> The Refuel option is always off. If the user wants to refuel and select the 'YES' option, the Refuel relay switch will turn off to cut off the hydrogen from entering the fuel cell and open the fueling port gate. The high-torque servo motor will also turn to its original state which is 0°. When the user selected 'No' again, the relay will turn on and the servo will control the internal pressure as coded.</p>	

Condition 6

This feature enables the user to turn on or off the warning alarm sound. The sound icon will start blinking upon selecting on. The specific sound ID from the app library for Condition 1 to 3 are as follows:

- Sound ID: 1023 (FLUORINE)
- Sound ID: 1031 (MEROPE)
- Sound ID: 1034 (MOONBEAM)

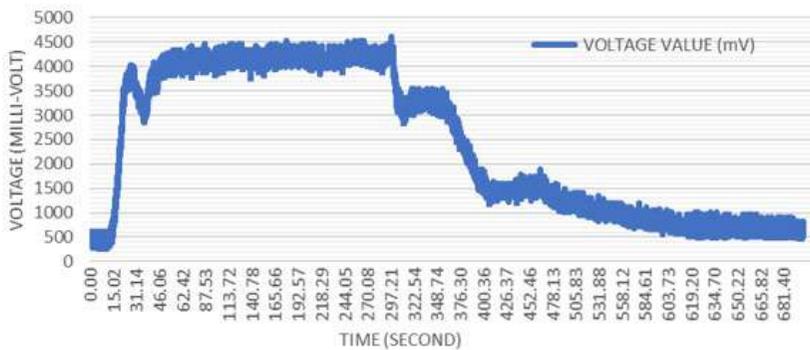


Figure 6. Fuel cell voltage production (mV) against Time (s)

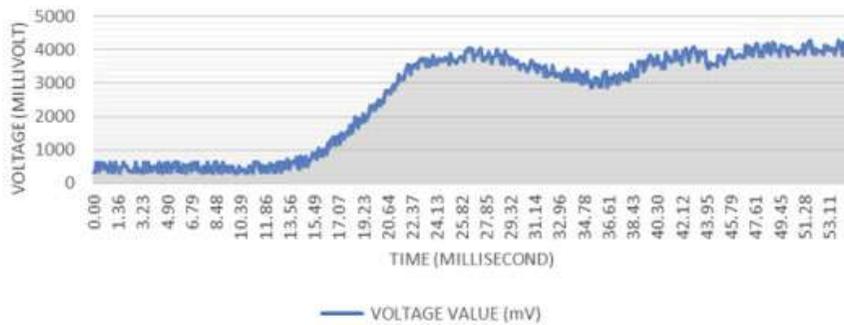


Figure 7. Fuel cell voltage (mV) transition

NOVELTY AND UNIQUENESS

This project is beneficial in the instrumentation and control engineering field. Various instruments such as hydrogen gas sensor, DC brushed motor, solenoid valve, relays, and ATMEGA Arduino Uno R3 as the controller were used.

The beneficial and capabilities of the proton electrolyte membrane (PEM) hydrogen fuel cell is also noted in this project as well as for future applications. The equipment related in developing this project are fully utilized to maximum conditions and used as a reference in making more reliable sensors that can be used in any environment or condition.

Moreover, the project portrays the capabilities of thermoelectric technology in terms of energy efficiency and ionization process, which can be further developed and improved in its efficiency in electrochemical energy between the junction of the electrode modules.

BENEFIT TO MANKIND

This project can contribute significantly to society as the hydrogen-fuel cell is becoming a more popular form of renewable energy. The global market value justifies the need for a more efficient and better application of hydrogen power. Thus, a vehicle that applies the method derived from the result of this study will be able to produce a more efficient and reliable results.

This project is also beneficial in current situations where society needs a more robust and reliable device that is efficient and not to mention cleaner in power consumption.

COMMERCIALIZATION POTENTIAL

According to the Blueprint for Fuel Cell Industries in Malaysia (2017), fuel cell applications are mainly focused on power generation and supply for vehicles such as transportation, materials handling, military, and also unmanned vehicles. The development of this project in its entirety is to introduce an alternative sustainable power source for a hybrid electric vehicle which is hydrogen fuel cell technology which eliminates the need of using harmful and non-renewable energy source such as fossil fuel in a vehicle. By accomplishing the development of this prototype, the possibility of using hydrogen fuel cell technology to power a real hybrid passenger vehicle is proven achievable in real life applications.

CONCLUSION

The developed prototype resulted for the hybrid runtime which shows an astounding 100% runtime with 96.94% battery power remaining for hybrid mode compared to 55.48 % of runtime and with only 9% remaining power compared to the battery-powered mode. Therefore, the hybrid mode boasts an increment of 44.52% of runtime and 87.94 % battery power remaining compared to the battery-powered mode. Hence, by addressing these data, the main objective for this project is proven achieved.

In conclusion, the development of this project in its entirety is to introduce an alternative sustainable power source for a hybrid electric vehicle which is the hydrogen fuel cell technology which eliminates the need of using harmful and non-renewable energy sources such as fossil fuel in a vehicle. By accomplishing the development of this prototype, the possibility of using hydrogen fuel cell technology to power a real hybrid passenger vehicle is proven achievable in real life applications.

ACKNOWLEDGEMENT (*OPTIONAL)

The authors would like to thank Universiti Kuala Lumpur, Malaysian Institute of Industrial Technology (UniKL MITEC), for providing a conducive environment and technical support for this project.

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PID30191

Development of Sensor-based System for Assessment of Surgical Skill using EEG and IOT Approach

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ABSTRACT

This project aims to develop an objective assessment system to accurately measure surgical skills. To test the system's functionality, three participants were involved in an experiment where suturing was chosen as the assessment task to simulate a real surgical procedure. The study utilized several sensors: a pulse sensor to monitor heart rate, a force sensor to measure applied force, and a gyroscope to track wrist movements. These sensors were connected to an Arduino Mega microcontroller, with an ESP8266 module providing internet connectivity. Data from the sensors were updated using a graphical user interface from the Blynk application on a smartphone and PLX-DAQ software on a computer. Additionally, an EMOTIVE EPOC EEG device measures brain activity to indicate focus levels, with the data displayed through the EMOTIV Xavier control panel. The results demonstrated that the system could generate measurement data reflecting various parameters of surgical skill. These parameters are displayed in real-time, offering a clear assessment of the participants' performance. This innovative approach introduces a new method for grading the performance of trainees, ultimately aiming to produce highly skilled surgeons.

KEYWORDS: Assessment surgical skill, Internet of Things (IOT), sensors, electroencephalogram (EEG)

PRODUCT DESCRIPTION

This project was developed using a combination of various hardware and software components. Figure 1 provides an overview of the development of the surgical assessment system. The hardware used in this project

included an Arduino Mega, an ESP8266 module, a heart rate sensor, a force sensor, an accelerometer, and the EMOTIVE EPOC EEG device. The software utilized included PLX-DAQ, Blynk, Arduino IDE, and the EMOTIV Xavier control panel. The Arduino Mega was used to control the system's input and output signals, while the ESP8266 module enabled wireless data transmission for IoT applications. The Force Sensitive Resistor (FSR402) was used on Crile forceps and fake skin to measure the applied force during suturing. The Accelerometer Sensor Module (GY-521) recorded hand movements on the X, Y, and Z axes and the Heart-rate Sensor Module (XD-58C) measured real-time pulse readings to assess the relationship between heart rate and stress. The EMOTIV EPOC+ EEG monitored brain activity to identify focus levels. Data integration was done via Arduino IDE, and PLX-DAQ displayed performance graphs using data transmitted through ESP8266 and Blynk.

Figure 2 depicts the flowchart of the system, whilst Figure 3 shows the circuit diagram with sensors connected to the Arduino Mega board. The heart rate and force sensors provide analog data supported by the analog pin, while the gyroscope sensor connects to the serial port via SCA and SCL. All sensors and the ESP8266 are powered by a 5V DC supply. The toggle button functions as a Start/Pause control, pausing data collection if sudden movement occurs. An LED indicator lights up when data is being collected and turns off when the toggle button is off. A 10 k Ω resistor limits the force sensor's range from 0 to 13 N.

For the experiment setup, participants were equipped with sensors: pulse sensors on their middle fingers, force sensors on their index fingers, gyroscopes wrapped around their palms with hand bands, and EMOTIV EEG devices on their heads. Figure 4 shows the sensor connection to the participant's hand. Moreover, the assessment was divided into three stages, in which each stage requires participants to complete it within five (5) minutes.

Stage 1:

Initialization: Participants watched a video of a suturing task and followed along, serving as an introductory familiarization stage since they had no prior suturing experience.

Stage 2:

Training: Participants repeated the task while watching the video.

Stage 3:

Final: Participants performed the task without the video and were encouraged to achieve their best results.

The system was tested by three (3) male students completing the suturing task. Figure 5 shows the PLX-GUI application, whilst Figure 6 depicts the EMOTIV Xavier control panel. In addition, Figure 7 shows the EEG result using the Emotive Xavier control panel and Figure 8 shows the live data extracted using PLX-DAQ software.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

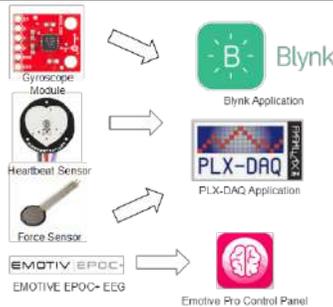


Figure 1. Project overview

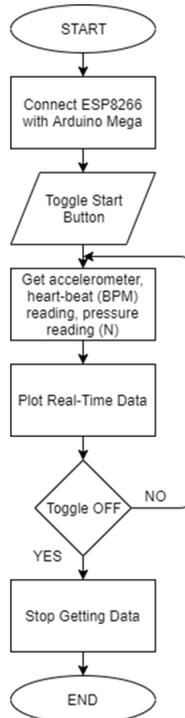


Figure 2. System flowchart

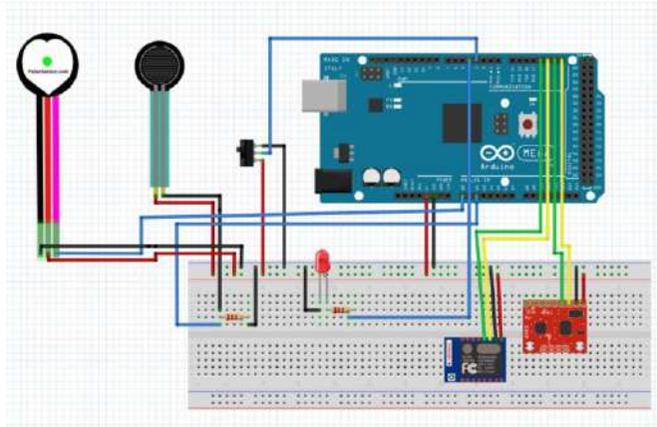


Figure 3. Circuit diagram



Figure 4. Sensors connected to the participant's hand

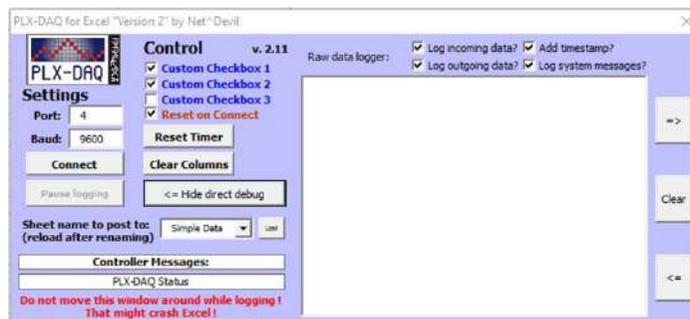


Figure 5. PLX-GUI application

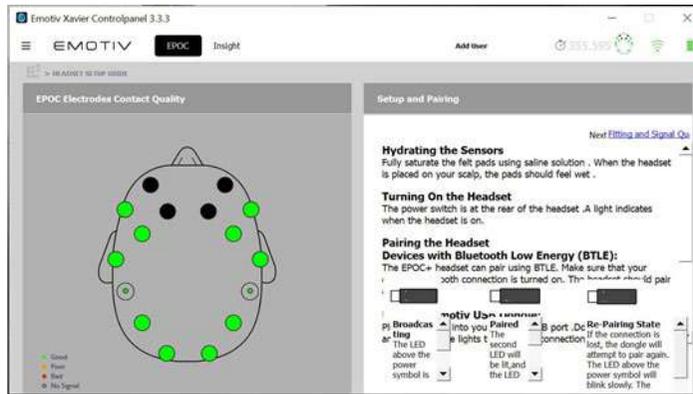


Figure 6. EMOTIV Xavier control panel



Figure 7. EEG results extracted from the Emotiv Xavier system

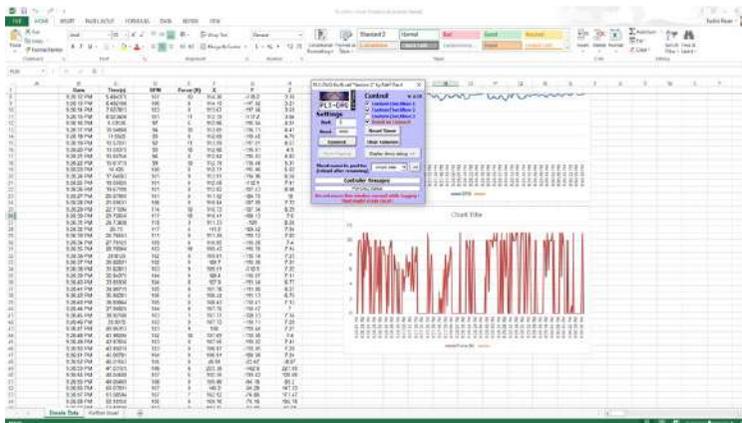


Figure 8. PLX-DAQ live plotting graph

NOVELTY AND UNIQUENESS

The novelty of this project is the prototype was developed to closely mimic real-time applications. Silicone was used to imitate biological skin due to its similar characteristics, making it an ideal material choice. Wrist movement data, collected from the accelerometer, indicated the smoothness of hand movements. The force sensor attached to the forceps provided reliable data on the force applied to the skin, which is crucial for assessing suturing technique. Excessive force could result in unintended skin tears. In addition, the IoT integration in this system offers a user-friendly monitoring interface, allowing participants to effectively track their performance.

BENEFIT TO MANKIND

The system was successfully tested and generated several parameters for assessing surgical tasks such as suturing. These parameters included the force applied using a force-sensitive resistor, the participant's heart rate using a heart-rate sensor module, wrist movements using a gyroscope, and focus level using EEG. Ultimately, implementing this system can significantly reduce and potentially eliminate the need for animals and cadavers in medical assessments.

COMMERCIALIZATION POTENTIAL

There is a great deal of marketing potential for the project. Specialising in surgical training and healthcare technology, it targets a rising global market and meets important demands in medical education and training, professional certification, and patient safety. By combining cutting-edge EEG and IoT connectivity with objective, real-time assessments and adaptable training programmes, the system gives users a competitive edge. The business model consists of premium data analytics, licensing, subscriptions, direct sales, and consulting services. Market expansion is facilitated by scalability, which can be achieved through modular design and flexible infrastructure. Recurring revenue streams provide the possibility of large profit margins even with expensive initial development expenditures. Adherence to regulatory agencies such as the FDA, CE marking, and data protection statutes like GDPR and HIPAA is essential. An efficient patent, trade secret, and licensing agreement-based intellectual property strategy.

CONCLUSION

In conclusion, this project was designed to provide a sensor-based assessment system for improving and analyzing participants' movements

and variables during suturing tasks. The system can measure and log the force applied in Newtons using a force-sensitive resistor, monitor the participant's heart rate in beats per minute (BPM) with a heart-rate sensor module, and track wrist orientation using a gyroscope. Additionally, focus levels can be identified and observed with an EEG. The project findings revealed that the force sensor provides accurate measurements over a wide range of forces and the heart rate sensor is a cost-effective tool for determining heart rate. The system of this project is effective and has the potential for future use. Additionally, the use of artificial silicon skin and testing samples reduces costs and minimizes the impact of unseen variables during suture assessment.

ACKNOWLEDGEMENT (*OPTIONAL)

The authors would like to thank the Universiti Kuala Lumpur Malaysian Institute of Industrial Technology (UniKL MITEC) and Fundamental Research Grant Scheme (FRGS) for providing facilities and funding for this project.

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PID30202

RehabServE Value Chain

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ABSTRACT

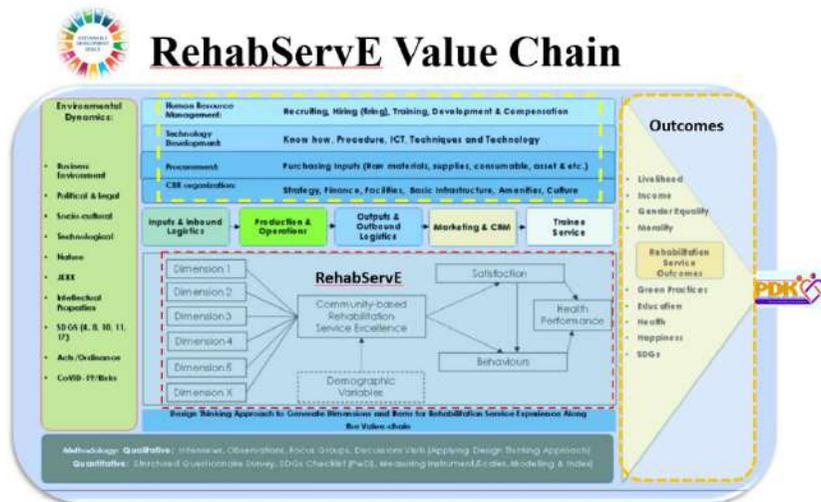
Co-creating, delivering, controlling, and sustaining excellent service for organisations (especially nongovernmental organisations) are very challenging. Leaders and managers are in search of solutions on how things can be understood and evaluated effectively. The related systems and processes are yet to be comprehensively and empirically identified. Many others have been wondering about values that can be co-created with the right stakeholders, what to be emphasised and controlled accordingly, how to make input-output connectivity, and how performance can be sustainable. Having a valid and reliable measurement is essential, especially when serving people with special needs. RehabServE (Rehabilitation Service Excellence) Value Chain can help to inclusively measure and manage the community-based rehabilitation (CBR) centres for service excellence to care for the employees, parents/guardians, and persons with disabilities (PwD). RehabServE scale and system have been copyrighted and are ready to be commercialised. Individuals or rehabilitation centres worldwide can buy this new product. CBR centres in Malaysia have benefited from this unique and comprehensive RehabServE Value Chain for sustainability.

KEYWORDS: Rehabilitation service excellence, Value chain, PwD

PRODUCT DESCRIPTION

RehabServE is a valid and reliable multi-item measurement to serve people with special needs. RehabServE (Rehabilitation Service Excellence) Value Chain is a comprehensive framework with measurement as the focus that can help to inclusively measure and manage the community-based rehabilitation (CBR) centres for service excellence to care for the employees, parents/guardians, and PwD. RehabServE scale and system have been copyrighted and are ready to be commercialised. Individuals or rehabilitation centres worldwide can buy this new product. CBR centres in Malaysia have benefited from this unique and comprehensive RehabServE Value Chain for sustainability.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



NOVELTY AND UNIQUENESS

The measurement-driven RehabServE Value Chain framework is new for NGOs to serve persons with disabilities (PwD). It comprehensively encompasses the supply-side, production, and demand-side elements, as well as the environmental variables for inclusive service value management for sustainability. The measurement is valid and reliable. The RehabServE measurement consists of 6 dimensions (with 38 items). The RehabServE research and measurement system aims to help the CBR centres do their self-assessments based on the relevant rating scale (1-7). RehabServE was found to have a positive effect on the parents'/ guardians' satisfaction

and personal health performance of the PwD. The system is copyrighted and ready to be commercialised.

BENEFIT TO MANKIND

The RehabServE Value Chain and the measurement system can help the CBR centres do their self-assessments based on the relevant rating scale (1-7). RehabServE was found to have a positive effect on the parents'/ guardians' satisfaction and personal health performance of the PwD.

COMMERCIALIZATION POTENTIAL

RehabServE was found to have a positive effect on the parents'/ guardians' satisfaction and personal health performance of the PwD. The RehabServE Scale and RehabServE System are copyrighted and ready to be commercialised. Performance management with the RehabServE Value Chain will be a useful training and evaluation tool to be offered to the centres locally and/or internationally at the proposed price of RM1,000 per package.

CONCLUSION

RehaServE Value Chain is an innovation project developed using empirical research in Malaysia. It will benefit the CBR Centres, parents/ guardians, and their PwD for a better quality of life. The centres are positive about this innovation and willing to use it.

ACKNOWLEDGEMENT (*OPTIONAL)

We thank the support offered by Universiti Teknologi MARA (UiTM) and the management of Universiti Teknologi MARA Sarawak Branch. Thanks to the participants of the Focus Group Discussions and survey respondents for their kind assistance. This research is supported by the Fundamental Research Grant Scheme (FRGS) of the Malaysian Ministry of Higher Education with reference numbers FRGS/1/2022/SS02/UiTM/01/1 and RMC file no. 600-RMC/FRGS 5/3 (014/2022).

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PID30211

AquiSpec: Leading the Way in *Aquilaria* Oil Identification with K-NN Algorithm

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ABSTRACT

AquiSpec presents an innovative solution for precise and efficient identification of *Aquilaria* oil species, focusing on four key species namely *Aquilaria beccariana*, *Aquilaria malaccensis*, *Aquilaria crassna*, and *Aquilaria subintegra*. By integrating advanced analytical techniques such as Gas Chromatography-Mass Spectrometry (GC-MS) and Gas Chromatography-Flame Ionization Detector (GC-FID) with cutting-edge technology, AquiSpec streamlines the analysis process while maintaining high levels of accuracy. Pre-processing data from four significant compounds, namely dihydro- β -agarofuran (b), δ -guaiene (c), 10-epi- γ -eudesmol (d), and γ -eudesmol (e), are referred to by their respective acronyms. AquiSpec utilizes the K-Nearest Neighbors (K-NN) algorithm to ensure that only the most relevant chemical compounds are considered in the classification process, reducing computational overhead and improving efficiency. The service offers user-friendly interfaces and detailed analysis reports, making it accessible to researchers, producers, and quality control laboratories in the *Aquilaria* oil industry. AquiSpec's impact extends beyond its technical capabilities, enhancing trust and confidence in *Aquilaria* oil products, and supporting sustainable practices and ethical sourcing.

KEYWORDS: species identification, *Aquilaria* oil species, GC-MS, GC-FID, K-NN algorithm, chemical compounds

PRODUCT DESCRIPTION

AquiSpec offers precise and reliable analysis to ensure the quality and authenticity of various *Aquilaria* oil species, including *Aquilaria beccariana*, *Aquilaria malaccensis*, *Aquilaria crassna*, and *Aquilaria subintegra*. Utilizing advanced GC-MS and GC-FID techniques, the service identifies significant chemical compounds and applies rigorous data pre-processing to ensure accurate results (Mohd Yusoff et al., 2024). This innovative approach incorporates a K-Nearest Neighbour (K-NN) model to analyze relationships between chemical compounds and species, delivering robust and reliable classification. Detailed, user-friendly reports provide clear analysis results, supported by comprehensive performance metrics such as accuracy, sensitivity, precision, and specificity (Mohd Amidon et al., 2023).

Ideal for researchers, producers, and quality control laboratories in the *Aquilaria* oil industry, this service enables verification of species and maintenance of product integrity. Researchers could benefit from accurate data for scientific studies, while producers will be able to verify the authenticity and quality of their products. Quality control laboratories can ensure market products meet the highest standards (Abd Latib et al., 2022). This method supports various applications, including scientific research, production verification, and market quality control, offering high accuracy and fast turnaround times at competitive prices (Pandey et al., 2017).

AquiSpec service introduces a cutting-edge service for precise species identification in *Aquilaria* oil production and research. Advanced techniques ensure unparalleled accuracy, supported by clear analysis reports and dedicated customer assistance. This product is dedicated to promoting transparency and maintaining quality standards in the market, academic research, industrial production, and quality assurance needs.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

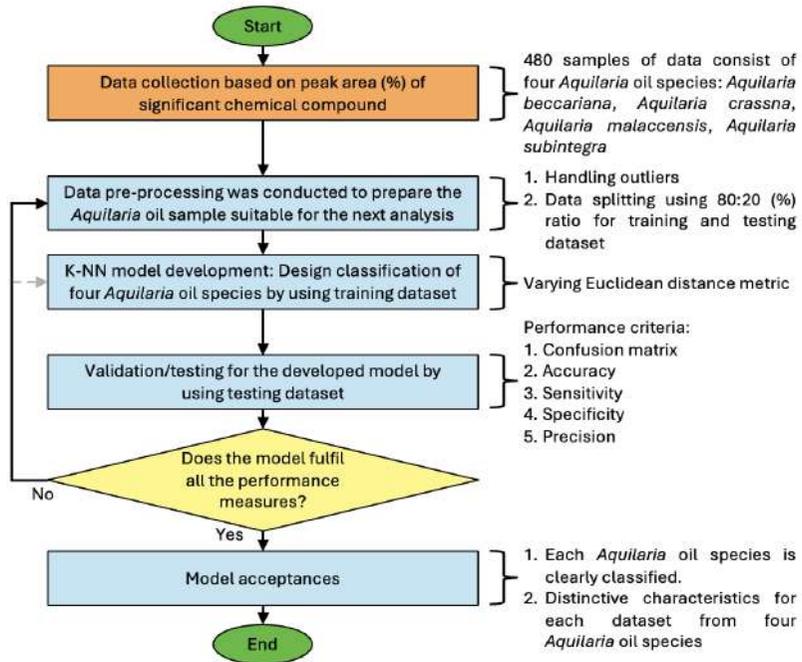


Figure 1. Flowchart of K-NN model development

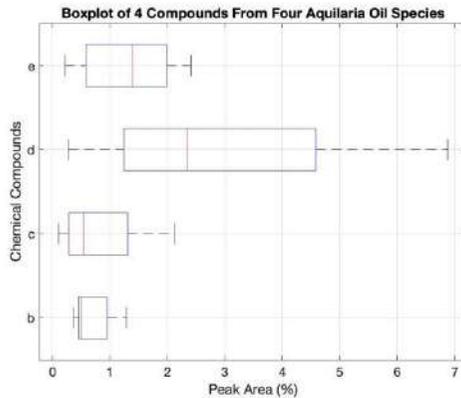


Figure 2. The boxplot of four significant compounds from four *Aquilaria* oil species

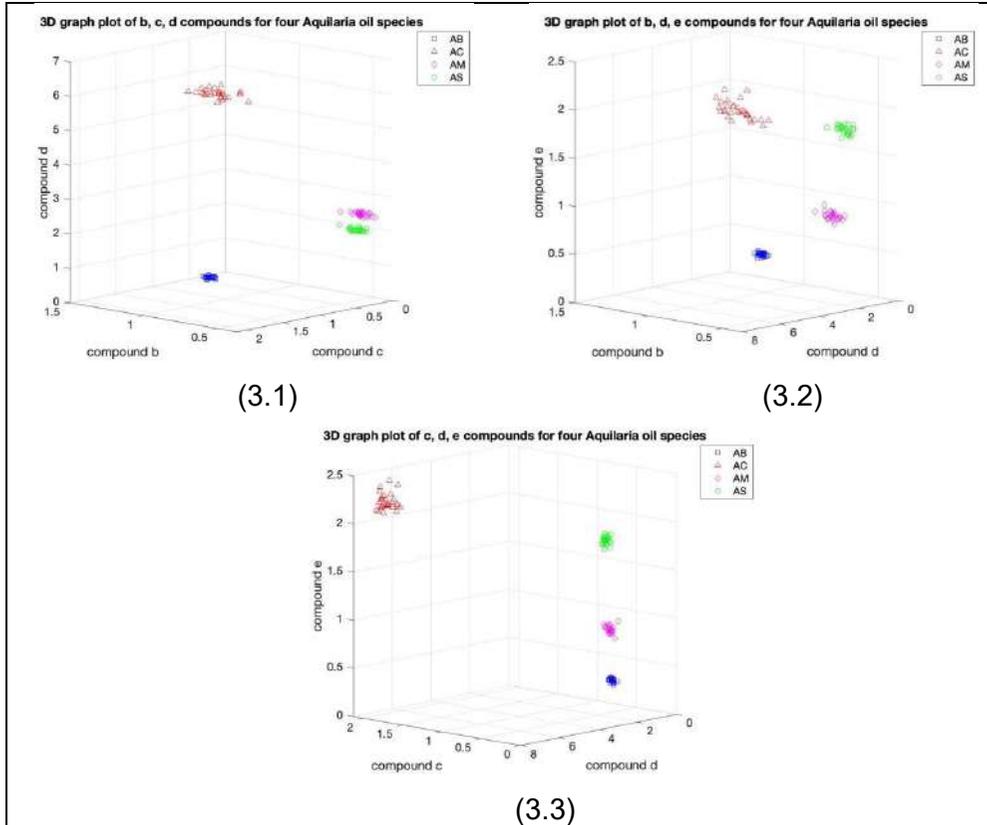


Figure 3. The 3-Dimension graphs of four *Aquilaria* oil species based on b, c, d (3.1), b, d, e (3.2), c, d, e (3.3) compounds

Confusion Matrix - Training Data

Output Class	1	2	3	4	
1	24 25.0%	0 0.0%	0 0.0%	0 0.0%	100% 0.0%
2	0 0.0%	27 28.1%	0 0.0%	0 0.0%	100% 0.0%
3	0 0.0%	0 0.0%	24 25.0%	0 0.0%	100% 0.0%
4	0 0.0%	0 0.0%	0 0.0%	21 21.9%	100% 0.0%
	100% 0.0%	100% 0.0%	100% 0.0%	100% 0.0%	100% 0.0%
	1	2	3	4	Target Class

(4.1)

Confusion Matrix - Testing Data

Output Class	1	2	3	4	
1	6 25.0%	0 0.0%	0 0.0%	0 0.0%	100% 0.0%
2	0 0.0%	3 12.5%	0 0.0%	0 0.0%	100% 0.0%
3	0 0.0%	0 0.0%	6 25.0%	0 0.0%	100% 0.0%
4	0 0.0%	0 0.0%	0 0.0%	9 37.5%	100% 0.0%
	100% 0.0%	100% 0.0%	100% 0.0%	100% 0.0%	100% 0.0%
	1	2	3	4	Target Class

(4.2)

Figure 4. Confusion matrix of four *Aquilaria* oil species for (4.1) training data and (4.2) testing data

Parameters	Percentages (%)
Accuracy	100
Sensitivity	100
Specificity	100
Precision	100

Figure 5. Standard performance evaluation of four different *Aquilaria* oil species

Figure 1 shows the flowchart of the model development that was conducted in this methodology part. The project begins with a boxplot analysis to identify the most significant compounds for further study, as shown in Figure 2. Through this process, four key compounds are selected: dihydro- β -agarofuran (compound b), δ -guaiene (compound c), 10-epi- γ -eudesmol (compound d), and γ -eudesmol (compound e). These significant compounds are then used to develop a K-NN model, utilizing an 80:20 data split ratio for training and testing. Following this, 3-Dimension graphs of the four *Aquilaria* oil species are created based on combinations of these compounds—b, c, d (Figure 3.1), b, d, e (Figure 3.2), and c, d, e (Figure 3.3). The confusion matrix results for both training data and testing data, as shown in Figure 4, demonstrate that the standard performance evaluation for species classification achieved 100% accuracy, sensitivity, specificity, and precision (Figure 5). This method ensures precise and reliable species identification of *Aquilaria* oils, leveraging the detailed analysis of these four significant compounds to distinguish between different species with unparalleled accuracy.

NOVELTY AND UNIQUENESS

The novelty of AQUISpec lies in its advance approach to *Aquilaria* oil analysis, integrating Gas Chromatography-Mass Spectrometry (GC-MS) and Gas Chromatography-Flame Ionization Detector (GC-FID) data for precise species identification. While other methods may utilize machine learning algorithms like Support Vector Machines (SVM) or Artificial Neural Networks (ANN) (Skarysz et al., 2018; Sugianto et al., 2024), AQUISpec exclusively employs the K-NN algorithm. This specialized focus enhances accuracy and reliability, distinguishing AQUISpec from existing solutions. By introducing this unique combination of analytical techniques and specializing in K-NN, AQUISpec revolutionizes *Aquilaria* oil analysis with its tailored and innovative approach.

BENEFIT TO MANKIND

AquiSpec offers significant benefits to mankind by ensuring product authenticity and quality in the *Aquilaria* oil industry. It addresses critical challenges related to product verification and integrity, enhancing consumer trust and confidence. By promoting sustainability and environmental stewardship through accurate species identification, it contributes to the preservation of natural resources. Additionally, the service supports economic growth by enabling producers to deliver high-quality products and expand market opportunities. Through its advancements in analytical techniques and knowledge dissemination, it fosters innovation and education in the field, ultimately enriching both global and local communities.

COMMERCIALIZATION POTENTIAL

AquiSpec holds substantial commercialization potential in the burgeoning *Aquilaria* oil industry. With increasing market demand driven by consumer interest in authentic and high-quality products, AquiSpec offers a competitive advantage through its precise species identification and trust-building capabilities. Its scalable business model caters to diverse stakeholders, including researchers, producers, and quality control laboratories. Cost-effective analysis, coupled with favorable profit margins, ensures financial viability. Regulatory compliance and certifications enhance credibility, while a robust intellectual property strategy safeguards innovation. Overall, AquiSpec is poised to capitalize on market opportunities and emerge as a leading solution in the *Aquilaria* oil industry landscape.

CONCLUSION

In conclusion, AquiSpec represents a significant breakthrough in *Aquilaria* oil analysis, offering precise species identification and fostering trust in product authenticity. By integrating advanced analytical techniques and innovative technology, AquiSpec has demonstrated its ability to streamline the analysis process while maintaining high levels of accuracy. The project's focus on four key *Aquilaria* species and the identification of four significant compounds highlights its comprehensive approach to species classification. Moving forward, further research could explore expanding AquiSpec's capabilities to include additional species and compounds, thereby enhancing its applicability and market reach. Overall, AquiSpec has the potential to revolutionize the *Aquilaria* oil industry by providing a

reliable and standardized method for species identification, promoting sustainability, and supporting ethical sourcing practices.

ACKNOWLEDGEMENT (*OPTIONAL)

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PID30222

Liveable Community Smart App myLiveable

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ABSTRACT

Urbanization is a global phenomenon marked by a significant migration of populations from rural to urban areas, including Malaysia. While urbanization is economically beneficial, it poses challenges for social and environmental aspects. The influx of residents can lead to local dissatisfaction as newcomers compete for services and privileges originally meant for long-time residents. It is essential to prioritize and address the concerns of the local population using advanced technological systems. This study aims to design and develop a mobile application named "myLiveable," which will evaluate and enhance the quality of life within communities. Community engagement is crucial in this application for assessing livability over time. The development of this application employs a quantitative approach to data collection and analysis. Based on a comprehensive literature review, three dimensions of livability have been identified; social, economic, and environmental. The evaluation of community livability will be based on indicators derived from each of these dimensions. The presence of this application will aid in identifying the shortcomings and needs of the community in a thorough manner. Furthermore, the scoring values generated by the app will assist authorities in implementing appropriate strategies or programs aimed at improving community livability. The myLiveable app is expected to significantly enhance the quality of life and well-being of society by providing reliable data and comprehensive assessments.

KEYWORDS: Community liveable, Mobile application, Smart application, User engagement

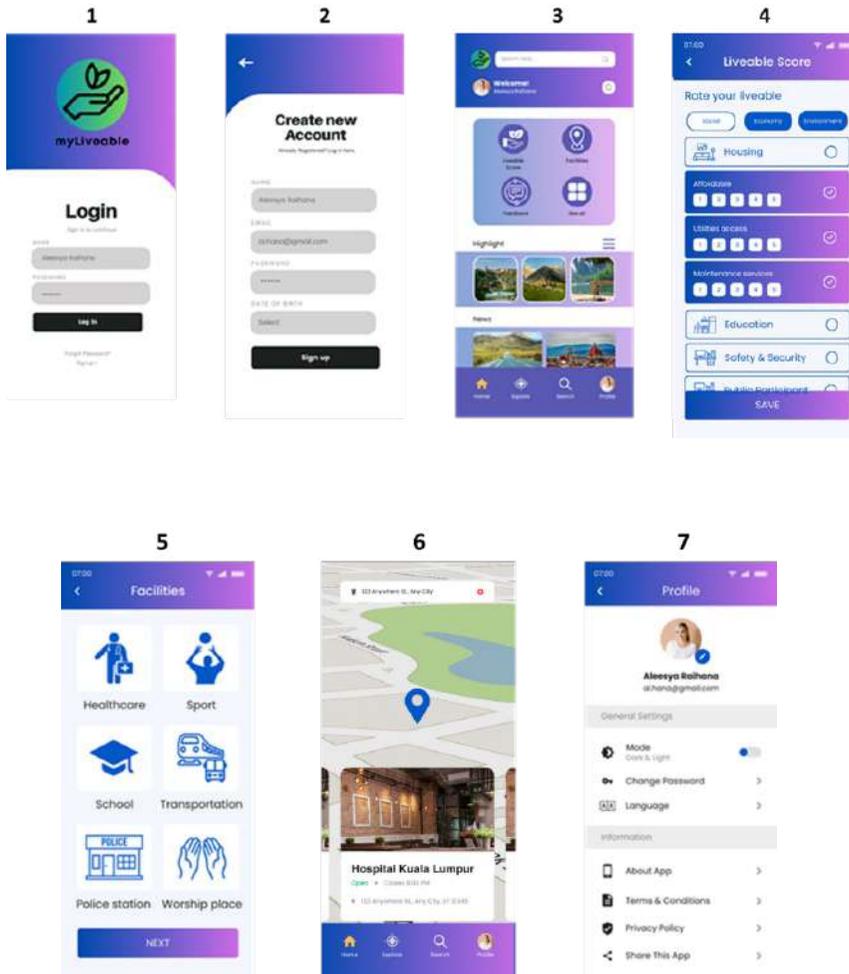
PRODUCT DESCRIPTION

Based on a report by the Ministry of Housing and Local Government (KPKT), Malaysia ranks 59th out of 143 countries globally with a happiness index score of 5.975. This indicates that the happiness level of Malaysian residents has not yet reached a satisfactory level. According to the Minister of KPKT, happiness can be measured by citizens' satisfaction when all basic needs are met, maintaining a connection with nature, and fostering friendly interactions within the community. The concept of happiness is closely linked to livability, which meets human needs in various aspects such as social, economic, environmental, physiological, and safety (Sheikh & Van Ameijde, 2022).

The development of the myLiveable application in Malaysia is driven by several critical issues related to rapid urbanization, including pressure on infrastructure (World Bank, 2020), environmental degradation (Azyana & et al., 2012; Nurhidayu et al., 2016), the increase in slum housing (Madrigal et al., 2018), and competition for resources and services (Abd Rahman et al., 2020).

With myLiveable application, stakeholders can access community feedback and make complaints to facilitate planning and implementation aimed at enhancing community well-being and happiness. MyLiveable is a mobile application designed to measure and improve the quality of life within communities. It provides evidence-based tools for residents, urban planners, and local decision-makers, assisting them in making informed decisions about community livability. The app offers a comprehensive view of various aspects of livability in a given community and is also useful for travelers seeking information about their destinations.

User interface and user experience



User Interface

Interface	Features
1 & 2	User login or register to create an account
3	Homepage, all features are listed and latest news is provided
4	Liveable rating system
5	Facilities location
6	Location map
7	Profile user

Key Features

Liveability Index: Calculates a livability score based on factors such as safety, health, education, environment, transportation, and housing.

Scoring system: Using a scoring system to identify the liveability level of the local community.

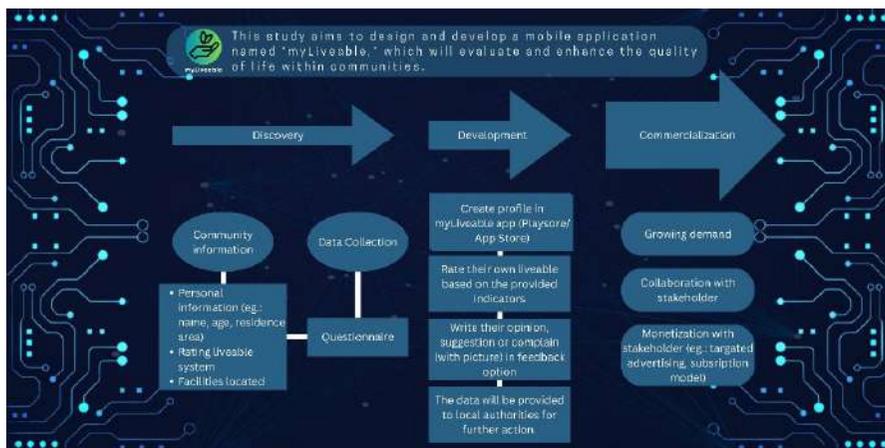
Community Engagement: Allows residents to share comments, upload photos, and participate in local discussions.

Real-Time Data Integration: Integrates data from reliable sources to provide up-to-date information.

Interactive Mapping: Provides an interactive map that highlights key facilities, public transport stops, and points of interest.

User Surveys and Feedback: Users can contribute to liveability ratings by providing feedback on their experiences.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



NOVELTY AND UNIQUENESS

The myLiveable app stands out by integrating real-time data for accurate, up-to-date information and providing a holistic view of community livability through factors like safety, education, and the environment. It encourages local participation via user reviews, photo uploads, and discussions, fostering community engagement. Utilizing advanced technology and focusing on sustainability, myLiveable offers a dynamic and efficient user experience while promoting well-being and a sustainable future.

BENEFIT TO MANKIND

The myLiveable app enhances quality of life by providing relevant community information and enabling better decision-making. It promotes active local involvement and foster a sense of ownership and awareness. The app offers accurate data for authorities, improving urban planning and resource management. By raising awareness of safety, education, and health, and enriching tourism experiences with useful information, myLiveable supports sustainable development and meaningful community engagement.

COMMERCIALIZATION POTENTIAL

The myLiveable app has significant commercialization potential, driven by growing demand for community well-being and urban development. Its scalable concept allows for global adaptation, reaching diverse users. Monetization opportunities include subscription models, government collaborations, and targeted advertising. Collaboration with stakeholders enhances credibility and reach. Value-added services and a focus on long-term sustainability ensure continued commercial success.

CONCLUSION

In conclusion, the myLiveable app has great potential to enhance community quality of life and strengthen relationships between residents, urban planners, and authorities. With real-time data integration, comprehensive insights, and a focus on sustainability, it provides valuable tools for informed decision-making. Monetization opportunities, strategic collaborations, and continuous innovation ensure long-term relevance, making myLiveable a catalyst for positive changes in community life.

ACKNOWLEDGEMENT (*OPTIONAL)

We would like to express our gratitude to the Research Management Centre (RMC), Universiti Teknologi MARA, for granting full trust to us to do this research (600-RMC/FRGS 5/3 (080/2022). Special thanks to our sponsors of MOHE - Fundamental Research Grant Scheme 2022-1 (FRGS) (FRGS/1/2022/SS02/UITM/02/14) for providing an adequate provision for this research. Thanks also to the UiTM Perak Branch, Department of Built Environment and Technology and Centre Studies of Town and Regional Planning and UiTM Perak Library for the invaluable support during the research period.

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PID30231

Liveable Community Smart App myLiveable

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ABSTRACT

In recent years, Malaysia's economy has flourished, thanks to the large part of the oil palm industry, one of the country's most vital industries. However, the industry must overcome challenges, such as the impact of plant diseases on harvest amounts. Effective disease management measures are essential if the sector is to maintain or perhaps enhance its production and profitability. Anthracnose, Bagworm, Curvularia leaf spot, and Pestalotiopsis are oil palm diseases that reduce agricultural output. This research aims to build a system that can identify and monitor these diseases early on. The proposed system combines an autopilot-equipped custom-built drone with computer vision algorithms, namely Convolutional Neural Networks (CNN), to identify diseases in real-world scenarios. This innovative approach integrates object recognition (YOLOv3) with picture classification (VGG16 and AlexNet) to accurately identify and pinpoint illnesses. As a result, farmers can step in quickly to boost output. A thorough analysis of CNN designs looked into the effects of many aspects on performance. The results demonstrated an incredible F1 score of 99.2%, indicating that VGG16 surpassed AlexNet due to its advanced pattern recognition capabilities. Meanwhile, AlexNet reached its highest F1 score of 98.5% with the same hyperparameters. We looked at the custom

drone from top to bottom, including its construction, flying path, and sickness detection capabilities. In palm oil areas, the real application worked, and the modifications were seen as acceptable.

KEYWORDS: Agri Drone, Deep learning, Convolutional Neural Networks (CNN), VGG16, Real-time monitoring system

PRODUCT DESCRIPTION

Enhance your oil palm yields with Agri Drone, an innovative solution designed to tackle the challenges posed by plant diseases in Malaysia's thriving oil palm industry. Our state-of-the-art system combines custom-built drones with cutting-edge computer vision technology to detect and monitor diseases like Anthracnose, Bagworm, Curvularia leaf spot, and Pestalotiopsis, ensuring early intervention and optimal crop health.

Agri Drone employs advanced Convolutional Neural Networks (CNN), integrating object recognition (YOLOv3) with image classification models (VGG16 and AlexNet) for precise disease identification. With an impressive F1 score of 99.2%, VGG16 demonstrates superior pattern recognition capabilities, while AlexNet achieves a notable F1 score of 98.5%.

Our comprehensive approach includes detailed analysis of drone construction, flight paths, and disease detection mechanisms. The real-world application in oil palm plantations has proven effective, providing farmers with a reliable tool to enhance productivity and profitability. Invest in Agri Drone for a smarter, more efficient way to safeguard your crops and boost agricultural output.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS /SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

The major emphasis of the study is on the outcomes of training and validating the categorization model. Anthracnose, Bagworm, Curvularia Leaf Spot, and Pestalotiopsis were the four illnesses that were examined, and their detection findings are shown in Figures 1, 2, 3, and 4. This inquiry will provide a thorough understanding of the model's disease detection capabilities.

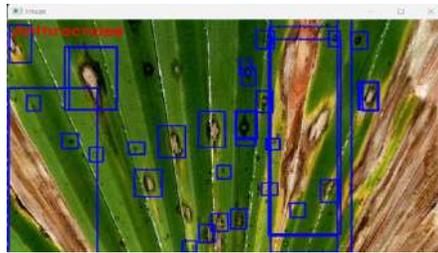


Figure 1. Anthracnose Detected on Oil Palm's Leaf.



Figure 2. Bagworms Detected on Oil Palm's Leaf.

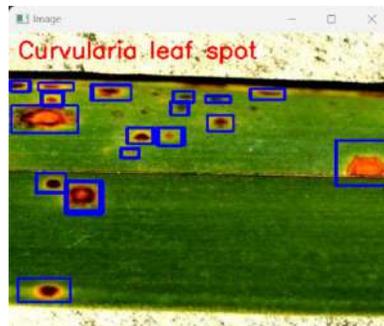


Figure 3. Curvularia Leaf Spots Detected on Oil Palm's Leaf.



Figure 4. Pestalotiopsis Detected on Oil Palm's Leaf.

Figures 1 to 4 demonstrate the proposed design's ability to accurately identify oil palm leaf diseases. By combining image classification with object recognition techniques, the system is able to accurately detect and localize several leaf diseases, including Anthracnose, Bagworms, Curvularia Leaf Spots, and Pestalotiopsis. Disease classification and localization are both excelled at by this suggested architecture, which merges VGG16 and YOLOV3. This method has enhanced agricultural disease management by simultaneously diagnosing and localizing diseases in oil palms, which gives a more complete picture of their health. The innovative project described in the abstract has achieved significant recognition and protection through three registered copyrights with MyIPO as shown in Figure 5. The first copyright is for "A Review on Plant Diseases Classification Methods Using Machine Learning Algorithms" (2023), with Notification Number CRLY2023J00114. The second copyright covers "Image Processing For Palm Oil Leaf Disease Detection Using Deep Learning Models" (2023), identified by Notification Number LY2023J01805. Lastly, the project has secured a copyright for "Coding for AGRI DRONE using MATLAB and Deep Learning Models" (2023), under Notification Number LY2023J01806. These registrations underscore the project's originality and the comprehensive approach taken to protect its innovative methodologies and technologies.

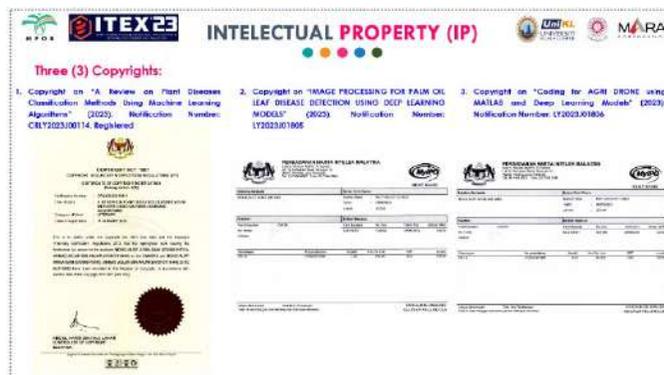


Figure 5. Three Registered Copyrights With MyIPO.

This project has also won several prestigious awards in international competitions as shown in Figure 6. Notably, it secured the Gold Medal at the 34th International Invention, Innovation & Technology Exhibition 2023 (ITEX2023) for the AGRI DRONE, held in Kuala Lumpur, Malaysia, on 11–12 May 2023. Additionally, the project earned the Silver Award at the

Malaysia Technology Expo 2023 (MTE 2023) for the development of Deep Learning Models for Crop Leaf Disease Detection on Real-Time Drone Monitoring, which took place from 16–18 March 2023. Furthermore, it received The Most Outstanding Innovation Award, Special Award, and Gold Award at the International Research Conference & Innovation Exhibition 2022 (IRCIE2022) at Universiti Kuala Lumpur, Malaysian Institute of Industrial Technology (UniKL MITEC), on 23 November 2022, for its work on Plant Disease Detection and Classification by Deep Learning. The project also won a Bronze Medal at the Malaysia Technology Expo 2019 (MTE 2019) for the Oil Palm Fruit Ripeness Grading Machine using Artificial Neural Network. These accolades highlight the project's innovative approach and significant contributions to the field.

As depicted in Figure 7, this project has also published several journal articles, contributing to the academic and scientific community. One notable publication is titled "A Review on Plant Diseases Classification Methods Using Machine Learning Algorithms," which appears in the prestigious SpringerBriefs in Applied Sciences and Technology series by Springer. This article, featured in "Analyzing Education, Sustainability, and Innovation," highlights the project's innovative approach to utilizing machine learning for classifying plant diseases, showcasing its relevance and impact in the field of agricultural technology and sustainability.



Figure 6. Awards and Recognitions for the AGRI DRONE Project and Related Innovations.

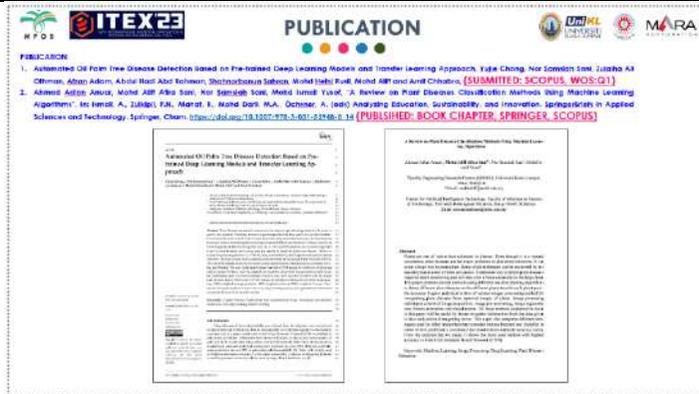


Figure 7. Published Journal Articles from the AGRI DRONE Project.

As shown in Figure 8, the project has received several research grants from various agencies, such as the Research Grant and Innovation Fund from MARA (DPIM), for the project titled "Automatic Disease Detection and Classification in Local Oil Palm Trees Using Machine Learning and Real-Time Drone Monitoring System," where the role was as the Project Leader. Additionally, funding was secured from the Malaysian Palm Oil Board (MPOB) and Universiti Kebangsaan Malaysia (UKM) Endowment Chair Research Grant 2021 for the project titled "Detection of Oil Palm Crop Diseases Based on Deep Learning," where participation was as a Member. Another grant obtained was from MyIPO, specifically the IP 2.0 Fund. Furthermore, the project has collaborated with MPOB and the Center for Artificial Intelligence Technology, Faculty of Information Science & Technology, Universiti Kebangsaan Malaysia.



Figure 8. Collaboration and Funding Sources in Palm Oil Disease Detection Project.

NOVELTY AND UNIQUENESS

The innovation project presents a groundbreaking approach to disease management in the oil palm industry, a crucial sector for Malaysia's economy. This project's novelty and uniqueness are highlighted by the following aspects:

Integration of Advanced Technologies:

- **Custom-Built Drone with Autopilot:** The use of a custom-built drone equipped with autopilot functionality ensures precise and efficient monitoring of oil palm plantations.
- **Computer Vision Algorithms:** Leveraging state-of-the-art Convolutional Neural Networks (CNN), the system integrates object recognition (YOLOv3) with advanced image classification models (VGG16 and AlexNet), providing robust and accurate disease detection.

Early Detection and Intervention:

- The system's capability to identify diseases such as Anthracnose, Bagworm, Curvularia leaf spot, and Pestalotiopsis at an early stage allows for timely intervention, which is crucial for maintaining and enhancing agricultural productivity.

High Accuracy and Performance:

- The project demonstrates exceptional performance with an F1 score of 99.2% using VGG16, surpassing AlexNet's highest F1 score of 98.5%. This high level of accuracy in disease detection showcases the effectiveness of the selected CNN models and hyperparameters.

Comprehensive System Analysis:

- A thorough evaluation of the drone's construction, flight paths, and disease detection capabilities ensures that the system is not only innovative but also practical and reliable for real-world application in oil palm plantations.

Proven Real-World Application:

- The system has been tested and validated in actual oil palm areas, demonstrating its efficacy and adaptability to real-world conditions. The successful implementation underscores the project's potential to revolutionize disease management in the oil palm industry.

This innovative project sets a new standard in agricultural disease management by combining advanced drone technology with cutting-edge

machine learning algorithms, offering a highly effective solution for one of Malaysia's most important industries.

BENEFIT TO MANKIND

The innovation project offers significant benefits to mankind by addressing critical plant diseases in the oil palm industry, thus enhancing agricultural output and farmers' livelihoods. It promotes sustainability by reducing the need for chemical treatments and supports economic growth by preventing crop loss. The integration of advanced technologies like CNN and YOLOv3 advances agricultural knowledge and practices. Socially, it preserves traditional farming while incorporating modern methods. The project was tested with several oil palm farmers, including a meeting with Mr. Izhar Hairi, a supervisor on a palm oil plantation. The project demonstrates both local and global relevance, providing a scalable solution for various agricultural challenges, ensuring economic stability, and improving quality of life.

COMMERCIALIZATION POTENTIAL

The intended users of this innovative solution include the Malaysian Palm Oil Board (MPOB) and oil palm farmers across Malaysia, encompassing Sabah and Sarawak, which collectively cover an area of 5,674,742 hectares. With a retail selling price of RM 2500, the product offers a significant cost advantage, being 78% cheaper than comparable alternatives in the market. In terms of return value, the revenue generated amounts to RM 2500.00, with an OEM cost (Prototype) of RM625.00, resulting in a net profit of RM1875.00, representing a 75% return. Furthermore, the solution is both effective and safe, ensuring its viability and utility in the field.

CONCLUSION

In conclusion, this innovative project has developed a drone-based system integrating advanced computer vision algorithms to effectively detect oil palm diseases, crucial for sustaining Malaysia's economy. Achieving impressive F1 scores of 99.2% for VGG16 and 98.5% for AlexNet underscores its efficacy. The system's ability to identify diseases early enables timely interventions, enhancing agricultural productivity and profitability. Future directions may involve refining the system's capabilities and fostering collaboration with stakeholders for broader adoption. Ultimately, this technology promises to significantly contribute to the

sustainability and growth of Malaysia's oil palm industry, addressing critical challenges and ensuring its continued prosperity.

ACKNOWLEDGEMENT (*OPTIONAL)

We would like to express our sincere gratitude to Universiti Kuala Lumpur (UniKL) for their invaluable support throughout the duration of this project. Their unwavering commitment to fostering innovation and research has been instrumental in the development and success of our drone-based system for oil palm disease detection.

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PID30241

Sistem Pengurusan Pemusatan Perkhidmatan Teknikal ICT Sekolah (S3PTIS) dalam Meningkatkan Kecekapan dan Ketepatan Pengurusan Aktiviti Pasukan Teknikal ICT Sekolah (PTIS) di Negeri Kedah

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ABSTRAK

Sistem Pengurusan Pemusatan Perkhidmatan Teknikal ICT Sekolah (S3PTIS) telah dibangunkan khusus untuk menambah baik pengurusan aktiviti Pasukan Teknikal ICT Sekolah (PTIS) di setiap Pejabat Pendidikan Daerah Negeri Kedah. Aplikasi ini direka sebagai solusi kepada beberapa masalah utama seperti pelaporan aktiviti yang tidak selaras, tidak lengkap, dan proses penyediaan laporan yang memakan masa serta tidak sistematik. Objektif utama pembangunan S3PTIS adalah untuk membantu PTIS dalam penyediaan laporan aktiviti dengan lebih efisien, memudahkan Penyelaras PTIS mengurus dan menyelia aktiviti PTIS, serta menyediakan data berpusat sebagai One Stop Center untuk PTIS. Aplikasi ini dibangunkan menggunakan platform JotForm dan Appsheet sebelum dipindahkan ke Google Sites untuk kestabilan dan kemudahan akses. Justeru, ia dapat diakses dengan mudah dimana sahaja dan pada bila-bila masa dengan menggunakan apa sahaja peranti mudah alih terutamanya telefon pintar. Setelah melalui proses ujilari yang komprehensif selama 6 bulan, S3PTIS kini telah digunakan sepenuhnya oleh Pasukan Teknikal ICT Sekolah (PTIS) di seluruh Negeri Kedah. Penggunaan aplikasi ini telah membuktikan keberkesanannya dalam meningkatkan kecekapan pengurusan dan pelaporan aktiviti teknikal di peringkat Jabatan Pendidikan Negeri Kedah, menjadikan proses lebih sistematik dan teratur. S3PTIS kini menjadi alat penting dalam memastikan pelaporan dan pengurusan aktiviti teknikal di sekolah-sekolah dapat dijalankan dengan lebih cekap dan berkesan.

KATA KUNCI: sistem pengurusan pemusatan perkhidmatan teknikal ICT, Pasukan Teknikal ICT Sekolah (PTIS), pelaporan aktiviti, google sites, data berpusat

PENERANGAN PRODUK

Sistem Pengurusan Pemusatan Perkhidmatan Teknikal ICT (S3PTIS) adalah aplikasi yang direka untuk menambah baik pengurusan aktiviti Pasukan Teknikal ICT Sekolah (PTIS) di setiap Pejabat Pendidikan Daerah. Tujuan utama pembangunan SP3TIS adalah untuk mengatasi masalah pelaporan aktiviti yang tidak selaras dan tidak lengkap, serta mempercepatkan proses penyediaan laporan yang sebelum ini memakan masa yang lama dan tidak sistematik. Aplikasi ini menawarkan penyelesaian dengan menyediakan satu platform berpusat yang memudahkan PTIS dalam menyediakan laporan aktiviti secara efisien dan menyeluruh..

Antara ciri utama S3PTIS adalah kemampuannya untuk mengintegrasikan pelbagai data teknikal dari sekolah-sekolah, menyediakan laporan berstruktur dan lengkap, serta memudahkan Penyelaras PTIS mengurus dan menyelia aktiviti PTIS dengan lebih teratur. Fungsi utama aplikasi ini termasuk penjejakan dan pengurusan aktiviti teknikal, penyimpanan data berpusat, serta penyediaan laporan yang boleh diakses oleh pihak berkenaan dengan mudah dan pantas. Prestasi S3PTIS telah diuji selama enam bulan dan terbukti meningkatkan kecekapan dalam pengurusan dan pelaporan aktiviti teknikal.

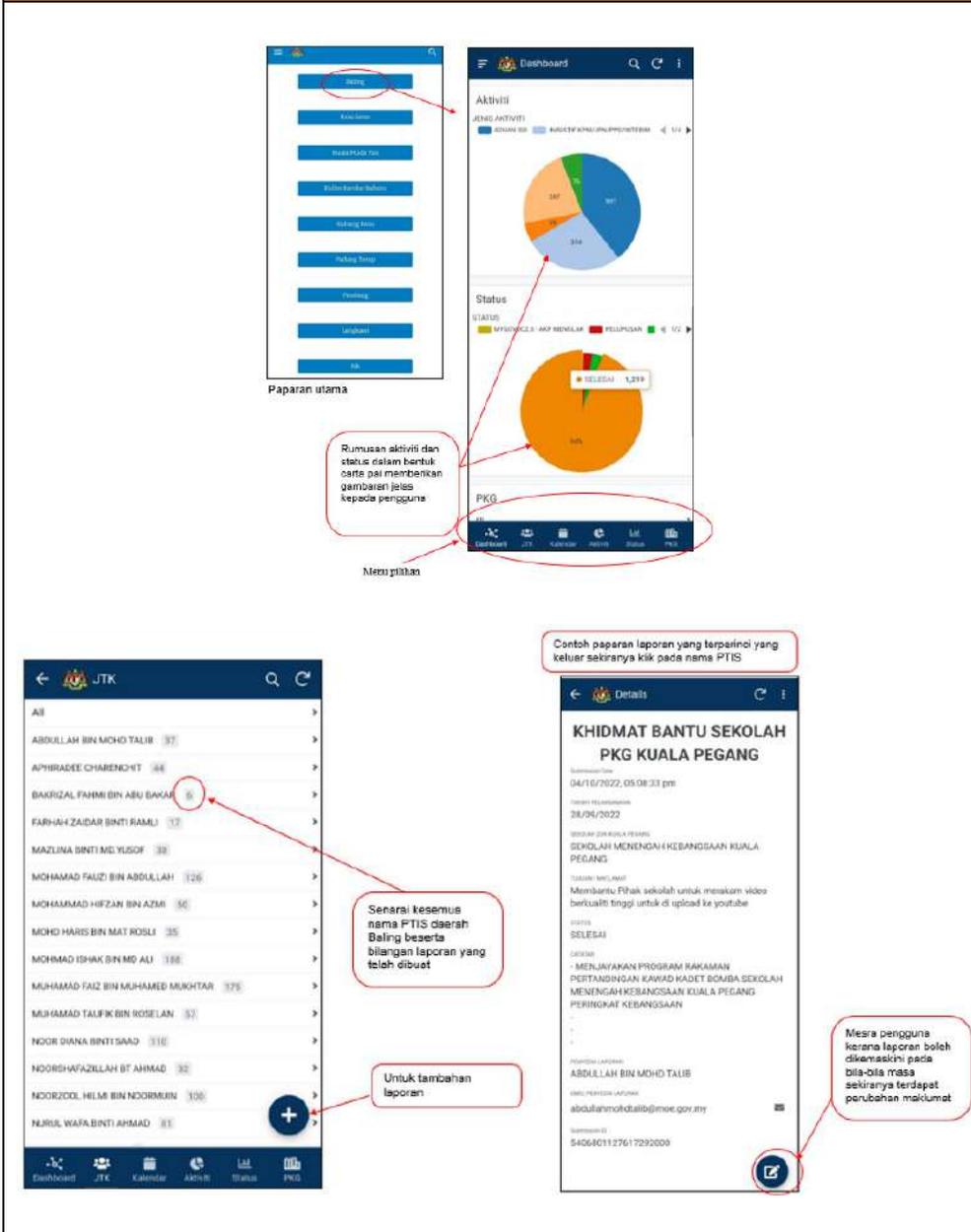
Pengalaman pengguna dengan S3PTIS adalah lebih lancar dan intuitif, di mana antara muka yang mesra pengguna membolehkan PTIS dan penyelaras mengakses maklumat dengan mudah, cepat dan tepat. Aspek inovasi S3PTIS terletak pada penggunaan platform JotForm dan Appsheet yang kemudiannya dipindahkan ke Google Sites, menjadikannya lebih stabil dan mudah diakses.

Kumpulan sasaran utama S3PTIS adalah Pasukan Teknikal ICT Sekolah dan Penyelaras PTIS di seluruh Negeri Kedah. Aplikasi ini digunakan secara meluas untuk memudahkan pengurusan aktiviti teknikal di semua pejabat Pendidikan Daerah negeri Kedah. Manfaat dan kelebihan SPPPTI termasuk peningkatan kecekapan pengurusan, penyediaan laporan yang lebih sistematik, dan penjimatan masa dalam proses pelaporan.

Keseluruhannya, S3PTIS merupakan alat penting dalam memastikan pengurusan dan pelaporan aktiviti teknikal di sekolah-sekolah dapat dijalankan dengan lebih cekap, teratur, dan berkesan. Penyediaan serta

pemantauan terhadap laporan yang melibatkan perkhidmatan teknikal ICT di seluruh Pejabat Pendidikan Daerah dapat di akses menggunakan pelbagai peranti mudah alih menjadikan aplikasi ini mudah diakses pada bila-bila masa dan dimana sahaja.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



Paparan utama

Rumusan aktiviti dan status dalam bentuk carta pai memberikan gambaran jelas kepada pengguna

Menu pilihan

Contoh paparan laporan yang terperinci yang keluar sekiranya klik pada nama PTIS

Senarai kesemua nama PTIS daerah Baling beserta bilangan laporan yang telah dibuat

Untuk tambahan laporan

Mesa pengguna kerana laporan boleh dikemaskini pada bila-bila masa sekiranya terdapat perubahan maklumat

KEBAHARUAN DAN KEUNIKAN

Kebaharuan dan keunikan aplikasi Sistem Pengurusan Pemusatan Perkhidmatan Teknikal ICT Sekolah (S3PTIS) terletak pada pendekatan integratifnya dalam menguruskan aktiviti teknikal secara berpusat. Melalui penggunaan JotForm dan Appsheet serta Google Sites, menjadikan aplikasi ini dapat menawarkan platform yang stabil dan mudah diakses. Keupayaan aplikasi ini untuk menyediakan laporan berstruktur dan lengkap dengan pantas serta boleh diakses di mana-mana sahaja menjadikannya berbeza daripada sistem sebelumnya yang lambat dan tidak sistematik. S3PTIS juga mempermudah pengurusan data dan penyeliaan aktiviti oleh Penyelaras PTIS, meningkatkan kecekapan operasi keseluruhan.

MANFAAT KEPADA MANUSIA

Aplikasi S3PTIS menawarkan pelbagai manfaat, termasuk penyelesaian masalah pelaporan aktiviti teknikal yang tidak selaras dan tidak lengkap, serta meningkatkan kecekapan kerja Pasukan Teknikal ICT Sekolah (PTIS). Ia menyumbang kepada peningkatan kualiti hidup dengan mengurangkan beban kerja dan meningkatkan ketepatan data. Dari segi kesinambungan, aplikasi ini menyokong penggunaan sumber yang lebih efisien dan mengurangkan penggunaan kertas, memberi kesan positif terhadap alam sekitar. Manfaat ekonomi termasuk pengurangan kos operasi melalui peningkatan produktiviti. Ia juga mempercepatkan penyampaian maklumat teknikal dan pengetahuan, memberi impak sosial dengan memudahkan kerjasama antara daerah. Aplikasi ini relevan secara global dan glocal, memajukan pengurusan perkhidmatan teknikal ke tahap lebih tinggi.

POTENSI UNTUK PENGKOMERSILAN

Potensi pengkomersilan, dengan permintaan yang tinggi dari institusi pendidikan yang memerlukan pengurusan teknikal yang efisien. Saiz pasaran meliputi pejabat-pejabat kerajaan dan swasta peringkat negeri serta peringkat nasional. Kelebihan persaingan termasuk keupayaan integrasi data yang unggul dan kemudahan penggunaan. Model perniagaan boleh merangkumi langganan bulanan atau tahunan. Analisis kos menunjukkan pelaburan awal dalam pembangunan dan penyelenggaraan yang berpatutan dengan margin keuntungan yang menarik. Strategi hak cipta intelektual melibatkan paten dan perlindungan perisian untuk memastikan keunikan dan keselamatan produk.

KESIMPULAN

Sistem Pengurusan Pemusatan Perkhidmatan Teknikal ICT Sekolah (S3PTIS) adalah aplikasi inovatif yang menyatukan pelbagai platform teknologi untuk mengatasi masalah pelaporan dan pengurusan teknikal yang tidak sistematik. Dengan menggunakan JotForm, Appsheet, dan Google Sites, S3PTIS menawarkan kecekapan, ketepatan pelaporan, dan kemudahan akses yang tinggi. Kepentingan projek ini terletak pada peningkatan produktiviti PTIS dan penyelarasan tugas yang lebih baik. Yang paling utama, penghasilan aplikasi ini menyokong perkembangan teknologi digital semasa selain selari dengan kempen kelestarian alam dengan mengurangkan penggunaan kertas. Untuk masa hadapan, kajian boleh memberi tumpuan kepada penambahbaikan fungsi analitik data dan integrasi dengan sistem pengurusan lain, serta penerokaan aplikasi dalam industri selain pendidikan untuk meningkatkan kebolehpasaran dan impak yang lebih luas.

PID30251

B Genki Medium : The Future of Orchid Propagation

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ABSTRACT

B Genki Medium is an innovative formulation designed for the micropropagation of *Brassavola nodosa*, a rare orchid species known for its night-blooming, fragrant flowers. Traditional propagation methods for *Brassavola nodosa*, such as seed germination and vegetative division, are often slow and unpredictable due to the need for specific symbiotic relationships with fungi and the plant's natural growth limitations. B Genki Medium addresses these challenges by offering a specialized blend that includes a medium enriched with essential nutrients like nitrogen, phosphorus, potassium, calcium, magnesium, and iron, along with vitamins, amino acids, charcoal, and a biotic elicitor. This comprehensive formulation creates an optimal environment for robust and uniform plant growth in a controlled, sterile setting, significantly enhancing the speed and success rate of micropropagation. Research findings demonstrate that B Genki Medium promotes faster root development and healthier plantlets compared to traditional media. Easy to use, the medium preparation involves simple steps, including adjusting pH and sterilization, making it accessible for both hobbyists and professional growers. B Genki Medium represents a significant advancement in orchid propagation technology, ensuring the healthy growth and proliferation of *Brassavola nodosa*.

KEYWORDS: B Genki Medium, *Brassavola nodosa*, orchid, propagation, plant tissue culture

PRODUCT DESCRIPTION

B Genki Medium is a revolutionary formulation designed for the micropropagation of *Brassavola nodosa*, a prized orchid known for its fragrant, night-blooming flowers. Traditional propagation methods, like seed germination and vegetative division, often suffer from slow growth and low success rates due to the orchid's reliance on specific fungal relationships and limited natural propagation rates. B Genki Medium addresses these challenges by providing an optimized growth environment that enhances the micropropagation process.

This medium contains a balanced mix of essential macro and micronutrients, including nitrogen, phosphorus, potassium, calcium, magnesium, and sulfur source. It also includes crucial micronutrients such as iron, manganese, zinc, boron, copper, and molybdenum. Additionally, it is enriched with vitamins (thiamine, nicotinic acid, and pyridoxine) and amino acids (glycine) to support robust plant development. To further boost growth, B Genki Medium incorporates activated charcoal, which adsorbs impurities and growth inhibitors, and abiotic elicitor, which stimulates plant defense mechanisms and promotes vigorous growth.

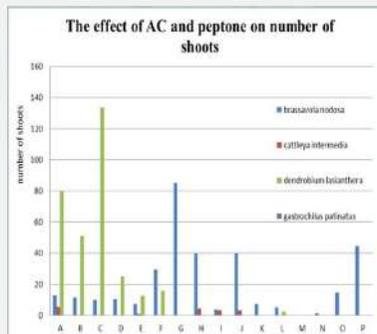
Designed for convenience, B Genki Medium comes in three easy-to-use sachets. To prepare, simply pour Sachets 1 and 2 into a container, add distilled water to make 1 liter of solution, adjust the pH to 5.6-5.8, and then add Sachet 3. Mix thoroughly and sterilize the medium by autoclaving at 120 psi for 20 minutes. Once sterilized, the medium is ready for use in micropropagation.

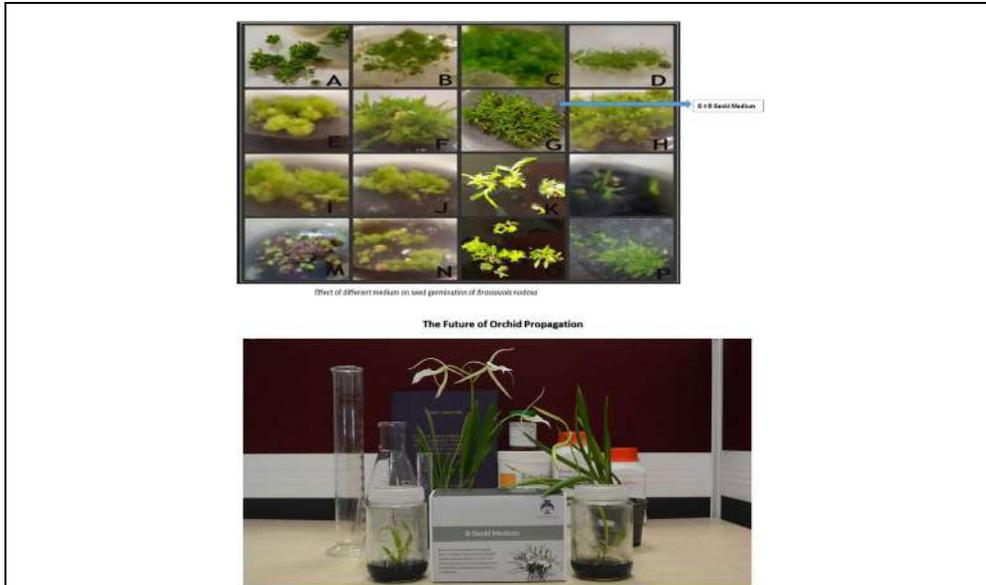
This user-friendly medium is accessible to both amateur orchid enthusiasts and professional growers. Even individuals with no background in plant tissue culture can successfully use B Genki Medium to grow *Brassavola nodosa*. With a shelf life of up to two years at room temperature, it ensures a reliable, high-quality medium. B Genki Medium fosters faster root development, healthier plantlets, and higher success rates, representing a significant advancement in orchid cultivation for the healthy growth of *Brassavola nodosa*.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



MICROPROPAGATION OF *BRASSAVOLA NODOSA* USING PLANT TISSUE CULTURE TECHNIQUE





NOVELTY AND UNIQUENESS

B Genki Medium is a novel formulation specifically designed for the micropropagation of *Brassavola nodosa*, addressing traditional propagation challenges. Its uniqueness lies in its comprehensive blend of macro and micro nutrients, activated charcoal, and a biotic elicitor, promoting robust plant growth and minimizing contamination. Packaged in three easy-to-use sachets, it ensures a straightforward preparation process suitable for both novices and professionals. Even those with no background in plant tissue culture can successfully use it to grow *Brassavola nodosa*, thanks to its easy preparation and application. Its two-year shelf life at room temperature enhances convenience and accessibility, making it an exceptional solution for efficient and successful orchid propagation.

BENEFIT TO MANKIND

B Genki Medium offers significant benefits to mankind by solving critical propagation challenges for *Brassavola nodosa*, enhancing biodiversity and orchid conservation. It promotes sustainable and efficient plant production, reducing the need for wild harvesting and supporting environmental preservation. Economically, it enables both hobbyists and commercial growers to produce high-quality orchids, boosting local and global markets. The medium promotes the advancement of knowledge in plant tissue culture, encouraging both education and research. Socially and culturally, it preserves the heritage of orchid cultivation and brings beauty to homes

and gardens worldwide. Its user-friendly design democratizes access to advanced horticultural techniques, making orchid propagation accessible to all.

COMMERCIALIZATION POTENTIAL

B Genki Medium has significant commercialization potential due to high market demand for effective orchid propagation solutions. Its competitive advantage lies in its ease of use, rapid and high-volume production capabilities, and suitability for both amateurs and professionals. The business model can focus on direct sales to growers, nurseries, and retail partnerships. Scalability is strong, with low production costs and high profit margins. Regulatory compliance and certifications will ensure market trust, while securing intellectual property rights will protect the innovation. This comprehensive, shelf-stable medium supports a growing global market for ornamental plants, promising robust commercial success.

CONCLUSION

In conclusion, the B Genki Medium innovation project has successfully developed a groundbreaking solution for the micropropagation of *Brassavola nodosa*, addressing critical challenges in traditional propagation methods. This advanced medium provides optimal growth conditions, significantly enhancing root development, plant health, and propagation success rates. Its user-friendly design makes it accessible to both amateur enthusiasts and professional growers, ensuring broad market appeal. The comprehensive research and development efforts have underscored the medium's effectiveness and commercial potential. Moving forward, expanding this technology to other orchid species and exploring further improvements in formulation will enhance its impact. B Genki Medium represents a significant advancement in orchid cultivation, promising to revolutionize the industry and contribute to the conservation and proliferation of rare orchid species.

ACKNOWLEDGEMENT (*OPTIONAL)

We would like to express our deepest gratitude to the Faculty of Pharmacy, Universiti Teknologi MARA, for providing the facilities and support necessary to conduct this research. Their contributions have been invaluable to the success of our study on the development of B Genki Medium for the micropropagation of *Brassavola nodosa*. Thank you for your unwavering support and dedication to advancing scientific research and innovation.

PID30271

IoT Integrated Advanced Inventory Management System

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ABSTRACT

The IoT Integrated Advanced Inventory Management System is an innovative solution designed to streamline inventory management by leveraging IoT technologies. Traditional manual inventory systems are prone to errors, lack real-time data, and face security vulnerabilities. This project addresses these issues by automating inventory processes, providing real-time monitoring, and enhancing security. Key components include RFID technology for accurate item tracking, motion sensors for detecting unauthorized access, weight sensors to prevent overloading, and an ESP32 microcontroller for processing and connectivity. The system also features an LCD display for real-time updates and integrates with the Blynk IoT platform for remote monitoring and management. The objectives of this project are to automate inventory tasks, enable remote access, and ensure inventory security. The system's novelty lies in its comprehensive integration of multiple IoT components, which enhances efficiency and reduces human error. Successful implementation demonstrates the system's ability to provide automated management, real-time data access, and effective security measures. This project offers a robust, scalable, and cost-effective solution for various industries, including manufacturing, retail, and warehousing, significantly improving productivity and operational efficiency.

KEYWORDS: Inventory, RFID, IoT, Real-time monitoring

PRODUCT DESCRIPTION

The IoT Integrated Advanced Inventory Management System is designed to revolutionize inventory management by automating processes and enhancing security. This innovative solution aims to address the limitations

of traditional manual systems, which are prone to errors, lack real-time data, and are vulnerable to security breaches. Key features of the system include RFID technology for precise tracking and identification of inventory items, motion sensors to detect unauthorized access and movement, and weight sensors to monitor inventory weight and prevent overloading. The ESP32 microcontroller serves as the central processing unit, integrating all components for seamless operation, while an LCD display provides real-time visual updates on inventory status and system events.

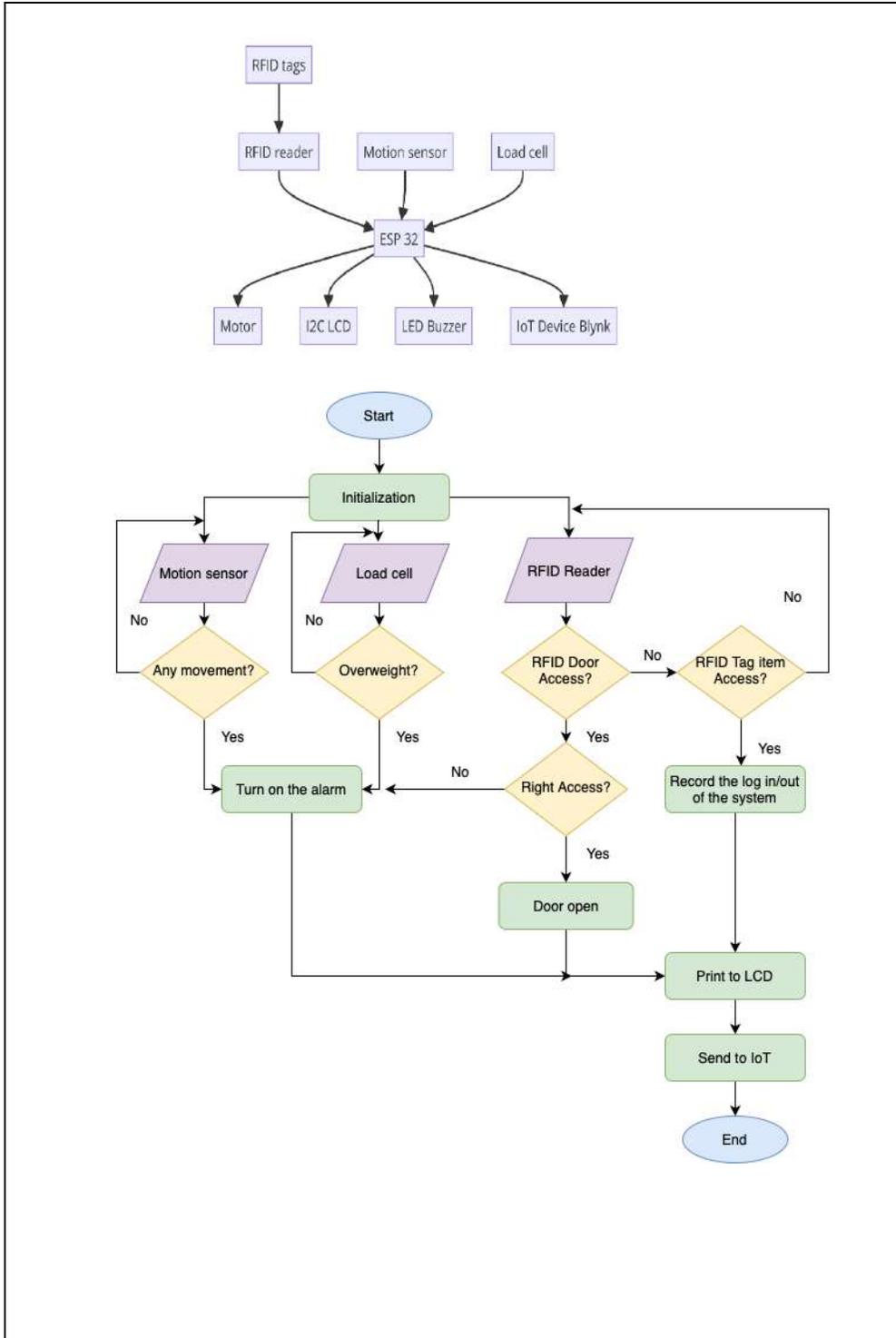
Functionality and performance are optimized through automated tracking, utilizing RFID to enable seamless registration and removal of items, reducing manual intervention. Real-time monitoring offers instant updates on inventory status and alerts via the Blynk IoT platform, ensuring that users can maintain inventory integrity through integrated security measures and remote access capabilities. The user interface is designed for ease of use, featuring an intuitive LCD display for immediate feedback and the Blynk IoT platform for a user-friendly mobile and web interface. Visual and auditory alerts, through LEDs and a buzzer, provide immediate notifications to users.

Innovative aspects of the system include its comprehensive integration of multiple IoT technologies, enhanced security through advanced sensors and RFID technology, and the reduction of human errors through automation. The target audience encompasses industries such as manufacturing, retail, warehousing, and logistics, benefiting business owners, inventory managers, and operational staff by improving productivity and operational efficiency. Applications and use cases include warehouse management, retail inventory monitoring, and manufacturing component tracking. The system offers significant benefits and advantages, such as increased efficiency, accuracy, security, and flexibility. Technical specifications include the ESP32 microcontroller with WiFi and Bluetooth connectivity, PIR motion sensors, load cells, and an MFRC522 RFID reader, with the Blynk platform providing IoT connectivity and remote monitoring. Additional elements highlight the system's cost-effectiveness, scalability, and user-friendly design, making it adaptable for various industries and operational scales.

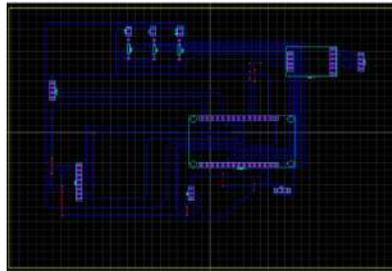
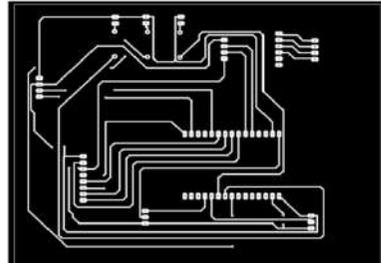
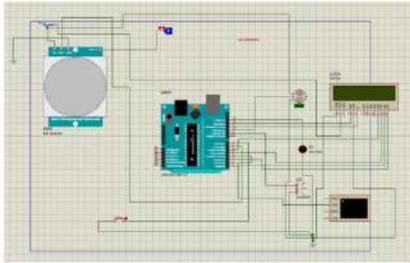
**PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/
SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS**

Design Phase

Block diagram and flowchart development to outline system functionality



Simulation and Hardware Phase



Hardware Results



Circuitry of the Project



Prototype of the Project

Data Monitoring through Blynk



LCD display that replicates the format and content of the actual I2C LCD, showcasing real-time information regarding inventory status and events.

- Three LEDs—red, green, and black—synced with their physical counterparts.
- The red and green LEDs correspond to system status indicators, mirroring the actual LEDs
- The black LED simulates the buzzer

This gauge provides visual feedback on the weight status, alerting users in the Blynk app when the storage weight surpasses the set threshold



NOVELTY AND UNIQUENESS

The IoT Integrated Advanced Inventory Management System uniquely combines multiple IoT technologies into a cohesive solution, enhancing inventory management efficiency. Key innovations include advanced security through RFID and sensors, real-time monitoring for instant updates, and remote data access. Automation reduces human errors and streamlines processes, significantly boosting efficiency. The user-friendly Blynk IoT platform offers an intuitive interface for both mobile and web applications. This integration of advanced technology and user-centric design sets it apart as a pioneering solution in inventory management.

BENEFIT TO MANKIND

The IoT Integrated Advanced Inventory Management System significantly enhances efficiency by streamlining inventory processes and reducing time and labor costs. It minimizes errors in inventory tracking and data entry, ensuring greater accuracy. Enhanced security features protect inventory from theft and damage. The system's remote monitoring and control capabilities offer improved operational flexibility. Overall, it boosts productivity and operational efficiency across various industries, including manufacturing, retail, and warehousing, providing a robust, scalable, and cost-effective solution for modern inventory management challenges.

COMMERCIALIZATION POTENTIAL

The IoT Integrated Advanced Inventory Management System meets the high demand for efficient inventory solutions in manufacturing, retail, and warehousing. Its scalability allows adaptation to various industry sizes and needs. The system's affordability, due to cost-effective components, ensures significant cost savings. User-friendly design and easy integration with existing systems enhance its appeal. By offering improved efficiency, accuracy, and security, the system presents a compelling commercial opportunity, addressing critical inventory management challenges and driving operational excellence across diverse sectors.

CONCLUSION

The IoT Integrated Advanced Inventory Management System successfully addresses the inefficiencies and vulnerabilities of traditional manual inventory systems by leveraging advanced IoT technologies. Its comprehensive integration of RFID, motion sensors, and weight sensors, managed by the ESP32 microcontroller, ensures seamless and automated

inventory tracking, real-time monitoring, and enhanced security. The system's real-time data access and remote monitoring capabilities, facilitated by the user-friendly Blynk IoT platform, significantly improve operational flexibility and decision-making. By reducing human errors and labor costs, the system enhances productivity and operational efficiency across various industries, including manufacturing, retail, and warehousing. The project's successful implementation demonstrates its scalability, cost-effectiveness, and robust performance, making it a viable solution for modern inventory management challenges. Overall, this innovative system paves the way for more efficient, secure, and accurate inventory management practices.

ACKNOWLEDGEMENT (*OPTIONAL)

REFERENCES (*OPTIONAL, MAXIMUM 6 RELEVANT REFERENCES)

PID20031

Plasma Device Developed for Germination and Growth of Seeds

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ABSTRACT

A plasma device consisting of a powerful and manageable plasma beam generator, a controllable and practical electrode, a torch system, and a gas flow system is developed to improve the germination and growth of seeds with a special application method. Using the torch system, the generated plasma is directed at the seed embryo. The optimum plasma beam exposure duration is 420 s. This device and performance method can be easily adapted to large-scale industries such as farms and greenhouses.

KEYWORDS: Plasma Device, Plant, Seed Germination, Seed growth,

PRODUCT DESCRIPTION

A plasma device, consisting of an adjustable and powerful signal generator capable of producing signals with the desired characteristics, is designed and developed. The electrode and torch system is designed to be suitable for simultaneous applications on seeds. The gas flow system is also contrived alongside the electrodes in a way that the operator can easily control the procedure. The plasma reactor is designed to cover the subject of the plasma beam, whether seeds or plants that have a dielectric role in the system, and a stepper motor system with a controller manages the plasma exposure duration. The seeds are transported to the plasma reactor from the container through a belt, which is managed by a stepper motor and controller system. The operator can adjust the plasma exposure duration using this system. The produced plasma beam is the source of reactive species and other physical factors with biochemical effects on plant cells [1–3]. The result of produced plasma preformation on seeds improves the germination rates of chickpea seeds by modifying the seed surface and enhancing the hydrophilic characteristics of the seeds. Our plasma device has the benefit of plasma

application on a series of seeds in the same environment and with the same characteristics simultaneously. Another important focal point in our plasma application method is the position of the beam's collision with the seed tissue. Our research indicates that the focused operation of plasma on the embryo (cotyledonary node) of the seed improves germination and is ameliorative of epigeal and hypogeal growth. The optimized plasma application duration is another effective growth factor for chickpea seed samples; the 420s is the optimum duration. This operation process improves the lifespan of the sprouting and reduces the possibility of dormancy, reducing the chance of sprout death.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



Figure 1. The process of germination and growth of seeds with the pulsed plasma application duration of 300s (repeated four times): (left) at time intervals of six, (middle) ten, and (right) fifteen days after planting. The first row from the left in each image is the control group. The Pulsed plasma performed focused on: (the second row of each image) Embryo, (the third row of each image) Back of the embryo, (the fourth row of each image) Cotyledons.



Figure 2. Pulsed plasma performed Chickpea Seeds growth process after 14 days (repeated three times). The sample on the right side of each image is the control sample (without plasma application), the duration of Plasma application for the second from the right sample of each image is (3 minutes), For the third sample is (7 minutes) and for the fourth sample is (12 minutes).

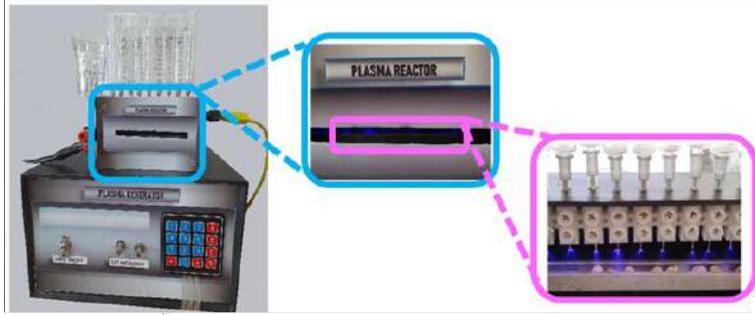


Figure 3. Pulsed plasma device, the Plasma Reactor section, and plasma beam application to the Chickpea seeds

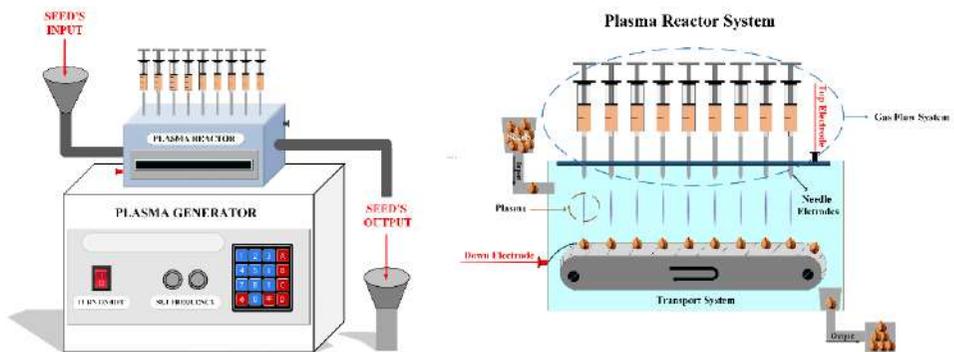


Figure 3. The schematic pattern of : (Left) the fabricated pulsed plasma device, (Right) the plasma reactor, and the individual gas flow and application systems. The seed transport system is also shown schematically inside the plasma reactor section of the device.

NOVELTY AND UNIQUENESS

A plasma device consists of an adjustable and powerful signal generator with the capability of producing different types of signals with desired characteristics that are designed and developed in this project. The electrode and torch system is designed to be controllable, and suitable for simultaneous applications on seeds and plants as well. The gas flow system is also contrived alongside the electrodes in a way that the operator can easily control the procedure. This method can be easily adapted to large scale industries such as farms and greenhouse applications.

BENEFIT TO MANKIND

Seeds are easier to store and transport than other food items. Mankind has been trying to increase the germination rate and health of agricultural products. Various chemical methods or genetic manipulation of crops to increase product quantity are

subjects of discussion from a health point of view. Germination is an important part of the plant's life and growth. Among different methods such as magnetic fields, ultraviolet rays, and other applications, our plasma beam device utilization is a more controllable, environmentally safe, and low-cost method that has the benefit of portable usage and also on a larger scale.

COMMERCIALIZATION POTENTIAL

According to the International Fertilizer Association, the worldwide fertilization consumption in 2023 was 192.5 million metric tons and it is expected to rise 4-5% each year. The Global fertilizers Market is estimated at USD 384.37 billion in 2024 and is expected to reach USD 543.20 billion by 2030. Given the extensive use of chemicals and their detrimental effects on both humans and the environment, the application of plasma devices presents a modern, safe, accessible, and cost-effective solution for ensuring food safety and conserving both economic and natural resources.

CONCLUSION

This project aims to improve the germination process and increase the growth rate of seeds through a modern, controllable, low-cost, and environmentally safe plasma device. The adjusted plasma beam duration and application point are utilized to optimize our device. This system is adaptable to large scales, such as farm and greenhouse employment.

ACKNOWLEDGEMENT (*OPTIONAL)

We would like to express our sincere gratitude to the Nano-Electronic Laboratory of Urmia University for their invaluable support and resources provided during this research. Their dedication to advancing this research and contribution to academic excellence is deeply appreciated.

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PID20041

Pests controlled by Low Frequency Electromagnetic

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ABSTRACT

The greenhouse whitefly (*Trialeurodes vaporariorum*) is one of the most important pests in greenhouses, causing significant damage to greenhouses and agricultural products every year. In this study, the effects of electromagnetic fields with different frequencies on all life stages of this pest were investigated in both acute (short-term) and chronic (long-term) forms. For this purpose, we designed a device that can produce electromagnetic fields at different frequencies. Electromagnetic fields with different frequencies were investigated in all life stages of this insect, and after about three years of research in this field, the best effective frequency was determined. The innovative aspect of this invention is that by placing a device in every 200 square meters of the greenhouse and pulling a wire about 20 cm long around the plants infected with the pest, this pest can be eliminated. The aforementioned frequency range does not cause the slightest damage to plants and workers exposed to the greenhouse environment. By examining the hemolymph of the affected insects, it was found that the immune system of anemones is weakened. Also, by testing the spermograms of insects under the influence of the electromagnetic field, a decrease in the number of live sperm was reported.

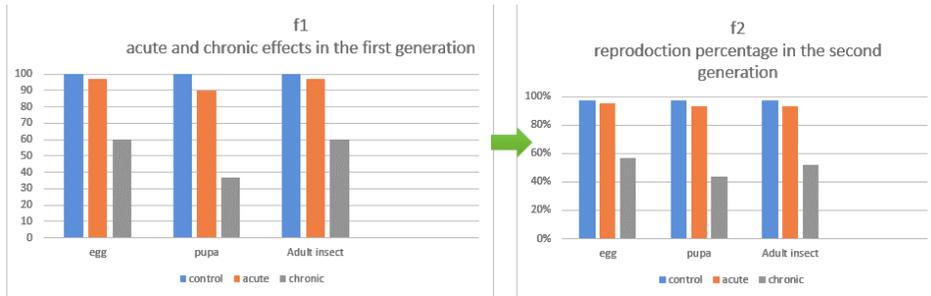
KEYWORDS: Key words: electromagnetic fields, greenhouse whitefly, spermogram, hemolymph, immunocells

PRODUCT DESCRIPTION

This device is low-cost and portable, making it easy to install in greenhouses. A common wire is connected to the device's outlet, and this wire covers a greenhouse area of 200 square meters. The other end of the wire is then connected to the device's second output. This device has a control product screw, and by turning it, you can set the desired frequency within a radius of about 20 cm of the wire. If this device works for 8 hours every day and night and this operation continues for 10 days, we will achieve the desired result.

This device can be installed and used in all greenhouses, and this pest can be controlled and eliminated without using different agricultural poisons. The cost of using pesticides has decreased, and the harm caused by different pesticides to the environment and humans will no longer exist. It has been determined by very careful testing of plants in the greenhouse that the use of this device in the frequency range used does not cause any damage to the plants. Also, this device can be turned on and used at any time of the day or night. Therefore, by turning on this device outside of working hours, you can avoid possible damage to the workers working in the greenhouse. Of course, during working hours, there is no harm to humans within a distance of more than twenty centimeters, as the majority of the electromagnetic field's effect is limited to a radius of twenty centimeters around the wires.

**PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/
SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS**

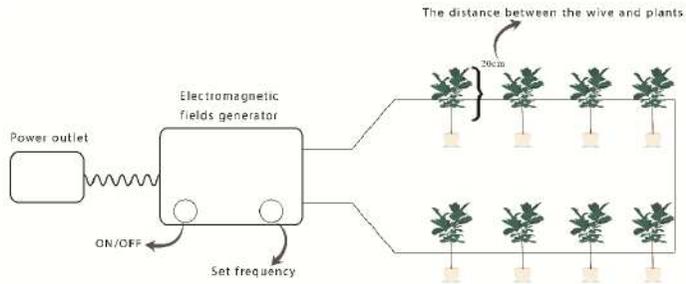


Explanation of the table:

In the acute stage, there was no significant difference with the control group in the number of eggs, pupae, and complete insects.

In the next generation, there was no significant difference with the control group in the percentage of reproduction.

In the chronic phase, in all stages of the pest's life, there are significant differences with the control group in their reproduction percentage.



Schematic figure of how the device works



Figure 1. Adult greenhouse whitefly in the control group



Figure 2. White fly pupa in the control group



Figure 3. White fly eggs in control group



Figure 4. Whiteflies killed in the group under the influence of EMF



Figure 5. Lost and reduced pupae in the group under the influence of EMF



Figure 6.Reduction and destruction of eggs in the group under the influence of EMF

Description of the photos:

In photos 1 to 3, all the stages of life, from the stage of maturity to the pupa and egg in the control group, are shown. The photos on the left were taken with a laboratory loupe and the photos on the right were taken with a special camera. Photos 3 to 6 are taken in the same order as all stages of life in the group under the influence of electromagnetic fields. As is clear in the photos, the number of eggs, pupae, and adult insects in the groups affected by EMF has decreased significantly.



NOVELTY AND UNIQUENESS

Providing a cheap and economical method to control agricultural pests in greenhouses without using pesticides and without harming the environment and human health.

BENEFIT TO MANKIND

Indiscriminate use of pesticides in greenhouses has a very high cost and endangers the health of the environment and consumers. It also makes pests resistant to poisons and remains in agricultural products. This device can be used with a very low production cost and can be easily used in any greenhouse under any conditions, and its use does not create any kind of resistance to pests.

COMMERCIALIZATION POTENTIAL

Due to the lack of water and special weather conditions in different regions of the world, most agricultural activities are directed towards the production of agricultural products at the greenhouse level. Therefore, it is essential to protect greenhouse products from pest damage. On the other hand, this invention greatly reduces costs in the agricultural sector, and in mass production, it will have a very good market among greenhouse product producers.

CONCLUSION

This invention was used in two ways:
In an acute form: which was used only once for 8 hours in each stage of the whitefly's life, which did not have a favorable result.

In a chronic form: which was affected by this pest for 8 hours a day for 10 days at every stage of its life and was able to control this pest significantly. Even in the next generations, it left its effect in the production of fewer eggs. These data were completely statistically analyzed and it was found that the number of pests in the chronic group in each generation was significantly different from the control group. Considering the ability of this device to control whitefly, taking into account the physiological similarities of all pests with each other, if the project continues and further research, it can be used to control most greenhouse pests.

ACKNOWLEDGEMENT (*OPTIONAL)

In this invention, I would like to thank:

- 1- Knowledge base company that collaboration with Urmia University, who made the device with the given instructions.
- 2- Urmia University
- 3- Mr. Dr. Valizadegan, esteemed professor of herbal medicine department of Urmia University.
- 4- Mr. Dr. Ahmadi, the esteemed professor of Urmia University Physics Department, who helped and guided me with the utmost care and selflessness.

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PID20081

Plasma Infection Cleaner

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ABSTRACT

Hygiene is important in all aspects of everyday life at home, in schools, and in hospitals. The need for low-cost, accurate, well-planned, and rapidly available disinfection and sterilizers that are not environmentally harmful prompted our research team to design and fabricate a portable, manageable plasma surface cleaner. Our device consists of the energy and frequency controlling systems that control the resonance phenomena and frequency control systems that control the resonance phenomena and emission intensity in the radiation. The adjustable frequency controller is the voucher to set the beam frequency in the range of UV radiation for immediate and safe surface disinfection. The gas splendor is designed for manageable gas flow during the application. The suitable torch system is designed and fabricated for safe, efficient, and practical usage on different surfaces. The plasma beam interacts with a surface and reactively charged and neutral chemical species that have an oxidation effect, reacting with organic matter, and the plasma high-energy ions break the hydrogen bonds in organic molecules, disrupting cellular structures and rendering microorganisms inactive. Our portable plasma device is also a good means of disinfection within the ambulance or any other vehicle with the risk of infection.

KEYWORDS: Plasma Device, Disinfection, Sterilization, Surface Cleaner

PRODUCT DESCRIPTION

The hygiene routine must be accurate, well-planned, and rapidly available for situations. Chemical and Ultraviolet (UV) disinfection systems are common in hospitals, clinics, offices, and more broadly, but they have limitations. For UV cleaning, shadows can prevent thorough

decontamination, treatment takes several hours, and it is not safe to be used in the presence of operators and patients. Chemical disinfectants are even more harmful, because of chemical We have developed an atmospheric pressure air plasma technique in the presence of carbon nanoparticles that provides a huge number of electrons in the plasma reactor region and enriches plasma effectiveness for many applications, with it initially tested for general purpose antimicrobial disinfection (bacteria, viruses, fungi) 99% removal of bacteria (E-Coli) is confirmed. This technology provides a revolutionary solution for infection removal systems with numerous advantages such as: being fast, without shadow effect, safe which can be used in the presence of operator and patient, appropriate for any material in a range of environments, can be used where chemicals cannot, amazing diffusion length in porose surfaces, and – additionally – it is in line with world net zero programs by reducing the use of harmful chemicals [1-3]. Through this project -we aim to scale up our novel atmospheric pressure plasma generator for infection removal systems that can be used not only in hospitals but also in everyday life. This device consists of the energy and frequency controlling systems that control the resonance phenomena and emission intensity in the radiation. The gas splendor is designed for manageable gas flow during the application. The suitable torch system is designed and fabricated for safe, efficient, and practical usage on different surfaces. Our portable plasma device is a good means of disinfection within the ambulance or any other vehicle with the risk of infection.

**PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/
SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS**

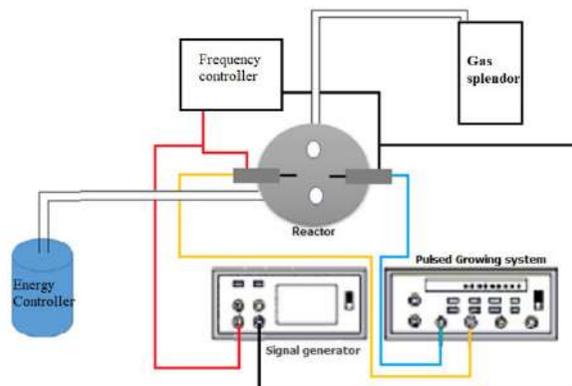


Figure1. schematic illustration of the fabricated plasma generator



Figure 2. The front, controller, torch, and air pump view of the fabricated plasma device

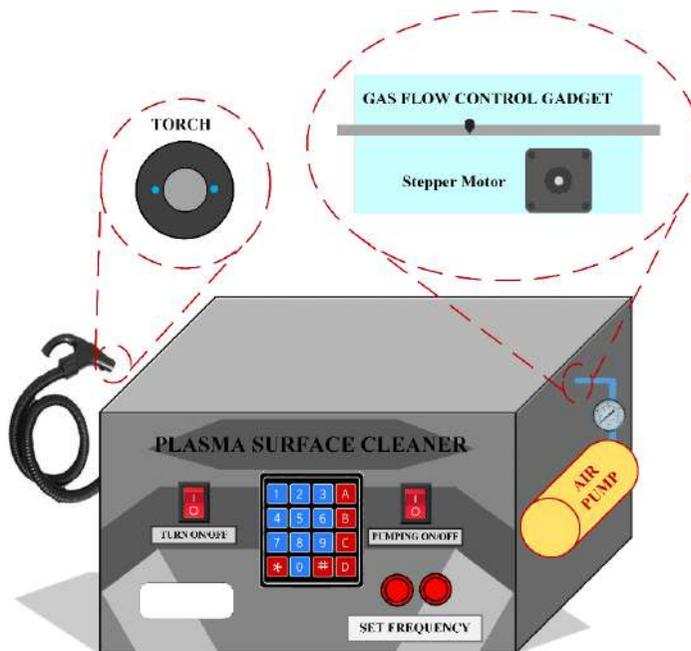


Figure 3. The schematic view of the fabricated plasma device: the plasma generator and controlling system, the plasma torch, the air pump, and the gas flow control gadget with stepper motor

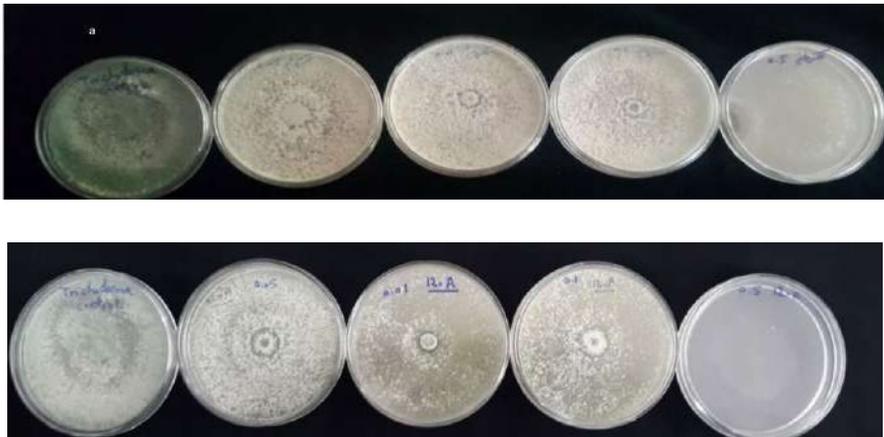


Figure 4. Trichoderma fungus Petri dishes after one min plasma treatment (Down) in comparison with chemical-treated(Up) in 10 days of monitoring. The growth rate is reported every 2 days

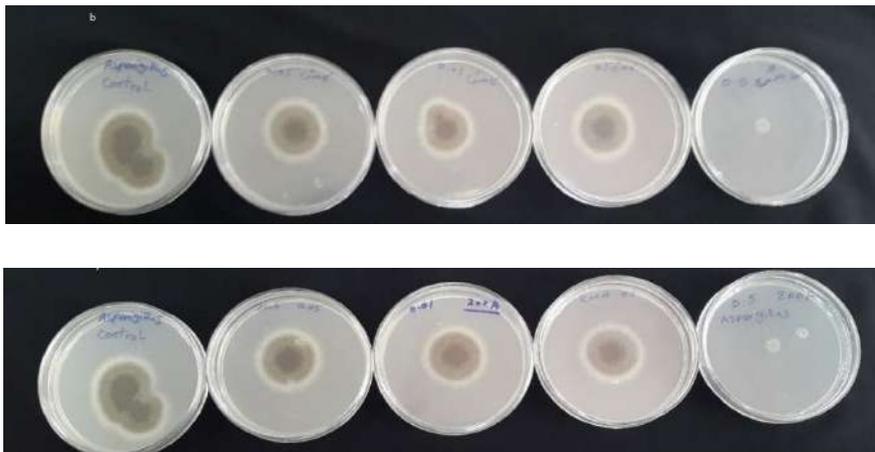


Figure 5. Aspergillus fungus Petri dishes after one min plasma treatment treatment (Down) in comparison with chemical-treated (Up) in 20 days of monitoring. The growth rate is reported every 4 days

NOVELTY AND UNIQUENESS

Our fabricated plasma disinfection device with its powerful, and adjustable plasma generation and application system offers an efficient alternative approach to cleaning and sterilization methods. Its adjustable frequency controller is the voucher to set the beam frequency for immediate and safe surface disinfection. The gas splendor is designed for manageable gas flow during the application. The suitable torch system is designed and fabricated

for safe, efficient, and practical usage on different surfaces. Our portable plasma device is a good means of disinfection within the ambulance or any other vehicle with the risk of infection.

BENEFIT TO MANKIND

Hygiene is important in all aspects of everyday life at home, in schools, and more crucial in hospitals. The effective reduction of the transmission rate of pathogenic bacteria, viruses, and fungi is the primary step for personal health and public safety. The fabricated portable and adjustable plasma beam generator device with a practical frequency controller offers a safe eco-friendly, low-cost disinfection and sterilization system that can operate instantly on desired surfaces of everyday life and in medical services and especially in emergency services vehicles and ambulances.

COMMERCIALIZATION POTENTIAL

The effective reduction of the transmission rate of pathogenic bacteria, viruses, and fungi is the primary step for personal health and public safety. Hospital infections present a huge burden on healthcare services, costing the Scottish NHS £46m per year (with the cost to the wider NHS presumed to be even higher). The traditional disinfection routine at schools and other public places with hygiene concerns or in hospitals with the crucial need for an immediate and trustworthy sterilization plan, or in emergency services, necessitates a powerful, portable, and functional plasma surface cleaner is an easy, low-cost, effective eco-friendly alternative with instant results. Therefore, our plasma system is commercially beneficial for public and medical services.

CONCLUSION

The traditional disinfection routine at schools and other public places with hygiene concerns or in hospitals with the crucial need for an immediate and trustworthy sterilization plan, or in emergency services, necessitates a powerful, portable, and functional plasma surface cleaner is an easy, low-cost, effective eco-friendly alternative with instant results. Our fabricated plasma disinfection device with its powerful, and adjustable plasma generation and application system offers an efficient alternative approach to cleaning and sterilization methods. Its adjustable frequency controller is the voucher to set the beam frequency in the favorable range of radiation for immediate and safe surface disinfection. The gas splendor is designed for manageable gas flow during the application. The suitable torch system is designed and fabricated for safe, efficient, and practical usage on

different surfaces. Our portable plasma device is a good means of disinfection within the ambulance or any other vehicle with the risk of infection.

ACKNOWLEDGEMENT (*OPTIONAL)

We would like to express our sincere gratitude to the Medical Campus of Xi'an Jiao Tong University, Xi'an, China, and the Nano-Electronic Laboratory of Urmia University for their invaluable support and resources provided during this research. Their state-of-the-art facilities of laboratory staff were instrumental in the completion of this work

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PID20101

Development and Analytical Evaluation of an Innovative Self-Centering Viscoelastic Damper with Disk Spring

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ABSTRACT

The recent earthquakes have caused significant damage and highlighted the need for intelligent and sustainable cities. Consequently, there is a growing preference to avoid permanent damage or disruption to urban structures caused by earthquakes or other factors. This paper introduces a viscoelastic damper that can be installed on beam-column connections, braces, and shear walls. One common method for reducing earthquake damage to structures is the use of dampers. Dampers have the ability to dissipate energy and increase the damping of the structure, but they exhibit permanent deformations after unloading. The combination of dampers with self-centering systems is an emerging method that aims to increase damping while minimizing residual deformations of the structure. The damper introduced in this article is made from a combination of disc springs and viscoelastic materials, resulting in a viscoelastic self-centering damper. Numerical modeling in ABAQUS shows that the damper's flag-shaped behavior matches the expected outcome accurately. The results indicate that the device can enhance energy dissipation, increase tolerable force, and reduce residual deformations. The combination of viscoelastic materials with pre-compressed disc springs reduces residual deformation to almost zero and increases load-bearing capacity threefold.

KEYWORDS: 1, Viscoelastic damper 2, Self-centering systems 3, Disc springs 4, Avoidance of failure

PRODUCT DESCRIPTION

The introduced viscoelastic damper consists of two components. The first part comprises the cylindrical viscoelastic damper, while the second part consists of disc springs. The viscoelastic materials are responsible for

dissipating energy, whereas the disc springs are responsible for creating self-centering behavior.

One unique feature of this damper is its ability to be designed in various sizes for different force ranges without any disruption in its performance. Additionally, this damper can be installed in various locations of different structures and is not specifically designed for a particular component, unlike most self-centering dampers.

The construction of this damper is relatively simpler compared to other self-centering dampers, and it also entails lower manufacturing costs. This damper, if developed further, not only has applications in the construction industry but also in bridge construction, vibration isolation equipment, automotive manufacturing, and more.

Despite all the mentioned advantages, it's worth noting that the design and manufacturing phase of this damper require a high level of engineering precision to ensure its proper and flawless performance.

The development of self-centering dampers is a subject that many researchers are actively working on. However, most self-centering dampers are designed in a way that they are only suitable for specific locations. They exhibit self-centering behavior only at the designated location and in interaction with other components. In contrast, the introduced damper is a standalone self-centering damper that can be installed in various locations. It only needs to be designed according to the desired force it needs to withstand. The behavior of this damper entirely depends on the properties of the viscoelastic materials and the springs, both of which offer a wide range of options for various behaviors. By installing this damper in structural members, post-earthquake damage to the structure is significantly reduced, leading to lower damages and costs resulting from earthquakes.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

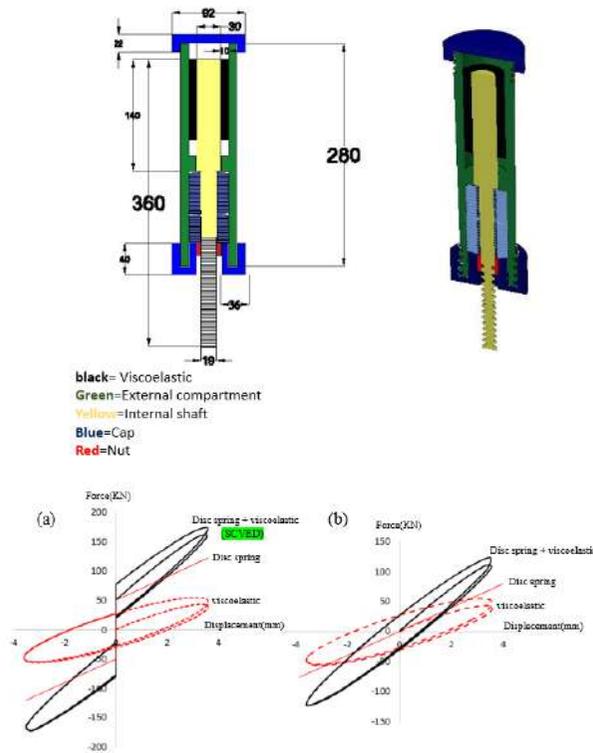
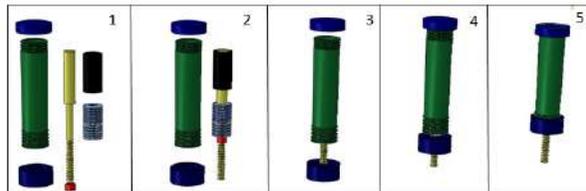


Figure 9): (a) Numerical modeling results (displacement force diagram) with pre-compression, (b) Numerical modeling results No pre-compression.



NOVELTY AND UNIQUENESS

Viscoelastic dampers combining smart alloys and prestressed cables exist, but they are only usable in specific regions, and their implementation is very complex. Additionally, these dampers are costly and have limitations in size and type of load. The self-centering damper introduced in this article not only has simple and inexpensive construction but also can withstand various compressive, tensile, and torsional forces. Viscoelastic dampers

and disc springs are widely used and inexpensive, but until now, no one has combined these two components to create a self-centering damper.

BENEFIT TO MANKIND

Recent earthquakes, such as the 2023 Turkey earthquake, have demonstrated that earthquakes can inflict significant financial and human losses on a country and its people. Therefore, building design codes are transitioning from current methods that accept damage towards approaches that aim to avoid failure. Self-centering dampers can easily reduce the human and financial losses caused by structural damage from earthquakes. However, for people to use these dampers in ordinary buildings, they must be economical and accessible. The introduced damper can achieve this goal with its affordable price and accessibility to the general public.

COMMERCIALIZATION POTENTIAL

Given that numerical analysis using ABAQUS software has shown that this damper can increase load-bearing capacity and reduce damage, it has the potential to capture a market as large as the global construction market. This damper offers a very unique performance at a significantly lower cost compared to other self-centering methods. For a damper with a diameter of 7 cm and a height of 30 cm, the cost is less than \$50. The installation cost for a damper on a typical concrete beam-column connection is \$100. It should be considered that although the materials used in this damper are accessible and inexpensive, the high level of creativity and engineering precision in its design can generate significant added value.

CONCLUSION

Over the last few decades, society has witnessed several large earthquakes that have caused extensive damage to buildings, leading to significant repair costs, human casualties, and structural damage. This has led society to build structures with high resilience and low vulnerability. A new device for avoiding damages has been developed and modeled in ABAQUS software. The device consists of a combination of disk springs and viscoelastic materials and can be installed in slotted beams, shear walls, and bracing. The disc springs serve as self-centering, while the viscoelastic materials provide damping. Modeled it in finite element software and tested them with sinusoidal cyclic loading. The device's hysteresis curve takes the form of a flag shape, which is expected of damage-avoidance devices. Further studies have been scheduled to carry

out experimental tests on the device and to demonstrate its efficiency for actual structural systems. The introduced damper is expected to demonstrate satisfactory performance under seismic loads based on similar research findings.

ACKNOWLEDGEMENT (*OPTIONAL)

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PID35012

HMPStore: An Online Merchandise and Souvenir Store of Perbanas Institute

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ABSTRACT

HMPStore is a 5-star online business established by the Perbanas Institute, Jakarta, Indonesia student association. This business was initiated by a dream to have a university business incubator that needed a big investment to be conducted offline. Then an idea comes as a solution, a business incubator also can be developed online and using an existing e-commerce platform that is already operated in Indonesia. The product development, supplier, distribution and design are managed by students. So they will have experience in entrepreneurship and an agile personality to face future competition after they graduate. HMPStore is an official store of Perbanas Institute commercial merchandise and souvenirs.

KEYWORDS: student-preneur, university incubator, merchandise, souvenir

PRODUCT DESCRIPTION

1. Product Name: HMPStore
2. Type Product: Merchandise
3. Segmentation: all ages, men and women.
4. Targeting: Visitors, guests, high school graduates who apply as students, students, lecturers, alumni, business partners, staff and families of the Perbanas Institute community.
5. Key features: Customized university commercial merchandise for Perbanas Institute
6. Marketing area: Indonesia
7. Innovative aspect: Merchandise and souvenirs official for Perbanas Institute, 100% profit to support outstanding student
8. User experience: Customized

9. Technical specification: high-quality product, so not unique but also useful and durable.
10. Supplier: we curated the cheapest and most qualified vendor. So there is no single vendor to make the product stay unique, in good quality, and competitive price.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

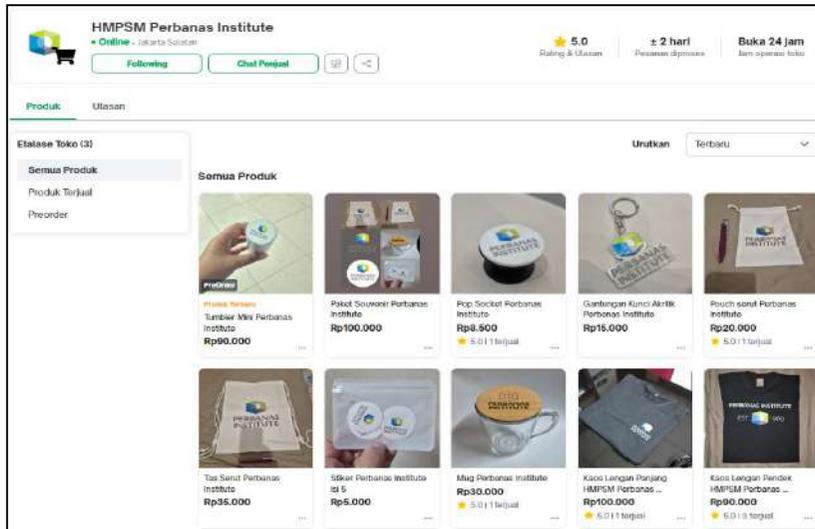


Figure 1. Product Catalog in the E-commerce



Figure 2. Promotion Poster

NOVELTY AND UNIQUENESS

HMPStore is an online store initiated by the student and all the target benefits must be returned to the student. This is a commitment to educate students in developing business ideas, designing practical or useful products, and finding the business vendor that has competitive prices but the best quality.

Most issues faced by university merchandise and souvenirs are not durable or useful, and the product is only used for display. So the function of memorable products and promotion is not working. The technology used is the existing e-commerce platforms such as Tokopedia, Google My Business, and Instagram, so students can focus on product creativity.

BENEFIT TO MANKIND

The business working capital is financially supported by Perbanas Institute. The profit of the sales is 100% to the outstanding students of Perbanas Institute. So besides educating students to be creative, efficient, also motivated to be outstanding in academic and non-academic sectors. One day, when the business is profitable enough, profit will be allocated for product development as well. As long as beneficial to the student.

COMMERCIALIZATION POTENTIAL

Perbanas Institute was established in 1969, which means over 55 years ago. So the number of alumni is big enough to the one of the market segments. Even the main market segment is current events held by all divisions in Perbanas Institute that require souvenirs or merchandize, The market segment comes from alumni, lecturers, active students, Perbanas Foundation members, and common customers who are welcome to purchase the product through the online platform. For example the bookstore at the University of Chicago, or Harvard University, has customers from all over the world due to the reputation of the university. HMPStore also can be reached by common customers who are interested in collecting the product due to the function, design, or brand image. In the future, the business also will register the brand to make a strong image and legalize the business to reach sustainable and reputable business.

CONCLUSION

Perbanas Institute is one of the oldest private institutes in Indonesia located in the middle of the dynamic capital city of Indonesia, Jakarta. This is one of the privileges of being involved in a business trend that is near the

supplier, distribution company, target market, and all the resources related to the business infrastructures. So a business incubator is a must to develop in university-based idea. HMPStore is an online official store for Perbanas Institute merchandise and souvenirs. The business model's purpose is to make a profit and return it to the student welfare. Business is segmented mainly to the Perbanas Institute only, when the institution needs souvenirs and merchandise for the guests, visitors, and or exchange students. The target market seems a niche, but powerful number due to the annual spending on souvenirs and merchandise being large enough in Perbanas Institute itself. Education on developing business is not only in business theory but also practical.

ACKNOWLEDGEMENT (*OPTIONAL)

Thank you for all the support of the Perbanas Institute stakeholders and the organizer of the 6th Digitalised International Invention, Innovation and Design Competition.

REFERENCES (*OPTIONAL, MAXIMUM 6 RELEVANT REFERENCES)

Reference Type: Catalog
Record Number: 2464
Author: HMPStore
Year: 2024
Title: HMPStore Souvenirs and Merchandise Online Store
Institution: Tokopedia
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Record Number: 2465
Author: Manajemen, Perbanas
Year: 2021
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Institution: Instagram
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Author: Perbanas
Year: 2024
Title: Official Website of Perbanas Institute
Institution: Website
URL: <https://www.perbanas.id>

SECTION 3

THE LIST OF THE PROJECTS 6th DIIID JOHOR 2024

**CATEGORY B
TERTIARY**



PD20011

Enhancing Wireless Communication Systems via Guard Interval Design: An Approach to 5G Modelling

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ABSTRACT

Considering a wireless system with a basic transmitter and a receiver to transmit a signal. The process of transmitting a signal experiences great signal interference due to wireless channels and other disturbances. Thus, it is important to improve the transmitter system together with its receiver system by deploying a guard band or an additional frequency to avoid interference. The additional frequency is called Guard Interval (GI). The GI is a period inserted between channels or data packets to mitigate the effect of multipath interference or channel impairments. The length of the GI should be chosen with a proper measurement based on the expected channel conditions. In theory, longer GI can provide better protection against multipath interference but reduce the overall bit error rate (BER). The effectiveness of the GI length also depends on the specific modulation scheme and coding used in the wireless system. This project shows that the GI measurements for the 5G network had obtained at $BER_{0.0942}$, which is $1/8 N_{FFT}$ with 256 subcarriers. It can be further improved in terms of data rates and smoothing the signal transmission efficiency.

KEYWORDS: 5G, Spectral Efficiency, Bit Error Rate, Guard Interval.

PRODUCT DESCRIPTION

Enhancing a communication model has become a great challenge to reduce the error rate during the process of data transmission. The reduction of the Error Rate (BER) is crucial to improving the performance and reliability of wireless communications systems,

particularly in 5G technology. 5G represents the fifth generation of wireless communication networks, promising a revolutionary leap in connectivity and communication capabilities with high spectral efficiency (SE). The most common issue with high SE is maintaining the signals' reliability with minimum error. One effective technique employed to minimise BER with higher SE in 5G networks is the use of Guard Interval (GI) measurements. In wireless communication such as mobile and satellite, signals can be distorted due to various factors such as multipath fading and signal interference, as shown in Figure 1.

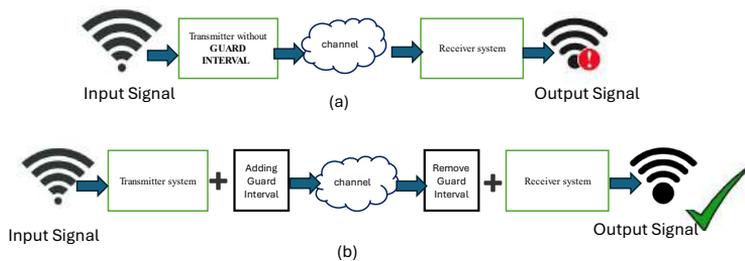


Figure 1. (a) A system without the Guard Interval (b) A system deploy the Guard Interval

Figure 1 (a) and (b) illustrate a system with and without the deployment of GI in the application of a wireless communication system, respectively. These distortions can lead to errors in the received bits, impacting the overall quality of communication. Referring to Figure 2, the block diagram showed a new feature of the wireless communication model with the use of a block coder technique, adding GI and error correction code.

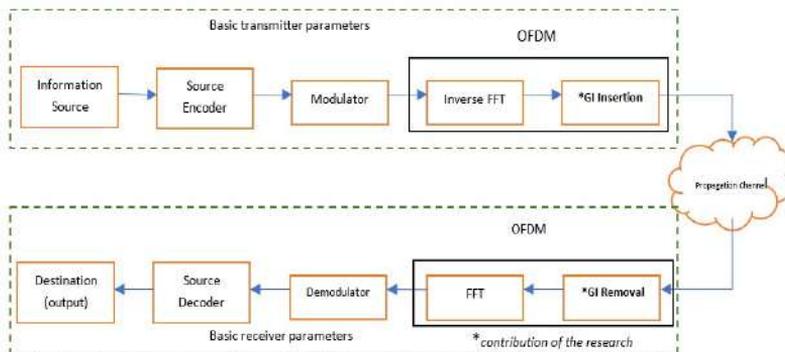


Figure 2. Block diagram of the system

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

Figure 3 illustrates the simulation flow chart of GI inserted into the system model. The model supports the 5G approach in order to minimise the bit error. The process involved converting bits in the channel, and then GI was added to mitigate interference. Its performance was measured by calculating the BER values at the receiving end. Such approach would be novel in the transmission efficiency utilisation of real-world data to dynamically optimise system performance.

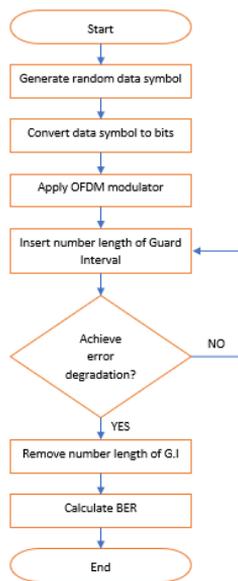
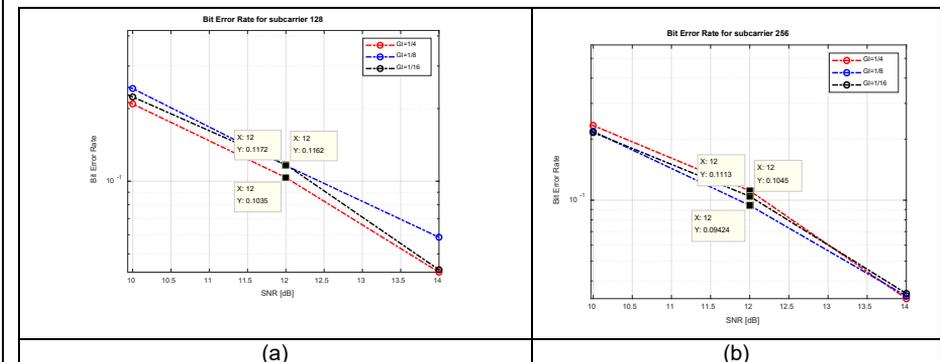


Figure 3. System flow chart for wireless system



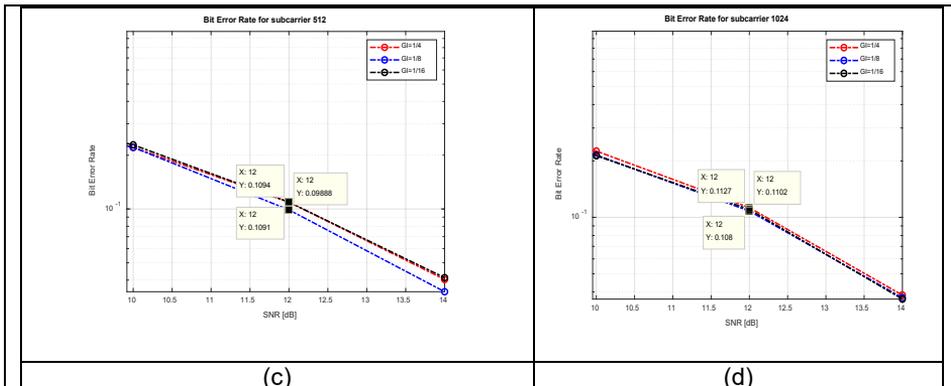


Figure 4. The MATLAB simulation results of BER measurements for varies of subcarrier of the system (a) Subcarrier 128, (b) Subcarrier 256, (c) Subcarrier 512, (d) Subcarrier 1024

Table 1. The BER measurements for varies of subcarrier of the system

Subcarrier	128		256		512		1024	
	SNR(dB)	BER	SNR(dB)	BER	SNR(dB)	BER	SNR(dB)	BER
1/4 of N_{FFT}	12	0.1035	12	0.1045	12	0.0988	12	0.1102
1/8 of N_{FFT}	12	0.1162	12	0.0942	12	0.1091	12	0.1127
1/16 of N_{FFT}	12	0.1172	12	0.1113	12	0.1094	12	0.108

The present study was designed to determine the effect of error rate on variations in GI length. The results in Table 1 obtained from the MATLAB simulation show that a subcarrier with 256 and 1/8 of N_{FFT} has 0.0942 error rate. As compared to other subcarriers, it has the lowest BER value.

NOVELTY AND UNIQUENESS

By dynamically adjusting GI length in the wireless communication model, it has been shown that this can mitigate the effects of multipath propagation and thus reduce the bit error rate. Hence, this will further improve the channel conditions, overall performance, and reliability of 5G networks. The guard intervals also help to minimise the time taken

for signals to reach the receiver, thereby reducing latency and improving the responsiveness of 5G networks, leading to fewer packet errors and better quality of service for users.

BENEFIT TO MANKIND

Increase the performance of data transmission by using GI to serve 5G telecommunication service providers. Refining the received signal contributes to user benefits in communicating within the multiple networks. This could fulfil the growth demand on 5G users for the quality of network, for which the deliverable will be improved in terms of signal and data rate. This could help telecommunications service providers serve their customers through this innovation and advancement in reducing the error rate that occurs during network transmission.

COMMERCIALIZATION POTENTIAL

The system model provides more efficient data transmission by innovating the specific length of guard interval between the channels. It visualises receiving a sharp signal at the destination (receiver). This algorithm could include enhancing the error rate, network expansion, or technology updates for existing hardware. Thus, it contributes to commercial opportunities for ZTE and Huawei.

CONCLUSION

It is concluded that the objective has been achieved. This system has huge potential to support a new approach to 5G modelling technology for transmitting multiple signals. The length of GI has the capability to mitigate the signal interference, or BER, for the OFDM system. It is shown that $1/8 N_{\text{FFT}}$ with 256 subcarriers has an approximate 90% improvement as compared to $1/8$ of N_{FFT} GI length with 128 subcarriers inserted into the system. The transmitted signal is always improved by increasing the GI length; however, there are limits to the size of the GI because the duration is subtracted from the total amount of time allotted to the data. In a nutshell, this research proves that the GI length has improved the BER value in the OFDM system, which is applicable in the 5G network.

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PID20061

Delami Marina

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ABSTRACT

In the face of escalating environmental concerns and the imperative for sustainable development, the architecture and construction industries are undergoing a transformative shift. This paradigmatic evolution is driven by a pressing need to mitigate the adverse impacts of urbanisation, climate change, and resource depletion. As for various turtle conservation centres, they strive to uphold the principles of protection and education regarding these revered reptiles. Each centre exhibits its unique approach, blending architectural ingenuity with environmental consciousness to mirror the turtles' natural habitat. Like DELAMI MARINA, this centre often features contemporary designs seamlessly integrated into coastal landscapes, fostering a sense of harmony between human intervention and nature's splendour. Moreover, this centre emphasises the intrinsic value of nature beyond its role as a sanctuary for turtles, highlighting its broader significance in sustaining life on Earth. Through their collective efforts, these establishments epitomise the universal commitment to safeguarding biodiversity while nurturing a deeper appreciation for the delicate balance between human activity and the natural world. The concept of biomimicry lies at the heart of this endeavour, advocating for the emulation of nature's time-tested strategies and systems to solve human challenges. By integrating natural elements such as daylight, vegetation, water features, and natural materials into the built environment, designers can create spaces that resonate with occupants on a fundamental level, fostering a sense of connection and harmony.

KEYWORDS: Green technology, sustainable architecture, sustainable design, Green Building, Natural Lighting.

PRODUCT DESCRIPTION

DELAMI MARINA, a beacon of turtle conservation, embodies a profound dedication to safeguarding these iconic creatures and enlightening the public about their precarious plight. Rooted in our core mission is an unwavering commitment to the nurturing care of these majestic beings. What distinguishes our centre is not only its noble cause but also its striking architectural design, marrying elegance with functionality in a contemporary aesthetic that seamlessly blends with the natural surroundings, mirroring the very coastal habitats that turtles call home.

From the break of dawn until the twilight hours, DELAMI MARINA opens its doors daily, inviting visitors to immerse themselves in the realm of turtle conservation. Yet, beyond serving as a sanctuary for these revered reptiles, the centre recognises the intrinsic value of the natural environment as the cornerstone of life itself. It acts as a nurturing haven, fostering a rich tapestry of biodiversity essential for our collective existence.

Through our tireless endeavours, we aspire not merely to shield turtles from harm but also to underscore the profound interconnectedness between humanity and nature. With each interaction, we endeavour to inspire a sense of stewardship that transcends generations, fostering a future where harmony between humans and the natural world flourishes. Amidst this backdrop, the integration of nature-inspired solutions into building design and operations emerges as a promising avenue for enhancing both environmental sustainability and overall building performance (Guy & Farmer, 2001; Okeil, 2010).

At its core, enhancing building performance through nature-inspired solutions encompasses a multifaceted approach that encompasses various aspects of sustainable design and operation (Kaliappan & Hamid, 2021). This includes optimising energy efficiency through passive design strategies, enhancing indoor environmental quality, promoting biodiversity, and minimising resource consumption throughout the building's lifecycle.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

Figure 1 shown the bioclimatic section and exploded perspective of the building. This bioclimatic section of a building provides detailed insights

into how the structure interacts with its environment to achieve sustainability and energy efficiency. One key aspect of a bioclimatic design is the use of natural lighting to illuminate the interior spaces, reducing the need for artificial lighting and thereby conserving energy. The arrows in the bioclimatic section show the distribution of daylight and wind inside the building. The exploded perspectives in Figure 1 also show the details green elements and materials used in the building.



Figure 1. Bioclimatic Section of the building



Figure 2. Natural Lighting at the atrium area inside DELAMI MARINA



Figure 3. Another view of atrium inside of DELAMI MARINA



Figure 4. View of Atrium inside the DELAMI MARINA

NOVELTY AND UNIQUENESS

The atrium in the building functions as a green sanctuary, showcasing innovative green technology and architectural aesthetics. With a unique blend of vertical gardens, solar panels, and reflective surfaces, the atrium serves as a multifunctional space that promotes sustainability and human well-being. Its novel design harnesses renewable energy, optimizes natural light, and purifies indoor air, creating a refreshing environment that inspires creativity and productivity. This fusion of green technology and architectural beauty not only distinguishes the building but also sets a new standard for sustainable design, captivating occupants and visitors alike.

BENEFIT TO MANKIND

The integration of green technology and architectural innovation in the building's atrium offers manifold benefits to mankind. By addressing

critical issues like energy efficiency and indoor air quality, it enhances the quality of life for occupants, fostering healthier and more productive environments. Moreover, the sustainable design reduces environmental impact, mitigating carbon emissions and conserving resources. Economically, it leads to long-term cost savings through reduced energy consumption. The novel design serves as a platform for advancing knowledge and education in sustainable practices, while also fostering social and cultural engagement. Its global relevance lies in inspiring similar initiatives worldwide, while locally, it contributes to community well-being and pride in sustainable development efforts.

COMMERCIALIZATION POTENTIAL

The commercialization potential of our green technology-infused atrium lies in its significant market demand and size driven by the growing emphasis on sustainability in building design. Our competitive advantage stems from our unique blend of innovative green features and architectural aesthetics, setting us apart in the market. Scalability is achievable through modular designs and strategic partnerships. Cost analysis ensures competitive pricing, while profit margins are optimized through efficient operations. Regulatory compliance and certifications validate our commitment to sustainability, enhancing market trust. Our intellectual property strategy includes patenting unique design elements and technology integration.

CONCLUSION

In conclusion, the integration of green technology and architectural innovation in the building's atrium presents a compelling solution to pressing environmental and societal challenges. Our findings underscore the immense market demand for sustainable building solutions and the potential for significant economic and environmental benefits. The project's significance lies in its ability to enhance the quality of life for occupants, reduce environmental impact, and inspire a shift towards sustainable practices. Looking ahead, future directions could involve further research and development to refine and expand upon the current design, as well as fostering collaborations to drive widespread adoption of sustainable building practices on a global scale.

ACKNOWLEDGEMENT

We extend our heartfelt gratitude to the individuals, organizations, and entities whose invaluable contributions have been instrumental in the development and success of our project.

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Our sincere appreciation extends to everyone who has played a role, no matter how large or small, in shaping the success of this endeavor. Thank you for your commitment, generosity, and belief in our vision.

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PID20111

Development of Home Energy Management System V2H Technology

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ABSTRACT

Vehicle-to-Home (V2H) technology represents a significant advancement in energy management, particularly for peak shaving. This paper examines how V2H systems use the battery storage of electric vehicles (EVs) to power homes during peak demand, reducing strain on the electrical grid and lowering electricity costs. We start by discussing current energy challenges related to peak demand and then explore the technical aspects of V2H, such as integrating EVs with home energy systems, bi-directional charging, and the required infrastructure. V2H technology transforms EVs into dynamic home energy components, offering economic benefits to consumers and utility providers while also reducing greenhouse gas emissions. Challenges include the need for widespread EV adoption, standardised communication protocols, and concerns about EV battery longevity. Future prospects highlight V2H's role in developing smart grids and integrating renewable energy sources. The study concludes that V2H technology, with its peak shaving capabilities, provides a sustainable energy management solution, enhancing grid resilience and efficiency. Collaborative efforts among stakeholders are essential to maximise V2H benefits and promote its widespread adoption.

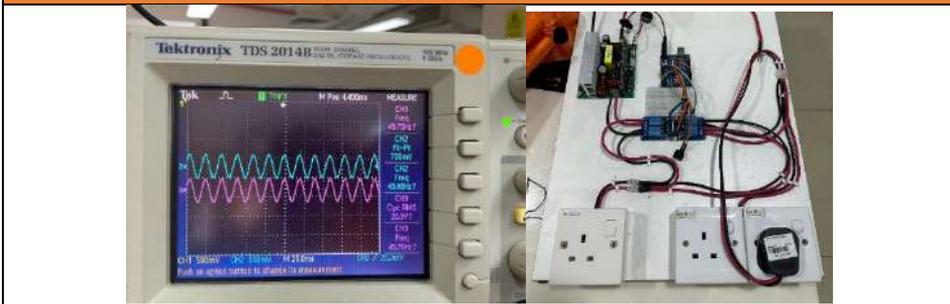
KEYWORDS: Energy management, peak shaving, smart grid, costs, renewable energy

PRODUCT DESCRIPTION

The V2H, or Vehicle-to-Home, project delves deep into peak shaving technology, focusing on how electric vehicles (EVs) can seamlessly integrate their inverted AC signals into grid sources. The project

ambitiously aims to assess the feasibility, reliability, and efficacy of this system in real-world scenarios. The project covers various crucial elements, including converting DC sources into AC signals, implementing bidirectional energy flow control, using a phase-locked loop to synchronise signals, and maintaining the overall system's reliability. These components are carefully crafted through a combination of theoretical analysis and hardware simulation. The ultimate goal is to leverage Vehicle-to-Home (V2H) technology to reduce peak load demand on the electrical grid and decrease carbon emissions, aligning with the Sustainable Development Goals (SDGs). By using the battery storage of electric vehicles (EVs) to supply power to homes during peak demand periods, V2H technology helps balance the load on the grid, ensuring more stable and efficient grid operations. This not only mitigates the need for additional, often fossil-fuel-based, power generation during peak times but also promotes the use of cleaner, renewable energy sources. The implementation of V2H supports several SDGs, including affordable and clean energy (SDG 7), sustainable cities and communities (SDG 11), and climate action (SDG 13). Through strategic use of EV batteries for energy storage and distribution, V2H technology aids in creating a more sustainable, resilient, and low-carbon energy system, ultimately fostering environmental sustainability and advancing global efforts towards achieving the SDGs. This comprehensive investigation spans theoretical concepts to practical applications, using a synergistic blend of power electronics and power system integration. The objective is not only to explore theoretical underpinnings but also to translate insights into tangible, real-world solutions for more efficient and sustainable energy management.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



NOVELTY AND UNIQUENESS

Electric cars (EVs) can now be used as flexible energy sources thanks to Vehicle-to-Home (V2H) technology, which allows electricity to move both ways between the EV and the house or power grid. As part of a larger trend towards smarter grids and sustainable living, this enables EVs to supply energy during periods of high demand, stabilize the grid, support the use of renewable energy, lower utility company maintenance costs and homeowner electricity bills, and ultimately contribute to a smarter, more sustainable, and economical energy management system that lowers greenhouse gas emissions and dependence on fossil fuels.

BENEFIT TO MANKIND

The main benefits of Vehicle-to-Home (V2H) technology include:

1. Flexible Energy: V2H lets electric vehicles (EVs) supply power to homes or the grid when needed. Your EV becomes a versatile energy resource.
2. Grid Stability: During high demand, V2H stabilises the power grid by providing extra energy. This reduces the need for more electricity from polluting sources.
3. Backup Power: Think of V2H-enabled EVs as backup generators. They keep your home running during power outages.
4. Renewable Energy: V2H integrates with solar panels. Excess solar energy gets stored in your EV battery for later use.
5. Cost Savings: Homeowners can use stored EV power instead of expensive grid electricity during peak hours. Lower bills!
6. Grid Efficiency: V2H smooths out demand peaks, saving on grid maintenance costs for utility companies.
7. Green Impact: By using clean energy and reducing fossil fuel reliance, V2H helps fight climate change.
8. Smart Living: V2H is part of a bigger trend towards sustainable living, where vehicles play a key role in energy management.

COMMERCIALIZATION POTENTIAL

Vehicle-to-home, or V2H, technology has enormous economic potential since it takes advantage of the increasing number of electric cars (EVs) to store extra renewable energy, lower homeowner electricity bills, and supply backup power during blackouts. In order to encourage

renewable energy, governments are supporting V2H with incentives and regulations. As EV usage rises, so too will the demand for V2H systems. V2H is a promising mainstream technology for the future due to its mix of financial benefits, energy security, and environmental sustainability, even in the face of obstacles like the need for standardisation and increased public awareness.

CONCLUSION

In conclusion, current technology homes can be powered by electric vehicles (EVs), which helps utility providers, homeowners, and the environment. Vehicle-to-Home (V2H) technology lowers dependency on polluting sources, helps incorporate renewable energy sources like solar, and serves as a backup power source during blackouts. By using stored EV power during peak hours, it also helps homes save money on their electricity bills. With the increasing prevalence of electric vehicles, V2H holds the potential to transform energy management and usher in a more sustainable and eco-friendly future.

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PID20141

HAVEN

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ABSTRACT

The current global biodiversity crisis has led to the migration of numerous species to new habitats to avoid the threat of extinction due to changing environmental conditions. Species with longer life spans are particularly at risk, prompting the implementation of ex-situ conservation measures such as assisted colonisation. However, there remains a lack of empirical evidence regarding establishing new populations for these species or the efficacy of assisted colonization as a conservation practice. In Malaysia, the four primary sea turtle species, namely the Leatherback, Hawksbill, Green, and Olive Ridley, are presently classified as endangered or critically endangered on the IUCN Red List. This underscores the critical necessity for the implementation of conservation measures. Conservation centres like HAVEN play an indispensable role in protecting turtles by providing secure nesting sites, conducting scientific research, rehabilitating injured individuals, raising public awareness, and preventing the extinction of endangered species. HAVEN is a designated turtle sanctuary that emphasises Conservation, Education, and Research, providing visitors with the opportunity to engage with and gain a deep understanding of turtle life while raising awareness about the importance of conservation efforts. Through their comprehensive approach, HAVEN is making a substantial impact on the preservation of endangered sea turtle species.

KEYWORDS: Sanctuary, Education, Conservation, Research, Preservation

PRODUCT DESCRIPTION

HAVEN is a crucial sanctuary for turtles, providing a secure refuge for these remarkable creatures. Through the provision of meticulously maintained nesting sites, these establishments afford the turtles a safe

space for egg-laying, thereby ensuring the perpetuation of the species. Additionally, these centres undertake essential scientific research to unravel the mysteries of turtle behaviour, migration patterns, and the impact of human activities on their habitats. When turtles are injured, these facilities act as rehabilitation centres, tending to their wounds and nurturing them back to health, fostering hope for their return to the wild. Furthermore, these conservation centres are instrumental in raising public awareness about the challenges facing turtles and marine ecosystems as a whole. By engaging with the community and sharing their knowledge, they ignite a passion for conservation and inspire action to protect these extraordinary animals. In the fight against the extinction of endangered turtle species, these centres stand as guardians. With unwavering dedication, they vigilantly protect nesting sites, thwart poaching activities, and work tirelessly to preserve natural habitats, thus safeguarding the future of these remarkable creatures. (WWF, 2018, June 10).

As a designated turtle sanctuary, HAVEN concentrates its efforts on conservation and education, inviting visitors to immerse themselves in the captivating world of turtles. From interactive exhibits to informative programmes, HAVEN instills a profound appreciation for turtle life and fosters a sense of responsibility for their preservation. Through its comprehensive approach, HAVEN emerges as a beacon of hope, leaving an indelible mark on the conservation of endangered sea turtle species.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

The figures below illustrate the sanctuary's surroundings, emphasising the turtle hatchery and the turtles' pool, which are integral to their longevity. Additionally, the sanctuary offers outdoor camping as an educational experience, allowing visitors to stay overnight and observe turtles laying eggs. Furthermore, the building houses a gallery walk that educates visitors and enhances their awareness.



Figure 1. Hatchery



Figure 2. Turtle's pool



Figure 3. Hatchery nest



Figure 4. Gallery Walk



Figure 5. Turtle Information Centre



Figure 6. Research Area

NOVELTY AND UNIQUENESS

HAVEN plays a crucial role in protecting endangered turtle species. The sanctuaries provide safe nesting grounds, monitor hatchlings, and educate the public about conservation efforts. HAVEN also significantly contributes to scientific research by studying turtle behaviour, migration patterns, and overall health. Their educational programmes, such as camping and guided tours, effectively raise awareness about the key threats. HAVEN offers a unique experience, allowing visitors to closely observe turtles in their natural habitat, promoting empathy, and fostering sustained support for conservation initiatives. Notably, the sanctuary's serene coastal location provides a peaceful environment beneficial to the well-being of both turtles and visitors.

BENEFIT TO MANKIND

HAVEN's primary goal is to promote population stability. The organisation aids in the recovery of dwindling populations by offering medical assistance to injured turtles and safeguarding their nesting

sites. Each rescued turtle contributes to the overall population. Moreover, these efforts yield economic benefits. Sea turtle ecotourism generates three times more revenue. Merchandise sales related to the sanctuary aid its growth and positively affect the economy centred around turtle conservation. HAVEN's key objectives include bolstering local enterprises and enhancing tourism. Regions with sea turtle conservation facilities attract tourists eager to watch and interact with the turtles, thereby stimulating tourism and generating income for local businesses.

COMMERCIALIZATION POTENTIAL

HAVEN, a unique turtle sanctuary in Malaysia, capitalises on its scarcity within the local market. As one of the few sanctuaries supporting turtle conservation, it attracts significant investment interest from organisations. HAVEN's focus on Conservation, Research, and Education distinguishes it as a premier destination for turtle observation. Scalability is facilitated by modular designs and strategic partnerships, ensuring growth potential. Rigorous cost analysis guarantees competitive pricing, while streamlined operations maximise profit margins. Adherence to regulations and certifications underscores the sanctuary's dedication to sustainability, bolstering market confidence. Intellectual property, including the trademark 'HAVEN,' symbolises a refuge for sea turtles, complemented by the educational initiative 'Save and Safe'.

CONCLUSION

Ultimately, the survival of endangered turtle species relies on HAVEN and its ability to maintain sanctuaries. The organisation's emphasis on scientific research contributes significantly to conservation efforts. The educational programmes offered by HAVEN effectively increase awareness of the major threats that turtle populations face. Furthermore, the sanctuary's serene coastal location provides a unique opportunity for the public to observe turtles in their natural habitat. By promoting population stability and offering medical assistance to injured turtles, HAVEN actively contributes to the recovery of dwindling populations. Furthermore, the sanctuary's promotion of sea turtle ecotourism and sales of merchandise for conservation also support economic development and local businesses. HAVEN sets

itself apart as a sustainable and expandable sanctuary with its emphasis on conservation, research, and education.

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PID30081

Increasing the rate and efficiency of gold production in the cyanide method by using anionic surfactant

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ABSTRACT

Gold is an indispensable and precious metal in human history, profoundly influencing the global economy and technologies. Extraction of gold from mine soil with cyanide is the main method of gold extraction in mines, where cyanide solution is used as a solvent for gold from ore and then gold is extracted from cyanide solution containing gold. Before the leaching process, the ore preparation stage is an essential process for extracting gold from the soil, which is mainly done by crushing and grinding the gold-bearing rocks to reduce the gold ore particle size. In the extraction of gold by the cyanide method, the long duration of the extraction process, the slow extraction rate and the efficiency of about 60% in the stages of preparation, leaching and recovery are considered as disadvantages of this method. In the project that we have done to increase efficiency and production by using sodium dodecyl sulfate (SLS) as an anionic surfactant, I, the processing time in the leaching stage has been reduced by half (12 hours), II, the gold extraction efficiency has reached 96%. In the samples tested using SLS in 12 hours, the amount of gold obtained was increased by about 30% and were 0.9943 and 1.001 grams, respectively.

KEYWORDS: Gold, Cyanide Leaching, Surfactant, Efficiency

PRODUCT DESCRIPTION

Samples of gold ores were prepared from the Varzghan gold mine in East Azarbaijan province, Iran (Fig.1). Samples are firstly crushed in a crusher (Fig.2) and then are ground by a ball mill (Fig.3). For each test, 1500 grams (Fig.4) of the sample are weighed and the cyanide leaching experiments are carried out in a 4000 ml glass cell (Fig.5) at ambient temperature, pH of 11, liquid to solid ratio of 2, sodium cyanide

concentration of 1 g/L, H₂O₂ 10 ml, particle size finer than 76µm, and leaching time of 12, and 24 hours (Fig.6). Granular activated carbon is used for the recovery of gold from cyanide solutions by the Carbon in pulp (CIP) process (Fig.7). In this invention, we used sodium dodecyl sulfate 0.05 g/L (Fig.8), as an anionic surfactant to increase the yield and rate of gold extraction from cyanide solution in four examples of experiments. The results showed that by adding lauryl sulfate, the amount of absorption in activated carbon increases and the yield increases from 67% to 96%. Also, by increasing the rate of gold adsorption from solution into activated carbon, the extraction time was reduced from 24 hours to 12 hours (Fig 9-12). In the samples tested using lauryl sulfate in 12 hours, the amount of gold obtained was 0.9943 and 1.001 grams, respectively, but in the samples without lauryl sulfate, the amount of gold obtained in 24 hours and under the same conditions was 0.7641 and 0.7710 grams.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



Fig.1



Fig.2



Fig.3



Fig.4



Fig.5



Fig.6



Fig.7

Fig.8

Fig.9



Fig.10



Fig.11



Fig.12

NOVELTY AND UNIQUENESS

The carbon in pulp (CIP) and carbon in leach (CIL) processes became firmly established in the gold mining industry in the 1980s, initially in South Africa and Australia, from where they spread rapidly to all the gold-producing regions of the world. The use of anionic surfactant lauryl sulfate to increase the rate and amount of adsorption due to the increase of surface adsorption of gold on activated carbon is announced for the first time in the world.

BENEFIT TO MANKIND

Gold is an indispensable and precious metal in human history, profoundly influencing the global economy and technologies. Therefore, the reduction of production costs will have a great impact on the amount of gold production in the world, and the use of gold in jewellery and electronic industries will increase for the progress and comfort of people. From the environmental aspect, decreasing the consumption of chemicals in the gold production process reduces environmental pollution. With the decrease in the price of gold and the possibility of buying it by people and giving it as a gift to women, women's interest in men increases and life becomes more loving.

COMMERCIALIZATION POTENTIAL

The rate of adsorption of gold cyanide onto activated carbon is very slow by normal industrial standards, and it can take days or weeks to attain true equilibrium loading. Because of this, all CIP and CIL plants are trying to increase the rate and amount of gold adsorption on activated carbon. Therefore, the use of lauryl sulfate to increase the rate and amount of production efficiency will be very significant from the economic aspect and operating costs, and it is expected that the costs of the production units where the amount of gold in the ore is low will be reduced by half.

CONCLUSION

In this invention, we used lauryl sulfate as an anionic surfactant to increase the yield and rate of gold extraction from cyanide solution in four examples of experiments. The results showed that by adding lauryl sulfate, the amount of adsorption in activated carbon increases and the yield increases from 67% to 96%. Also, by increasing the rate of gold adsorption from solution into activated carbon, the extraction time was reduced from 24 hours to 12 hours.

ACKNOWLEDGEMENT

It is necessary here to express my gratitude to Dr. Shafiei, Research Vice President of Urmia University, and Dr. Ahmadi, Director of International Relations of Urmia University, for their valuable guidance.

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PID20191

Unmanned Underwater Remotely Operated Vehicle (ROV) for Underwater Inspection

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ABSTRACT

The exploration of the world's oceans has always been a huge interest for scientists, engineers, and enthusiasts. It ranges from the exploration of marine biodiversity and the study of fragile ecosystems to the inspection of submerged infrastructures. However, underwater exploration has always been a dangerous task, and only trained professionals are able to perform such tasks, resulting in very slow progress in the exploration of the world's oceans. Because of that, there has been an increasing demand for safe, effective, and cost-efficient methods or systems that allow advancements and improvements regarding underwater exploration. Hence, this project aims for the design and development of an Unmanned Underwater Remotely Operated Underwater vehicle (ROV) for underwater inspections. The goal of this project is to design and develop the 4-degree of freedom ROV, which is able to perform basic underwater tasks by optimising its equipment and providing data that can be analysed and understood by its user. The study focuses on the ability of ROV to maintain at certain depths for doing underwater tasks by using designed propulsion systems consisting of a four-thruster configuration for better manoeuvrability of ROV. The performance of ROV will be evaluated in terms of stability, buoyancy, velocity, and acceleration.

KEYWORDS: Underwater exploration, Unmanned Underwater Remotely Controlled Vehicle (ROV), Safety, Efficiency, Propulsion Systems

PRODUCT DESCRIPTION

Introducing a cutting-edge ROV (Remotely Operated Vehicle), meticulously engineered to revolutionise underwater exploration and inspection. With dimensions measuring 500 mm × 300 mm × 350 mm, the ROV in question is compact yet powerful, capable of navigating through underwater environments with precision and efficiency.

We built the ROV with durability, efficiency, and customizability in mind. The acrylic frame body of the ROV is favored due to its lightweight nature, ability to withstand wear and tear, UV rays, and moisture. This makes the ROV extremely durable. With a smartly designed 4 thruster configuration, it ensures the ROV's precise maneuverability underwater. This enables the ROV to execute precise maneuvers and sustain excellent motion control during its descent or ascent into the water.

The ROV also comes with features like leakage sensors to alert the user as soon as possible, and it is also capable of live video streaming through an LCD screen with waterproof fishing camera. Besides, the ROV is also equipped with pressure sensors capable of depth measurement. This feature is very useful in providing essential data in navigation, safety, and control of ROV while underwater. Not only that, the ROV is also specifically designed for customizability. With powerful computer systems like Arduino Uno and Raspberry Pi 3B supported on the device, it allows easy installation of gadgets and accessories on the spacious body frame. This makes it an ideal option for both novices and experts who utilize it for various purposes.

Equipped with a state-of-the-art stability system, the ROV boasts subsea polyurethane foam for enhanced buoyancy control. With 90% negative buoyancy in water, it remains stable and manoeuvrable in challenging underwater conditions. The addition of a neutral buoyancy 15-metre tether further reduces drag, allowing for seamless movement through the water. Whether it's studying marine biodiversity or conducting research in fragile ecosystems, our ROV is equipped to handle the task with ease.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

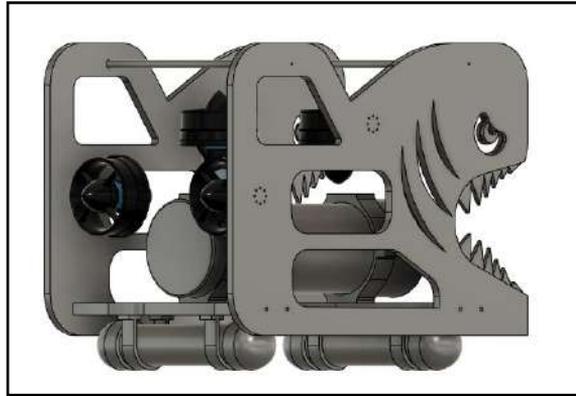


Figure 5. The overall prototype that drawn in Fusion 360.

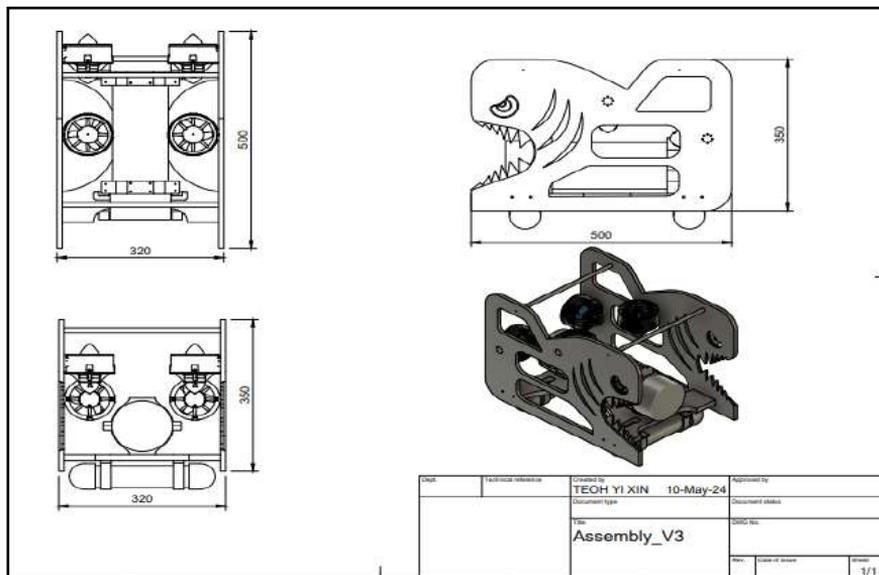


Figure 6. Orthographic Drawing

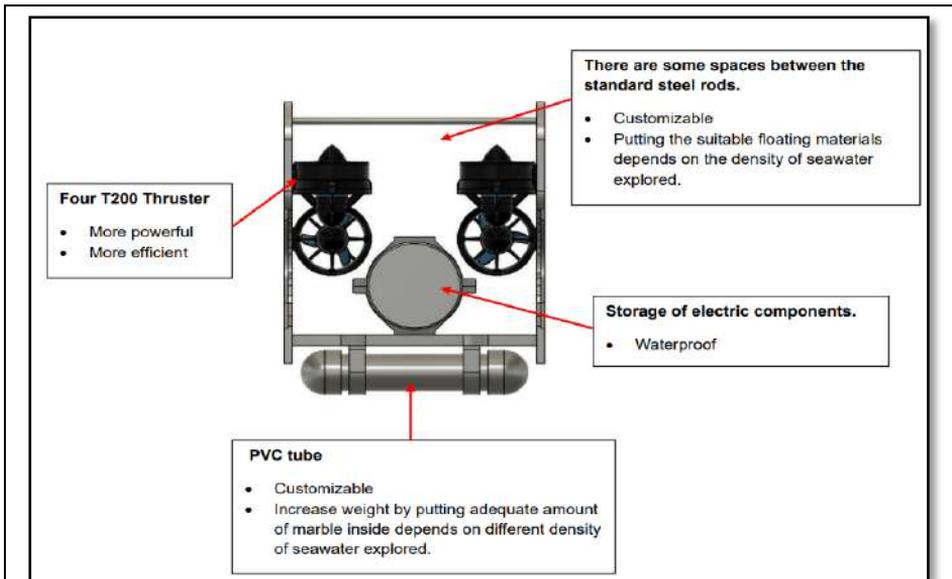


Figure 7. Components of designation of ROV

NOVELTY AND UNIQUENESS

There has been a poor balance between functionality and durability for ROVs, with larger-sized ROVs being very sturdy and durable against the cruel sea conditions with the sacrifice of great manoeuvrability due to their great size and heavy mass. On the other hand, compact-sized ROVs are too weak against accidental collisions. Therefore, this ROV brings a balance between functionality and durability while also allowing great customizability for a wide range of consumers. The ROV can be customised by adjusting its load and floating materials along with other equipment to make it useful in various different seawater densities and applications.

BENEFIT TO MANKIND

ROVs offer immense benefits to mankind by enabling safe and efficient exploration of underwater environments. They facilitate scientific research, aiding in the study of marine ecosystems, biodiversity, and geological formations. Additionally, ROVs play a crucial role in inspecting and maintaining underwater infrastructure, such as pipelines and offshore platforms, ensuring their integrity and safety. By reducing the need for human divers in hazardous conditions, ROVs minimise risk while maximising the scope and accuracy of underwater tasks.

Ultimately, ROVs contribute to advancements in knowledge, resource management, and environmental protection, benefiting both humanity and the planet.

COMMERCIALIZATION POTENTIAL

The commercialization potential for the ROV is very broad due to the freedom for customizability and balance between functionality and durability. Users can easily install cameras and manipulators because of the lenient and spacious frame body of the ROV. Not only that, the design of the frame of the ROV is also interesting towards children, making it suitable to be introduced for educational purposes. It can allow teachers and parents to share the knowledge and experience of ROVs with children, allowing them to learn while having fun. Hence, this ROV is not only aimed for research and underwater laboratory uses, but it is also a great choice for educational purposes.

CONCLUSION

After studying various ROV designs and understanding the fundamentals of its properties and functionalities, the ROV that we have created does have a specific niche in the broad range of ROV options. It comes with a lot of unique advantages that are not available on other ROVs, while also being extremely open to changes and upgrades to improve it as a product overall.

However, we need to make sure our product can remain competitive in the market. The future of the ROV's design will be focused not only on the product's improvement but also in its pricing and marketing. Lowering costs while maintaining strong functionality and improving marketing strategies through advertisements, sponsorships, and collaborations can help build the ROV's reputation.

ACKNOWLEDGEMENT

We wish to express our gratitude to the honourable Universiti Teknikal Malaysia Melaka (UTeM) for supporting this research. Special appreciation and gratitude, especially for Fakulti Teknologi dan Kejuruteraan Elektrik (FTKE) and Underwater Technology Research Group (UTeRG), Center for Robotics and Industrial Automation (CERIA) for supporting this research.

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PID20201

Integrated Sensory System of Air Quality and Temperature for Unmanned Aerial Vehicle (UAV)

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ABSTRACT

This project is designed to satisfy the need to monitor the environment in a more effective and inexpensive manner. The system is the sensor for measuring air quality and temperature, which is integrated with unmanned aerial vehicle systems. The Internet of Things is applied to collect real-time data to minimise pollution problems (Potter et al., 2019). The objective of this project involves creating air quality and temperature monitoring systems, sending the acquired data to an IoT platform for visualisation, and validating the results (Matos & Postolache, 2016). The gases, including carbon monoxide (CO), nitrogen dioxide (NO₂), and volatile organic compounds (VOC) and ethyl alcohol (C₂H₅CH), were identified, and the temperature was kept under observation in the surrounding UAV's. For programming, the Arduino IDE programming was used, while the ground station is used to collect and display data. The LoRa technology is used for data transfer from one place to another efficiently in the long distance, which leads to better communication (Myagmardulam et al., 2021). The use of a website with the help of an IP address, which maintains the process to collect the data, helps monitor the status of work (Matos & Postolache, 2016; Shafiril et al., 2016). The project presented the opportunity to monitor the atmosphere at low cost and appropriately anywhere; the only need is to mount such a system to UAV's. Therefore, drones provide an excellent opportunity to fully cover a large number of conditions, which radically changes the method of collecting data in real-time (Li et al., 2022). It can be argued that this modern

method complements the current efforts to counteract the negative effects of pollution on the environment and affecting people's health.

KEYWORDS: UAV's, LoRa Technology, IOT, Arduino IDE, Web Interface

PRODUCT DESCRIPTION

The UAV Environmental Monitoring System. In response to the pressing need for efficient and cost-effective environmental monitoring, we've engineered a sensor system that seamlessly integrates with unmanned aerial vehicles (UAVs), leveraging the power of the Internet of Things (IoT) to gather real-time data on air quality and temperature. Our system is designed to address and mitigate the negative impacts of pollution by providing up-to-the-minute data on key pollutants such as carbon monoxide (CO), nitrogen dioxide (NO₂), volatile organic compounds (VOCs), and ethyl alcohol (C₂H₅CH). Simultaneously, it monitors the surrounding temperature, ensuring comprehensive environmental monitoring. Powered by the Arduino IDE for programming, our system utilises LoRa technology for efficient and long-distance data transmission, enabling communication over vast distances of up to 20 km. This ensures that our UAVs can cover extensive areas, reaching remote locations that were previously inaccessible. The ground station serves as the central hub for data collection and visualisation, providing users with valuable insights into environmental conditions. With a user-friendly interface accessible via a designated IP address, monitoring and managing the data collection process is intuitive and straightforward. One of the key advantages of our system is its portability and versatility. The compact size of our sensors allows them to be easily integrated into UAVs, making them highly mobile and flexible for deployment in various environments. Additionally, unlimited users can access the data by simply knowing the IP address, enabling widespread collaboration and information sharing. By revolutionising the way environmental data is collected and analysed, our UAV Environmental Monitoring System represents a significant step forward in environmental stewardship. With its ability to provide real-time data over large areas, it empowers decision-makers and stakeholders to take proactive measures to protect the environment and safeguard public health. Join us in ushering in a new era of environmental monitoring with our innovative solution.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

In addition to the presented detailed narrative of the project, a set of visual aids that relate to the schematic diagrams, flow charts, screenshots, graphs, and all the relevant visuals has been prepared. This series of visual presentations is vital to the improvement of the presentation level quality and ensuring the level of professionalism supported in the adaptation. Various components of the Environmental Monitoring System are covered by the visuals, supporting a full grasp of the electronic system aspects through all the process points, including the system architecture, its sensors, data transmission with ground stations, the environmental data look of systems, and the operating reachable areas. The overall aim is to create a presentation that comfortably enables the audience to comprehend the system's internal mechanics and functioning aspects. Review the following visuals to fully understand and project the functionality and efficiency of the Environmental Monitoring Systems. These visual representations serve as invaluable tools for illustrating complex concepts, processes, and data trends in a more accessible and engaging manner.

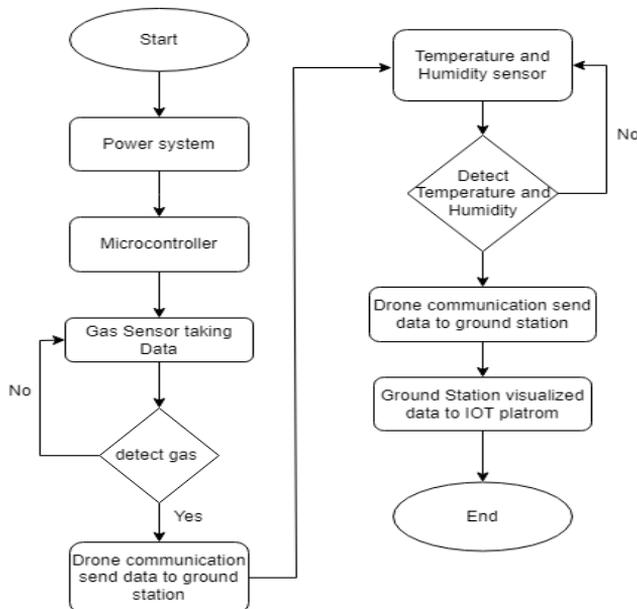


Figure 1. System Architecture Overview

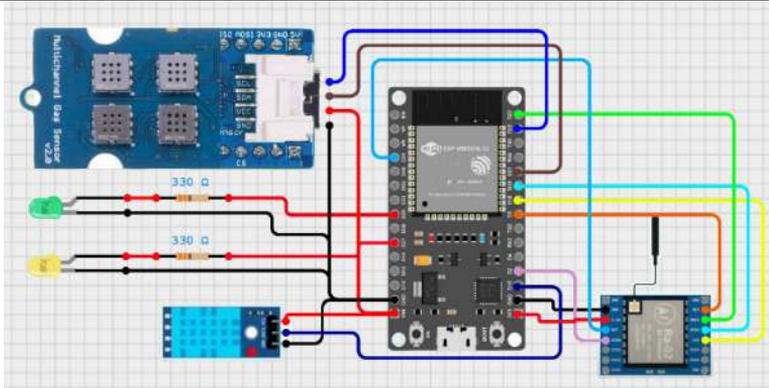


Figure 2. Wiring Diagram for Sensor Integration of UAV's

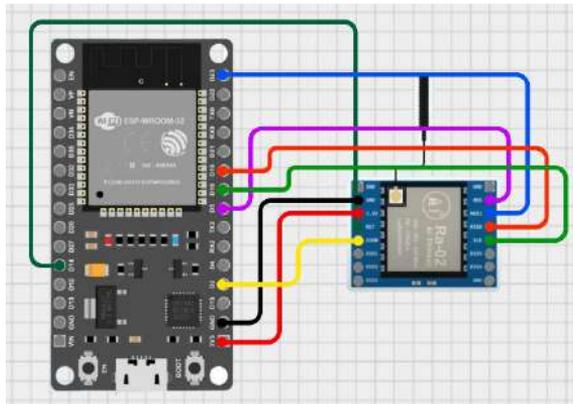


Figure 3. Wiring Diagram for Ground station



Figure 4. Real Prototypes of Sensor Integration in UAV's



Figure 5. Ground station of UAV Environmental Monitoring System



Figure 6. Web Interface of Monitoring System

NOVELTY AND UNIQUENESS

This research proposes a novel method of environmental surveillance by combining unmanned aerial vehicles (UAVs) with advanced sensor systems. The system's uniqueness is living in its ability to adapt and effortlessly communicate with drones of different sizes, including both consumer-grade and industrial versions. This adaptability enables widespread implementation and coverage in various environmental contexts. The project places a high value on cost efficiency by utilising cheap components and using established technologies such as the Internet of Things (IoT) and LoRa for efficient data transfer. In addition, its ability to scale allows for unlimited user access, promoting collaborative participation and the sharing of knowledge across users. Revolutionising Environmental Monitoring with Innovation.

BENEFIT TO MANKIND

The project carries multiple advantages to humanity, responding to urgent environmental issues, improving the quality of life, and supporting sustainable initiatives. These benefits include the immediate impact the monitoring of the air and its quality and the temperature has on the decision makers, allowing them to opt for health-conscious approaches to preserving human lives and managing pollution. Moreover, the project is affordable and accessible, thus being valuable for most communities. Along with that, the project is of high educational value, as it promotes innovation in technology and environmental science. Finally, the project is socially useful as it has a global scope and impact, which means that its implementation contributes to the future of the planet and the quality of lives of future generations. Empowering Environmental Guardianship for a Healthier Future.

COMMERCIALIZATION POTENTIAL

Given the rapidly increasing consumer demand for reliable, cost-effective environmental monitoring, the potential for commercialization is indeed promising. The platform's unique selling propositions are its universal applicability, affordability, and flexibility, which enable it to span across multiple industries and applications. A subscription-based model could guarantee a continuous influx of profits. Collaboration with international drone manufacturers and local environmental agencies alike is essential to ensure comprehensive market coverage. Cost comparison indicates a high profit yield, as additional expenses on sensor upgrades and data connectivity remain low. Compliance with current regulations and obtaining certifications can boost credibility. Intellectual property protection will ensure security with potential competitors. Overall, the project demonstrates strong potential for commercial success in the growing rapidly environmental monitoring market.

CONCLUSION

To sum up, the UAV Environmental Monitoring System is a revolutionary invention that creates multiple opportunities for environmental protection and defence against harmful factors for human health. The integration of high-tech and unmanned aerial vehicles equipped with sensors into a single system makes it mobile and facilitates the regular

fixation of environmental indicators.

Moreover, its flexibility and high compatibility with various areas make it available worldwide for implementation in different spheres. The gathered information regarding the level of pollutant' concentration and the air temperature allows policymakers to generate effective solutions to reduce the negative impact of pollution and preserve the environment. However, it is a vast topic that requires further investigation and in-depth study of each aspect for improving the system. In the end, the project becomes a proof-of-concept on how technology can be utilised to solve environmental issues, thus paving the way for a future generation that is healthier and more sustainable.

ACKNOWLEDGEMENT

Gratitude is extended to Universiti Teknikal Malaysia Melaka (UTeM) for providing essential support and resources for the development of this project. Special appreciation goes to Ir. Dr. Fariz bin Ali@Ibrahim and Assoc. Prof. Dr. Mohd Shahrieel bin Mohd Aras for their invaluable guidance and expertise throughout the project's progression. Their dedication has significantly contributed to the project's success. Additionally, recognition is extended to all individuals, organisations, and entities whose contributions have been instrumental in the design and development of sensing systems for air quality and temperature in unmanned aerial vehicles.

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PID25012

Coin Counter: Mobile Game Innovation as a Learning Platform for Students to Improve Financial Literacy

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ABSTRACT

Coin Counter is an innovative mobile game-based financial literacy education platform, combining various types of interactive games with financial literacy learning to provide a unique and interactive approach to education. Players complete financial literacy-related missions to earn points, which are used to build a virtual city. The platform comes with customisable questions for instructors, quizzes, rankings, and quiz battles, making it an ideal tool for educational institutions. With a focus on raising awareness about financial literacy from an early age, Coin Counter aims to address the low level of financial literacy in Indonesia and support the achievement of the Financial Services Authority (OJK) targets. The platform's strengths include ease of learning complex concepts, engaging interactive learning, and fostering a competitive streak. As a mobile game-based learning platform available for Android and iOS systems, Coin Counter has great potential to positively impact financial literacy and promote cultural values such as saving and investing awareness.

KEYWORDS: Financial Literacy, Virtual City, Mobile Game-Based Learning, Financial Education, Interactive Learning

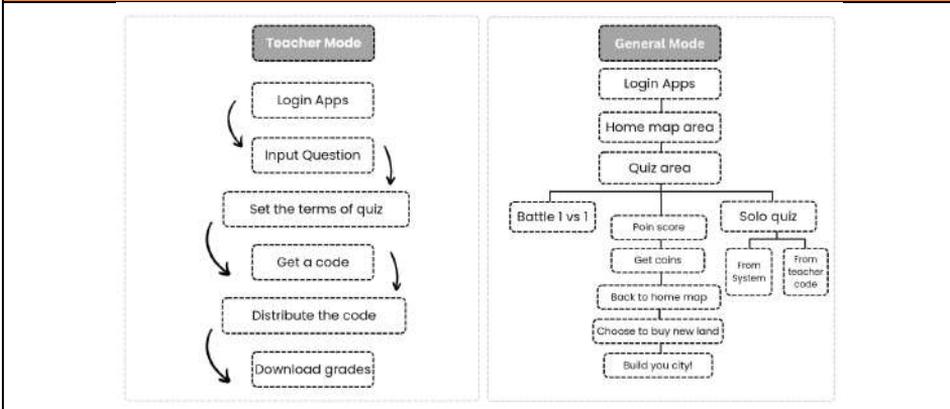
PRODUCT DESCRIPTION

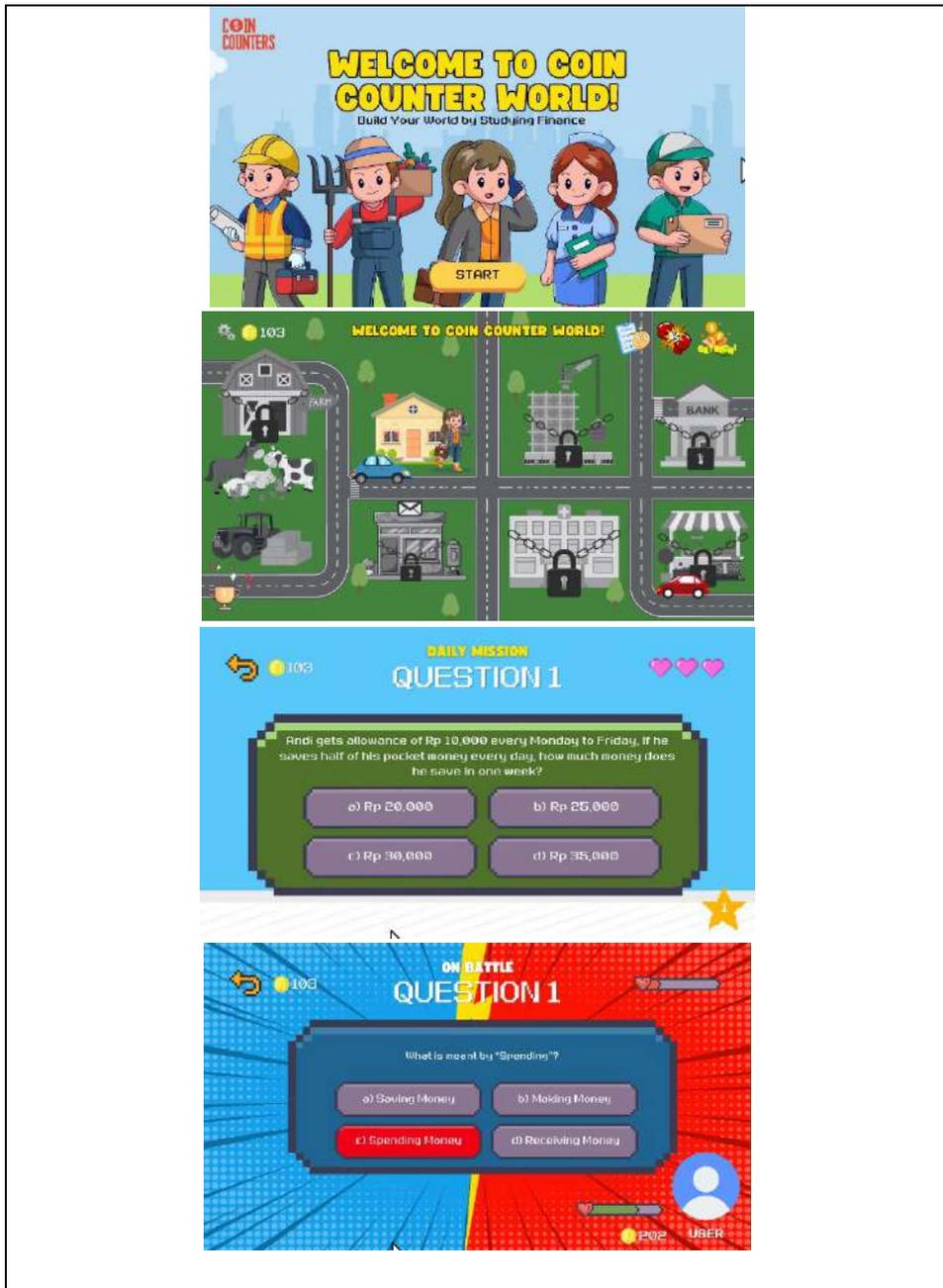
Coin Counter is an innovative financial literacy education platform that uses mobile games as its foundation. The game is a simulator where players are required to complete several missions related to financial literacy to earn points that will be used to build the city. Features include the ability to customise questions for instructors, quizzes to improve

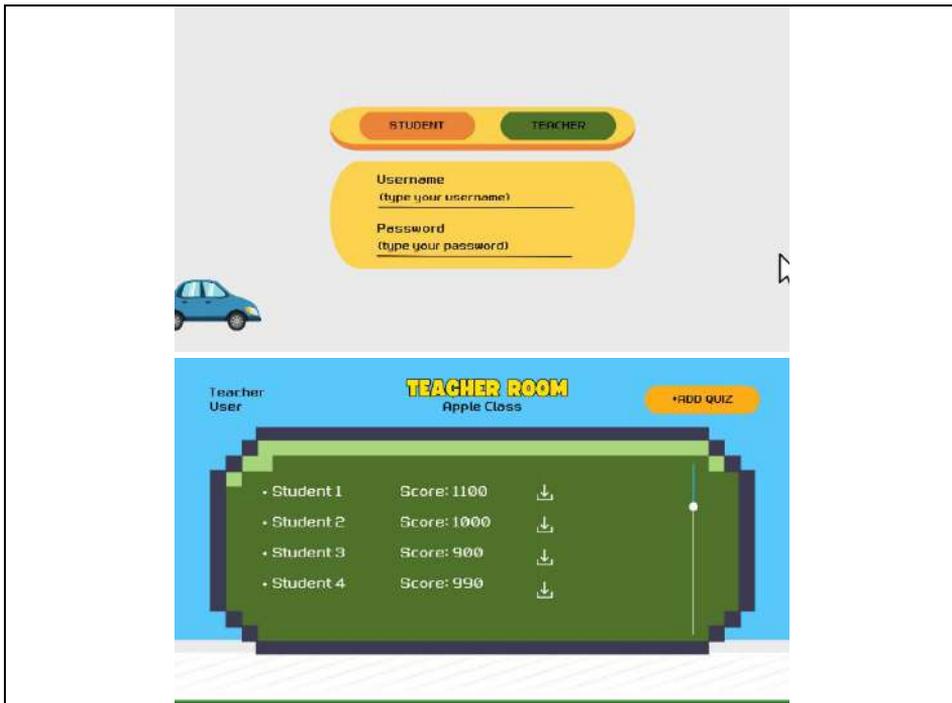
understanding, rankings for players, and quiz battles. The main goal is to raise awareness about financial literacy early on by presenting engaging and interactive content. According to the 2022 financial literacy survey, the literacy rate is only at 49.68% in Indonesia. This means that the Indonesian people lack understanding and knowledge about finance (OJK, 2022). The Financial Services Authority (OJK) targets the financial literacy rate to reach 65% and financial inclusion to reach 93% by 2027. Hopefully, the gap between financial inclusion and literacy will narrow in the future. Therefore, Coin Counter comes as a solution to address these problems and as an effort to support the target achievement.

The main advantage of this game lies in combining financial literacy learning with various engaging game types while also providing a rating system. The innovative approach integrates concepts from popular games such as Mobile Legends, Sim City, and Quizizz. Partnering with educational institutions is also a key advantage of this app, which can provide a more interactive and fun learning experience for students. The audience includes all students worldwide, especially those in areas with good internet connectivity, with an age range of 7 to 17 years old from different backgrounds and genders. Benefits include ease of learning complex concepts, engaging interactive learning, and cultivation of a competitive spirit. The platform is available as a mobile game-based e-learning for Android and iOS systems.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS







NOVELTY AND UNIQUENESS

Coin Counter is a mobile game-based financial literacy education platform. Unlike most other games, in this city simulator game, players are required to complete several missions related to financial literacy to earn points to build the city. Additionally, this game can serve as an interactive learning tool for educational institutions; namely, teachers can conduct quizzes and even tests by entering questions into the application, which will then award points for students to build cities.

BENEFIT TO MANKIND

Research indicates that adults lacking childhood financial education are prone to unemployment or earning below the national average wage. Nearly 79% of such adults struggle with timely bill payments (Roberts, 2021). Understanding the importance of early financial literacy, Coin Counter seeks to create a lasting impact by fostering understanding from a young age. This initiative not only aims to diminish financial crimes but also to positively impact the education sector. By providing engaging financial content and effective learning methods, Coin Counter aims to instill crucial values like awareness of saving and investing.

COMMERCIALIZATION POTENTIAL

According to the latest research, the market size and revenue share of the global game-based learning market reached approximately USD 10.9 billion in 2022. It is projected to expand significantly, reaching around USD 52.8 billion by 2030, with a compound annual growth rate (CAGR) of about 19.51% from 2023 to 2030 (Zion Market Research, 2023). The cost of developing the game is around \$40,000, with a profit margin of approximately \$48,000 per year, with revenue from subscriptions and advertisements as sources of income.

CONCLUSION

In brief, Coin Counter presents an innovative solution to the challenge of low financial literacy by merging it with an engaging gaming experience. Drawing inspiration from popular games, it offers an interactive approach to learning. Its key strengths lie in engaging players, particularly students, through financial literacy-focused quizzes. Players earn coins from these quizzes, which they can use to build their city, and a competitive ranking system adds excitement and fosters a competitive spirit. Additionally, the game acts as a learning tool for educational institutions, letting teachers add questions for students. Beyond its educational benefits, Coin Counter is poised to contribute to reducing financial crime by promoting early financial awareness. Consequently, the platform has significant potential to positively impact financial literacy and promote cultural values such as saving and investment awareness. Therefore, we believe Coin Counter is the solution to solving financial literacy problems in an interactive and fun way.

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PID25032

AGROW: Empowering Farmers and Consumers Alike through Innovative Features for Mutual Benefit

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ABSTRACT

Agrow is an innovative agricultural distribution platform designed to empower farmers and streamline the process of distributing agricultural produce in Indonesia. With the aim of eliminating third-party intermediaries (middlemen), Agrow presents a solution to connect farmers directly with retail buyers through a mobile application system. Agrow offers various features, including two user roles, an in-app payment system, an agricultural news forum, a verification process, future harvest scheduling, as well as reviews and ratings. The unique "future harvest" feature of this application allows farmers to display their production schedules, enabling retail buyers to pre-order agricultural products and plan accordingly. With this application, farmers can obtain higher prices while retail buyers benefit from lower purchasing costs. This innovative solution not only enhances profitability for farmers but also improves product flexibility and availability for buyers. With commercial potential and a focus on user experience, Agrow aims to revolutionise the agricultural industry in Indonesia, promoting prosperity and sustainability for all stakeholders involved.

KEYWORDS: Farmers, Agrow, Features, Agricultural Yield

PRODUCT DESCRIPTION

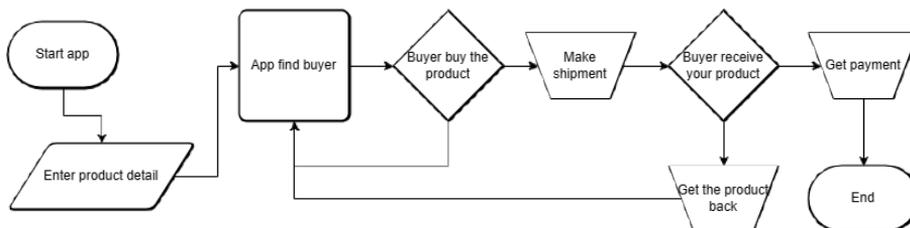
In 2023, Indonesia had a total of 27,799,280 farmers (BPS, 2023). In a study conducted by Chu et al. (2020) the agricultural sector plays a crucial role in determining economic growth. Growth driven by innovation will influence the growth rate, thus significantly impacting the income profile over the entire economic transition period. Therefore, Agrow introduces digital innovation to assist farmers in distributing their agricultural

products, enabling significant industrialization of the agricultural sector. In Indonesia, farmers still face obstacles in marketing their agricultural products due to middlemen, or intermediaries. Agrow aims to address this issue by eliminating middlemen from the agricultural product distribution process and connecting farmers and retail sellers directly through a marketplace-based application. Without intermediaries, farmers can sell their agricultural products directly to buyers, thus increasing the value of their agricultural products. To enhance user convenience, Agrow offers several features, such as GrowMart, GrowPO, GrowNews, and GrowNect. With Agrow, agricultural products can be distributed effectively and efficiently. In this application, farmers only need to provide their agricultural products, take photos, upload them to Agrow, and let the Agrow application distribute the agricultural products to potential buyers. To expedite the sale of agricultural products, Agrow also provides advertising features so that agricultural products can gain top placement in the product search column. In addition to these main features, Agrow also provides several supporting features, such as GrowPay, GrowLive, GrowRange, GrowVerif, GrowFeedback, and GrowRef. With these supporting features, farmers and prospective buyers will have a pleasant experience during the transaction process.

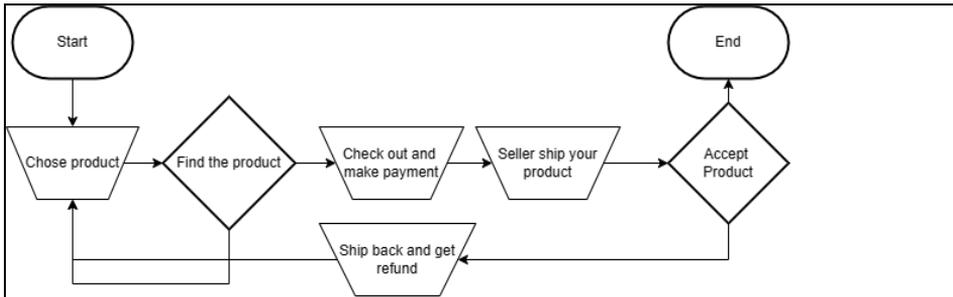
PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

Application Scheme

The Agrow application has a simple and efficient scheme, making it easy for farmers and buyers to use the application, thus providing a comfortable experience.



Scheme 1 (Steps farmers need to follow when selling products using the Agrow application)



Scheme 2 (Steps buyers need to follow when searching for products through the Agrow application)

Application Display

Homepage display in the Agrow application



Display of GrowMart and GrowPO features



GrowMart: Farmers can sell their products more profitably and efficiently to consumers directly through Agrow, improving agricultural supply chain efficiency, increasing profits, and connectivity.

GrowPO: Allows pre-harvest product ordering, helping farmers plan sales more effectively.

GrowNect



GrowNect: Allows users to share farming activities and experiences, strengthening the farming community.

GrowNews



GrowNews: Provides the latest information on agriculture and farming tips to improve productivity.

In addition to these main features, the Agrow application also has supporting features such as:

- GrowRange: Explore various agricultural products from various sellers, ensuring options for every need.

- GrowPay: Enjoy peace of mind with secure payment options and buyer protection policies for every transaction.
- GrowLive: Join interactive live sessions where sellers showcase their products and provide real-time advice and demonstrations.
- GrowVerif: Trusted sellers and verified profiles ensure authenticity and quality in every purchase.
- GrowFeedback: Transparent reviews and ratings from previous buyers help users make informed decisions.
- GrowReff: Easy return policies and fast refunds guarantee customer satisfaction.



<https://agrow-omega.vercel.app/>

NOVELTY AND UNIQUENESS

While applications for selling agricultural produce are not the only ones available, there have been several similar applications like Tanihub before. Agrow introduces a solution-oriented innovation that sets it apart from previous applications by offering various features that enhance user convenience. Payments within the application undergo monitoring by the company and relevant authorities, following security standards, ensuring security guarantees for both sellers and buyers. Coupled with the features provided, sellers and buyers will experience a new level of convenience, thus ensuring smooth distribution processes for agricultural produce.

BENEFIT TO MANKIND

The Agrow application has a significant impact on increasing the industrialization of agricultural products, thus contributing to economic growth for the country. By providing easy and efficient access to farmers and buyers, the sale of agricultural products can increase, resulting in greater profits for farmers and smooth agricultural industrialization processes. Buyers will also find it easier to discover agricultural products that meet their preferences. Transactions between farmers and buyers will benefit service providers facilitating product delivery, thereby allowing

the Agrow application to provide benefits to all three parties involved in every transaction process.

COMMERCIALIZATION POTENTIAL

As a measure to ensure the continuous smooth operation and sustainability of this application, the developers can generate revenue through advertising promotions for products that farmers wish to advertise. The cost of advertising promotions requires farmers to pay additional fees as a service fee to the application development company. The revenue obtained by the company will be used to further develop the application. Additionally, the company will also impose administrative fees on each transaction, enabling the company to generate additional income to continue maintaining and developing the application.

CONCLUSION

With Agrow, farmers can market and sell their products more easily and at better prices. They can reach end buyers who are looking for agricultural products right at their fingertips. With greater opportunities, agriculture can develop more smoothly. Considering that the majority of the Indonesian population are farmers, by improving the welfare of farmers, it is hoped that the level of prosperity in Indonesia itself will increase significantly.

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PID25042

Global Fin: Financial Planner Application to Achieve Individual Financial Stability

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ABSTRACT

Global Fin is a revolutionary app that combines personal financial management with advanced investing and trading education. Global Fin provides a smarter and more targeted financial experience with features such as income and expense tracking, customized budgeting, and personalized investment recommendations. The main advantage lies in the utilization of real-time data from the user, allowing the app to provide more detailed budget recommendations that match the user's spending and income patterns. Global Fin's trading and investment features also utilize real-time user data, allowing users to make smarter investment decisions that are responsive to market changes. With access to global markets, Global Fin provides greater flexibility and portfolio diversification opportunities. In addition, its interactive learning features help users understand basic investment concepts and effective trading strategies. Backed by innovative features, real-time data and international excellence, the app helps users take control of their finances and achieve long-term financial goals with more confidence. Suitable for all levels of investors, Global Fin is the key to achieving financial freedom and investment success in the dynamic digital age.

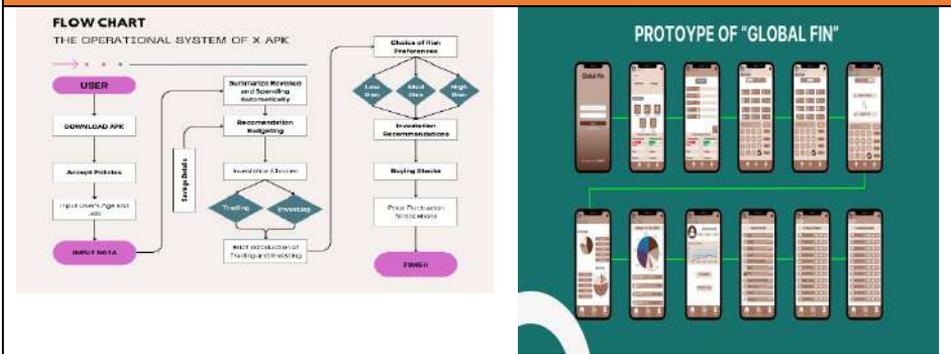
KEYWORDS: Global Fin, Trading, Investment, Budgeting, Revolutionary

PRODUCT DESCRIPTION

This application is a revolutionary solution that integrates personal finance management with advanced investment and trading education. By combining features of tracking and tracing income and expenses, customized budgeting, and personalized investment recommendations,

this application provides a smarter and more directed financial experience. Its main advantage lies in its ability to utilize real-time data from users. By leveraging transaction information directly, the application can provide more detailed and targeted budgeting recommendations based on users' spending and income patterns. This allows users to manage their finances more effectively and optimize fund allocation according to their personal preferences. The trading and investment features of this application also harness real-time user data. When users choose to trade or invest, the application provides more accurate market analysis and personalized investment recommendations based on the latest transaction data. Thus, users can make smarter investment decisions that are responsive to market changes. Its international advantage is also a unique attraction. With access to investment and trading options from the global market, users can access investment instruments from various countries worldwide. This provides flexibility and greater opportunities for users to diversify their investment portfolios. Moreover, the application offers interactive learning features that allow users to understand basic investment concepts, effective trading strategies, and risk factors to consider. With step-by-step guidance, users can enhance their knowledge and skills in managing their investment portfolios more effectively. With its combination of innovative features, real-time data support, international advantage, and interactive learning features, this application helps users take control of their finances more effectively and achieve long-term financial goals with greater confidence. Ideal for both novice and experienced investors, this application is the key to achieving financial freedom and investment success in today's dynamic digital era.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



NOVELTY AND UNIQUENESS

Our application offers a holistic approach to financial management with a focus on real-time data innovation. Currently, there is no application that seamlessly integrates investment and budgeting into one platform. For instance, existing investment apps like Bibit, Jago, and others only cater to investments, while budgeting apps like Money Lover solely focus on budget management. Hence, there is a need for a new innovative application to integrate these two aspects seamlessly. Therefore, we initiated the development of this application.

According to Budraj and Adrian (2021), the utilization of real-time data enables recommendation systems to swiftly and accurately respond to market changes, providing investors with the most current and relevant information for their investment decision-making. Therefore, in this context, it can be assumed that the use of real-time data has the potential to positively impact investments by enhancing the speed, accuracy, and relevance of investment recommendations.

BENEFIT TO MANKIND

According to Sarpong-Kumankoma (2020), financial freedom not only helps individuals reduce financial crises but also enhances financial awareness in society. Fintech applications play a significant role in this regard by providing a clear overview of expenses and income, as well as offering recommendations on effective saving methods and managing savings by suggesting investments suitable based on individual risk profiles and financial goals. By utilizing these applications, individuals can make smarter investment decisions and have full control over organizing assets and passive income sources. This enables individuals to meet financial needs and pursue desired lifestyles without having to work actively. Overall, the implementation of fintech applications is a step towards achieving financial freedom for individuals.

COMMERCIALIZATION POTENTIAL

The application “Global Fin” has high commercialization potential due to several reasons. The first is in terms of application design, which is an application based on daily income and expenditure tracking which can be integrated with the advisor feature. This feature can provide detailed advice regarding income and expenses inputted by the user as

well as selected advice instrument investments on the scale of the ASEAN and American Stock Exchange (AMEX) that can be taken by users based on their budget line and tracking income and spending. In this case, users can access all application features without having to subscribe. The profit margin for this application is obtained through advertising and trading fees, where the design construction uses an RnD budget.

CONCLUSION

Global Fin is an innovative app that integrates personal financial management with advanced investment and trading education. This innovative solution combines features such as income and expense tracking, customized budgeting, and personalized investment recommendations, by leveraging real-time data from users to offer a more purposeful financial experience. By utilizing real-time data, the app improves budgeting accuracy and offers more accurate market analysis for smarter investment decisions that are responsive to market changes. In addition, Global Fin also provides international market access for portfolio diversification and interactive learning features. Global Fin's holistic approach addresses gaps in existing platforms, catering to both novice and experienced investors. Its commercialisation potential is high, offering detailed advice on income and expenses, investment instruments, and a subscription-free model with revenue streams from advertising and trading fees. Overall, Global Fin signifies a step towards achieving financial freedom and increasing financial awareness in society.

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to the Faculty of Economic and Business, University of Lampung, for their support and guidance throughout this project. Special thanks to Mr. Arif Darmawan for his invaluable mentorship, encouragement, and expert advice that greatly contributed to the success of this work. We would also like to extend our appreciation to Ms. Lidya for her role as a controller and helper, providing assistance and support at critical stages of this endeavor. Your guidance and dedication have been instrumental in shaping this project and enhancing our learning experience. Thank you for your unwavering support and commitment.

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PID25052

Fooling: An Integration of IOT-Based Food Waste Management System to Realize a Circular Economy in Bandar Lampung

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ABSTRACT

Recently, food waste has become a problem widely discussed by the public. The challenges of food waste management in Indonesia require solutions. Therefore, the concept of Circular Economy in the Food Chain is introduced to address food waste issues. As a preventive measure, this paper proposes a solution involving a system called a Food Cycling System (FOOLING) to facilitate the buying and selling of food waste by Application and Website. It aims to connect food waste generators with waste processors to promote a circular economy.

KEYWORDS: food waste, circular economy, system, waste management, food and beverage

PRODUCT DESCRIPTION

The Pervasive Food Waste Crisis

The alarming trend of food waste, commonly known as "food waste," has become a significant concern in many nations, including Indonesia. Data reveals that food scraps constitute the most substantial contributor to national waste, amounting to a staggering 43,051 tons annually. This not only poses a severe threat to environmental health but also squanders precious natural resources and exacerbates the looming food crisis.

Challenges and Opportunities

The management of food waste in Indonesia remains woefully inadequate. To effectively address this pressing issue, an innovative, integrated, and sustainable solution is urgently required. The Fooling

system concept emerges as a beacon of hope, offering a transformative approach to tackling the food waste challenge.

Fooling: An Innovative Solution for Food Waste Management

Fooling, an acronym for Food Cycling System, stands as an ingenious integrated concept that seamlessly connects food waste generators, such as restaurants and eateries, with food waste processors, including maggot farmers, compost producers, and various other stakeholders. This concept harnesses the power of cutting-edge technology through a dedicated application, facilitating effortless interaction and transactions between these parties.

The Multifaceted Benefits of Fooling:

- **Reduced Food Waste:** Fooling system effectively diverts food scraps away from landfills, thereby minimizing their detrimental environmental impact.
- **Circular Economy:** By transforming food waste into valuable products such as compost, livestock feed, and biogas, Fooling fosters a circular economy model.
- **Responsible Consumption:** This innovative concept promotes public awareness, encouraging mindful food consumption practices and minimizing wastage.
- **Unlocking Business Opportunities:** Fooling paves the way for new business ventures, empowering food waste processors and entrepreneurs to actively participate in the circular economy.

Conclusion: Embracing Fooling for a Sustainable Future

The Fooling system concept presents a groundbreaking and sustainable solution to Indonesia's food waste dilemma. By effectively implementing this system, we can achieve a circular economy, elevate responsible consumption practices, and make a significant contribution to environmental preservation.

Supporting Fooling Implementation: A Collective Endeavor

To successfully implement Fooling and reap its transformative benefits, a concerted effort from various stakeholders is essential:

- **Government:** Enact supportive regulations and policies, including incentives for businesses involved in food waste management.

- **Private Sector:** Foster investments in developing Fooling-related technologies and infrastructure.
- **Public:** Raise awareness about the importance of food waste reduction and encourage active participation in Fooling initiatives.

By working together, we can harness the power of Fooling to combat food waste, promote sustainable practices, and pave the way for a greener and more environmentally conscious Indonesia.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

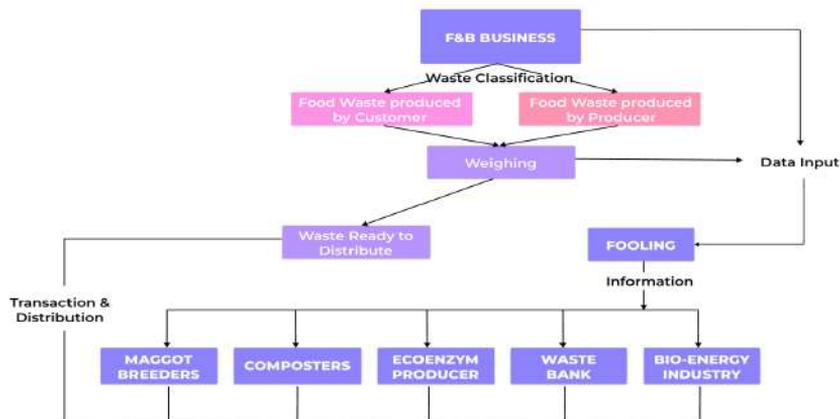


Figure 1. Chart Flow of Fooling System

Initial Stage:

1. Waste Classification:

- Sorting food waste into two categories: consumer food waste and production food waste.
- Objective: To identify the potential for self-processing and donation.
- Recommendation: Donate edible production waste to poor people or to stakeholders (selling).
- Alternative: Self-management (composting) of vegetable and fruit waste.

2. Weighing and Data Input:

- Waste generators (food industries, restaurants, eateries) weigh their waste independently.

- Vendors are required to input waste data: type and total weight of waste.
- Data input is done through the registered user/industry account.
- The application will channel the data to the waste processor.

Transaction Stage:

1. Notification and Waste Search:

- Prospective waste buyers (waste processors) receive notifications or can search for waste independently.
- Display waste details: type, total weight, seller's address.
- Location feature: Displays waste in the vicinity of the prospective buyer.

2. Bookings and Deadlines:

- Prospective buyers can place an order by pressing the "book" button.
- The booked waste has a deadline to minimize decay and odor.
- If the deadline expires and there is no transaction, the waste is transferred to another potential buyer or waste bank.

3. Transactions and Communications:

- Transactions are done face-to-face or by FOB shipping point/destination point.
- The app provides a chat box for price and transaction type negotiation between sellers and buyers.

4. Waste Management:

- Buyers decompose food waste according to their procedures.

Account Registration:

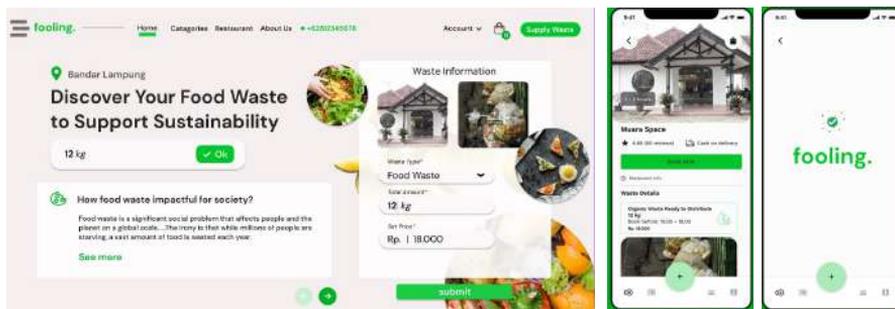
- Account registration is done during socialization to relevant parties.
- Self-registration allows multiple parties to join.
- Account information: company name, address, company type, contact, company photo.

- Benefits: Company details appear automatically when inputting waste data.

Notes:

- The above paragraphs focus on the structure and order of information.
- Details and technical explanations can be added as needed.
- Language and format can be customized according to preference.

The Prototype



The FOOLING system prototype manifests as a web-based platform accessible to food waste generators, specifically businesses in the food and beverage sector. A mobile application, meanwhile, facilitates communication between both parties: food waste generators and potential buyers, encompassing relevant stakeholders.

NOVELTY AND UNIQUENESS

Fooling is a system that functions to channel information from waste sellers to waste buyers containing transaction activities. The Fooling concept connects sellers and buyers of waste to determine the waste they will sell and those that are still suitable will be given to underprivileged people or to stakeholders who need food waste or channelled to waste banks. Transactions in the Fooling concept are done by FOB, and equipped with a chat box that can facilitate communication between sellers and buyers.

BENEFIT TO MANKIND

In this research, the benefits provided are quite a lot, starting from solving the problem of food waste management in the industry to being able to make business ideas by managing waste, especially food waste, which has economic value, and the surrounding environment becomes cleaner and more comfortable. In its development, this research provides opportunities for the community by contributing and participating as investors.

COMMERCIALIZATION POTENTIAL

Fooling is a system for transactions, especially related to waste and food waste in Indonesia. In the process of developing the Fooling we need several related parties, especially investors in order to help the application process of Fooling. The transaction concept in Fooling is done face to face but there is a payment for the admin if the transaction is successful.

CONCLUSION

Based on data from the United Nations Environment Programme (UNEP) in 2020, the amount of food waste in Indonesia reached 20.94 million metric tons. The Ministry of Environment and Forestry's National Waste Management Information System (SIPSN KLHK) in 2022 food waste reached 41.64% of all waste in Indonesia. The Circular Economy is an alternative solution to the traditional Conventional linear economy in which the system will minimize wasted resources, waste, and energy emissions. Fooling is a food waste system that is integrated with IoT-based solutions to industrial production and waste reduction in Indonesia. The Fooling system has a positive impact on society and the environment, such as the opening of jobs and a clean and comfortable environment.

ACKNOWLEDGEMENT

We extend our gratitude to FEB UNILA for providing research facilities and fostering this research to compete at the International Scoop-Competition. Their support has been invaluable in bringing this project to fruition.

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PID25072

Xelypops: Xylitol Erythritol Lollipop An Innovative Solution to Prevent Malnutrition and Caries

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ABSTRACT

Malnutrition and caries are two related diseases that are a problem, especially for child development in Indonesia. According to BRIN, the percentage of stunted children in Indonesia reaches 21.6% while the percentage of caries in children reaches 60-80%. The main cause of Malnutrition is a long-term lack of nutrition which can be caused by the environment and parenting patterns that make children not eat well. Children who have difficulty eating tend to like sweet foods that are attractively shaped like lollipops candy. On the other hand, sweet foods such as lollipop can also stimulate the production of the hormone leptin which helps increase appetite. However, candy made from sugar can cause caries which is also a major problem in children's development. Therefore, we innovated to make Xelypops, lollipop with the basic ingredients of xylitol, erythritol and other natural ingredients such real juice and soy milk that are attractive and full of nutrition to help increase children's appetite while meeting children's nutritional needs. Xelypops can also help increase saliva production and good saliva pH to prevent caries.

KEYWORDS: Malnutrition, Caries, Lollipop candy, Xyllitol, Erythritol

PRODUCT DESCRIPTION

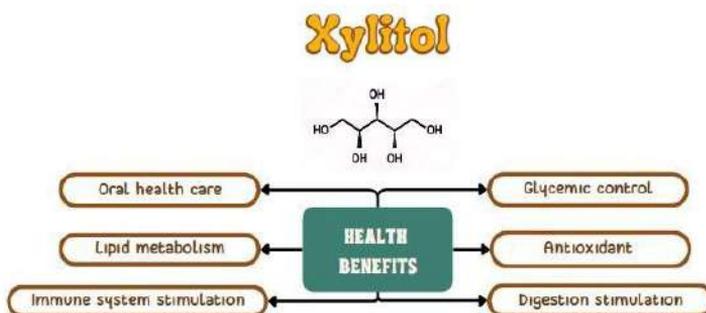
Xelypops is a non-cariogenic hard candy that was invented as a nutritional innovation. Characterized by the combination of ingredients that provides a balance of sweetness and essential nutrients, including

proteins, vitamins, antioxidants, and other properties that combat oral microbial colonization. Meticulously crafted with attention to the needs of children and individuals with health concerns, Xelypops offers a plant-based, dairy-free, and nutritious treat crafted specifically for those with malnutrition or special dietary requirements.

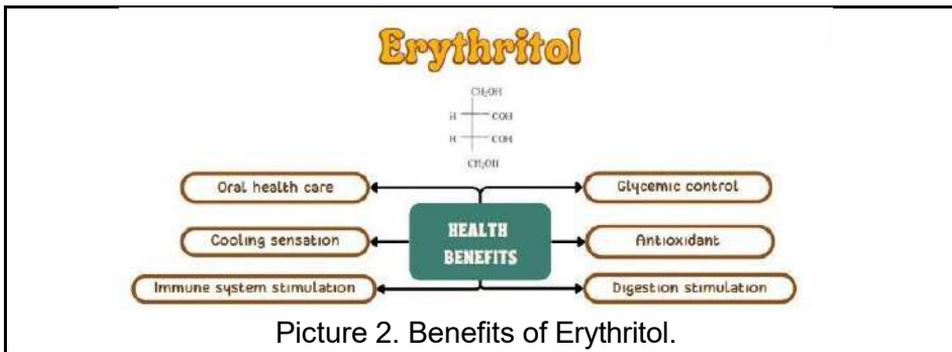
Infused with xylitol, erythritol, stevia, soy milk, and real juice, Xelypops offers an exclusive combination that not only satisfies cravings but also fulfills nutritional needs without compromising oral health. These ingredients not only provide sweetness but also have a low glycemic index, making them ideal for all, especially malnourished children, to encourage consumption because of their sweetness without the cariogenic effect. Xylitol has been shown to inhibit the growth of *Streptococcus mutans* bacteria, which is primarily responsible for dental caries. But Xelypops go beyond mere sweetness; they are a fusion of nutrition and taste. Enriched with nutritious ingredients, such as low-sugar fruit juice and calcium-fortified soy milk, they serve as a great source of essential vitamins, minerals, and antioxidants, which can reduce the risk of dental caries caused by overconsumption of sugar.

By increasing Xelypops' distribution through retail and online platforms, families can easily access a healthier snacking alternative, thereby promoting the well-being of children. It's time to revolutionize snacking—one Xelypop at a time!

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



Picture 1. Benefits of Xylitol.



Picture 2. Benefits of Erythritol.

NOVELTY AND UNIQUENESS

Xelypops stand out due to their dual appeal of sweetness and health benefits. Crafted to indulge children's sweet cravings while potentially promoting dental health by inhibiting bacteria growth, they are infused with nutrient-rich ingredients tailored to combat malnutrition in children. Xelypops' diverse array of flavors derived from real fruits and unique shapes propose a delightful twist on the classic treat. With fewer calories and an alluring taste and visuals, Xelypops emerge as an enticing option for both kids and health-conscious individuals alike, seeking a healthier snack option.

BENEFIT TO MANKIND

Children with malnutrition have short and long term impacts, in the form of cognitive impairment, illness, risk of degenerative diseases in the future and resulting in death. This problem has an impact on all aspects, namely economic, social and national health. Thus, xelypops was created, namely one word with millions of meanings. Xelypops is an innovative candy created to prevent malnutrition with anti-caries ingredients. With this candy, children will increase their appetite with natural ingredients so that children have their nutritional needs met. Apart from that, xelypops has a non-cariogenic effect (preventive process) and anti-cariogenic (reversal process).

COMMERCIALIZATION POTENTIAL

Xelypop offers natural ingredient-based products with sugar substitutes to reduce the risk of cavities and improve nutrition. These products are aimed at undernourished children. To ensure quality and safety, the products will collaborate with nutritionists and dentists to validate health claims, making them safe to consume and beneficial for health. The

distribution of these products will be through health institutions such as health centers, schools, and supermarkets. The goal is to build trust as a leading children's health brand. Priced at Rp. 3,500.00 per unit, Xelypop positions itself as an accessible and health-oriented choice in the market.

CONCLUSION

Malnutrition and caries pose significant challenges to child development in Indonesia. BRIN reports that 21.6% of Indonesian children suffer from stunted growth, while 60-80% face dental caries. Prolonged nutritional deficiencies, often stemming from environmental and parental factors, contribute to malnutrition. Children, drawn to sweet treats like lollipops, further exacerbate the issue. However, such candies, laden with sugar, also fuel dental decay. To address this, Xelypops was innovated, utilizing xylitol, erythritol, real fruit juice, and soy milk to enhance nutrition and appetite while preventing cavities. This non-cariogenic hard candy stands out for its nutritional prowess, combining high-quality protein and essential vitamins. Moreover, its diverse flavors and appealing shapes make it an enticing and healthier alternative for both children and health-conscious consumers. Xelypops not only tackles malnutrition but also promotes oral health, embodying a multifaceted solution to Indonesia's child health crisis.

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PID25092

Bubur Biji Telang (BUBILANG): Butterfly Pea Seed Infusion in Porridge For Stunting Prevention in Indonesia

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ABSTRACT

Stunting is a chronic malnutrition problem in the context of 1,000 days of life resulting from insufficient nutritional intake over a long period of time. In Indonesia, Stunting has grown to be a major issue that needs to be addressed to improve the quality of life for future generations. This study aims to evaluate the potential of butterfly pea seeds as a nutrient-rich source needed for the growth and development of children in the first 1,000 days of life. Complementary feeding of butterfly pea seed infusion porridge can improve the nutritional status of children and reduce the risk of stunting. The implementation of the "BUBILANG" product (Bubur Biji Telang - Instant Nutritious Porridge with Butterfly Pea Seeds Infusion) is expected to be a practical solution to prevent stunting in Indonesia. These initiatives involve collaboration between the government, hospital, public health center, and the commercial sector in ensuring the availability of natural porridge of butterfly pea plant seeds, nutrition education, and frequent growth monitoring of children's first 1,000 days of life. It is hoped that "BUBILANG" can be a positive step in tackling stunting and enhancing the overall health outcomes of young children in Indonesia.

KEYWORDS: Stunting, Nutrition, Butterfly Pea Seeds

PRODUCT DESCRIPTION

BUBILANG (Bubur Biji Telang) is an instant nutritious porridge with butterfly pea seeds infusion specifically designed to be complimentary food for children in the first 1,000 days of life. The porridge is designed to be rich in nutrients with the composition of butterfly pea seeds flour (10%), purple sweet potato flour (35%), banana flour (20%), skimmed

milk powder (20%), and vegetable oil (10%). Butterfly pea seeds infusion contributes to high protein and minerals to promote balanced nutrition in BUBILANG. Moreover, the overall composition product of BUBILANG contained high carbohydrate, protein, calcium, phosphor and several vitamins (vitamin A, vitamin B, vitamin C) that are suitable for addressing the issue of stunting in Indonesia. Additionally, this product is specifically made by adapting to the tastebud of children and its instant ease of use. BUBILANG not only serves as a natural delicious porridge but also as a tool for educating parents and caregivers about the significance of proper nutrition for children.

BUBILANG will be sold commercially for Rp.15.000 (6 x 20 gr per package). The price is designed lower than the market price, in order to be accessible for everyone (low to high social class) to combat the problem of stunting in Indonesia. This product can be found in the marketplace (Shopee, Tokopedia, and Lazada) with the support of social media promotion (TikTok, Instagram, and Facebook). Moreover, within the partnership with the Ministry of Health, BUBILANG will be distributed massively in Hospital and Puskesmas (Public Health Centre) as a complimentary food for children (first 1,000 days of life). The commercialization potential of BUBILANG ensures the massive spread of the product in Indonesia. It is hoped that this product will be accessible for everyone and can be a positive step for stunting prevention in Indonesia.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

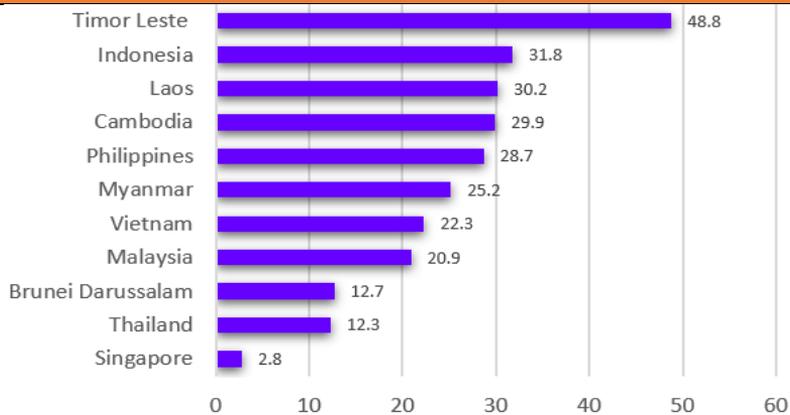


Figure 1. Stunting Graphics in South East Asia (Source: WHO, 2020)

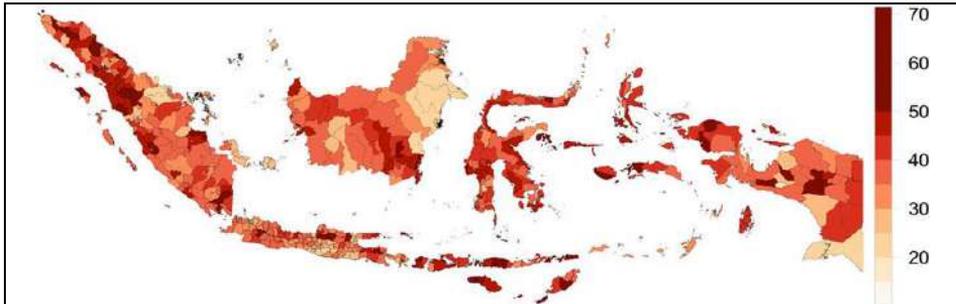


Figure 2. Indonesia Prevalence of Stunting (Source: Ministry of Health)

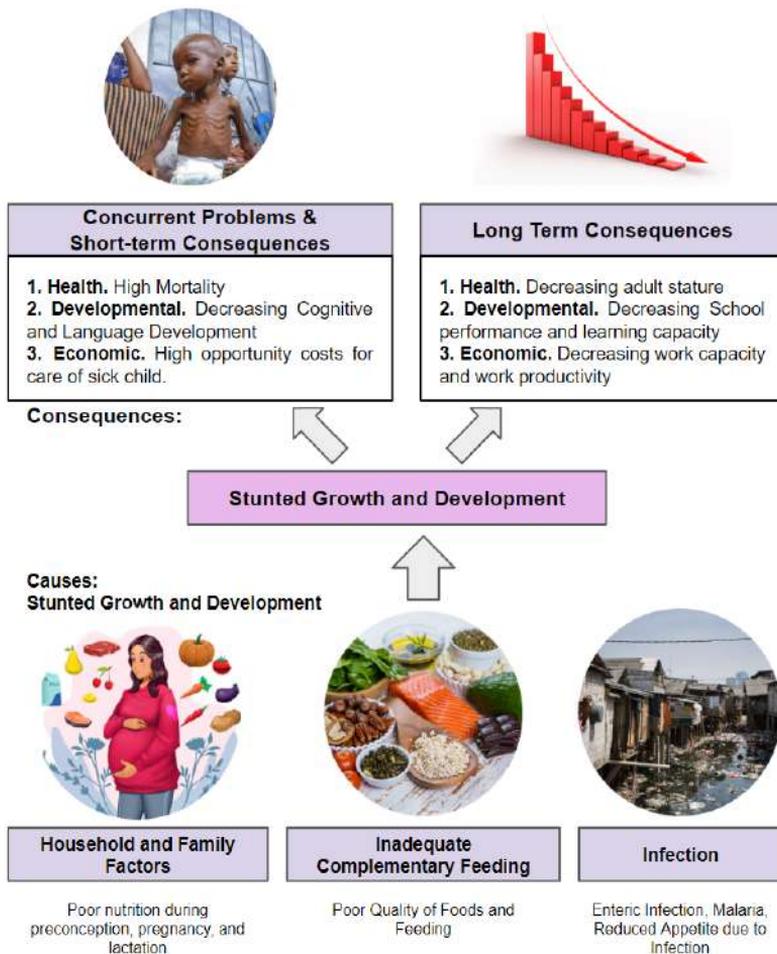


Figure 3. Stunting Causes and Consequences (Source: Nkurunziza et al., 2017)

Table 1. Composition of Butterfly Pea Green Part, Seed, and Stem
(Source: Heuze et al., 2012; Barro and Ribeiro, 1983)

Composition	Unit	Green Part	Seed	Stem
Dry Ingredients	-	21,9	95,8	89,04
Crude Protein	%DI	21,3	42,5	34,84
Crude Fat	%DI	3	10	4,24
Mineral				
Calcium	g/kg DI	12,7	0,7	-
Phosphorus	g/kg DI	2,9	5,7	-
Potassium	g/kg DI	16,9	12,3	-
Sodium	g/kg DI	0,7	0,1	-
Magnesium	g/kg DI	4,2	2,4	-
Manganese	g/kg DI	68	60	-
Zinc	g/kg DI	33	58	-
Copper	g/kg DI	7	17	-
Iron	g/kg DI	-	144	-
Amino Acid				
Arginin	% protein	-	7,4	-
Sistein	% protein	2,1	2,5	-
Glisin	% protein	-	4,1	-
Histidin	% protein	-	2,4	-
Isoleusin	% protein	-	4,2	-
Leusin	% protein	-	7,4	-
Lisin	% protein	4,4	6,1	-
Metionin	% protein	1,5	1	-
Fenilalanin	% protein	-	3,6	-
Treonin	% protein	4,4	2,2	-
Triptofan	% protein	1,7	1,2	-
Tirosin	% protein	-	3,3	-
Valin	% protein	-	4,4	-

Situation	<ul style="list-style-type: none"> • High Stunting Rate. Indonesia ranked #27 in the world and #2 in South East Asia with the condition 21.6% of young children in Indonesia were stunted (Siregar et al., 2024) • Uneffective Stunting Prevention Program. The government's effort through stunting prevention have not been able to solve the problem of stunting in Indonesia (Murtiningsih, 2024; Riskesdas, 2018) • Low Awareness For Butterfly Pea Seeds Health Benefit. Butterfly Pea seed is not widely used and known for the potential health benefit (Marpaung, 2020). However, the seeds contain protein that can help to boost the growth of a child in 1000 days of living.
Complications	<ul style="list-style-type: none"> • Traditional porridge options in Indonesia still lack nutrients to combat stunting effectively • There are still low awareness about the nutritional benefits in butterfly pea seeds
Questions	<ul style="list-style-type: none"> • How can we leverage the nutritional benefits of butterfly pea seeds to create a porridge product that addresses the specific nutritional needs of children at risk of stunting in Indonesia? • What strategies can be implemented to increase awareness and access to this product, especially in rural and underserved areas? • How can we ensure affordability and scalability of production to reach a larger population?
Answer	<ul style="list-style-type: none"> • Develop BUBILANG (Bubur Biji Telang) as a porridge with Butterfly Pea Seed infusion that enriched with essential nutrients such as protein, mineral, vitamins for child development • Collaborate with several stakeholder to raise awareness about the benefits of the porridge in preventing stunting and provide education on proper nutrition. • Establish distribution channels targeting both urban and rural areas, including partnerships with local markets, schools, and health centers to make the product accessible to families in need.

Figure 4. SCQA (Situation, Complications, Questions, and Answer) Analysis



Bubilang
Bubur Biji Bunga Telang

Figure 5. Logo and Product of BUBILANG

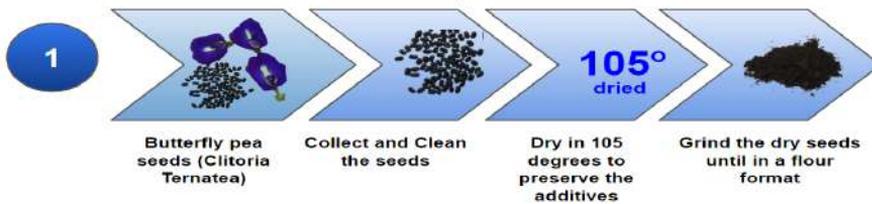


Figure 6. Visualization Product of BUBILANG

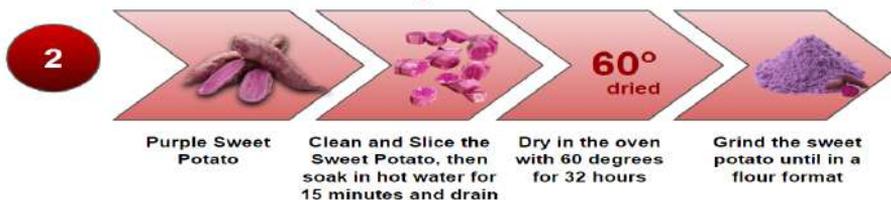
Table 2. Composition and Contents of BUBILANG

Ingredients	Allocation	Visualization	Contents
Butterfly Pea Seeds	10%		High Mineral and Protein (Heuze et al., 2012; Barro and Ribeiro, 1983)
Purple Sweet Potato Flour	35%		Carbohydrate, Protein, Calcium, Vitamin B Complex, Vitamin C, and Vitamin E (Putri et al., 2022)
Banana Flour	25%		Carbohydrate, Fats, Proteins, Vitamin A, and Mineral (Us et al., 2024)
Skim Milk	15%		Proteins and Calcium (Ahamadi et al., 2024)
Vegetable Oil	5%		Fat (Yeasmin et al., 2024)

Production Process of Butterfly Pea Seeds Flour



Production Process of Purple Sweet Potato Flour



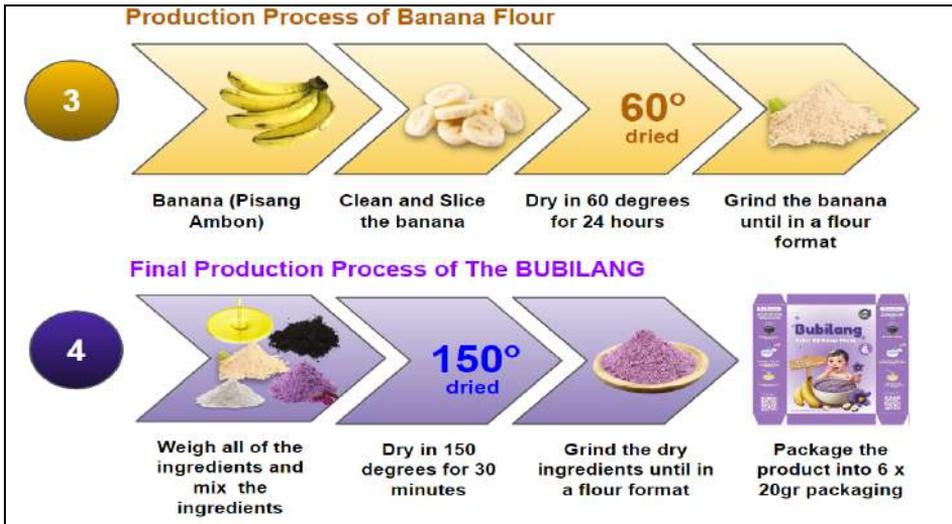


Figure 7. Production Stage of BUBILANG

Table 3. Taste, Texture, Aroma, and Color of Product BUBILANG

Taste	With Purple Sweet Potato Flour (35%), Banana Flour (25%), and Skimmed Milk Powder (20%) making up 80% of the total components, BUBILANG will naturally have the fruit sweet and milky taste from the fruit flour and skimmed milk flour. Flour made from butterfly pea seeds isn't going to assist because it has no taste. Meanwhile, the percentage of vegetable oil of 10% will not contribute to the overall taste.
Texture	The combination of 5 ingredients (Butterfly Pea Seeds Flour, Purple Sweet Potato Flour, Banana Flour, Skimmed Milk Powder, and Vegetable Oil) will be dried and ground into the format of flour. This flour texture will help to make it easier to keep and use.
Aroma	BUBILANG will have the aroma of fruity-milky . The fruity contributed from Purple Sweet Potato Flour and Banana Flour. The milky aroma came from the Skimmed Milk Powder. However, Butterfly Pea Seeds Flour will not contribute as it has no aroma.
Color	The color of BUBILANG will be violet that came from the high contribution of 35% from Purple Sweet Potato Flour.

Table 4. COGM (Cost of Good Manufactured)

Cost of Goods Manufactured	
Direct Material Used in Production	3.795.000
Cost of Direct Labor	420.000
Overhead Manufacturing Cost	530.000
Total Manufacturing Cost	Rp4.745.000
Cost of good manufactured/unit	
Assumption 2500 unit	Rp1.898

Table 5. Selling Price

Selling Price
<p>COGM + Mark Up = 1.898 + 25% = Rp. 2.500</p> <p>Per Package (6 x 20 gr) = Rp. 15.000</p>



Figure 8. Packaging of Product BUBILANG

Table 6. Commercial Channel BUBILANG

Commercial Channel	Detail
Marketplace	
Social Media	
Hospital and Puskesmas (Public Health Centre)	<p>Within the partnership with the Ministry of Health, BUBILANG will be distributed massively in Hospital and Puskesmas (Public Health Centre) as a complimentary food for children (first 1,000 days of life).</p>

Table 7. Stakeholder role

No.	Actor	Definition	Modality	Role
1.	Government	Ministry of Health		Monitoring and evaluating the BUBILANG innovation and playing a role in campaigning for this innovation.
		Ministry of Cooperative and SMEs		The party that adjusts the entrepreneurial needs of BUBILANG products with the Ministry of Health and implements partnerships with other external parties (companies, MSMEs, and other business actors).
2.	Student	Bachelor/ Diploma	Receiving learning and implementation in real words	As a target entrepreneurial business owner of BUBILANG products.
3.	Educational Institutions	Higher Education (University/Campus)	Providing <u>accesibility</u> for to implement Green Entrepreneurship Ecosystem	Physical support (Innovation centre, incubator, study rooms, and laboratories)
				Technical support (Become an affiliate that makes it easy for users to obtain capital assistance and sponsorship)
				Specialized support (Lecturers, Competition, and Mentoring)
4.	External Parties	MSME (Micro, Small, and Medium Enterprises)	Workforce	Contribute to job creation in strengthening the local economy.
		Companies/ <u>Swasta</u>	Real time Learning	Act as the party that organizes pilot projects, supports and facilitates future BUBILANG product programs.

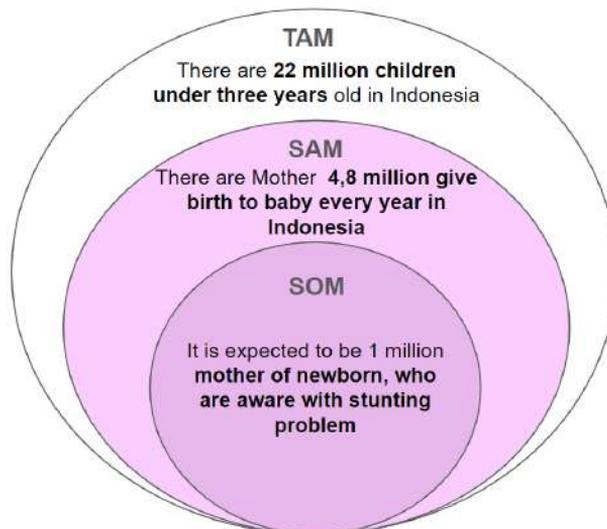


Figure 9. TAM, SAM, SOM Analysis

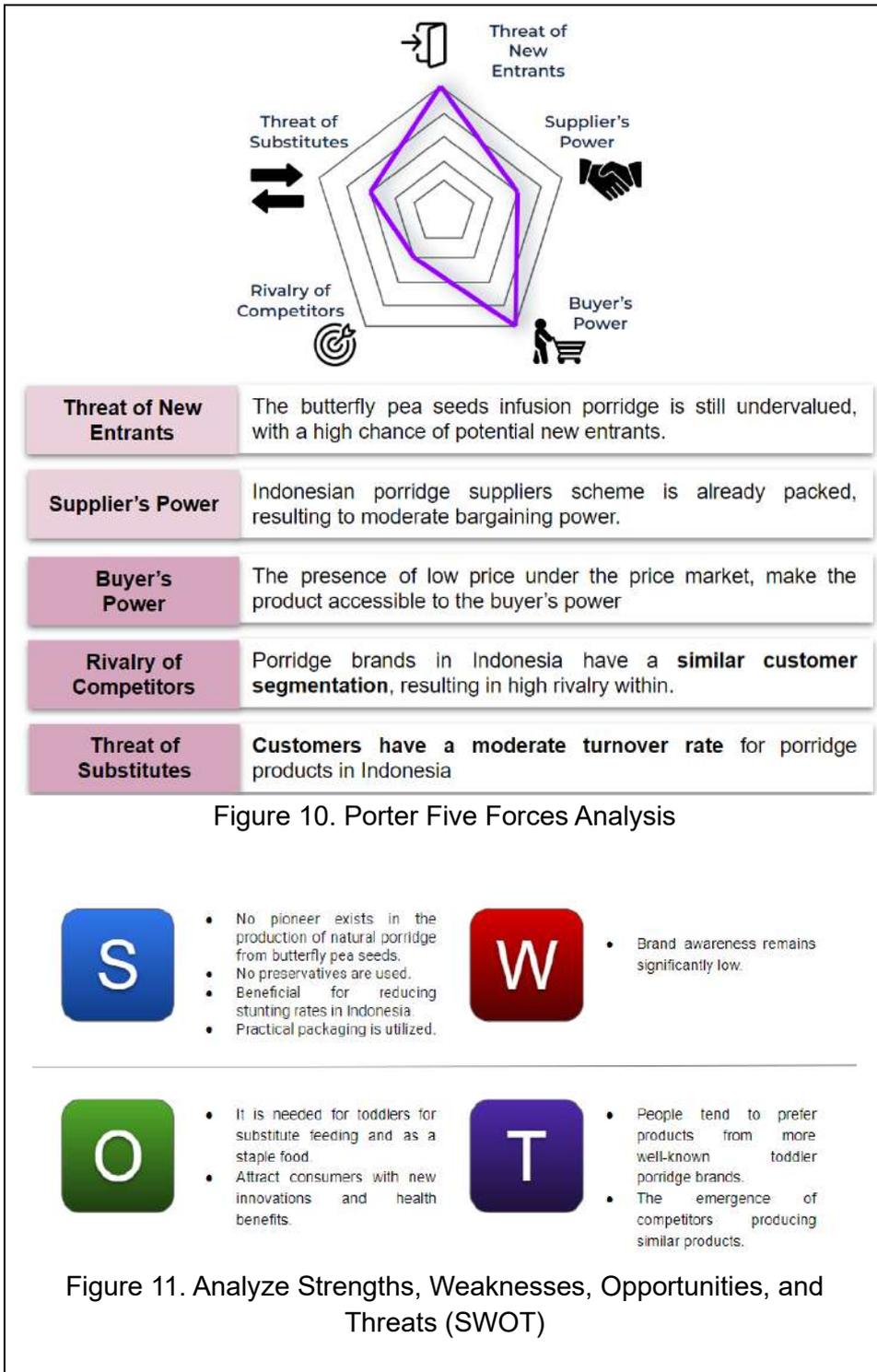


Table 8. Rivalry Among Competitor

Product	BUBILANG	Cerelac Homestyle meals	Promina Ala Homemade	Milna Bubur Bayi Organik	Ala Carte Meals
Taste	Fruity sweet & milky taste	Brown rice	Yellow pumpkin broccoli chicken	Greeny veggies & sweet corn	Creamy chicken broccoli
Texture	Puree	Puree	Mashed	Puree	Puree
Audience	Age: 6 month+	Age: 6 month+	Age: 8 month+	Age: 6 month+	Age: 6 month+
Price per Net Weight	Rp15,000 per 120g	Rp16,600 per 120g	Rp20,500 per 100g	Rp39,000 per 120g	Rp35,000 per 150ml
Rating	Not started yet	4.9	4.9	4.9	4.9

NOVELTY AND UNIQUENESS

The presence of butterfly pea seeds is not widely used and known for the potential health benefit (Marpaug, 2020; Suarna et al., 2021). It is also found that the use of butterfly pea seeds infusion in porridge has never been explored before. According to Heuze et al. (2012) and Sutedi (2013) the most nutritious part from butterfly pea is the seeds, not other parts. Barro and Rebeiro (1983) stated that butterfly pea seeds contain potential nutrients, such as protein, fiber, minerals, and antioxidants. Additionally, BUBILANG will be sold for Rp. 15.000 (under market price), that will be accessible for everyone.

BENEFIT TO MANKIND

The BUBILANG product benefits humanity by providing a natural porridge produced from butterfly pea seeds that may serve to reduce the rate of stunting in Indonesia, whereas Indonesia ranked 2nd in South East Asia (WHO, 2020). The overall composition of BUBILANG contains high carbohydrate, protein, calcium, phosphor and several vitamins that are suitable for addressing the issue of stunting for children. With an emphasis on vulnerable childrens and parents who are unaware of the significance of stunting prevention. As a result, providing butterfly pea seed porridge on a regular basis is projected to potentially enhance the health of Indonesian children.

COMMERCIALIZATION POTENTIAL

The commercialization potential of the BUBILANG product is promising due to its unique selling points, such as being the first natural porridge

made from butterfly pea flower seeds, not using preservatives, and utilizing local resources.

Segmenting	Gender: Both boys and girls Country: Indonesia Social class: Everyone (Low to High Class) Loyalty status: Medium
Targeting	We are targeting new parents in Indonesia who are concerned about preventing stunting in their children (first 1,000 days of life).
Positioning	Our Product provides high-quality nutrition for children, helping new parents prevent stunting and ensure healthy growth and development.

CONCLUSION

Stunting represents a critical concern in Indonesia, manifesting as a significant public health challenge whereby numerous children under the age of five endure impaired growth, culminating in enduring adverse effects on their health and developmental trajectories. The introduction of BUBILANG food products, enriched with essential vitamins, minerals, and proteins, emerges as a viable alternative solution in the collective endeavor to combat stunting.

BUBILANG toddler porridge offerings hold the potential to mitigate nutritional deficiencies, commonly implicated as precipitating factors in stunting occurrences. It is imperative to underscore that the innovation presented by BUBILANG should complement, rather than supplant, staple dietary provisions. Nutrients sourced from BUBILANG's natural ingredients are deemed optimal for nurturing the growth and development of children. Hence the importance to disseminate public awareness pertaining to balanced nutrition and its intrinsic significance. Furthermore, concerted efforts aimed at enhancing access to nutritious food merit prioritization, particularly within regions susceptible to stunting.

ACKNOWLEDGEMENT

To the dedicated team of writers whose passion and hard work brought this paper, we extend our deepest gratitude. Your collective effort has been instrumental in shaping this research and bringing it to fruition. We also extend our sincere appreciation to the esteemed lecturers of the Faculty of Economic and Business University of Lampung. Your

invaluable expertise, guidance, and feedback have significantly enriched our study and contributed to its depth and quality. Lastly, we are profoundly grateful to our families for their unwavering support and understanding throughout this journey.

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PID25122

Boarding House Mapping Application Geographic Information System: Effort Helping Student in Finding Boarding House

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ABSTRACT

For students, it is important to have a place to live that is comfortable and suits their tastes, because this is the place they will use to spend their time after studying on campus and being involved in other activities. As the number of students increases every year, the need for housing also increases. Rental houses, dormitories, and boarding houses are some of the housing options available to students. Therefore, students need to carry out a careful review in choosing the boarding house they will live in later, especially considering the location close to campus. In line with advances in information technology which are growing very quickly, we can use this technology to make it easier to find a place to live with various facilities, both for students and workers, so that they can choose a place to live that suits their preferences. As a response to this need, a Geographic Information Mapping Application in the University Area was developed. This application can be accessed via a browser on a computer or smartphone. It is hoped that this application can help students or workers in finding and choosing a suitable boarding house.

KEYWORDS: Geographic information system, Boarding house, GIS, Mapping Application, Student.

PRODUCT DESCRIPTION

A graphical information system is software designed to enter, store, manage, display and produce geographic information and its attributes.

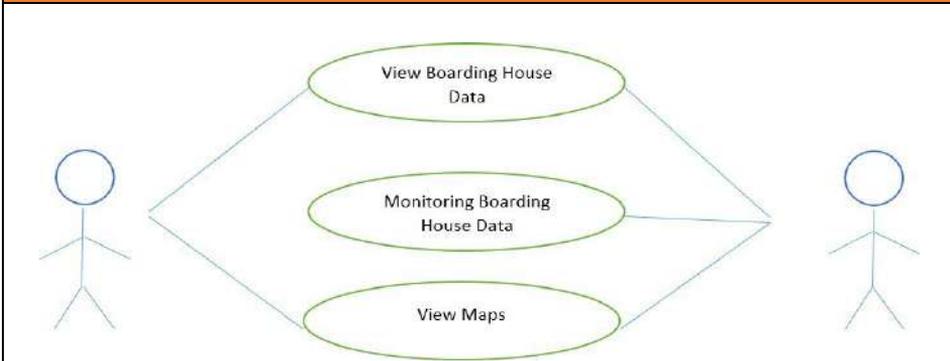
This GIS also functions to help overseas students find the best boarding house.

Smart analysis

1. Specific An application to help all out-of-town/regional students to have the right accommodation
2. Measurable It has a potential of 97% usage among out of town students. $(140/144) = 97\%$
3. Acceptable Assist students or professionals in searching for and selecting suitable boarding houses.
4. Realistic It has been tested and proven to help the students I mentioned earlier.
5. Timed-Bound This application will be useful for incoming freshmen students. (July-August).

In the GIS application there are also 4 application menus consisting of "Front page", "Boarding house data", "Boarding house distribution map" and "About". GIS also has an application concept which is of course very helpful for overseas students in finding boarding houses, namely the admin and user can look at each other's boarding house map, the admin and user can also see the boarding house information listed in the application, so it can make it easier to get information easily. and it is clear and only admins can input the database. The GIS design used in this application also uses use case diagrams. The use case diagram itself describes an interaction between the system and actors. This use case is used to find out the functions in a system and who has the right to use these functions.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



The design of the Use Case Diagram involves two actors, namely the user and the admin. Below is a further explanation of the roles of each of these actors

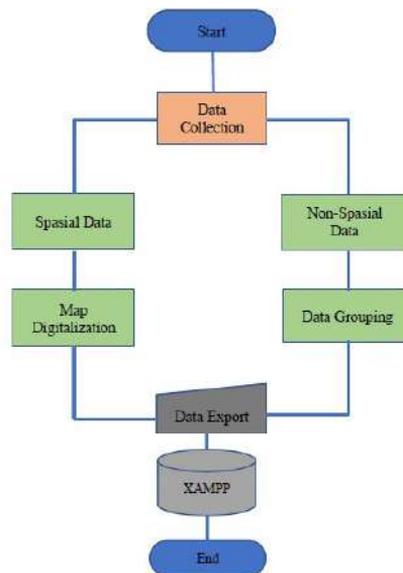
Table 1. Actor Description

Actor	Description
Admin	The admin has the ability to monitor and receive data from the boarding house owners and can also input boarding house data.
User	The user can only view boarding house data and maps.

The design of the use case diagram includes 3 use cases, with the following explanations for each use case:

Use Case	Description
View boarding house data	The admin and user can monitor and receive data from boarding house owners.
Manage boarding house data	Only admin can input boarding house data.
View maps	Both the user and the admin can view boarding house data and maps.

Map Creation Flowchart:



The software used to developing this application includes:

1. XAMPP Control Panel as WebServer
2. MySv v4.1.3 or above as Program Language
3. PHP Database
4. Sublime Text or Notepad as Script Editor.
5. Bootstrap Website Template Maker
6. Google Chrome as a viewer

NOVELTY AND UNIQUENESS

The novelty and uniqueness is with a large sample collection of boarding house data and currently focusing on just one area (around Unila, Bandar Lampung) and the target is Unila's new students, this application offers more affordable boarding houses.

BENEFIT TO MANKIND

The benefits of this application are to improve the ease and availability of information for students in finding accommodation that meets their needs, preferences, and financial conditions. When students find a boarding house that matches their tastes, they will naturally feel more comfortable and be able to focus on all aspects of their studies at that boarding house. Additionally, when the boarding house fits the student's financial situation, they can allocate their money for other purposes. This application is also beneficial for boarding house owners to market their properties, which will ultimately lead to increased revenue for them.

COMMERCIALIZATION POTENTIAL

In the future, this application will develop a payment method feature which makes the developer the middle man between service users and boarding house owners where this mid man takes 5% profit from the total boarding house rental proceeds.

CONCLUSION

Amid the high demand from students for boarding houses to support their studies, this application was created to enhance the ease and availability of information for students in finding accommodation that suits their needs, preferences, and financial conditions. The availability of boarding house information in this application uses the waterfall model method, and the design of the Use Case Diagram can help students in searching for and selecting accommodation that meets their needs and preferences. It is hoped

that this application will be fully supported, promoted, and socialized among students and subsequently become the number one choice for students in finding a boarding house to live in.

ACKNOWLEDGEMENT

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PID25132

Empower Youth Community and Local Culture through the Pentahelix Model at Krui

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ABSTRACT

Krui, renowned for its natural beauty and strong waves, attracts international surfing contests but remains underutilized by local communities. This project aims to showcase Krui's potential by promoting its lesser-known beaches, unique local culture, and natural and handcrafted products through digital marketing. Key activities include conducting mini-research to understand traveller preferences, training local youth in digital skills, and engaging stakeholders using the penta-helix concept, which integrates academia, business, community, government, and media. By leveraging social media and customer relationship management, the project intends to boost local businesses and tourism, promote sustainable development, and reduce youth unemployment. Ultimately, this initiative aspires to enhance Krui's visibility and support its economic growth through innovative and community-focused strategies.

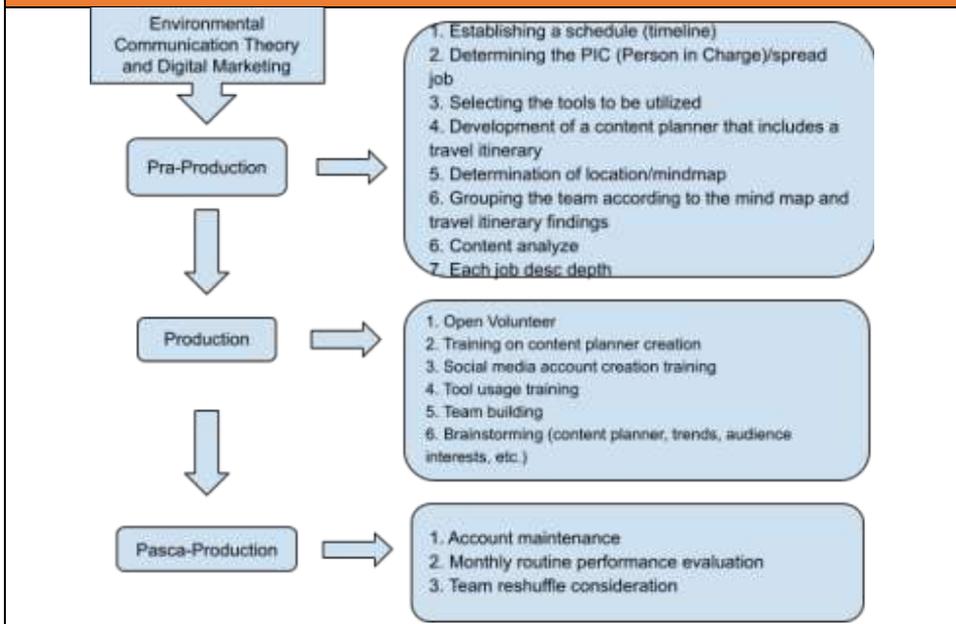
KEYWORDS: Krui, Digital Marketing, Sustainable Tourism, Penta-Helix, and Community Development.

PRODUCT DESCRIPTION

Krui is a popular destination for international surfing contests because it is a coastal area with a maintained natural environment, strong waves, and gorgeous white sand beaches. Despite its benefits, Krui is still not well-integrated into the community, which means that MSMEs, neighbourhood shops, and even the beaches are frequently overlooked. We discovered a solution by diverging from these issues

and focusing on Communication Science, our major. We aim to showcase Krui's untapped potential, encompassing the lesser-known beaches, the distinctiveness of the local way of life, and untapped natural and handicraft items. The social conditions of Krui are strongly associated with the friendliness of the locals and the culture of the seaside. Culinary delicacies, regional celebrations, and traditional dancing are examples of culture that can be established. Homestays run by locals, ecotourism, and historical and cultural tourism are further opportunities. The project's main objectives are to create digital marketing and booking services, promote lesser-known locations, enhance destination branding, and give local goods a platform. We will perform a mini-research to find out what influences travellers' interest, the number of current visitors, and their degree of recommendation to others. We will also hold training and socializing events to equip young people in the area with useful digital skills. Being a part of our team allows you to enhance your social media analysis expertise, establish connections with regional stakeholders, and directly benefit the target community by giving young people better opportunities for employment and a better quality of life. We intend to raise awareness of Krui and encourage its sustainable development through this effort.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



NOVELTY AND UNIQUENESS

We point to refine the "Program Desa Broadband" in arrangement with Kominfo (Ministry of Communication and Information)'s vision. While cultivating volunteer input, we will manage media management as the essential point of contact (PIC). Volunteer engagement remains pivotal, particularly in engaging Krui's youth. We'll evaluate existing substance to guarantee sustainability and development. Utilizing the penta-helix concept, including Academician, Commerce, Community, Government, and Media (ABCGM), is key to increasing tourism. These components synergize to improve our program's adequacy, cultivating collaboration over segments. Through vital coordination, we try to maximize affect and cultivate development in progressing broadband get to and community strengthening.

BENEFIT TO MANKIND

Social media has made it possible for local businesses to engage with clients worldwide. Beaches and culinary delicacies in the area offer excellent chances for international exposure, which boosts revenue and sales. By raising environmental awareness and digital literacy, this promotes the sustainable development and economic growth of the area. Youth can become change agents by receiving training in social media and digital marketing. The development of new jobs in the digital industry, such as social media administration and content creation, lowers youth unemployment and promotes the growth of ecotourism.

COMMERCIALIZATION POTENTIAL

The concept of Customer Relationship Management is utilized for marketing with the collaboration of partnerships & local entrepreneurs in creating product / service advertising through Instagram & TikTok. Content production by a team of volunteers in the form of beaches, natural resources, as well as local culinary delights such as Gulai Taboh / Sea Cucumber Chips. Plus, an eco-friendly open trip program for tourists that includes activities on the coast, a cultural festival "kekiceran" & an introduction to the agroforestry system "repong damar". Through social media monetization & open trip registration, profit is earned which will be shared based on a percentage of operational costs.

CONCLUSION

The project aims to promote sustainable tourism and economic development in Krui by showcasing its lesser-known beaches, local culture, handicrafts, and culinary through digital marketing and booking services. The project's objectives include creating a mini-research to understand traveler preferences, conducting training and socializing events to equip young people with digital skills, and engaging regional stakeholders. The project leverages the "penta-helix" concept, integrating academic, commercial, community, government, and media components to foster collaboration and maximize impact. The project's benefits include promoting sustainable development and economic growth, reducing youth unemployment, and enhancing ecotourism. The project's commercialization potential lies in its use of customer relationship management and social media platforms like TikTok and Instagram to promote local products and services, generating profits through monetizing social media accounts and open trip registration fees.

ACKNOWLEDGEMENT

In the process of generating ideas and preparing our writing until the implementation of this program, we received invaluable support from several parties. The Faculty of Social and Political Sciences at the University of Lampung provided us with subsidized funds and crucial information that enabled our participation in this competition. The SPEC Student Activity Unit served as an inspiration for the program we aim to implement in the future. We also benefited greatly from the input of Mr. Yoga and Mr. Feri, who acted as our supervisors for this competition. Lastly, Ajong provided us with detailed information about the real situation in the field, which was extremely helpful.

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PID25142

Parking Availability Monitoring System Using a Microcontroller Based on Android

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ABSTRACT

This paper describes a design and implementation of a Parking Availability Monitoring System (PAMS) through a microcontroller interfaced to an Android application. The work proposes a system that can monitor the availability of parking spaces in real-time to improve the efficiency of parking management. The system makes use of a network of ultrasonic sensors; the microcontroller is thus capable of constantly keeping track of the status of each parking slot. The sensors gather data on the status of the parking slot, the processing of which is later updated in an Android application through a wireless module. This report presents an Android application for updated parking availability information that would be accessible by the users through their smartphones with the application installed. The integration with Android provides a user-friendly interface and high accessibility. The proposed system does not only save the time for drivers to find open spots quickly but also concurrently decreases the vehicle density and the emission of pollutants from cars while looking for parking spots. The modular design of the system allows for scalability and adaptability within the small private parking area to the very large public garage. Experimental tests show the accuracy and responsiveness of the system to the level of validity as an effective tool for modern urban parking management.

KEYWORDS: Parking Availability, Microcontroller, Android Application, Real-Time Monitoring, Ultrasonic Sensors.

PRODUCT DESCRIPTION

PAMS is designed to address the prevailing problem of scarcity of parking spaces in urban centers. The system continuously updates its users on the current status of available spaces, hence reduces the time wasted when looking for parking in most congested urban settings.

Key Features of the System

- **Real-Time Information:** The system keeps the user abreast of the current parking status, hence good decision-making and fewer frustrations.
- **Scalability:** The system can be easily expanded from small-sized parking lots to multilevel parking garages.

Ultrasonic sensors are installed in each parking space, which detects a vehicle's presence or absence. This information is processed in the ESP32 microcontroller, which then integrates and processes this data. The resultant data is then passed to the Android application, thereby updating the end-user on the current status of parking spaces. The system has been optimized for faster response time, with near-zero lags between the transmission of data and its update.

The Android application has a very intuitive interface, which delivers a parking area map showing the status of parking spaces. There is a clear indication of open parking lots and occupied parking spaces. The application also assists the user to find the nearest parking space, with updates on space availability.

PAMS is an integration of ultrasonic sensing technology, wireless data transmission technology, and mobile application development into one seamless parking management solution. The use of the ESP32 microcontroller guarantees low power consumption coupled with high processing speeds, while the Android application ensures the solution can be accessed by a greater audience for higher user engagement.

The targeted end users include city drivers, commercial parking management providers, and municipal authorities. The PAMS will be

very effective in busy city centers, shopping malls, airports, and office towers with the need for efficient parking management.

Benefits and Advantages

- Time: Drivers have reduced time when looking for parking.
- Greenhouse Gas Emissions: Reduced emissions related to idling and driving when looking for parking.
- User Convenience: A hassle-free parking experience with real-time updates.
- Scalability: Adaptability to different parking lot sizes and configurations.

Technical Specifications

- Sensors: Ultrasonic vehicle detection sensors.
- Microcontroller: ESP32 for data processing and wireless communication.
- Application: The user interacts with an Android-based UI.
- Communication: Wi-Fi or Bluetooth for data transmission.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

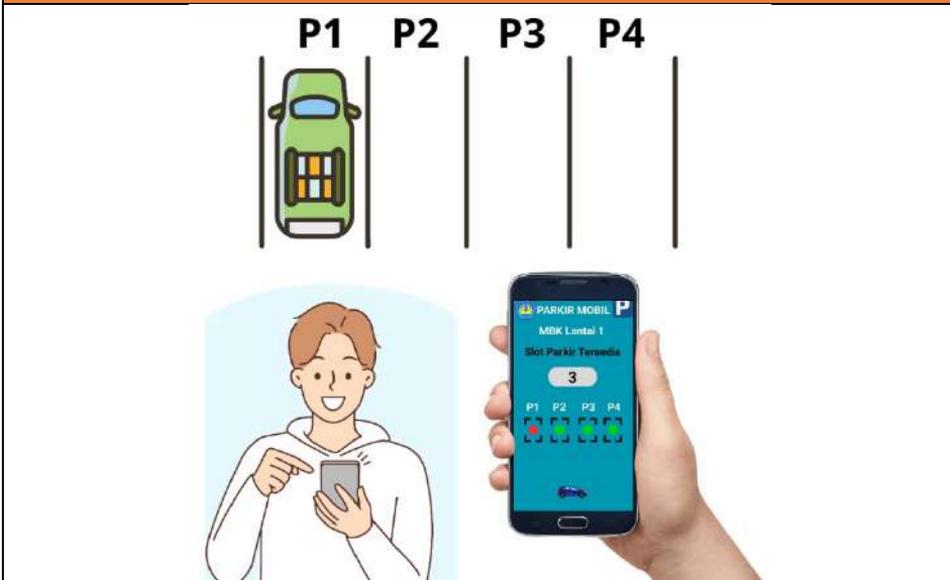


Figure 1. General Overview of the Parking Availability Monitoring System

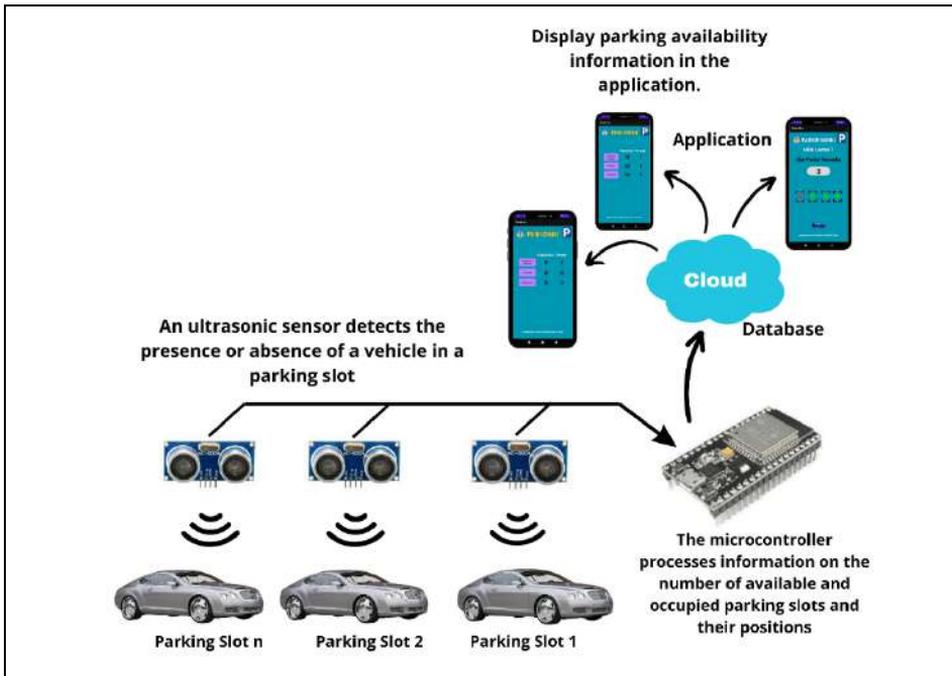


Figure 2. Concept of Parking Availability Monitoring System Design

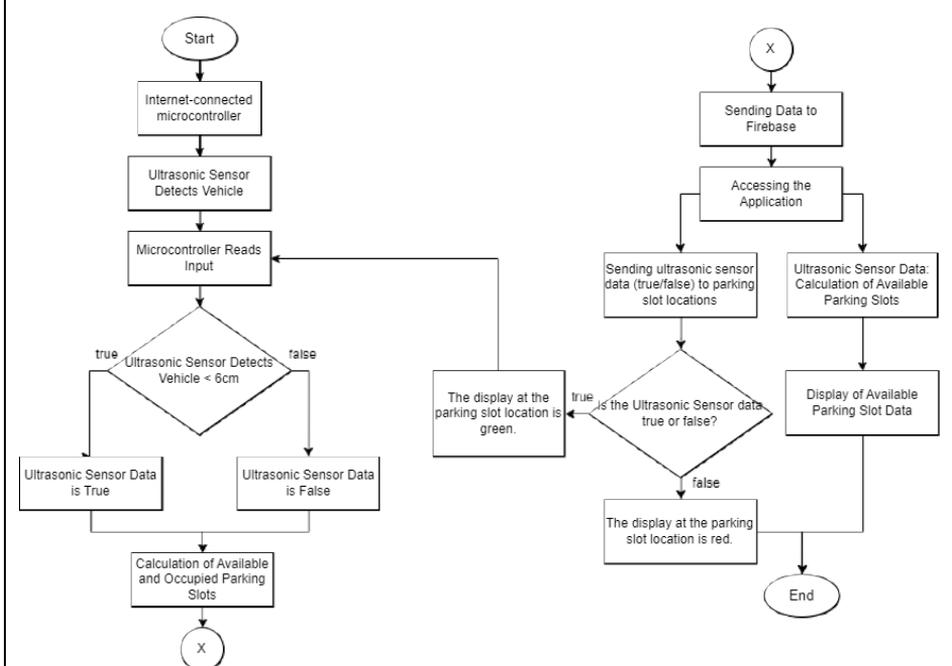


Figure 3. Flowchart of Parking Availability Monitoring System

NOVELTY AND UNIQUENESS

The Parking Availability Monitoring System (PAMS) offers a unique solution by integrating ultrasonic-sensing technology with the ESP32 microcontroller to give real-time parking space occupancy data through an Android application. Unlike earlier systems that were based on manual monitoring or simple hardware, PAMS provides a wireless, automated, and scalable solution. The unique use of ultrasonic sensors for accurate vehicle detection and seamless communication between the microcontroller and a mobile interface makes it different from other existing parking solutions. The union improves efficiency, cuts down on operational costs, and offers the user an immediate and friendly experience

BENEFIT TO MANKIND

The Parking Availability Monitoring System (PAMS) brings high added value to society through urban congestion relief and the reduction of environmental idling and circling for parking. It improves life quality by saving time and reducing stress for drivers, and on the other hand, it sustains low vehicle emissions. Economically, it optimizes parking space utilization, benefiting businesses and municipalities. In addition, PAMS would lend support to smarter urban planning and would drive innovation in traffic management based on IoT, thus contributing to advancements in both practical applications and technological knowledge.

COMMERCIALIZATION POTENTIAL

The commercial potential for the Parking Availability Monitoring System is immense, based on the fact that urbanization is on the rise and there is a growing need for parking solutions that are both efficient and cost-effective. This system has a competitive advantage over a number of other systems in the market because of its real-time data accuracy, low-cost hardware, and compatibility with mobile technology. The scalable design of the software can be deployed across an array of parking facilities, right from small parking lots to large complexes. There could be monetization through direct sales to municipalities and parking operators, subscription models around continuous data services, and smart city integrations through partners. Its design for scalability in various parking facilities assures that the Parking Availability Monitoring

System will be highly relevant across different market segments: small lots to large complexes. Regulatory compliance and potential patents further enhance market viability and protect intellectual property.

CONCLUSION

The Parking Availability Monitoring System (PAMS) effectively addresses the challenges of urban parking management by providing an innovative, real-time solution. Through the integration of ultrasonic sensors, the ESP32 microcontroller, and an Android application, PAMS offers precise parking space monitoring and user-friendly access to parking information. This system significantly reduces search time, alleviates traffic congestion, and lowers emissions, contributing to improved urban mobility and environmental sustainability. PAMS stands out due to its scalability, cost-effectiveness, and ease of deployment across various parking environments. Future development could include expanding the system's capabilities to integrate with broader smart city infrastructures, enhancing data analytics, and incorporating predictive algorithms for even greater efficiency.

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PID25152

World of AI: Media Specialization Using Artificial Intelligence

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ABSTRACT

The World of AI (WOA) website is the latest innovation in the use of Artificial Intelligence (AI), designed to meet the needs of information, education and advice. Based on research from Semrush, global interest in AI is very high with 5.2 million monthly searches, and in Indonesia, AI ranks fourth with 301 thousand monthly searches. WOA is the first media on Google to comprehensively cover all types of AI. Aimed at beginners, students and professionals, the content is available in Indonesian and English, allowing WOA to reach international markets. Key features include the latest AI news, courses on Course Academy, and specialized AI for Academics and AI for Creators categories. The intuitive and visually appealing interface increases user engagement. Benefits of WOA include critical problem solving, improved quality of life, and business productivity through AI consulting. With tremendous monetization potential through private course subscriptions, advertising, and technology product endorsements, WOA plays an important role in advancing science and technology, making it an essential platform for the future of AI.

KEYWORDS: Utilization of AI, Comprehensive AI Information, Online AI Courses, AI Consulting

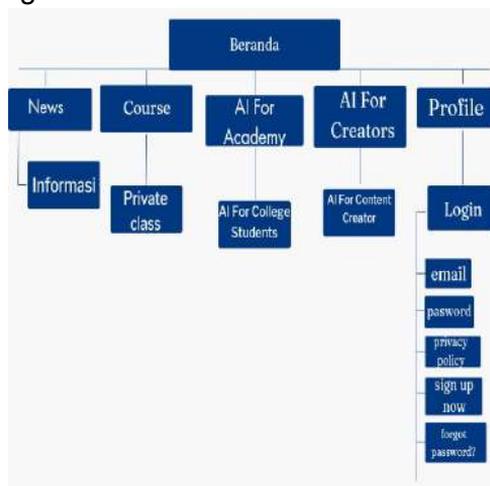
PRODUCT DESCRIPTION

THE WORLD AI website is the latest innovation in artificial intelligence (AI) that has attracted global attention. Based on research from Semrush data, interest in AI is very high with 5.2 million global searches

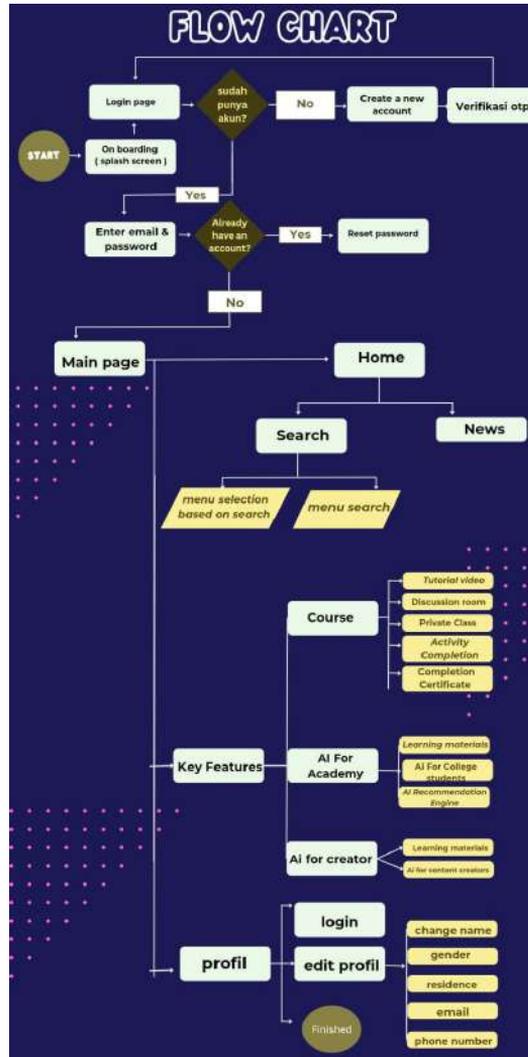
and Indonesia ranks fourth with 301 thousand monthly searches. Recognizing the market void of comprehensive media on AI, DUNIA AI comes as a solution that answers this need. The "DUNIA AI" website is the first dedicated media on Google that comprehensively discusses the use of all types of AI. The main goal of the DUNIA AI website is to be a source of AI information, education, and advice for everyone, including high school students, college students, and professionals. The platform offers content in both Indonesian and English, allowing it to reach an international audience. Key features of DUNIA AI include the latest AI news, AI product tutorials, and AI courses at Course Academy. The platform is designed with an intuitive and user-friendly interface and attractive visuals to increase user engagement. DUNIA AI is not only a source of information and education, but also a solution to critical problems by providing AI tutorials and improving quality of life through AI courses and consultations. In addition, the platform supports sustainability with eco-friendly product reviews and flexibility in content updates. With a focus on AI beginners, students and professionals looking to improve their skills, AI WORLD has great potential to attract a wide market and loyal customers. With benefits such as increasing business productivity, building a knowledge-sharing community, and contributing to the development of AI, AI WORLD is a big step towards the advancement and sustainability of AI in the future.

SCHEMATIC DIAGRAMS/ FLOW CHARTS/ PICTURES/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

1. Schematic Diagrams



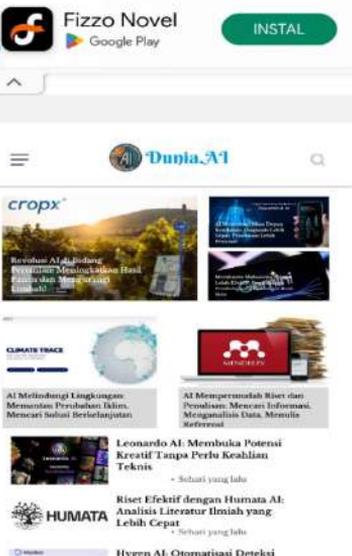
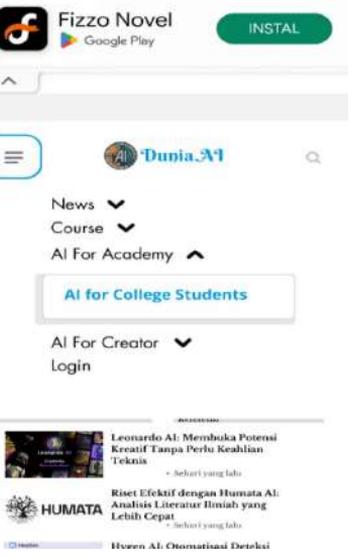
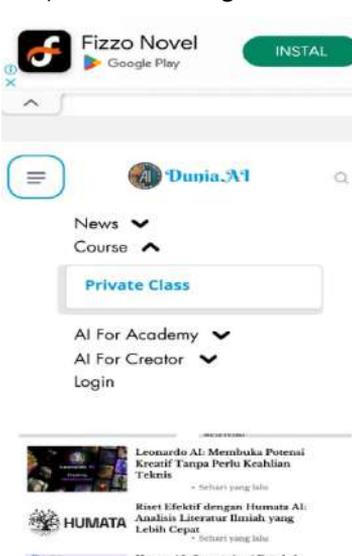
2. Flow Charts

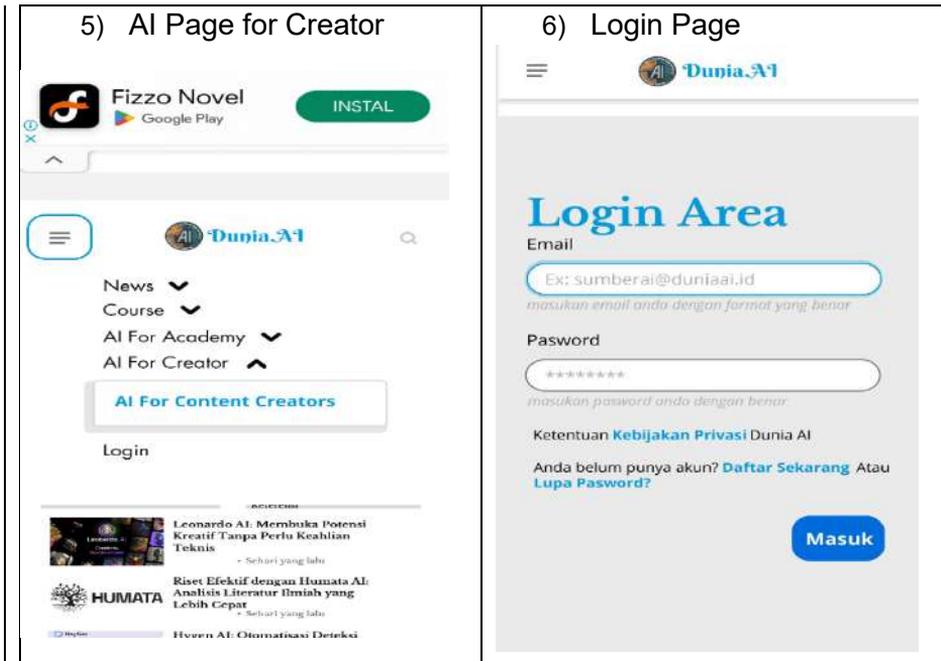


3. Picture

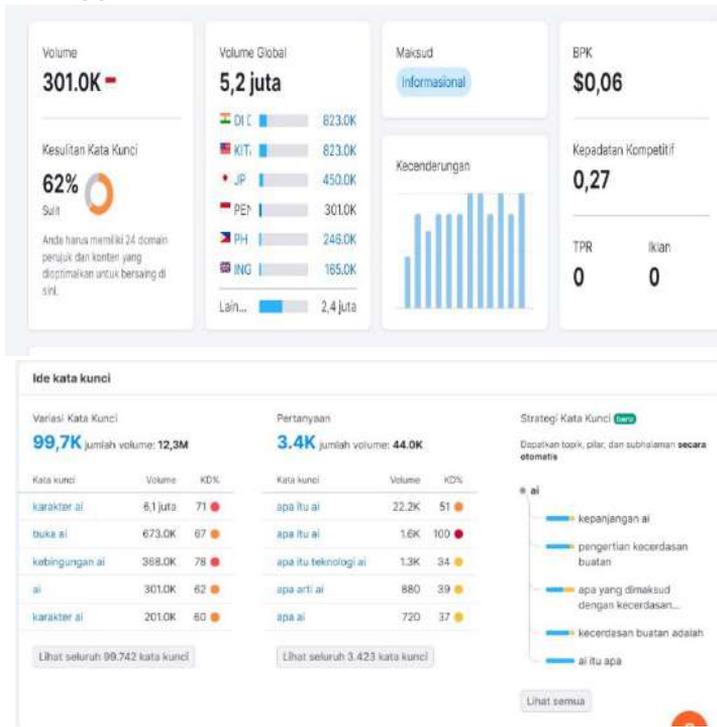
1) Logo Website Picture	Information
	<p>Globe: It symbolizes the world as a whole. The World of AI Putting these two elements together creates a picture of a world that is already integrated with AI. This can be interpreted as a world that utilizes AI for progress or a world influenced by AI.</p>

4. Screenshots of Website Page

<p>1) Home Page</p>  <p>The screenshot shows the home page of the Fizzo Novel app. At the top, there is a 'Fizzo Novel' logo with a 'Google Play' icon and an 'INSTAL' button. Below this is a navigation bar with a hamburger menu icon, the 'Dunia.AI' logo, and a search icon. The main content area features several article cards. The first card is titled 'cropx' and discusses AI in agriculture. The second card is titled 'CLIMATE TRACE' and discusses AI in climate change. Below these are two more cards: 'Leonardo AI: Membuka Potensi Kreatif Tanpa Perlu Keahlian Teknis' and 'Riset Efektif dengan Humata AI: Analisis Literatur Ilmiah yang Lebih Cepat'. At the bottom, there is a 'HUMATA' logo and a link to 'Hoven AI: Otomatisasi Deteksi'.</p>	<p>2) Home Page</p>  <p>This screenshot shows the same home page as screenshot 1, but with a different navigation menu. The 'News' and 'Course' options are expanded, showing a dropdown menu. The 'AI For Academy' option is highlighted with a blue bar. Below this, there is a 'Login' button. The main content area is the same as in screenshot 1.</p>
<p>3) Course Page</p>  <p>The screenshot shows the course page of the Fizzo Novel app. It features the same 'Fizzo Novel' logo and 'INSTAL' button at the top. The navigation bar is similar to the home page, but the 'Course' option is expanded, showing a dropdown menu. The 'Private Class' option is highlighted with a blue bar. Below this, there are links for 'AI For Academy', 'AI For Creator', and 'Login'. The main content area is the same as in the home page screenshots.</p>	<p>4) AI Page for Academy</p>  <p>This screenshot shows the AI page for the Academy. It features the same 'Fizzo Novel' logo and 'INSTAL' button at the top. The navigation bar is similar to the home page, but the 'AI For Academy' option is expanded, showing a dropdown menu. The 'AI For Academy' option is highlighted with a blue bar. Below this, there are links for 'AI For Creator' and 'Login'. The main content area is the same as in the home page screenshots.</p>



5. Grafik Pengguna Dan Pencarian AI



NOVELTY AND UNIQUENE

The WOA website is the first dedicated media on Google that comprehensively discusses the use of all types of AI. With high AI search data, the website offers content in two languages (Indonesian and English) and is able to reach international markets. Unique features such as the latest AI news, AI courses, and specialized categories such as "AI for Academics" and "AI for Creators" make WOA an innovative platform that is flexible and constantly updated. The site supports the development of AI in various fields and helps users from all walks of life, from beginners to academics.

BENEFIT TO MANKIND

The WOA website provides multiple benefits to people. By providing up-to-date information and AI tutorials, the platform helps solve critical problems and improve the quality of life through AI courses and consulting. Economically, AI consulting services increase business productivity and create employment opportunities. In education, WOA advances science and supports student learning. Socially and culturally, the site builds a knowledge-sharing community and supports the development of AI in various fields. With bilingual content, WOA is globally and locally relevant, making it an important platform for AI development.

COMMERCIALIZATION POTENTIAL

Our innovative use of AI offers promising market opportunities, with global searches reaching 5.2 million and Indonesia ranking fourth in the world with 301 thousand searches per month. Significant revenue is generated from monthly or annual subscriptions for exclusive private lessons on our platform. We also generate revenue from advertising and endorsements of technology products, as well as working with top brands to promote their products to our large and active user base.

CONCLUSION

The World of AI comes as a superior innovation in the use of artificial intelligence (AI) for information, education and advice. Based on research by Semrush, global interest in AI is very high with 5.2 million monthly searches, and Indonesia ranks fourth with 301 thousand searches per month. The lack of specialized media that comprehensively discusses AI creates a great opportunity for Dunia of

AI to fill this gap. The site caters to beginners to professionals, with content in both Indonesian and English, making it flexible and able to reach an international audience. Key features include the latest AI news, AI courses, and specialized categories for academics and creators. The World of AI offers critical problem solving, improved quality of life, business productivity, and the creation of a knowledge-sharing community.

ACKNOWLEDGEMENT

We would like to express our deepest gratitude to our supervisor, Mr. Riyanto, S.I. Kom, and the head of the Digital Business study program, Mrs. Dr. Besse Wediawati, S.E., M.Si., for invaluable guidance, support and direction during the development of this project. Without their contribution and dedication, this project would not have been possible. We also express our gratitude to our beloved Jambi University for the facilities and opportunities provided to develop this idea. Support from all parties has been a source of inspiration and motivation for us to achieve success.

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PID25162

Unlocking Potential: Skillful Work for Prisoners

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ABSTRACT

Unlocking Potential: Skillful Work for Prisoners is a training initiative specifically designed for soon-to-be-released prisoners, aiming to prepare them for the world of work with skills that are relevant and in demand in today's job market. The training program includes Digital Marketing, Graphic Design, Microsoft Excel, Microsoft Word, Microsoft PowerPoint, Foreign Languages, and Artificial Intelligence courses. Through a comprehensive and practical curriculum, participants will gain the knowledge and skills necessary to contribute productively in the modern work environment. Each participant who completes the training will receive an official certification that can improve their chances of finding a job. Unlocking Potential: Skillful Work for Prisoners not only focuses on providing technical skills but is also committed to providing ongoing support and career guidance, helping prisoners reintegrate into society with confidence and independence. With a mission to reduce unemployment and improve social reintegration, Unlocking Potential: Skillful Work for Prisoners seeks to create a better future for prisoners and the community as a whole.

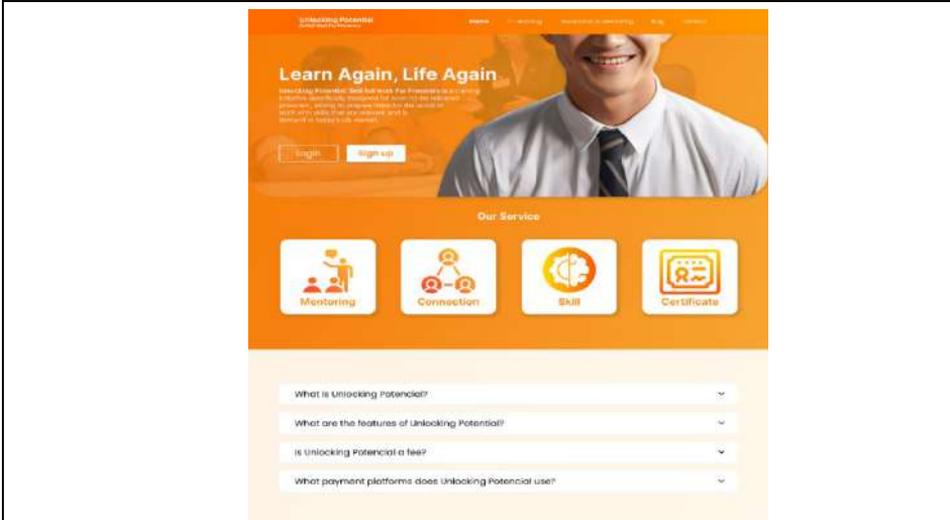
KEYWORDS: Training, Knowledge, Skill, World of Work, Prisoners

PRODUCT DESCRIPTION

The digitalization training program for inmates aims to prepare them to return to society with relevant skills such as IT, manufacturing, customer service, and entrepreneurship. The program is designed with an intuitive and easy-to-follow interface to support efficient user

experience, using digital devices and industry-standard training materials. In addition, the program provides career guidance including resume building, interview preparation, and job connection. Mentor support and social rehabilitation are also provided to increase employment opportunities, reduce crime rates, and create safer and more inclusive communities. The target audience for this program is inmates who will soon be returning to the community. Some of the important elements considered include the program overview and objectives, key features, functionality and performance, user interface and experience, innovations, applications and use cases, and program benefits and advantages. However, one of the main challenges inmates face in getting a job is the social stigma and mistrust from potential employers. Employers often perceive inmates as lacking adequate skills or at risk of repeating past mistakes. The program aims to address such stigma by equipping inmates with industry-recognized skills and providing them with the support needed to succeed in the workforce. By providing industry-standard training and comprehensive career support, the program seeks to facilitate inmates' transition into work and society, minimize the likelihood of returning to prison, and contribute to the safety and well-being of the community. The program is expected to help inmates better rebuild their lives, create real employment opportunities, and change society's view of ex-offenders, thereby creating a more inclusive and supportive environment.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



Unlocking Potential

Home
Training
Resource & Material
Blog
Contact

Learn, Get Skills and Certificates

Prioritizing Quality Materials, Trained Skills, and Official Certificates for a Bright Future.

View selected programs





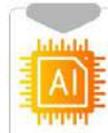
Digital Marketing



Microsoft Office



Foreign Language



Artificial Intelligence

Unlocking Potential

Home
Training
Resource & Material
Blog
Contact

Ready to Go Back to Society with Digital Skills

Achieve Independence with Digital Skills, Ready to Face the Outside World

View selected programs





Digital Marketing Fundamental



Strategi & Content Digital Marketing



English for Freedom: Mastering..



Speak Up, Stand Out: English Bootcamp...



AI Mastery : Foundations of...



AI Mastery: Deep Learning...



Wordsmith Warrior: Master Microsoft...



From Zero to Word Hero: Coaching...



Excel Expert: Data Analysis and...



Unlock Excel's Power: Complete Training...



PPT: Master the Art of Ideas Delivery



PowerPoint Pro: Create Slides...

NOVELTY AND UNIQUENESS

Unlike other programs, our inmate training program is the only one of its kind in Indonesia, specifically designed to help inmates acquire the skills needed to succeed after release. This comprehensive program is taught by experienced instructors and provides practical skills that can

be immediately applied in the real world. Together, we can give inmates hope and a second chance to build a brighter future and contribute to a better society.

BENEFIT TO MANKIND

Unlocking Potential: Skillful Work for Prisoners provides a solution to an important problem by reducing unemployment and resocializing ex-prisoners. The program improves quality of life through relevant skills training and certification, enabling access to decent work. The program's sustainability supports social and economic integration, strengthens communities, and reduces stigma against ex-prisoners. In addition, it promotes the advancement of knowledge and education and has a positive impact on the local and global economy by creating a skilled workforce ready to contribute productively.

COMMERCIALIZATION POTENTIAL

We provide prisoners with a second chance to lead a better life after release through comprehensive and practical training at an affordable cost of only IDR 175,000 per month. This training has significant commercial potential as the first innovative program in Indonesia, helping prisoners acquire the skills needed in the job market and offering valuable certification. The program also opens job opportunities after incarceration enhances rehabilitation, and facilitates reintegration into society, thereby contributing to a better community. By collaborating with the government, we can run this training for an extended period.

CONCLUSION

Unlocking Potential: Skillful Work for Prisoners provides comprehensive training for prisoners who are about to be released, focusing on digital and professional skills to ease reintegration into society and the job market. The program emphasizes the importance of certification as the first step toward economic independence. In the future, the project can expand by adding new courses and establishing partnerships with companies for job placement. This initiative contributes significantly to reducing unemployment and improving social stability.

ACKNOWLEDGEMENT

We would like to express our deepest gratitude to our supervisor, Mr. Ifwan Adinata.S.Ip. and the head of the Digital Business study program Mrs. Dr. Besse Wediawati S.E M.Si for their invaluable guidance,

support, and direction throughout the development of this project. Without their contribution and dedication, this project would not have been realized properly. We also extend our gratitude to our beloved Jambi University for the facilities and opportunities provided to develop this idea. The support from all parties has been a source of inspiration and motivation for us to achieve success.

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PID29042

Lubuk Alung Local Wisdom Sourced Asam Kandis Herbal Drink as an Antioxidant in Maintaining Endurance for Office Workers

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ABSTRACT

Asam Kandis Herbal Drink is a drink made by using asam kandis fruit (*Garcinia atroviridis*) as the main ingredient, combined with other spices such as lemongrass, galangal, ginger, dried cloves, bunga lawang, nutmeg, dried cinnamon, turmeric and granulated sugar, which are boiled for a certain time. This herbal drink has a distinctive spice aroma. Asam Kandis Herbal Drink is tested to have antioxidant content as much as IC₅₀ = 728.8130 ppm and vitamin C with levels as much as 0.2475 which is very useful especially for office workers. Consumption of Asam Kandis herbal Drink containing antioxidants can help neutralize free radicals, reducing the risk of developing various diseases, including heart disease, diabetes, and cancer. Asam Kandis herbal Drink contains a lot of vitamin C, which helps office workers boost the immune system, healing and regeneration of body cells, which can speed up recovery from stress or fatigue that often occurs in busy office workers.

KEYWORDS: Asam Kandis, Antioxidant, Vitamin C, Herbal Drink, Office Workers

PRODUCT DESCRIPTION

Asam Kandis Herbal Drink is a drink made by using asam kandis fruit (*Garcinia atroviridis*) as the main ingredient. Asam kandis is a fruit that grows in Southeast Asia and has long been used in traditional medicine for various health conditions. Asam Kandis Herbal Drink is an innovative beverage processed in a simple way. Although simple, this drink

provides benefits for those who consume it. The ingredients used to make this drink are very easy to find in the surrounding environment in the form of herbal plants. This drink can be consumed by all ages because it has good properties for the body.

By utilizing local wisdom in the utilization of Asam Kandis Herbal Drink, the community can produce value-added products, strengthen the local economy, and promote their cultural heritage to the world. The following is an explanation of Asam Kandis Herbal Drink as an antioxidant, Winata, (2018): source of antioxidants; cell protection; prevention of degenerative diseases; refreshing and healthy; and traditional use.

The ingredients used to make Asam Kandis Herbal Drinks are dried asam kandis 20 grams, lemongrass 70 grams, galangal 10 grams, ginger 30 grams, dried cloves (10 grains) 1 gram, bunga lawang (2 pieces) 1.5 grams, nutmeg (1 piece) 3.5 grams, dried cinnamon 3 grams, turmeric 15 grams, granulated sugar 40 grams, and mineral water 1000 ml. With the steps of making are, first, peel the ginger, galangal, lemongrass, and turmeric and then wash them. Next, put all the ingredients into a stew pot, boil for 90 minutes until reduced. From 1000 ml of boiled water will produce 350 ml of Asam Kandis Herbal Drink.

There are two ways of serving this drink as follows; Can be drunk directly with a serving size of 5 - 10 ml (one shoot drink). The next serving method can be mixed with boiled water. However, it is recommended for 25 ml of asam kandis mixed with 100 ml of boiled water. To get more benefits, it can be added with date extract or honey.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

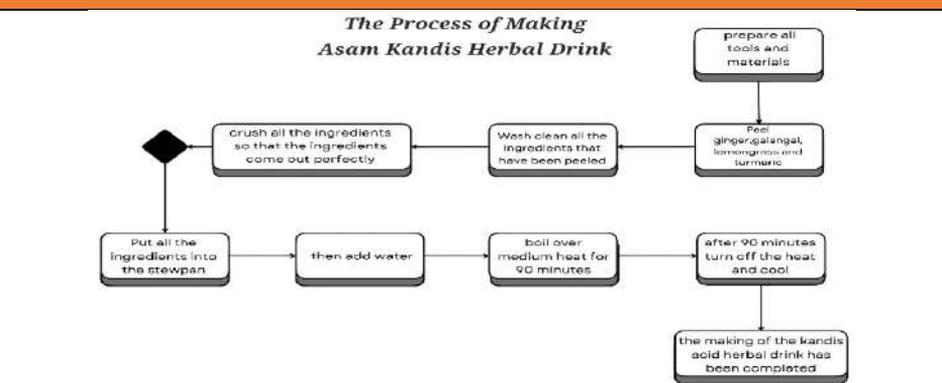


Figure 1. The process of making Asam Kandis Herbal Drink



Figure 2. Beverage ingredients and product results



Figure 3. Antioxidant Content Test Process

Table 1. Results of the antioxidant test on the product

No	Ppm concentration	Absorbance	% Inhibition	IC50
1	15.625 ppm	0.2655	72.9413	728.8130 ppm
2	31.25 ppm	0.2523	74.2866	
3	62.5 ppm	0.2246	77.1097	
4	125 ppm	0.1863	81.0130	
5	250 ppm	0.1425	85.4770	
6	500 ppm	0.4821	89.6759	



Figure 4. Vitamin C content test process

Table 2. Results of the Vitamin C test on the product

No	Sample Name	Iod volume 0.01N (mL)	Sample Mass (mg)	Vitamin C content (%)
1.	Asam Kandis Herbal Drink	1.15	20000.0	0.6652
		1.10	20000.0	0.6335

NOVELTY AND UNIQUENESS

Asam kandis has been sold dry for cooking purposes only. It has high antioxidants and vitamin C making it good for health. Jorong Gamaran Nagari Salibutan Lubuk Alung has the potential for innovation related to this product.

Asam Kandis Herbal Drink is a simple and innovative product, made from locally sourced ingredients and can be consumed by people of all ages. According to Winata (2018), asam kandis herbal drink is a source of antioxidants, cell protection, disease prevention, refreshing, and traditional medicine.

BENEFIT TO MANKIND

From laboratory tests, Asam Kandis Herbal Drink contains antioxidants and vitamin C. Asam Kandis Herbal Drink contains a lot of vitamin C, which helps boost the immune system. This is especially important in a work environment that is often full of microbial exposure and stress. Office workers are often exposed to air pollution, computer radiation, and stress, which can increase the production of free radicals in their bodies. Consumption of Asam Kandis Herbal Drink that contain antioxidants can help neutralize these free radicals, reducing the risk of developing various diseases, including heart disease, diabetes, and cancer.

COMMERCIALIZATION POTENTIAL

Making Asam Kandis Herbal Drink by utilizing local wisdom has a positive economic impact on the community, including; Increased income, empowerment of local farmers and craftsmen, development of small and medium enterprises, promotion of tourism and local products, and encouraging innovation and product development. Thus, making Asam Kandis Herbal Drink by utilizing local wisdom not only provides economic benefits to the local community, but also strengthens cultural identity and advances the local industry as a whole.

CONCLUSION

The utilization of Asam Kandis Herbal Drink by utilizing local wisdom has great potential in economic and social aspects. Processing herbal drinks through production innovation and unique product development supports local economic growth and promotes regional products. In addition, the use of ka Asam Kandis Herbal Drink also plays a role in preserving cultural heritage and empowering local communities by involving farmers and local people. Health-wise, the antioxidant content in kandis sour herbal drinks helps boost immunity and protect against cell and tissue damage. This makes Asam Kandis Herbal Drink not only refreshing, but also makes a positive contribution to the well-being and health of the community at large.

ACKNOWLEDGEMENT

We express our gratitude to all parties involved in this project ; Pokdarwis Nagari Salibutan, Kelompok PKK Nagari Salibutan, Dr. Feri Ferdian, Yuke Permata Lisna, M.Par, Waryono, MM.Par, Rahmi Fadila, M.Pd, Biochemistry Laboratory (cience faculty of Universitas Negeri Padang), Tourism Department of Tourism and Hospitality Faculty, UNP.

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PID29062

AR OSIL: Development of Interactive Learning Media Based on Augmented Reality in Understanding OSI Layer Material

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ABSTRACT

The era of Industrial Revolution 4.0 towards Society 5.0 demands the involvement of technology in various forms of educational activities. One application of technology is Augmented Reality (AR) learning media in understanding OSI Layer material. This research aims to develop Augmented Reality media for OSI Layer material in Computer Network subjects in Vocational High Schools (SMK) and Universities. The type of research used is Research and Development (R&D) with a development method consisting of four main stages (4D), namely definition, design, development, and implementation. The learning media product development process began with an analysis of the needs of 49 vocational students to understand their expectations. Based on this analysis, appropriate product designs, methods, and tools are selected. Product prototypes are created, tested, revised, and developed until they become the final product. The product is then socialised, users are trained, and evaluated to ensure its effectiveness. The research results show that the AR media developed is effective in increasing students' understanding of the OSI Layer material. This is proven by the test results, which show the average score of students who use AR media is higher than students who do not use AR media.

KEYWORDS: Augmented Reality, OSI Layer, Learning Media, Education, AR OSIL.

PRODUCT DESCRIPTION

This AR application helps students understand *OSI Layer* material in an easier, engaging, and interactive way through 3D visualisation and direct interaction.

Main Features

1. OSI Layer 3D Visualisation
This media displays 3D models of 7 OSI layers that can be viewed from various points of view.
2. 3D Animation and Simulation
The media is equipped with animations and simulations that explain how data flows through computer networks according to the OSI Layer model.

This media can be accessed anytime and anywhere, so students can learn flexibly. This AR media is designed with an intuitive and easy-to-use user interface. This AR application is an innovation in the world of education because it uses AR technology to help students understand OSI Layer material more easily, interestingly, and interactively. In Indonesia, augmented reality (AR)-mediated learning has previously been applied to several subjects, namely mathematics, history, English, and several other subjects. However, there is no AR application specifically for OSI layer material in Network Engineering subjects. Considering that OSI material is a visualisation material that is heavy and focuses on certain details, it is important to provide visualisation to increase students' understanding and interest in studying the material. AR OSIL helps students understand OSI Layer material easily, interestingly, and interactively through 3D visualisation and direct interaction. This AR media can be used for all vocational education units and universities.

This AR application can be used for various purposes, such as:

1. Explanation of OSI Layer material in class
2. Self-study outside the classroom
3. Presentation

This AR application has many benefits and advantages, including:

1. Increase students' understanding of OSI Layer material

2. Make learning easier, engaging, and interactive
3. Increase students' interest in learning independently
4. Improve the quality of learning.

Technical Specifications

1. Operating system : Android 5.1 or higher
2. Hardware : Smartphone
3. Internet connection : Not required

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

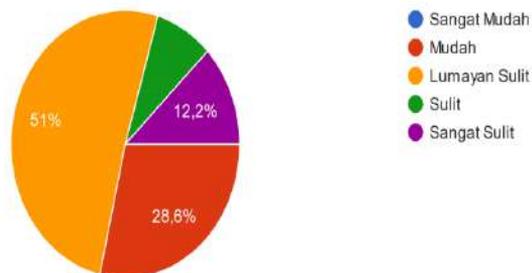
Before choosing the learning material to be developed, the author conducts analysis and observation. The results show that there are three materials needed for AR media:

1. OSI Layer
2. Fibre Optic
3. VOIP

This result was corroborated by a questionnaire to class XII students of Computer Network Engineering and Telecommunications.

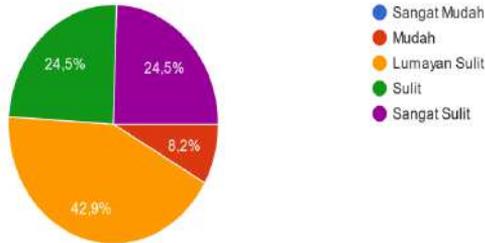
VoIP adalah singkatan dari "Voice over Internet Protocol," yang dalam bahasa Indonesia dikenal sebagai "Suara melalui Protokol Internet." Ini adal...berapa sulitkah materi tersebut untuk di mengerti?

49 jawaban



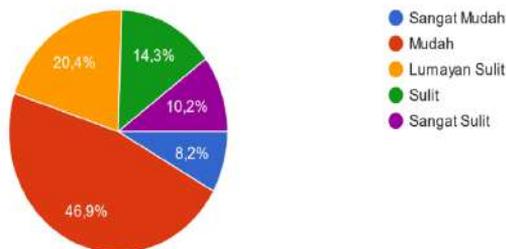
Picture 1. VOIP material requirements survey

OSI (Open Systems Interconnection) adalah model referensi yang digunakan untuk menggambarkan cara komunikasi jaringan kom...apa sulit kah materi tersebut untuk di mengerti?
49 jawaban



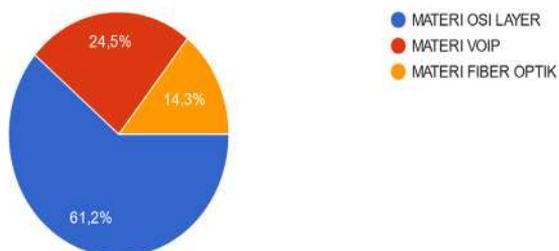
Picture 2. OSI Layer material requirements survey

FO merupakan singkatan dari "Fiber Optic" atau dalam bahasa Indonesia disebut "Serat Optik." Fiber Optic adalah teknologi transmisi data yang menggu...erapa sulitkah materi tersebut untuk di mengerti?
49 jawaban



Picture 3. Fiber Optic material needs survey

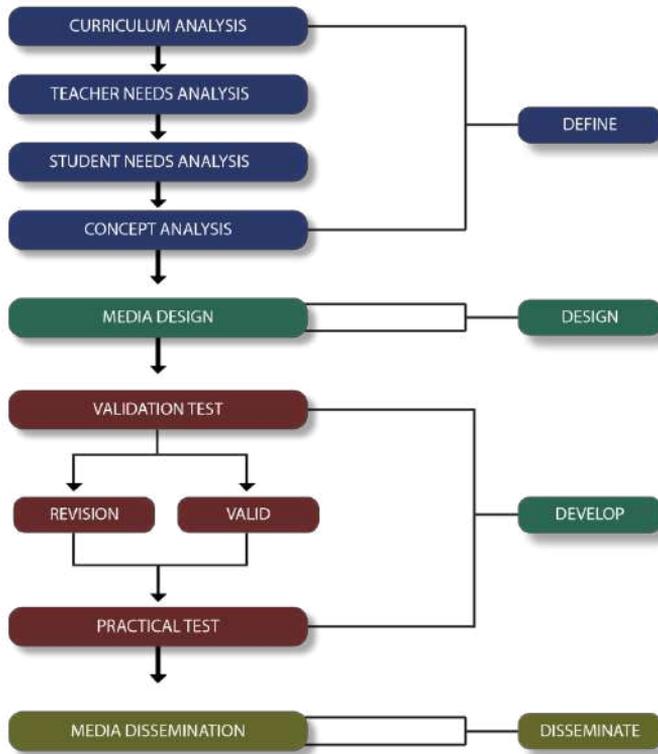
AR merupakan singkatan dari "Augmented Reality" atau dalam bahasa Indonesia disebut "Realitas Tambah." Augmented Reality adalah teknologi y... butuhkan untuk dibikinkan materinya kedalam AR?
49 jawaban



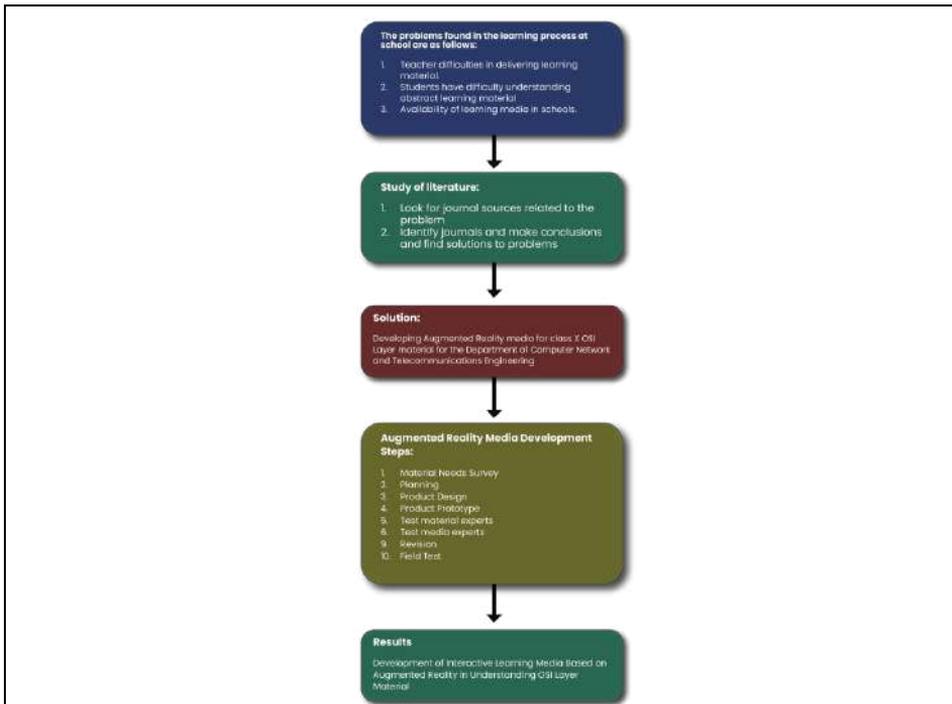
Picture 4. Results of the survey of student learning material needs

Based on the survey results above, it can be concluded that understanding the OSI Layer is more difficult than VOIP and Fiber

Optics. Demand for OSI Layer material is higher: 61.2% vs. 24.5% (VOIP) and 14.3% (Fiber Optics).



Picture 5. Conceptual Framework



Picture 6. Development Model



Picture 7. Main page



Picture 8. AR Scan Pages



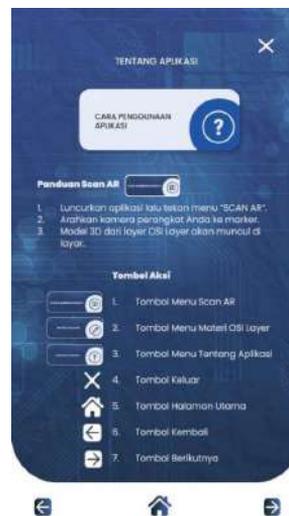
Picture 9. Pages of Material



Picture 10. About Apps Page



Picture 11. How To Page



Picture 12. Developer Information Pages



Picture 13. Referral List Pages

Picture 14. AR Scan Book

NOVELTY AND UNIQUENESS

Based on market research conducted, it was found that there had been no AR applications specifically for OSI layer materials before. AR OSIL has been registered under copyright protection number 000616650.

Below are the uniqueness of AR OSIL:

1. Innovative Approach: Utilising AR technology to visualise abstract OSI Layer concepts.
2. Engaging Interactions: Provide immersive and interactive learning experiences
3. Flexible Access: Students can study anytime and anywhere
4. Intuitive Design: Easy-to-use interface and attractive visualisations.
5. A new and easy-to-understand visual concept of mail delivery simulation.

BENEFIT TO MANKIND

Effective Learning:

Increase motivation, understanding, interest in learning and retention of information about the OSI Layer.

Better Quality of Life:

1. Prepare for a career in information and communication technology.

<p>2. Improve digital literacy</p> <p>Sustainability and Environmental Impact:</p> <ol style="list-style-type: none"> 1. Reduce the use of paper and printed materials in learning. 2. Promote the use of environmentally friendly technology. <p>Social and Cultural Impact:</p> <ol style="list-style-type: none"> 1. Encourage inclusivity and diversity in learning. 2. Strengthen a culture of innovation and creativity. <p>Global and Local Relevance:</p> <ol style="list-style-type: none"> 1. Prepare students to face global challenges in the digital age. 2. Increase the nation's competitiveness in the international arena.

COMMERCIALIZATION POTENTIAL

<p>Market Demand:</p> <ol style="list-style-type: none"> 1. High demand for innovative education solutions in the digital age. 2. The rapid growth of the AR technology market. <p>Competitive Advantage:</p> <ol style="list-style-type: none"> 1. Innovative approach to OSI Layer material. 2. User-friendly design. <p>Business Model:</p> <ol style="list-style-type: none"> 1. Sales of software licenses. 2. OSI Layer AR package book sales. <p>Scalability:</p> <p>Scalable business model to reach global markets.</p> <p>Cost Analysis:</p> <ol style="list-style-type: none"> 1. Relatively low initial development costs. 2. High profit margin potential. <p>Regulatory Compliance and Certification:</p> <ol style="list-style-type: none"> 1. Compliance with data privacy and cybersecurity regulations. 2. Obtain relevant certifications for education.
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CONCLUSION

The AR OSI Layer is an innovation in education that offers a new and exciting way to learn complex OSI Layer concepts. This medium has the potential to increase student understanding and participation, and advance education in the digital age.

Key Findings:

1. AR media can visualise abstract concepts of OSI Layer in an easy-to-understand way.
2. Students are more interested and motivated to learn with AR media.
3. AR media can be used for both self-paced and collaborative learning.
4. AR media has the potential to improve the quality of education

OSI Layer AR media is an innovative solution to overcome challenges in education today. This medium has the potential to revolutionise the way we learn and teach. Further research and development is needed to improve the effectiveness of OSI Layer AR media. This media also needs to be promoted and adopted by schools and other educational institutions.

ACKNOWLEDGEMENT

I would like to thank all those who have contributed to the development and success of this OSI Layer AR Media project. Special thanks go to:

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2. Students of grade 12 Computer Network Engineering and Telecommunications 1 and 2 SMKN 1 Tebing Tinggi for their participation in the survey and for valuable input.
3. A team of researchers and developers who have worked hard to make this project a reality.
4. Family and friends who have provided support and encouragement throughout the project process.

I would also like to thank all those who have helped in the completion of this project. Without the support and assistance of all parties, this project would not have been realized. Thank you for all your help and cooperation.

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PID29072

ZENCARE (Zero-Stress Emotional Care Hub): Smart Innovation for Child and Adolescent Mental Health Monitoring and Therapy in the Age of Technology

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ABSTRACT

The development of Information Technology has brought us into the "e-life" era, where daily life is heavily influenced by electronic needs. The use of technology, especially social media, often negatively impacts mental health, causing depression and anxiety. This issue is worsening among the younger generation, with rising rates of depression and suicide. This article aims to address mental health issues caused by technology overuse by introducing ZENCARE, an innovative tool designed to monitor and improve mental health through IoT (Internet of Things) and AI (Artificial Intelligence) technologies. Using the 4D method (Define, Design, Develop, Disseminate), the Define stage identifies mental health problems due to excessive technology use. The Design stage involves creating a tool integrating IoT and AI technology. During the Development stage, the tool is tested and optimized. The Disseminate stage involves distributing and implementing the tool among users for further evaluation and improvement. ZENCARE features EEG and PPG sensors to monitor brain activity and heart rate, and an Augmented Reality (AR) screen for audiovisual therapy. Users can also access online counseling sessions through a smartphone app connected to the device. ZENCARE aims to reduce digital pressure, alleviate stress and anxiety, and maintain young people's mental well-being in the technological era.

KEYWORDS: AI, IoT Mental Health, Social Media

PRODUCT DESCRIPTION

ZENCARE is an ergonomic device designed as an earphone with integrated high technology. With a transparent screen that can be pulled

down, the device serves as an Augmented Reality (AR) screen for audiovisual therapy. The PPG (photoplethysmography) optical heart rate sensor located around the ear monitors blood volume changes with the help of infrared light to detect heart rate and measure emotions. With its non-invasive design, ZENCARE continuously monitors heart rate without direct contact with the chest or wrist. In addition, ZENCARE is equipped with an EEG (electroencephalogram) sensor to record the brain's electrical activity through electrodes on a headband attached to the scalp.

The electrodes on ZENCARE involve placing small electrodes on the scalp at several points on the headband, to measure the difference in electrical potential on the surface of the head. The brain generates electrical signals from the activity of nerve cells that communicate with each other, with various wave patterns reflecting brain activity. The recorded brain waves are converted into graphs and displayed in the ZENCARE mobile app.

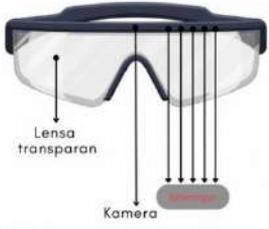
ZENCARE also has various features that aim to improve the user's mental health. These features include mental health monitoring, various therapy sessions, online counseling, social connections through the HARMONY forum, and a control center that manages device settings, privacy, and notifications.

In addition, ZENCARE has gone through SWOT and PESTEL analysis to understand the internal and external factors affecting its project. Based on these analyses, several key strategies have been designed to realize ZENCARE effectively. Thus, ZENCARE presents a comprehensive solution to improve users' mental health and help them overcome emotional challenges they may face.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/ SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

PICTURES OF ZENCARE AND ITS COMPONENTS

ZENCARE display	
<p>In general, ZENCARE is a headphone with some additional features. Apart from being used to listen to music, some additional features can help navigate mental health or stress in its users.</p>	

ZENCARE Components	
<p>Photoplethysmography (PPG) Sensor</p> <p>1) Measures changes in blood volume in the blood vessels under the skin around the ear using infrared light.</p> <p>2) Detects heartbeats by measuring changes in light intensity absorbed by vessels blood during the cardiac cycle.</p>	
<p>Electroencephalogram (EEG) Sensor</p> <p>EEG sensors are used to monitor changes in brain activity related to mental and emotional health. It helps in measuring stress levels, anxiety, and mood swings user</p>	 <p>(Cup Elektroda EEG) (Ilustrasi)</p>
<p>AR Screen</p> <p>1) Visualization Therapy.</p> <p>2) Visual Interaction and Changing the Visual Environment; when the user is stressed, the AR screen can be used to partially change the surrounding visual environment and add elements on top of the existing real visuals.</p>	 <p>Lensa transparan</p> <p>Kamera</p> <p>Keterangan:</p> <ol style="list-style-type: none"> 1. Komponen proyeksi/penyajian 2. Sensor Cahaya 3. Sensor Gerak 4. Prosesor 5. Pelacakan gerakan

INTERNET OF THINGS SENSOR PERFORMANCE FLOW CHART AND USER INTERFACE

Internet of Things (IoT) sensors in ZENCARE begin to detect user activity and responses to the device through *PPG* and *EEG* sensors.



Results from *IoT* sensors, such as heart rate, brain activity, or user interaction, are relayed to the user *interface of the ZENCARE*



The user sees an audio-visual display presented on the *AR* screen, *implements* supporting the therapy and an indication of the mood being felt.



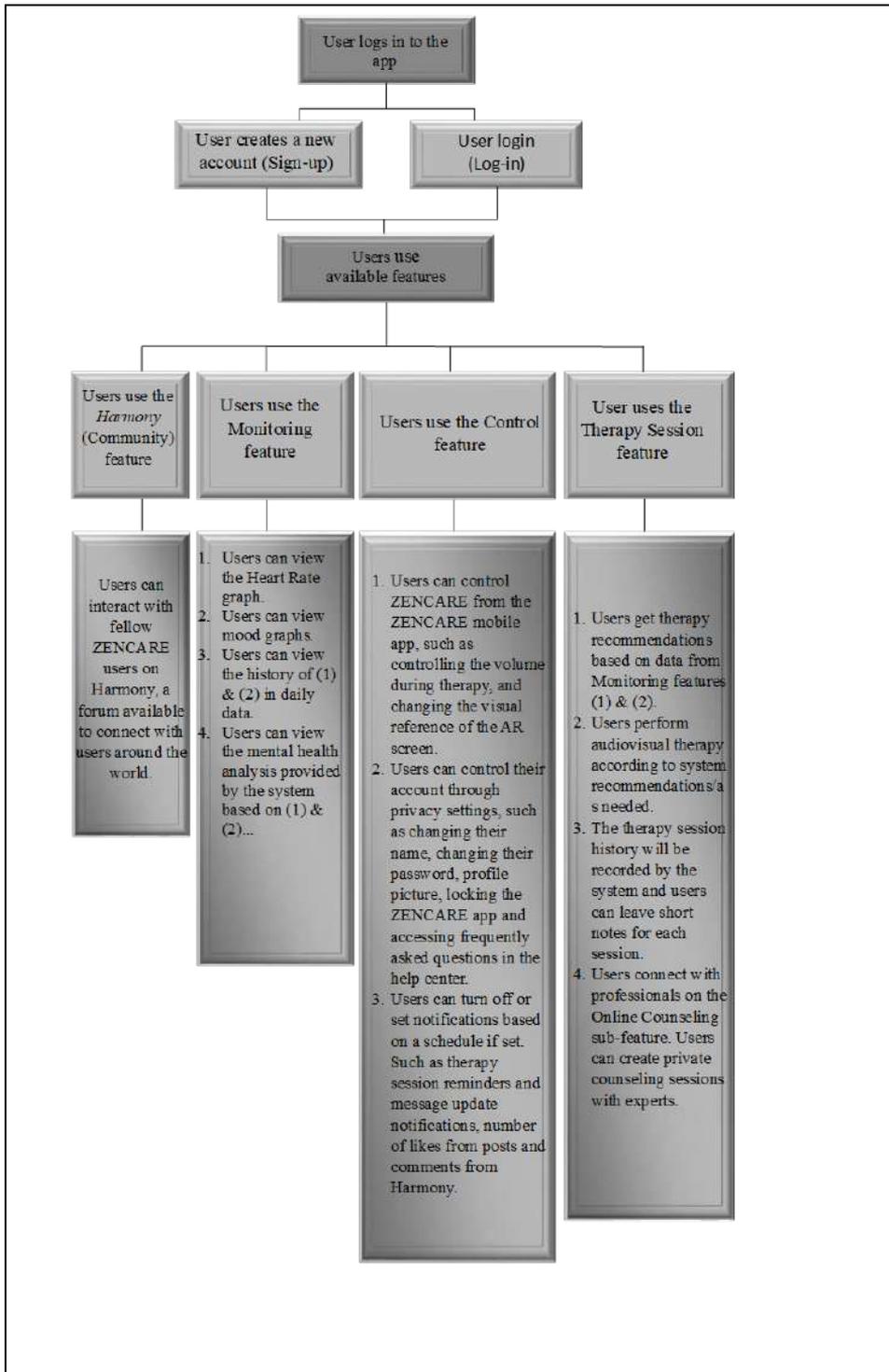
Users engage in therapy by seeing and hearing the effects of the visual, and audiovisual displays presented by ZENCARE.



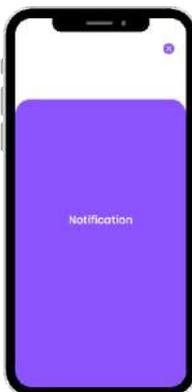
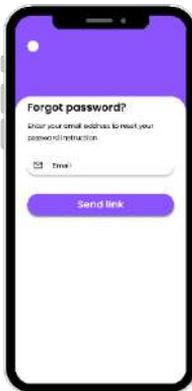
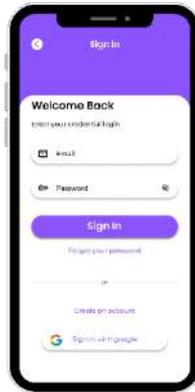
The data received from the user is sent to the ZENCARE *mobile* app and stored for analysis and to provide further insight into the user's mental health.

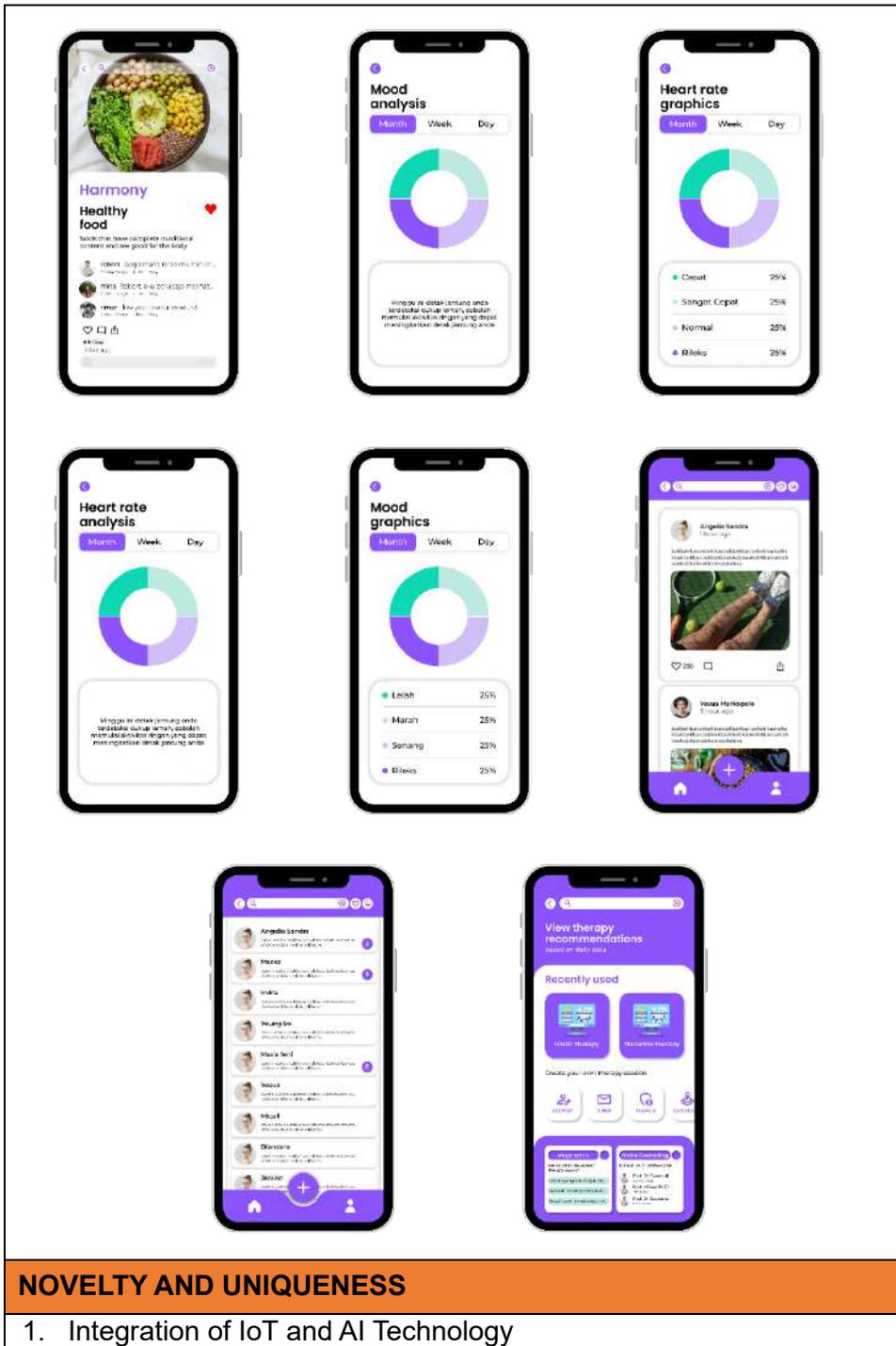


Users can view the analysis results and recommendations presented by the ZENCARE *mobile* app to assist them in mental health navigation and recovery.



APPLICATION DESIGN





NOVELTY AND UNIQUENESS

1. Integration of IoT and AI Technology

<p>Using IoT and AI for real-time mental health monitoring and analysis allows continuous tracking and personalized therapy adjustments based on collected data.</p> <ol style="list-style-type: none"> 2. Use of EEG and PPG Sensors Combining EEG sensors for brain activity and PPG sensors for heart rate offers complete, accurate data on the user's mental and emotional state, a feature rarely seen in personal mental health tools. 3. Augmented Reality (AR) Therapy 4. Integrated Mobile Application Users control tools, monitor mental health, and access therapy and online counseling from a single, user-friendly platform.

BENEFIT TO MANKIND

<ol style="list-style-type: none"> 1. Quality of Life Improvement <ol style="list-style-type: none"> a. Better Mental Health b. Immersive Therapy Experience 2. Impact on Surrounding Nature. <ol style="list-style-type: none"> a. Reducing the Negative Impact of Technology Use 3. Benefits to the Economy <ol style="list-style-type: none"> a. Productivity Improvement b. Reduced Healthcare Costs 4. Advances in Knowledge and Education <ol style="list-style-type: none"> a. The data collected by ZENCARE can be used to further research in the field of mental health 5. Social and Cultural Impact <ol style="list-style-type: none"> a. Awareness Raising: ZENCARE helps to raise awareness of the importance of mental health, reduce stigma, and promote a culture that cares more about emotional and well-being.

COMMERCIALIZATION POTENTIAL

<p>ZENCARE has significant commercialization potential due to the growing demand for mental health solutions and widespread smartphone usage. Its competitive edge lies in the integration of IoT and AI technologies with unique AR-based audiovisual therapy. The business model includes direct sales, app subscriptions, and institutional partnerships. Efficient production costs and a sustainable subscription model ensure healthy profit margins. Compliance with health certifications and data protection standards is guaranteed.</p>
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Intellectual property strategies, including technology patents and trademarks, protect ZENCARE's innovations. Collaborations with healthcare professionals and market education will boost product credibility and adoption. These factors position ZENCARE to lead the tech-based mental health solutions market.

CONCLUSION

The development of information technology, especially social media, has had a significant impact on mental health, especially the younger generation. ZENCARE is an innovative solution that integrates IoT and AI technologies to monitor mental health in real-time and provide personalized audiovisual therapy. ZENCARE's advantages include the use of EEG and PPG sensors and AR screens, offering immersive therapy and accurate health data. The flexible business model, including direct sales, app subscriptions, and institutional partnerships, opens up great opportunities for commercialization. By complying with health and data protection regulations, ZENCARE meets international standards. ZENCARE has the potential to become a leader in technology-based mental health solutions, improving quality of life and positively impacting the economy, knowledge, and social well-being. The product is expected to help prevent mental problems in the younger generation, creating a healthier and more sustainable future.

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The authors would like to thank all those who have supported and contributed to this article. The support and guidance have been invaluable in completing this project. Thank you for your dedication and cooperation.

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PID29082

Eco-Island: Tourism Development Strategy in Karimunjava Based on Eco Enzyme in Realizing SDGs

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ABSTRACT

The diverse natural ecosystems of the Karimunjava Islands are an attraction for tourists and investors. Karimunjava's natural conditions are currently experiencing changes as a result of the arrival of tourists and industrialization in the region. One of these impacts is the abundance of organic and non-organic waste. The waste has not been managed properly by the local community, if this is left unchecked it can cause sustainable problems and impact on various sectors of Karimunjava community life. Eco-Island is an innovative model of community empowerment integrated with technology that consists of managing organic and non-organic waste into products with economic value and aims to reduce water pollution. In addition, Eco-Island provides information on various tourist destinations in Karimunjava. With the innovation of Eco-Island, it can help the growth of the creative economy of the community in the tourism sector and be aware of waste management. Eco-Island can also make it easier for tourists to access tourist information in Karimunjava.

KEYWORD: Eco-Island, Eco Enzyme, Karimunjava, Tourism

PRODUCT DESCRIPTION

Karimunjava Island, located in Jepara Regency, Indonesia is facing various environmental problems due to uncontrolled population and increasing number of tourists, especially water pollution (Santoso et al., 2020). To overcome this, an innovative strategy is needed in tourism development through the Eco-Island program. Eco-Island is a tourism

concept that empowers the Karimunjawa community in Jepara Regency. The program includes various initiatives to produce environmentally friendly products.

Characteristics and Uniqueness

- 1) **Karimunjawa Build a Tourism Island:** This program provides capital to improve accessibility, infrastructure, and supporting facilities for Karimunjawa to become a tourist village. The Karimunjawa Tourism Awareness Group (POKDARWIS) was formed with support from the government, entrepreneurs, academics, communities and CSR.
- 2) **Eco enzyme Creation Assistance:** This program trains communities and visitors in tourism management and eco enzyme creation. Tourists are charged a fee to make eco enzyme, so this product has commercial value.
- 3) **Eco-Island App:** An app with features such as Home, History, Happiness, and Accessibility supports this program.

Functions and Benefits

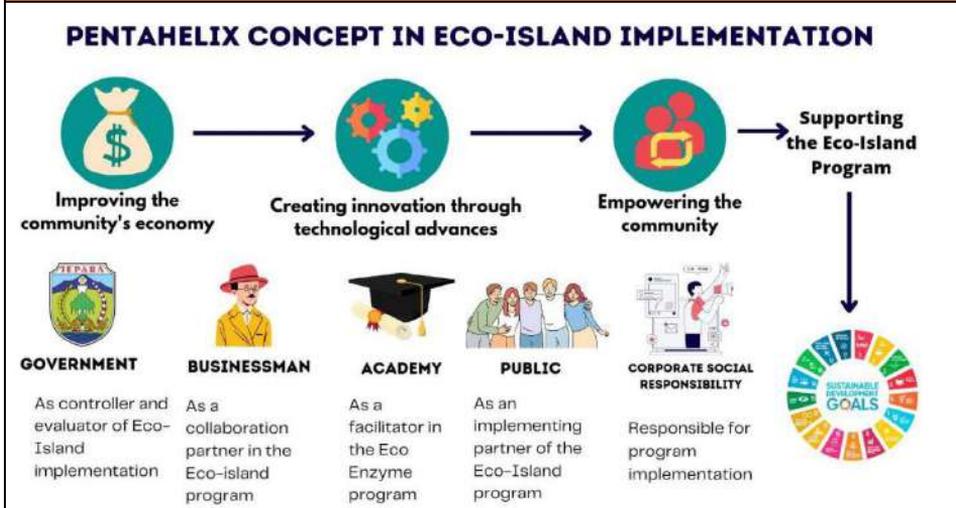
Function: Resolving environmental issues and improving the quality of tourism in Karimunjawa.

Benefits: to Improve the quality of life of the community through training and empowerment and Reduce water pollution and environmental damage with commercially valuable eco-friendly enzymes.

Target audiences and The main purpose

The target audience of the Eco-Island program is the Karimunjawa community and tourists. The main purpose of this program is to develop sustainable and environmentally friendly tourism. Additionally, the program aims to empower local communities through training and produce environmentally friendly enzymes that can reduce pollution. So, the Eco-Island program is expected to make Karimunjawa Island a sustainable and environmentally friendly tourist destination and improve the welfare of the local community.

VISUAL PICTURES



The Pentahelix concept in the Eco-Island program describes the collaboration of five elements working together to develop sustainable tourism on Karimunjawa Island and is the right step to achieve *Sustainable Development Goals* (SDGs). The program is integrated with Eco-Island App technology as a supporting medium in community empowerment. The main focus of this paper is to improve human resources to achieve independence in waste management, by involving youth of Karang Taruna in various empowerment programs. Eco Island App has a menu consisting of profile, Happiness, and accessibility.





NOVELTY AND UNIQUENESS

There are many studies that discuss *eco enzyme*, such as research conducted by Benny *et. al* (2023) explaining the process of making eco enzyme and its utilization in agriculture. In addition, similar research was also conducted by Fadlila *et. al* (2023) which explained the utilization of eco enzyme on plant growth. The novelty designed in the Eco-Island innovation raises the concept of community empowerment by collaborating with waste management activities and combining it with digital technology in the form of applications as a means of education and control.

BENEFIT TO MANKIND
Eco-Island is a visionary innovation in the form of a waste management program with the concept of community empowerment and integrated technology. Eco-Island has a good impact on the environment and climate. The eco enzyme solution used can reduce water pollution while reducing organic waste. In addition, Eco-Island can help economic growth in the tourism sector. This modeling can also be applied in tourism areas throughout Indonesia. It is hoped that Eco-Island can raise public awareness about climate and environment.
COMMERCIALIZATION POTENTIAL
Karimunjawa with its stunning charm, has become a popular destination for local and foreign tourists. The Eco-Island business model will attract tourists because there are tour packages in the form of making eco enzyme and selling products, such as eco print totebags. Cooperation with travel agents, hotels and local restaurants through the app will also help expand market reach and increase profitability. Another benefit is to campaign or as edutourism in waste management. Thus, Eco-Island can be a means to support local economic development.
CONCLUSION
The Eco-Island concept offers an innovative solution to develop tourism on Karimunjawa Island by empowering the local community to help preserve the environment. With problems such as water pollution and environmental degradation due to increasing tourist population and visits, Eco-Island aims to create sustainable and stable tourism. Various EduTourism activities can be an attraction for tourists to visit Karimunjawa. Thus, Karimunjawa Island can become a model of sustainable tourism that not only boosts the local economy but also maintains the balance of the island's ecosystem. This provides long-term benefits for the environment.
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PID29052

Tanjung Putus EcoTourism Empowerment

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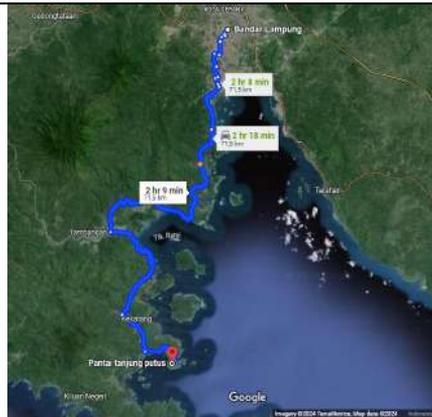
ABSTRACT

This program aims to enhance the Human Resources (HR) capacity in Desa Sukarame, Pesawaran, Lampung, through a Community Based Tourism (CBT) approach. It focuses on environmentally friendly tourism management, aligned with the Sustainable Development Goals (SDGs) 13th on "*Climate Action*". Pantai Tanjung Putus serves as the main location for this program, possessing significant tourism potential yet remains underutilized. Through the utilization of social media platforms, training sessions, educational tours, and environmental campaigns, this program is dedicated to enhance local HR capacity and foster economic sustainability by involving the community in tourism management. This innovative approach integrates CBT and SDGs to create practical and inclusive solutions for sustainable tourism development. By employing scalable strategies and fostering sustainable partnerships, this program does not only develop local tourism potential but also contributes to global efforts in climate change mitigation. Thus, this project underscores the urgency and necessity of advancing responsible and sustainable tourism efforts in the future.

KEYWORDS: Community Based Tourism (CBT), Sustainable Development Goals (SDGs), Climate Action, Sustainable Tourism, Community Empowerment

PRODUCT DESCRIPTION

Our community-based tourism initiative in Sukarame Village, Lampung, epitomizes a pioneering stride towards fostering sustainable and inclusive tourism paradigms. Seamlessly intertwining the core tenets of Community Based Tourism (CBT) with the overarching aspirations



Picture 1.2 Distance from City Center to Beach

In Picture 1.1, it can be observed that there are no famous tourist attractions, eco-friendly facilities, or conservation areas in the vicinity. Additionally, only a few homestays are listed on the map.

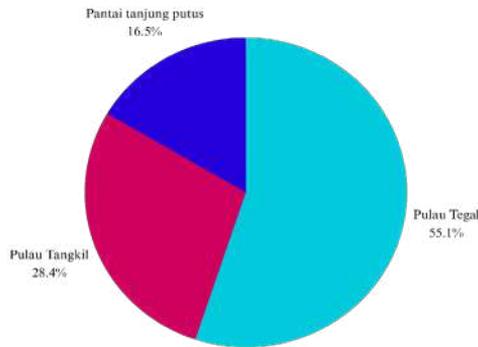
In Picture 1.2 it can be seen that the distance from the center of Bandar Lampung City to the beach is quite far, therefore safe and comfortable transportation is also needed considering the roads are also quite damaged.



Picture 1.3 Damaged access road

In Picture 1.3, it can be seen that Residents around Tanjung Putus have voiced significant concerns about the severely damaged road from Sukarame via Dusun Umbul Salak. The deteriorated condition poses safety risks and hampers mobility for locals, including fishermen and

farmers. Critically, it obstructs tourist access, undermining the area’s tourism potential and local economy. Immediate road repairs are essential to enhance safety, improve accessibility, and fully leverage the region’s tourism potential, ensuring sustainable economic growth.

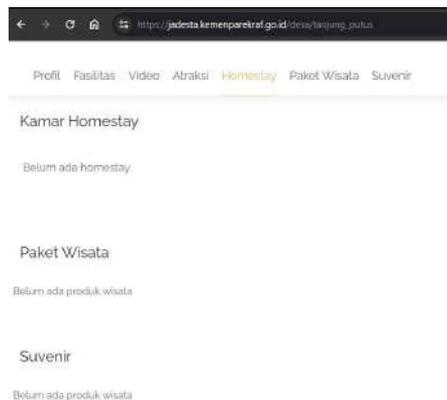


Picture 1.4 Comparison of the Number of Beach Tourism Visitors (2021)

In Picture 1.4, it can be seen that the beach of Tanjung Putus has smaller visitors even though for its own facilities the beach island of Tanjung Putus is no less good. That’s because the two beaches that have a larger number of visitors are closer to the center of the city of Bandar Lampung.



Picture 1.5 Beach’s instagram account



Picture 1.6 Beach’s website

In Picture 1.5 and 1.6, it can be observed that previously, Tanjung Putus Beach had a website and an Instagram account. However, the information provided was insufficient and the marketing strategy was

not compelling. Therefore, we recognize the need for immediate improvements.

Table 1.1 Comparison of the Costs of Visiting 3 Beaches

Subject	Tanjung Putus Island	Tegal Mas Island	Tangkil
Entrance ticket	<i>Rp. 15.000/pax</i>	<i>Rp. 45.000/pax</i>	<i>Rp. 10.0</i>
Boat Ticket	<i>Rp. 400.0000/boat</i>	<i>Rp. 250.000/boat</i>	<i>Rp. 500.</i>
Total per person	<i>Rp. 55.000/pax</i>	<i>Rp. 70.000/pax</i>	<i>Rp. 60.0</i>

In Table 1.1, the highest expenditure for entrance and ferry tickets is at Tegal Island, amounting to Rp 70,000 per person, followed by Tangkil Island at Rp 60,000 per person, and lastly, Tanjung Putus Island at Rp 55,000 per person.

NOVELTY AND UNIQUENESS

This project introduces a novel approach to tourism development by integrating Community Based Tourism (CBT) and Sustainable Development Goals (SDGs) 13th. Through partnerships with local communities, and the government, the project aims to enhance environmentally friendly-sustainable tourism management at Tanjung Putus Beach, Lampung. A phased approach ensures community empowerment, economic sustainability, and technological innovation in tourism development. By leveraging social media and smart technology, the project also aims to enhance the promotion and digital marketing of tourism destinations. Overall, this project offers a comprehensive solution that does not only develop local tourism potential but also contributes to global efforts in climate change mitigation.

BENEFIT TO MANKIND

The community-based tourism development program in Tanjung Putus Beach, Lampung, offers significant benefits to the local community and the environment. Through capacity building and sustainable approaches, this program can address critical issues, enhance quality of life, maintain environmental sustainability, provide economic benefits, advance knowledge and education, strengthen social and cultural

aspects, and have both global and local relevance. Therefore, this program has the potential to bring about broad and sustainable positive impacts.

COMMERCIALIZATION POTENTIAL

To identify the commercialization potential within the Capacity Building Program for Human Resources through Community Based Tourism (CBT) in Tanjung Putus Beach, Lampung, aspects such as economic sustainability, local community empowerment, technological innovation, and partnerships need to be considered. Potential commercialization strategies include the development of sustainable tour packages, marketing of local ecotourism products, conducting paid educational activities, and the development of eco-friendly accommodations. With a focus on climate action (SDGs 13th), these strategies are expected to strengthen the local economy, protect the environment, and empower the community.

CONCLUSION

The community-based tourism development project in Tanjung Putus Beach, Lampung, integrates an innovative approach of Community Based Tourism (CBT) and Sustainable Development Goals (SDGs) 13th on "*Climate Action*." With a focus on community empowerment, economic sustainability, technological innovation, and partnerships, this program aims to enhance local human resource capacity, preserve the environment, and advance the tourism sector holistically. Potential commercialization strategies include the development of sustainable tour packages, marketing of ecotourism products, conducting paid educational activities, and the development of eco-friendly accommodations. With broad and sustainable positive impacts, this project reinforces the urgency to continue developing responsible and sustainable tourism efforts in the future.

ACKNOWLEDGEMENT

We would like to express our sincere appreciation to the organizers of the competition for providing us with a valuable opportunity to explore the potential of Tanjung Putus Beach, Sukarame Village, Pesawaran Regency, Lampung. We also extend our gratitude to the student affairs division of the Rectorate and the Dean's Office of the Faculty of Social and Political Sciences, University of Lampung, for their significant

encouragement for our participation in this competition. We deeply value the guidance and valuable insights provided by Mr. Indra Jaya Wiranata, S.IP., M.A., Ms. Fitri Juliana Sanjaya, S.IP., M.A., and all the lecturers of the International Relations Department who have assisted us along the way. Additionally, we would like to convey immense appreciation to our extraordinary team members: Abiyu Farras Taufiqurrahman, Daffa Al Ghiffari Wahdiat Putra, M. Sczasimbi Barantis Putra, and Ummi Nida Afifa. Your hard work and dedication in the research and development of this project are truly unforgettable and immensely meaningful to us. Thank you for all the support you have given us.

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SECTION 3

THE LIST OF THE PROJECTS 6th DIIID JOHOR 2024

**CATEGORY C
SCHOOL**



PID10032

RenewMask

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ABSTRACT

RenewMask is an eco-friendly mask recycling system that collects and recycles face masks for medical and home use. The recycling system produces plastic fibre that can be reused in production of other plastic products. Due to the emergence of COVID-19, extensive usage of disposable face masks generates millions of tons of plastic waste and leads to worldwide pollution. 129 billion face masks will be disposed of monthly. Since masks are made of plastic, it decomposes very slowly and can release hazardous fumes and chemicals which are harmful to the environment and life on earth. Thus, we invented RenewMask that aims to recycle face masks into plastic fibre that can be reused. RenewMask focuses on recycling polypropylene, polyethylene, polyurethane, polystyrene, polycarbonate, polyacrylonitrile contained in face masks, which add plastic or microplastic pollution to the environment and cause negative impact to aquatic life. Recycling the petroleum-based material in face masks can reduce the consumption of non-renewable energy, petroleum. Also, RenewMask aims to enhance public health by mitigating the risk of disease transmission by proper disposal of masks. RenewMask tends to create a user-friendly mask disposal device which is widely used by the public to reduce the pandemic waste that is produced daily.

KEYWORDS: Face mask, COVID-19, Plastic pollution, 3R, Sustainable development goals

PRODUCT DESCRIPTION

RenewMask are strategically placed along busy streets, hospitals, clinics, houses, or schools to facilitate the collection of face masks. Each RenewMask consists of a bin divided into two parts: an upper part for collecting masks and a lower part for processing them into new plastic material using heat. The bin is constructed using ABS plastic, which is capable of withstanding temperatures up to 220 degrees Celsius. To ensure an aesthetically pleasing and compatible design, the ABS plastic is 3D printed into a bin shape.

The upper part of the bin features a solar panel that serves as an electrical power source for the RenewMask. A location sensor is incorporated to detect the placement of the bin and prevent theft. When a user approaches the cover at a limited distance, an infrared (IR) sensor detects the presence of a mask and activates a motor to open the cover. This mechanism prevents direct contact with masks that may be contaminated with bacteria. Additionally, users are reminded to manually remove iron sticks from the masks before disposal to ensure effective heating during the recycling process.

To ensure the masks are free from germs, UV rays are planned to be installed inside the RenewMask. Users can conveniently monitor the level of masks inside the bin through our mobile application, which provides real-time data in the form of graphics detected by another ultrasonic sensor within the bin. When the upper part of the bin is full, the ultrasonic sensor detects the capacity and triggers the inner cover to open, allowing the masks to fall into the lower part of the bin.

In the lower part of the bin, the masks are heated to their melting point (170°C). To facilitate this process, a piece of iron is positioned above the heater, allowing the heat to be conducted to the iron. As the masks fall onto the iron piece, they receive heat and begin to melt. Once melted, the plastic is left to solidify naturally at room temperature. A timer in the second part notifies the owner when the process is complete, indicating that the solidified plastic is ready to be retrieved from the bin. To prevent overheating and potential hazards, a fan is installed within the system to remove excess heat and maintain a safe operating temperature.

First, the target audience for RenewMask includes individuals and households. Next, healthcare facilities like hospitals, clinics and other healthcare organisations use many face masks daily. They are looking for an eco-friendly solution to dispose of their medical waste

Figure 2 : Sketching model briefly

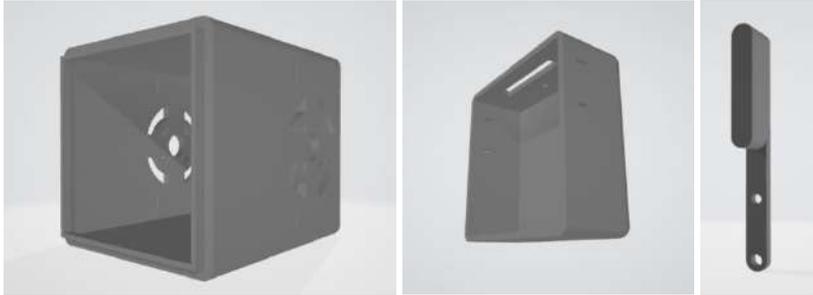
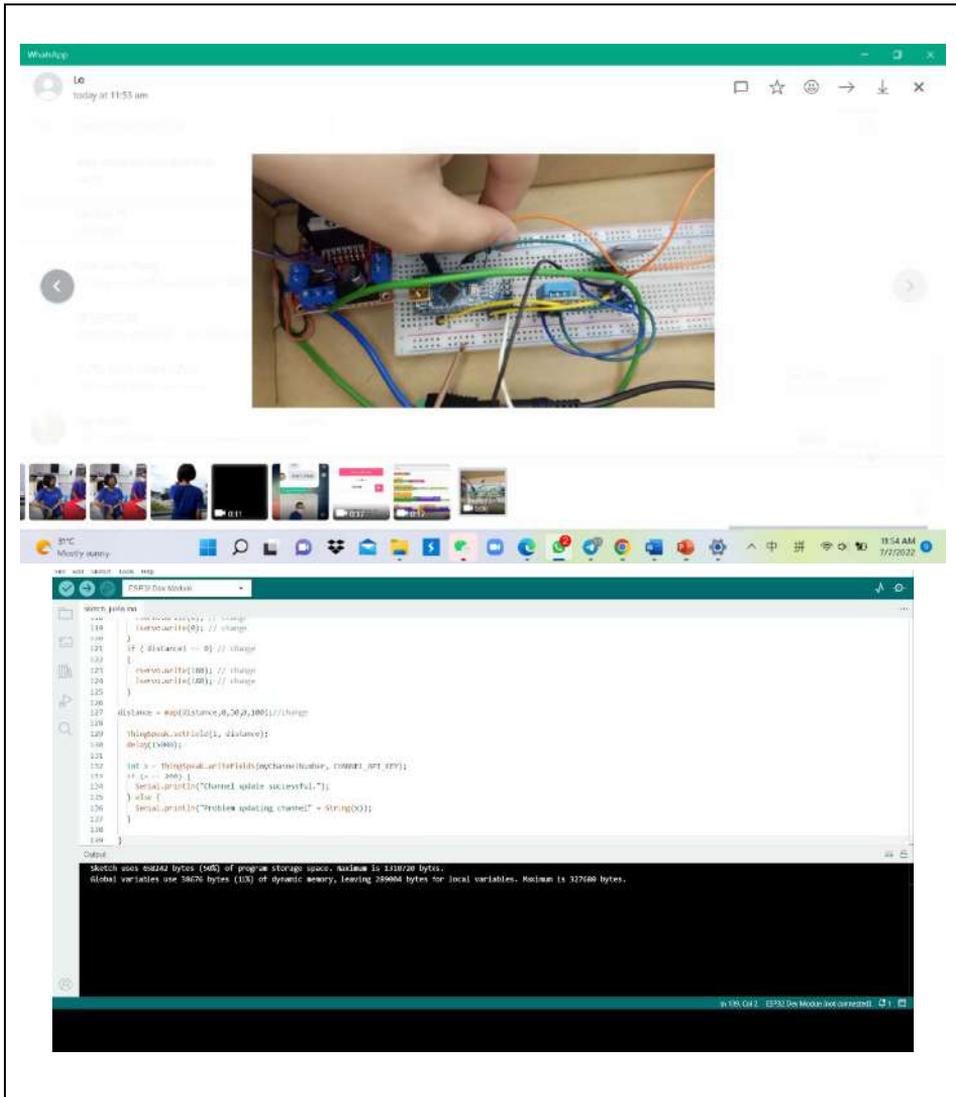


Figure 3 : Plan out 3D model



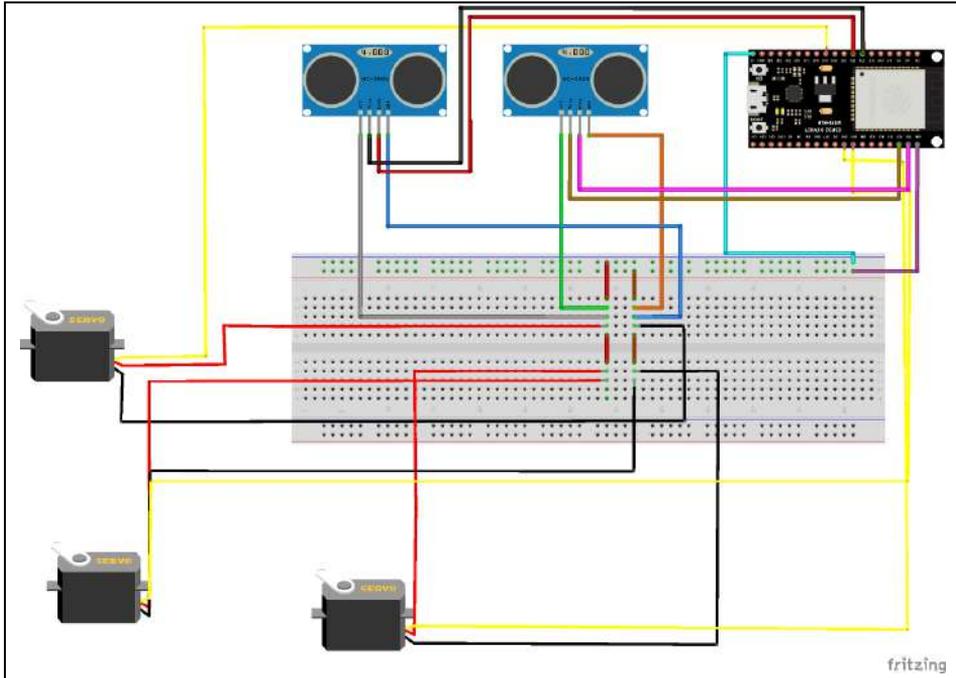


Figure 4 : Create a working, makeshift prototype

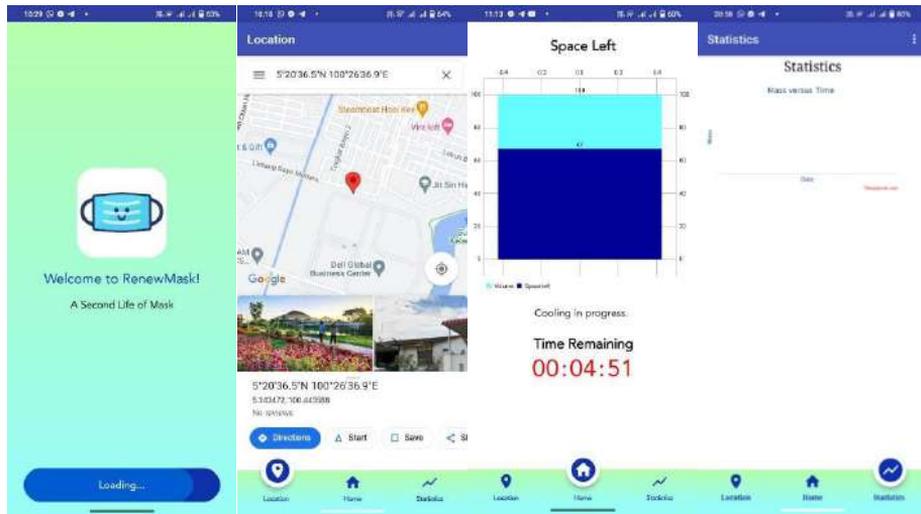


Figure 5 : Creating an App Using Kodular



Figure 6 : Connect the components together permanently



Figure 7 : Finally Complete!

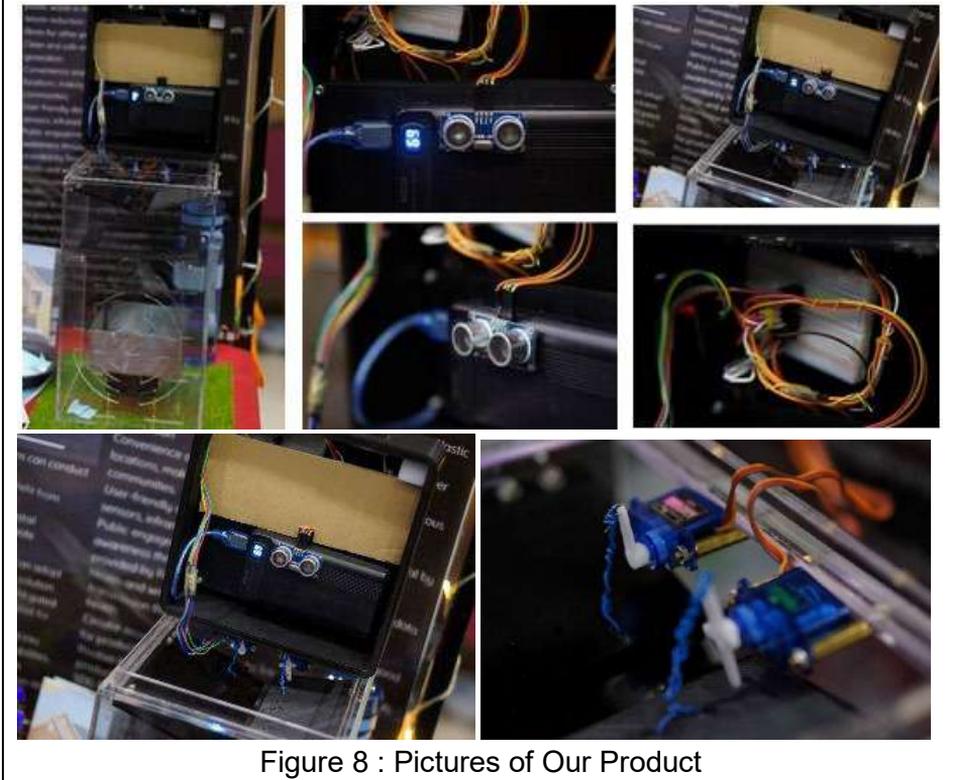


Figure 8 : Pictures of Our Product

NOVELTY AND UNIQUENESS
<p>After research, we found that there is no system that recycles face masks available in the Malaysian market or around the world (unique). RenewMask collects masks in durable bins with solar panels (eco-friendly) and ultrasonic sensors (hygienic). Masks are heated to create reusable plastic fibre, reducing reliance on non-renewable resources (plastic). A user-friendly app (including use of IoT) tracks bin locations and levels (safer), notifying when recycling is complete (more convenient). It promotes responsible waste management and a sustainable future (achieves SDG), empowering communities to actively participate in environmental preservation.</p>
BENEFIT TO MANKIND
<p>RenewMask plays a vital role in improving public health. It manages to mitigate the risk of disease transmission by promoting proper mask disposal, achieving SDG 3: Good Health and Well-being.</p> <p>RenewMask, which is environmentally friendly, helps in reducing the amount of face mask waste that ends up in landfills or incinerators, achieving SDG 11: Sustainable Cities and Communities. By providing a convenient and accessible recycling system, RenewMask encourages individuals and communities to properly dispose of their masks, which achieves SDG 12: Responsible Consumption and Production.</p> <p>Through the recycling of petroleum-based materials used in mask production, the consumption of non-renewable energy sources like petroleum can be reduced. This aligns with SDG 7: Clean and Affordable Energy, as we contribute to the transition to cleaner and more sustainable energy systems.</p>
COMMERCIALIZATION POTENTIAL

We have a strong vision to establish a collaborative partnership with the Malaysian government in order to implement and distribute RenewMask on a national scale. By working hand in hand with the government, we aim to create a clean, sustainable and responsible community throughout Malaysia.

We plan to forge alliances with prominent plastic companies in Malaysia, such as THM Plastic Industries in Bukit Tambun, Iconic Medicare Glove Factory in Batu Kawan, which are actively involved in mask production. By collaborating with these companies, we can establish a sustainable supply chain where the plastic material produced by RenewMask is sold to them.

CONCLUSION

In conclusion, RenewMask stands as a pioneering, innovative and transformative solution to the pressing environmental issues associated with disposable face masks. We tackle the problem of plastic pollution while actively contributing to the achievement of SDGs.

RenewMask does not only address the immediate concern of mask waste but also empowers individuals and communities to actively participate in the mitigation of daily waste generation during the ongoing pandemic. With its user-friendly design and wide distribution, RenewMask encourages responsible waste management practices and fosters a sense of environmental stewardship.

RenewMask is more than just a call to action—it is a commitment to a greener future, where being clean, safe and healthy goes hand in hand with protecting the environment. Together, we can create a sustainable and resilient world that benefits both present and future generations. RenewMask—be the change, and together, let us shape a better tomorrow.

ACKNOWLEDGEMENT

First and foremost, we would like to extend our heartfelt gratitude and profound appreciation to our esteemed parents for their unwavering support and generous financial assistance throughout the entire development of our groundbreaking project, RenewMask. Their unwavering encouragement and steadfast belief in our abilities have been pivotal in our triumph. We are truly indebted to their unwavering

support, both emotionally and monetarily, as it has enabled us to bring this innovative solution to fruition.

Additionally, we would like to express our sincere thanks to our dedicated and exceptional teammates who have demonstrated unwavering commitment and relentless efforts throughout this arduous journey. Their unwavering dedication, tireless work ethic, and exceptional spirit of collaboration have been invaluable. Together, we have surmounted countless challenges, engaged in fruitful brainstorming sessions, and seamlessly collaborated, ensuring the seamless progress and success of our ambitious project. We are deeply appreciative of their unwavering commitment and the remarkable synergy we have cultivated as a cohesive unit.

Furthermore, we would like to acknowledge and express our profound gratitude to the esteemed organisers of the 6th Digitalised International Invention, Innovation & Design Competition 2024 (DIID), which is UiTM Cawangan Johor. Your steadfast commitment to fostering innovation and providing a prestigious platform for young talents to showcase their groundbreaking ideas is truly commendable. Our participation in this esteemed competition has not only provided us with a remarkable opportunity to present our trailblazing innovation but has also broadened our intellectual horizons and enriched our scientific acumen. We would also like to extend our deepest appreciation to our esteemed teacher advisor, Pn Najwatussheema Bte Abdul Hamid. Her unparalleled guidance, unwavering expertise, and invaluable suggestions have played a pivotal role in shaping the very fabric of our project and refining our visionary concepts. Her unwavering commitment to our personal growth and resounding success has been a constant source of inspiration. We are profoundly grateful for their tireless efforts in meticulously organising logistics, providing sagacious guidance, and ensuring the seamless execution of our visionary project. Last but certainly not least, we want to express our profound thanks to our esteemed senior mentors, whose distinguished scientific knowledge and profound experiences have significantly enriched our intellectual landscape. Their profound insights and engrossing discussions have been instrumental in deepening our understanding of the intricate scientific concepts underpinning our transformative project. Their invaluable guidance and sagacious advice have proved invaluable in navigating the treacherous terrain of challenges and avoiding potential

pitfalls. We are immeasurably grateful for their exceptional contributions to our project's resounding success.

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**6th Digitalised International Invention, Innovation and Design
Competition
(DIIID 2024)**

PID10052

SustainaCrop: Cultivating Precision Through Agriculture

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ABSTRACT

According to a 2023 World Bank report, Malaysia's agricultural productivity is only 45% of the average among high-income countries due to labour shortages, lack of technology, and reliance on a narrow range of crops. These issues exacerbate the struggle to meet food demand, especially for vulnerable groups like low-income residents and refugees. This research aims to examine Malaysia's agricultural productivity, identify the challenges, and explore how innovative solutions like the SustainaCrop robot can make a meaningful impact in addressing these issues. The study utilizes the SustainaCrop, an Ev3-based automated farming robot equipped with sensors and a user interface, through prototype testing, data analysis, and sustainability assessment with vegetable crops. Findings indicate that the robot offers a viable solution by automating critical farming tasks such as planting, watering, fertilizing, and harvesting, increasing efficiency by 70% and reducing dependency on manual labour and foreign workers. Furthermore, the robot's modular and solar-powered design makes it adaptable to various crops and terrains, ensuring sustainable farming practices. In conclusion, while Malaysia's agricultural sector faces significant challenges that threaten productivity and food security, integrating innovative technologies like the SustainaCrop robot can play a crucial role in addressing these issues over the long term. Although the robot alone cannot solve the problem immediately, it enhances productivity, promotes sustainability, and supports food security efforts by automating key agricultural processes. Future research and partnerships are necessary to continuously improve the robot's

functionality and explore additional applications across various crop types and farming conditions.

KEYWORDS: Agriculture, Malaysia, Automation, Sustainability, EV3

PRODUCT DESCRIPTION

SustainaCrop is an innovative Lego Mindstorms-based robot designed to handle all the necessary tasks involved in crop management, including planting, watering, fertilizing, and plucking. Its modular design allows for easy customization, making it adaptable to different crop types and terrains. Additionally, it's built with durable materials, ensuring longevity and reliability in any weather condition.

The robot can precisely plant seeds in a designated pattern, ensuring optimal growth and maximum yield. The robot's watering system is equipped with sensors that detect the soil's moisture level, ensuring that crops receive the perfect amount of water. The fertilizing system automatically dispenses the ideal amount of nutrients to promote healthy plant growth, while the plucking mechanism can efficiently harvest crops without damaging them. This robot is easy to operate and user-friendly, with a simple interface that allows farmers to program tasks and monitor progress. Its compact size and lightweight design makes it easy to transport, and its solar-powered system eliminates the need for bulky and expensive batteries or fuel.

The robot could be programmed to perform specific tasks such as planting, watering, fertilizing, and harvesting based on the type of crop being grown. In addition, the robot is equipped with sensors to monitor crop growth and detect issues such as pests and diseases, allowing for timely intervention.

The SustainaCrop targets small-scale farmers especially in developing regions that rely heavily on agriculture for their livelihoods. In addition, larger farms and agribusinesses that manage extensive agricultural operations and seek innovative solutions to optimize efficiency, can increase yields and minimize environmental impacts. We also target agricultural cooperatives that also play a crucial role in supporting smallholder farmers by pooling resources, facilitating collective action, and accessing markets.

By targeting these diverse customer segments, we aim to create a sustainable and inclusive market for our product. This approach drives positive impacts across the agricultural value chain and contributes to global food security and sustainable development goals.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

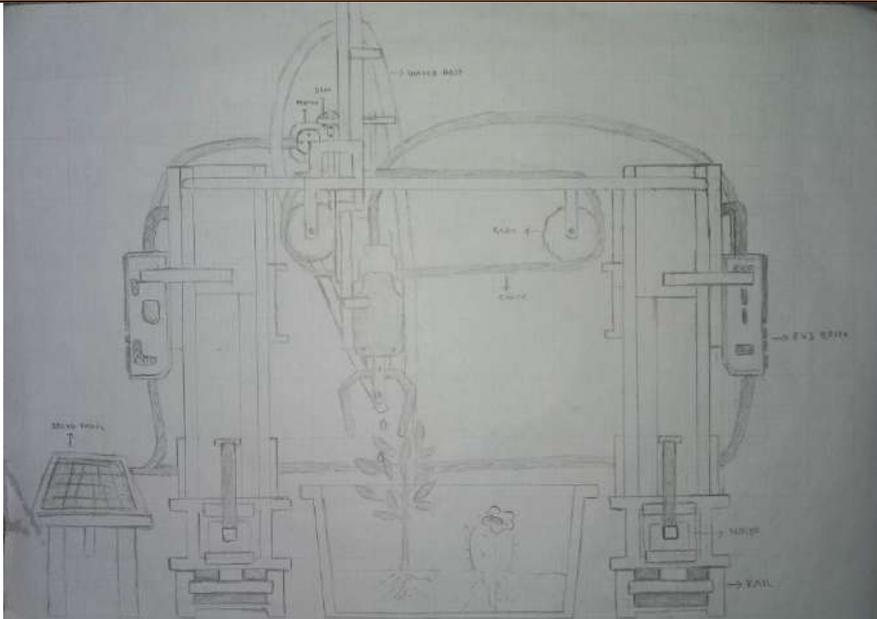


Figure 1: Initial sketch of robot's overall structure

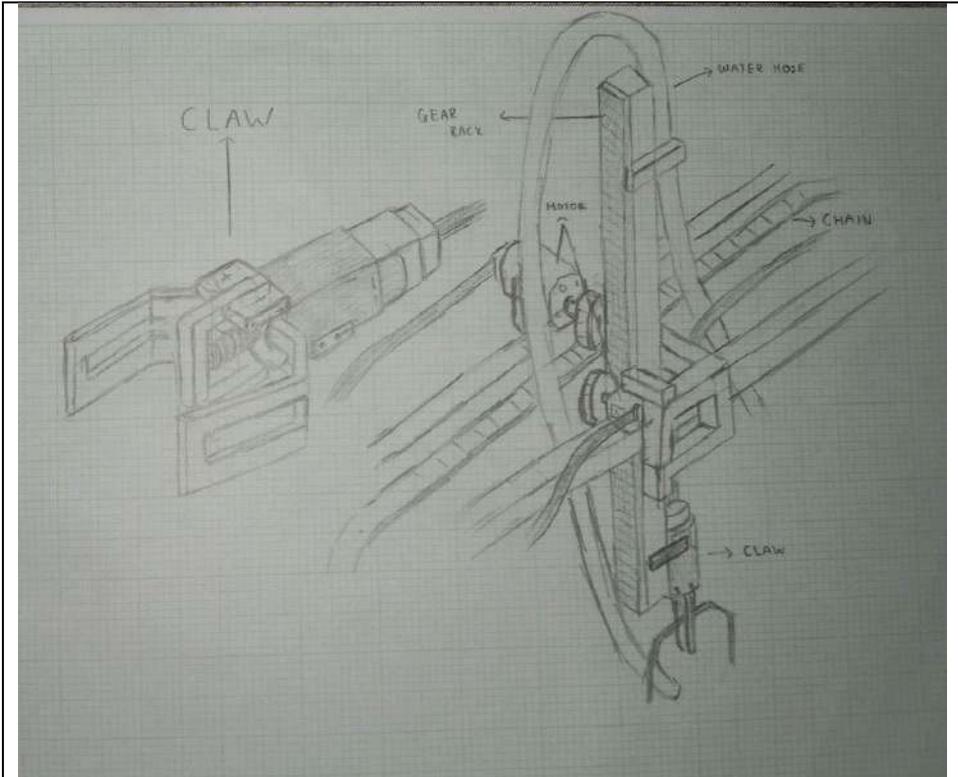


Figure 2 : Initial sketch of robot's conveyor mechanism and gripper



Figure 3 : Final design of the SustainaCrop including with solar design and fertilizer system



Figure 4 : Closeup of the robot's structure and crop arrangement

NOVELTY AND UNIQUENESS

The SustainaCrop robot is unique as it offers a comprehensive and sustainable solution to the challenge of crop management and food insecurity. While there are other available inventions that automate certain aspects of crop management, such as planting or harvesting, the SustainaCrop robot is designed to handle all of the necessary tasks involved in crop management, including planting, watering, fertilizing, harvesting, field mapping and soil analysis (Kristin Houser, 2023). Furthermore, the SustainaCrop robot's solar-powered design and potential for reducing the use of harmful chemicals and pesticides make it a more environmentally-friendly and sustainable solution compared to other available inventions. The robot's ability to improve crop yields and reduce manual labor also sets it apart from other available inventions that may only address one aspect of crop management. In addition, the SustainaCrop robot has the potential to promote self-plant growth in the community, allowing individuals to grow their own food and address food insecurity at the

local level (Maximo Torero, 2021). Its compact and lightweight design makes it easy to transport and operate, and its modular structure allows for customization to meet the needs of different communities. The robot's self-harvesting energy further reduces the cost of production, making it a more accessible solution for communities with limited resources. Overall, the SustainaCrop robot offers a unique and comprehensive solution to the challenge of crop management and food insecurity by automating all necessary tasks, improving efficiency and productivity, and promoting sustainable agriculture (Tanya M. Anandan, 2020).

BENEFIT TO MANKIND

The SustainaCrop robot has the potential to be a game-changer in the field of agriculture and could help address the challenge of food insecurity by improving the efficiency and sustainability of crop management. This could benefit various stakeholders such as the community, the environment, and businesses. By promoting community-based agriculture, the robot could create opportunities for collaboration and sharing of resources, leading to a more resilient and sustainable community (Zach Winn, 2023).

The community could also benefit from increased food security and improved access to locally grown produce. The robot's environmentally-friendly and sustainable design could also help reduce the negative impact of traditional farming practices on the environment (Rose, 2021).

COMMERCIALIZATION POTENTIAL

Market Demand and Size:

The market demand for the SustainaCrop robot in Malaysia is growing due to the increasing need for sustainable agriculture. With agriculture being a significant part of the Malaysian economy and employing a large portion of the population, there is a substantial market for solutions that can increase efficiency and sustainability. The adoption of agricultural robots in Malaysia is expected to rise as the country seeks to modernize

its agricultural practices and address challenges such as labour shortages and climate change. It is projected that the Malaysian market for agricultural robots could reach RM 3 billion by 2030, indicating a robust demand for such innovations.

Competitive Advantage:

The SustainaCrop robot offers several competitive advantages, including:

- Increased Efficiency: Automates critical farming tasks, increasing efficiency by 70%.
- Sustainability: Solar-powered and modular design ensures environmentally friendly practices and adaptability to various crops and terrains.
- Cost-Effectiveness: Reduces dependency on manual labour and foreign workers, cutting operational costs.
- Advanced Technology: Equipped with sensors and a user interface for precise farming operations and data-driven decision-making.

Business Model:

Our business model is designed to cater to both smallholder farmers and large-scale commercial farms:

Subscription-Based Model: For smallholder farmers, offering technology and services on a pay-as-you-go basis to minimize upfront costs.

Customized Solutions: For larger commercial farms, providing tailored solutions and consulting services, including upfront purchases or long-term contracts.

Scalability:

The project is scalable due to the modular design of the SustainaCrop robot, which can be adapted for different crops and farming conditions. Strategic partnerships with agricultural cooperatives and commercial farms will facilitate broader adoption. The technology's flexibility allows it to be easily expanded and customized based on specific agricultural needs and regional demands.

Regulatory Compliance and Certifications:

To ensure compliance with agricultural and technological standards, we will:

- Obtain Certifications: Secure necessary certifications for safety, environmental impact, and performance standards.

- Adhere to Regulations: Follow local and international regulations for agricultural machinery and robotics.
- Quality Assurance: Implement rigorous testing and quality control measures to meet regulatory requirements and ensure product reliability.

Intellectual Property (IP) Strategy

To protect our intellectual property and safeguard our innovative smart farming technology, we plan to implement a multi-faceted strategy that includes:

1. Patents and Trademarks:

We will file for patents to protect the unique features, functionalities, and inventions of our smart farming technology, including hardware, software, and data analytics techniques. Additionally, we will register trademarks to secure our brand identity, logos, and product names against unauthorized use or infringement.

2. Licensing and Partnerships:

We may pursue licensing agreements or strategic partnerships with reputable companies, research institutions, or industry stakeholders. These collaborations will leverage expertise, resources, and distribution channels while maintaining control over our IP rights. Such partnerships will also provide additional protection through contractual obligations and shared interests in preserving the exclusivity of our technology.

Revenue Generation Strategy

Our revenue generation strategy involves a combination of selling products and services, tailored to the specific needs and preferences of our target market segments.

Selling Products:

We will generate one-time revenue through the sale of our smart farming technology, including hardware components such as IoT sensors, data collection devices, and control systems, as well as software platforms for data analytics, crop monitoring, and decision support. The sale of these products will provide upfront revenue from initial purchases by customers, including smallholder farmers, commercial farms, agricultural cooperatives, and other stakeholders.

Selling Services:

In addition to product sales, we will generate recurring revenue through the provision of value-added services, including technical support, maintenance, and software subscriptions. Subscription-based services will offer customers access to ongoing updates, upgrades, and personalized insights derived from data analytics, ensuring the continuous improvement and optimization of our technology over time. Consulting services, training programs, and agronomic advisory services will also generate revenue by providing additional value to customers seeking expert guidance and support in implementing sustainable agricultural practices and maximizing the benefits of our solution.

Income and Sales

Machine Selling Price:

RM6,000 per unit.

Annual Sales Target:

Targeted 50 machines per year.

Total Annual Income:

Total Income = RM6,000 X 50 machines

Total Income per year = RM300,000

Fees:

- Production Cost per Machine: RM3,000 per machine.

- Annual Fixed Costs: Fixed costs amounting to RM50,000 per year (including employee salaries, administration costs, etc.).

Total Annual Production Cost:

Total Cost Production = RM3,000 X 50 machines

Total Cost Production = RM150,000

Total Annual Cost:

Total Cost = Total Cost Production + Annual Fixed Costs

Total Cost = RM150,000 + RM50,000

Total Cost = RM200,000

Net Profit:

Net Profit = Total Income – Total Expenses

Net Profit = RM300,000 - RM200,000

Net Profit = RM100,000 per year

CONCLUSION

In conclusion, our innovation project highlights the transformative potential of the SustainaCrop robot in addressing the critical challenges facing Malaysia's agricultural sector. Through advanced automation of essential farming tasks, the robot significantly enhances efficiency by 70%, reduces dependency on manual labor, and promotes sustainable practices. These improvements are crucial for boosting agricultural productivity and ensuring food security, particularly for vulnerable populations.

While the SustainaCrop robot cannot solve these issues overnight, it represents a significant step forward in modernizing farming methods and fostering a resilient agricultural system. Future research and strategic partnerships will be essential to continuously refine the robot's capabilities and expand its application across diverse crop types and farming conditions, ultimately contributing to a more sustainable and secure food system.

PID10062

Maherian Ice Cream

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ABSTRACT

INTRODUCTION : Maherian Ice Cream is an invention that's in a form of food that can be consumed daily which is inspired by "Malaysia Ice Cream". The main ingredient in Maherian Ice Cream is psyllium. Psyllium, or also known as ispaghula, is the common name used for several members of the plant genus *Plantago* whose seeds are used commercially for the production of mucilage. Psyllium is mainly used as a dietary fiber to relieve symptoms of both constipation and mild diarrhea, and occasionally as a food thickener. Constipation affects the majority of the world's population nowadays. This problem arises as a result of an imbalanced diet in the population's food intake. The majority of the food consumed daily contains less fat or not enough fiber. This is the main reason for constipation. The objective of this product is to overcome constipation problems. To make Maherian Ice Cream, add 6 spoons of psyllium into 1 liter of water. Then proceed to wait for 10 minutes. After it's become jelly textured, add in sugar and mix it with syrup rose flavored. Next, mix the selected flavor jelly thoroughly. Using one liter of water can produce 10 sticks of Maherian Ice Cream. Leave it in the refrigerator for 2 hours, then it can be enjoyed or sold immediately. As a result, constipation problems can be resolved. In conclusion, Maherian Ice Cream is a solution for everyone, especially students who are having difficulty consuming vegetables as a daily meal.

KEYWORDS: Good tummy, Good mood with Maherian ice cream

PRODUCT DESCRIPTION

INTRODUCTION: Maherian ice cream is an invention that's in a form of food that can be consumed daily which is inspired by "Malaysia ice cream". The main ingredient in Maherian Ice cream is psyllium. Psyllium, or also known as ispaghula, is the common name used for several members of the plant genus Plantago whose seeds are used commercially for the production of mucilage. Psyllium is mainly used as a dietary fiber to relieve symptoms of both constipation and mild diarrhea.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



Figure 1 : Customer's Review

NOVELTY AND UNIQUENESS

- Will not have any side effects.
- Organic substances are used, and have no toxicity.

- Comply with Islamic sharia and halal.
- Cheap and delicious.
- Suitable for any kind of ages, race and gender
(Suitable for people who consume little vegetables)
- Cost for treatment is much cheaper.
- Phobia problem can be solved.
- Malaysians and the whole world will be healthier and happier.
- Prevent constipation
- Prevent colon cancer.

BENEFIT TO MANKIND

- Will not have any side effects.
- Organic substances are used, and have no toxicity.
- Comply with Islamic sharia and halal.
- Cheap and delicious.
- Suitable for any kind of ages, race and gender
(Suitable for people who less fond in eat vegetables)
- Cost for treatment is much cheaper.
- Phobia problem can be solved.
- Malaysians and world will be healthier and happier

COMMERCIALIZATION POTENTIAL

Based on our studies and information from social media, constipation problems occur due to lack of fat in daily food intake. Although there are vegetables in their meals, most students avoid or choose not to eat them anyway. They would rather eat something sweet or unhealthy. So, Maherian Ice Cream is used as a replacement for vegetables and to make sure everyone, mainly students consume enough fiber in their daily meal but in a form that is more enjoyable and tasty. Not to mention, Maherian Ice Cream is very suitable for students, pregnant mothers and those who are always facing constipation problems.

CONCLUSION

Based on our studies and information from social media, constipation problems occur due to lack of fat in daily food intake. Although there are vegetables in their meals, most students avoid or choose not to eat them anyway. They would rather eat something sweet or unhealthy. So, Maherian Ice Cream is used as a replacement for vegetables and to make

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ACKNOWLEDGEMENT

First of all, we would like to thank Allah SWT, for smoothing our process while making this project. We also do not forget to thank our beloved Principal, Dr Hj. Rani binti Abd. Mutalib who has given us the green light to proceed with the project and gave her full support to us throughout the process of this project. We also would like to thank our Science teacher, Mr. Mohd Zaidi bin Mat for guiding and encouraging us to continue this project. We also would like to extend our gratitude to our parents who supported our decision to enter this competition and who helped us gather the materials for the project. Lastly, we would like to thank all of our friends who supported us and helped us to finish this <https://youtu.be/zh0QiCYP6Kw> video. The members of MAHERIAN ICE CREAM project really appreciate all your works and help you gave.

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PID10072

Gerobok Rezeki RFID Vending Machine (G-VEM)

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ABSTRAK

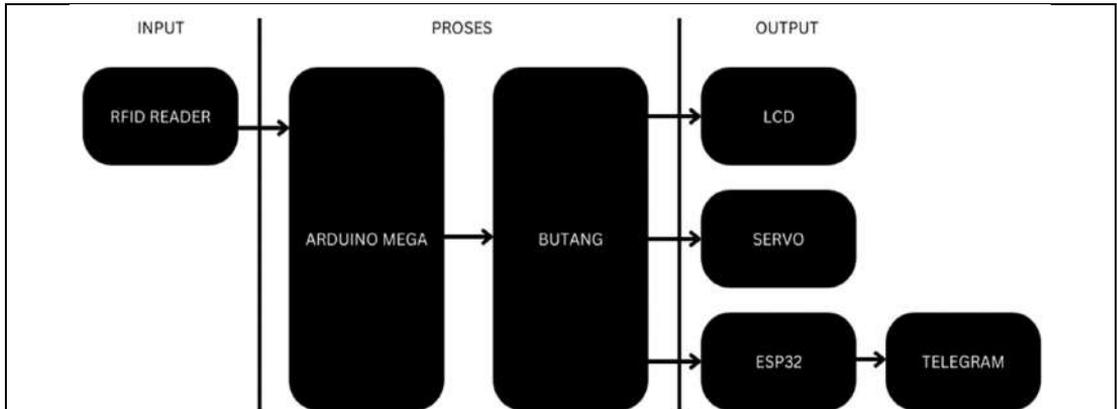
Gerobok Rezeki merupakan satu inisiatif dari pihak masjid untuk menyalurkan bantuan makanan kepada golongan memerlukan. Konsep gerobok rezeki ini telah berkembang bukan sahaja di masjid tetapi di institusi pendidikan dan di tempat persendirian. Namun begitu, timbul beberapa masalah berkaitan seperti terdapat pihak yang mengambil kesempatan mengambil bantuan dengan sesuka hati dan menyebabkan pihak yang betul-betul memerlukan bantuan tidak dapat menerima bantuan. Selain itu, pihak petugas perlu berada di premis bagi merekodkan pengambilan bantuan bagi mengelakkan ketirisan. Oleh itu, projek Gerobok Rezeki RFID Vending Machine (G-VEM) direka bagi mengatasi masalah ini agar penerima yang berdaftar dapat mengambil bantuan dengan mudah tanpa mengira masa. Kad pengenalan frekuensi radio (RFID) hanya perlu diimbas dan maklumat penerima akan diterima oleh petugas. Maklumat pengambilan akan sampai ke aplikasi telegram petugas dan ini akan memudahkan mereka merekod transaksi pengambilan dengan mudah. G-VEM dapat mengelakkan ketirisan di dalam proses memberi bantuan makanan dan ianya dapat digunakan 24 jam tanpa perlu pengawasan. Projek ini dapat menyediakan satu bentuk pemberian dan pengambilan bantuan yang lebih kreatif dan memudahkan penerima. Projek ini menggunakan reka bentuk produk mesin layan diri dan menggunakan kad RFID sebagai medium pengambilan bantuan dan RFID akan menghantar isyarat ke ESP32 untuk menghantar mesej ke telegram bagi tujuan merekod pengambilan. Hasil projek ini dapat diperluaskan penggunaannya kepada pihak-pihak yang menjalankan program gerobok rezeki kerana projek ini menyediakan satu mekanisme berteknologi untuk memudahkan pengurusan gerobok rezeki.

KATA KUNCI: Gerobok Rezeki, RFID, Vending Machine, G-VEM

PENERANGAN PRODUK

Gerobok Rezeki menjadi platform penting untuk menyediakan bantuan kecemasan kepada mereka yang memerlukan dan membantu mengurangkan beban hidup yang berat di kalangan masyarakat yang terkesan. Program ini telah mendapat sokongan daripada orang ramai dan terus berkembang hingga hari ini dan tidak terbatas hanya di masjid. Namun begitu, timbul beberapa masalah berkaitan dengan penyediaan Gerobok Rezeki seperti terdapat pihak yang mengambil kesempatan mengambil bantuan dengan sesuka hati sehinggakan ada pihak yang terpaksa menghentikan program Gerobok Rezeki yang dijalankan. Justeru, projek Gerobok Rezeki RFID Vending Machine (G-VEM) ini dibangunkan bagi mengatasi masalah yang timbul. Tujuan projek ini dijalankan adalah untuk mengadaptasi dan menambah baik penggunaan *vending machine* dengan menggunakan RFID untuk pengeluaran barang dan menghantar pesanan ke aplikasi telegram untuk direkod. Selain itu, projek ini adalah bagi memudahkan pengurusan program Gerobok Rezeki dengan menambah baik sistem pengambilan dan pengurusan rekod bantuan. G-VEM berfungsi menggunakan kad RFID. Penerima sumbangan yang telah berdaftar dengan pihak masjid akan menerima 1 kad RFID. Kad ini digunakan di G-VEM dengan mengimbas kad pada tempat yang disediakan. Kemudian, pihak penerima boleh memilih barangan yang diperlukan dengan menekan butang bernombor. Setelah barang yang dipilih keluar, pihak penerima boleh mengambil barang tersebut. Semasa kad diimbas dan barang dikeluarkan, satu pesanan akan sampai ke aplikasi telegram petugas. Pesanan ini boleh digunakan untuk tujuan merekod pengeluaran barang. Dengan ini, pengurus bantuan boleh mengawal barang dan membuat rekod pengeluaran dengan mudah tanpa perlu menunggu di masjid. Pengeluaran juga boleh dihadkan, contohnya menghadkan pengeluaran kepada 4 barang utk 1 kali pengeluaran setiap bulan. Limitasi ini adalah untuk mengelakkan pembaziran dan penyalahgunaan sumbangan. Penggunaan kad RFID ini juga membolehkan penerima mendapatkan barang pada bila-bila masa.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



Gambarajah 1

KEBAHARUAN DAN KEUNIKAN

Program Gerobok Rezeki masih dijalankan dengan meluas sehingga kini. Ini menunjukkan bahawa projek ini adalah relevan untuk dibangunkan. Tambahan lagi, pihak penganjur program Gerobok Rezeki bersikap terbuka untuk menerima mekanisme yang lebih kreatif untuk manfaat penerima bantuan (Bernama, 2023). Projek ini difokuskan kepada kegunaan program Gerobok Rezeki yang dijalankan di masjid. Projek ini menggunakan reka bentuk produk *vending machine* sedia ada dan ditambahbaik menggunakan RFID dan aplikasi telegram. Selain itu, projek ini menggunakan pengawal mikro Arduino Uno dan ESP 32 dan merupakan model kepada projek sebenar iaitu seperti replika yang mempunyai fungsi yang sama tetapi bukan saiz sebenar.

MANFAAT KEPADA MANUSIA

Berdasarkan hasil projek, didapati G-VEM ini mempunyai beberapa kelebihan iaitu yang pertama dapat mengelakkan ketirisan di dalam proses memberi bantuan makanan kepada golongan yang memerlukan. Yang kedua, projek ini dapat menyediakan satu bentuk pemberian dan pengambilan bantuan yang lebih kreatif dan memudahkan penerima. G-VEM ini boleh digunakan 24 jam tanpa perlunya pengawasan. Oleh itu, ia memudahkan penerima bantuan untuk mengambil bantuan pada bila-bila masa. Petugas juga dapat merekod bantuan yang diambil tanpa perlu berada di tempat bantuan. Maka, projek ini dapat mengelakkan daripada berlakunya pembaziran.

POTENSI UNTUK PENGKOMERSILAN

Program Gerobok Rezeki masih dijalankan dengan meluas sehingga kini. Ini menunjukkan bahawa projek ini adalah relevan untuk dibangunkan dan ia bukan sahaja boleh digunakan dalam program Gerobok Rezeki di masjid, bahkan juga bagi program Gerobok Rezeki yang lain seperti masjid, sekolah, institusi pengajian tinggi (IPT), premis perniagaan, bangunan badan bukan kerajaan (NGO) atau premis persendirian.

KESIMPULAN

Sebagai kesimpulannya, projek ini telah berjaya dihasilkan dan mencapai objektif yang dinyatakan. Produk yang dihasilkan ini diharapkan dapat memberi manfaat kepada penerima dan pengurus program Gerobok Rezeki. Produk ini akan diperluaskan penggunaannya kepada pihak lain yang turut menjalankan program ini. Diharapkan produk ini dapat memberi kebaikan dan menyumbang kepada perkembangan teknologi semasa.

PENGAKUAN

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PID10102

Absorber Spring Opener

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ABSTRAK

KATA KUNCI: Spring absorber, Kenderaan, Institusi kemahiran, Bengkel kenderaan, Penyelenggaraan

PENERANGAN PRODUK

Untuk mengekalkan kestabilan dan prestasi kenderaan, absorber perlu diselenggara dan diperiksa. Untuk melakukan kerja penyelenggaraan, absorber spring perlu dibuka. Prosedur penggantian absorber biasa adalah rumit dan berisiko apabila memampatkan spring untuk memisahkan absorber daripada spring. Ia adalah prosedur yang berisiko kerana tekanan yang tinggi boleh menyebabkan spring melantun dan mencederakan orang dan merosakkan peralatan berhampiran. Selain itu, ia juga boleh menyebabkan mekanik dan pengguna yang melakukan kerja tersilap pasang dan boleh mengakibatkan kerosakan spring absorber. Absorber Spring Opener boleh memudahkan proses menukar absorber dengan selamat dan dalam masa yang cepat. Justeru, kerja penyelenggaraan adalah lebih mudah, selamat dan juga pantas kerana ia boleh membuka 2 unit spring absorber dalam satu masa. Alat ini bukan sahaja memberi manfaat kepada mekanik di bengkel kereta, terutamanya mereka yang menawarkan perkhidmatan penyelenggaraan absorber atau servis kereta biasa, malah ia juga dapat membantu pensyarah dan pelajar di institut kemahiran automotif terutamanya semasa proses pengajaran dan pembelajaran khusus dalam tajuk penyelenggaraan

kereta dan penyelenggaraan absorber. Absorber Spring Opener ini disyorkan kepada kolej vokasional terutamanya kerana mereka memerlukan alat untuk membantu menjimatkan masa semasa kerja amali. Pada masa hadapan, projek ini boleh diperbaiki dengan menambah motor untuk menggantikan kaedah manual memampatkan atau menyahmampat spring.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



Gambarajah 1 : Alatan yang biasa digunakan untuk membuka spring absorber (jaw coil compressor) . Pengguna perlu memasang satu persatu bergilir-gilir pada absorber untuk membuka spring absorber



Gambarajah 2 : Absorber Spring Opener

KEBAHARUAN DAN KEUNIKAN

Pengguna tidak lagi perlu membuka spring absorber satu persatu kerana ia memakan masa dan berisiko. Dengan menggunakan Absorber Spring Opener, dua spring absorber boleh dipasang dalam satu masa dan ianya lebih selamat.

MANFAAT KEPADA MANUSIA

Alat ini dapat membantu pekerja terutama di bengkel kenderaan untuk melakukan kerja menservis absorber dengan cepat dan selamat. Dengan itu, para pengusaha bengkel kenderaan dapat meningkatkan produktiviti pekerja dengan lebih baik. Selain itu, para pensyarah di institusi kemahiran, khususnya dalam bidang automotif, dapat menggunakan alat ini sebagai alat bantu mengajar sewaktu mengajar tajuk penyelenggaraan absorber dalam kursus Chassis Kenderaan terutama di kolej vokasional. Para pelajar pula dapat memanfaatkan alat ini sebagai bantuan sewaktu melaksanakan penilaian mahupun tugas amali berkenaan absorber dan chassis kenderaan.

POTENSI UNTUK PENGKOMERSILAN

Sekiranya alat ini dikomersialkan, absorber spring opener akan digunakan secara meluas kepada para pengusaha bengkel, pusat servis kenderaan dan institusi kemahiran.

KESIMPULAN

Absorber spring opener dapat membantu para pekerja dan mekanik di bengkel kenderaan dalam melakukan kerja menyelenggara absorber selain dapat membantu menjamin kualiti pengajaran dan pembelajaran amali dan praktikal dalam bidang teknikal dan vokasional di institusi pembelajaran. Dengan adanya alat ini, persekitaran kerja bebas risiko serta produktiviti dapat ditingkatkan.

PENGAKUAN

Jutaan penghargaan khas buat Pengarah Kolej Vokasional Ampangan, Pn Siti Kamariah bt Mohd Husin, barisan pengurusan, pensyarah Teknologi Automotif KV Ampangan dan pelajar-pelajar Teknologi Automotif KV Ampangan.

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PID10112

AAA Meow

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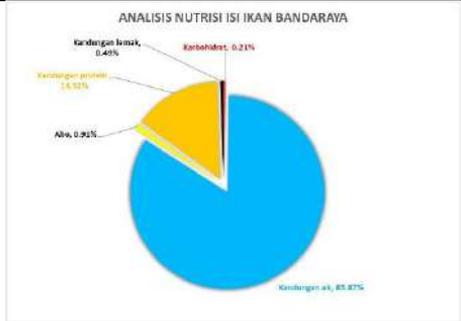
ABSTRAK

Ikan bandaraya, atau nama saintifiknya *Hypostomus Plecostomus*, merupakan ikan air tawar tropika yang berasal daripada Amerika Tengah dan Amerika Selatan. Ikan ini sangat popular untuk dibela dalam akuarium kerana tabiatnya yang gemar membersihkan dasar dan dinding akuarium. Ikan bandaraya akan memakan lumut, alga dan saki baki makanan ikan di dalam akuarium. Namun begitu, penyebaran populasinya yang tidak terkawal menyebabkan ikan ini banyak didapati di sekitar sungai-sungai di Malaysia. Ikan ini adalah dikategorikan sebagai spesies asing invasif kerana menjadi ancaman kepada spesies ikan lain. Selain itu, ikan bandaraya mempunyai kadar pembiakan yang pantas sekaligus mengganggu ekosistem tempatan kerana ia memakan telur ikan lain serta menggugat mata pencarian nelayan. Pengkaji telah memilih Sungai Rantau dan Sungai Batu Tiga di Mambau, Negeri Sembilan untuk mendapatkan ikan bandaraya. Objektif projek ini adalah untuk membantu mengurangkan populasi ikan bandaraya daripada perairan tempatan dengan menghasilkan produk yang berguna untuk haiwan lain. Bagi menghasilkan AAA Meow, ikan bandaraya telah ditangkap menggunakan jala oleh nelayan, diproses, dimasukkan ke dalam pembungkusan, dibekukan dan dikomersialkan sebagai AAA Meow untuk dijadikan makanan kucing. Pengkaji telah menjalankan pemerhatian dengan memberikan produk AAA Meow kepada 18 ekor kucing yang berbeza jenis. Hasil dapatan mendapati 15 daripada 18 ekor kucing telah menghabiskan ikan bandaraya yang diberikan oleh pengkaji.

KATA KUNCI: *Hypostomus Plecostomus*, Ikan bandaraya, Spesies asing invasif, Makanan kucing, AAA Meow

PENERANGAN PRODUK

Produk AAA Meow adalah makanan kucing inovatif yang direka untuk mengurangkan populasi spesies asing invasif di perairan tempatan, khususnya ikan bandaraya, sambil menyediakan makanan kucing yang selamat. Produk ini menggunakan ikan bandaraya yang biasanya dianggap sebagai sumber buangan, dihasilkan tanpa pewarna, pengawet, atau perisa tiruan, dan merupakan satu-satunya makanan kucing di Malaysia yang menggunakan ikan ini sebagai bahan utama. Fungsi AAA Meow adalah memberikan nutrisi protein untuk kucing. Hasil kajian sebuah universiti awam pada 2022 menunjukkan kandungan merkuri ikan bandaraya lebih rendah berbanding ikan yang biasa kita makan seperti gelama, selar kuning dan siakap. Kadarnya kurang daripada 0.5 yang membuktikan ia selamat untuk dimakan. Selain membantu pemuliharaan alam sekitar dengan mengurangkan spesies ikan bandaraya, AAA Meow diterima baik oleh kucing dari segi rasa dan tekstur terutamanya kucing terbiar dan kucing peliharaan. Inovasi utama terletak pada penggunaan ikan bandaraya sebagai bahan utama, yang tidak pernah dilakukan sebelum ini di Malaysia, menjadikannya produk yang mampan dan mesra alam. AAA Meow mudah disediakan seperti makanan kucing biasa, tersedia dalam bentuk beku untuk mengekalkan kesegaran, dan memberikan manfaat seperti pemeliharaan alam sekitar, menyediakan makanan kucing semulajadi dan bebas bahan kimia, serta membuka peluang ekonomi melalui pengkomersialan produk ini. Produk ini dihasilkan melalui proses pembersihan, penyediaan, dan pembungkusan yang ketat untuk memastikan kualiti dan keselamatan makanan, mengandungi protein dari ikan bandaraya. Secara keseluruhan, produk ini memberikan penyelesaian kepada masalah ekologi serta menyediakan pilihan makanan untuk kucing, sekaligus menjadikannya produk yang unik dan berpotensi di pasaran.



Gambarajah 1 : Analisis Nutrisi Ikan Bandaraya

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



AAA MEOW
Isi bersih 20 gram
100% *100% PRODUK MUSLIM*
Terdapat peracik, perisa dan pengawet tiruan
Harap RM2.00
0124988563
Produk Muslim

Strategic Plan for Biodiversity 2011–2020 and the Aichi Targets
Target 9
By 2020, invasive alien species and pathways are identified and priority species are controlled or eradicated, and measures are in place to manage pathways to prevent the introduction and establishment.

IMBAS DI SINI

Gambarajah 2 :

Pembungkusan AAA Meow

Gambarajah 3 : Maklum Balas Pelanggan

dan Video



ANALISIS DATA RESPONDEN (KUCING)

BIL	JENIS BAKA KUCING	UMUR KUCING	JENIS MAKANAN (BASAH, KERING, HANCUR)	KUANTITI MAKANAN	ADAKAH KUCING MAKAN?	CATATAN
1	MUNCHKIN	2 HINGGA 4 TAHUN	BASAH	2 GRAM	TIDAK	KUCING SEKADAR BALU
2	MOGGY	2 HINGGA 4 TAHUN	BASAH	2 GRAM	YA	KUCING BAU DAN MAKAN
3	MOGGY	2 HINGGA 4 TAHUN	KERING	2 GRAM	YA	KUCING BAU DAN MAKAN
4	MOGGY	2 HINGGA 4 TAHUN	BASAH DAN HANCUR	2 GRAM	YA	KUCING BAU DAN MAKAN
5	STRAY CAT	3 HINGGA 5 TAHUN	BASAH DAN HANCUR	2 GRAM	YA	KUCING TERUS MAKAN
6	STRAY CAT	3 HINGGA 5 TAHUN	BASAH DAN HANCUR	2 GRAM	YA	KUCING TERUS MAKAN
7	STRAY CAT	3 HINGGA 5 TAHUN	BASAH DAN HANCUR	2 GRAM	YA	KUCING BAU DAN MAKAN
8	STRAY CAT	3 HINGGA 5 TAHUN	BASAH DAN HANCUR	2 GRAM	YA	KUCING TERUS MAKAN
9	STRAY CAT	3 HINGGA 4 TAHUN	BASAH DAN HANCUR	2 GRAM	YA	KUCING BAU DAN MAKAN
10	STRAY CAT	3 HINGGA 5 TAHUN	BASAH DAN HANCUR	2 GRAM	TIDAK	KUCING SEKADAR BALU
11	STRAY CAT	3 HINGGA 5 TAHUN	BASAH DAN HANCUR	2 GRAM	TIDAK	KUCING SEKADAR BALU
12	STRAY CAT	3 HINGGA 5 TAHUN	BASAH DAN HANCUR	2 GRAM	YA	KUCING BAU DAN MAKAN
13	STRAY CAT	3 HINGGA 5 TAHUN	BASAH DAN HANCUR	2 GRAM	YA	KUCING BAU DAN MAKAN
14	BULU LEBAT	3 HINGGA 5 TAHUN	BASAH	2 GRAM	YA	KUCING BAU DAN MAKAN
15	BULU LEBAT	3 HINGGA 5 TAHUN	BASAH	2 GRAM	YA	KUCING BAU DAN MAKAN
16	BULU LEBAT	3 HINGGA 5 TAHUN	BASAH	2 GRAM	YA	KUCING BAU DAN MAKAN
17	BULU LEBAT	3 HINGGA 5 TAHUN	BASAH	2 GRAM	YA	KUCING BAU DAN MAKAN
18	BULU LEBAT	3 HINGGA 5 TAHUN	BASAH	2 GRAM	YA	KUCING BAU DAN MAKAN

Gambarajah 4 : Bahan Dan Kaedah Pelaksanaan

KEBAHARUAN DAN KEUNIKAN

Produk AAA Meow mempunyai beberapa keunikan dan pembaharuan yang menarik, antaranya ialah menukarkan sumber buangan, iaitu ikan bandaraya yang merupakan spesies asing invasif, kepada produk yang bernilai dan membantu mengurangkan populasi spesies ini yang mengganggu ekosistem tempatan. Pengkaji telah menjalankan tinjauan dan soal selidik terhadap 10 orang responden yang memiliki kucing dan memberikan produk AAA Meow untuk dihidangkan kepada kucing mereka. Hasil dapatan menunjukkan maklum balas yang positif, di mana kucing menyukainya. Produk ini mengandungi 100% isi ikan semulajadi, tanpa pewarna, perisa, dan pengawet tiruan. Lebih unik lagi, AAA Meow adalah satu-satunya produk makanan kucing di Malaysia yang menggunakan ikan bandaraya sebagai bahan utama, memberikan kelebihan kompetitif dan membezakan produk ini daripada makanan kucing lain di pasaran. Dengan ciri-ciri ini, AAA Meow bukan sahaja membantu menjaga ekosistem tempatan dengan mengurangkan populasi ikan bandaraya, tetapi juga menyediakan pilihan makanan untuk kucing peliharaan.

MANFAAT KEPADA MANUSIA

Produk AAA Meow memberi manfaat kepada manusia dari pelbagai aspek. Pertama, ia membantu menyelesaikan masalah spesies asing invasif yang menyebabkan kerosakan kepada sumber semulajadi, meningkatkan kualiti hidup dengan mengekalkan keseimbangan ekosistem, kerana ikan ini menjadi ancaman kepada spesies ikan lain. Kedua, penggunaan sumber buangan seperti ikan bandaraya menjadikan projek ini lebih mampan dan mesra alam. Ketiga, dari segi ekonomi, produk ini boleh dikomersialkan, menjana pendapatan tambahan dan menambah peluang pekerjaan. Keempat, ia meningkatkan pengetahuan dan pendidikan tentang kepelbagaian biologi dan kelestarian. Selain itu, usaha mengawal populasi ikan ini, membantu nelayan air tawar menangkap ikan tanpa merosakkan pukut dan jala mereka.

POTENSI UNTUK PENGKOMERSILAN

AAA Meow merupakan satu usaha yang diketengahkan untuk mengawal populasi ikan bandaraya. Walaupun usaha ini masih di peringkat awal dan belum ada produk ikan bandaraya yang dihasilkan di Malaysia, potensi untuk dikomersialkan adalah besar. Di Asia Tenggara, seperti Indonesia, Vietnam, dan Thailand, ikan ini dijadikan sumber makanan. AAA Meow mempunyai potensi untuk dikomersialkan dengan margin yang menguntungkan. Saiz pembungkusan yang kecil dan harga yang berpatutan juga boleh menarik minat pelanggan ingin mencuba produk ini. Dengan kos pengeluaran yang berpatutan, AAA Meow boleh menawarkan margin yang menguntungkan bagi kandungan isi ikan sebanyak 20 gram dan harga jualan hanya RM2.00, AAA Meow berpotensi menarik minat pelanggan yang ingin mencuba produk baru ini. Produk ini juga mudah disimpan dan sesuai untuk penyimpanan sejuk beku, menjadikannya pilihan yang praktikal bagi pemilik kucing.

KESIMPULAN

Projek inovasi produk AAA Meow yang dijalankan ini diharap dapat memberi faedah dan dapat menyelesaikan isu utama iaitu membantu mengurangkan populasi ikan ini daripada perairan tempatan dengan menghasilkan produk yang berguna untuk haiwan lain seperti kucing. Projek inovasi AAA Meow juga menyumbang kepada SDG 15 dan Target 11, National Policy on Biological Diversity 2016-2025 iaitu mencegah dan mengurangkan spesies asing invasif kerana spesies ini menjadi ancaman kepada ekosistem semulajadi. Konklusinya, dengan adanya usaha dan kerjasama dengan Jabatan Perikanan, Institut Penyelidikan Perikanan dan Veteriner, pengkaji berharap produk AAA Meow mendapat perhatian daripada pihak

tertentu sekaligus membuka ruang serta membawa manfaat kepada ekonomi dan industri lain di Malaysia seperti bidang kosmetik, pertanian dan penyelidikan.

PENGAKUAN

Ucapan penghargaan dan terima kasih ini ditujukan kepada Cikgu Nur Aini binti Amran, Guru SMK Panchor, Seremban merangkap guru pembimbing yang telah membimbing kami menyiapkan kajian dan projek ini. Beliau memberikan segala tunjuk ajar dalam penghasilan projek inovasi ini dalam tempoh masa yang ditetapkan. Sekalung budi juga ditujukan kepada barisan pentadbir serta pengurusan dan rakan-rakan seperjuangan SMK Panchor kerana memberi sokongan dalam menghasilkan projek ini. Tidak lupa juga kepada Pengarah dan Pegawai Penyelidik Kanan Dr. Haslawati binti Baharuddin daripada Institut Penyelidikan Perikanan (IPP) Glami Lemi Jelebu, Negeri Sembilan di atas bantuan sepanjang projek ini dijalankan. Ucapan terima kasih juga kepada Puan Hidayah daripada Pejabat Perikanan Negeri Sembilan atas bantuan bahan-bahan poster berkaitan ikan bandaraya. Penghargaan ini juga ditujukan kepada mana-mana pihak yang terlibat sama ada secara langsung atau tidak kerana sentiasa memberikan kerjasama, buah fikiran dan dorongan dalam melancarkan proses projek kami ini.

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PID10132

Smart Flood Detection System (SFDS)

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ABSTRACT

Smart Flood Detection System (SFDS) is a flood detector that is able to send flood alert to emergency responders. SFDS is able to predict flash flood based on the intensity of rain. The prototype has been tested in a controlled environment and has been able to send out an SMS alert. SFDS is multi-sensor fusion that integrates data from sensors, such as rainfall water level sensors, using advanced fusion algorithms to increase accuracy and reliability. SFDS uses Real-Time Monitoring and Alerts to enhance the system's effectiveness in mitigating flood risks by collaborating with emergency responders. SFDS allows proactive measures to be taken to protect people or communities, their families, and their property. This can lead to reduced loss of life, injuries, and property damage during flood events. Prototype will be further improved to enhance precision in based on feedback from emergency responders.

KEYWORDS: Smart Flood Detection System (SFDS), flood, prediction, emergency responders.

PRODUCT DESCRIPTION

SFDS aims to aid in disaster management. SFDS contributes to disaster preparedness and management by providing early warning systems for floods and helping to mitigate their impact on communities and infrastructure. Emergency responders, such as firefighters, police, and disaster relief organizations, benefit from timely information provided by SFDS. This will enable them to plan and execute rescue and relief efforts more effectively. People living in flood-prone areas benefit from early warning systems provided from SFDS as they have more time to evacuate or prepare for flooding, reducing the risk to their lives and property. SFDS

uses Real-Time Monitoring and Alerts. The monitoring of key environmental parameters and issues timely alerts to communities and authorities, allowing for prompt action and response in the event of a flood. This real-time capability enhances the system's effectiveness in mitigating flood risks. This predictive capability allows for proactive measures to be taken before floods occur, reducing their impact. By forecasting floods, SFDS enables proactive measures to be taken before they occur, such as preemptive evacuations or flood prevention efforts, reducing the impact of flooding.

**PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/
GRAPHS AND OTHER RELATED VISUALS**



Figure 1. Smart Flood Detection System (SFDS)

NOVELTY AND UNIQUENESS

SFDS is multi-sensor fusion that integrates data from sensors, such as rainfall water level sensors, using advanced fusion algorithms to increase accuracy and reliability. SFDS Smart Flood Detection System utilizes machine learning algorithms to analyze flood data and environmental parameters, enabling it to predict and anticipate flood events with greater precision and lead time. SFDS uses Real-Time Monitoring and Alerts to enhance the system's effectiveness in mitigating flood risks by collaborating with emergency responders. Integration of Advanced Technologies in SFDS uses multi-sensor fusion, machine learning algorithms, and real-time monitoring to provide accurate and timely flood detection as well as increasing effectiveness and reliability.

BENEFIT TO MANKIND

Communities and residents in flood-prone areas benefit from early warnings and accurate predictions provided by SFDS. SFDS allows them to take proactive measures to protect themselves, their families, and their property. This can lead to reduced loss of life, injuries, and property damage during flood events. Emergency responders can also make proper plans and execute precautionary steps.

COMMERCIALIZATION POTENTIAL

Technology Readiness

Advances in sensor technology, data analytics, and communication networks have made it increasingly feasible to develop sophisticated SFDS at a reasonable cost. SFDS leverages these technological advancements to provide accurate and timely flood warnings.

Further Development and Refinement

The key is to continuously refine and improve SFDS based on feedback from testing, prototyping, and demonstration projects to emergency responders. Incorporating new technologies, algorithms, and features is important to enhance its accuracy, reliability, and usability.

CONCLUSION

The prototype of SFDS can be tested. Below is the table of the tests carried out.

Water Level (mm)	Ability to Activate
1-10	Yes
11-30	Yes
31-60	Yes
>60	Yes

Table 1: SFDS Activation Test

The second test was for the prediction of flash floods based on the intensity of rainfall.

Intensity of rainfall (mm/h)	Signal Produced
1-10	Safe
11-30	Alert
31-60	Danger
>60	Danger

Table 2: SFDS Flash Flood Prediction

SFDS allows proactive measures to be taken to protect people or communities, their families, and their property. This can lead to reduced loss of life, injuries, and property damage during flood events.

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PID10142

TIME TREK: Platform Interaktif Sejarah

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ABSTRAK

Pembelajaran sejarah di dalam kelas banyak berasaskan penceritaan oleh guru daripada buku teks dan nota tambahan kerana subjek sejarah banyak memerlukan hafalan fakta. Mengambil kira pelajar yang mempunyai gaya dan pilihan pembelajaran yang berbeza, pengkaji telah mengenal pasti banyak kajian yang menekankan pembelajaran secara interaktif dan visual dapat meningkatkan prestasi pelajar. Oleh itu, Time Trek merupakan aplikasi pembelajaran berasaskan web interaktif yang dibangunkan untuk membantu menaikkan minat pelajar di dalam mempelajari subjek Sejarah.

KATA KUNCI: Platform interaktif, Mudah dicapai, Pembelajaran atas talian, Pembelajaran sendiri, Subjek sejarah

PENERANGAN PRODUK

Time Trek diciptakan untuk membantu guru mengatasi masalah sumber terhad kepada material artifak dengan memberikan akses yang lebih luas kepada maklumat sejarah. Time Trek menggunakan bantuan visual seperti peta dan elemen multimedia untuk membantu pelajar memahami dan mengingati peristiwa sejarah dengan lebih baik. Selain itu, Time Trek yang berciri mudah dicapai dapat membantu guru melaksanakan sesi pengajaran dan pembelajaran di mana-mana sahaja dan ia juga boleh diakses oleh pelajar yang tidak dapat hadir ke sekolah kerana masalah kesihatan.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



Gambarajah 1 : Prototaip Time Trek di Telefon Pintar

KEBAHARUAN DAN KEUNIKAN

Time Trek mengandungi kandungan pembelajaran, capaian kepada penerangan di dalam bentuk imej dan video, contoh soalan ujian dan aktiviti tambahan serta ruang forum untuk pelajar dan guru berkolaborasi secara atas talian.

MANFAAT KEPADA MANUSIA

Time Trek bukan sahaja menyokong pembelajaran secara dalam talian, malah juga boleh digunakan sebagai bahan bantu mengajar secara bersemuka di dalam kelas. Time Trek juga selari dengan tema pendidikan lestari di mana ia tidak memerlukan cetakan sekaligus menjimatkan kertas dan mengurangkan penggunaan karbon.

POTENSI UNTUK PENGKOMERSILAN

Pengkaji akan memohon IPO untuk produk ini pada tahun 2025. Walaupun Time trek dibangunkan tanpa melibatkan sebarang kos, namun Time Trek berupaya untuk dikomersilkan kerana kandungan yang terdapat di dalam platform ini dapat membantu pembelajaran pelajar secara sendiri dan secara berkumpulan.

KESIMPULAN

Hasil analisis daripada soal selidik mendapati 82% daripada responden sangat bersetuju yang aplikasi ini dapat membantu meningkat minat mereka terhadap subjek sejarah. Dengan adanya bahan pembelajaran seperti Time Trek, diharapkan ia dapat membantu meningkatkan prestasi pelajar di dalam subjek Sejarah.

PID10152

E-Komik: Meneroka Keajaiban Sains

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ABSTRAK

Pendidikan merupakan cabaran yang sentiasa berkembang, memerlukan strategi inovatif untuk meningkatkan minat dan penglibatan pelajar dalam pembelajaran. Satu pendekatan yang semakin mendapat perhatian ialah penggunaan komik sebagai alat pembelajaran yang berkesan dan menarik. Mengambil kira faktor ini, kajian ini bertujuan untuk meneroka strategi inovatif dalam menggunakan komik pendidikan dalam menjadikan pembelajaran lebih menarik kepada pelajar. Kaedah kajian yang digunakan ialah analisis literatur untuk memahami konsep dan faedah penggunaan komik dalam pendidikan, serta kajian kes untuk mengenal pasti strategi inovatif yang telah berjaya dilaksanakan dalam pelbagai konteks pendidikan. Selain itu, temu bual dengan guru dan pelajar telah dijalankan untuk mendapatkan gambaran secara langsung tentang pengalaman mereka menggunakan komik dalam pembelajaran. Hasil kajian menunjukkan bahawa penggunaan komik pendidikan dengan pendekatan inovatif, seperti integrasi teknologi, pembangunan cerita yang berkaitan, dan penggunaan elemen interaktif secara berkesan dapat meningkatkan minat dan penglibatan pelajar dalam pembelajaran secara aktif.

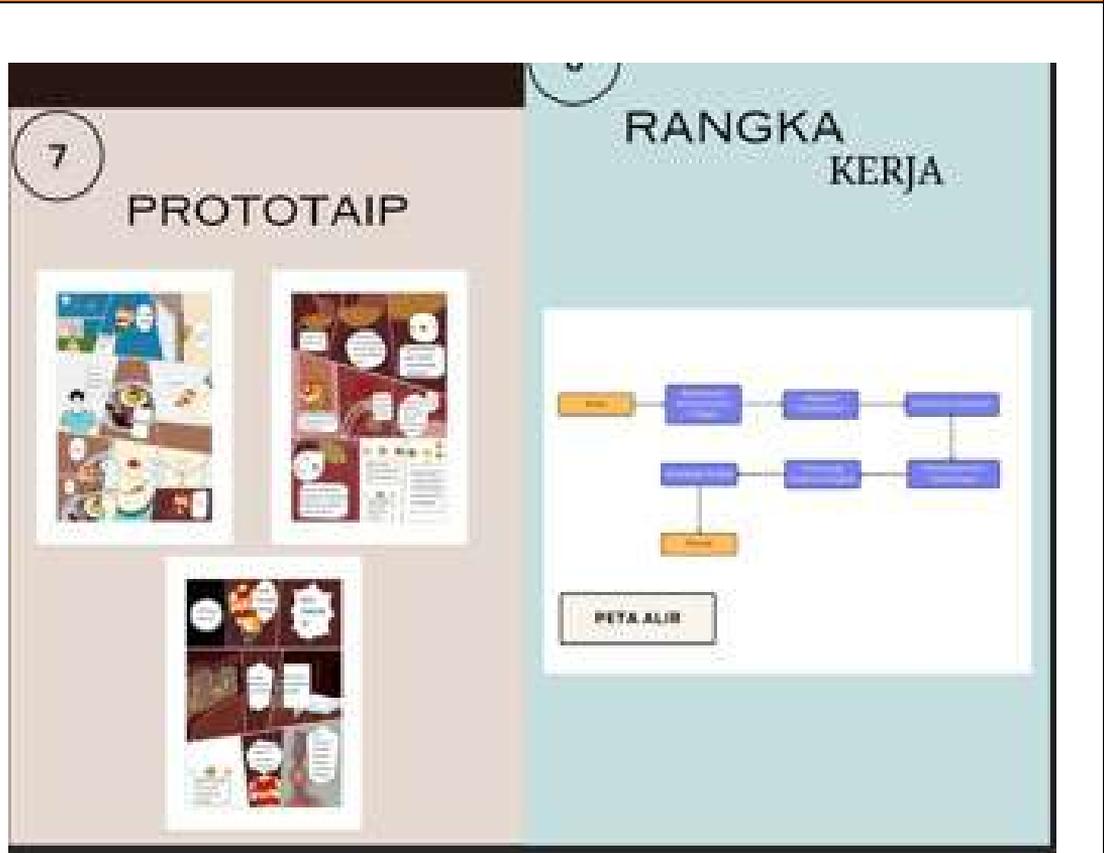
KATA KUNCI: Komik Pendidikan, Integrasi Teknologi, Pembangunan Cerita, Elemen Interaktif, Kemahiran Kreatif

PENERANGAN PRODUK

E-Komik dihasilkan melalui aplikasi Ibispaint, platform kreatif yang membolehkan pencipta komik menggambarkan cerita secara digital dan aplikasi Canva digunakan untuk memudahkan proses penyuntingan imej yang digunakan di dalam E-Komik ini. E-Komik memfokuskan kepada proses pencernaan manusia yang merupakan

topik penting dalam subjek Sains. Sebagai sebuah komik pendidikan, karya ini mengetengahkan beberapa ciri; antaranya ialah penggunaan bahasa yang mudah difahami, ilustrasi yang jelas dan menarik, serta penyampaian maklumat yang tepat dan relevan dengan standard kurikulum. E-Komik yang dibangunkan bukan sahaja bertujuan untuk menyampaikan maklumat, tetapi juga untuk membangkitkan minat dan pemahaman mendalam tentang topik sains yang kompleks. Diharapkan E-Komik ini dapat memberi sumbangan penting kepada peningkatan prestasi pelajar dan digunakan dengan berkesan dalam konteks pendidikan yang berkembang.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



Gambarajah 1 : Prototaip dan Rangka Kerja/Peta Alir bagi e-Komik

KEBAHARUAN DAN KEUNIKAN

E-Komik pendidikan memperkenalkan subjek sains dengan cara yang menyeronokkan dan interaktif serta membantu pelajar memahami dan mengingati maklumat dengan lebih baik. Grafik dan ilustrasi dalam E-Komik membantu menjelaskan konsep-konsep sains yang kompleks dengan cara yang lebih mudah untuk difahami. E-Komik boleh diakses dengan mudah melalui pelbagai peranti seperti telefon pintar, tablet, dan komputer, membolehkan pelajar belajar pada bila-bila masa dan di mana sahaja. Ia juga boleh disesuaikan dengan pelbagai saiz skrin dan orientasi, yang mampu menyediakan pengalaman pembelajaran yang lebih fleksibel.

MANFAAT KEPADA MANUSIA

Penghasilan dan pengedaran E-Komik lebih kos efektif dan dapat mengurangkan beban kewangan. Guru boleh menggunakan E-Komik sebagai alat pengajaran tambahan untuk menerangkan konsep-konsep yang kompleks dengan cara yang lebih mudah difahami. Ia juga membuat pembelajaran sains lebih menyeronokkan dan menarik bagi pelajar, sekaligus dapat meningkatkan minat mereka dalam subjek tersebut. E-Komik juga mengurangkan keperluan kertas dan pencetakan, menjadikannya ia pilihan yang lebih lestari untuk alam sekitar.

POTENSI UNTUK PENGKOMERSILAN

E-Komik boleh menarik minat pelajar, guru, dan ibu bapa di seluruh dunia, menyediakan pasaran yang luas memandangkan generasi sekarang lebih suka membaca kandungan yang ringkas dan mudah difahami. Untuk perancangan komersil, pengkaji bercadang untuk menyediakan beberapa bahagian atau episod E-Komik secara percuma untuk menarik minat pelanggan, kemudian kenakan bayaran untuk kandungan premium yang lebih terperinci.

KESIMPULAN

E-Komik yang dibangunkan bukan sahaja bertujuan untuk menyampaikan maklumat, tetapi juga untuk membangkitkan minat dan pemahaman mendalam tentang topik sains yang kompleks. Diharapkan E-Komik ini dapat memberi sumbangan penting kepada peningkatan prestasi pelajar dan digunakan dengan berkesan dalam konteks pendidikan yang berkembang.

PID10162

The Polygon Pirates and the Treasure of Triangles

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ABSTRACT

Since the start of the COVID-19 pandemic in 2019, the global education scenario, including in Malaysia, has seen big changes. With everyone having to learn from home, teachers and students have had to quickly get used to using computers and the internet for school. Traditional chalk and talk methods in the classroom are no longer considered as the diversity of learning styles among students. This method also has proven less effective in engaging students who have grown used to using digital platforms. Recognizing this challenge, our research aims to innovate mathematics education through captivating animation.

KEYWORDS: Animation, Mathematics Education, Digital

PRODUCT DESCRIPTION

The research utilised storytelling through animation to simplify mathematical concepts, making them easily understandable and beneficial for Form 1 students to enhance their understanding of mathematics concepts. By transforming complex mathematical concepts into easily understandable narratives, this study seeks to facilitate deeper engagement among secondary school students in Mathematics subjects. This research animated content is designed to not only simplify mathematical concepts but also to captivate student interest. This research has utilised popular animation software such as Adobe Animate and Flippa Clip to ensure that the educational materials are visually engaging and accessible to all learners.

CONCLUSION

In conclusion, this research aims to bridge the gap between traditional teaching methods and the rising needs of today's digital learners. By adopting the power of animation storytelling, the goal is to inspire students with a passion for mathematics education and excel in mathematics. As the educational environment continues to change rapidly, commitment is needed to promote innovation and creativity in pursuing enhanced learning outcomes for all.

PID10172

Automatic Gimmick Launcher

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ABSTRAK

Produk **Automatic Gimmick Launcher** ini dihasilkan dengan tujuan untuk memudahkan pengguna menggunakan party popper di dalam sesebuah majlis atau acara. Hal ini dikatakan sedemikian, ramai orang mengalami kesukaran ketika menggunakan party popper tersebut kerana butang yang ada pada party popper tersebut agak sukar ditekan ketika sesebuah majlis atau acara. Oleh itu, kami hadir dengan party popper yang menggunakan alat kawalan jauh yang dapat memudahkan pengguna menggunakannya dari jarak tertentu. Kami juga mencari inisiatif lain dengan menggunakan besi katil yang terpakai sebagai medium utama untuk menghasilkan produk ini. Besi itu akan “memegang” party popper tersebut dan akan disambungkan dengan motor dan gear. Kami menggabungkan reka bentuk mekatronik dan mekanikal untuk menghasilkan produk tersebut dengan lebih berkesan dan efisien. Reka bentuk ini juga menarik, ergonomi dan mesra alam.

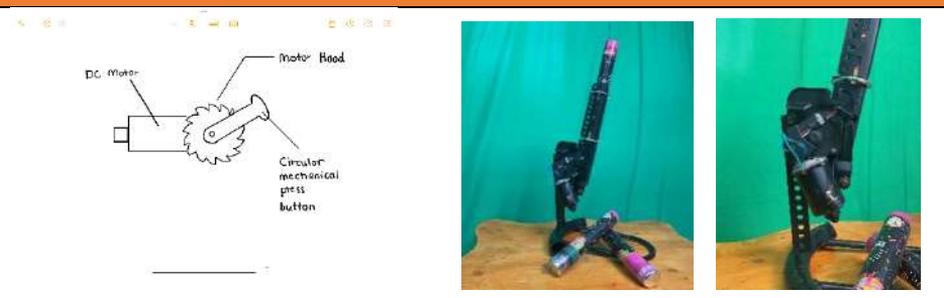
KATA KUNCI: Party popper, Alat kawalan jauh, Besi katil, Mekatronik dan mekanikal, Ergonomi, Mesra alam .

PENERANGAN PRODUK

Automatic Gimmick Launcher mempunyai pelbagai ciri yang menarik seperti mudah disebut, ringkas, mudah digunakan, tidak mudah rosak serta mesra alam. Ianya juga berfungsi untuk memudahkan pengguna untuk melancarkan party popper tersebut dalam keadaan yang mudah

dan jimat masa. Kami mengambil inisiatif iaitu menggunakan alat kawalan jauh untuk menekan butang **ON / OFF** samada dari jarak yang jauh atau dekat. Terdapat pelbagai keunikan faktor kebolehpasaran produk ini ialah tahan lasak dengan penggunaan besi katil sebagai medium utama, reka bentuk produk yang menarik dan stabil. Produk ini ditujukan terutamanya kepada pihak pengurusan majlis atau acara kerana kelebihan tersendiri. Antara kelebihan produk ini juga ialah dapat digunakan pada waktu yang tepat serta menjimatkan tenaga para pengguna dengan menekan butang di alat kawalan jauh.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



Gambarajah 1: Lakaran motor dan gear

Gambarajah 2: Produk sebenar

KEBAHARUAN DAN KEUNIKAN

Dengan mengaplikasikan prinsip mekatronik iaitu penggunaan tuas, motor dan gear, ia dapat berfungsi dengan lancar apabila sistem tuil menggerakkan gear. Pengaplikasian ini dapat menjadikan produk ini lebih efektif iaitu menukarkan nisbah gear, kuasa mekanikal boleh dihantar dengan cekap dari satu komponen ke komponen yang lain. Selain itu kami menginovasikan besi katil sebagai bahan utama terpakai yang digunakan untuk penghasilan produk. Hal ini kerana, ia mempunya daya tahan lasak dan tahan karat.

MANFAAT KEPADA MANUSIA

Produk ini dapat memberi banyak manfaat kepada pengguna antaranya ialah produk ini dapat membantu pengguna untuk melancarkan party popper pada masa yang tepat. Produk ini dapat digunakan tanpa menggunakan sebarang tenaga manusia kerana hanya menggunakan

alat kawalan jauh untuk melancarkannya. Selain itu, ia juga menggunakan sumber elektrik yang lebih sedikit kerana ianya tidak menggunakan tenaga motor yang banyak untuk menggerakkan gear.

POTENSI UNTUK PENGKOMERSILAN

Produk ini berpotensi untuk dikomersilkan kerana kos yang lebih rendah, jimat dan berbaloi. Hal ini kerana ia hanya menggunakan bahan terpakai iaitu besi katil dan dapat dieksport kepada pasaran di luar atau dalam negara atau di dalam talian. Hal ini kerana, Produk ini mempunyai reka bentuk yang lebih ringkas dan ringan untuk dipasarkan di mana-mana pasaran. Selain itu, ia juga boleh dipasarkan dengan lebih banyak dan murah kerana produk tersebut mempunyai reka bentuk yang menarik yang dapat meningkatkan lagi potensi produk untuk dikomersilkan.

KESIMPULAN

Dengan meletakkan harapan yang tinggi, Kami percaya dan yakin produk ini dapat membantu seseorang atau sesebuah majlis dari pelbagai segi aspek di masa akan datang. Hal ini kerana kami menghadapi pelbagai masalah untuk menyelesaikan projek tersebut agar dapat memudahkan perjalanan majlis dan kehidupan seseorang. Projek ini juga dapat mengembangkan lagi kemajuan wawasan teknologi dan alam elektronik di dalam kehidupan serta dapat mengembangkan lagi idea-idea bernas dari generasi yang akan menanti.

PENGAKUAN (*PILIHAN)

Kami mengucapkan ribuan terima kasih kepada guru kami kerana sentiasa membantu kami dalam menyiapkan projek ini. Walaupun kami menghadapi banyak cabaran dan masalah yang harus dihadapi, guru kami sentiasa menyokong, memberi semangat untuk melakukan dan menyiapkan projek ini dengan lancar dan baik. Semoga projek ini dapat memberi banyak manfaat kepada kehidupan seseorang atau sesebuah majlis di masa akan datang.

PID10182

HUSKATS

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ABSTRAK

HUSKATS adalah bahan yang dibangunkan hasil inovasi sepenuhnya menggunakan bahan buangan iaitu sekam padi bagi mengatasi masalah bau busuk dan tidak menyenangkan daripada najis kucing. HUSKATS ini sangat bersesuaian untuk pencinta haiwan peliharaan ini tanpa mempunyai masalah sama ada memelihara di sekitar rumah atau dikurung di dalam sangkar. Penggunaan bahan ini dengan meletakkan di tempat yang sering menjadi tempat buangan najis kucing atau diletakkan di bawah sangkar haiwan peliharaan itu. Kajian menunjukkan bahawa 1: 5 keluarga daripada seramai 12.8 juta keluarga yang terdapat di Malaysia yang memelihara kucing di rumah. Sehubungan dengan itu, penggunaan bahan buangan iaitu sekam padi dan campuran sedikit pewangi menyebabkan bahan ini dapat mengatasi bau busuk daripada najis haiwan peliharaan iaitu kucing atau peliharaan lain seperti anab, burung dan lain-lain. Pembangunan HUSKATS ini dapat mengatasi masalah yang sedia ada di mana bahan seumpama ini dijual di pasaran kebanyakan menggunakan pasir, serbuk kayu dan campuran mekanikal sahaja manakala penggunaan HUSKATS ini terhasil daripada proses mengeluarkan kandungan selulosa pada suhu sehingga 80 darjah celcius daripada sekam padi manakala memerlukan suhu bilik antara 30 hingga 37 darjah celcius untuk proses penyejukan bagi membentuk palet yang dikehendaki dengan menggunakan mesin hammermil. Proses untuk menghasilkan dalam satu-satu masa adalah sebanyak 250 kilogram dengan mengambil masa selama 1 jam 15 minit manakala penggunaan pewangi hanya sebanyak 5 ml. Oleh itu, penggunaan HUSKATS ini, bukan sahaja memudahkan pelanggan dengan hanya "flush" di dalam lubang tandas setelah menggunakannya, malah dapat menjimatkan kos, masa dan tenaga serta penyimpanannya sangat mudah dan lestari.

KATA KUNCI: HUSKATS, Haiwan peliharaan, Kucing, Sekam padi, Bahan terbuang

PENERANGAN PRODUK

HUSKATS adalah singkatan nama daripada perkataan sekam padi daripada bahasa Inggeris iaitu husk dan cat. HUSKATS yang membawa maksud sekam padi dan kucing. Secara umumnya produk ini diperbuat daripada bahan buangan iaitu sekam padi. Produk ini diperbuat daripada sekam padi bagi menggantikan pasir kucing yang sedia ada di pasaran. HUSKATS digunakan untuk mengatasi pencemaran bau terhadap najis kucing dan haiwan peliharaan lain kerana produk ini bertindak memerangkap bau najis daripada tersebar ke udara. HUSKATS sesuai digunakan untuk haiwan peliharaan seperti kucing dan haiwan peliharaan yang lain.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



KEBAHARUAN DAN KEUNIKAN

Keunikan HUSKATS ialah diperbuat daripada sisa buangan iaitu sekam padi yang hanya dibakar secara terbuka ada akan mencemarkan alam sekitar. HUSKATS juga diperbuat daripada alam semula jadi iaitu sekam padi dan boleh digunakan kembali untuk dijadikan baja tumbuhan selepas digunakan. HUSKATS bertindak sebagai perangkap bau najis daripada tersebar ke udara berbanding pasir kucing yang sedia ada di pasaran.

MANFAAT KEPADA MANUSIA

HUSKATS merupakan suatu produk yang tidak mencemarkan alam sekitar kerana HUSKATS diperbuat daripada sekam padi yang kebiasaanya dilupuskan dengan kaedah pembakaran terbuka yang dapat menjejaskan alam sekitar dan juga memberi impak yang negatif terhadap kesihatan manusia. Pemilik sawah padi turut mendapat manfaat dengan menjual sekam padi kepada pengeluar HUSKATS dengan harga yang tertentu bagi meningkatkan ekonomi dan taraf hidup serta menjadi sumber pendapatan tambahan petani.

POTENSI UNTUK PENGGOMERSILAN

Penghasilan HUSKATS hanya memerlukan kos yang rendah kerana bahan untuk menghasilkannya adalah daripada bahan semula jadi iaitu sekam padi. HUSKATS juga mempunyai potensi yang cerah dalam pasaran kerana permintaan yang tinggi terhadap pasir kucing di kalangan pemelihara kucing. Reka bentuk HUSKATS yang berbentuk palet mudah untuk disimpan dan dibawa kemana sahaja. HUSKATS juga boleh dibuang ke tandas atau digunakan sebagai baja.

KESIMPULAN

Kesimpulannya,projek inovasi HUSKATS ini dapat membantu pemilik kucing peliharaan bagi memproses najis kucing peliharaannya. Projek inovasi HUSKATS memerlukan komitmen secara berpasukan dalam kalangan murid dan guru yang sangat tinggi. Perbincangan antara guru Penasihat dan bantuan daripada agensi luar seperti UNIMAP dapat memantapkan lagi dalam penghasilan produk inovasi iaitu HUSKATS dengan lebih kreatif.

PENGAKUAN (*PILIHAN)

Setinggi- tinggi penghargaan kepada para pelajar, guru pembimbing,dan pihak UniMAP yang telah bertungkus lumus dan memberikan komitmen yang jitu bagi memastikan HUSKATS berjaya dihasilkan.

RUJUKAN (*PILIHAN, MAKSIMUM 6 RUJUKAN YANG RELEVAN)

CAT LITTER : PINE WOOD

<https://masreeni.blogspot.com/2015/06/cat-litter-pine-wood.html>

EPA

<https://www.epa.gov/>

SEKAM PADI

<http://animhosnan.blogspot.com/2015/03/padi-apa-dia-sekam.html>

PID10202

SHIELD

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ABSTRAK

SHIELD adalah produk unik berbeza daripada produk desinfektan yang terdapat di pasaran kerana SHIELD boleh digunakan pada permukaan muka selain tangan pengguna. SHIELD adalah produk yang dibangunkan hasil inovasi lengkap menggunakan bahan organik bagi menggantikan cecair pembasmi kuman yang terdapat di pasaran sekarang. SHIELD boleh melindungi kita daripada virus covid 19 dengan berkesan. Ia juga membantu kita menjaga kebersihan tangan dan muka. Kebiasaannya, pengguna menggunakan cecair pembasmi kuman seperti sanitizer yang hanya menyapu di tangan, tetapi penggunaan SHIELD bukan sahaja dibersihkan di tangan malah turut digunakan di muka dan tidak menyebabkan air mata. Menurut kajian, kebanyakan pengguna berasa segar selepas menggunakan produk tersebut. SHIELD diperbuat daripada bahan organik seperti natrium klorida, natrium lauril eter sulfat, minyak wangi minyak, betain dan air. Kesan SHIELD sangat wangi dan menyegarkan pengguna tidak seperti produk lain di pasaran dan tidak mengandungi alkohol. Tambahan pula, SHIELD sangat sesuai untuk semua jenis kulit termasuk kulit sensitif terutamanya di kalangan remaja. Dengan kos dan keberkesanannya sangat digalakkan untuk menggunakan produk ini.

KATA KUNCI: Perisai, Lindungi, Virus Covid-19, Permukaan

PENERANGAN PRODUK

SHIELD merupakan produk yang dibangunkan hasil inovasi menggunakan bahan organik bagi menggantikan cecair pembasmi kuman yang terdapat di pasaran sekarang. SHIELD sangat bersesuaian untuk kegunaan mencuci tangan dan muka sebagai pelindung daripada dijangkiti virus COVID 19. Cecair pembasmi kuman yang terdapat di pasaran sekarang hanya mencuci tangan sahaja tetapi produk SHIELD bukan sahaja mencuci tangan malah boleh digunakan untuk mencuci muka. SHIELD dihasilkan daripada bahan-bahan organik berbanding cecair pencuci

lain yang menggunakan bahan alkohol yang tinggi. SHIELD sesuai dengan semua jenis kulit termasuk kulit yang sensitif terutama dalam kalangan remaja. Penggunaan bahan organik serta tanpa sebarang kandungan alkohol membolehkan produk SHIELD ini dapat digunakan tanpa sebarang kerisauan.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



KEBAHARUAN DAN KEUNIKAN

SHIELD merupakan produk pembasmi kuman yang tidak diperbuat daripada bahan kimia dan selamat digunakan oleh pelbagai lapisan umur. Produk ini bukan sahaja boleh digunakan di tangan malah ia boleh digunakan sebagai pencuci muka. SHIELD juga sesuai dengan semua jenis kulit termasuk kulit yang sensitif dan tidak memberikan kesan sampingan kepada pengguna.

MANFAAT KEPADA MANUSIA

SHIELD dapat membasmi kuman serta dapat digunakan oleh semua lapisan umur masyarakat. Produk SHIELD yang tidak menggunakan bahan kimia seperti alkohol selamat untuk digunakan ke atas pelbagai jenis lapisan kulit termasuk kulit sensitif dan tidak memberikan kesan sampingan kepada penggunanya. Produk ini juga tidak memedihkan mata seperti produk lain di pasaran.

POTENSI UNTUK PENGGOMERSILAN

SHIELD mempunyai harga yang berpatutan dan sesuai untuk semua golongan terutama yang berpendapatan rendah dan golongan yang hilang pekerjaan akibat pandemik COVID-19. Produk ini mempunyai peningkatan permintaan yang tinggi

dalam kalangan masyarakat, terutamanya ketika pandemik COVID -19 dan penyebaran penyakit Influenza. Ini menyebabkan pasaran bagi produk SHIELD semakin meluas di Malaysia mahupun luar negara memandangkan peningkatan angka kebolehhangkitan yang semakin meningkat.

KESIMPULAN

Kesimpulannya, SHIELD merupakan produk unik berbeza dengan produk membasmi kuman yang ada di pasaran kerana SHIELD boleh digunakan pada permukaan wajah selain tangan pengguna. Menggunakan SHIELD, kesannya amat harum dan menyegarkan kepada pengguna berbeza dengan produk yang ada di pasaran. SHIELD menggunakan bahan organik sepenuhnya dan tidak mengandungi alkohol. Menggunakan SHIELD hanyalah dengan memicit dan menyapu pada tangan dan muka.

PENGAKUAN (*PILIHAN)

Setinggi- tinggi penghargaan kepada para pelajar, guru pembimbing, dan pihak UUM dan Makmal Analisis Logam Berat Bio SYNERGY yang telah bertungkus lumus dan memberikan komitmen yang jitu bagi memastikan SHIELD berjaya dihasilkan.

RUJUKAN (*PILIHAN, MAKSIMUM 6 RUJUKAN YANG RELEVAN)

NATIONAL LIBRARY OF MEDICINE

<https://www.ncbi.nlm.nih.gov/books/NBK144054/>

EPA

<https://www.epa.gov/>

Halal OEM manufacturer

<https://halaloemmanufacturer.com/cara-buat-hand-sanitizer-yang-betul-dan-selamat-digunakan/>

PID10221

Minecraft Smart Sifir

Asmani binti Abu Bakar^{1*}, Muhammad Darwisy Qusyairi bin
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ABSTRAK

Sifir merupakan kunci utama dalam penguasaan subjek Matematik. Penguasaan sifir memudahkan murid menjawab soalan matematik dengan mudah dan pantas. Malangnya, murid mudah bosan dan tidak berminat untuk menghafal sifir secara tradisional dan bertulis. Oleh itu, penghasilan Minecraft Smart Sifir menggunakan Minecraft sebagai platform utama penghasilan game atas talian kerana amat sinonim dan popular dikalangan murid. Projek inovasi Minecraft Smart Sifir menyediakan soalan kuiz dalam dunia Minecraft mengikut tema seperti lautan, hutan rimba dan sebagainya. Murid perlu menjawab kuiz bermula dari 1 hingga 10 untuk mengumpul diamond sekiranya menjawab dengan betul. Terdapat sifir 2 hingga 10 yang telah dibina dalam dunia Minecraft dengan pelbagai ciri-ciri menarik seperti meniti jambatan gantung, menaiki bot dan teleport untuk ke soalan berikutnya. Murid tidak akan merasa bosan dan dapat menghafal sifir sambil bermain game. Kesemua dunia sifir Minecraft ini dihipunkan dalam google site untuk memudahkan murid memuat turun dan bermain menggunakan peranti masing-masing. Guru juga boleh menjadikan Minecraft Smart Sifir sebagai kerja rumah di dalam Google Classroom. Untuk tujuan penambahbaikan di masa hadapan, Minecraft Smart Sifir akan mempelbagaikan ciri-ciri menarik lagi, seperti menyediakan watak interaktif dan memasukkan lagu sifir, serta menyediakan menu soal jawab untuk sebarang persoalan.

KATA KUNCI: Sifir, Matematik, Minecraft, Bermain game, Memuat turun

PENERANGAN PRODUK

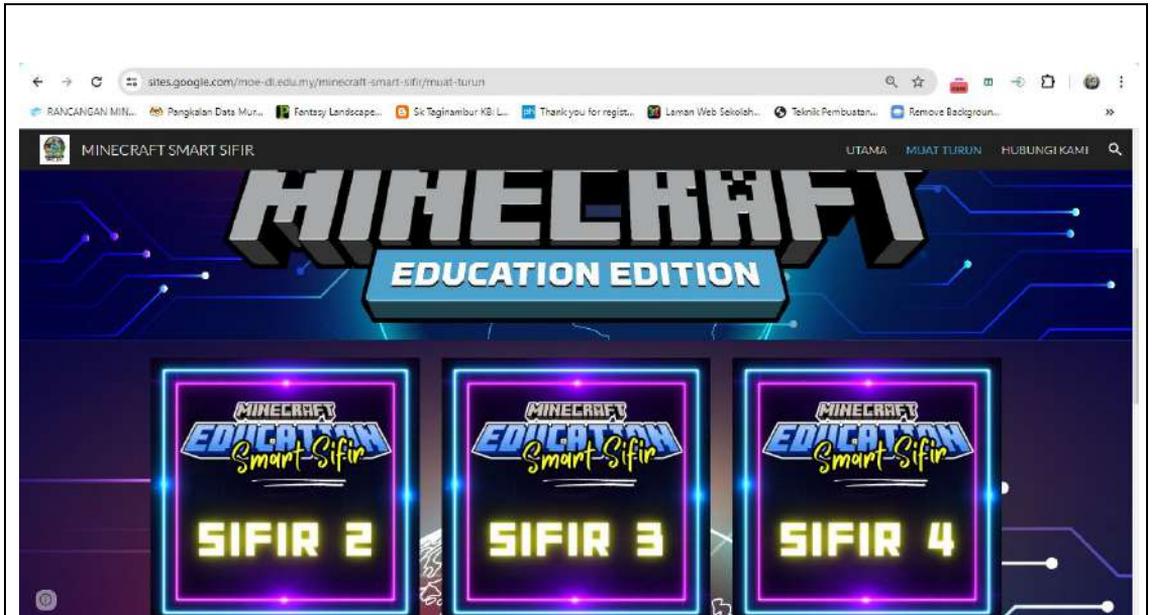
Minecraft Smart Sifir adalah permainan game untuk memantapkan penguasaan sifir di kalangan murid. Murid tidak akan merasa bosan atau terbeban untuk menghafal sifir secara kaedah tradisional, tetapi dapat melatih mereka menghafal sifir secara permainan atas talian. Dunia Minecraft yang menarik dan mencabar murid untuk

meneroka sifir 2 hingga 10 dapat membantu murid untuk kekal fokus mengingat sifir. Murid perlu mengumpul 10 diamond dalam setiap sifir sebelum meneruskan ke sifir yang berikutnya. Murid dapat memuat turun semua dunia Minecraft sifir ini di laman google site yang telah disediakan secara mudah. Seterusnya, murid perlu memuat naik dunia tadi ke dalam Minecraft Education Edition dan memulakan permainan. Secara keseluruhannya, Minecraft Smart Sifir ini memberikan impak positif dalam meningkatkan semangat dan kesungguhan murid menguasai sifir dengan lebih cekap dan berkesan. Terbukti penguasaan murid dalam menghafal sifir meningkat dan lebih efisien.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



Gambarajah 1: Laman Google Sites Minecraft Education



Gambarajah 2: Muat Turun Dunia Minecraft Smart Sifir



Gambarajah 3: Permainan Sifir Dalam Dunia Minecraft

KEBAHARUAN DAN KEUNIKAN

Minecraft Smart Sifir menjadikan platform Minecraft sebagai keunikan utama dalam menarik minat murid dalam menguasai sifir. Minecraft adalah permainan atas talian yang sinonim dengan murid pada masa sekarang, malah menjadi trend permainan atas talian yang paling popular di kalangan murid. Atas kesempatan ini, tidak hairanlah Minecraft Smart Sifir ini terbukti berkesan dalam membantu murid menguasai sifir tanpa perlu dipaksa untuk menghafal secara tradisional.

MANFAAT KEPADA MANUSIA

Penguasaan sifir terbukti dapat membantu murid menguasai seterusnya meminati subjek Matematik dengan lebih berkesan. Murid merasakan Matematik subjek yang susah disebabkan banyak penyelesaian melibatkan sifir yang memerlukan murid menghafal dan mengingat. Dengan Minecraft Smart Sifir, murid mampu mengingat sifir tanpa perlu menghafal secara tradisional. Sememangnya, Minecraft Smart Sifir memberikan manfaat kepada semua murid terutamanya murid sekolah rendah yang masih lemah dalam menghafal sifir.

POTENSI UNTUK PENGKOMERSILAN

Minecraft Smart Sifir mampu dikomersialkan sekiranya ditambah pelbagai ciri menarik seperti video lagu sifir dan juga soal jawab untuk membantu murid yang masih tidak memahami sifir. Dengan kos penghasilan yang rendah, pastinya Minecraft Smart Sifir dapat memberikan keuntungan berlipat ganda dengan permintaan tinggi di kalangan murid.

KESIMPULAN

Kesimpulannya, Minecraft Smart Sifir adalah projek inovasi berasaskan permainan sifir atas talian yang menarik dan berkesan untuk memantapkan penguasaan sifir murid. Dengan kebolehcapaian terhadap dunia Minecraft Smart Sifir yang mudah, murid tidak mempunyai sebarang kekangan untuk menguasai sifir seterusnya meminati subjek Matematik dengan menyeluruh. Mempunyai ciri-ciri yang menarik dan unik, pastinya murid lebih bersemangat dan tertarik untuk menghafal sifir sambil bermain Minecraft. Semoga Minecraft Smart Sifir dapat disebarluaskan untuk kegunaan semua.

PENGAKUAN (*PILIHAN)

Kami, SKePa Pro-M Team mengucapkan setinggi-tinggi penghargaan kepada semua guru SK Pauh terutamanya, Guru Besar yang sentiasa memberikan sokongan dan motivasi untuk kami merealisasikan projek inovasi ini.

RUJUKAN (*PILIHAN, MAKSIMUM 6 RUJUKAN YANG RELEVAN)

Homepage. education.minecraft.net. (n.d.). <https://education.minecraft.net/en-us>
Homepage. <https://www.youtube.com/channel/UC2XjBkW16jGLGSEF9vo4PDA>

PID10231

MY BundUler

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Norshahrizat¹, Muhammad Awwal bin Mohamed Roshimi¹, Nur Dhiya
Qhaisara binti Norshahrizat¹, Che Nurin Imtiyaz binti Che Johan¹

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ABSTRAK

Pembundaran merupakan topik dalam Matematik yang perlu dikuasai oleh murid sejak tahun 2 lagi. Malangnya, murid sering terkeliru dengan konsep pembundaran tradisional seperti naik bukit turun bukit, nombor kaya nombor miskin, perlu tambah 1 atau tidak. Maka, lahirlah projek inovasi ini, My BundUler atau singkatan bagi bundar guna ruler (pembaris). Menggunakan konsep pembaris, nombor yang berakhir dengan 5 dan berikutnya akan bergerak ke arah kanan, manakala nombor yang berakhir kurang dari 5 akan bergerak ke kiri. My BundUler dihasilkan menggunakan aplikasi Mit App Inventor kerana ianya percuma, mudah dan sangat sesuai untuk projek inovasi ini. Terdapat 4 menu utama iaitu ; Nota, Tutorial, Jom Cuba dan Kuiz. Untuk menu Nota, murid dapat mengetahui apa itu My Bunduler, iaitu Bundar guna Ruler. Di bawah menu Tutorial, murid dapat menonton video penerangan supaya lebih jelas lagi. Keistimewaan aplikasi My BundUler adalah kalkulator bundar di bawah menu Jom Cuba, yang mudah untuk digunakan. Murid hanya perlu memasukkan nombor yang ingin dibundarkan dan tekan button bundar mengikut nilai tempat yang diinginkan. Jadi, murid dapat menyemak hasil pembundaran mereka betul atau salah. My BundUler juga dilengkapi dengan kuiz untuk menguji sejauhmana pemahaman murid. Terdapat 3 level kuiz yang disediakan dengan markah penuh 100%. Murid dapat menilai tahap penguasaan mereka dengan menjawab kuiz yang menarik ini. My BundUler terbukti dapat membantu murid menguasai topik pembundaran dengan mudah dan cepat. Untuk masa hadapan, aplikasi ini akan dipertingkatkan dengan menambah beberapa ciri yang lebih menarik lagi, seperti memperbanyakkan kuiz dalam bentuk permainan, serta menyediakan menu soal jawab untuk sebarang persoalan. Projek inovasi aplikasi android MyBundler mampu membantu meningkatkan pemahaman topik bundar seterusnya memberikan manfaat besar buat semua.

KATA KUNCI: Pembundaran, Matematik, Mit App Inventor, Kalkulator bundar

PENERANGAN PRODUK

Projek inovasi aplikasi android My Bunduler dicipta untuk membantu murid memahami dan menguasai topik pembundaran dalam Matematik dengan lebih berkesan. Dengan keunikan ciri-ciri seperti Kuiz serta Kalkulator Bundar, sudah pasti, mampu menarik minat murid belajar topik pembundaran dengan mudah dan cepat. Murid tidak perlu dipaksa untuk menghafal konsep pembundaran yang mengelirukan dan sukar diingat. Dengan pengintegrasian teknologi dan pembaris yang mudah digunakan, guru akan dapat memperjelaskan konsep pembundaran dengan realistik dan nyata. Murid-murid terutamanya di sekolah rendah, lebih mudah memahami dan menguasai pembundaran dengan bimbingan minima dari guru. Dengan My BundUler terbukti, murid lebih mudah menguasai pembundaran dengan pantas.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



Gambarajah 1: Paparan Antaramuka Aplikasi My Bunduler Yang Sangat Menarik

KEBAHARUAN DAN KEUNIKAN

Keunikan projek inovasi aplikasi android My BundUler adalah mudah di muat turun dengan selamat kepada semua pengguna di android masing-masing. Jadi, murid dan guru tiada kekangan untuk menggunakan projek inovasi ini pada peranti

sendiri. My BundUler dilengkapi Kalkulator Bundar sehingga Juta terhampir menjadikan aplikasi ini mudah digunakan untuk menyemak hasil kiraan murid. Murid juga dapat membuat semakan sendiri untuk memudahkan pembelajaran secara individu. Kuiz yang dilengkapi skor markah dan bunyi menarik membuatkan murid lebih teruja untuk bermain sambil menguji kefahaman mereka. Pastinya, projek inovasi My BundUler mampu membantu murid memahami topik pembundaran sepenuhnya.

MANFAAT KEPADA MANUSIA

My BundUler merupakan aplikasi android yang memudahkan guru dan murid untuk memahami topik pembundaran. Projek inovasi ini terbukti berjaya meningkatkan pencapaian murid yang diuji dalam topik pembundaran seterusnya meningkatkan minat murid untuk mempelajari subjek Matematik. Dengan My BundUler, murid tidak perlu membuatkan guru pening kepala untuk menjelaskan konsep pembundaran kerana murid mampu belajar secara sendirian.

POTENSI UNTUK PENGKOMERSILAN

Projek Inovasi My BundUler mampu dikomersialkan sekiranya ditambah pelbagai ciri menarik seperti seperti memperbanyakkan kuiz dalam bentuk permainan, serta menyediakan menu soal jawab untuk sebarang persoalan. Dengan kos penghasilan yang rendah, pastinya My BundUler dapat memberikan keuntungan berlipat ganda dengan permintaan tinggi di kalangan murid dan guru.

KESIMPULAN

Kesimpulannya, My BundUler adalah projek inovasi berasaskan aplikasi android yang menarik dan berkesan untuk memantapkan penguasaan topik pembundaran dikalangan murid. Dengan kemudahan akses kepada My BundUler yang mudah, murid tidak mempunyai sebarang kekangan untuk menguasai pembundaran seterusnya meminati subjek Matematik dengan menyeluruh. Mempunyai ciri-ciri yang menarik dan unik, pastinya murid lebih bersemangat dan tertarik untuk memahami pembundaran sambil bermain kuiz atas talian. Semoga My BundUler dapat disebarluaskan untuk kegunaan semua.

PENGAKUAN (*PILIHAN)

Kami, SKePa Rangers Team mengucapkan setinggi-tinggi penghargaan kepada semua guru SK Pauh terutamanya, Guru Besar yang sentiasa memberikan sokongan dan motivasi untuk kami merealisasikan projek inovasi ini.

RUJUKAN (*PILIHAN, MAKSIMUM 6 RUJUKAN YANG RELEVAN)

Homepage. Mit app inventor <https://appinventor.mit.edu/>

PID10242

OxyPulse Alert System

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ABSTRACT

Oxypulse Alert System: Advanced Oxygen Level and Heart Rate Monitoring with Alert Solution.

Introduction

The Oxypulse Alert System offers real-time monitoring of oxygen levels and heart rates, with immediate alerts for various users including medical professionals, home care providers, athletes, and high-risk individuals. Its compact design, user-friendly interface, and WiFi connectivity ensure ease of use, while data storage through Google Sheets allows for convenient review and analysis.

Features

- Real-Time Monitoring
- Immediate Alerts
- User-Friendly Interface
- WIFI Connectivity
- Compact and Portable

Specifications

- Display: 0.96-inch OLED display
- Connectivity: WIFI
- Dimensions: 7cm x 5cm x 5cm
- Weight: 0.065kg

Benefits

- Convenience and Ease of use
- Early Detection
- Emergency Preparedness to enhance Patient Safety
- Reducing caregivers' Workload

Usage

1. Power On: Press the power button to turn on the device
2. Place Sensor: Attach the fingertip to the sensor
3. Monitor: View real-time data on the display
4. Alerts: when the data meets any of the stated conditions, the system automatically sends a notification to the caregivers through Telegram for immediate action
5. Sync: data storage through Google Sheets for review and data storage

Target Audiences

- Medical Professionals
- Home Care Providers
- Athletes and Fitness Enthusiasts
- Elderly and High-Risk Individuals

KEYWORDS: OxyPulse, Measurement, Spo2, Alert

PRODUCT DESCRIPTION

The OxyPulse Alert System excels in continuous, real-time monitoring of oxygen saturation levels and heart rates, enhancing patient safety through early detection and automatic alerts. Its portability, user-friendly design, and wireless connectivity allow for seamless integration with hospital systems and remote monitoring solutions, making it highly adaptable across diverse healthcare settings.

Key features such as continuous monitoring, optional manual or auto mode, and data transfer to Google Sheets via Arduino Wemos D1 R1 ensure comprehensive monitoring and facilitate easy access to crucial patient data. Its unique selling points, including high accuracy and reliability, customizable alerts, integration capabilities, and comprehensive data management, highlight its commitment to providing advanced patient care.

The system's effectiveness in ensuring patient safety is highlighted by innovative features such as advanced sensor technology, cloud-based data storage, alert system management, and remote monitoring capabilities. Its applications span from continuous patient monitoring in hospitals to remote monitoring in home healthcare, addressing diverse needs including monitoring elderly and at-risk populations.

Its benefits, including early detection, emergency preparedness, and reducing caregivers' workload, make it an indispensable tool for clinics, hospitals, outpatient centers, home healthcare providers, long-term care facilities, and fitness centers.

Hardware Specifications:

- SCL and SDA lines for clock and data transfer
- GND for stable ground
- 3.3V line for device power
- A1 for analog signal input
- 0.96-inch OLED display
- MAX30100 Pulse and SpO2 sensor
- Tact Switch
- IoT Processor: Arduino Wemos D1 R1

Software Specifications:

Measurement of Oxygen Saturation (SpO2) and Pulse rate

Data Storage and Logging:

Cloud Storage with syncing capability

Alerts and Notifications:

Customizable thresholds for SpO2 and heart rate alerts

Visual, audible, and vibration alerts

Remote alerts sent to caregivers via app

Integration and Compatibility:

API Access for integration with third-party health apps and systems

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



Figure 1: Component & Connection

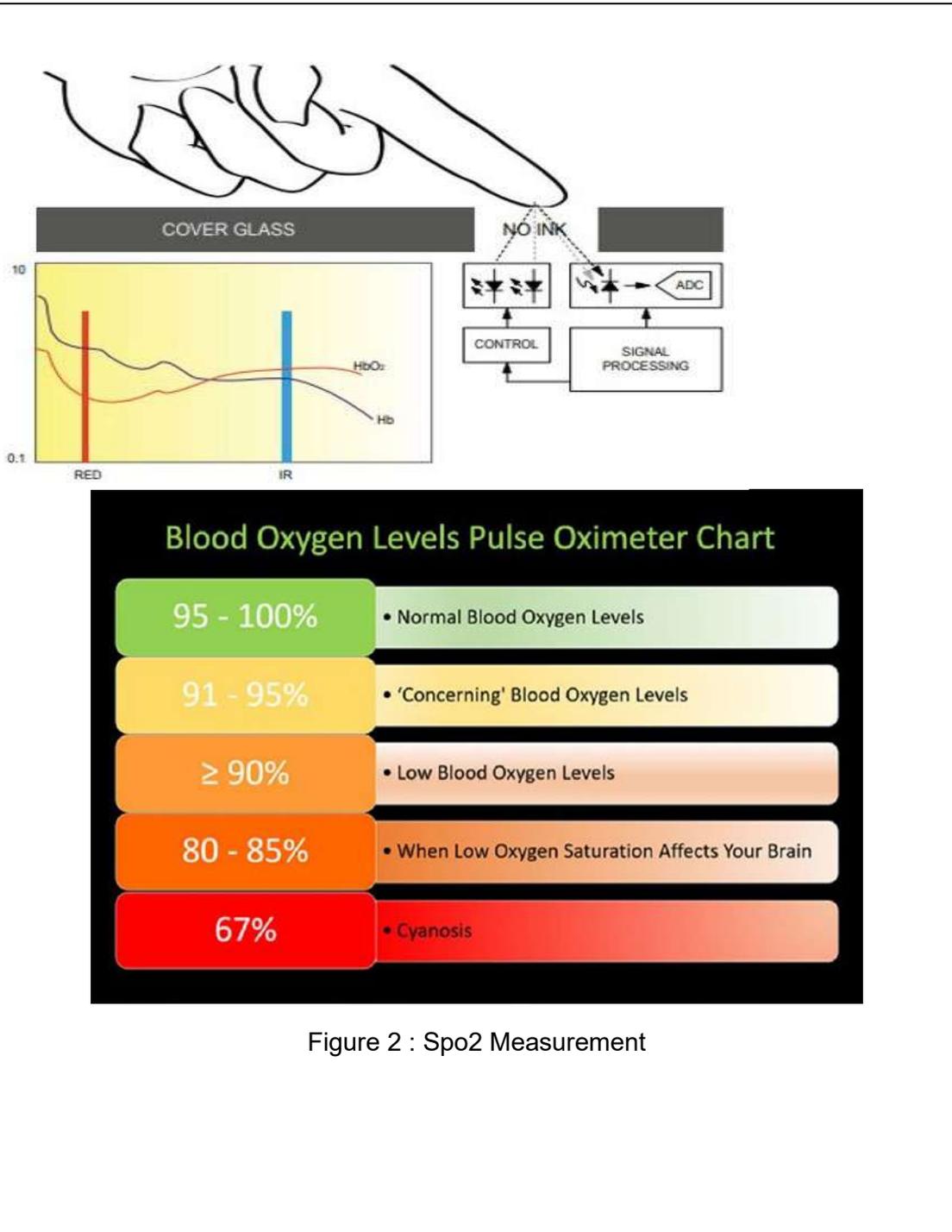


Figure 2 : Spo2 Measurement

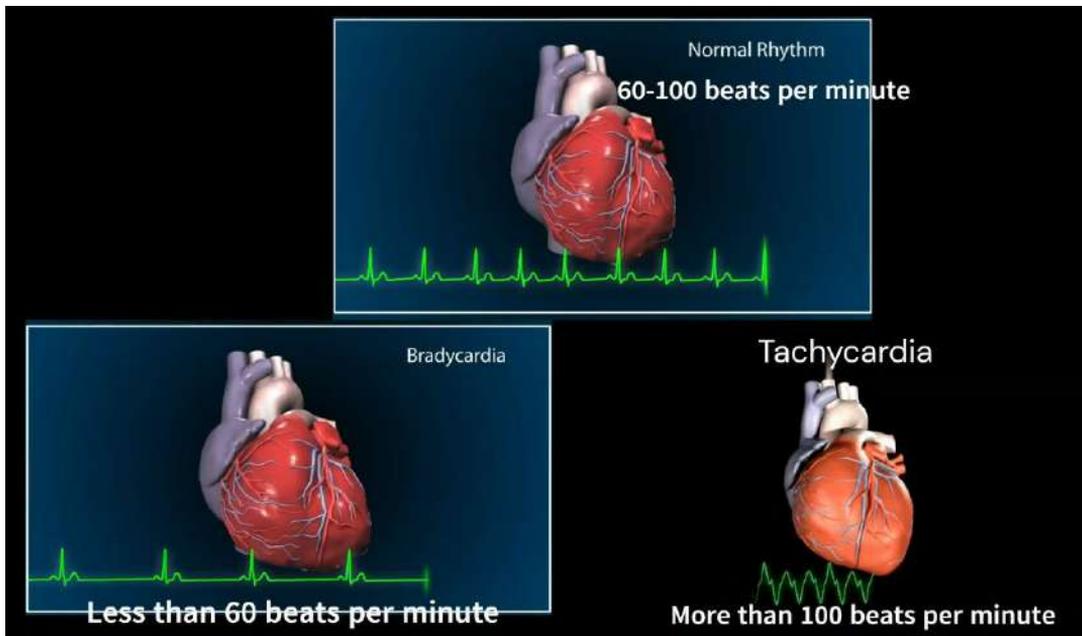
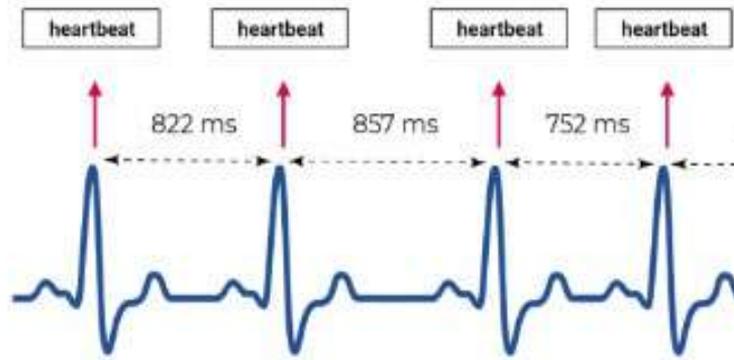
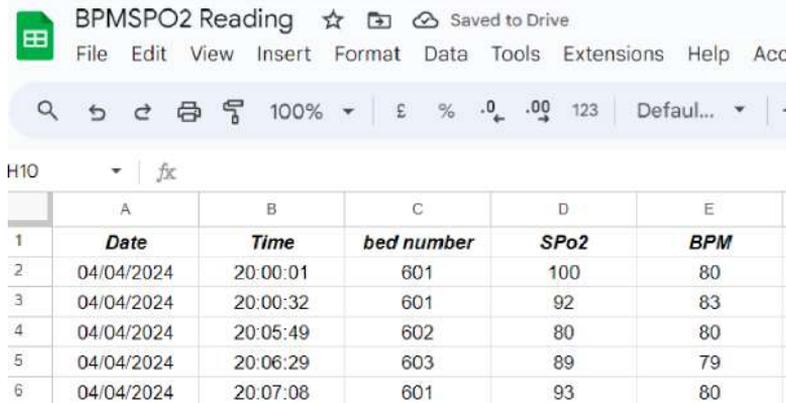


Figure 3: Heart Rate Measurement



	A	B	C	D	E
1	Date	Time	bed number	SPo2	BPM
2	04/04/2024	20:00:01	601	100	80
3	04/04/2024	20:00:32	601	92	83
4	04/04/2024	20:05:49	602	80	80
5	04/04/2024	20:06:29	603	89	79
6	04/04/2024	20:07:08	601	93	80

Figure 4: Data Logging Using Google Sheet

Data Logging Using Google Sheet: We use Google Sheets as an IoT cloud to log the data generated by a Pulse and SpO2 Sensor.

Google Sheet: Google Sheet is used, and credentials such as the Google Sheet ID need to be set up. These will be written in the Arduino and Python Program.

```

if (SendDataStatus == 0) {
  if (!client.connect(host, httpsPort)) {
    display.clearDisplay();
    display.setCursor(0, 0);
    display.setTextSize(1);
    display.print("host connection failed.... ");
    display.display();
    return;
  }
  SendDataStatus++;
} else if (SendDataStatus == 1) {
  String string_room = String(Bed, DEC);
  String string_spo2 = String(spo2, DEC);
  String string_bpm = String(heartRate, DEC);
  String url = "/macros/s/" + GAS_ID + "/exec?room=" + string_room + "&spo2=" + string_spo2 + "&bpm=" + string_bpm;
  client.print(String("GET ") + url + " HTTP/1.1\r\n" +
    "Host: " + host + "\r\n" +
    "User-Agent: BuildFailureDetectorESP8266\r\n" +
    "Connection: close\r\n\r\n");

  SendDataStatus++;
} else if (SendDataStatus == 2) {
  if (client.connected()) {
    SendDataStatus++;
  }
} else if (SendDataStatus == 3) {
  line = client.readStringUntil('\n');
  if (line == "\r") {
    SendDataStatus++;
  }
}

```

```

message = None

# Check the condition for BPM
if BPM < 60:
    message = "BPM less than 60! Bradycardia diagnosed"
elif BPM > 100:
    message = "BPM more than 100! Tachycardia diagnosed"
else:
    message = None
    if SPO2 <= 67:
        message = "Cyanosis"
    elif SPO2 <= 85:
        message = "Low Oxygen Saturation"
    elif SPO2 <= 90:
        message = "Low Blood Oxygen Level"
    elif SPO2 <95:
        message = "SPO2 less than 95! 'Concerning' Blood Oxygen Level "
    else:
        message = None

# If message is not None, send the message
if message:
    # Define the URL for the Telegram Bot API
    url = f"https://api.telegram.org/bot{bot_token}/sendMessage"

    # Define the request parameters
    params = {
        "chat_id": chat_id,
        "text": message
    }

    # Send the message
    response = requests.post(url, json=params)

    # Check if the message was sent successfully
    if response.status_code == 200:
        print("Alert message sent successfully!")
    else:
        print("Failed to send alert message:", response.text)
else:
    print("No alert message to send")

```

Figure 5 : Sending Notification

NOVELTY AND UNIQUENESS

The Oxypulse Alert System introduces a novel approach to continuous health monitoring by combining advanced pulse oximetry with real-time alert capabilities. Unlike traditional oximeters, it offers seamless integration with cloud platforms, enabling remote monitoring and instant notifications for caregivers and medical professionals.

This innovation enhances patient safety and care efficiency, particularly for chronic and high-risk conditions, setting a new standard in proactive health management.

BENEFIT TO MANKIND

The Oxypulse Alert System revolutionizes healthcare by continuously monitoring oxygen levels and heart rates in real-time, providing early detection of respiratory distress and other potential issues. This innovation dramatically improves patient outcomes, especially in critical care settings, reducing the risk of complications and saving lives.

Its seamless integration into existing healthcare infrastructure enhances efficiency, reduces healthcare costs, and empowers medical professionals with timely data for informed decision-making. Moreover, its accessibility and affordability make it globally relevant, particularly in resource-limited regions, ensuring equitable healthcare access and advancing global health initiatives.

COMMERCIALIZATION POTENTIAL

Market demand and size are influenced by several key factors:

- Growing Health Consciousness
- Aging Population
- Rise in Chronic Diseases.
- Influence of the COVID-19 Pandemic.

Its key competitive advantages lie in its ability to provide real-time and accurate data on oxygen levels and heart rates, offering immediate alerts in case of abnormalities. Moreover, its intuitive design makes it accessible to users of all backgrounds.

The scalable business model ensures widespread adoption, while cost analysis shows competitive pricing with high profit margins. Intellectual property protection secures technological advancements. Additional factors such as regulatory compliance and customer feedback further bolster its commercial viability.

CONCLUSION

The project is successful as it has produced a 100% working prototype. Sustainability can also be defined in social terms, meaning improving the quality of life. This project not only helps medical staff and family members but also enables patients to receive treatment more quickly. Additionally, the system's remote monitoring capabilities are particularly advantageous for chronic and high-risk patients, allowing for home monitoring and reducing hospital visits.

Overall, the Oxypulse Alert System's ability to improve patient outcomes, potentially reduce healthcare costs, and alleviate the burden on caregivers makes it a valuable asset for modern healthcare systems.

Future development plans for the OxyPulse Alert System include incorporating advanced analytics and AI to predict future health events based on data trends. Additionally, the system will utilize 3D printing technology and nylon filament to create a waterproof container.

ACKNOWLEDGEMENT (*OPTIONAL)

As the team leader, I am deeply grateful to everyone who contributed to this project's success.

Thank you to my teammate, NG RUI EN, for your dedication and hard work. Your collaboration was invaluable.

Special thanks to our project advisors, Cikgu Siti Sarah binti Noor Meah from SMJK JIT SIN and Puan See Peck Chin, for your expert guidance and support.

We also appreciate the support from the School Organization for providing essential resources.

Finally, heartfelt thanks to our family and friends for their constant encouragement.

Sincerely,
TeamLeader,
NG KAI SHENG

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PID10252

EGNA 2.0: Baja Semulajadi

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ABSTRAK

Kulit telur dan kulit pisang adalah sisa domestik yang digunakan untuk menghasilkan baja organik ini. Ia berkos efektif. Salah satu inovasi dalam penghasilan baja organik. Dapat meningkatkan ekonomi masyarakat setempat. Mengurangkan kebergantungan terhadap bahan kimia di pasaran. EgNa fertilizer ini juga berfungsi sebagai baja organik serta dapat menyelesaikan masalah setempat berkenaan dengan lambakan kulit telur. Inovasi ini dapat membuktikan keberkesanan kulit telur dan kulit pisang membantu pertumbuhan pokok. Produk ini mesra alam, mudah & jimat serta lebih selamat. Keputusan eksperimen yang diperoleh ialah nilai pH neutral dan pokok menjadi lebih subur apabila ditambah baja EgNa. Antara sumbangan produk ini adalah mengurangkan jumlah pokok mati akibat baja kimia. Seterusnya, ia juga dapat meningkatkan ekonomi setempat dan mengoptimumkan penggunaan kulit telur dan kulit pisang serta dapat mengurangkan pencemaran. Tiada baja lain yang menggunakan kulit telur dan kulit pisang sebagai bahan utama. Mudah untuk digunakan. Menjimatkan sumber semula jadi. Meningkatkan ekonomi penduduk setempat. Mengurangkan masalah lambakan kulit telur dan kulit pisang. Produk ini berpeluang dipasarkan kerana bahan asasnya semula jadi dan ia menguntungkan. Keuntungan dijangka seawal suku tahun pertama pemasaran. Produk ini sangat menarik perhatian pembeli khususnya pencinta alam. Penggunaannya dikhususkan dalam industri pertanian. Kumpulan sasaran adalah petani dan pekebun. Kaedah penghasilannya adalah ayak kulit yang telah dikisar untuk mendapatkan serbuknya. Serbuk kulit telur dicampurkan dengan kulit pisang yang telah di gunting. Tambahkan sedikit air kemudian kisar kedua-dua bahan tersebut. Bahan yang telah dikisar kemudian dipanaskan selama 15 hingga 20 minit. Baja yang telah dipanaskan kemudian dituras menggunakan kain.

KATA KUNCI: Kulit telur, Baja organik

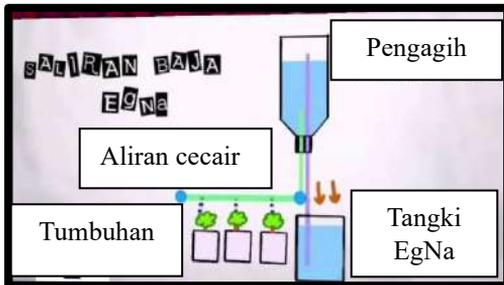
PENERANGAN PRODUK

Tujuan projek ini adalah untuk mengatasi masalah penduduk setempat yang menghadapi masalah lambakan kulit telur dan kulit pisang. Inovasi ini diharapkan mampu memberikan penyelesaian terhadap masalah penduduk setempat serta meningkatkan ekonomi mereka serta mengurangkan pencemaran alam akibat dari pembuangan lambakan kulit telur. Rasional penghasilan produk ini adalah untuk mengatasi masalah lambakan kulit telur dan kulit pisang serta menyelesaikan masalah ekonomi penduduk setempat. Dilihat produk ini sangat signifikan dalam menyelesaikan masalah yang dihadapi. Keboleh pasaran baja EgNa ini dilihat mampu memberikan daya saing kepada produk berasaskan baja yang lain kerana lebih jimat, mesra alam serta boleh dipercayai.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN



Gambarajah1: EgNa Serbuk & Egna Cevair



Rajah 2: carta alir penggunaan EgNa 4.0

EKPERIMEN	KEPUTUSAN
Nilai pH	pH 8
Pertumbuhan pokok melawan kehadiran EgNa	EgNa meningkatkan pertumbuhan pokok
Perbandingan Serbuk EgNa dan Cecair EgNa	Cecair lebih berkesan berbanding serbuk
Perbandingan Kandungan Baja EgNa dengan baja lain	Baja EgNa lebih berkesan berbanding baja lain
Jisim EgNa dengan pertumbuhan pokok	Jika jisim EgNa 20 g, maka pertumbuhan pokok meningkat

Jadual 1: Eksperimen Baja EgNa

Keputusan eksperimen menunjukkan bahawa EgNa sangat berkesan dalam membantu anak pokok, neutral, selamat dan mudah alih. Hasil eksperimen adalah nilai pH neutral dan pokok menjadi lebih subur apabila ditambah ke dalam sekam telur. Antara produk yang menyumbang untuk mengurangkan jumlah tumbuhan mati yang disebabkan oleh baja kimia. Tambahan pula, ia juga meningkatkan ekonomi tempatan dan mengoptimumkan penggunaan kulit telur dan mengurangkan pencemaran. Tiada baja lain menggunakan kulit telur sebagai bahan utama. Mudah untuk digunakan. Menjimatkan sumber semula jadi.

KEBAHARUAN DAN KEUNIKAN

Penghasilan produk berasaskan sisa domestik (kulit pisang dan kulit telur) yang belum ada dipasaran. Kreativiti dalam penghasilan produk bertunjangkan baja EgNa seperti baja organik

MANFAAT KEPADA MANUSIA

1. Mengurangkan penggunaan bahan kimia dalam baja.
2. Menjimatkan sumber semula jadi
3. Mengurangkan pencemaran alam.
4. Meningkatkan ekonomi penduduk setempat
5. Mengurangkan pembuangan kulit telur dan kulit pisang.
6. Mengurangkan kadar lambakan kulit telur dan kulit pisang.
7. Dapat meningkatkan kualiti baja

POTENSI UNTUK PENGGOMERSILAN

Produk EgNa Fertilizer dilihat relevan untuk diguna pakai kerana jumlah kulit telur dan kulit pisang yang banyak dibuang setiap tahun. Produk yang dihasilkan turut dilihat relevan untuk diguna pakai dan sesuai dipasarkan. Dapat dipasarkan sebagai produk mesra alam. Menguntungkan kerana bahan asasnya semula jadi. Keuntungan dijangka seawal suku tahun pertama pemasaran. Produk ini sangat menarik perhatian pembeli khususnya pencinta alam.

KESIMPULAN

Baja EgnA Fertilizer ini dapat ditambahbaik dengan meningkatkan campuran kulit pisang dan kulit telur dalam adunan EgNa Fertilizer. Produk EgNa Fertilizer dilihat mampu memberikan impak positif terutamanya kepada masyarakat setempat dalam meningkatkan taraf ekonomi mereka. Produk EgNa fertilizer yang dihasilkan dapat digunakan dalam menyelesaikan masalah berkaitan kehidupan seharian. Baja EgNa mudah digunakan. Ia membantu orang ramai menguruskan masa dan meningkatkan produktiviti mereka. Ia juga menjimatkan sumber alam semula jadi dengan menggunakan bahan buangan. Penggunaan EgNa boleh meningkatkan ekonomi tempatan dengan meningkatkan hasil tanaman mereka, menyediakan peluang pekerjaan baru dan ia juga boleh mengurangkan masalah kulit telur dan pisang yang dibuang. Kesimpulannya, Baja EgNa adalah produk terbaik untuk menyelesaikan masalah alam sekitar.

PENGAKUAN

Ribuan terima kasih kepada pihak sekolah kerana memberi kepercayaan dan keyakinan kepada peserta pertandingan dengan memberikan sumbangan untuk menghasilkan baja EgNa. Pentadbir sekolah, guru-guru dan staf makmal turut menyumbang idea dan tenaga sepanjang penghasilan produk inovasi ini. Pembuatan model prototaip untuk baja turut di bantu oleh ahli komuniti, En Ismail Bin Pahmi.

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PID10262

Soldier biscuit (SoCuut)

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Nur Atiqah Husna binti Mohamad Samsudin¹,

Alesya Amara binti Abdul Halim¹, Suhaimi Sulong^{1,*}

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ABSTRAK

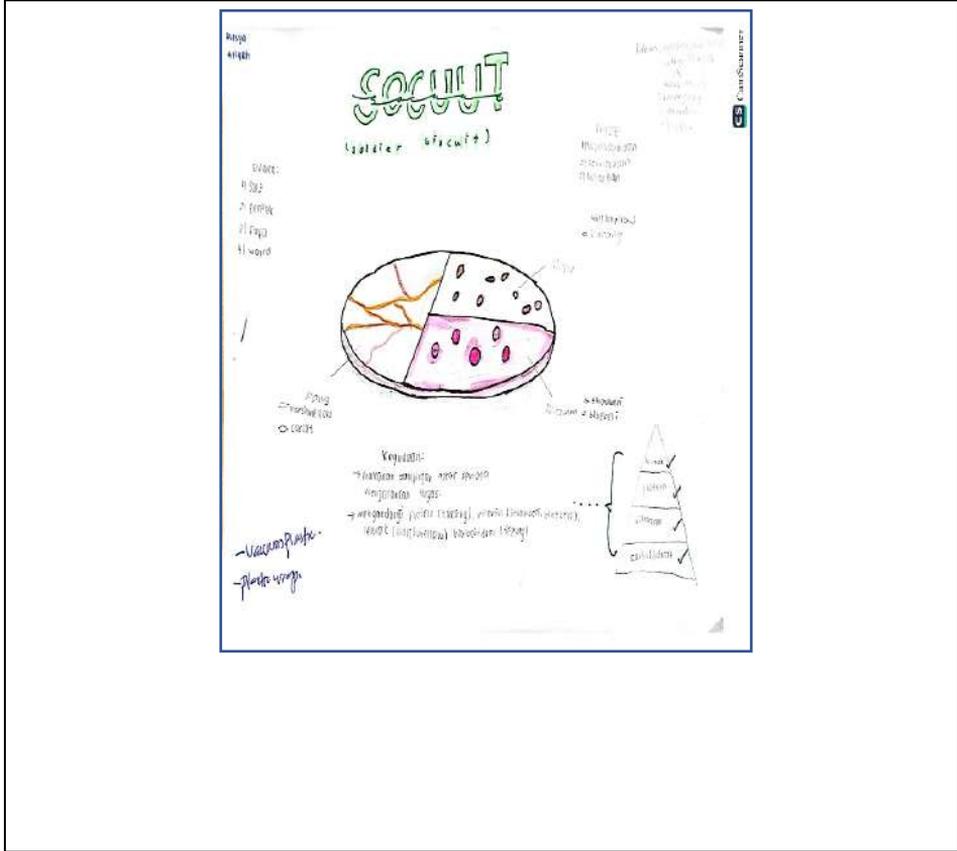
Produk **Soldier Biscuit (SoCuut)** dihasilkan dengan tujuan untuk menambah baik biskut askar yang sedia ada bagi menjadikannya lebih menyelerakan dan mengenyangkan. Biskut askar (SoCuut) ciptaan kami ini, kami hasilkan dengan meneliti dari semua aspek sama ada dari aspek kelemahan biskut askar sedia ada seperti kurang menyelerakan, kurang sihat dan sukar dibawa ke mana-mana mahupun dari aspek kelebihan biskut askar ciptaan kami seperti lebih menyelerakan dan mudah dibawa ke mana-mana. Biskut askar (SoCuut) ini dilengkapi dengan prinsip reka bentuk makanan seperti kepelbagaian, keringkasan dan kesatuan. Selain itu, terdapat juga elemen reka bentuk makanan seperti saiz, bentuk, rupa dan warna. Kami menggabungkan reka bentuk makanan dan reka bentuk pemasaran untuk menghasilkan biskut askar (SoCuut) ini. Terdapat pelbagai penambahbaikan yang ditambah baik dalam ciptaan biskut askar (SoCuut) ini. Walau bagaimanapun, kami masih mengekalkan ketahanan produk ini iaitu biskut askar ini dapat bertahan lama demi memudahkan askar-askar untuk menyimpan biskut ini dan dapat dimakan pada bila-bila masa sahaja tanpa perlu membeli yang baharu kerana telah capai tarikh tamat tempoh.

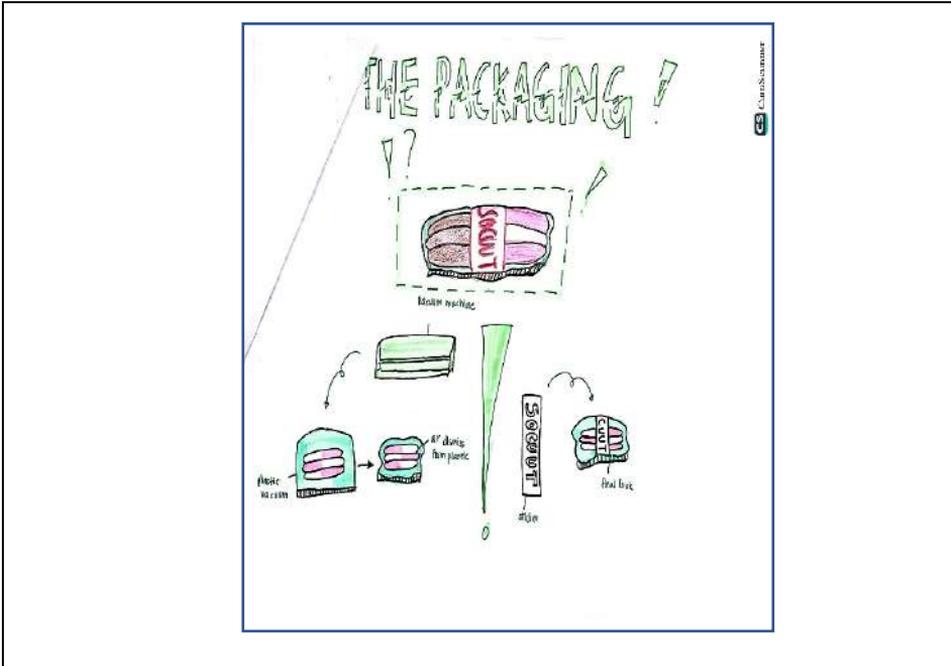
KATA KUNCI: Menambah Baik, Semua Aspek, Ketahanan Produk, Reka Bentuk Makanan, Reka Bentuk Pemasaran

PENERANGAN PRODUK

Soldier Biscuit (SoCuut) mempunyai pelbagai ciri yang menarik seperti mudah disebut , ringkas , mudah digunakan , tidak mudah rosak. Lanya juga berfungsi untuk memudahkan askar-askar untuk menyimpan dan makan pada bila-bila masa tanpa perlu memikirkan tarikh tamat tempoh . Kami mengambil inisiatif iaitu dengan menambah baik biskut askar yang sedia ada dengan melihat dari semua aspek. . Terdapat pelbagai keunikan dan faktor kebolehpasaran produk ini seperti dapat tahan lama dengan penggunaan marshmellow serta bahan-bahan lain yang tidak mudah rosak, yang dapat membuatkan produk ini bertahan lebih lama.Biskut ini dapat dilihat dengan jelas bahawa ia dihasilkan khas untuk para askar.Kami terinspirasi untuk membuat biskut ini kerana biskut askar yang sedia ada mempunyai rasa yang tawar dan askar semestinya mahukan biskut yang lebih menyelerakan dan lebih berkhasiat. Dengan itu, beginilah cara biskut askar (SoCuut) ini dicipta.

LAKARAN / TANGKAPAN PRODUK





KEBAHARUAN DAN KEUNIKAN

Kami menggabungkan prinsip reka bentuk makanan dan reka bentuk pemasaran agar produk ini menjadi lebih produktif dan efisien. Kami memilih reka bentuk yang agak unik iaitu berbentuk bulat yang mempunyai beberapa pecahan. Keunikan daripada produk ini, kami mengaplikasikan prinsip kepelbagaian, keringkasan dan kesatuan. Kebaharuan produk kami adalah terdapat 3 jenis perisa dalam satu biskut iaitu yang berperisa manis (coklat), masam (buah beri) dan masin (kacang). Tambahan lagi, kebaharuan produk kami yang menjadi bahan menarik yang utama ialah kami menggunakan biji nangka dan cempedak yang dapat dikaitan dengan ubi-ubian.

MANFAAT KEPADA MANUSIA

Produk ini dapat memberi banyak manfaat kepada pengguna. Antaranya, pengguna mudah untuk membawa biskut ini kemana-mana. Hal yang demikian kerana, bentuk dan bungkusan yang kecil dan mudah untuk dibawa kemana-mana. Seterusnya, biskut ini dapat mengekalkan Kesihatan badan serta tidak akan memberi kesan buruk terhadap kesihatan pengguna. Ini kerana biskut askar ciptaan kami ini mengikut piramid makanan yang terdiri daripada karbohidrat, protein, vitamin dan

lemak dalam kuantiti yang tertentu. Kesannya, biskut ini sedikit sebanyak dapat mengenyangkan askar-askar. Tambahan lagi, kesan daripada penggunaan biji nangka dan cempedak ini seperti dapat bantu melawan peradangan dan meningkatkan sistem kekebalan tubuh. Ini adalah kerana biji nangka dan cempedak mempunyai antioksidan yang tinggi.

POTENSI UNTUK PENGKOMERSILAN

Produk ini berpotensi untuk dikomersilkan kerana kos yang lebih rendah, jimat dan berbaloi. Hal yang demikian kerana produk ini mudah dihasilkan dan bahan-bahan yang digunakan berkos rendah. Selain itu, produk ini juga mempunyai reka bentuk yang menarik sama ada dari aspek biskut itu sendiri mahupun bungkusannya. Dengan itu, produk ini dapat menarik perhatian pengguna untuk membeli dan mencuba biskut askar ini. Produk ini dicipta dengan diinspirasikan oleh askar-askar, namun orang awam juga boleh mencuba biskut ciptaan kami ini. Terlebih lagi, kami menggunakan bahan yang berkhasiat serta bahan yang tidak pernah digunakan oleh orang lain didalam suatu projek masakan iaitu penggunaan biji nangka dan cempedak.

KESIMPULAN

Dengan meletakkan harapan yang tinggi, Kami percaya dan yakin produk ini dapat membantu askar-askar dan pengguna lain dari pelbagai aspek. Hal ini kerana kami menghadapi pelbagai halangan dan cabaran untuk menyelesaikan projek tersebut agar dapat memudahkan urusan para pengguna berkaitan pencarian makanan yang mengandungi zat yang secukupnya. Projek ini juga dapat mengembangkan lagi kemajuan negara kita serta dapat mengembangkan lagi idea-idea bernas dari generasi yang akan datang.

PENGAKUAN (*PILIHAN)

Kami mengucapkan ribuan terima kasih kepada guru kami kerana sentiasa membantu kami dalam menyiapkan projek ini. Walaupun kami menghadapi banyak cabaran dan masalah yang harus dihadapi, guru kami sentiasa menyokong, memberi semangat untuk melakukan dan menyiapkan projek ini dengan lancar dan baik. Semoga projek ini dapat memberi banyak manfaat kepada semua.

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PID10271

ANTI SLEEP SAVE YOUR LIFE

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ABSTRACT

Driver fatigue is a significant contributor to road accidents, especially among long-haul truck drivers and transport operators. To address this critical concern, we propose an innovative solution: the “Anti-Sleep Eye Blink Detection System for Drivers Using IR Sensor.” The primary objective of our system is to prevent accidents caused by drowsy driving. Our system utilizes an IR sensor to monitor the driver’s alertness levels. When the driver wears the specially designed spectacles with the sensor fitted, it continuously tracks eye movements. When the driver closes their eyes for an extended period, the system triggers an alert. This alert can be in the form of a beep or vibration, ensuring that the driver regains focus and opens their eyes promptly. The system continuously analyzes the driver’s eye blinks. If prolonged eye closure occurs, the alert mechanism activates, prompting the driver to take corrective actions. By addressing drowsiness-induced lapses in attention, our system significantly reduces the risk of accidents caused by fatigue. In conclusion, the “Anti-Sleep Eye Blink Detection System for Drivers Using IR Sensor” project holds immense potential to enhance road safety. By empowering drivers with timely alerts, we pave the way for safer roads and a more secure transportation ecosystem.

KEYWORDS: Anti Sleep, Eye Blink, Sensor, Driver, Alert, Accidents

PRODUCT DESCRIPTION

Develop an innovative anti-sleep eye blink detection system for drivers using an infrared (IR) proximity sensor. These glasses incorporate an eye blink sensor that continuously monitors the driver’s eye blinks. If the driver’s eyes remain closed for a specific duration (indicating drowsiness), the glasses activate an alert system. This system includes a vibration

sensor that vibrates and a buzzer that beeps to 6th Digitalised International Invention, Innovation and Design Competition (DIID 2024) wake up the driver. Some advanced versions even include a GSM module to notify the vehicle owner if the driver falls asleep, providing location information and nearby police stations. Pupil identification technology analyzes pupil characteristics to determine fatigue or inattention. These glasses enhance road safety by combating drowsiness-related accidents during long drives, night shifts, and late-night study session. The system serves to prevent accidents caused by driver drowsiness by detecting and alerting the driver about potential fatigue-induced lapses in attention. The development of anti-sleep spectacles using IR sensors would require careful consideration of comfort, power efficiency, and data accuracy. These innovative spectacles could find applications not only in preventing drowsy driving but also in industries where alertness is crucial, such as aviation, long-haul trucking, and heavy machinery operation.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

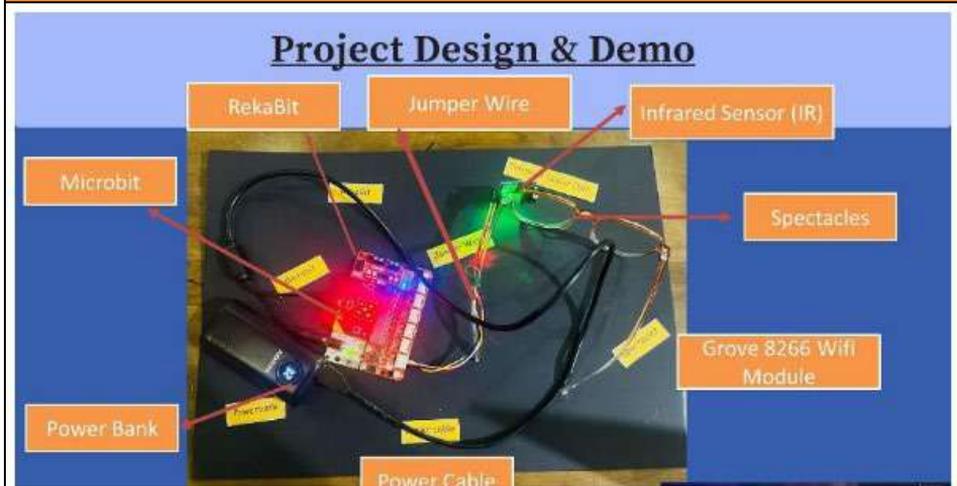


Figure 1 : Project Design & Demo

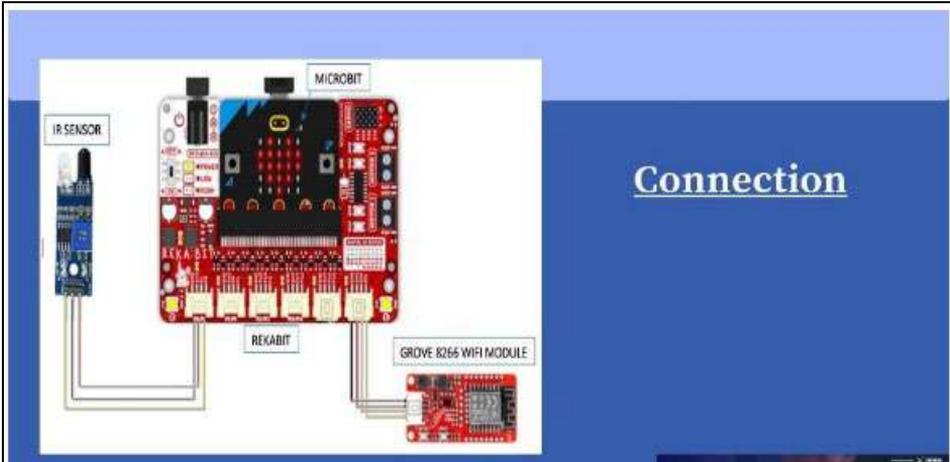


Figure 2 : Connection



Figure 3 : Project Design (Software)

NOVELTY AND UNIQUENESS

The novelty and uniqueness of anti-eye blink spectacles, also known as drowsiness detection glasses, lie in their ability to prevent accidents caused by driver fatigue. These innovative glasses incorporate an eye blink sensor that continuously monitors the driver’s eye blinks. If the driver’s eyes remain closed for a specific duration (indicating drowsiness), the glasses activate an alert system. This system includes a vibration sensor that vibrates and a buzzer that beeps to wake up the driver. Some advanced versions even include a GSM module to notify the vehicle owner if the driver falls asleep, providing location information and nearby police stations. Pupil identification technology analyzes pupil

characteristics to determine fatigue or inattention. These glasses enhance road safety during long drives, night shifts, and late-night study sessions.

BENEFIT TO MANKIND

Anti sleep device enhance road safety by reducing the risk of accidents caused by drowsy or fatigued individuals. It improve drivers performance and can make drivers more aware of their fati gue levels. This increased awareness may prompt them to take breaks, rest when needed, or avoid driving altogether when they are too tired, thereby reducing the risk of accidents. Anti eye blink help them stay alert during long hours on the road. helping drivers stay focused and attentive on the road.

COMMERCIALIZATION POTENTIAL

The commercialization potential of anti-eye blink spectacles lies in their ability to address a critical safety concern: preventing accidents caused by driver fatigue. As road safety becomes increasingly important, these innovative glasses can find applications in various sectors:

- **Transportation Companies:** Fleet operators can equip their drivers with anti-eye blink spectacles to reduce accidents and insurance costs.
- **Long-Haul Trucking:** Truck drivers often face fatigue during extended journeys; these glasses can enhance their alertness.
- **Public Transport:** Bus and taxi drivers can benefit from this technology, ensuring passenger safety.
- **Personal Vehicles:** As awareness grows, individual drivers may invest in these glasses for added safety during long trips. By marketing them effectively and emphasizing their life-saving potential, manufacturers can tap into a growing demand for safer roads.

These spectacles are particularly valuable during long journeys or night driving, where fatigue-related accidents are more common. By promoting driver safety and reducing the risk of accidents due to drowsiness, anti-eye blink spectacles enhance road safety and protect lives.

CONCLUSION

In conclusion, the "Anti-Sleep Eye Blink Detection System" for drivers project has successfully addressed a critical concern in road safety: driver fatigue and drowsiness. By alerting drivers and family members enabling them to take timely corrective actions. The system contributes to safer roads and a more secure driving environment for all. Incorporating IR sensors into anti-sleep spectacles and linking them with notification systems like Telegram represents a promising solution to combat drowsy driving and improve safety in various industries. By promoting driver safety and reducing the risk of accidents due to drowsiness, anti-eye blink spectacles enhance road safety and protect lives. Remember, staying awake and attentive behind the wheel is crucial for everyone's safety on the road.

PID10281

AI E-Library

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Visshalan A/L Gunasilan¹, Komathi A/P Ramasamy¹
Gavitha A/P Kanapathy¹, Theeba A/P Yellapan¹

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ABSTRACT

The main challenge of current library system is very outdated and there are a lot of limitation. As a solution, we develop this AI E-Library system. Our key challenges were integrating the recognition technology while keeping the system user-friendly. This system is in line with United Nations Sustainable Development Goals or SDG number 4 and SDG number 9. Our system features are, secure login through face recognition, borrowers' basic details, inventory of books that available in the school library, the books returning due dates and a notification on due dates of books returning. In this system, the librarian can view the borrowed books and due dates in a user-friendly dashboard. The students can receive reminders via notifications to return books on time. The students also can easily renew book if needed. In the face recognition login, the students can log in securely using face recognition technology and no need to remember passwords, just look at the camera. In the main dashboard whereby, the librarian can view all the relevant details such as number of borrowed books, types of books at the library and so on. In this era of ICT and AI, the digitalization of library system is vital and to get rid of from the outdated traditional way of managing the library system. So, we produce reading student community to ensure a better future for all.

KEYWORDS: Library, AI, Face Recognition

PRODUCT DESCRIPTION

AI FACE RECOGNITION E-LIBRARY SYSTEM

Our key challenges were integrating the recognition technology while

keeping the system user-friendly. This system is in line with United Nations Sustainable Development Goals or SDG number 4 and SDG number 9. Our system features are, secure login through face recognition, borrowers' basic details, inventory of books that available in the school library, the books returning due dates and a notification on due dates of books returning.

- i. Borrowed books
- ii. Due Dates
- iii. Receive notifications
- iv. Log in securely using face recognition

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



Figure 1 : System Interfaces (Librarian Login, Librarian Page)



Figure 2 : System Interfaces (Face Scan)



Figure 3 : System Interfaces (Dashboard)

BENEFIT TO MANKIND

In this system, the librarian can view the borrowed books and due dates in a user-friendly dashboard. The students can receive reminders via notifications to return books on time. The students also can easily renew book if needed. In the face recognition login, the students can log in securely using face recognition technology and no need to remember passwords, just look at the camera. In the main dashboard whereby, the librarian can view all the relevant details such as number of borrowed books, types of books at the library and so on.

COMMERCIALIZATION POTENTIAL

This system provides effective technical support for the construction of smart libraries in schools. The commercialization potential lies in enhancing security management, reader identity authentication, and service levels in libraries. Using face recognition technology in libraries helps keep our books safe. Integrating face recognition technology into library systems can lead to efficient and secure operations benefiting both staff and students.

CONCLUSION

In this era of ICT and AI, the digitalization of library system is vital and to get rid of from the outdated traditional way of managing the library system. So, we produce reading student community to ensure a better future for all.

PID10291

BESTARI IOT FARM

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ABSTRACT

The Bestari IoT Farm project aims to revolutionize traditional farming practices by integrating smart technologies. The project detects soil moisture levels using specialized sensors and automates irrigation, ensuring optimal water usage. It provides real-time temperature and moisture data for informed decision-making. The sensors gather and analyze data about changing weather, soil moisture, moisture conditions, water temperature and water level. This system saves manpower and efficiently utilizes the water resources available, ultimately leading to more profit. The Bestari IoT Farm aims to enhance overall productivity by optimizing resource usage and improving crop management. Increased crop yield due to efficient irrigation and data-driven decisions contributes to food security. This innovation focus on SDG 6, SDG 9, SDG 12 SDG 13, and SDG 15: Bestari IoT Farm offers numerous advantages to farmers and garden owners, including improved efficiency, increased crop yield, resource conservation, data-driven decision-making, and remote monitoring and control. By adopting these technologies, farmers can enhance productivity, reduce costs, and make more sustainable and informed farming decisions.

KEYWORDS: IoT, Sensors, Moisture Level, SDG

PRODUCT DESCRIPTION

The main aim of this project is to maintain the nature of the plants. To build an intelligent farm with the Smart Agriculture. This product is used to determine the moisture content of the soil. Next is to make it easier for farmers and gardeners to keep track of their soil moisture and temperature levels. The third aim is to keep the fish safe in ponds by checking the water temperature and the water level. Our BESTARI IOT FARM keeps our garden safe by censoring people who get in.

The sensors gather and analyze data about changing weather, soil moisture, moisture conditions, water temperature and water level. Soil moisture sensor detect the moisture of the soil from the soil moisture sensor and water it automatically if the value is less than the threshold, Water level sensor detect the water level in the container and display its status on micro:bit. The current temperature and moisture values display on the OLED screen. The current water level value displays on the OLED screen, if it is too high, the rainbow LED lights on in red for reminding. If the device detects any people coming to the farmlands, the red light turns on and the buzzer alarms. Material selected for this project are IoT:bit, Internet WIFI extension board for micro:bit, DS18B20 sensor- Water proof temperature , DHT11–Temperature and Humidity Sensor, Sonar:bit, Soil moisture sensor, Water level sensor, OLED screen, EF92A 180° servo, micro USB cable and jumper wires.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



Figure 1 : Our Prototype



Figure 2 : Sensors



Figure 3 : Full View

NOVELTY AND UNIQUENESS

Smart agriculture involves the integration of interconnected sensors, devices, and data analytics to enable precision monitoring and management of farm operations. By leveraging IoT solutions, farmers can optimize resource usage (such as water, land, and labor) and enhance overall productivity. Specifically, smart agriculture using IoT refers to the application of IoT solutions in agriculture. These solutions collect environmental and machine metrics through sensors, allowing farmers to make informed decisions and improve various aspects of their work, from livestock management to crop farming.

BENEFIT TO MANKIND

Bestari IoT Farm can provide several benefits to farmers and individuals who own gardens. Here are some ways in which smart agriculture can help:

- i. **Improved Efficiency:** Bestari IoT Farm enable farmers to automate and optimize various processes, leading to increased efficiency in resource management.
- ii. **Increased Crop Yield:** By monitoring environmental conditions such as temperature, humidity, and soil moisture, Bestari IoT Farm system help farmers create ideal growing conditions for crops. This can result in increased crop yield and better quality produce.
- iii. **Resource Conservation:** Bestari IoT Farm promotes the efficient use of resources such as water and energy. By using sensors like water level sensors and weather stations, farmers can accurately monitor and control irrigation, reducing water waste. Furthermore, automated systems can adjust irrigation schedules based on weather forecasts, preventing overwatering or watering during rainfall. This conservation of resources is not only environmentally friendly but also helps reduce costs for farmers.

COMMERCIALIZATION POTENTIAL

Bestari IoT Farm offers numerous advantages to farmers and garden owners, including improved efficiency, increased crop yield, resource conservation, data-driven decision-making, and remote monitoring and control. By adopting these technologies, farmers can enhance

productivity, reduce costs, and make more sustainable and informed farming decisions.

CONCLUSION

The implementation of IoT technology can provide educational opportunities for the community about sustainable farming practices and the importance of environmental conservation. In farming industry sensors can provide early warnings of adverse conditions (e.g., low moisture levels) enabling farmers to take preventive actions and reduce crop losses. Real-time data from sensors can inform farmers about the condition of their crops. In summary, Bestari IoT Farm offers numerous advantages to farmers and garden owners, including improved efficiency, increased crop yield, resource conservation, data-driven decision-making, and remote monitoring and control. By adopting these technologies, farmers can enhance productivity, reduce costs, and make more sustainable and informed farming decisions. We can view the detection results from anywhere in the world when it connects to the WiFi module. The data can be saved for future reference.

PID10301

Noise Free Classroom

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ABSTRACT

A noisy classroom typically refers to an educational environment where there is a high level of ambient noise or sound. To address this challenge, we introduce the Noise-Free Classroom device. The Noise-Free Classroom device aims to foster a conducive learning environment. It can enhance learning because productive classrooms allow effective instruction delivery and active student participation. The second aim is to contribute to students comfort and mental ease. The third aim is to improve communication between teachers and students. The device utilizes IoT components, including a sensor bit, an OLED screen, and traffic-light-like coloured LEDs. The built-in microphone detects sound levels and lights these LEDs accordingly. In addition, the sensor bit also provides real-time data on the ambient noise level in decibels (dB). The noise level readings are displayed on the OLED screen. The sensor bit triggers different LED colours based on the noise level. The Green LED indicates a normal range (up to 60 dB) while Yellow shows a moderately noisy (60–85 dB) environment, and finally the Red LED detects harmful noise levels (above 90 dB). By using noise detection devices effectively, teachers can create a more conducive learning environment for all students. This can lead to improved learning outcomes, reduced stress levels, and enhanced classroom anagement.

KEYWORDS: Noise, Decibel, Classroom, Learning

PRODUCT DESCRIPTION

A noisy classroom typically refers to an educational environment where there is a high level of ambient noise or sound. This tool designed to monitor and manage ambient noise levels, ensuring an optimal learning environment by minimizing distractions. This noise can be distracting and impact students' ability to focus and learn effectively. These devices are

particularly useful in maintaining quietness and helping teachers manage classroom dynamics effectively. The device utilizes IoT components, including sensor bit (microphone build-in), Traffic-light-like coloured LEDs and OLED Screen. Sensor bit provides real-time data on the ambient noise levels in decibels (dB). The built-in microphone detects sound levels and lights these LEDs according to Decibel reading. The noise level readings are displayed on the OLED screen. Students and teachers can easily see the current noise intensity. The sensor bit triggers different LED colors based on the noise level. Remember, addressing classroom noise requires collaboration among educators, students, and administrators. By prioritizing a peaceful learning environment, we enhance the educational experience for everyone.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS






NOVELTY AND UNIQUENESS

Classroom Noise Monitors
 Develop standalone devices that continuously monitor noise levels in classrooms. These devices can provide real-time feedback to teachers and students.

Integration with Classroom Management System

Integrate noise monitoring features into existing classroom management software or learning platforms.

Customizable Solutions

Offer noise detection solutions that adapt to different classroom sizes, functions, layouts, and noise sources.

BENEFIT TO MANKIND

There are several benefits to using noise detection devices in classrooms. These benefits include:

- i. Improved learning outcomes: Reduced noise levels can improve student concentration and focus, leading to better understanding and retention of information.
- ii. Enhanced classroom management: Noise detection devices can help teachers identify and address noise issues early on before they become disruptive to the learning process.
- iii. Increased teacher effectiveness: By reducing noise levels, teachers can be more effective in delivering instruction and interacting with students.
- iv. Improved student behavior: Reduced noise levels can lead to improved student behavior and a more positive classroom atmosphere.

COMMERCIALIZATION POTENTIAL

Educational Institutions: Schools, colleges, and universities are continually looking for ways to improve the learning environment. A device that can help manage noise levels could be highly attractive to these institutions.

Special Education: Classrooms with students who have special needs, particularly those with sensory sensitivities or hearing impairments, may find a noise detection device beneficial.

Libraries and Study Areas: Institutions with designated quiet zones could use this device to maintain the appropriate noise levels.

The commercialization potential for a noise detection device in classrooms is significant, given the clear benefits and growing demand for educational technology solutions.

CONCLUSION

In conclusion, the "Anti-Sleep Eye Blink Detection System" for drivers project has successfully addressed a critical concern in road safety: driver fatigue and drowsiness. By alerting drivers and family members enabling them to take timely corrective actions. The system contributes to safer roads and a more secure driving environment for all. Incorporating IR sensors into anti-sleep spectacles and linking them with notification systems like Telegram represents a promising solution to combat drowsy driving and improve safety in various industries. By promoting driver safety and reducing the risk of accidents due to drowsiness, anti-eye blink spectacles enhance road safety and protect lives. Remember, staying awake and attentive behind the wheel is crucial for everyone's safety on the road.

PID10311

Smart Solar Refrigerator (SSR)

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ABSTRACT

Smart refrigerator system is an application in the work place and living place that now be use oft to monitored effectively without the need for cold water or hot things via smartphone by moving. The objective of the project is to generate electricity using solar power system to help the refrigerator system by lower expenses over conventional energy production technology and to test the rate at which energy is consumed. Second objective is to design the moving solar refrigerator for disable person and old citizen for their needs. In addition, this refrigerator can be use in two ways, that is ac current and solar system. The most critical advantage of solar panels is that it is a fully sustainable source of electricity. Solar cells are capable of directly converting sunlight into electricity. As a result of this whole project successfully produced with solar system for the refrigerator system have been good accuracy with an average error rate of monitoring results of solar panel. Based on these results, the results of analysis and discussions that have been conducted, can conclude that solar system to generate electricity for smart moving refrigerator this system has achieved the objective that has been discussed.

KEYWORDS: Refrigerator, COVID Patients, Solar, Movable

PRODUCT DESCRIPTION

Smart Moving Solar Refrigerator been around long days in the history of technology. Nowadays, lots of research is going on in this world. The moving Solar Refrigerator is a refrigerator which runs on solar energy and may include solar energy. Solar Refrigerator are

used in the location where utility provided AC power is not available. Therefore, some major drawbacks were faced in these Radio Frequency systems such as limited frequency, blocking the infrared controller by large obstacles between paths and also during day time, sunlight could interface with infrared signals. Later this limitation was solved by using a mobile phone network system for control the moving refrigerator. This improved system could cover a large working area and also no possibility of interfacing with other controllers. The Moving Solar Refrigerator also can share the moving structure and mechanical features under the same control. Besides that, the power source of the moving solar refrigerator, we have used renewable energy solar power to run the whole system. We have used to design Solar energy testing results shows the efficiency of our designed solar panel that was good enough to run the moving solar refrigerator even on normal temperature. The ESP32-CAM has been used to design the microcontroller and whole system circuits to get the input from a cell phone. The user can send the command from the cell phone to move The Solar Refrigerator. The results show the successful implementation of proposed design with appropriate testing.

**PICTURES/ SCHEMATIC DIAGRAMS/ FLOW
CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED
VISUALS**



Figure 1 : Front View



Figure 2 : Back View



Figure 3 : Top View



Figure 4 : Side View

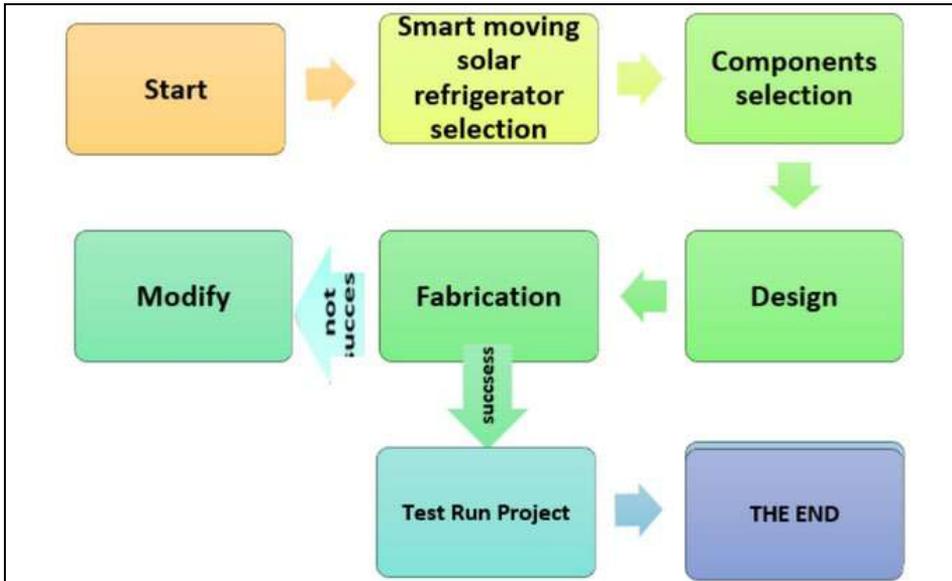


Figure 5 : Flow Chart

NOVELTY AND UNIQUENESS

This type refrigerator used to disable people, old people and COVID19 quarantined patients. Emergence of COVID-19 situation has greatly boosted the growth of the patients and they was isolated. So, all the patients and old aged people prefer and will buy smart solar refrigerator. Construction workers ho exposed to the solar, may use this for their thirst.

BENEFIT TO MANKIND

This type refrigerator used to disable people, old people and COVID19 quarantined patients. Emergence of COVID-19 situation has greatly boosted the growth of the patients and they was isolated. So, all the patients and old aged people prefer and will buy smart solar refrigerator. Construction workers who exposed to the solar, may use this for their thirst.

COMMERCIALIZATION POTENTIAL

This system provides effective technical support for the construction of smart libraries in schools. The commercialization potential lies in enhancing security management, reader identity authentication, and service levels in libraries. Using face recognition technology in libraries helps keep our books safe. Integrating face recognition technology into library systems can lead to efficient and secure operations and benefiting both staff and students.

CONCLUSION

In conclusion, this innovative product "Smart Solar Refrigerator" was successfully developed and succeeded in achieving the desired objective of developing innovations using natural resources such as the use of solar energy to move the display information through solar panels using the software 'ESP -32 'and also produces electricity. In addition, this product successfully turns on the lighting system in areas where there is no electricity supply.

PID10332

Eko-Hidro

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ABSTRAK

Tenaga elektrik merupakan sumber tenaga yang amat penting di dalam hidup kita. Tanpa adanya bekalan tenaga elektrik, banyak jentera dan alat tidak dapat beroperasi. Namun, untuk menjana tenaga elektrik, kita perlukan sumber bahan yang banyak. Antara sumber bahan yang penting adalah bahan api fosil yang semakin terhad pada masa kini. Justeru itu, banyak kajian dilakukan untuk mencari sumber tenaga alternatif bagi menggantikan bahan api fosil yang merupakan sumber habis guna.

Kumpulan kami telah memilih untuk mengkaji penggunaan tenaga hidro dalam menjana tenaga elektrik. Tenaga kuasa hidro merupakan tenaga yang boleh diperbaharui yang boleh menjana elektrik. Ia merujuk kepada penghasilan tenaga elektrik menggunakan air sebagai sumber tenaga. Tenaga hidro melibatkan kuasa hidroelektrik, kuasa air pasang surut, kuasa ombak atau apa-apa sahaja sumber air yang bergerak untuk memutar turbin dan menggerakkan penjana elektrik. Tenaga hidro adalah lebih konsisten dan stabil jika dibandingkan dengan tenaga solar dan angin.

Produk yang telah kami hasilkan ialah Eko-Hidro, iaitu model kuasa hidro yang bersaiz kecil dan mudah alih khas untuk kegunaan di rumah sahaja. Produk ini boleh digunakan semasa bekalan elektrik terhad atau terputus, malah boleh juga digunakan di kawasan pedalaman atau kawasan hutan. Pembinaan model ini amat ringkas dengan menggunakan bahan kitar semula.

KATA KUNCI: Tenaga, Hidro, Elektrik, Penjana, Kuasa

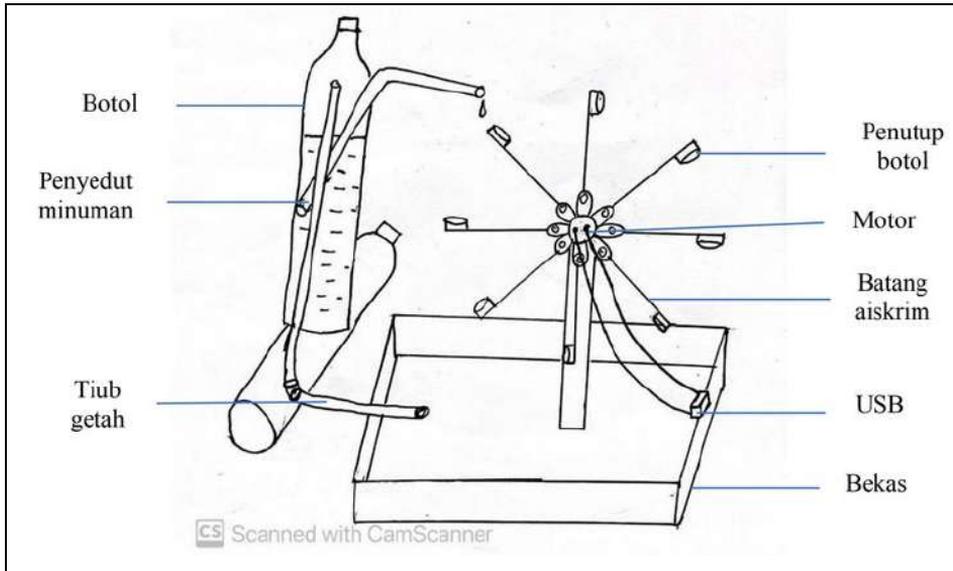
PENERANGAN PRODUK

Projek Eko-Hidro adalah penyelesaian bagi masalah kekurangan sumber bahan untuk menjana tenaga elektrik. Ia merupakan sumber tenaga yang bersih kerana tidak menghasilkan gas rumah hijau yang menyebabkan pencemaran alam sekitar. Sumber tenaga hidro merupakan sumber tenaga yang boleh diperbaharui. Jika dibandingkan dengan sumber tenaga lain seperti solar dan angin, tenaga hidro adalah lebih stabil dan konsisten. Sumber tenaga solar dan angin pula bergantung kepada keadaan cuaca yang semakin tidak menentu pada masa kini.

Produk Eko-Hidro bertujuan untuk menghasilkan tenaga elektrik pada skala yang kecil dan cukup untuk digunakan pada waktu-waktu kecemasan seperti semasa bekalan elektrik terputus. Produk ini amat sesuai digunakan di rumah. Penduduk di kawasan pedalaman boleh memanfaatkan produk ini jika berlaku ketidakstabilan bekalan elektrik. Model ini bersaiz kecil dan mudah dibawa ke mana-mana sahaja. Malah, ahli tentera juga boleh menggunakan produk ini untuk kegunaan di dalam hutan.

Model tenaga hidro ini terdiri daripada menara air mini, kincir atau turbin, motor DC yang bertindak sebagai penjana elektrik dan bekalan air yang boleh diguna semula. Atas dasar penjimatan kos dan konsep mesra alam, kami telah menggunakan bahan-bahan yang boleh dikitar semula untuk membina model kuasa hidro. Dengan cara ini, model ini amat mudah dibina dengan menggunakan bahan-bahan yang mudah dijumpai di sekeliling kita.

**GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN
SKRIN/GRAF DAN VISUAL BERKAITAN LAIN**



KEBAHARUAN DAN KEUNIKAN

Kebanyakan peralatan yang ada di pasaran pada masa kini menggunakan sumber tenaga solar. Kumpulan kami mengambil pendekatan yang berlainan dengan menggunakan tenaga hidro. Ini kerana sumber tenaga hidro adalah lebih konsisten dan stabil. Tenaga elektrik dapat dijana dengan lebih mesra alam. Model kuasa hidro ini juga mudah dipasang dan sesuai digunakan di rumah.

MANFAAT KEPADA MANUSIA

Produk Eko-Hidro adalah bermanfaat kepada masyarakat kerana bekalan elektrik adalah amat penting kepada semua orang. Produk ini dapat membantu menyelesaikan masalah bekalan elektrik yang terhad dengan menggunakan sumber semula jadi. Produk ini dapat menjimatkan kos perbelanjaan bil elektrik yang semakin hari semakin meningkat. Penjanaan tenaga elektrik tidak akan lagi menjadi beban kepada masyarakat.

POTENSI UNTUK PENGKOMERSILAN

Setakat ini, produk Eko-Hidro masih dalam fasa prototaip sahaja. Terdapat kelemahan yang perlu diatasi sebelum produk ini dapat dipasarkan. Kelemahan utama ialah kuasa elektrik yang dijana masih

belum mencukupi. Kami masih berusaha untuk mengoptimumkan penjaanaan elektrik oleh model kuasa hidro ini. Selain itu, roda kincir air perlu diperbaiki agar pengaliran air boleh berlaku dengan lebih lancar.

KESIMPULAN

Secara rumusnya, projek Eko-Hidro adalah projek yang amat berpotensi untuk menjana elektrik secara berterusan tanpa perlu bergantung kepada sumber bahan api yang terhad. Masyarakat sering diseru untuk menjimatkan tenaga elektrik kerana penjaanaan tenaga elektrik melalui pembakaran bahan api menyebabkan isu kesan rumah hijau dan juga isu pemanasan global. Dengan adanya Eko-Hidro, kita tidak perlu lagi risau tentang isu-isu sebegini lagi.

PENGAKUAN

Kumpulan kami amat berterima kasih kepada Cikgu Jane Ling selaku guru pembimbing kami. Selain itu, kami amat menghargai sokongan daripada pihak sekolah kerana membenarkan kami menggunakan fasiliti sekolah bagi perlaksanaan projek kami. Kami juga ingin merakamkan penghargaan kepada rakan-rakan sekolah yang telah banyak berkongsi idea untuk menjayakan projek ini.

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PID10341

Fast and Easy Board 2.0

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ABSTRAK

Fast and Easy Board 2.0 suatu inovasi yang telah direka bagi membantu murid-murid untuk menulis nisbah dengan betul, mewakili nisbah dua kuantiti dalam bentuk yang termudah dan menentukan kuantiti berkadar dengan berdasarkan nisbah yang diberi. Dengan tema cepat dan mudah, murid-murid dapat memberikan jawapan secara terus dari Fast and Easy Board 2.0. Inovasi ini juga turut menyokong tiga jenis gaya pembelajaran murid-murid yang utama iaitu visual, auditori dan kinestetik. Ujian pra yang telah dilakukan menunjukkan hampir separuh daripada bilangan murid tidak mahir sifir untuk memberikan jawapan nisbah dalam bentuk termudah. Dengan terciptanya inovasi ini membolehkan mereka untuk menguasai kemahiran ini dalam jangka masa yang singkat dan secara tidak langsung mengubah persepsi mereka terhadap subjek Matematik. Murid yang terlibat turut dapat menyelesaikan soalan yang melibatkan kadaran dengan mudah. Malah, mereka dapat mencapai TP6 dalam pentaksiran Pentaksiran Bilik Darjah (PBD) bagi topik ini. Bahan bantu mengajar ini bukan sahaja ringan malah mudah dibawa dan disimpan. Inovasi ini boleh digunakan untuk aktiviti berkumpulan bagi meningkatkan kemahiran kognitif dan psikomotor. Secara tidak langsung, murid dapat belajar secara kolaboratif dengan rakan lain. Rekaan inovasi ini menyokong Kelestarian amalan kitar semula iaitu dihasilkan daripada butang, bahan terpakai, kad soalan dan pen marker. Fast and Easy Board 2.0 turut dapat merealisasikan Pembelajaran Abad ke-21 (PAK21) dan SKPMg2 Standard 4 (4.3.1). Selain itu, papan inovasi ini juga boleh digunakan untuk topik lain seperti tambah, tolak, pecahan dan peratus. Fast and Easy Board 2.0 turut boleh

digunakan sebagai permainan bahasa dalam Bahasa Melayu dan Bahasa Inggeris

KATA KUNCI: Matematik, Kadaran,PBD, Kelestarian, PAK21

PENERANGAN PRODUK

Inovasi Fast and Easy Board 2.0 ini dihasilkan sebagai bahan bantu mengajar yang mudah dibawa dan mudah digunakan. Rekaan ini menggunakan butang baju terpakai, kotak dan pen marker. Murid-murid mewakili nisbah dua kuantiti yang diberikan menggunakan butang baju di atas Fast and Easy Board 2.0 ini. Kemudian, dengan menyusun semula butang baju- butang baju berkenaan , sisihkan mengikut lajur bagi kedua-dua bahagian sehingga memberikan jawapan nisbah dua kuantiti dalam bentuk termudah. Dengan satu lirik lagu khas, murid-murid akan teruja untuk menyelesaikan soalan nisbah dalam bentuk termudah terutama murid-murid yang lemah penguasaan sifir. Murid-murid lemah ini dapat mencapai tahap penguasaan yang lebih baik apabila menjawab soalan kadaran menggunakan inovasi ini. Inovasi ni bukan sahaja untuk aktiviti individu, kumpulan malah permainan antara kumpulan. Inovasi ini juga membantu murid-murid membina peta iThink yang betul.Objektif utama penghasilan inovasi ini Membantu murid lemah sifir untuk menulis nisbah dengan betul,membantu murid lemah sifir mewakili nisbah dua kuantiti dalam bentuk termudah serta membantu murid untuk menyelesaikan soalan kadaran dengan mudah.

Murid-murid yang terlibat melibatkan 10 orang murid yang lemah matapelajaran Matematik. Setelah penggunaan inovasi ini, mereka sangat teruja dan telah mengubah persepsi mereka terhadap pembelajaran Matematik. Mereka turut mendapat pencapaian yang lebih baik bagi topik ini.

GAMBAR/RAJAH SKEMATIK/CARTA ALIR/TANGKAPAN SKRIN/GRAF DAN VISUAL BERKAITAN LAIN

Inovasi ini boleh digunakan sebagai bahan bantu mengajar. Di samping itu guru boleh membimbing murid secara intensif dalam aktiviti individu dan murid-murid boleh menggunakan semasa aktiviti berkumpulan. Ini meningkatkan Kemahiran interaksi mereka semasa menjalankan aktiviti.



Aktiviti individu



Aktiviti berkumpulan

Gambarajah 1 : Penggunaan Inovasi

Semasa pembelajaran dan pemudahcaraan (pdpc), murid-murid turut diminta untuk menjawab soalan dalam peta titi. Ini adalah salah satu amalan dalam teknik pembelajaran abad ke-21 (PAK21).

PETA TITI

Nisbah	2 : 10	8 : 32	12 : 8	18 : 24
Bentuk termudah	1 : 5	1 : 4	3 : 2	3 : 4

Gambarajah 2 : Peta Titi

Inovasi ini turut menyediakan set soalan mengikut tahap penguasaan 1 hingga tahap penguasaan 6 Pentaksiran Bilik Darjah (PBD). Guru dan murid dapat melakukan pentaksiran PBD dengan mudah. Murid-murid yang mahir boleh membimbing murid yang lemah.



Gambarajah 3: *Fast and Easy Board 2.0*

KEBAHARUAN DAN KEUNIKAN

Kos yang murah namun memberikan impak yang tinggi mewujudkan 'Fun Learning'. Menerapkan pembelajaran abad ke-21. Murid berkolaboratif secara aktif dan interaksi secara berkesan. Guru hanya bertindak sebagai fasilitator Murid-murid dapat membina Peta Titi. Murid-murid yang memiliki gaya pembelajaran visual atau kinestetik seronok dengan pembelajaran seumpama ini. Membantu penguasaan sifir dalam kalangan murid-murid lemah. Mengubah persepsi murid-murid terhadap pembelajaran matematik. Papan serbaguna ini turut boleh digunakan untuk topik tambah, tolak, darab, bahagi, peratus dan juga perpuluhan. Di samping itu boleh digunakan dalam permainan bahasa bagi matapelajaran Bahasa Melayu, Bahasa Inggeris dan Bahasa Arab.

MANFAAT KEPADA MANUSIA

Bahan kitar semula yang mudah diperolehi seperti butang baju dan juga kotak. Bahan ini diubahsuai menjadi suatu inovasi yang dapat membantu murid terutama murid-murid yang lemah dalam Matematik. Inovasi ini juga turut menyokong tiga jenis gaya pembelajaran murid-murid yang utama iaitu visual, auditori dan kinestetik. Murid-murid ini akan teruja belajar melalui kaedah ini. Murid-murid ini dapat berinteraksi dengan rakan semasa proses pembelajaran dan pemudahcara dijalankan. Guru hanyalah sebagai fasilitator sahaja.

POTENSI UNTUK PENGGOMERSILAN

Inovasi ini berpotensi untuk disebarluaskan kepada pihak lain. Inovasi ini boleh diperluaskan ke sekolah-sekolah daerah Segamat bagi membantu murid-murid lemah untuk mencapai Tahap Penguasaan PBD minimum TP3. Soalan-soalan KBAT turut disediakan untuk memberikan cabaran kepada murid-murid cemerlang menguasai PBD yang lebih baik. Guru-guru turut boleh menggunakan inovasi ini dengan udah. Fast and easy board merupakan papan serbaguna. Boleh digunakan bagi matapelajaran matematik seperti untuk pembelajaran bagi operasi tambah, tolak, darab, bahagi, pecahan dan peratus. Selain itu boleh digunakan untuk matapelajaran yang lain seperti Bahasa Melayu dan Bahasa Inggeris sebagai permainan bahasa.

Penjelasan melibatkan beberapa perkara penting untuk dipertimbangkan termasuklah permintaan dan saiz pasaran, kelebihan persaingan, model perniagaan, analisis kos, margin keuntungan, pematuhan regulasi dan pensijilan, strategi hak cipta intelektual, dan aspek lain yang relevan. (50-100 PERKATAAN)

KESIMPULAN

Kesimpulannya, penghasilan inovasi ini menyokong kelestarian alam sekitar dengan mengguna semula kotak dan butang baju. Inovasi ini yang mudah dibawa dan mudah digunakan dapat membimbing murid-murid lemah dan mengubah persepsi mereka mengenai pembelajaran Matematik yang sebelum ini dianggap matapelajaran yang susah dikuasai. Murid-murid ini juga boleh mendapat pentaksiran bilik darjah yang lebih baik. Semoga penghasilan inovasi ini dapat diperluaskan dan dapat mengubah persepsi masyarakat sehingga sebenarnya pembelajaran Matematik ini amat menyeronokkan.

PENGAKUAN

Ucapan sekalung penghargaan dan terima kasih buat Cikgu Aniza, penasihat Kelab Inovasi dan Sains, SK Paya Jakas yang telah banyak memberikan bimbingan dan nasihat sepanjang penghasilan inovasi ini. Jutaan terima kasih juga buat Tuan Guru Besar SK Paya Jakas, Cikgu Muhammad Adzam Shah yang telah memberikan nasihat dan dorongan untuk menjayakan inovasi ini. Tidak lupa juga buat para guru dan para ibu bapa yang banyak memberikan kata-kata semangat untuk menghasilkan inovasi ini.

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PID10352

MonitoRing

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ABSTRACT

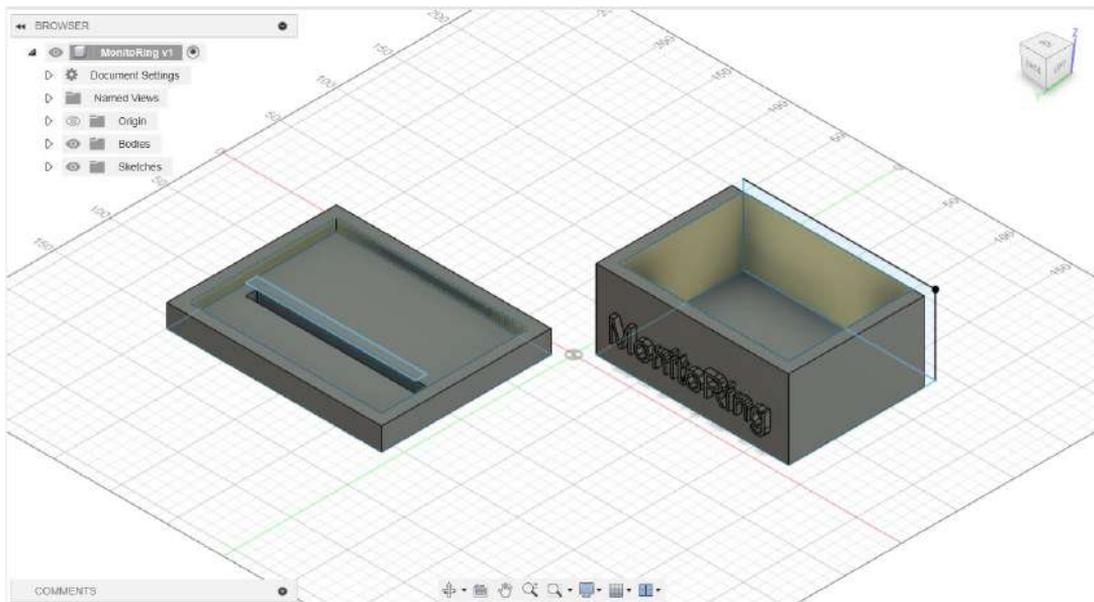
In an era of rapid urbanization, ensuring the safety, comfort, and well-being of urban residents while addressing the challenges posed by wild animals are really important. MonitoRing allows users to maintain the environmental conditions in enclosed spaces like storerooms and attics. These areas often suffer from issues such as temperature fluctuations, humidity problems, insufficient lighting, and potential gas-related hazards. Since MonitoRing is collecting data using WiFi Module, it can transfer data to the Cloud. Thus, users can install it in an empty house although they are not in the surrounding area. Users can easily monitor the environmental condition of their house through the mobile app which gets data from the Cloud. What sets MonitoRing apart is its ability to intelligently detect and manage wildlife. Advanced sensors identify the presence of wild animals in real-time, enabling homeowners to take proactive measures to prevent encounters, potential damage to property, and even harm to the animals. MonitoRing will chase away the animals effectively by releasing sound waves and making bright light. Other than that, MonitoRing offers a user-friendly interface, allowing homeowners to access data through the Blynk page. This feature ensures peace of mind and prompt action when needed.

KEYWORDS: Monitor Environmental Condition, Detect Wildlife, Empty Houses, Access Data Online

PRODUCT DESCRIPTION

MonitoRing is a device used to guarantee the safety of our homes, by monitoring the conditions of environments around from time-to-time and ensuring no wild animals stay in our living area. It is a portable device to be installed at corners as they tend to become a hiding place for wild animals. For example, inside attics or storerooms. Sensors in MonitoRing will collect data of the condition of an environment such as temperature, humidity, light intensity and air quality. The data collected will be transferred to a linked mobile app to allow users to monitor the environment in their house occasionally. From the data collected, users can analyze if the surroundings of their home is safe, by preventing disasters from happening. MonitoRing can protect users from unhealthy and unsafe living spaces in this context. Other than that, MonitoRing is able to detect if there are living things around the circuit, typically wild animals. When there is something alive around, MonitoRing can detect it although it has no motion. MonitoRing won't harm the animals by using any materials that are dangerous to them but just release noisy sound and produce bright lights to chase it away.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS





NOVELTY AND UNIQUENESS

MonitoRing combines home environment monitoring and wildlife control in one easy-to-use device. It provides real-time updates on temperature, humidity, air quality, and light levels. It helps to keep our homes safe and comfortable effectively. What makes MonitoRing truly special is its humane method of repelling animals. It uses noisy sounds and bright lights to scare them away without causing any harm. Additionally, the device links to a mobile app for remote monitoring and instant alerts, making it incredibly convenient and user-friendly. MonitoRing is ideal for anyone looking to protect their home and coexist with wildlife responsibly.

BENEFIT TO MANKIND

The project's advanced environmental sensors enable residents to monitor their indoor living conditions effectively, by providing real-time data on temperature, humidity, light intensity and air quality. MonitoRing also offers residents an unparalleled sense of security and peace of mind. By effectively detecting and managing wildlife, homeowners can now enjoy their living spaces without worrying about hazards caused by intruders. Lastly, with the increasing challenges of climate

urbanization, MonitoRing supports the creation of homes that can withstand various environmental stressors.

COMMERCIALIZATION POTENTIAL

Due to the growing market demand for smart home security and environmental monitoring solutions, the increasing need for home safety and effective wildlife control in urban areas highlights the market size and demand for MonitoRing. The device's unique combination of real-time environmental data and humane wildlife control offers a competitive advantage. Its scalable design ensures it can adapt to various market sizes and demands. The business model can focus on direct consumer sales and partnerships with home security companies. With low production costs and high-profit margins, MonitoRing is economically viable. An intellectual property strategy will maintain a competitive edge.

CONCLUSION

MonitoRing has the potential to transform the way we manage the challenges of sharing our living spaces with wildlife. By addressing the harmful consequences of these intrusions, MonitoRing offers an array of remarkable advantages, from enhancing safety and providing peace of mind to championing eco-conscious living. As the cities grow, so does the urgency to mitigate the challenges they brought. MonitoRing's ability to efficiently detect, manage, and monitor the environment within our living areas not only ensures a safer and more comfortable living environment, it also empowers residents to make informed decisions about their well-being. In conclusion, MonitoRing is more than a project, it's a testament to our capacity to adapt and coexist in a rapidly changing world. The MonitoRing project represents that humans and the natural world would thrive together in a shared urban ecosystem, setting the stage for a more balanced and sustainable future.

ACKNOWLEDGEMENT

First of all, we would like to thank the organizer of 6th Digitalised International Invention, Innovation, and Design Competition (DIID 2024) . for giving us a chance to take part in this competition. Through this competition, we have learned much knowledge that cannot be obtained in classroom lessons. We learned to cooperate with each other from the process of doing this project and carrying out experiments as young innovators. We would like to express our thanks to our school principal, Mr Ooi Yek Hwa and Senior Assistant, Mr Sim An Thea, for their support and understanding throughout our project. We would also like to give our gratitude to our teacher-in-charge, Puan Noor Najwatussheema for giving us lots of advice and suggestions. Last but not least, we would like to appreciate our lovely parents. They

have paid out their time and energy to help us in completing our project. They have also contributed ideas for us to complete our project. When we encounter frustration, they give us moral support and encourage us. In a nutshell, we couldn't finish our project successfully without their helping hands. Once again, we would like to show our gratitude to those who helped us and gave us ideas.

PID10361

Aktivitiku: A Fun Daily Routine Schedule for Kids

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ABSTRACT

"Aktivitiku" is an innovative schedule designed to help children develop essential life skills through structured daily routines. This platform integrates a wide range of activities, including personal hygiene, household chores, educational tasks, and spiritual practices, into a cohesive timetable. By making these routines engaging and fun, that motivates children to stick to their schedules and complete tasks efficiently. It is not only aids in the development of essential life skills but also enhances children's motivation and engagement through fun activities, ultimately leading to a well-rounded and harmonious family environment.

KEYWORDS: innovative, schedule, routine, skills

PRODUCT DESCRIPTION

Introducing timetables to children at an early age lays a strong foundation for their future development, helping them cultivate essential life skills and habits that will benefit them throughout their lives. Establishing a routine is consistently recognized as essential for children (Arlinghaus & Johnston, 2019). "Aktivitiku" was created to support various daily routines by integrating activities such as brushing teeth, bathing, and praying into a structured timetable. This approach allows children to develop crucial life skills while learning the importance of consistency and discipline.

Timetables to kids at an early age sets a strong foundation for their future development, helping them cultivate essential life skills and habits that will serve them well throughout their lives. "Aktivitiku" incorporates fun elements to motivate children to stick to their schedules and complete tasks in a timely manner. This makes the process enjoyable and engaging, providing children with effective tools

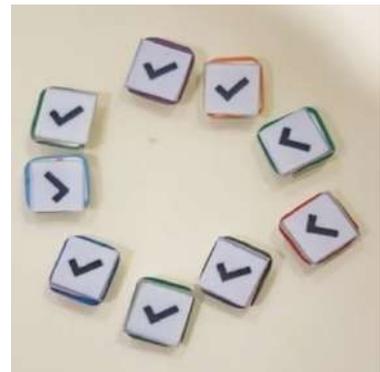
for organization and motivation. As a result, it contributes to a harmonious family life by fostering a sense of routine, cooperation, and accomplishment.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

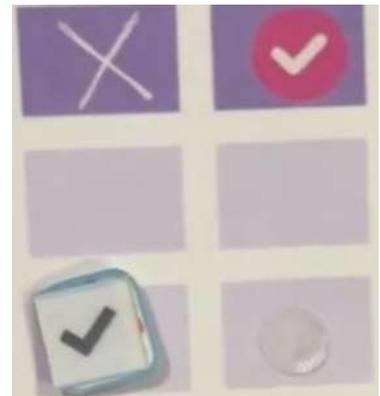
MY-TASK:AKTIVITIKU **Daily** schedule

TUGASAN	NAJMINA	HANA	ALEENA
SELESAI/TIDAK	X	✓	X
LAP MEJA			
SAPU SAMPAH			
BUANG SAMPAH			
KEMAS DISHWASHER			
BASUH PINGGAN			
KEMAS BEG SEKOLAH			
KEMAS KATIL			
BASUH BAJU			
IRON BAJU			
GOSOK GIGI/MANDI			
SOLAT			
BACA QURAN/HOMEWORK			
KEMAS BILURUMAH			
LIPAT BAJU			

A3 Laminated Film



Velcro-backed tick



Ticking activity performed

"Aktivitiku" is printed on A3 paper and laminated to ensure durability. Children can mark their completed tasks by moving a Velcro-backed tick, providing a more secure and reusable option compared to stickers or markers.

NOVELTY AND UNIQUENESS

"Aktivitiku" stands out due to its comprehensive, flexible, and engaging approach to developing essential life skills in children. The platform likely includes interactive features that make it easy for children and parents to use. This user-friendly interface ensures that the tool is accessible and appealing to young users. This encourage children to stay on track that helps build self-esteem and a sense of accomplishment. By combining daily routines with fun and interactive elements, it not only teaches consistency and discipline but also makes the learning process enjoyable and culturally relevant.

BENEFIT TO MANKIND

"Aktivitiku" offers a comprehensive approach to child development by establishing routines, building responsibility, enhancing time management skills, and developing independence. These benefits contribute to a child's overall growth, preparing them for future challenges and helping them become well-rounded individuals. In a review of 24 studies examining the relationship between routines and children's social and emotional skills, 23 reported positive associations, while one found no significant connection (Selman & Dilworth-Bart, 2023). This mainly indicate that routines are associated with positive developmental outcomes in children. The structured yet flexible approach of "Aktivitiku" ensures that children learn valuable life skills in an engaging and enjoyable manner, making it an effective tool for parents and educators alike.

COMMERCIALIZATION POTENTIAL

The unique features of "Aktivitiku" stands out by combining daily routines with educational activities and incorporating fun elements to keep children engaged. Its unique approach to blending routine tasks with personal development activities provides a holistic developmental tool. The ability to customize schedules based on individual child needs and preferences offers a personalized user experience, making it more appealing to parents. This is a ready product that has potential of commercialisation.

CONCLUSION

In conclusion, "Aktivitiku" is a valuable tool for parents and educators, providing children with the structure and motivation needed to develop crucial life skills. Its engaging and flexible approach ensures that children not only learn essential

habits and routines but also enjoy the process, making it an effective and enjoyable addition to their daily lives.

ACKNOWLEDGEMENT (*OPTIONAL)

The authors would like to thank Muhd Safwan Abdul Satar for his support throughout this project.

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PID10372

MOSREPELLENT INNOVATION: A SOLUTION TO THE WORLDWIDE'S HEALTHCARE

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ABSTRACT

The issue of dengue fever became a hot conversation when many deaths were recorded involving people all over the world which is increasing, and Malaysia is no exception being one of the highest records of dengue fever cases in Asia. For that, we developed an innovation called Mosrepel which is named after the word Mosquito Repellent and aims to reduce the mosquito population. In addition, the innovation we have developed is inspired by an environmentally friendly and low-cost concept that was able to reduce the Aedes population and able to reduce the death rate. This product uses banana peel, cooking oil, and lemon peel. When research is done, banana skin has a high potassium content which causes more lactic acid content to be produced which is likened to a magnet for mosquitoes. Used cooking oil releases carbon dioxide gas which is an agent of mosquito attraction and lemon can corrode mosquito eggs. The container used is opaque and has a funnel that can confuse mosquitoes after the mosquito releases its eggs in the container.

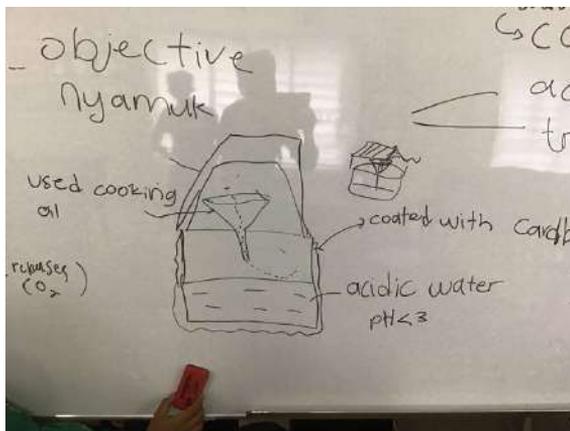
KEYWORDS: Dengue, Environmentally Friendly, Reduce Death Rate, Carbon Dioxide, Attraction

PRODUCT DESCRIPTION

Our innovation is created based on environmentally friendly products. Our goal is to save the world from dengue fever without harming the environment. Our product consists of reusable material to support the current world economy by reducing the material needed and reusing the current material for daily use. Our product feature is to prevent the reproduction of Aedes mosquitoes to reduce dengue fever further dissemination. Our product only affects the targeted species which is Aedes mosquitoes so it does not affect the ecosystem around the product when in use. Our product works the most with its potential in nature, especially at night. It

performs the best result in rural areas because of the low pollution level there. Our product is easy to handle by the majority of people with its easy comprehensive manual. The consumer only needs to use basic household ingredients such as cooking oil, banana, and lime. The consumer will receive an express result within 8 hours after set up depending on the area this product is used. We design the product so that it does not need a large space area to use the product by compacting the design to its current state. We already have a target audience in mind which is people all around the globe from every continent that has a problem or want to prevent dengue infection. Our product advantage is its low-cost and environment-friendly base product. Even after all those advantages our product still has a disadvantage which is its inability to be used in certain weather which is in rain.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS



- MATERIALS NEEDED:**
- Plastic container
 - Reuse oil
 - Lime
 - Funnel
 - Black cloth
 - Water



NOVELTY AND UNIQUENESS

The innovation we developed was inspired by the Rex mosquito trap, but there were many modifications we made. Because rex mosquito traps use lights and fans that use a lot of electricity, we replace them with water that can attract the attention of mosquitoes as a place to hatch mosquito eggs and eventually kill the eggs and larvae. We have the foresight that the innovation we developed is not only to reduce dengue cases but can preserve the environment. There is no point if we reduce the mosquito population but, in the end, we are harming our beloved earth.

BENEFIT TO MANKIND

The product we developed is not only to reduce the mosquito population and reduce dengue cases, but it can save the environment especially when dealing with the issue of global warming and El-Nino because it uses used materials including banana peels, cooking oil, water, and lemon zest as a trap to the mosquitoes. In addition, this product is very suitable for use in communities and neighborhoods and can be a component of education for students as a step to solving global issues.

COMMERCIALIZATION POTENTIAL

This innovation can be easily marketed either through stores or online such as Shopee, Lazada, and so on. Furthermore, due to the low cost of this innovation due to the use of used materials, the profit obtained is very high because the set selling costs are high. This innovation can be designed by yourself or by users using used materials such as garden waste, kitchen waste, and so on.

CONCLUSION

In summary, this innovation will play a huge role in reducing dengue fever all around the world. This innovation prevents aedes mosquito reproduction without affecting the flora and fauna around us. With this, we can bring tranquility into this modern world. This innovation has a huge future potential for further development.

ACKNOWLEDGEMENT

We as a team would like to thank our beloved teacher, Mrs. Saizatul Akmar binti Baharom for becoming our assistant in this innovation program.

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PID15012

From Classroom to Career: POW (Powering Our World) Innovative Approach to Job Creation

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ABSTRACT

The inability to find jobs requiring work experience is the main reason why many college graduates end up unemployed. It's challenging to obtain a job that requires work experience if you don't have any. These days, technology is a part of everyday existence. People can now readily look for and receive information thanks to technology. Likewise, thanks to technology, obtaining a profession in this day and age is simple. We were therefore inspired to develop a teacher finder service application so that both recent graduates and those who have not yet graduated might obtain work experience by working as private tutors. One other purpose of this application is to assist students in finding tutors who meet their needs.

KEYWORDS: Education, Lesson, Private

PRODUCT DESCRIPTION

POW (Powering Our World) is an innovative app that aims to create a work experience for students and non-students by becoming a private tutor. This app offers instructional materials in Indonesian and assists students in finding tutors that meet their needs. One of POW's features allows students to search for tutors who meet their requirements while also letting them read reviews from other students who have taken classes with the tutor in the past. This

helps to guarantee that students receive instruction from teachers who are a good fit for them. Even if a prospective tutor lacks teaching experience, POW's registration system qualifies and validates them to guarantee their eligibility. Additionally, POW can help set up classes so that tutors have flexible time management. POW assures its users of a simple and secure payment process. POW also offers a chat function for students and tutors to communicate, along with a discussion.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

An innovative app is designed to connect fresh graduates and non-fresh graduates with students who need qualified tutors. POW not only helps recent graduates gain valuable work experience, but it also ensures students can learn from the best. The following is an explanation of the various menus in the POW application:

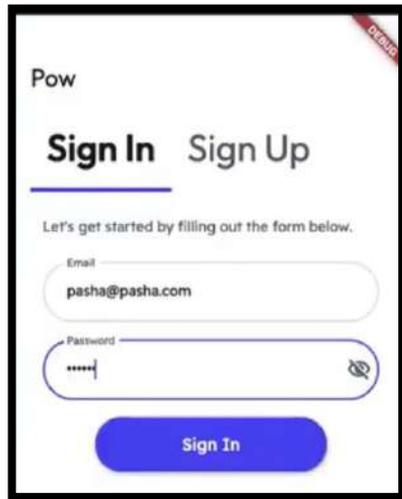


Figure 1. Menu Loading

The loading menu on the POW app displays a dynamic and informative start screen during the application process of loading data. Users will see the "POW" application logo along with the tagline "Powering Our World." The screen also features simple animations to indicate that the app is in

the process of loading, providing a pleasant experience and ensuring users that the app is working properly.

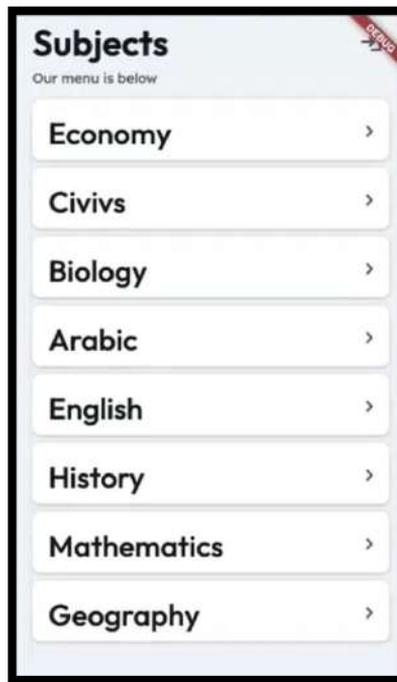


Figure 3. Biodata Menu and Access Teaching Methods

The biodata menu serves as a profile page for tutors to fill in and update their personal information. Tutors can fill in details such as their full name, profile photo, educational qualifications, teaching experience, and areas of specialization. In addition, this menu also allows tutors to explain their methods and approaches to teaching, including teaching techniques, teaching materials used, and effective learning strategies. This information helps students choose a tutor that suits their learning style.

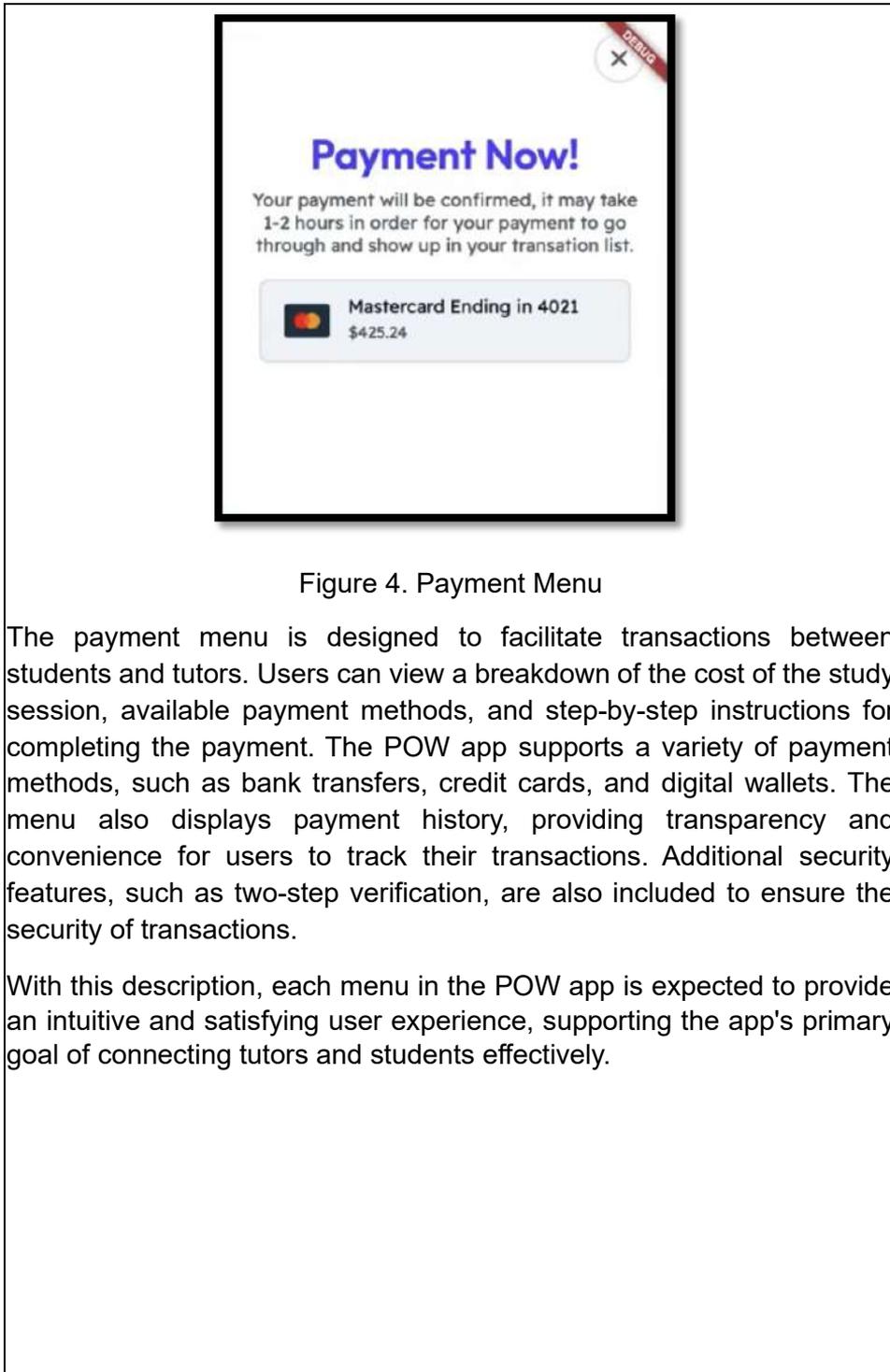


Figure 4. Payment Menu

The payment menu is designed to facilitate transactions between students and tutors. Users can view a breakdown of the cost of the study session, available payment methods, and step-by-step instructions for completing the payment. The POW app supports a variety of payment methods, such as bank transfers, credit cards, and digital wallets. The menu also displays payment history, providing transparency and convenience for users to track their transactions. Additional security features, such as two-step verification, are also included to ensure the security of transactions.

With this description, each menu in the POW app is expected to provide an intuitive and satisfying user experience, supporting the app's primary goal of connecting tutors and students effectively.

NOVELTY AND UNIQUENESS

POW allows anyone to register as a private tutor, regardless of their educational background. This provides an opportunity for individuals with specific skills or knowledge to share, teach, and gain valuable work experience. POW provides a platform for students and non-students to gain real work experience as private tutors. This not only adds value to their resume but also helps them develop their communication and teaching skills. In addition, POW provides a very simple and intuitive registration process, ensuring that users, both as teachers and students, can easily get started without any complicated administrative barriers. Security and trust are also top priorities, with a rigorous verification and scoring system to ensure the credibility and competence of registered teachers.

BENEFIT TO MANKIND

Among the benefits of our application are the ability to offer work experience to recent university graduates who are struggling to find employment, as many companies today require work experience as a prerequisite for registration. Our app is also a liaison between the teacher and the student to be educated; the student who will be educated can also choose the teacher himself with the criteria he needs. So, our application promises work or teaching experience to university freshmen, allowing them to later register at the company or teach at the educational institution they want, and also provides students with tutors to help in the subjects they want.

COMMERCIALIZATION POTENTIAL

Based on the total statistical data of the Ministry of Education and Culture (2023) and BPS Bandar Lampung (2023), with 13,617 teachers and 45,192 unemployed in Bandar Lampung, this application has a large potential market. Its competitive advantage lies in its freedom as a platform where educators or aspiring educators who have an interest in teaching can develop their potential without the need for work experience with private teaching and educational content. Its business model relies on revenue from teaching transaction commissions and pop-up ad services to

promote the services of educators on our app. The app is highly scalable and can be expanded to other cities in Indonesia as users increase. The cost analysis includes app development and maintenance, marketing, and customer support. Profit margins are expected to be high, with ongoing revenue from commissions and advertising subscriptions. Compliance with education regulations and user data protection will be ensured, and the intellectual property strategy will include copyright and patent registration for the app's innovative features. POW has great potential to be an innovative solution for education and unemployment reduction in Indonesia.

CONCLUSION

With POW, we hope to provide an effective and efficient solution in the world of education, as well as provide opportunities for many individuals to develop their skills through structured teaching and learning experiences.

ACKNOWLEDGEMENT

We, the ar-raihan team, would like to express our gratitude to Allah SWT for the smooth running of this work. We sincerely thank our team members, who have devoted all of their strength and energy to completing this work. We also thank the school that provides a place for us to show our abilities, and we also thank Miss Winda Pitriani Parhamah as our supervisor, the teachers who help us, and our parents, who always pray for our success in this world and the hereafter.

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SECTION 4

THE ANNOUNCEMENT CEREMONY OF WINNER 6th DIIID JOHOR 2024



The 6th DIIID 2024 was officiated by, Yang Berhormat Professor Datuk Dr Shahrin Bin Sahib @ Sahibuddin, Uitm Vice-Chancellor on 27th July 2024. The event was broadcast live on YouTube on the UiTM channel. The event went off without a hitch, was vibrant, and filled everyone with excitement, although it was being held virtually. The important dates for the 6th DIID in 2024 are as follows:

- Competition Period: 01 February 2024 – 25 May 2024**
- Entry Deadline and Payment of Fees: 25 May 2024**
- Judging Period: 06 – 12 June 2024**
- Judging Period (Special Awards): 19 – 23 June 2024**
- Announcement of Winners: 27 July 2024**
- Prize-Giving Ceremony: 29 August 2024**



The poster features a dark blue and purple background with glowing geometric shapes. At the top, it displays logos for JOHOR 2024, Universiti Teknologi Mara, and Universitas Lampung. Below these are logos for UTM, UTM, and UTM. The main text reads: "6th DIGITALISED INTERNATIONAL INVENTION, INNOVATION AND DESIGN (6th DIIID) UNIVERSITI TEKNOLOGI MARA CAWANGAN JOHOR 2024". Underneath is the tagline "Innovate for Sustainability: Shaping a Brighter Future". The largest text on the poster is "WINNER ANNOUNCEMENT" in bold, yellow, 3D-style letters. At the bottom, it states "OFFICIATED BY : PROFESSOR DATUK DR. SHAHRIN BIN SAHIB @ SAHIBUDDIN, FASC VICE-CHANCELLOR UNIVERSITI TEKNOLOGI MARA (UITM)". It also includes the date "27 JULY 2024 (SATURDAY)" and times "10.00 AM (Malaysian time)" and "9.00 AM (Indonesian time)". A YouTube logo and "UITM CHANNEL" are at the bottom left.



**Winner of the Best of the Best Award in Science and Technology:
Category : Professional**

PID30231 : Agri Drone – Deep Learning Models for crop leaf disease detection on real-time drone monitoring (Malaysian Institute of Industrial Technology- MITEC)



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KUALA LUMPUR



**Winner of the Best of the Best Award in Social Science:
Category: Professional**

PID30102 : Sang Kancil AR Painting: Bridging Tradition to Technology (UiTM Shah Alam)



اَوْنَبُوْر سَيِّدِي تَيْكُوْلُوْجِي مَبَارَا
UNIVERSITI
TEKNOLOGI
MARA



**Winner of the Best of the Best Award in Science and Technology:
Category: Tertiary**

PID30091: An innovation of ultra Z-blade Turbine for Pico-Hydro System



**Winner of the Best of the Best Award in Social Science:
Category: Tertiary**

PID25092: Bubur Biji Telang (BUBILANG): Butterfly Pea Seed Infusion in Porridge For Stunting Prevention in Indonesia





**Winner of the Best of the Best Award in the School:
Category: Secondary**

PID10352 : MonitoRing (SMKJK Jit Sin)



**Winner of the Best of the Best Award in the School:
Category: Primary**

PID10221 : Minecraft Smart Sifir (Sekolah Kebangsaan Pauh)





The Merit of Distinction Award

PID30231 : Agri Drone – Deep Learning Models for crop leaf disease detection on real-time drone monitoring (Malaysian Institute of Industrial Technology- MITEC)



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Please visit <https://www.youtube.com/watch?v=ujUR2-f9lmg> to rewatch the winner announcement ceremony



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