

RESPEX 2025: Designing The Future

9th Regional Educators and Students' Product Exhibition



MINISTRY OF HIGHER EDUCATION
DEPARTMENT OF POLYTECHNIC AND COMMUNITY COLLEGE EDUCATION



POLITEKNIK
MALAYSIA
PORT DICKSON

RESPEX'25

Innovating, Integrating & Sustaining TVET Through Technology

9th Regional Educators and Students' Product Exhibition



Designing The Future

RESPEX 2025

THE COMPILATION OF PRODUCT INNOVATION
9th REGIONAL EDUCATORS
& STUDENTS' PRODUCT EXHIBITION



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OVERVIEW TO RESPEX 2025

The Regional Educators and Students Product's Exhibition (RESPEX) is an annual academic showcase that celebrates the spirit of discovery, invention, and applied research within the Technical and Vocational Education and Training (TVET) community. Since its inception, RESPEX has evolved into a prestigious platform that unites bright, inquisitive minds from polytechnics and higher education institutions across Malaysia, providing them with the opportunity to present innovative ideas and tangible solutions to real-world challenges. RESPEX 2025 marks another significant chapter in this journey, carried forward under the inspiring theme *"Empowering Innovation for Sustainable Impact."* This year's edition focuses on ideas that are transformative, environmentally conscious, and socially responsive projects that reflect a strong sense of purpose beyond technical competence. More than just a competition, RESPEX is a catalyst for collaboration and growth. It brings together students, academics, industry professionals, and community stakeholders to explore and nurture ideas that have the potential to improve lives and contribute meaningfully to national and global development goals. Through this initiative, we affirm the polytechnic sector's critical role in producing not only skilled graduates but also thought leaders, problem-solvers, and changemakers.

RESPEX 2025, hosted by Politeknik Medan Indonesia and cohost by Politeknik Port Dickson, features an impressive assembly of product innovations developed by students and academic staff from polytechnics and invited institutions. This year, the showcases were held on 18th-19th June 2025 physically, each presenting original projects aligned with categories such as:

01. Art, Multimedia, Graphic & Design and Fashion & Beauty
02. Business, Marketing & Entrepreneurship
03. Civil Engineering and Architectural
04. Electrical, Electronics Engineering and Information Technology
05. Hospitality
06. Mechanical Engineering and Automotive
07. Teaching & Learning
08. Youth Stem

Each entry is a testament to the participants' creativity, technical acumen, and commitment to addressing current and future societal needs. From initial ideation to the development of working prototypes, participants engage in a full innovation journey, simulating real-world processes of research, development, and presentation. The event includes:

- Product showcase booths (physical and/or virtual)
- Poster presentations and digital portfolios
- Judging by a distinguished panel of experts
- Networking opportunities with industry and academic figures
- An awards ceremony celebrating outstanding achievements

In alignment with Malaysia's TVET agenda and the Sustainable Development Goals (SDGs), RESPEX 2025 stands as a platform that inspires and leads innovation with real impact. This proceeding book, *"Designing the Future"*, compiles abstracts and posters as a tribute to the creativity, knowledge, and dedication of all participants, celebrating innovation that shapes communities, industries, and society towards a sustainable future.



FOREWORD

Director of Programme 1
Regional Educators and Students Product Exhibition
(RESPEX 2025)

Dear participants and team of Regional Educators
and Students Product Exhibition | RESPEX 2025.

All praise be to Allah SWT. With His divine will, the Department of Polytechnic and Community College Education (POLYCC), Malaysia, in collaboration with Politeknik Port Dickson (PPD), Malaysia, and the main organiser, Politeknik Negeri Medan, Indonesia, alongside the Malaysian Technologists Association (TAM), has successfully convened the Regional Educators and Students Product Exhibition (RESPEX) 2025.



RESPEX 2025 has brought together hundreds of educators and students to present their innovative ideas and research. This exhibition reinforces the mission of strengthening TVET within Malaysian Higher Education, in line with the dynamic needs of fast-evolving industries which demand a highly skilled and adaptable workforce ready to face future challenges. The diverse range of presentations highlights relevant concepts across various disciplines, reflecting the ongoing transformation in both technology and the global economy. We are deeply appreciative of all contributors who have encapsulated their presentations in this volume, which serves as a rich academic resource for teaching and learning—particularly in aligning with the current and future needs of industry.

The success of RESPEX 2025 plays a pivotal role in fostering a culture of research, sharing innovation, and enhancing the quality of education. Congratulations to all participants who have made the most of this international platform to elevate the standard of their work. It is our hope that the ideas and knowledge shared here will serve as valuable references for aligning skills and expertise with the evolving demands of contemporary and future industries. May these proceedings inspire further collaboration and excellence in teaching, research, and innovation.

In conclusion, we sincerely hope that the innovative products and papers presented in RESPEX 2025 will contribute meaningfully to interdisciplinary academic discourse and enrich our collective body of knowledge. We also aspire for this proceedings book to remain a continuous effort that supports the enhancement of educational quality in tandem with the ever-changing demands of industry.

Thank you.

Dr. Isha Baizura binti Ismail
Director of Programme 1
Regional Educators and Students Product Exhibition (RESPEX 2025).



MESSAGE

Director of Politeknik Port Dickson

Assalamualaikum warahmatullahi wabarakatuh,
Warm greetings and boundless innovation.

As host of RESPEx 2025, it gives me immense pride and pleasure to welcome everyone to this Closing Ceremony, a gathering where brilliant minds converge, bold ideas take flight and innovation knows no boundaries. Since its humble beginnings in 2017 as the Regional Student Project Exhibition, RESPEx has grown by leaps and bounds. What began as a platform to showcase student creativity soon expanded its horizons. Acknowledging the pivotal role of educators, we rebranded the event from 2019 to 2023 as the Regional Student and Educator Product Exhibition, placing stronger emphasis on commercialisation, market relevance and industrial alignment. Each chapter of its evolution reflects our unwavering commitment to staying ahead of the curve. Today, in its ninth edition, RESPEx 2025 proudly stands as a collaborative effort between Politeknik Negeri Medan of Indonesia, Politeknik Port Dickson and the Ministry of Higher Education Malaysia. We are equally grateful for the strong backing of the Department of Polytechnic and Community College Education (DPCCE) and the Malaysian Technology Association (TAM), our valued strategic partners who continue to fuel this journey of innovation. RESPEx is far more than an annual exhibition. It serves as a living and breathing laboratory where innovation meets application, where students and educators tackle real-world industrial challenges with ingenuity and vision. The enthusiastic participation this year, especially from Malaysian students, is proof that innovation has moved beyond classroom walls, transforming into tangible, high-value products with commercial potential. Politeknik Port Dickson is truly honoured to helm RESPEx 2025. This trust reflects our readiness to lead high-impact initiatives in line with the National Higher Education Plan and the Fourth Industrial Revolution policy. We see ourselves not just as educators but as catalysts for future-ready talent and solutions.



To the organising committee, your dedication, precision, and tireless spirit have been the engine behind this success. I extend my heartfelt gratitude. And to all participants, congratulations! You are the pulse of the innovative ecosystem. Your creativity, competitiveness and entrepreneurial drive are lighting the path forward. You prove that the future belongs to those who dare to create it.

As we close this chapter, let us carry forward this spirit of innovation, cross-border collaboration and powerful industry partnerships. Here at Politeknik Port Dickson, we believe the future is not something we wait for, it is something we build. And that work starts now.

Thank you for being part of RESPEx 2025.

We look forward to seeing you again, bigger, bolder, and stronger, at RESPEx 2027.

Tn. Hj. Wan Zulkifly bin Wan Zakaria
Director, Politeknik Port Dickson
Malaysia.



MESSAGE

Director General
Department of Polytechnic and Community College
Education Malaysia

Assalamualaikum Warahmatullahi Ta'ala
Wabarakatuh and warm greetings,

Welcome all of you to the Closing Ceremony of RESPEX 2025, especially to the esteemed exhibitors from Malaysia, Indonesia, South Korea, Laos and Brunei. RESPEX 2025 serves as a premier platform for innovators to showcase creative designs and innovative products that not only meet the needs of local industries but are also aligned with global developments.



RESPEX 2025 aims to strengthen collaboration among students and educators across Southeast Asia while encouraging the exchange of knowledge and best practices in innovation development. Through this platform, we support the development of human capital capable of meeting the challenges of a high-technology-driven economy, in line with the Fourth Industrial Revolution and the evolving demands of the job market.

With the increasing number of participants from ASEAN as well as Asia-Pacific countries, this reflects the crucial role RESPEX plays in promoting high-impact, market-oriented innovation that contributes to enhancing the transformation of industries and communities.

As a strategic partner, Department of Polytechnic and Community College Education (DPCCE), Ministry of Higher Education Malaysia remain committed to expanding collaborative networks with universities and regional institutions that share the vision of empowering community- and industry-driven innovation that will accelerate the transfer of knowledge, technology, and expertise to enhance the nation's global competitiveness.

In conclusion, DPCCE wishes to express sincere appreciation and gratitude to all participating institutions and individuals whose outstanding commitment has made RESPEX 2025 a success.

Thank you for being part of our shared efforts to strengthen innovation and technology for a brighter future.

Dato' Dr. Haji Mohd. Zahari bin Ismail
Director General of Polytechnic and Community College Education
Malaysia.



MESSAGE

Director of Politeknik Negeri Medan, Sumatera Indonesia.

Assalamualaikum Warahmatullahi Ta 'ala Wabarakatuh and warm greetings,

Allow me to take this opportunity to extend my heartfelt congratulations to all parties who have contributed to the outstanding success of RESPEx 2025. Your unwavering commitment, spirit of collaboration, and tireless dedication are truly commendable and deserve the highest recognition.



In today's fast-paced industrial landscape driven by technological advancement, automation, and digital transformation—RESPEx stands out as a premier platform for nurturing talent and cultivating a spirit of innovation among the younger generation. It is not merely a space for showcasing new creations, but a vital forum for shaping future innovators who are not only technically proficient but also visionary and mindful of societal and environmental needs.

All too often, designers and researchers become absorbed in technical details without considering the broader context. Therefore, it is crucial that we instill a holistic approach in the process of design and innovation merging technical precision with long-term vision. A successful product or idea does not rely solely on current achievements but on its capacity to evolve, adapt, and deliver lasting impact. In this light, any gaps or questions in research should be seen as golden opportunities for discovery and progress.

RESPEx 2025 has brought together remarkable works spanning multiple disciplines including engineering, architecture, environmental studies, economics, and the social sciences. This interdisciplinary collaboration is the true strength of modern innovation, enabling ideas to flourish more comprehensively and effectively. Our panel of judges, comprising highly experienced experts, has played a pivotal role in upholding the quality, transparency, and integrity of the evaluation process throughout the event.

To all participants, organisers, and judges—thank you for your exceptional contributions. The excellence of RESPEx is proof that when education, research, and industry come together, we can create something truly meaningful.

My deepest appreciation also goes to Politeknik Port Dickson for their meticulous and well-organized hosting of this year's exhibition. Inter-institutional collaboration is a key foundation for building a dynamic and competitive innovation ecosystem.

Once again, congratulations to all. May RESPEx catalyze high-impact innovation and play a vital role in shaping the future of both industry and our nation.

Thank you.

Dr. Ir. Idham Kamil, S.T., M.T,
Director, Politeknik Negeri Medan,
Indonesia.

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Photo Gallery of RESPEX 2025



Category

RESPEX 2025

01 Art, Multimedia, Graphic & Design
and Fashion & Beauty

02 Business, Marketing &
Entrepreneurship

03 Civil Engineering & Architectural

04 Electrical, Electronics Engineering
and Information Technology

05 Hospitality

06 Mechanical Engineering and
Automotive

07 Teaching & Learning

08 Youth Stem



ART, MULTIMEDIA, GRAPHIC, & DESIGN

1. RESPEX 25-019
THE RHYTHYN9 ART COMMUNITY CENTRE
POLITEKNIK PORT DICKSON
2. RESPEX 25-077
IOT-BASED SMART TOURISM DESTINATION TECHNOLOGY WITH
3D MAPPING IN LINGGA TOURISM VILLAGE
POLITEKNIK NEGERI MEDAN

THE RHYTHYN9 ART COMMUNITY CENTRE

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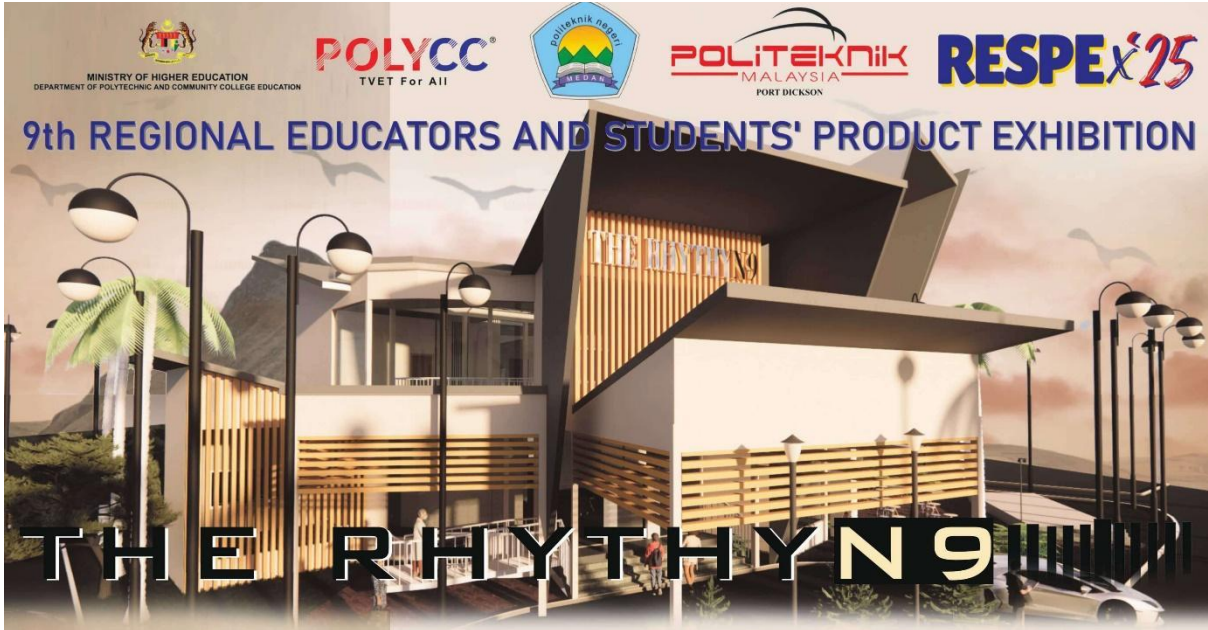
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Abstract

The art centre is a contemporary cultural hub designed to preserve and celebrate the traditional arts of Negeri Sembilan, with a special focus on local music and sculpture, especially since the proposed site is located within the state. Many local people nowadays are unaware of their own traditional music, particularly Bongai, which holds deep cultural value. Because of this, the main reason behind the proposal of this building is to raise awareness and appreciation of Bongai among the younger generation and the wider public, ensuring that this important cultural heritage is not forgotten. The design concept is inspired by the rhythms and flow of Bongai music, which influence both the architectural layout and the roof form. The floor plan reflects the five main instruments commonly used in Bongai performances which is rebana, gong, gendang, salung, and tumbuk kalang as well as five popular rhythms such as anak bocek and irama petaseh. This approach connects the physical design of the centre to the traditional music it aims to honour. The centre functions not only as a gallery for art exhibitions and performances but also as a learning space that offers hands-on workshops and classes in both sculpture and music, open to all age groups. It also acts as a platform for community engagement, encouraging local gatherings, celebrations, and deeper connections to the arts. Architecturally, the building adopts a contemporary style with natural elements, wood is used on the facade for aesthetic warmth, while stone is selected for the main walls due to its durability, particularly in a coastal environment. The use of a peach colour palette further enhances the connection to the nearby beach, creating a soft and welcoming visual tone that complements the overall design. From an environmental perspective, the centre emphasizes sustainability by using eco-friendly materials, such as responsibly sourced wood and low-carbon concrete, and integrating energy-efficient lighting, focused only where needed, such as on display areas. Water-saving fixtures are included to reduce consumption, and organic waste is managed responsibly to support green practices. This art centre is not only a physical space but a cultural symbol that promotes, protects, and revives the essence of Negeri Sembilan's traditions. In addition to establishing cultural buildings like this, government initiatives and community events should also be maximized to ensure that our local heritage continues to flourish and is not lost to the passage of time.

Keyword: Art Centre, Architecture, Rhythm, Bongai Music, Negeri Sembilan









9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

THE RHYTHM9

INTRODUCTION

To propose an art centre for all group of ages to move the rhythm of our heritage art and culture by designing an art centre that can attract the attention to all ages.

AIM

To propose a design of art centre that can move the rhythm of our heritage art and culture based on rhythm concept.

OBJECTIVE

- Making a design that can promote the rhythm of our heritage art and culture
- Designing a building layout just like rhythm
- Planning landscape between the rhythm of the building

ISSUE

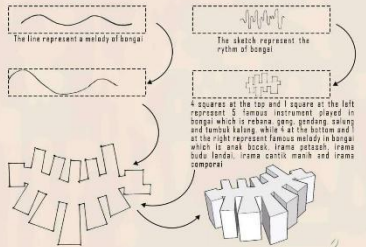
- There is no art centre that promotes the rhythm of our art and heritage.
- Making a research about traditional music of Negeri Sembilan.
- Proposed site has a high temperature because of the sunlight and located by the beach

CASE STUDY

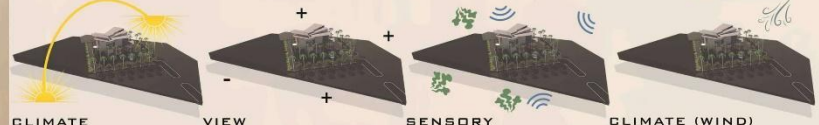
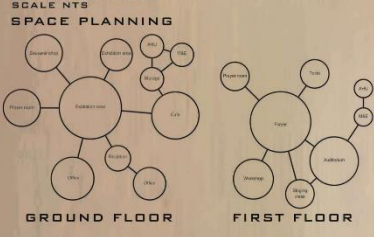


A concrete material with a rhythm concept of roof, very strong and resistant to various external factors such as extreme weather, heavy rain, strong winds, and fire.

Green wall provided the natural insulation, reducing the need for air conditioning in the hot weather. They are also help filter pollutants and carbon dioxide out of the air. It is also give an aesthetic appeal for the building.



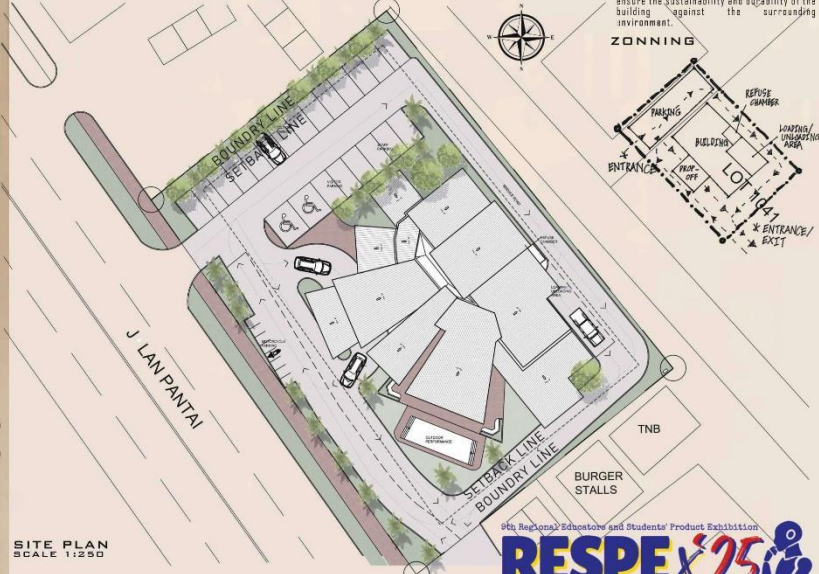
SITE ANALYSIS

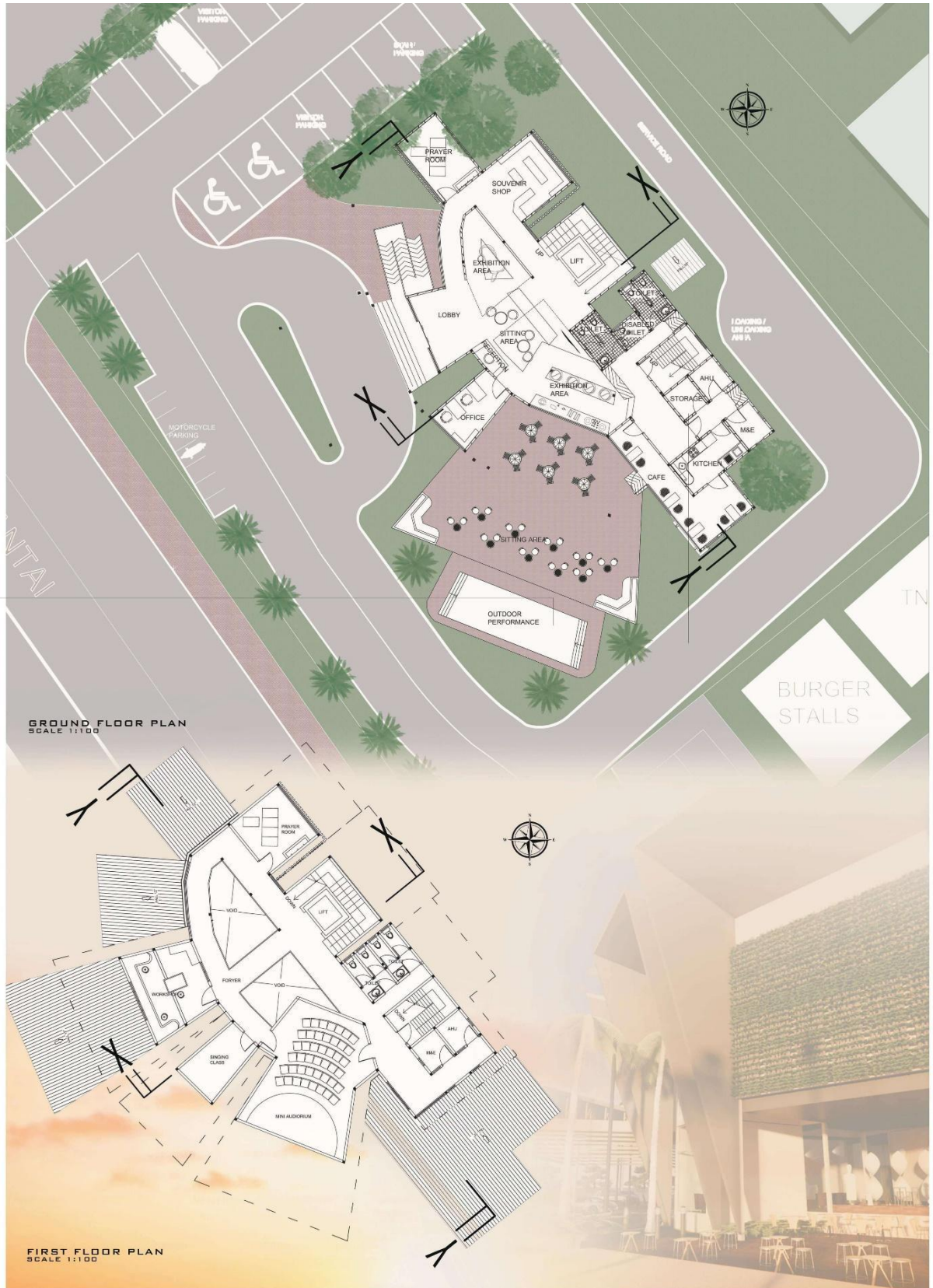


to apply facade and roof that against the Put a space that need a beautiful view to a sunlight so that the interior want get the positive view such as cafe, lobby and around the building, especially in the part used, especially the sea breeze which has direct sunlight. In addition, planting trees courtyard. While the side with negative view that has the unwanted sounds. Put the nature high humidity, this can cause building damage to protect the building from direct could be placed with closed space and does chamber on the side that is not visited by visitors to avoid the bad being exposed.

Filter out unwanted sounds by planting trees. Put the nature high humidity, this can cause building damage due to high humidity, this requires the use of materials that are resistant to corrosion to ensure the sustainability and durability of the building against the surrounding environment.

The wind affects how the material selection is used, especially the sea breeze which has direct sunlight. In addition, planting trees courtyard. While the side with negative view that has the unwanted sounds. Put the nature high humidity, this can cause building damage due to high humidity, this requires the use of materials that are resistant to corrosion to ensure the sustainability and durability of the building against the surrounding environment.





AHMAD SYAMIL BIN AHMAD SYAKIR | 06DSB22F1050 | DCA40155 DESIGN STUDIO 4 | MDM NORLIZA BINTI HOJAN | MDM NORZALINA BINTI MD. YUSDP | MDM MAHANIM BINTI ABULLAH SADALI





FRONT ELEVATION
SCALE 1:1000



REAR ELEVATION
SCALE 1:1000



LEFT ELEVATION
SCALE 1:1000



RIGHT ELEVATION
SCALE 1:1000

AHMAD SYAMIL BIN AHMAD SYAKIR | 06DSB22F1050 | DCA40155 DESIGN STUDIO 4 | MOM NORLIZA BINTI HOJAN | MOM NORZALINA BINTI MO. YUSOP | MOM MAHANIM BINTI ABDULLAH SADALI

TYPICAL SECTION
SCALE 1:25

DETAIL A
SCALE 1:10

76MM X 150MM RAFTER BATTEN AT 700 C/C

450MM X 150MM RC BEAM TO ENGR'S DETAIL

DETAIL B
SCALE 1:10

150MM X 200MM X 200MM RC FOOTING TO ENGR'S DETAIL

EXTERIOR

INTERIOR

EXPLODED VIEW

ROOF LEVEL

FIRST FLOOR LEVEL

GROUND FLOOR LEVEL

AHMAD SYAMIL BIN AHMAD SYAKIR | 0608822F1050 | DCA40155 DESIGN STUDIO 4 | MDM NORLIZA BINTI HOJAN | MDM NORZALINA BINTI MD. YUSOP | MDM MAHANIM BINTI ABULLAH SADALI

IOT-BASED SMART TOURISM DESTINATION TECHNOLOGY WITH 3D MAPPING IN LINGGA TOURISM VILLAGE

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Abstract

This research develops sustainable tourism technology innovation through the implementation of Smart Tourism Destination Tools based on the Internet of Things (IoT) integrated with 3D Mapping technology to support the Green Tourism concept in Lingga Village, Karo Regency, North Sumatra. The technology developed combines three main components, namely a web-based IoT system, 3D mapping technology using drones, and an integrated framework with the MDLC (Multimedia Development Life Cycle) methodology. The IoT system developed uses NFC (Near Field Communication) technology for registration and access to tourism information, integrated IoT sensors for real-time monitoring, and a web-based platform that allows tourists to easily access tourism information. 3D mapping technology presents interactive modeling using drones for mapping tourist areas, 3D spatial visualization that provides a comprehensive picture of the physical and environmental conditions of the village, and orthomosaic imaging to produce detailed and accurate 3D maps. The advantage of this technology lies in the first 3D mapping innovation in Lingga Village which shows linear growth by maintaining the orientation of traditional houses as cultural centers. This system achieved a satisfaction level of 85.4% of respondents in terms of visual appeal and color selection, and was able to identify the potential for Green Tourism through sustainable mapping technology. Technology features include real-time monitoring through IoT sensors, 3D visualization for immersive tourism experiences, data analytics for destination management optimization, and a mobile-friendly interface for maximum accessibility. The implementation of this technology is designed as Tourism Leisure 5.0 which integrates environmental conservation and local culture, community economic empowerment, sustainable digital tourism experiences, and environmental education through interactive media. The positive impacts generated include cultural preservation through the digitalization of cultural and natural heritage, increasing the creative economy through technological innovation, supporting the concept of sustainable tourism, and easy access to tourism information through digital platforms. The technology output is in the form of a 3D IoT Mapping prototype for the tourism sector, Copyright for 3D IoT Mapping technology, integrated applications for smart tourism destinations, and a technology-based sustainable tourism business model. This technology represents an innovative step in the digital transformation of Indonesia's tourism sector, especially in supporting the vision of Green Tourism and Smart Tourism Destination which is sustainable to increase the competitiveness of local tourist destinations in the digital era.

Keyword: IoT, Mapping, Immersive, Tourism, Economic



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION



IOT-BASED SMART TOURISM DESTINATION TECHNOLOGY WITH 3D MAPPING IN LINGGA TOURISM VILLAGE

ANDI SUPRIADI CHAN, S.KOM., M.KOM.,
 ANNALISA SONARIA HASIBUAN, S.PD., M.PD., ANDAM LUCKYHASNITA, S.DS., M.DS

Introduction



Potensi Ekonomi Pariwisata Indonesia yang Belum Optimal dimana Indonesia menargetkan devisa negara dari sektor ekonomi pariwisata sebesar 30 Miliar USD dengan jumlah perjalanan wisatawan mancanegara 22,3 juta kedatangan pada tahun 2024, serta Krisis Ketimpangan Regional dalam Pengembangan Pariwisata. Kendala Teknologi dan Informasi di Kabupaten Karo, segmentasi pembangunan dan pengembangan hanya berada pada beberapa titik destinasi super prioritas dengan pengembangan yang masih terbatas.

Significant of the Study



Signifikansi dalam studi ini terletak pada penerapan teknologi IoT-Based Smart Tourism dan pemetaan 3D untuk mengembangkan Lingga sebagai desa wisata digital berbasis budaya lokal. Teknologi seperti sensor, CCTV, dan pemetaan 3D memungkinkan wisatawan menjelajahi lingkungan dengan aman dan interaktif,

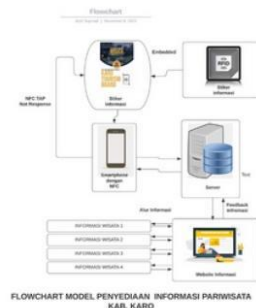
Problem Statement

Kebutuhan Mendesak akan Inovasi Teknologi Pariwisata seperti Kerugian Ekonomi Langsung, Keterlambatan Pembangunan, Hilangnya Daya Saing serta Degradasi Lingkungan Tanpa konsep green tourism, pengembangan pariwisata berpotensi merusak kelestarian alam dan budaya lokal

Objectives

Implementasi Smart Tourism Destination Tools berbasis IoT dengan teknologi Mapping 3D memiliki nilai ekonomis yang tinggi karena dapat Meningkatkan Kunjungan Wisatawan, Menciptakan Ekonomi Digital, Efisiensi Pengelolaan, Branding Destinasi serta Multiplier Effect jangka Panjang,

Materials/Method



sekaligus mengenal rumah adat dan budaya Karo secara virtual. Sistem informasi berbasis cloud mendukung pengelolaan data secara real-time untuk promosi dan keamanan. Dengan konektivitas digital, wisatawan dapat mengakses informasi secara praktis. Studi ini menegaskan peran teknologi dalam mendukung pelestarian budaya, meningkatkan pengalaman wisata, dan mendorong pariwisata berkelanjutan berbasis masyarakat.

Innovation Highlight

Momentum pemulihan ekonomi pasca pandemi dan komitmen pemerintah terhadap pembangunan pariwisata berkelanjutan sebagai salah satu pilar ekonomi nasional. Tanpa adanya inovasi teknologi ini, Kabupaten Karo akan kehilangan kesempatan emas untuk menjadi destinasi wisata unggulan yang dapat berkontribusi signifikan terhadap perekonomian daerah dan nasional.





Business, Marketing & Entrepreneurship

1. RESPEX25-032
BUSINESS ADVENTURE - THE ENTREPRENEUR'S QUEST
POLITEKNIK PORT DICKSON,
POLITEKNIK SULTAN AZLAN SHAH,
POLITEKNIK KOTA BHARU
2. RESPEX25-054
LEKOMIX SECUBIT RASA
POLITEKNIK PORT DICKSON
3. RESPEX25-057
FISLI (FISH SLICE FLAVOR ENHANCER)
POLITEKNIK PORT DICKSON
4. RESPEX25-058
QUICKFIX PRO
KOLEJ KOMUNITI KUALA PILAH
5. RESPEX25-079
OPTIMIZING BUSINESS MODEL CANVAS FOR SUSTAINABLE
GROWTH: A CASE STUDY OF CV KINARIA EVENT
ORGANIZER
POLITEKNIK NEGERI MEDAN
6. RESPEX25-081
SUMLEKOR
POLITEKNIK PORT DICKSON
7. RESPEX25-072
TEPUNG CUCUR LEKOR
POLITEKNIK PORT DICKSON
8. RESPEX25-097
PATTYKO
POLITEKNIK PORT DICKSON

BUSINESS ADVENTURE - THE ENTREPRENEUR'S QUEST

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Abstract

Today's world shows an increasing demand for educational resources that go beyond theory which aim to develop practical skills and encourage an entrepreneurial mindset. This is evident that in the rapid changes in economic landscapes, innovation, and entrepreneurship. The Entrepreneur's Quest: Business Adventure is an innovative educational board game designed to transform how business and entrepreneurship concepts are taught in higher educational institutes, especially to diploma and undergraduate students. Moving beyond passive learning, the game engages players in an active simulation where they must navigate the complexities of starting and growing a business from launching a startup to managing a corporate empire. In contrast to conventional board games, this game combines a structured knowledge system through tier up question cards covering management, marketing, strategy and digital entrepreneurship. Players must answer questions given correctly to make strategic moves such as purchasing properties, upgrading businesses and making investment decisions. The inclusion of real-world inspired event cards such as market crashes, tech booms, and product recalls has added layers of unpredictability and critical decision-making. By doing so, it's allowing players to experience the volatility and excitement of entrepreneurial ventures in a lower risk setting. This study adopts a design-based research (DBR) methodology to evaluate the educational impact of the game among a group of diploma students in polytechnic. Data collected through observations, focus group discussions, and pre/post-game surveys reveal that the game significantly enhances commitment, motivation, and comprehension of core business concepts. Result reported that students increased confidence in applying theory to practice, along with improvements in financial literacy, strategic thinking, and teamwork. The findings verify the game's effectiveness as both a revision tool and a platform for experiential learning. It encourages students to think critically, collaborate, and adapt to challenges as skills essential in today's entrepreneurial ecosystem. Furthermore, the game's content aligns with current trends in digital business, such as innovation, online marketing, and globalization, making it a relevant and future-oriented teaching tool. This product innovation recommends integrating The Entrepreneur's Quest into entrepreneurship and management curricula to complement conventional teaching methods. It also proposes digital adaptation and content customization to be broad and versatile. Ultimately, this gamified approach redefines how management and entrepreneurship is taught, making learning more engaging, outstanding, and impactful.

Keyword: Entrepreneurship, Business Adventure, Management, Educational Board Game.



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

TITLE : BUSINESS ADVENTURE - THE ENTREPRENEUR'S QUEST

Name	Status	Institution Name
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Norashikin binti Rosli	Project Members	Politeknik Sultan Azlan Shah
Norbaini binti Ghazali	Project Members	Politeknik Kota Bharu

Introduction

Business Adventure: The Entrepreneur's Quest is an educational board game designed to simulate real-world entrepreneurial experiences and strategic business decision-making in a structured and engaging environment.

Objectives

1. To apply entrepreneurial decision-making in dynamic business scenarios
2. To demonstrate understanding of core management functions
3. To integrate marketing, finance, and strategy in business development
4. To foster entrepreneurial mindset and risk-taking behaviour

Significant of the study

By simulating real-world entrepreneurial challenges and scenarios, the game promotes critical thinking, strategic planning, and financial literacy, making it not only entertaining but also a powerful learning resource.

Commercial values

Business Adventure: The Entrepreneur's Quest is an innovative, experiential board game that taps into the booming edutainment and gamified learning markets. With a focus on real-world entrepreneurship, it's designed for teens, educators, and aspiring founders, making it a highly valuable tool in an age where business education and interactive learning are in high demand

1

2

3

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7

8

Problem Statement

The integration of digital economy elements such as e-commerce growth, technology disruption, and globalization are critical in preparing students for current market realities

Materials/Method

The game was introduced as a supplementary learning tool during workshop sessions. Students were divided into groups of 4-5 players or groups, and each session included a short briefing, gameplay lasting 60-90 minutes. Observations and focus groups were used to capture student responses and experiences throughout the sessions

Innovation Highlight

Business Adventure: The Entrepreneur's Quest is an innovative educational board game that incorporates a structured knowledge system through tiered question cards covering management, marketing, strategy, and digital entrepreneurship

Conclusion

By embracing gamified learning tools like Business Adventure: The Entrepreneur's Quest, educators can empower students with the skills and mindset necessary to thrive in the modern business landscape.

LEKOMIX SECUBIT RASA

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Abstract

This study focuses on the development of a unique and innovative seasoning blend made from locally sourced ingredients, keropok lekor (traditional fish cracker), peria (bitter melon), shiitake mushroom, salt, onion, and garlic. The aim is to create a nutritious, flavor enhancing seasoning powder that combines umami, bitterness, and savoriness, suitable for use in a variety of Malaysian and fusion dishes. Each ingredient contributes distinct sensory and nutritional properties keropok lekor adds a rich seafood flavor, peria introduces beneficial antioxidants and a hint of bitterness, shiitake mushrooms offer umami depth, while onion and garlic enhance aroma and taste. The seasoning is processed through drying, blending, and fine grinding to ensure a balanced and easy to use product. This seasoning provides a natural alternative with reduced reliance on artificial flavor enhancers like less MSG and healthy, appealing to health-conscious consumers and promoting local food innovation while adding value to traditional ingredients.

Keyword: Innovative, Seasoning, Food Innovation, Natural and Healthy Apitalize



THE LEKOMIX HQ



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 NURUL FATIHAH BT RAZLAN 06DPR22F2022

SUPERVISOR : PUAN AZIELINA BT MOHD



TASTE OF EAST COAST

INTRODUCTION

- **Easy & Delicious**
Our seasoning makes it simple to enjoy authentic keropok lekor at home or for business.
- **Unique & Healthy Recipe**
Made with bitter melon and black pepper for a balanced, tasty, and healthy flavour.
- **High-Quality Ingredients**
We use only fresh, top-quality ingredients for consistent and safe flavour.
- **Street Food Taste for Everyone**
Enjoy the taste of Malaysian keropok lekor anytime, anywhere.

SIGNIFICANCE OF THE STUDY

- **Preserve Traditional Flavours**
Helps maintain the authentic taste of keropok lekor, keeping it beloved by many.
- **Enhance Local Product Quality**
Helps producers create tastier and more consistent products.
- **Encourage Food Innovation**
The unique blend of ingredients introduces new ideas in traditional food.

OBJECTIVES

- To increase brand awareness through effective marketing campaigns and strong digital presence.
- To maintain high product quality by using premium ingredients and upholding strict quality control standards.
- To collaborate with culinary influencers, retailers, and food creators in promoting innovative and delicious ways to use Lekomix products.

INNOVATION HIGHLIGHT

- **Unique Flavor**
Combining bitter melon and black pepper for a tastier and healthier keropok lekor.
- **Quality Ingredients**
Uses fresh, high-quality ingredients for consistent and premium taste.
- **Easy-to-Use**
Simple for both home cooks and food businesses to create authentic flavour with minimal effort.

PROBLEM STATEMENT

- Many keropok lekor lack consistent taste due to uneven seasoning or low quality ingredients.
- It's hard to find seasoning that truly captures the rich, traditional taste of Malaysian keropok lekor, especially outside coastal regions.
- Preparing the right blend of spices at home takes time, effort, and skill especially for beginners.

COMMERCIAL VALUES

- High quality seasonings at an affordable price for everyone.
- Suitable for both small and large scale production, helping businesses grow.
- Unique flavors and premium quality make the product stand out
- Healthier ingredients attract consumers who care about wellness.

CONCLUSION

- **Authentic Taste** - Secubit Rasa brings the true taste of keropok lekor.
- **Unique Flavors** - A healthier and exciting taste with bitter melon and black pepper.
- **Easy to Use** - Perfect for both home cooks and businesses.
- **Affordable Quality** - Premium seasoning at a great price.



FISLI: INNOVATIVE SLICE-FORM FISH FLAVOUR ENHANCER FOR HEALTH-CONSCIOUS CONSUMERS

**Ahmad Azim Mohd Nor Harisham¹, Nur Ain Sofea Norazmira¹,
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Abstract

FiSli is an innovative slice-based fish flavour enhancer developed to cater to the growing demand for healthier, MSG-free, and protein-rich food options. Designed for busy individuals, health-conscious consumers, and culinary professionals, FiSli solves the problem of artificial additives and preparation hassle found in conventional flavour enhancers. This product leverages spray drying technology to produce ready-to-cook slices from fresh fish and natural ingredients, including star gooseberry leaves, which provide added nutritional benefits. The development process involved market research, product formulation, prototyping, and consumer feedback, ensuring a solution that is convenient, nutritious, and sustainable. Findings indicate that FiSli offers superior convenience, quick solubility, and an authentic umami flavour without synthetic additives, surpassing traditional powders and cubes. The business model emphasizes eco-friendly practices, targeted marketing strategies, and scalable distribution through retail and online platforms. With promising results from product testing and positive market reception, FiSli is positioned to lead the next wave of alternative protein flavour enhancers. Further improvements will focus on expanding product lines, engaging community outreach, and strengthening branding to ensure long-term sustainability and consumer loyalty.

Keyword: Fish Slice, Natural Flavour Enhancer, Spray Drying Technology, Health-Conscious Consumers, Product Innovation



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SUPERVISOR:

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INTRODUCTION

FISli (short for Fish Slice) is a modern, innovative food product designed to revolutionize the way we enjoy seafood.

PROBLEM STATEMENT

Existing flavor enhancers made from fish are currently available only in the form of powder, liquid, or cubes packaged in aluminum foil. These products are typically made from dried anchovies and often contain MSG. However, there are no options made from fresh fish to cater to customers who are allergic to dried anchovies.

INNOVATION HIGHLIGHT

- **Versatile Usage** suitable for a wide range of dishes such as soups, and marinades – making it a multi-functional ingredient in the kitchen
- **Convenience-Oriented** Pre-sliced, quick to cook, and easy to store – ideal for busy households, food services, and health-conscious consumers.
- **Unique Format** fish-based protein in slice form, offering a fresh take on how seafood can be consumed and incorporated into everyday meals.

COMMERCIAL VALUE

- **Targets multiple segments:** Suitable for health-conscious consumers, flexitarians, pescatarians, and busy individuals seeking quick, nutritious meals.
- **Scalability & export potential:** Strong potential for regional and international growth with proper packaging and shelf-life management.
- **Trend alignment:** Matches global trends such as sustainable eating, protein innovation, clean-label food, and convenience-driven consumption.
- **Sauropus androgynus advantage element :** Sweet leaf is rich in nutrients, supports eye health, aids blood production, and promotes brain and nervous system function.

MATERIALS

Fresh sardines, Sago flour, Himalayan salt, Tapioca flour, Garlic, Shallots, Pucuk manis (Souropus androgynus), Carrots, and Chinese parsley

METHOD

- Fish sardines and fish crackers are processed (**cooked, dried, crushed**).
- Leafy greens are processed using **spray drying technology** into flakes, and other ingredients like carrots and spices are crushed.
- All prepared ingredients are mixed and formed into a dough-like layer.
- The formed pieces are then **baked** using **spray drying technology** and shaped for packaging.

OBJECTIVE

- **Promote healthy eating habits** by offering a protein-rich, omega-3 packed seafood option.
- **Enhance mealtime convenience** with ready-to-use, pre-sliced fish pieces.
- **Diversify the protein market** by introducing a new format of seafood that fits modern cooking and eating lifestyles.

SIGNIFICANT OF STUDY

Convenience & Innovation

It introduces an innovative format of fish consumption – sliced and ready to use – aligning with modern lifestyles that demand quick, easy-to-prepare meal options.

CONCLUSION

In conclusion, FISli offers a healthier, more convenient, and sustainable seafood alternative. With FISli, you enjoy great taste while making a smart choice for your health and the planet.

QUICKFIX PRO

Challe Entap Anak Laurance¹, Qayyim Ibtisam Bin Fazrul Zahidi¹, Muhammad Danish Hakimi Bin Mohamad¹, Idi Nur Bin Mohamad, Helmiah Binti Othman¹

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Abstract

Mobile repairing services, especially focusing on the smart phones are currently being in demand as the smart phones had transformed to be a need, instead of a want. Most of the smart phone repairing services are operating in premises such as shop lots and some mobile technicians provide door-to-door services. It is important to have a systematic and conducive workplace environment to ease the assembly and repair processes. However, these requirements are being a challenge for mobile technicians as they need setup an appropriate workspace at every different place they go. Furthermore, component storage and handling components are crucial due to adjustment of new working environment and this consumes time and delays their repairing services. In worst case, small components such as screws and plates could be misplaced if not handled with caution. Therefore, a compact, foldable, and portable working table for mobile device repairing was innovated with branding of “QuickFix Pro” to tackle these issues faced by mobile technicians. QuickFix Pro is a prototype that comprises a foldable working table that is adequate for mobile repairing with compartments that could systematically store the small components of mobile devices. It is also equipped with anti-static silicon mat for easy placement of the devices during the repairing process. In a simple description, QuickFix Pro looks like a luggage bag with wheels that can be folded and easily transported anywhere with a complete tools and spare parts storage compartment. This prototype was developed by recycling items such as woods and steels to provide a strong and stable structure besides being light and handy. The entire process of developing QuickFix Pro was designing the structure, selection of materials, building the prototype and testing it. The significant result of this prototype is the comparison analysis before and after implementing it. Previously, mobile technicians consumed time to setup their work space despite they having complete toolbox. But it became simpler, easier, and faster with QuickFix Pro because they only need to unfold working table at anywhere that is suitable and everything is ready like a one-stop centre. So, QuickFix Pro is a best solution to facilitate mobile technicians and graduates in this field to start-up own business at a cost effective and affordable approach. It can be commercialized among mobile technicians and mobile devices entrepreneurs. Power sockets, energy generator and indicator lightings can be added advantages to this product in the future.

Keyword: Mobile Device Repairing, Foldable, Working Table, Entrepreneurship and Innovation

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

NAMA PROJEK : QUICKFIX PRO

KETUA KUMPULAN: QAYYIM IBTISAM BIN FAZRUL ZAHIDI

**AHLI KUMPULAN : NAMA PESERTA 2 : CHALLEB ENTAP ANAK LAURANCE
 NAMA PESERTA 3 : DANIAL HAZIQ BIN FAIZAL**

NAMA PENSYARAH PEMBIMBING : PN. HELMIAH OTHMAN

NAMA PENSYARAH PEMBIMBING : EN.IDI NUR BIN MOHAMAD

NAMA INSTITUSI : KOLEJ KOMUNITI KUALA PILAH



PENGENALAN

- Sijil Teknologi Peranti Mudah Alih merupakan satu program yang akan menghasilkan graduan TVET samada sebagai juruteknik baikipulih peranti mudah alih atau sebagai seorang usahawan.
- Perkhidmatan membaiki peranti mudah alih, khususnya telefon pintar, kini semakin mendapat permintaan kerana ia telah berubah menjadi satu keperluan setiap lapisan masyarakat.
- Kebanyakan perkhidmatan membaiki telefon pintar beroperasi di premis seperti lot kedai dan ada juga juruteknik mudah alih yang menawarkan perkhidmatan secara mobilliti.
- Namun, kita sedia maklum bahawa untuk menjadi seorang usahawan dalam bidang baikipulih peranti mudah alih, seseorang perlu memiliki gabungan kemahiran teknikal, ilmu keusahawanan dan yang paling penting modal permulaan yang besar.
- Dengan strategi dan peralatan yang betul seperti **QUICKFIX PRO**, graduan yang baru ingin menjimatkan kos permulaan boleh menjalankan perniagaan secara kecil-kecilan, menawarkan perkhidmatan secara fleksibel di mana-mana lokasi sahaja.

PERNYATAAN MASALAH

Antara masalah utama yang dikenal pasti :

- Kekangan untuk menyediakan ruang kerja yang kondusif, sistematik dan sesuai di lokasi kerja yang berbeza-beza.
- Ketiadaan ruang simpanan alat ganti dan peralatan setempat dan sistematik menyebabkan proses membaiki menjadi lambat.
- Masalah kehilangan komponen kecil seperti skru sering berlaku jika situasi kerja yang tidak tersusun.

OBJEKTIF INOVASI

Objektif inovasi ini ialah :

- Merekabentuk sebuah ruang kerja mudah alih yang boleh dilipat dan mudah dibawa ke mana – mana.
- Menyediakan ruang penyimpanan bagi memudahkan kerja-kerja membaiki peranti mudah alih.
- Boleh digunakan sebagai alat bantu promosi bagi program Sijil Teknologi Peranti Mudah Alih, Kolej Komuniti Kuala Pilah.
- Sebagai solusi dengan kos yang berpatutan kepada graduan yang ingin memulakan perniagaan baikipulih peranti mudah alih.

CIRI CIRI INOVASI

- Meja lipat kompak yang mudah dibawa seperti beg.
- Mempunyai roda bagi memudahkan ia dibawa ke mana-mana.
- Ruang khas untuk alatan membaikipulih.

KESIMPULAN

- Inovasi **QuickFix Pro** ini direka untuk menyelesaikan masalah kekangan ruang kerja yang kondusif, mudah alih pada lokasi kerja yang tidak tetap.
- Dengan reka bentuk yang boleh dilipat, inovasi ini bukan sahaja meningkatkan produktiviti kerja malah berpotensi tinggi untuk dikomersialkan.
- Produk ini direka seiring dengan trend semasa, menyokong mobilliti perniagaan dan gaya kerja digital yang fleksibel.
- Produk boleh ditambah baik dengan menambah bekalan kuasa tenaga tambahan, soket dan lampu.

BAHAN YANG DIGUNAKAN

Produk ini adalah prototaip di mana ia menggunakan bahan- bahan terpakai dan baharu seperti plywood, kayu pine dan besi .

POTENSI PENGKOMERSIALAN / PERNIAGAAN

- Boleh dipasarkan kepada juruteknik bebas, pelajar teknikal dan syarikat penyelenggaraan alat komunikasi sebagai peralatan wajib.
- Membuka peluang perniagaan baharu seperti sewaan meja kepada pelajar atau usahawan kecil dalam bidang membaiki telefon pintar dan peranti mudah alih.

KELEBIHAN PRODUK

Antara penyelesaian kepada masalah tadi ialah dengan menghasilkan **QuickFix Pro** iaitu :

- Meja lipat kompak yang mudah dibawa seperti bagasi di lokasi pelanggan, meja dibuka dan dikunci pada kedudukan kerja.
- Mempunyai roda bagi memudahkan ia dibawa ke mana-mana.
- Ruang khas untuk alatan membaikipulih.
- Meja boleh dilipat semula dan disimpan dengan mudah selepas selesai penggunaan.

METODOLOGI

Inovasi ini melalui beberapa fasa penghasilan iaitu:

- Peringkat Rekabentuk: Lakaran awal reka bentuk meja dibuat berdasarkan keperluan sebenar juruteknik. Reka bentuk menekankan aspek boleh lipat dan mudah dibawa.
- Pemilihan Bahan: Bahan seperti kayu, dan besi digunakan untuk mengekalkan kekuatan struktur sambil mengurangkan berat keseluruhan.
- Proses Pembinaan: Komponen meja dipotong dan disambung secara modular .
- Ujian Penggunaan: Meja diuji oleh juruteknik untuk menilai kestabilan, kebolehbawaan dan keselesaan semasa digunakan di pelbagai lokasi.



OPTIMIZING BUSINESS MODEL CANVAS FOR SUSTAINABLE GROWTH: A CASE STUDY OF CV KINARIA EVENT ORGANIZER

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Abstract

CV Kinaria Event Organizer, based in Medan, Indonesia, specializes in designing and executing corporate events—including seminars, product launches, and company gatherings. As the Meetings, Incentives, Conferences, and Exhibitions sector grows rapidly, competition among event providers intensifies, demanding more structured and adaptive business frameworks. CV Kinaria currently lacks such a framework to capture market opportunities and ensure long-term profitability. To address this, our study applied SWOT analysis to assess internal capabilities and external factors, then refined the nine building blocks of the Business Model Canvas into a cohesive strategy. We conducted semi-structured interviews with management and key clients, observed flagship events, and reviewed internal documents. The SWOT assessment revealed that CV Kinaria’s core strengths lie in its experienced event-planning team and strong client relationships, while weaknesses include underinvestment in digital promotion and limited online service offerings. Externally, the expanding MICE market and advances in virtual event technology present promising opportunities, whereas intense industry rivalry and shifting client preferences toward hybrid and fully virtual formats pose significant threats. Guided by these insights, we enhanced the value proposition with augmented and virtual reality experiences alongside on-demand virtual features, tailored customer segments to include technology startups and professional associations in addition to established corporate clients, and broadened distribution channels through targeted social media campaigns, search engine optimization, and partnerships with technology providers. Revenue streams were diversified via subscription-based event management and post-event analytics services. To translate these recommendations into practice, CV Kinaria should establish a dedicated digital marketing unit equipped with analytics tools, collaborate with AR/VR specialists to create immersive event packages, develop a standardized hybrid-event toolkit for efficient deployment, and introduce a tiered loyalty program offering exclusive benefits. Ongoing training in digital event platforms and project management techniques will further bolster internal capabilities. By implementing these measures, CV Kinaria will strengthen its competitive position, unlock new revenue sources, and build the resilience needed to lead in the dynamic event industry.

Keyword: BMC, Innovation, Sustainable, Event



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

Optimizing Business Model Canvas for Sustainable Growth: A Case Study of CV Kinaria Event Organizer

Optimizing Business Model Canvas for Sustainable Growth: A Case Study of CV Kinaria Event Organizer



Leader, Member

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 Ika Mary Pasaribu, S.E., M.Si.
 Harris P. Nasution, S.E., M.M
 Enda Yunita Surbakti, S.E.Ak., M.Si

Introduction

The event industry particularly within the MICE (Meetings, Incentives, Conferences, and Exhibitions) sector is rapidly evolving and demands adaptive strategies. CV Kinaria based in Medan has experience in organizing corporate events but operates without a structured and adaptive business model.

Problem Statement

Despite its reputation and client trust, CV Kinaria faces stagnation due to weak digital promotion, limited variety of services, overdependence on a few clients, and underutilization of modern technology such as AR/VR in event planning.

Business Model Canvas, event organizer, competitive advantage

Keyword:



Objective

To analyze the current business model of CV Kinaria using the Business Model Canvas (BMC).
 To integrate SWOT analysis in identifying strategic gaps.
 To develop sustainable strategies for growth and competitiveness in the MICE industry.

Methodology

This study used a qualitative case study approach:
 Data Collection: In-depth interviews, field observations, document review.
 Analysis: Integration of SWOT analysis with Business Model Canvas (Osterwalder & Pigneur framework) to propose strategic improvements.

Significance of The Study

The study contributes to the field of event management by showcasing how integrating strategic tools like BMC and SWOT can revitalize traditional businesses, helping them remain relevant and competitive in the digital era.



Innovation Highlight

Introduce augmented reality (AR) and virtual reality (VR) experiences as new offerings to elevate event engagement and differentiate CV Kinaria's services.

Build a robust digital presence by implementing search engine optimization and targeted social media campaigns. Develop hybrid and thematic event models that combine physical and virtual elements for greater flexibility and reach. Establish a customer loyalty program with tiered rewards and personalized post-event follow-ups to enhance retention. Implement segmented service packages for corporate clients, professional communities, and niche markets to deliver more relevant, customized experiences.



Commercial Value

The optimized model offers commercial benefits such as:
 New revenue streams from hybrid and tech-integrated events.
 Increased brand visibility through improved digital marketing.
 Higher client retention due to customized and value-added services.

Conclusion

CV Kinaria can achieve sustainable growth by:
 Enhancing digital marketing and online visibility.
 Offering hybrid and themed events using AR/VR.
 Establishing long-term client loyalty programs.
 Developing staff skills and optimizing internal resource management.
 These actions align with the objective of building a sustainable and competitive business in the growing MICE sector.

SUMLEKOR_SAVOBITES

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Abstract

A company of SavoBites which is expertise in innovate the kerepok lekor and dim sum to be in one dish. “Savo” represents the organization’s aspiration to bring delicious and healthy flavors to the Malaysian community while “Bites” illustrates the small and easy-to-enjoy portion size to be shared and eaten together. To prove the expertise, SavoBites came up with new innovative product “SumLekor” which is the first dim sum filled with kerepok lekor and vegetables to deliver the fusion of local and modern concept of healthy food. It is suitable for today’s generation who are looking for something new without losing the cultural identity, busy daily life and like to have something that is simple, easy and fast to get it as well as in healthy way. There is a lot of ready food and snack for these categories, but to have the good and healthy one is difficult. Then, SavoBites innovate SumLekor to balance the daily life actually. Based on the previous survey through questionnaire distribution in term of what make them interested towards SumLekor, majority of respondents (61%) prefer unique taste, while 51% looked up the affordable price, 42% of them interested towards the convenience and ease of eating and 40% demanded for healthy ingredients. By having SumLekor, people would enjoy their life with a healthy snack which is not just a snack and of course SumLekor would be “bites into happiness”. SavoBites believes in the peoples’ acceptance that SumLekor can varied the packaging size, improved the quality and durability of product as well as provided guides to serve SumLekor in different way.

Keyword: Kerepok Lekor, Dim Sum, Snack, Healthy, Busy Life



SumLekor



INTRODUCTION

SumLekor is the first dim sum filled with keropok lekor as an innovation on beloved Malaysian snack of Keropok Lekor which have a unique taste, crunchy and healthy snack produced by SavoBites.

"Bites into Happiness"

PROBLEM STATEMENT

- Only 4.6 % people in Malaysia eat vegetables in every meal (Idris, 2023)
- Gen Z prefer to buy ready meals at least once a week in 77% (Manifava, 2025).
- Zainuddin (2025) shared the fast-paced modern lifestyle has caused most people enjoy to consume fast food that are less nutritious.



OBJECTIVES

- Product Excellence:**
To produce and offer high quality, innovative, delicious, and nutritious food products that combine traditional and modern elements.
- Customer Satisfaction:**
To prioritize customer needs by providing products like SUMLEKOR that are easy to prepare, tasty, and cater to diverse tastes.
- Consumer Education and Empowerment:**
To educate consumers on the importance of healthy eating habits.

MATERIALS/ POSTERS

Materials : flour ,fish meat ,salt, garlic, holland onion, vegetables and wonton skin.



INNOVATION HIGHLIGHTS

Healthier version of traditional lekor with vegetable infusion.
Convenient pack for students and workers.



SIGNIFICANT OF STUDY

Encourages vegetables consumption through an appealing snacks by providing a healthier twist to traditional fried snacks that's convenience for all.



Commercial Value

Surely SavoBites believed that SumLekor would cater a high demand in school, colleges and office areas to be a healthy snacks branding.

*** POLITEKNIK PORT DICKSON ***

- ✓ Thieban A/L Rangan (Leader)
- ✓ Khairunna jwa binti Kamaruzaman
- ✓ Lailatul Waheeda binti Sukareman
- ✓ Nurul Alleya binti Othman
- ✓ Fasuriah binti Abd. Wahab (Supervisor)



CONCLUSION

Do believe that SavoBites is a creative and nutritious snacks (SumLekor) innovation designed to encourage healthier eating habits among Malaysian by combining modern and traditional flavors with healthy ingredients which is convenient for ALL.



TEPUNG CUCUR LEKOR

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Abstract

Keropok Lekor it is one of the favorite snacks in Malaysia, traditionally made with fish mixed with tapioca flour and enjoying its best moments fried. Well, this is an idea about the product of keropok lekor, imagining it into an instant fritter flour mix, just like ‘Tepung Cucur Adabi’. With this new invention, one will enjoy keropok lekor in crispy and fluffy fritters with a wonderful flavor. The texture and flavor of the fritter flour in keropok lekor are not like the usual mixture. Well-ground fish combined with tapioca flour and spices give these fritters a special taste, which is slightly chewy but has a crispy mouth. Flavorful and seasoned, therefore, each bite becomes deliciously fragrant. Besides that, it can also be variety-packed with extra ingredients such as chopped chilies, spring onions, or even shredded cheese for an added taste. The same shall be manufactured under halal certification and strict hygiene standards to ensure a safe, quality, and tasteful fritter mix for the consumer. Whether for breakfast, time snacks, or casual gatherings, this keropok lekor fritter flour offers an innovative way of enjoying a favorite Malaysian snack. In short, instant keropok lekor fritter flour comes out to be a new and more handy version of traditional keropok lekor. This ‘Tepung Cucur Lekor’ will become a very encouraging factor in Malaysian cuisine due to its ease of preparation, high seafood flavor concentration, and good usefulness.

Keyword: Tepung Cucur Lekor, Keropok Lekor



TEPUNG CUCUR LEKOR

LEKOR FRITTER FLOUR

LENGGAP
MUDAH
CEPAT



5 minit!!



Berat Bersih /
Net Weight
200 gram



PATTYKO HERBS

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Abstract

Blue Wave Enterprise is proud to introduce Patty Lektor Mix Herbs, a modern take on the traditional lekor patty, now crafted using sardines as the primary ingredient. Sardines are chosen for their high protein content and rich omega-3 fatty acids, making this patty both delicious and nutritious. This patty combines fresh sardine meat with a blend of natural herbs, resulting in a unique and enticing flavour profile. The preparation process involves finely grinding the sardine meat, mixing it with tapioca flour and selected herbs to form a dough, which is then shaped and cooked. This method ensures each patty has a tender interior and a crispy exterior. By utilizing sardines as the main ingredient, Blue Wave Enterprise not only offers a tasty and healthy product but also supports the local fishing industry, particularly sardine fishermen. This initiative aligns with the company's commitment to promoting local products and ensuring the sustainability of our marine resources. Patty Lektor Mix Herbs is versatile and can be enjoyed anytime, whether as a light snack or a main dish. It provides a healthier alternative to typical fried snacks without compromising on taste. Blue Wave Enterprise remains dedicated to delivering high-quality food products that cater to the tastes and nutritional needs of the Malaysian community.

Keyword: traditional lekor patty, sardines, marine resources



POLITEKNIK
 MALAYSIA
 PORT DICKSON



PATTYKO HERBS

A MODERN TWIST ON TRADITIONAL LEKOR WITH NATURAL HERBS



06DPR22F2037
 06DPR22F2002
 06DPR22FF2055

PREPARED BY
 MOHAMAD YUSAZIMAN BIN MOHAMAD JOHOR
 NALINES A/P KARTHIKESU
 AINA SURIANA BINTI MOHD ANSARUDIN

SUPERVISOR
 PUAN AMIMAH BINTI TALIB

PROBLEM STATEMENT

- Many traditional snacks are unhealthy due to the use of preservatives and artificial additives. There's a growing demand for healthy alternatives in the snack market.

OBJECTIVES

- Promote the health benefits of herb-infused lekor.
- Provide a nutritious, protein-rich, and tasty snack option.
- Support local farmers and the sustainable seafood industry.

SIGNIFICANCE OF THE STUDY

- Health Benefits: Omega-3 fatty acids from Sardines, reduced artificial additives.
- Cultural Relevance: Modernizing a beloved traditional Malaysian snack.

CONCLUSION

- Patty Lekor Mix Herbs stands as an innovative product that offers both health benefits and delicious taste. It meets modern consumer demands for healthier snack options while respecting traditional flavors

INTRODUCTION

- Blue Wave Enterprise introduces Patty Lekor Mix Herbs, a modern take on Malaysia's traditional snack, keropok lekor. The product combines sardines with herbs like oregano, thyme, and basil for a unique, flavorful, and nutritious snack option

MATERIALS

- Main Ingredients: Fresh Sardines meat, tapioca flour, a blend of natural herbs.

METHOD

- Sardines are ground, mixed with herbs and flour, then shaped into patties and frozen for convenience.

COMERCIAL VALUE

- Market Potential: Growing demand for healthy and convenient snacks.
- Sustainability: Promotes sustainable practices through the use of locally sourced ingredients and eco-friendly packaging.



CIVIL ENGINEERING & ARCHITECTURE

1. RESPEX25-017
GREEN ORGANIC COMPOST
MACHINE
POLITEKNIK PORT DICKSON
2. RESPEX25-028
KAJIAN TERHADAP
PENGUBAHSUAIAN BITUMEN
MENGUNAKAN ABU SEKAM PADI
POLITEKNIK PORT DICKSON
3. RESPEX25-034
STABILIZATION OF SOIL USING
COCONUT COIR
POLITEKNIK PORT DICKSON
4. RESPEX25-049
ECO STREET LIGHT
POLITEKNIK PORT DICKSON
5. RESPEX25-062
APPLICATION OF PLASTIC SHRED IN
CONCRETE FOR ROAD
MAINTENANCE
POLITEKNIK PORT DICKSON
6. RESPEX25-090
SMART G: A WEB-BASED LEARNING
TOOL FOR GEOTECHNICAL
ENGINEERING
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7. RESPEX25-023
DINAMIKA HOMELESS TRAINING
CENTRE
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8. RESPEX25-024
METAMORPH ART COMMUNITY
CENTRE
POLITEKNIK PORT DICKSON
9. RESPEX25-026
SALUAK ART COMMUNITY CENTRE
POLITEKNIK PORT DICKSON
10. RESPEX25-033
MEASURED DRAWING OF MAK ANI HERITAGE
HOUSE: DIGITAL DOCUMENTATION THROUGH 3D
VR PANORAMIC VISUALIZATION
POLITEKNIK PORT DICKSON
11. RESPEX25-037
MEASURED DRAWING OF PUAN ZAHARAH'S
HERITAGE HOUSE: DIGITAL DOCUMENTATION
FOR PRESERVING TRADITIONAL ARCHITECTURE
POLITEKNIK PORT DICKSON
12. RESPEX25-041
NOUVAEUVIE HOMELESS TRAINING CENTRE
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13. RESPEX25-042
GENESIS: HOMELESS SHELTER AND TRAINING
CENTER IN PORT DICKSON WATERFRONT
POLITEKNIK PORT DICKSON
14. RESPEX25-043
RUMAH WARISAN LATIFAH
POLITEKNIK PORT DICKSON
15. RESPEX25-044
RUMAH WARISAN INDUK SALBIAH
POLITEKNIK PORT DICKSON
16. RESPEX25-045
IMPIAN EMAS HOMELESS SHELTER AND
TRAINING CENTER IN PORT DICKSON
WATERFRONT
POLITEKNIK PORT DICKSON
17. RESPEX25-050
MEASURED DRAWING OF RUMAH WARISAN
PUAN JALILAH
POLITEKNIK PORT DICKSON
18. RESPEX25-053
IN AREA WE GROW: INSPIRING THE BEGINNING
OF ENGAGE (PAVILION PROJECT)
POLITEKNIK PORT DICKSON
19. RESPEX25-063
ARCHI-KIT: INNOVATING TRADITIONAL TIMBER
CONSTRUCTION LEARNING THROUGH 3D
MODELLING AND AUGMENTED REALITY IN TVET
POLITEKNIK PORT DICKSON
20. RESPEX25-064
KHAZANAH ART AND CULTURE CENTRE
POLITEKNIK PORT DICKSON
21. RESPEX25-074
POTATO AGRO TOURISM CENTER
POLITEKNIK PORT DICKSON
22. RESPEX25-094
AKAR MERAH STRAWBERRY AGRO-TOURISM
CENTRE
POLITEKNIK PORT DICKSON

GREEN ORGANIC COMPOST MACHINE

Wan Nur Basyirah binti Wan Zahari¹, Siti Nur Farzanah binti Kamaruzzaman¹, Izz Mukhlis bin Suhaimi¹, Nur Aina Najwa binti Nazri¹,

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Abstract

This project focuses on the design and development of a Garden Waste Shredder intended to process dry leaves and organic garden waste at households and educational institutions, addressing the growing issue of improper garden waste management, particularly the harmful practice of burning dry leaves which contributes to environmental pollution. The main problem identified is that existing manual composting methods are slow, labor-intensive, and inefficient, thus discouraging widespread adoption of sustainable waste management practices. To solve this, the project employed several approaches, including field observations at Politeknik Port Dickson, literature reviews, machine conceptualization, prototyping, experimental composting, and nutrient analysis. Data were collected through structured questionnaires and analyzed using SPSS software to evaluate public perception and acceptance. The findings revealed that the developed shredder significantly reduced leaf particle size, enhancing microbial decomposition and accelerating the composting process when used alongside the Green Organic Compost Machine (GOCM). Laboratory analysis confirmed that the resulting compost achieved an ideal C:N ratio, while survey results showed 94.8% of respondents endorsed the machine's design and time-saving capability, and 92.2% recognized its strong commercialization potential. The conclusion drawn is that integrating a shredding process into composting systems improves efficiency, product quality, and supports sustainable environmental practices. For future work, it is recommended to integrate renewable energy sources such as solar power, improve blade material for longer durability, and develop automated moisture control features to further enhance the machine's performance and sustainability in organic waste management applications.

Keyword: Garden Waste Shredding, Organic Waste Recycling, Green Composting, Waste Management Innovation, Compost Machine.



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

GREEN ORGANIC COMPOST MACHINE

Many places, including Politeknik Port Dickson, have problems with dry leaves being left around or burned, which causes mess and pollution. Normal composting takes a long time and is hard to do often. This project creates a simple solution using a Garden Waste Shredder and a Green Organic Compost Machine (GOCM). The shredder cuts the leaves into small pieces, and the machine turns them into compost faster. This helps keep the area clean and teaches students how to manage waste in an eco-friendly way.



PROBLEM STATEMENT



Garden waste (dry leaves) accumulates in residential and institutional areas, causing pollution. Burning waste leads to air pollution and health risks.



Traditional composting methods are slow and require high manual effort. Composting time is prolonged due to the absence of a mechanized system.



There is a need for a faster, more efficient, and eco-friendly solution for garden waste management.

OBJECTIVES

- Designing a compost machine capable of breaking down various types of landscape waste.
- Innovating the existing composting machine to a smaller form that is easy to use by households and educational institutions.
- Identify the content of the composition in the produced compost such as pH value, Ammonia nitrogen and Phosphorus

SCOPE OF STUDY

- Produce original organic soil fertilizer without using dangerous substances
- Used by households and workers in educational institutions to manage landscape waste.
- A combination of the concept of "Green Organic Compost" with "Green Technology".

METHODOLOGY



SIGNIFICANCE OF STUDY

- Helps manage garden waste like dry leaves more efficiently and cleanly.
- Makes composting faster and easier by shredding waste into smaller pieces.
- Produces better-quality compost with important nutrients for plants.
- Reduces air pollution caused by burning dry leaves. (Supports SDG 13: Climate Action)
- Keeps school and residential areas clean and healthy. (Supports SDG 3: Good Health and Well-being)
- Promotes eco-friendly habits and sustainable waste management. (Supports SDG 12: Responsible Consumption and Production)
- Encourages greener communities and cleaner cities. (Supports SDG 11: Sustainable Cities and Communities)
- Provides hands-on learning for students in green innovation. (Supports SDG 4: Quality Education)
- Inspires research, creativity, and environmental awareness.
- Has potential to become a marketable green technology product. (Supports SDG 9: Industry, Innovation and Infrastructure)

CONCLUSION

This project successfully created a small compost machine that can process garden waste like dry leaves and small branches. It was redesigned from a larger system to a compact version that is easy to use at home or in schools. The built-in shredder helps speed up composting. The compost produced was tested and showed good levels of pH, ammonia nitrogen, and phosphorus, proving it is safe and rich in nutrients. This machine is energy-efficient, reduces waste pollution, and supports sustainable and practical waste management for daily use.



INNOVATION HIGHLIGHT

- **Purpose-built for garden waste** – Specially designed to process dry leaves and other garden residues.
- **Mechanized composting** – Integrates shredding, aeration, and temperature control to speed up decomposition.
- **Faster composting cycle** – Significantly reduces composting time compared to traditional methods.
- **User-friendly operation** – Simple interface for easy use by staff and students.
- **Sustainable waste solution** – Converts organic waste into valuable compost for campus landscaping and agriculture.
- **Supports zero-waste goals** – Reduces landfill contributions and promotes circular resource use.
- **Educational impact** – Provides hands-on learning opportunities for students in sustainable practices.



COMMERCIAL VALUES

- **Efficient Waste Processing:** Shreds and composts garden waste quickly, improving composting speed.
- **Energy-Efficient:** Designed to use low power, making it cost-effective to run.
- **High-Quality Output:** Produces nutrient-rich compost for use or sale.
- **Durable Design:** Built with strong, corrosion-resistant materials for long-term use.
- **Scalable:** Can be used for both small and large-scale operations.
- **Eco-Friendly:** Helps reduce pollution by preventing garden waste burning.
- **Market Potential:** Ideal for households, schools, landscaping services, and local councils.
- **Low Maintenance:** Requires minimal upkeep, reducing operational costs.

PROJECT MEMBERS :

LEADER :



WANNUR BASYRAH BINTI WAN ZUHAIRI
(06DKA22F1026)



NURANA NALWA BINTI NAZRI
(06DKA22F1012)



IZZ MUKHLIS BIN SULHAN
(06DKA22F128)



STINAR FARZANAH BINTI KAMARUZZAMAN
(06DKA22F1030)

SUPERVISOR :



MRS. NORAZIEL BINTI MOKHTAR

KAJIAN TERHADAP PENGUBAHSUAIAN BITUMEN MENGGUNAKAN ABU SEKAM PADI (ASP)

Muhammad Sadli bin Abdullah¹, Ahmad Muttaqi bin Ahmad Zaini¹, Muhammad Danish bin Mohammad Fuad¹, Ahmad Iskandar Ridzwan bin Afzanizam¹

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Abstract

Kajian ini dijalankan untuk menilai keberkesanan abu sekam padi (ASP) sebagai bahan tambah dalam pengubahsuaian bitumen bagi aplikasi pembinaan jalan raya. Pemilihan ASP, yang merupakan bahan buangan pertanian, bukan sahaja menyumbang kepada kelestarian alam sekitar, malah berpotensi meningkatkan sifat fizikal dan termal bitumen. Dalam kajian ini, bitumen telah dicampur dengan ASP pada pelbagai nisbah (3g, 5g, 7g, 9g, dan 20g) dan diuji melalui tiga ujian utama: Penetration Test, Softening Point Test dan Flash and Fire Point Test. Keputusan menunjukkan penambahan ASP mengurangkan nilai penetration, sekali gus meningkatkan kekerasan bitumen. Selain itu, titik lembut bitumen turut meningkat, menandakan ketahanan terhadap suhu tinggi turut bertambah. Walau bagaimanapun, didapati bahawa penambahan ASP secara berlebihan (sehingga 20%) mengurangkan suhu titik nyalaan dan pembakaran, menimbulkan isu keselamatan. Oleh itu, penggunaan ASP dalam julat 5% hingga 7% dicadangkan sebagai kadar optimum untuk mencapai keseimbangan antara prestasi mekanikal dan keselamatan. Kajian ini menyokong penggunaan bahan buangan pertanian dalam industri pembinaan sebagai pendekatan yang lestari, ekonomik dan mesra alam.



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TITLE: KAJIAN TERHADAP PENGUBAHSUAIAN BITUMEN MENGGUNAKAN ABU SEKAM PADI (ASP)

1 AHLI KUMPULAN



3 OBJEKTIF

- Menghasilkan bitumen yang diubahsuai menggunakan abu sekam padi (ASP) dengan nisbah yang ditetapkan.
- Menguji sifat bitumen selepas dicampurkan dengan abu sekam padi mengikut pelbagai nisbah.
- Menilai setiap sampel bitumen yang dicampurkan dengan bahan tambah

5 DATA

PENETRATION TEST (mm)								
SAMPLE	1	2	3	4	5	6	7	MEAN (mm)
0%	89.1	75.2	72.3	88	73	95.6	84.5	82.5
3%	67.9	77.3	69	72.9	68.1	76.9	70.1	71.7
5%	71.9	63.2	66	62.3	65.7	61.7	72.7	66.1
7%	63	66.2	65.1	62.5	63.4	64.1	69.3	64.9
9%	56	66.9	57	58.9	60.6	58.2	61.4	59.8
20%	52.3	52.5	52.7	54.3	54	57.6	51.5	53.5

SOFTENING POINT TEST				FLASH AND FIRE TEST			
SAMPLE	BALL1 (°c)	BALL2 (°c)	Avg (°c)	SAMPLE	FLASH (°c)	FIRE (°c)	
0%	41	43	42.0	0%	291	319	
3%	45	46	45.5	3%	290	314	
5%	48	48	48.0	5%	276	303	
7%	48	48	48.0	7%	259	275	
9%	50	51	50.5	9%	234	270	
20%	55	56	55.5	20%	175	235	

7 ANALISIS

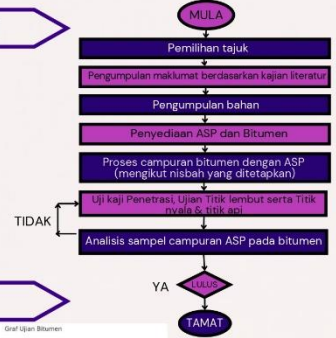
- Ujian Penetration**
- Menurun kepada 66.1 mm (5%) dan 71.7 mm (7%).
 - Memunjukkan peningkatan kekerasan dan ketahanan terhadap ubah bentuk.
 - Sangat penting bagi jalan raya yang menanggung beban trafik tinggi.
- Ujian Softening**
- Meningkat kepada 48°C bagi kedua-dua kadar 5% dan 7%.
 - Membuktikan peningkatan kestabilan terma bitumen apabila dipanaskan.
 - Sesuai digunakan di kawasan tropika seperti Malaysia.
- Ujian Flash dan Fire Point**
- Menurun kepada 276°C (5%) dan 259°C (7%), manakala fire point menurun kepada 303°C dan 275°C.
 - Memunjukkan had suhu maksimum pemanasan menjadi lebih rendah.
 - Oleh itu, bitumen perlu dipanaskan pada suhu terkawal bagi mengelakkan risiko nyalaan semasa aplikasi.



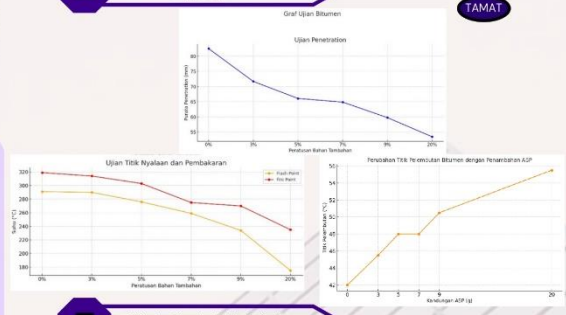
2 ABSTRAK

Kajian ini dijalankan untuk menilai keberkesanan abu sekam padi (ASP) sebagai bahan tambah dalam pengubahsuaian bitumen bagi aplikasi pembinaan jalan raya. Penilaian ASP, yang merupakan bahan buangan pertanian, bukan sahaja menyumbang kepada kelestarian alam sekitar, malah berpotensi meningkatkan sifat fizikal dan termal bitumen. Dalam kajian ini, bitumen telah dicampur dengan ASP pada pelbagai nisbah (3g, 5g, 7g, 9g, dan 20g) dan diuji melalui tiga ujian utama: *Penetration Test*, *Softening Point Test* dan *Flash and Fire Point Test*. Keputusan menunjukkan penambahan ASP mengurangkan nilai *penetration*, sekali gus meningkatkan kekerasan bitumen. Selain itu, titik lembut bitumen turut meningkat, menandakan ketahanan terhadap suhu tinggi turut bertambah. Walau bagaimanapun, didapati bahawa penambahan ASP secara berlebihan (sehingga 20%) mengurangkan suhu titik nyalaan dan pembakaran, menimbulkan isu keselamatan. Oleh itu, penggunaan ASP dalam julat 5% hingga 7% dicadangkan sebagai kadar optimum untuk mencapai keseimbangan antara prestasi mekanikal dan keselamatan. Kajian ini menyokong penggunaan bahan buangan pertanian dalam industri pembinaan sebagai pendekatan yang lestari, ekonomik dan mesra alam.

4 METODOLOGI



6 GRAF



8 KESIMPULAN

- Nilai Optimum ASP:**
- Kadar 5%–7% ASP memberikan prestasi terbaik dari segi kekerasan, kestabilan haba, dan keselamatan.
 - Pada kadar ini, bitumen lebih tahan terhadap ubah bentuk plastis dan suhu tinggi.
- Cadangan Ujian Lanjutan:**
- Ujian Marshall Stability untuk kestabilan beban sebenar.
 - Ujian Ductility untuk menilai kelenturan bitumen.
 - Analisis Scanning Electron Microscope untuk lihat interaksi ASP dan bitumen.
 - Analisis Statistik untuk kestabilan data.
- Penambahbaikan:**
- Kajian ketersediaan bahan dan kos pemrosesan untuk aplikasi skala besar.
 - Penilaian kebolehlaksanaan penggunaan ASP dalam industri pembinaan jalan raya.

STABILIZATION OF SOIL USING COCONUT COIR

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Abstract

Soil stabilization is a crucial process in geotechnical engineering, aimed at enhancing the physical properties of soil to improve its strength, durability, and overall performance under load. This study investigates the use of coconut coir, an eco-friendly and readily available natural fiber, as a stabilizing agent for weak or problematic soils. Coconut coir, a byproduct of coconut husk processing, possesses high lignin content and tensile strength, making it suitable for reinforcing soil structures. Laboratory tests, including compaction, sieve analysis, and Atterberg Limit test were conducted on soil samples mixed with varying percentages of coir fiber. The results demonstrated that the inclusion of coconut coir significantly improved the soil's load-bearing capacity, reduced plasticity, and enhanced resistance to erosion and cracking. This sustainable approach not only provides an effective alternative to conventional chemical stabilizers but also promotes the utilization of agricultural waste, contributing to environmental conservation and cost-effective construction practices. This study looks at the effectiveness of coconut coir as a soil addition in improving the stability of clayey sand in slope improvement structures. The qualities of clayey sand with varied concentrations of coconut coir were investigated using laboratory experiments such as sieve analysis and Atterberg limit tests. The sieve analysis revealed a well-graded particle distribution with a coefficient of uniformity (Cu) of 9.52 and a coefficient of curvature (Cc) of 0.72, whereas the Atterberg limit tests revealed a liquid limit (LL) of 74%, plastic limit (PL) of 52.89%, and plasticity index (PI) of 21%, indicating that the soil is highly plastic. The addition of coconut coir was discovered to lower the shear stress of the soil, with the greatest shear strength seen in the untreated clayey sand. Additionally, the study included in situ experiments on artificial slopes, which demonstrated that coconut coir improves soil strength and minimizes erosion, so contributing considerably to slope stability. The findings show that coconut coir is a useful and sustainable material for enhancing soil geotechnical qualities, making it a viable choice for soil stabilization in civil engineering applications. This study supports the use of coconut coir in slope enhancement structures, offering a novel approach to improving soil strength and stability.

Keyword: Soil stabilization, coconut coir, soil strength improvement, eco-friendly materials

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT

STABILIZATION OF SOIL USING COCONUT COIR

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DR. ISHA SAIZURA BINTI ISMAIL

Introduction

Soil stabilization using coconut coir is an environmentally friendly technique that increases strength and stability by incorporating coconut coir. Coconut coir is a natural material obtained from coconut husks that has high tensile strength, durability and water retention properties. When mixed with soil, coir will increase its load-bearing capacity, reduce erosion and make it suitable for various construction applications such as roads, embankments and slope stabilization. With this study, the use of coconut coir will be utilized, reducing the environmental impact and promoting resource efficient construction.

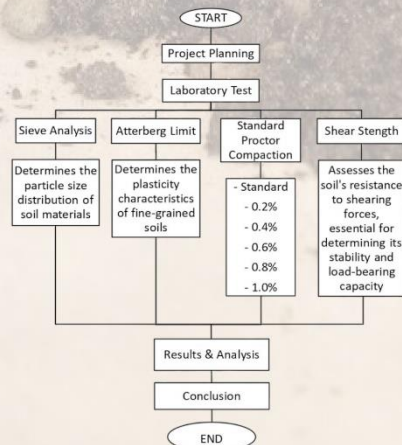
Objectives

- Identify the basic characteristics of the soil in the study area.
- Studying the strength of the soil using coconut coir as a mixture.
- Comparing the strength value of a mixture of soil and coconut coir in soil stabilization.

Problem Statements

Soil is a material that profoundly influences the stability of building structures, highway pavements, tunnels, and dams. Not all soils are suitable for direct application in Civil Engineering projects. Certain soils having a small bearing capacity, demonstrate considerable deformations or alterations, and exhibit higher moisture content, hence influencing the soil's consistency.

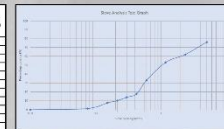
Methodology



Data Analysis

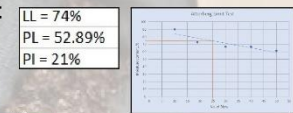
i. Sieve Analysis

Sieve No	Size (mm)	Weight of sieve (g)	Weight of soil retained on sieve (g)	Weight of soil passing (g)	Percentage (%)
4	4.75	1000	1200	880	88.0
10	2.00	140	237	1163	91.9
20	0.85	213	215	1185	93.2
40	0.425	275	201	1249	97.8
60	0.25	300	202	1248	97.9
75	0.212	350	206	1244	97.6
100	0.15	425	205	1245	97.7
200	0.075	500	219	1281	98.1
250	0.06	575	224	1326	98.6
Total Soil Retained			78		



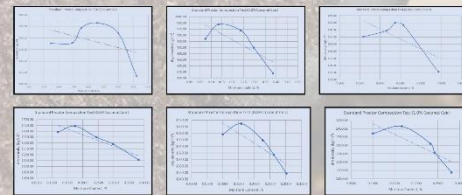
D60	2.30	Cu = D60 / D10	9.52
D30	0.55	Cc = (D30) ² / (D60 * D10)	0.72
D10	0.21		

ii. Atterberg Limit Test



iii. Compaction Test

Item	$\rho_d \text{ max (kg/m}^3\text{)}$	$w_{opt} \text{ (%)}$
Standard	1565.00	22.86
0.2 %	975.12	14.00
0.4 %	1359.59	23.68
0.6 %	1443.71	17.50
0.8 %	1409.18	15.91
1.0 %	1405.93	16.67



iv. Shear Test

Percentage of Coconut Coir	1.25kg load		2.5kg load	
	Normal stress (kg/m ²)	Shear stress (kg/m ²)	Normal stress (kg/m ²)	Shear stress (kg/m ²)
Standard	4.944	7.141	4.826	24.550
0.2%	4.851	33.508	4.773	49.315
0.4%	4.767	22.595	4.787	20.625
0.6%	4.918	22.375	4.825	17.392
0.8%	4.912	5.664	4.864	4.233
1.0%	4.890	16.574	4.826	14.806

Conclusion

Soil stabilization using coconut coir is an environmentally friendly technique that increases strength and stability by incorporating coconut coir. Coconut coir is a natural material obtained from coconut husks that has high tensile strength, durability and water retention properties. When mixed with soil, coir will increase its load-bearing capacity, reduce erosion and make it suitable for various construction applications such as roads, embankments and slope stabilization. With this study, the use of coconut coir will be utilized, reducing the environmental impact and promoting resource efficient construction.



ECO STREET LIGHT

Ts. Dr. Sivanandan a/l Balakrishnan¹, Aida Atirah binti Haidzir¹, Muhammad Arif bin M. Sani¹, Alia Adlina binti Zabil¹

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Abstract

Projek Eco Street Light merupakan satu pendekatan inovatif dalam menyelesaikan isu pencahayaan di kawasan pantai dengan menggunakan sumber tenaga boleh diperbaharui iaitu angin. Sistem ini dibina dengan tujuan untuk menyediakan lampu jalan yang berfungsi tanpa bergantung kepada bekalan elektrik konvensional, sekali gus mengurangkan kebergantungan terhadap sumber tenaga berasaskan fosil. Keperluan terhadap pencahayaan pada waktu malam di kawasan pantai yang sering dikunjungi oleh orang awam menjadikan projek ini satu keperluan sosial dan praktikal. Penggunaan turbin angin kecil yang direka khas untuk kawasan berangin sederhana membolehkan sistem ini menjana tenaga secara berterusan untuk menyimpan dalam bateri dan digunakan bagi menyalakan lampu LED pada waktu malam. Dari sudut kejuruteraan awam, aspek penempatan sistem dan kestabilan struktur adalah komponen penting dalam memastikan keberkesanan dan keselamatan sistem ini. Penilaian terhadap arah angin, kelajuan purata serta keadaan muka bumi merupakan antara pertimbangan teknikal utama. Reka bentuk struktur tiang serta dasar konkrit perlu disesuaikan dengan beban angin dan berat sistem, supaya tiang pencahayaan kekal stabil dan selamat dipasang di tepi jalan atau kawasan rekreasi. Ini membuktikan bahawa sistem mampu berfungsi dengan efisien di kawasan pantai yang secara semula jadi menerima hembusan angin yang konsisten. Data voltan yang diperolehi menunjukkan kestabilan dalam penyimpanan tenaga dan kebolehan sistem menyokong pencahayaan sepanjang malam. Selain daripada manfaat teknikal, projek ini juga seiring dengan agenda kelestarian dan pembangunan mampan. Ia menyokong matlamat SDG 7 iaitu "Tenaga Bersih dan Mampu Milik", serta menyumbang kepada persekitaran yang lebih selamat dan terang untuk pengunjung pantai pada waktu malam. Secara keseluruhannya, Eco Street Light merupakan satu inisiatif berimpak tinggi yang bukan sahaja menampilkan elemen inovatif, tetapi juga praktikal dan lestari. Dengan pelaksanaan yang betul, projek ini boleh dijadikan model rujukan untuk pembangunan infrastruktur awam yang berasaskan tenaga hijau. Melalui gabungan prinsip kejuruteraan awam dan teknologi tenaga boleh diperbaharui, projek ini bukan sahaja menyelesaikan masalah pencahayaan, malah menyumbang kepada kesejahteraan komuniti dan pemuliharaan alam sekitar.



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TAJUK: ECO STREET LIGHT

PENYELIA PROJEK



TS. DR. SIVANANDAN A/L
BALAKRISHNAN

AHLI KUMPULAN



AIDA ATIRAH BINTI HAIDZIR
06DKA22F2007



MUHAMMAD ARIF BIN M.SANI
06DKA22F2013

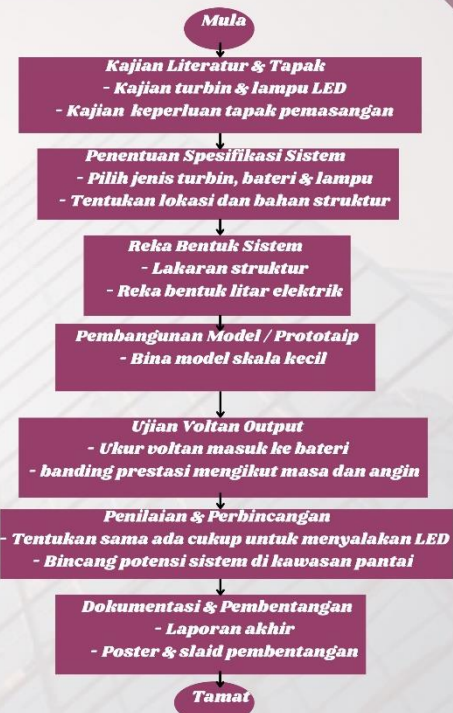


ALIA ADLINA BINTI ZABIL
06DKA22F2016

OBJEKTIF

- ◆ Mereka bentuk lampu jalan mesra alam berasaskan tenaga angin bagi menyokong pembangunan lestari dan keselamatan di kawasan gelap.
- ◆ Membina struktur tiang lampu jalan berasaskan tenaga angin yang menggunakan bahan kitar semula dan direka bentuk supaya tahan dalam pelbagai keadaan cuaca, selaras dengan prinsip pembinaan hijau dan kelestarian alam sekitar.
- ◆ Menguji kecekapan sistem menjana kuasa dan mengaktifkan lampu secara automatik apabila gelap.

METHODOLOGY (CARTA ALIR)



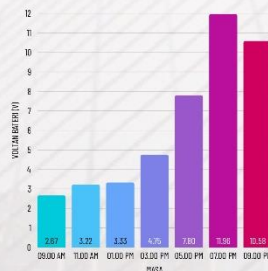
ABSTRAK

Projek ini membangunkan sistem lampu jalan mesra alam berasaskan tenaga angin bagi menyokong pembangunan infrastruktur awam yang lestari. Sistem ini direka khas untuk kawasan gelap dan tumpuan pelancong dengan tujuan meningkatkan keselamatan pengguna. Struktur tiang lampu dibina menggunakan bahan kitar semula yang tahan dalam pelbagai keadaan cuaca, sejajar dengan prinsip pembinaan hijau. Sistem turut dilengkapi dengan mekanisme automatik yang membolehkan lampu menyala apabila persekitaran menjadi gelap, tanpa memerlukan kawalan manual. Projek ini bukan sahaja menjimatkan tenaga, malah turut menyumbang kepada kelestarian alam sekitar.

ANALISIS

UJIAN MANOMETER

MASA	VOLTAN BATERI, V	CATATAN
09.00 AM	2.67 V	Voltan yang sedia ada pada bateri.
11.00 AM	3.22 V	Angin perlahan
01.00 PM	3.33 V	Angin konsisten
03.00 PM	4.75 V	Angin sederhana
05.00 PM	7.80 V	Angin kuat
07.00 PM	11.96 V	Voltan maksimum
09.00 PM	10.58 V	Voltan menurun - penggunaan lampu



KESIMPULAN

- ◆ Secara keseluruhan, projek Eco Street Light berasaskan tenaga angin ini membuktikan bahawa teknologi mesra alam dapat diaplikasikan dalam pembangunan infrastruktur awam yang lestari, khususnya di kawasan peranginan seperti kawasan pantai yang menerima tiupan angin konsisten.
- ◆ Lampu ini berfungsi secara automatik apabila persekitaran menjadi gelap, tanpa memerlukan kawalan manual atau sambungan kepada grid elektrik. Dari sudut kejuruteraan awam, projek ini memberi penekanan kepada aspek reka bentuk struktur yang kukuh, penggunaan bahan kitar semula, dan penempatan lampu yang bersesuaian mengikut keadaan persekitaran.
- ◆ Projek ini memberi penyelesaian yang berkesan dan menjimatkan tenaga untuk kawasan pantai yang sering digunakan oleh pengunjung pada waktu malam. Ini sekali gus menyokong usaha ke arah pembangunan infrastruktur awam yang lebih mampan dan mesra alam.

APPLICATION OF PLASTIC SHRED IN CONCRETE MIX FOR ROAD MAINTENANCE

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Abstract

This study investigates the potential of applying fibres derived from manually shredded recycled plastic bottles into concrete, aiming to develop a more sustainable and cost-effective solution for addressing common pavement defects such as potholes. The application of concrete as a quick fix for potholes in pavements has gained traction due to its durability, rapid setting properties, and cost-effectiveness. Motivated by the dual challenges of increasing plastic waste and the need for more durable construction materials, this project explores the viability of this approach within the context of road maintenance. Plastic shreds were added to 1:1.5:3 concrete mixes in varying proportions, ranging from 0.2% to 1.2%, and evaluated at early strength (1-3 days) for key mechanical properties, including workability and compressive strength. The results indicate that an optimum plastic shred content of 0.8% enhances the concrete's resistance to cracking while preserving acceptable workability. These findings highlight the potential of using recycled plastic shred as a viable and eco-friendly alternative in concrete mixtures, contributing to both improved pavement durability and environmental sustainability in the construction industry.

Keywords: Recycled Plastic Shred, Early Strength Concrete, Pavement Maintenance Sustainability, Compressive Strength



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

Application of Plastic Shred in Concrete Mix for Road Maintenance

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 Nurul Shahira binti Md Dewa

Supervised by:
 Pn. Nor Haniza binti Mustafar Kamar

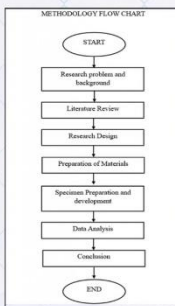
01 INTRODUCTION

Plastic waste is a growing environmental problem, with millions of tons ending up in landfills and oceans each year. To tackle this, the construction industry is exploring ways to reuse plastic in infrastructure projects. One promising solution is adding plastic shreds to concrete for road maintenance. This approach not only helps reduce plastic pollution but can also improve concrete's strength, durability, and resistance to cracking. Studies show that using the right amount of plastic can extend the life of roads, especially in areas needing frequent repairs. This project investigates how plastic-infused concrete can be a sustainable, cost-effective alternative for road maintenance.

02 OBJECTIVES

- To evaluate the impact of applying recycled plastic shreds on the compressive strength and workability of concrete.
- To identify the optimal percentage of plastic shred content for achieving balanced performance in concrete.
- To develop an environmentally sustainable concrete mix suitable for road maintenance applications.

03 METHODOLOGY

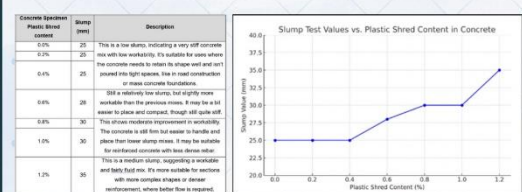
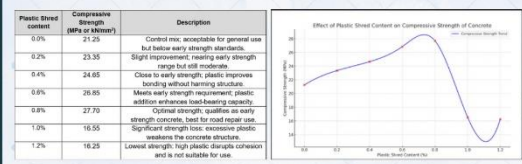


- Collection of Materials**
- Plastic wastewas collected, cleaned, and shredded into small pieces. Standard concrete materials—cement, sand, gravel, and water—were also prepared.
- Mix Design**
- Concrete mixes were prepared by replacing a portion of fine aggregate with shredded plastic at varying percentages
- Sample Preparation**
- Test specimens, such as concrete cubes and beams, were cast using each mix and cured under standard conditions for 28 days.
- Data Analysis**
- Results were compared across different plastic content levels to determine the most effective and sustainable mix for road maintenance use.

04 RESULTS

- Increased or sustained Compressive Strength of the concrete as compared to control.
- The optimal percentage is at 0.8% plastic shred content.

05 ANALYSIS



06 CONCLUSION

The tests showed that adding small amounts of plastic, up to 0.8%, helped make the concrete stronger. The highest strength recorded was 27.70 MPa at 0.8% plastic, which was much better than the normal mix (21.25 MPa). This shows that plastic shreds can help hold the concrete together and stop cracks from forming early. This is very useful for road repairs where fast strength is needed. However, when the plastic content was more than 0.8%, the concrete became weaker. At 1.0% and 1.2%, the strength dropped a lot, which means too much plastic can damage the concrete.

The concrete's workability, or how easy it is to mix and pour, went down a little as more plastic was added. Still, up to 0.6%, the concrete was easy enough to work with. Overall, the study found that 0.8% plastic shred is the best amount to get strong, early strength concrete that is still practical to use. This finding is especially important for Malaysia, where plastic waste is a big problem. By using this waste in concrete, we can reduce pollution and build stronger roads at the same time.



SMART G: A WEB-BASED LEARNING TOOL FOR GEOTECHNICAL ENGINEERING

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Abstract

Geotechnical engineering is a core area within civil engineering, focusing on the behavior of soil and its interaction with structures. A strong foundation in geotechnical principles is essential for students to effectively analyze and design safe, reliable infrastructure. However, traditional teaching methods—often limited to textbooks, lectures, and static laboratory sessions—frequently fail to fully engage students or accommodate diverse learning styles. As a result, students may struggle to grasp complex geotechnical concepts and apply theoretical knowledge to practical scenarios. In addition, conventional approaches to geotechnical data collection and analysis are typically labor-intensive, time-consuming, and prone to human error, leading to reduced efficiency and potential inaccuracies in experimental results. To address these challenges, the *Smart G* website was developed as an innovative educational tool tailored specifically for civil engineering students at Politeknik Port Dickson. *Smart G* is a user-friendly, interactive digital platform that enhances the teaching and learning of geotechnical engineering. It provides students with guided modules for conducting soil experiments, digital lab sheets for recording data, automated calculations, and visual tools for interpreting results. By integrating technology into the learning process, *Smart G* simplifies complex procedures, reduces the likelihood of error, and shortens processing time, ultimately improving the overall learning experience. Beyond academic support, *Smart G* also fosters the development of practical skills by simulating real-world geotechnical problem-solving environments. This prepares students for future professional practice by bridging the gap between theoretical understanding and field application. The platform exemplifies how digital innovation can be leveraged to modernize engineering education and address long-standing limitations in traditional pedagogical approaches. The development and implementation of *Smart G* mark a significant step toward more dynamic, accurate, and engaging geotechnical education.

Keyword: Geotechnical Engineering, Digital Learning, Interactive Platform, Educational Innovation



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

SMART G

Smart G is a user-friendly application that helps solve geotechnical exam questions and simplifies data collection, analysis, and geotechnical learning.

ABSTRACT

Smart G is a web-based learning tool designed to support students and lecturers in the Geotechnical Engineering course. Developed using Google Sites and integrated with Microsoft Excel, Smart G helps simplify data analysis and graph generation for geotechnical lab experiments.

PROBLEM STATEMENT

Traditional learning methods make it difficult for students to effectively understand geotechnical concepts	Errors in calculations and data interpretation can affect the accuracy of results
The process of data collection and analysis is time-consuming and complex	There are no tools available to help students easily collect, analyze, and understand data

The main goal of Smart G is to reduce calculation errors, save time, and improve students' understanding of lab results. Based on feedback from Politeknik Port Dickson students and lecturers, the application enhances report preparation and allows quick checking of graphs and data accuracy.

With its easy-to-use interface and reliable features, Smart G has shown great potential to assist in the teaching and learning process. It serves as a helpful companion for students to complete lab tasks more efficiently and understand geotechnical concepts better.



OBJECTIVE

- Provides a user-friendly platform for geotechnical testing and analysis.
- Reduces errors in geotechnical data processing.
- Provides a more effective and efficient learning method using digital technology.

SCOPE OF STUDY

- Ensures a user-friendly and easily accessible platform for students taking the Geotechnical Engineering course in the Diploma in Civil Engineering at Politeknik Port Dickson.
- Reduces human error in data processing and analysis.
- Develop a digital platform for geotechnical testing and analysis, automate data processing, and integrate digital technology to enhance learning effectiveness.

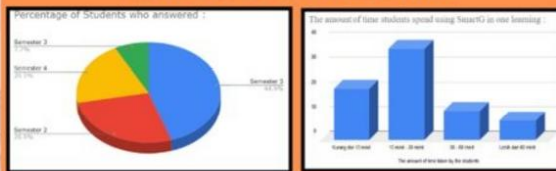
METHODOLOGY

- START
- IDENTIFY USER NEEDS
- RESEARCH OBJECTIVES
- PROJECT PLANNING
- QUESTIONNAIRE
- IMPROVEMENTS
- COMPLETION

SUPERVISOR : GROUP MEMBERS :



DATA & ANALYSIS



DINAMIKA HOMELESS TRAINING CENTRE

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Abstract

To tackle the issue of homelessness while contributing to inclusive community development, a Homeless Rehabilitation and Training Centre named Dinamika is proposed to be built at Medan Selera, Kampung Bahasa Kapor, Port Dickson, Negeri Sembilan. The name Dinamika, meaning “dynamics” or “movement,” captures the essence of the design concept “dynamic journey” which symbolizes the resilience, endurance, and transformation experienced by homeless individuals as they navigate life’s challenges. The concept is inspired by the sole of the foot, a metaphor for constant movement and perseverance, as many homeless people rely on walking great distances to survive. This design not only reflects their strength but also embodies their journey toward recovery, stability, and empowerment. Dinamika is envisioned as more than just a temporary shelter. It is a place for healing, learning, and rebuilding lives. The centre offers a range of programs, including job-seeking workshops, skills-based seminars, arts and crafts activities to encourage creativity and self-employment, and urban farming to promote responsibility, sustainability, and food security. These initiatives are in line with the United Nations Sustainable Development Goal 1: No Poverty, aiming to reduce inequalities and restore dignity to underserved populations. Architecturally, Dinamika is designed using anthropometric planning, ensuring comfort and accessibility. The spatial layout is organized to reflect a physical and emotional journey, where spaces unfold gradually along a main circulation axis leading users from arrival to recovery zones. This experience-driven layout helps guide individuals through phases of rest, reflection, learning, and reintegration into society. A soft, light-toned colour palette is used throughout the building to evoke a sense of calm, welcome, and warmth, while also passively reflecting heat to improve indoor thermal comfort. Sustainability plays a key role in Dinamika’s design. The centre incorporates green walls to reduce heat absorption, vent blocks to improve natural airflow, solar panels to harness renewable energy, and rainwater and greywater harvesting systems for efficient water use. These strategies not only reduce environmental impact but also lower long-term maintenance costs. With its innovative and compassionate design, Dinamika is intended to become a landmark of social responsibility offering hope, guidance, and opportunities for the homeless population of Port Dickson while also serving as a sustainable model for future community-based architecture.

Keyword: Homeless Centre, Architecture, Dynamic, Negeri Sembilan



INTRODUCTION

A homeless shelter that provides temporary housing, basic needs, and support services. Located at Medan Selera, Kampung Bahasa Kapor, Port Dickson, this centre offers free shelter, skills training, and economic opportunities to help individuals regain independence. It's sustainably designed with solar energy, rainwater harvesting, and supported by government, NGOs, and community donations.



AIM

To propose a design of Homeless Training Centre that support skills development, rehabilitation & reintegration into society based on the concept of dynamic & the idea symbolism of feet that represents stability, progress & hardwork of keep going even when shoeless.

ISSUES

Many homeless individuals lack proper guidance and mentorship that could lead them towards success. Without structured support systems, they face difficulties in accessing opportunities for education, employment, and personal growth.

OBJECTIVE 01

Apply "Anthropomorphic track" motifs on facades to symbolize progress, and the journey toward stability, using footprint elements to emphasize movement & dynamic.

OBJECTIVE 02

Incorporate urban farming, indoor garden, and arts & crafts room as key features.

OBJECTIVE 03

Employ green strategies like solar panels, green wall, rainwater harvesting and greywater harvesting.

DESIGN CONCEPT

The concept is inspired by the symbolism of feet, representing stability, progress, and perseverance. Feet carry individuals forward, enduring hardships and symbolizing the journey of resilience. The design reflects this idea, creating a space that empowers the homeless to rebuild their lives, step by step, even when they have nothing.

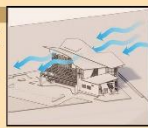


SITE ANALYSIS



SUNPATH

The most area that is mostly exposed to sunlight is the south & west area, proposing a solid block or screen block to reduce heat intake towards the building.



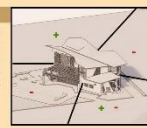
WINDPATH

Strongest wind from northwest, hence it is optimal to propose vent-block to increase airflow speed.



SOUND

Most site sounds are negative due to its location, hence it is optimal to add vegetation as a buffer barrier.



VIEW

Site views are mostly poor, facing building rear; strategic landscaping can enhance the overall appeal.



KEY PLAN
NOT TO SCALE



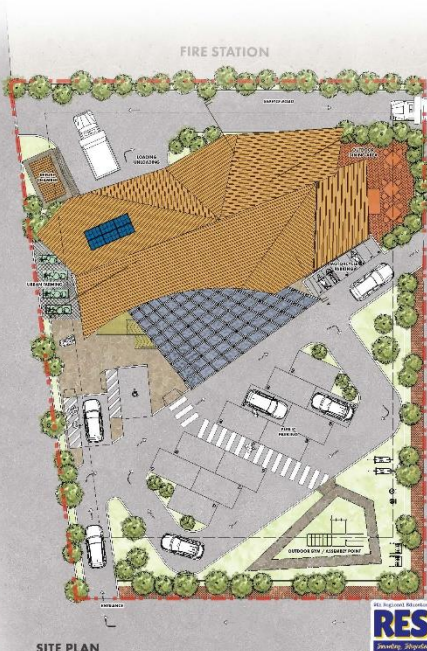
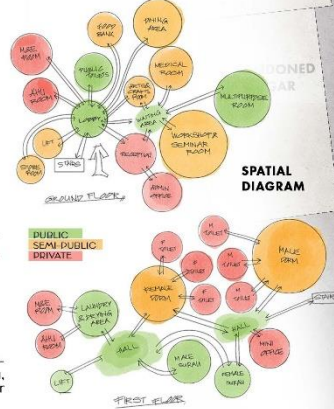
LOCATION PLAN
NOT TO SCALE

The Homeless Training Centre is strategically located near main roads, and essential services, providing easy access and strong community connection. Its location supports opportunities for employment, education, and personal growth, helping guide individuals towards independence.



SITE ZONING

The site includes a central building, parking, outdoor gym, garden/dining area, service zones, and circulation paths for smooth access and functionality.



SITE PLAN
SCALE 1:200

CASE STUDIES ON HOMELESS TRANSIT CENTRES



THE MBPP NIGHT SHELTER

This project in Denang, Malaysia highlights architecture's role in sustainability and social impact by integrating:

SOLAR PANELS

It is installed to harness renewable energy from the sun, reducing reliance on non-renewable energy sources.



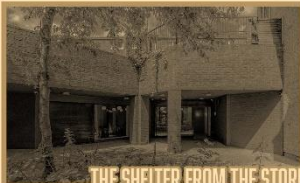
VENT BLOCKS

enhances the natural ventilation and acts as a shading device, reducing heat and sunlight intake into the building.



RAINWATER & GREYWATER HARVESTING

are used to collect and reuse water, promoting sustainable water management for irrigation and other non-potable needs.



THE SHELTER FROM THE STORM

This project in Islington, North London also highlights the use of solar panels as well as:

LONGLASTING DURABLE MATERIALS

the materials are selected for durability and warmth to ensure longevity and a more inviting, less institutional space.



All of these elements are applied at Dinamika to promote sustainability, enhance living conditions, and support self-sufficiency.

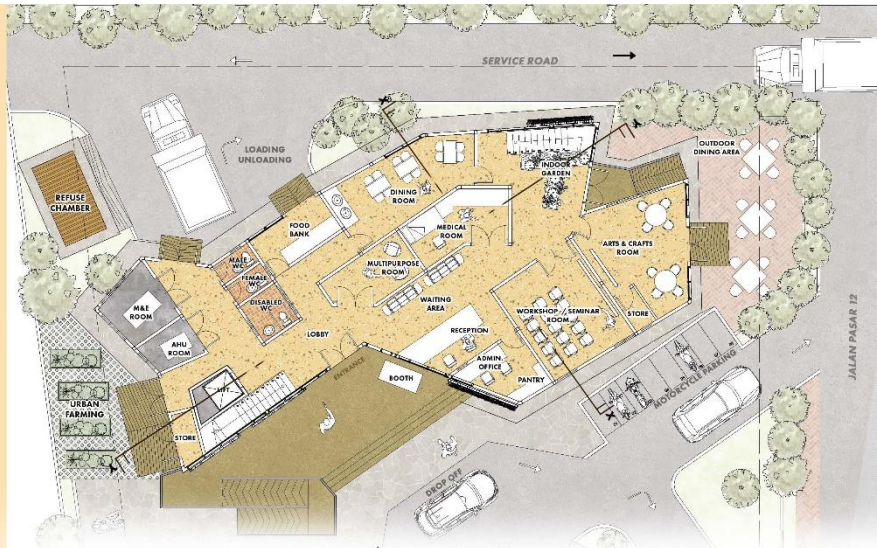


SUSTAINABLE GOALS APPLICATIONS

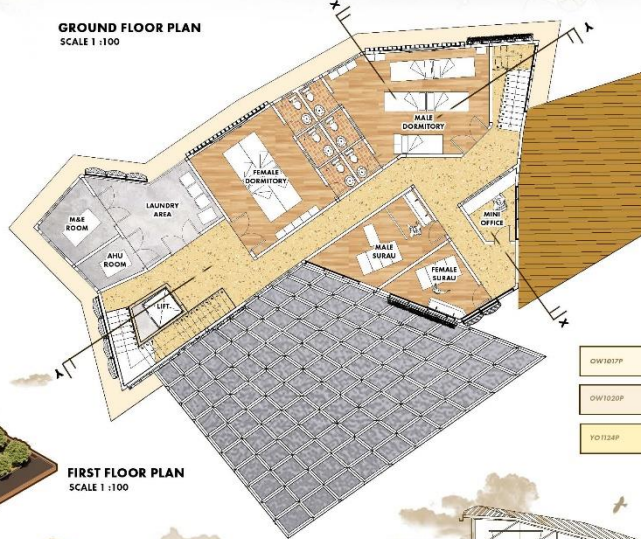


SPACE OF ACCOMMODATION

NO	SPACES	SIZES (SQM)	NOS	LEVEL
1.	LOBBY	35	1	GF
2.	RECEPTION	10	1	GF
3.	ADMINISTRATION OFFICE	7	1	GF
4.	WORKSHOP & SEMINAR ROOM	24	1	GF
5.	MULTIPURPOSE ROOM	25	1	GF
6.	MEDICAL ROOM	13	1	GF
7.	DINING AREA	22	1	GF
8.	ARTS & CRAFTS ROOM	9	1	GF
9.	FOOD BANK	8	1	GF
10.	PUBLIC TOILET MALE & FEMALE	2	2	GF
11.	OKU PUBLIC TOILET	4	1	GF
12.	MECHANICAL & ELECTRICAL ROOM	9	1	GF/FF
13.	AIR HANDLING UNIT ROOM	4	1	GF/FF
14.	FEMALE TOILET & SHOWERS	2	3	FF
15.	MALE TOILET & SHOWERS	2	3	FF
16.	MALE DORMITORY	34	1	FF
17.	FEMALE DORMITORY	28	1	FF
18.	LAUNDRY & DRYING AREA	17	1	FF
19.	MALE SURAU	15	1	FF
20.	FEMALE SURAU	10	1	FF
21.	STAIRS	4	1	FF
22.	PANTRY	10	1	FF
23.	STORE	1.2	1	GF
24.	MINI OFFICE	2	2	GF
25.	MINI OFFICE	6	1	FF
TOTAL		398SQM		



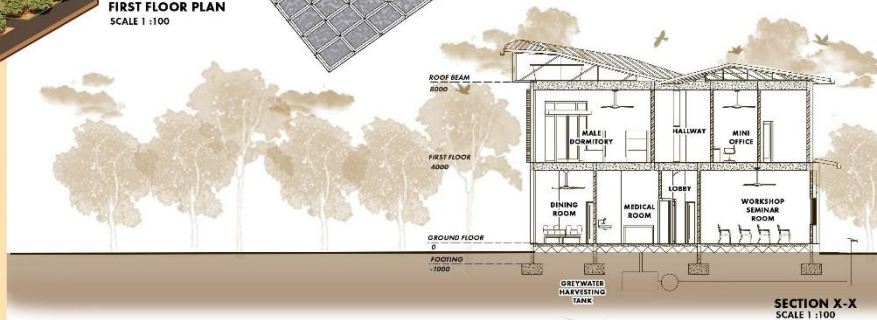
GROUND FLOOR PLAN
SCALE 1 : 100



FIRST FLOOR PLAN
SCALE 1 : 100



DW107P	SWAN WING
DW102P	ULTRA SMOOTH
YD128P	DAISY PEARL



SECTION X-X
SCALE 1 : 100



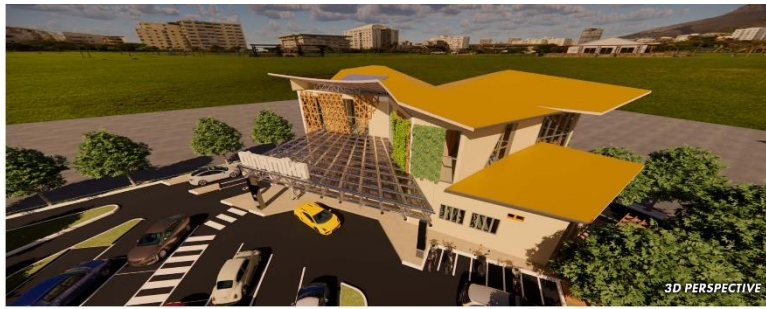
SECTION Y-Y
SCALE 1 : 100

DCA40155 - DESIGN STUDIO 4

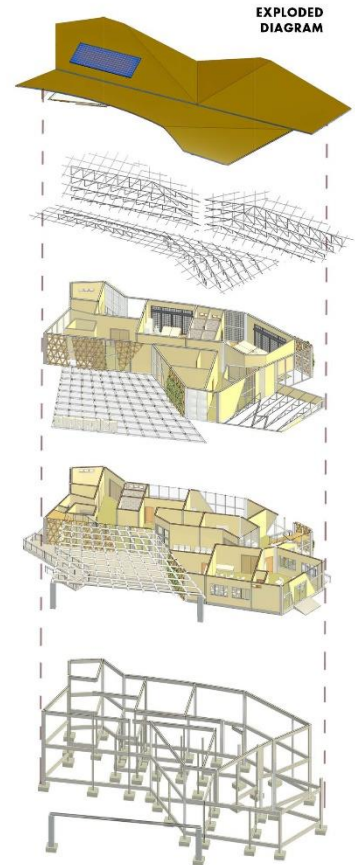
NAME : ANIS SYAFIQAH BINTI MOHD SAFEIA (06058231027) DSB44

LECTURER : MADAM NORLIZA BINTI JOHAN

02



3D PERSPECTIVE



EXPLODED DIAGRAM



RECEPTION



ARTS & CRAFTS ROOM



CLEAR SIGNAGE



WORKSHOP / SEMINAR ROOM



URBAN FARMING



DORMITORY



LAUNDRY AREA



FRONT ELEVATION
SCALE 1 :100

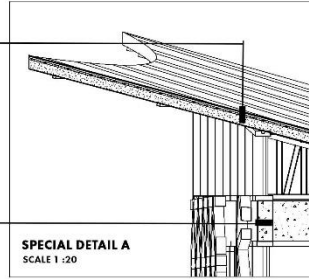
RIGHT ELEVATION
SCALE 1 :100



LEFT ELEVATION
SCALE 1:100

REAR ELEVATION
SCALE 1:100

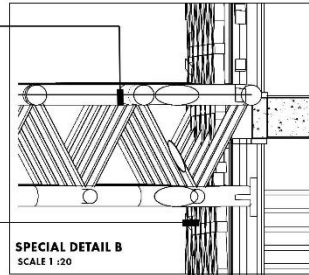
- ROOF CONSTRUCTION**
- 20mm shutter OS finish
 - 15mm rigid insulation
 - Vapour retarder membrane
 - Core boundary (layers above wrap)
 - 115mm concrete sand/cement screed substrate
 - Core boundary
 - Truss system: Timber trusses, 50mm x 100mm kiln-dried hardwood members, assembled with galvanized steel nail plates, spaced at 1200mm c/c



SPECIAL DETAIL A
SCALE 1 :20

150mm x 400mm concrete beam

- SPACEFRAME ROOF CONSTRUCTION**
- 100mm Ø steel pipes
 - 12mm low-E laminated glass
 - 200x200x6mm steel columns
 - 150mm hidden gutter



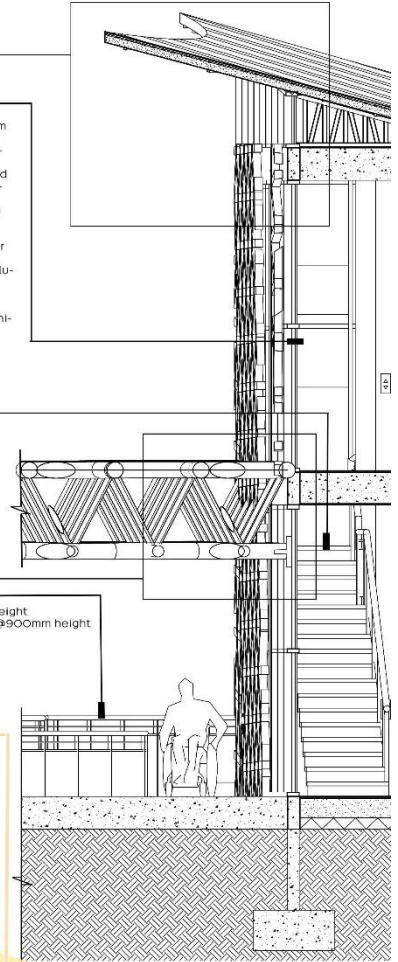
SPECIAL DETAIL B
SCALE 1 :20

110mm x 100mm HW geometric facade

- CURTAIN WALL SYSTEM**
- Stick-built aluminum framing system
 - Mullions: 150mm x 50mm extruded aluminum sections, 3mm wall thickness
 - Transoms: 100mm x 50mm extruded aluminum sections, 3mm wall thickness
 - Glazing: Double-glazed units (6mm low-E glass + 12mm air gap + 6mm clear tempered glass)
 - Silicone sealant with backer rod for all joints
 - Pressure plates and cover caps: aluminum, snap-on type
 - Integrated drainage and weep system within mullions
 - Thermal break: polyamide strip, minimum 24mm thickness
 - Finish: powder-coated aluminum

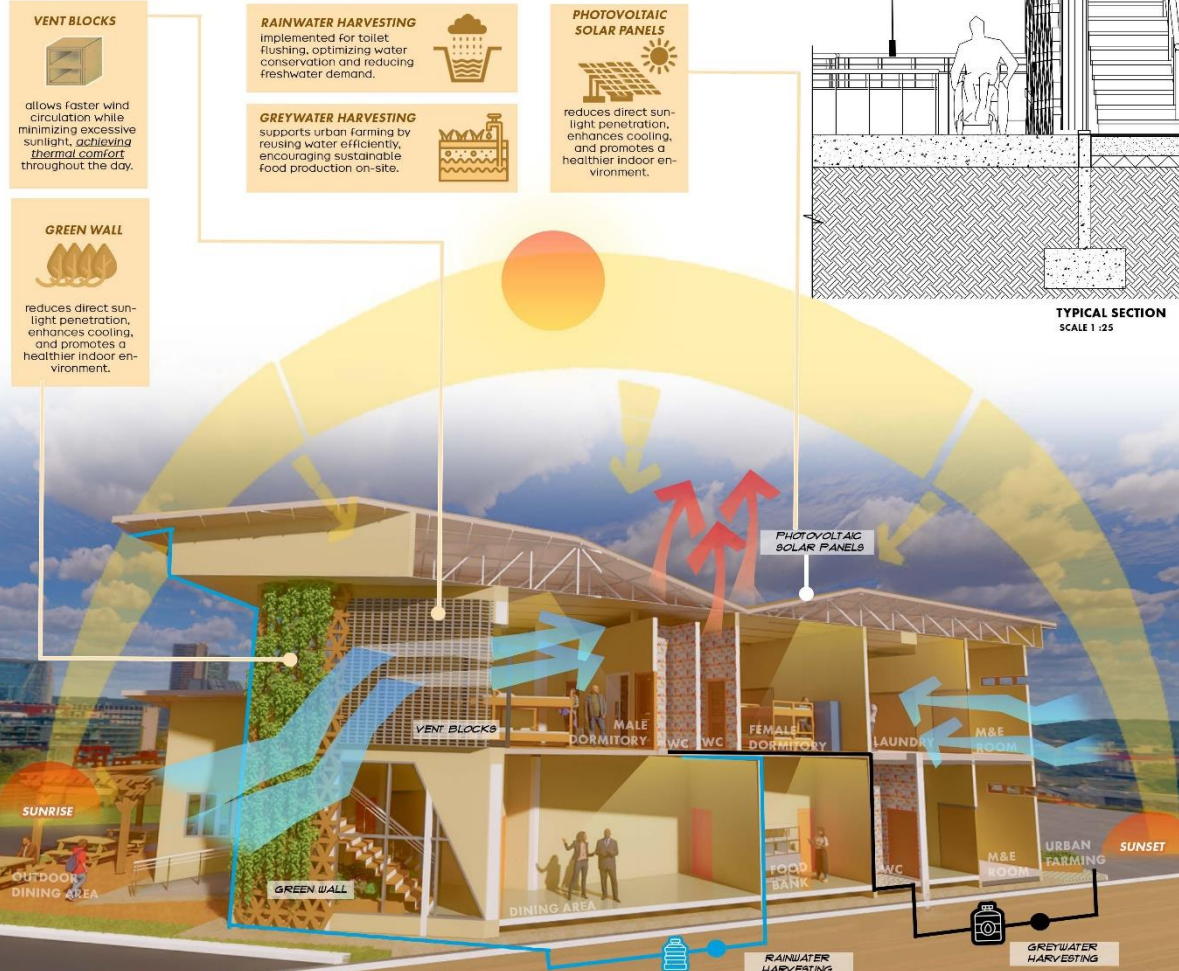
- STAIR CONSTRUCTION**
- 50mm timber tread
 - 13mm timber riser
 - 1200mm run width
 - 190mm riser
 - 250mm tread depth
 - steel stringer railing
 - glass balustrade railing

- RAILING CONSTRUCTION**
- Steel handrail Ø50mm @850mm height
 - 12mm tempered glass balustrade @900mm height
 - Steel stringer 100x50mm



TYPICAL SECTION
SCALE 1 :25

SUSTAINABLE DEVELOPMENT APPLICATIONS



VENT BLOCKS

allows faster wind circulation while minimizing excessive sunlight, *achieving thermal comfort* throughout the day.

RAINWATER HARVESTING

implemented for toilet flushing, optimizing water conservation and reducing freshwater demand.

GREYWATER HARVESTING

supports urban farming by reusing water efficiently, encouraging sustainable food production on-site.

PHOTOVOLTAIC SOLAR PANELS

reduces direct sunlight penetration, enhances cooling, and promotes a healthier indoor environment.

GREEN WALL

reduces direct sunlight penetration, enhances cooling, and promotes a healthier indoor environment.

SUNRISE

OUTDOOR DINING AREA

GREEN WALL

VENT BLOCKS

MALE DORMITORY

WC

FEMALE DORMITORY

LAUNDRY

M&E ROOM

DINING AREA

FOOD BANK

WC

M&E ROOM

URBAN FARMING

SUNSET

PHOTOVOLTAIC SOLAR PANELS

RAINWATER HARVESTING

GREYWATER HARVESTING

METAMORPH ART COMMUNITY CENTRE

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Abstract

The Metamorph Gallery, situated at Batu 4, Port Dickson, is designed to be a premier space for showcasing painting and sculpture. This project is conceived with the intent to create an environment that fosters artistic expression, community engagement, and cultural enrichment. The Metamorph Gallery's unique origami-inspired design, situated at Batu 4 in Port Dickson, serves as both an architectural marvel and a tourist attraction. The building's geometric folds and dynamic facades, reminiscent of the traditional Japanese art of paper folding, create a visually captivating structure that symbolizes transformation and creativity. This design not only enhances the gallery's aesthetic appeal but also integrates seamlessly with the cultural significance of Batu 4, drawing tourists and art enthusiasts alike to this iconic landmark. White and black paint creates a striking visual contrast that emphasizes its origami-inspired design. The white surfaces reflect light, highlighting the building's geometric folds and creating a sense of openness and purity. In contrast, the black surfaces absorb light, adding depth and shadow, which accentuates the intricate angles and dynamic forms. This interplay of light and dark not only enhances the architectural aesthetics but also symbolizes the balance between different forms of artistic expression housed within the gallery. The monochromatic scheme ensures a timeless and elegant appearance, making the building a standout landmark in Port Dickson. This gallery incorporates green technology with stacked ventilation, allowing warm air to rise and escape through roof openings, promoting natural cooling and reducing reliance on air conditioning. Numerous windows maximize natural lighting, decreasing the need for artificial lighting and enhancing energy efficiency. These features, combined with strategic design elements, create a sustainable environment that minimizes energy consumption while providing a comfortable and well-lit space for visitors. The Metamorph Gallery is more than just a building; it is a testament to the transformative power of art. It aims to bridge the gap between artists and the community, creating a space where creativity can flourish, and cultural dialogues can thrive. Through thoughtful design and strategic location, the Metamorph Gallery aspires to become a beacon of artistic and cultural excellence in Port Dickson.

Keyword: Art Centre, Architecture, Metamorph, Geometric Fold, Negeri Sembilan

METAMORPH

AIM
 To propose the design of Art Community Center that intentionally to promote and exhibit the masterpiece of local artist based of transformation concept

INTRODUCTION
 An Art Community Centre, which the vision is to display, promote and exhibit paintings of local artist. This Art center will also be a place where people can come for various activities and community bonding it is constructed at Pantai Batu 4, Port Dickson. The target audience is art enthusiasts, tourist and even students. This can be implemented by constructing the building at the landmark of Port Dickson

ISSUES
ON ART CENTRE
 -There are no count of art community center around Port Dickson
 -There are no building or location which expose integration between people in Port Dickson
 -In-term of design, very little count of building that has a sculpture feature in Port Dickson
 -Origami sculpture in Port Dickson has a very low vulnerability, yet has a very high demand and request not only from school student, but also from artist and art enthusiast.

ON SITE
 -A very hot temperature
 -High humidity, expose higher percentage of rust

OBJECTIVES
 The objective of the art center is to foster creativity and cultural engagement by providing an inclusive space for artistic expression, education, and collaboration, supporting artists, and inspiring the community through diverse programs and events

SITE ANALYSIS

VIEW
 Initiative that could have been used is apply more opening on the front building and less on the back of the building

NOISES
 It is recommended to apply soundproof material and feature on the building to avoid loud noises from the main road

SMELL
 The smell from the unmanaged drainage could disturb the harmony of the building. Drainage maintenance would be necessary

SUN DIRECTION
 The direction of the sun is important interm of building planning to avoid direct sunlight

SUSTAINABLE FEATURE

- Natural Lighting
- Natural Ventilation
- Natural Feature

DESIGN DEVELOPMENT

Based on the inspiration, it is from the Transformation of a 2D paper into a 3D form

Outlines which indicates the folding mark of the paper, raise the texture of the building

Paper is folded following the mark

As the paper continue to follow to fold mark it creates a form that could have been used both in Building form and facade

SITE ZONING

GROUND FLOOR

FIRST FLOOR

CASE STUDY LOCAL G3 GALLERY
 G3 GALLERY MADE THROUGH THE CASE STUDY BECAUSE OF HOW THEY MANAGED TO ARRANGE THE LIMITED SPACE OF AREA AND FIT A BUNCH OF PAINTING ART

INTERNATIONAL ARCHES GALLERY ABERFOYLE
 THE WAY THEY EXAGGERATE AND INTEGRATE THEIR BUILDING WITH NATURAL CONTEXTS AROUND THEM BY MAKING A GLASS WALL AND BIG DOOR AS THEIR MAIN SOURCES OF NATURAL LIGHTING

SITE ZONING

SITE PLAN SCALE 1:250

RAJA FAREZ IQBAL BIN RAJA RUSLI | 06DSB22F1017 | MDM NORLIZA BT JOHAN



RAJA FAREZ IQBAL BIN RAJA RUSLI 06DSB22F1017 MDM NORLIZA BT JOHAN



FRONT ELEVATION
SCALE 1:100



REAR ELEVATION
SCALE 1:100



3D SECTION
NOT TO SCALE

RAJA FAREZ IQBAL BIN RAJA RUSLI 06DSB22F1017 MDM NORLIZA BT JOHAN



Exterior View



Cafe



Gallery



LEFT ELEVATION
1:100

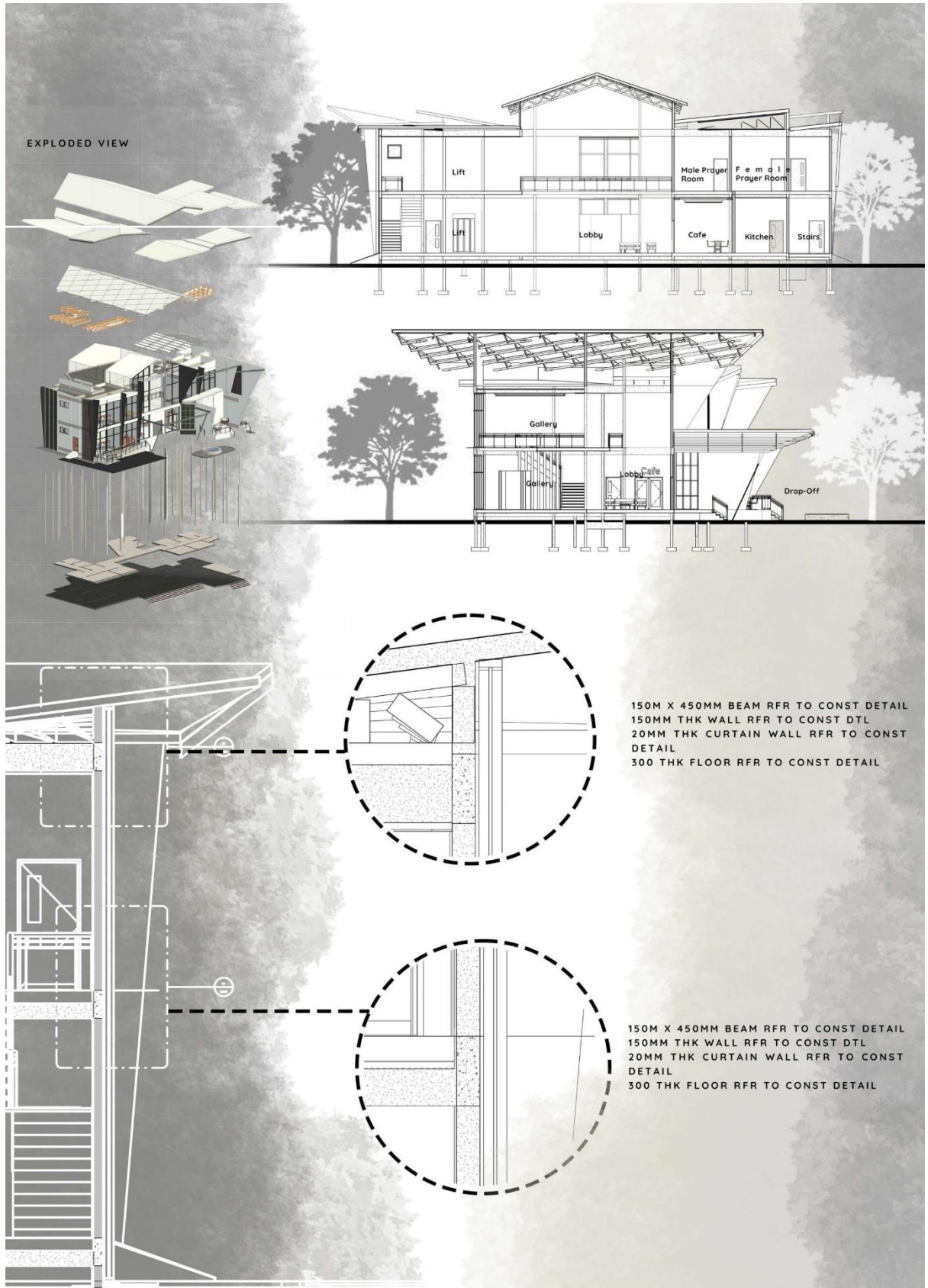


RIGHT ELEVATION
1:100

The architecture of geometrical buildings based on origami combines the artistic elegance of traditional paper folding with modern engineering and architectural practices. This approach results in innovative structures that are not only visually appealing but also highly functional, adaptable, and sustainable.



RAJA FAREZ IQBAL BIN RAJA RUSLI 06DSB22F1017 MDM NORLIZA BT JOHAN



150M X 450MM BEAM RFR TO CONST DETAIL
 150MM THK WALL RFR TO CONST DTL
 20MM THK CURTAIN WALL RFR TO CONST DETAIL
 300 THK FLOOR RFR TO CONST DETAIL

150M X 450MM BEAM RFR TO CONST DETAIL
 150MM THK WALL RFR TO CONST DTL
 20MM THK CURTAIN WALL RFR TO CONST DETAIL
 300 THK FLOOR RFR TO CONST DETAIL

RAJA FAREZ IQBAL BIN RAJA RUSLI 06DSB22F1017 MDM NORLIZA BT JOHAN

SALUAK ART COMMUNITY CENTRE

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Abstract

The Saluak Art Community Centre is a proposed cultural and artistic space situated at Batu 4, Port Dickson, facing the scenic Pantai Saujana. Developed with the intention of preserving and promoting Malaysia's rich cultural heritage, the project addresses the growing concern over the diminishing appreciation for traditional Malaysian apparel and arts, particularly among the younger generation. As modernization continues to reshape societal values, this centre aims to reconnect communities with their cultural roots by offering a dedicated venue for education, engagement, and creative expression. The central problem this project addresses is the gradual loss of cultural identity, especially in the context of traditional apparel and performing arts. By establishing a community-focused space, the project encourages collective learning and appreciation of Malaysia's diverse traditions. The concept is deeply inspired by the Minangkabau heritage of Negeri Sembilan, particularly the intricate patterns of the traditional songket. The name "Saluak" is derived from the "Saluak Berantai" pattern, symbolizing linking and connection which are values that are translated architecturally through interlinked building blocks and shared communal spaces. These include a multipurpose hall for a variety of performances, workshops, and an exhibition area that facilitate informal gatherings and storytelling. To realize this vision, the design process incorporated spatial modelling, sustainability studies, and contextual analysis. The centre employs eco-friendly methods such as the use of recyclable steel space frame structures and green walls to enhance thermal comfort and reduce environmental impact. A central courtyard improves natural ventilation and indoor environmental quality, promoting well-being among visitors and occupants. This innovative approach results in a facility that is not only architecturally modern but also culturally rooted. It serves as both a performance and exhibition venue for local artists and a cultural education hub for visitors. Compared to conventional art spaces, Saluak offers a more immersive and environmentally conscious experience. In conclusion, the Saluak Art Community Centre stands as a symbol of cultural preservation and artistic innovation. It fosters a supportive environment for emerging artists while enriching community life through shared cultural experiences. As the project moves forward, it is recommended that future developments include digital exhibitions, interactive workshops, and further exploration of sustainable construction technologies to enhance cultural education and environmental responsibility.

Keyword: Art Centre, Architecture, Saluak Berantai, Songket, Negeri Sembilan



INTRODUCTION

The art community centre is a that connects the locals with apparel professionals and their artworks.

The art community centre is proposed with the idea of strengthening the bond between the community members to better uplift and introduce the culture.

The art community centre is proposed to be located at Batu 4 as the main attraction of Port Dickson.

AIM

To propose the design of an art community centre that bridges connection based on linkages concept.

OBJECTIVES

To organise main spaces such as exhibition gallery and studio based on clustered organisation.

To apply repetition motifs on facades to symbolise "saluak berantai" pattern.

To utilise green design strategies such as natural lighting for energy saving and sustainability.

ISSUES



Port Dickson lacks Urban area like Batu 4 community space which makes it hard to especially hard for the cultural apparel to be introduced

Urban area like Batu 4 usually congested bridges connection, which makes it hard due to the lack of green technology.

The existing site is usually congested due to the lack of circulation.

USER STUDY



Community including tourists should have an easy access in getting accustomed with the local culture.

Aspiring **professionals** need a platform to enhance their skills before taking off into the industry.

Students need to be exposed to the cultural apparel in order to pique their interest in joining

IDEA & CONCEPT DEVELOPMENT



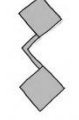
MINANGKABAU SONGKET
 Motifs on Minangkabau songket conform both to their philosophy of the natural world, and their folklore, steeped in traditional wisdom.



SALUAK BERANTAI
 The pattern is derived from Minangkabau songket which signifies strength within community.



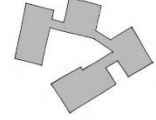
BOND
 A collection of two groups within the community are made.



INTEGRATION
 These groups are unified through a direct linking.



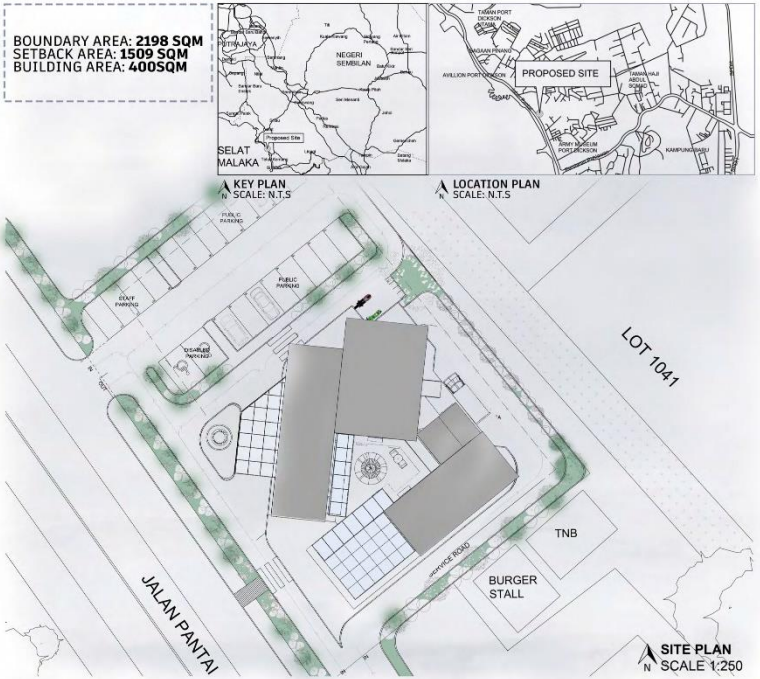
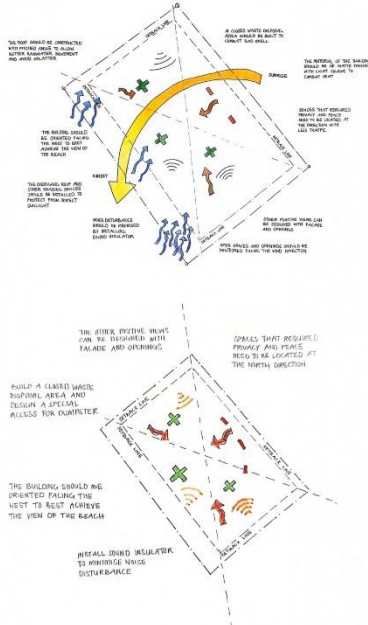
CONNECTION
 More groups within the community are linked.



LINKAGES
 The interconnection between multiple group of communities create

SITE ANALYSIS

CLIMATE



PRECEDENT STUDY

UR-MU ART GALLERY, MALAYSIA



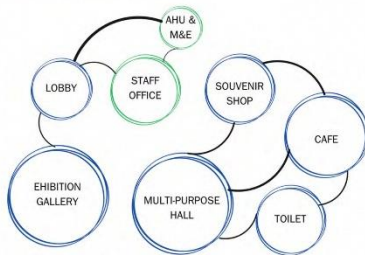
The use of glazing wall as a facade inspires my own design by creating a seamless connection between indoor and outdoor spaces, allowing natural light to flood the interior, and enhancing the modern aesthetic with sleek, transparent surfaces that promote energy efficiency and a sense of openness.

INZHOU STADIUM, CHINA

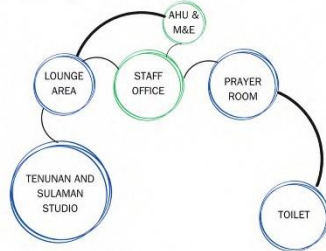


The use of curved steel frame as its trusses surely gives inspiration for the design of my roof. The steel helps in giving modern curvature look to the building.

SPATIAL PLANNING

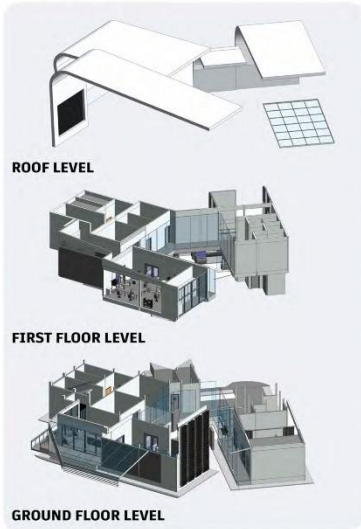


GROUND FLOOR PLAN

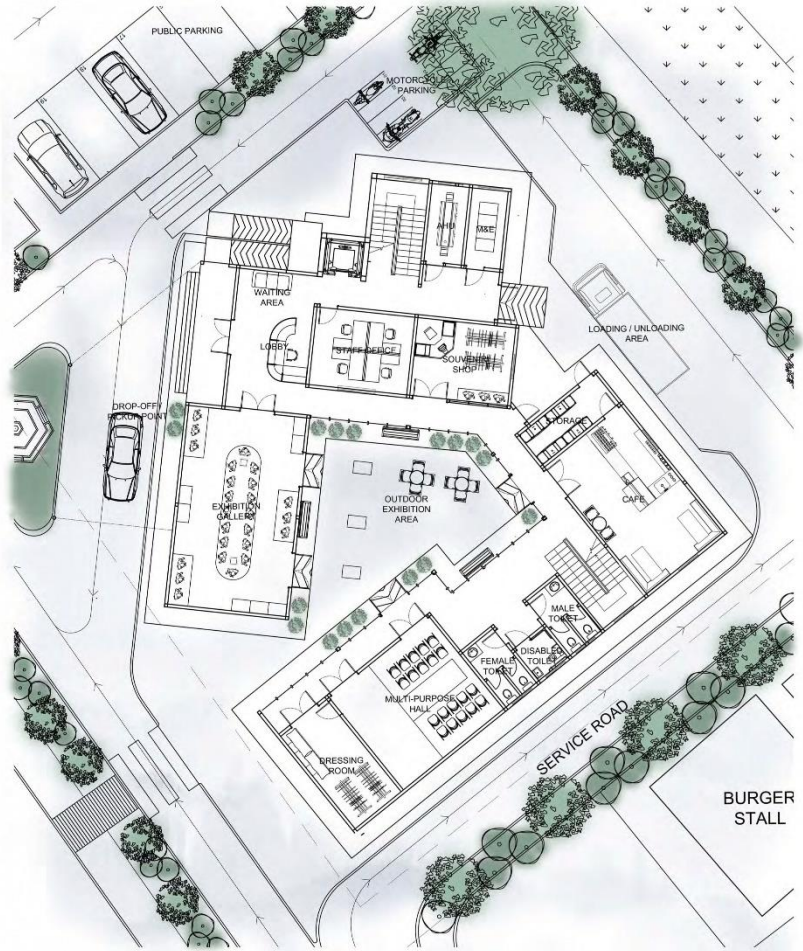


FIRST FLOOR PLAN

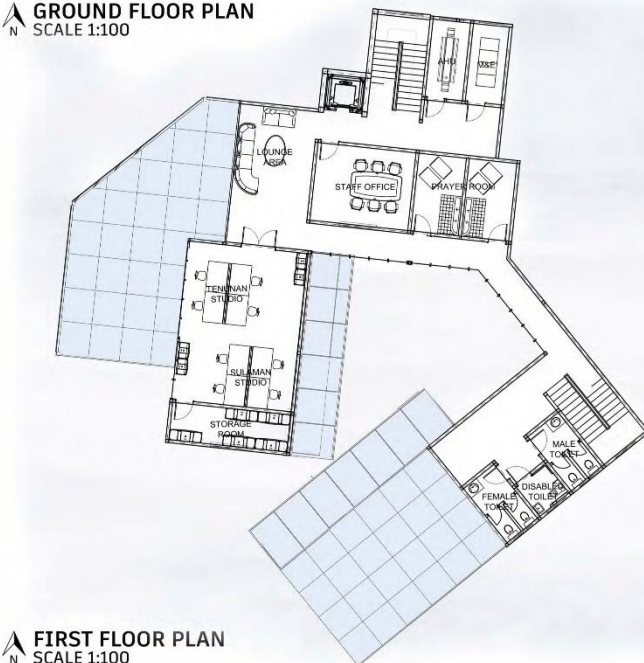
EXPLODED VIEW



GROUND FLOOR LEVEL

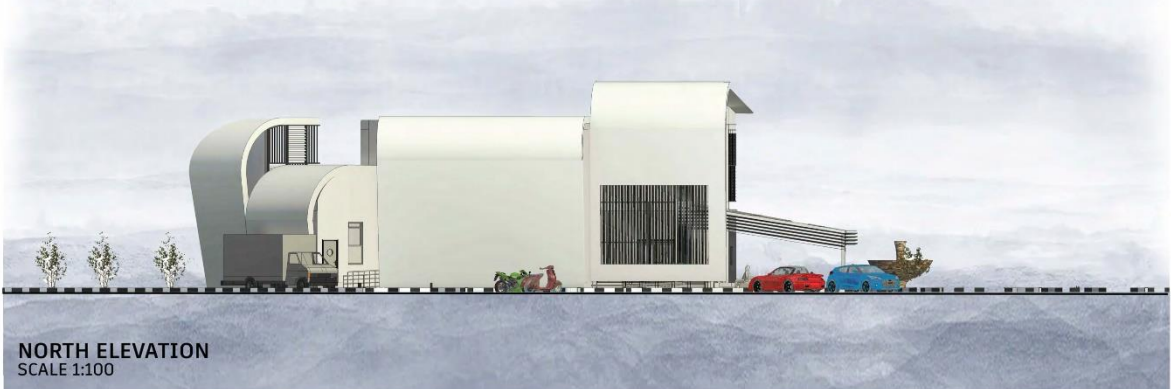


GROUND FLOOR PLAN
 SCALE 1:100

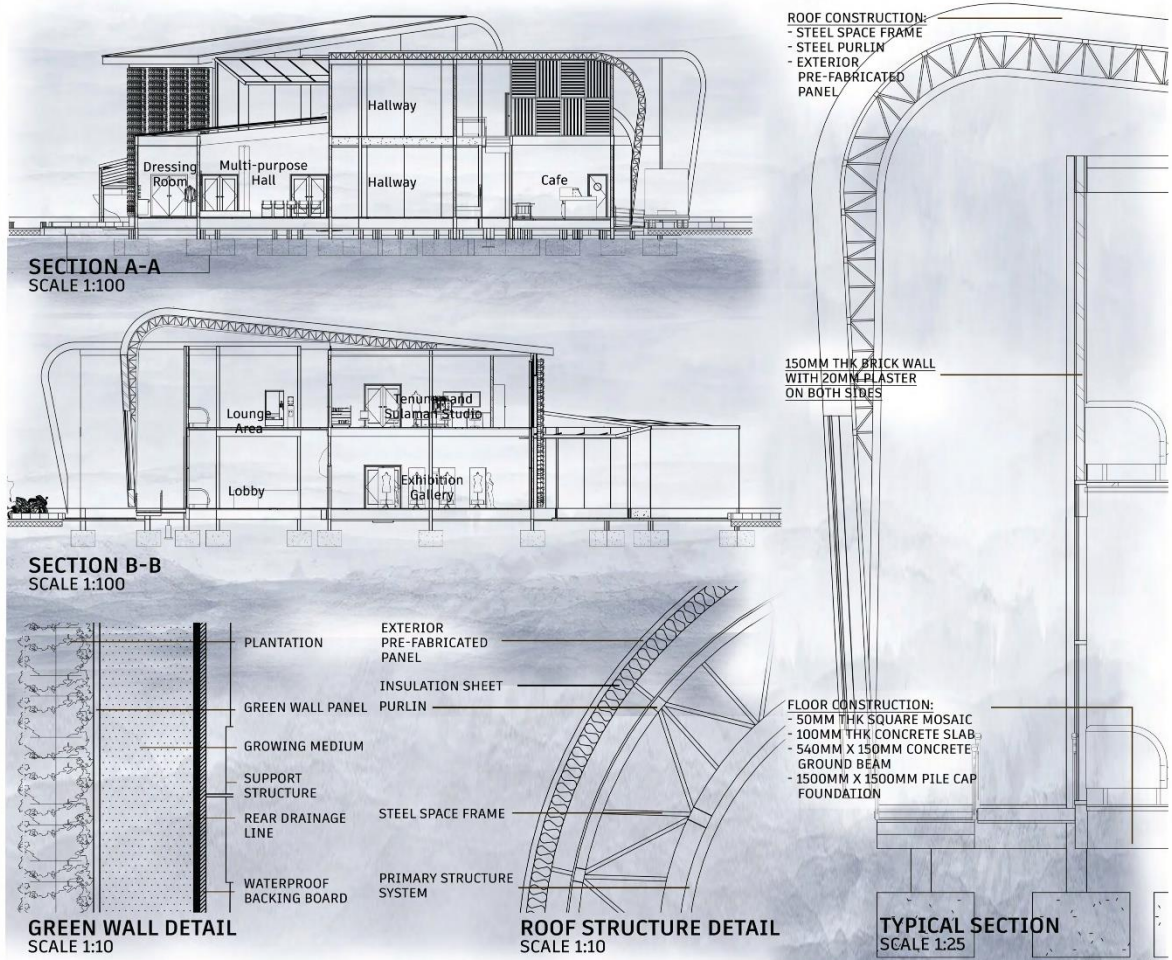


FIRST FLOOR PLAN
 SCALE 1:100

NUR QISTINA BINTI ROS AZMAN | 06DSB22F1064 | DCA40155 DESIGN STUDIO 4 | PN. NORLIZA BT JOHAN



NUR QISTINA BINTI ROS AZMAN | 06DSB22F1064 | DCA40155 DESIGN STUDIO 4 | PN. NORLIZA BT JOHAN



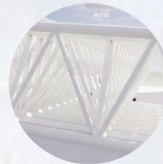
NUR QISTINA BINI ROS AZMAN | 06DSB22F1064 | DCA40155 DESIGN STUDIO 4 | PN. NORLIZA BT JOHAN



SUSTAINABLE DEVELOPMENT



GREEN WALL
 The green wall provides temperature control and heat reduction as the plants are better at absorbing sunlight than reflecting it.



SPACE FRAMING
 Space frame is a lightweight structure with short construction period and high adaptability. It also creates a smaller carbon footprint since it is made from recyclable materials.



CURTAIN WALL
 Curtain wall promotes natural daylighting and helps in regulating heat transfer, potentially reducing long-term energy costs.



COURTYARD
 A courtyard increases daylight and encourages natural ventilation by providing an area for warm air to escape the home.



NUR QISTINA BINTI ROS AZMAN | 06DS822F1064 | DCA40155 DESIGN STUDIO 4 | PN. NORLIZA BT JOHAN

MEASURED DRAWING OF MAK ANI'S HERITAGE HOUSE: DIGITAL DOCUMENTATION THROUGH 3D VR PANORAMIC VISUALIZATION

Siti Fatimah Tuzzahrah Bt Hj Abd Latif^{1*}, Nur Qistina Bt Ros Azman¹,
Muhammad Noor Elyas Bin Noor 'Azli¹, Ahmad Holil Bin Rusman¹, Nur Qistina
Iman Binti Mohd Norimran¹

¹Department of Civil Engineering, Politeknik Port Dickson 71050 Port Dickson, Negeri
Sembilan, Malaysia

*tuzzahrah@polipd.edu.my

Abstract

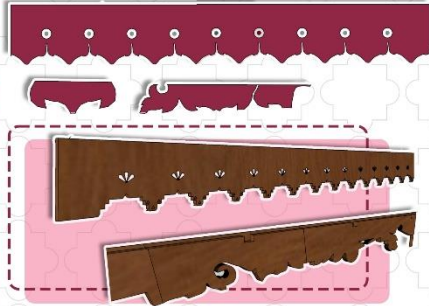
The Measured Drawing of Mak Ani's Heritage House: Digital Documentation through 3D VR Panoramic Visualization is an innovative initiative to document the Mak Ani Heritage House, which is over 100 years old and located in Kampung Parit Istana, Kuala Pilah, Negeri Sembilan. The house has been inhabited by four generations and showcases traditional Minangkabau architectural features, rich in historical and cultural significance. The primary objective of this project is to digitally document the design, history, and architectural elements of the heritage house, and to produce measured drawings that accurately depict each structural component of the house. Additionally, this project aims to present the research findings in an engaging, accessible, and interactive visual format. This research employs a combination of qualitative methods and modern digital technology. The qualitative methods include fieldwork such as measuring the building's structure, sketching the architectural design, recording motifs and carvings, photography, video and audio recording, as well as conducting interviews with the house's caretakers to gather oral history and narratives. Measured drawings are created through precise measurements to ensure accuracy in recording the house's architectural features. Furthermore, this project utilizes 3D modeling software, digital animation, and virtual reality (VR) technology to present the documentation in an interactive and engaging manner. Findings indicate that the design of Mak Ani's Heritage House is influenced not only by the cultural elements of the four main tribes in Kampung Parit Istana, but also by considerations for safety during the World War II era. The floral motifs found in the carvings symbolize the identity of the tribes living in the area. This project has produced final deliverables such as technical measured drawings, documentary videos, 3D digital models, visual posters, coffee table books, and VR contents. This approach not only strengthens efforts to preserve and educate about heritage but also opens up commercial potential as an academic and interactive reference suitable for today's digital generation.

Keywords: Measured Drawing, Heritage House, 3D Technology, Virtual Reality (VR), Heritage Preservation.

MINISTRY OF HIGHER EDUCATION
 MALAYSIA
POLYCC **POLITEKNIK** **RESPEX 25**
 TREET PARK MALAYSIA JOAL SKOLAN
9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

ANDE-ANDE

Motif ukiran ini adalah salah satu komponen seni bina adat seperti Rumah Minangkabau di Negeri Sembilan. Ande-ande adalah bahagian bawah tiang rumah yang biasanya mempunyai ukiran yang khas dan simbolik.



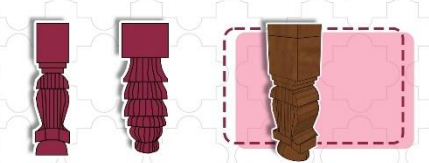
KEKISI ANGIN

Kekisi ini tertetak di dinding dan tebar layar rumah. Reka bentuk kekisi angin membolehkan cahaya semula jadi dan angin tanpa membiarkan pandangan luar masuk, sekaligus memberi privasi kepada penghuni rumah.



TIANG GANTUNG

Sebuah tiang gantung menunjukkan status pemilik golongan kedudukan dalam masyarakat serta kerabat diraja. Ia juga menunjukkan bukti masyarakat Melayu zaman lampau memahami ilmu tarikan daya bumi dan keseimbangan iaitu graviti.



TIANG SERI

Tiang ini dihiasi dengan ukiran yang unik di setiap sisi, di mana setiap sisi mewakili salah satu daripada empat suku utama yang menjadi asas masyarakat di Kampung Parit Istana. Ukiran pada setiap sisi tiang ini bukan sekadar hiasan, tetapi membawa simbolik mendalam yang melambangkan identiti dan asal-usul suku masing-masing.

UKIRAN SISI 1

Sisi pertama memperlihatkan ukiran untuk Suku Biduanda, suku terkenal sebagai penjaga adat dan pemegang warisan budaya.

UKIRAN SISI 2

Sisi kedua diukir untuk Suku Tiga Nenek, yang sering dikaitkan dengan sejarah keluarga dan keturunan masyarakat tempatan.

TIANG SERI

Ukiran pada tiang rumah tangga bukan sekadar hiasan, tetapi juga melambangkan aspek spiritual dan tradisi adat. Ia dianggap sebagai elemen penting yang membawa "seri" atau aura positif kepada rumah, menjadikan tiang seri sebagai pusat tumpuan dalam seni bina dan kehidupan rumah tangga.

UKIRAN SISI 3

Sisi ketiga menghormati Suku Anak Aceh, yang mencerminkan elemen budaya yang berakar dari sejarah Aceh dan hubungan erat mereka dengan masyarakat setempat.

UKIRAN SISI 4

Sisi terakhir pula menampilkan ukiran untuk Suku Sri Lemak melambangkan keunikan suku ini yang berperanan penting dalam struktur sosial dan adat kampung.

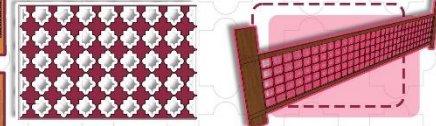
TINGKAP

Seni bina tingkap ini membolehkan sinar matahari yang mencukupi untuk memasuki dalam ruangan. Tingkap kaca ini berwarna (stained glass) yang menambah artistik dan memberikan efek visual yang menarik.



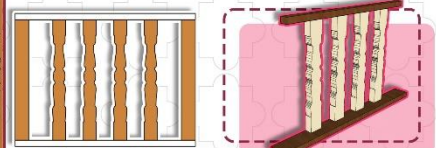
KEKISI ANGIN (POGHAN)

Kekisi angin di rumah ini ditempatkan di dinding loteng/poghan untuk memastikan udara segar dapat mengalir dengan lancar, manakala kelembapan dan bau tidak menyenangkan dapat keluar.



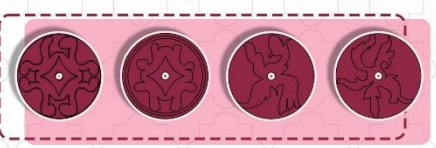
PAGAR MUSANG

Pagar musang biasanya diperbuat daripada kayu keras seperti cengal atau merbau yang tahan lasak. Pagar musang mempunyai ukiran bulat, silinder, atau corak yang



MOTIF UKIRAN

Motif ukiran pada ande-ande merujuk kepada corak ukiran yang terdapat pada komponen seni bina tradisional Melayu.



PANDANGAN KANAN
 SKALA: 1:100

PANDANGAN KIRI
 SKALA: 1:100

KERATAN A-A
 SKALA: 1:100



KERATAN B-B
 SKALA: 1:100

PANDANGAN KANAN
 SKALA: 1:100

PANDANGAN BELAKANG
 SKALA: 1:100

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

BUTIRAN - BUTIRAN PERINCIAN

LUKISAN PECAHAN ISOMETRIK

PENUNJUK:
 1. STRUKTUR LANTAI
 2. TANGGA
 3. LANTAI
 4. DINDING
 5. STRUKTUR LOTENG
 6. STRUKTUR BUMBUNG
 7. BUMBUNG

BUTIRAN - BUTIRAN PERINCIAN

BUTIRAN DINDING
SCALE 1:20

BUTIRAN BUMBUNG LOTENG
SCALE 1:20

BUTIRAN BUMBUNG RUMAH IBU
SCALE 1:20

BUTIRAN LANTAI
SCALE 1:20

BUTIRAN TANGGA
SCALE 1:20

PENGUDARAAN SEMULAJADI
 Angin dari luar akan memasuki dalam rumah menerusi kekisi angin, bukaan tingkap dan rekahan kayu botol. Dengan ini, ia membolehkan udara segar masuk.

PENCAHAYAAN SEMULAJADI
 Cahaya matahari memasuki menerusi tingkap dan bukaan lain. Jadi, ia tidak menggunakan elektrik untuk lampu.

PENGUDARAAN SEMULAJADI
 Angin dari luar akan memasuki dalam rumah menerusi jarak antara papan lantai dan kemudian mangkalkan udara panas yang berada di dalam rumah.

LUKISAN KERATAN PERSPEKTIF TANPA SKALA

06150223 **LUKISAN TERBUKUR**

Pn. Siti Fatimah Tuzzaerah Binti Md. Abd Latif

Rumah Warisan Melayu Asli

MEASURED DRAWING OF PUAN ZAHARAH'S HERITAGE HOUSE: DIGITAL DOCUMENTATION FOR PRESERVING TRADITIONAL ARCHITECTURE

Siti Fatimah Tuzzahrah bt Hj Abd Latif¹, Mas Diyan Sahputra bin Sunaryo¹, Nur Hamizah bt Zulkiflee¹, Nur Liyana bt Mohd Rizal¹, Danish Haikal bin Badrul Hisham¹

¹Department of Civil Engineering, Politeknik Port Dickson 71050 Port Dickson, Negeri Sembilan, Malaysia

tuzzahrah@polipd.edu.my

Abstract

This project aims to document and understand the architectural and cultural values found in Puan Zaharah's Heritage House, a traditional Malay house built in 1920 in Kampung Terap, Kuala Pilah, Negeri Sembilan. The house features important elements such as wooden pillars, a traditional tiered curved roof design, decorated timber walls, carved windows, and uses cengal wood as the main material. Its design reflects strong influences from Minangkabau culture and Adat Perpatih. As part of a student innovation effort, this project applies the measured drawing method along with digital tools to produce complete documentation. The students developed a 3D model, created a video animation, compiled a digital coffee table book, and produced a digital documentary. An interactive 3D model was also developed using the web-based platform Vectary, allowing users to explore the traditional house online using gadgets. The project enables students to explore heritage architecture and use technology for preservation. The final outcomes also serve as reference materials for educational institutions, heritage bodies, and the community.

Keywords: Measured Drawing, Traditional house, 3D Model, Student Innovation, Web-Based Visualization



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION



Imbas Kod QR bagi Visualisasi 3D Interaktif



Imbas Kod QR bagi e coffee table book

Abstrak

Projek ini bertujuan untuk merekod dan memahami nilai seni bina serta budaya yang terdapat dalam Rumah Pusaka Puan Zaharah, sebuah rumah tradisional Melayu yang dibina pada tahun 1920 di Kampung Terap, Kuala Pilah, Negeri Sembilan. Rumah ini mempunyai elemen penting seperti tiang kayu, bumbung tradisional, dinding papan, dan tingkap berukir, serta menggunakan kayu cengal sebagai bahan utama. Reka bentuknya dipengaruhi oleh budaya Minangkabau dan Adat Perpatih yang kaya dengan nilai warisan tempatan. Sebagai satu inovasi oleh pelajar, projek ini menggunakan kaedah lukisan terukur bersama pendekatan digital untuk menghasilkan dokumentasi yang lengkap. Pelajar telah membangunkan model 3D bagi menunjukkan struktur rumah dengan lebih jelas. Video animasi pula membantu memberi gambaran susun atur dan elemen seni bina secara interaktif. Projek ini turut menghasilkan buku meja kopi yang menghimpunkan lukisan dan maklumat rumah, serta dokumentari digital yang merakamkan sejarah dan kepentingan rumah pusaka ini. Impak projek ini ialah ia memberi peluang kepada pelajar untuk meneroka seni bina warisan dan memanfaatkan teknologi dalam usaha pemeliharaan. Ia juga dapat meningkatkan kesedaran masyarakat terhadap pentingnya menjaga identiti budaya. Selain sebagai bahan rujukan, hasil projek ini boleh digunakan oleh institusi pendidikan dan pihak berkuasa warisan. Secara keseluruhan, projek ini menggalakan generasi muda dan pereka masa kini untuk mengadaptasi nilai seni bina tradisional dalam rekaan moden demi kelestarian dan pemeliharaan warisan negara.

Isu

- Ketiadaan dokumentasi terperinci rumah warisan menyebabkan nilai seni bina tradisional sukar dipelihara untuk generasi akan datang.
- Kesedaran masyarakat yang rendah terhadap kepentingan memelihara rumah pusaka sebagai identiti budaya tempatan.

Objektif Projek

- Mendokumentasi struktur dan reka bentuk Rumah Pusaka Puan Zaharah secara terperinci melalui lukisan terukur.
- Menggunakan teknologi digital (model 3D, animasi, video) dalam proses dokumentasi.
- Menyemai kesedaran tentang kepentingan pemeliharaan warisan budaya.
- Menyediakan bahan pembelajaran rumah warisan untuk rujukan dan kegunaan akademik dan komuniti.

Metodologi

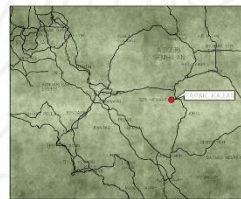
- Kerja lapangan dan pengukuran terperinci struktur rumah.
- Penghasilan lukisan terukur (pelan lantai, pandangan, keratan dan butiran).
- Pembangunan model 3D rumah menggunakan perisian SketchUp dan Enscape.
- Penerbitan video animasi untuk visualisasi susun atur dan struktur bangunan.
- Penghasilan dokumentari dan buku meja kopi yang memuatkan sejarah dan maklumat seni bina.



Video Dokumentasi Video Animasi Gambar 1: mengukur bangunan Gambar 2: membuat plan dan lukisan 2d Gambar 3: membuat 3D di SketchUp

Impak Projek

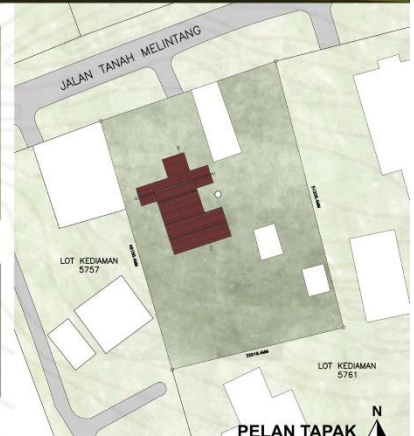
- Meningkatkan kesedaran pelajar dan komuniti terhadap nilai warisan.
- Menyediakan bahan pembelajaran yang interaktif.
- Menyumbang kepada pemeliharaan warisan seni bina yang kian pupus.
- Potensi dijadikan bahan promosi pelancongan warisan.



PELAN KUNCI
SKALA NTS



PELAN LOKASI
SKALA NTS

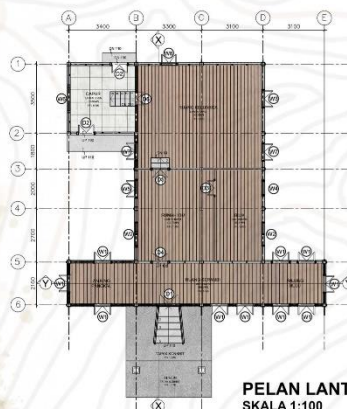


PELAN TAPAK
SKALA 1:300

Asal Usul

Kampung Terap adalah sebuah kampung berpenduduk yang terletak di Senaling, Kuala Pilah, Negeri Sembilan berposkod 72000. Kampung ini terletak diantara Kampung Cheriau dan Kampung Peraku disepanjang jalan Seri Menanti-Senaling.

Kampung Terap ini terletak di wilayah luak tanah mengandungi di luak ulu muar bersebelahan dengan luak beradat dan luak inas.



PELAN LANTAI
SKALA 1:100

Kesenian Susunatur Ruang

RUMAH IBU

Rumah ibu merupakan rangka yang menjadi penghubung kepada setiap bahagian lain. Ia juga merupakan ruang terpenting dan terhormat di sesebuah rumah tradisional Negeri Sembilan dimana ruang ini dominan kepada perempuan dimana adat pepatih yang bersifat matrilineal pihak perempuan sangat dijaga dan penting.

SERAMBI

Serambi adalah sebuah ruang yang terpanjang di rumah ini. Ia ditempatkan setelah ruang tangga atau rumah tangga. Kegunaan dan fungsi dari serambi ini adalah merupakan ruang penyambut tetamu di rumah ini.

RUANG KELUARGA

Ruang keluarga terbina sebagai ruang tambahan dan dihubungkan melalui tangga kecil daripada rumah ibu menjadikan ia ruang dengan aras kedua terendah selain dapur.





9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION
Kronologi Rumah Pusaka Puan Zaharah

Asal Usul	Legasi Rumah Pusaka	Pengubahsuaian	Kesepakatan
Rumah Pusaka Puan Zaharah merupakan kediaman keluarga Allahyarhamah Puan Zaharah yang diwariskan oleh ibu bapanya kepada beliau. Kini, rumah ini dijaga dan dipelihara oleh Encik Kamarul, cucu kepada Puan Zaharah. Rumah pusaka ini terletak di Kampung Terap, Senaling, Kuala Pilah, Negeri Sembilan.	Rumah ini siap dibina sekitar tahun 1910 hingga 1920 dan pada awalnya diduduki oleh keluarga Puan Zaharah, nenek kepada Encik Kamarul, yang kini menjadi penjaga rumah tersebut. Rumah ini diturunkan kepada Puan Ramlah, anak tunggal Puan Zaharah. Namun, setelah Puan Ramlah meninggal dunia, rumah ini diwarisi oleh anak sulung perempuan beliau, Puan Roshinah. Puan Ramlah mempunyai 10 orang anak, terdiri daripada 7 anak kandung dan 3 anak tiri.	Pada asalnya, rumah pusaka ini mempunyai satu bilik dan hanya diduduki oleh keluarga mereka pada waktu itu. Pengubahsuaian pertama dilakukan sekitar tahun 1960 untuk menambah bilik, berikutan bilangan cucu yang ramai. Kemudian, rumah ini ditambah baik lagi pada tahun 1980-an atas sebab kemajuan perumahan pada zaman itu. Atap rumah tersebut kini menggunakan atap zink setelah ditukar dari atap rumbia, selaras dengan perubahan zaman.	Rumah pusaka tersebut dijaga dan diselenggara oleh Encik Ujang, cucu kepada Puan Zaharah, setelah pemergian ibundanya pada tahun 2019. Encik Ujang dan adik-beradiknya bersepakat agar rumah pusaka ini dijaga bersama-sama dan biarlah kekal dengan nama nenek mereka sahaja. Rumah ini tidak pernah bertukar nama semajlag pemergian nenek beliau, Puan Zaharah.

PAGAR MUSANG

Di rumah ini terdapat pagar musang bermotif geometri dengan gabungan bentuk hati dan bintang yang melambangkan kesempurnaan dan keharmonian yang terletak diseluruh tingkap di serambi.

KEPALA PINTU & TINGKAP

Motif ukiran kepala tingkap dan pintu di rumah ini bercorak geometri. Kepala pintu dan tingkap berfungsi sebagai sokongan struktur, terutama untuk menanggung beban dinding atau struktur lain di atas pintu atau tingkap.

Tenis motif ukiran
Unsur ragam hias

ANDE-ANDE

Juga dikenali sebagai papan maris, ia merupakan elemen melintang bercorak geometri berulang-ulang bagi menutupi kayu kasau.

UKIRAN TEBUK TEMBUS TIDAK SILAT

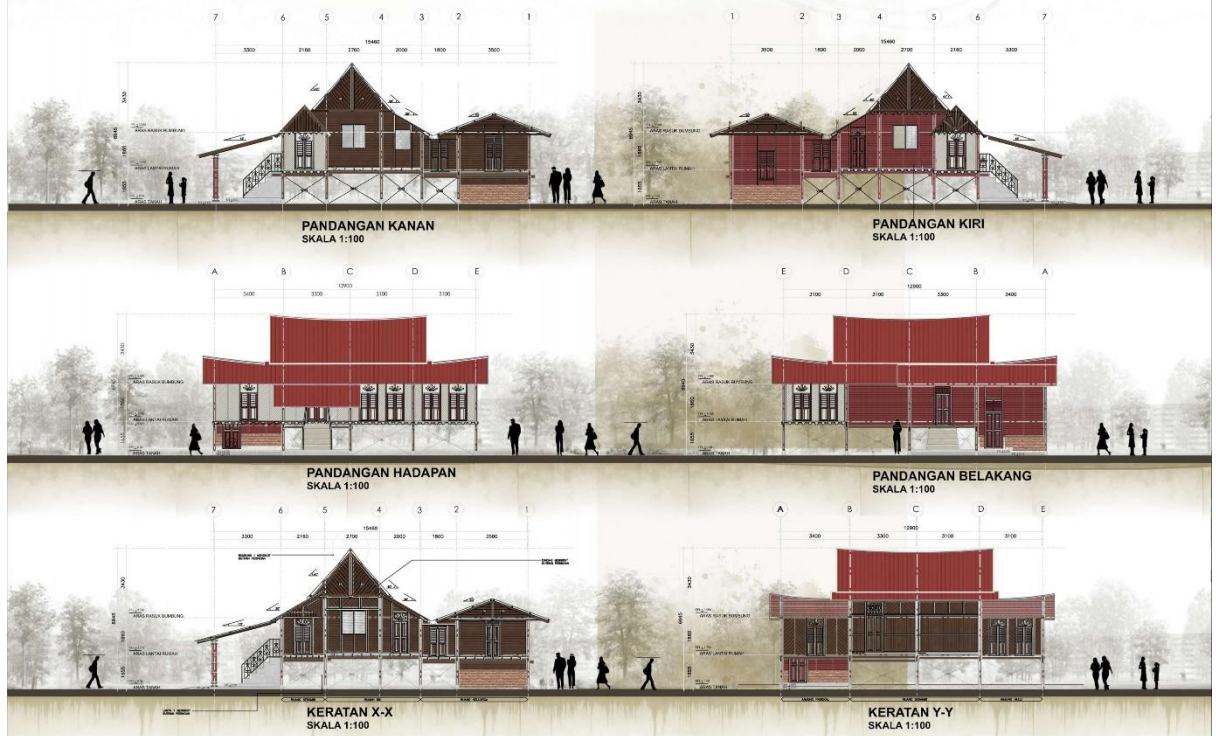
Ukiran larik bermotif flora-fauna di rumah ini adalah pada dasar permukaan kosong ditebuk menjadi lubang sedangkan motif dan coraknya dibiarkan rata tanpa silat.

UKIRAN LARIK

Ukiran larik berbentuk bulat dengan susunan gelang-gelang dan genting-genting yang menarik.

POLA LENGKAP

Bentuk ini menggabungkan ciri-ciri bentuk bujang dan bentuk pemingid. Bentuk ini menitikberatkan unsur tumbuh-tumbuhan, merangkumi akar, batang, buah, dahan, daun, putik dan sulungnya.



BUMBUNG ATAP LENTIK

Rekaan ini melambangkan kekuatan, keberanian, dan semangat kerjasama dalam budaya Minangkabau. bumbung inspirasi Minangkabau sering digunakan untuk menambahkan elemen budaya dan keunikan kepada bangunan.

TEBAR LAYAR

Motif matahari melambangkan kehidupan dan kebangkitan. Motif flora melambangkan keindahan alam semula jadi.

DINDING TINDIH KASIH

Dinding jenis susun sirih ini dibentuk dengan cara menyusun kepingannya yang seragam.

DINDING SERONG

Dinding serong juga mencipta ilusi ruang yang lebih luas atau tinggi, memberikan kesan perspektif yang menarik.

TINGKAP

Di rumah ini, terdapat penggunaan tingkap jenis "louvers" dan tingkap penuh yang membolehkan kawalan cahaya dan pengudaraan dengan lebih baik.



NOUVAEUVIE HOMELESS TRAINING CENTRE

Nazarul Iman Bin Mohd Zawawi¹, Rafidah Binti Suib¹ ¹ Department of Civil Engineering, Politeknik Port Dickson 71050 Port Dickson, Negeri Sembilan, Malaysia

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Abstract

The Covid-19 pandemic, compounded by job losses and economic instability, has intensified the issue of homelessness, pushing many families into vulnerable situations. This proposed project aims to address this crisis by providing a transitional facility that equips individuals with essential skills and opportunities for employment. Residents will undergo a 14-day transition program designed to help them reintegrate into society with dignity and purpose. The design concept draws inspiration from the human heart, symbolizing life, renewal, and emotional warmth—aligning with the project's mission to offer a second chance at life. This metaphor informed the early design stages and guided the spatial and formal strategies. Adopting a postmodern architectural style, the building features a warm palette of white and natural brown tones, using timber finishes to evoke a sense of comfort and welcome. Materials were carefully selected to withstand the site's coastal environment, including timber, concrete, and copper, which are resilient against salty air and humidity. The building design incorporates generous openings and large windows to maximize natural daylight, significantly reducing reliance on artificial lighting during daytime hours. A rainwater harvesting system is integrated to support on-site agricultural activities, promoting sustainable practices and self-sufficiency. In addition to its core functions, the facility includes a recycling sector, emphasizing environmental responsibility and waste reduction. Overall, this project serves as both a sanctuary and a stepping stone—rebuilding lives through thoughtful, sustainable, and humane architectural design.

Keyword: Homeless Centre, Architecture, Human Heart, Negeri Sembilan

NOUVEAUVIE

HOMELESS TRAINING CENTRE

By Nazarul Iman Bin Mohd Zamawi | DSB4A | 0605823F0105

POLYCC POLITEKNIK RESPEX 25
 9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

INTRO

NOUVEAUVIE or New Life are taken from the heart as concept which symbolize life. The site are located at Jalan Pasar Lama which coordinates at 02° 31' 23.9018"N 101° 47' 41.8448"E, this 2084.59 sqm site located near the Port Dickson Fire Station and Facing the abandon Train Station which operate by Sungai Ujong Railway Company from 1891 to 2008. With a 400 sqm building area it offers a quite setting away from busy roads. Surrounded by commercial building, the site provide easy access for the homeless since they are commonly found at urban area. Since the site near the Commercial building it will increase the chance of employment after finishing the training at the training centre.

AIM

To propose the design of Homeless Training Center that help people regain their independence and life by offering set skill and rehabilitation based on heart which is the concept of this design. It symbolic as a life where the heart always pumping the blood throughout the body to keep ourself alive

OBJECTIVES

- Provide social space and integration with nature to improve social skill and mental
- Implement the green technology by using rain water harvesting and solar energy
- Creating space for learning and honing the homeless skill.
- Providing shelter that is secured and comfortable

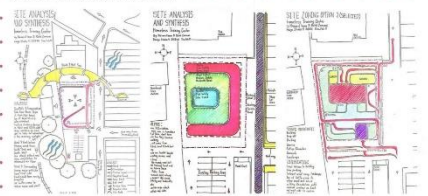
TARGET USER

- Male 8 Person
- Female 8 Person
- Family 8 Person
- Staff 8 Person

ISSUE

- Green Technology (Environmental): Use of vegetation and passive cooling design
- Site (Tropical Climate): Heavy rainfall, Hot humid, Hot evening sunlight and Wild life
- Homeless (User): Lack of basic needs and stability

SITE ANALYSIS



CONCEPT AND IDEA DEVELOPMENT

Hardshape and softshape symbolize that life not always hard and can be improve further

Taken from alveoli and nerve it being interpreted as green wall that supply oxygen

Top heart section resemblance division, used for floor plan idea

ACTIVITY AND TRAINING

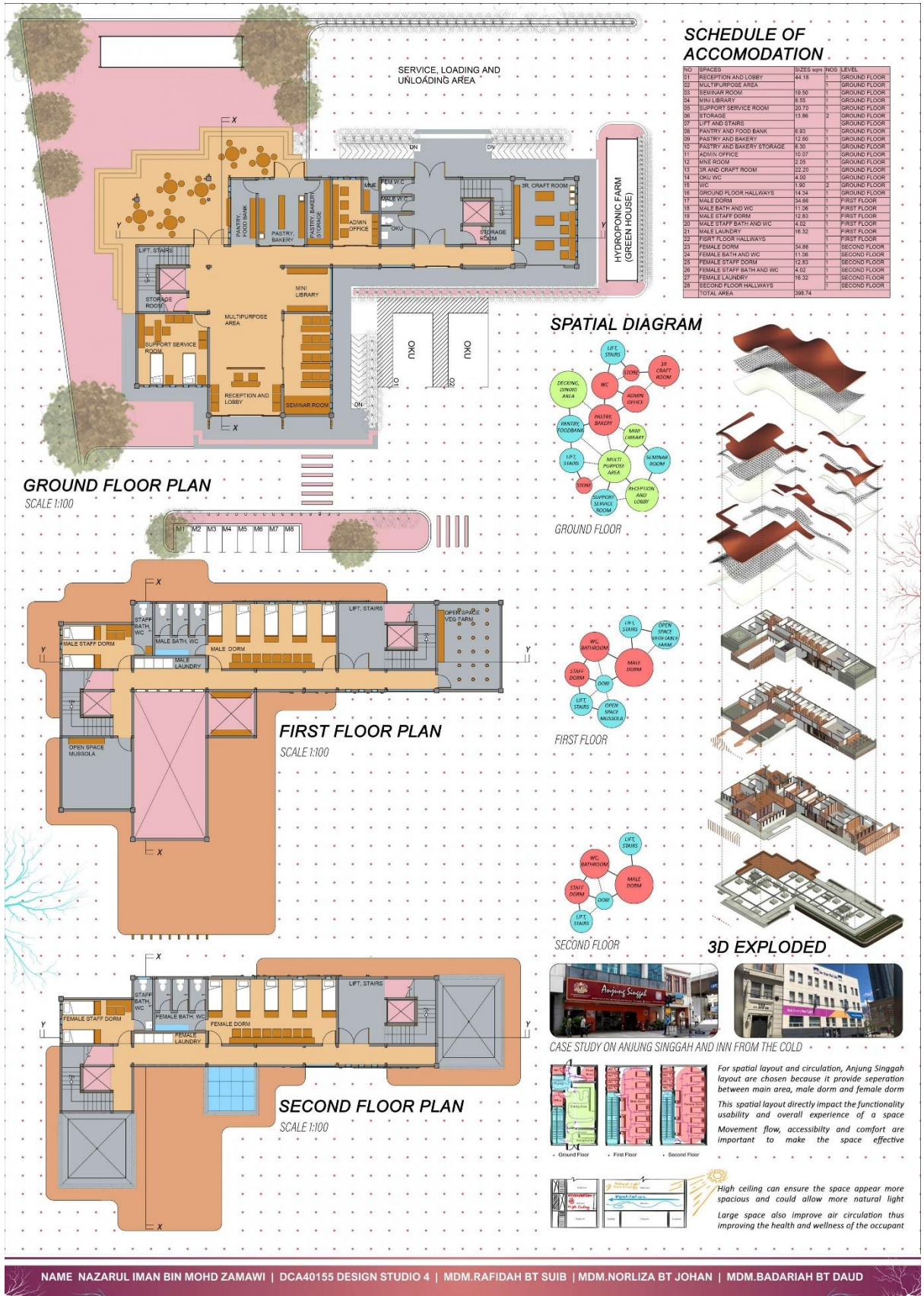
Social skill, Craft and Recycling, Farming, Pastry and Bakery



- 1 NO POVERTY
- 2 ZERO HUNGER
- 3 GOOD HEALTH AND WELL-BEING
- 4 QUALITY EDUCATION
- 5 DECENT WORK AND ECONOMIC GROWTH
- 6 CLEAN WATER AND AFFORDABLE ENERGY
- 7 AFFORDABLE HOUSING AND COMMUNITIES
- 8 CLIMATE ACTION
- 9 LIFE UNDER THE SEA
- 10 LAND, OCEANS AND ECOSYSTEMS
- 11 SUSTAINABLE CITIES AND COMMUNITIES



NAME NAZARUL IMAN BIN MOHD ZAMAWI | DCA40155 DESIGN STUDIO 4 | MDM.RAFIDAH BT SUIB





DETAIL SECTION 1
 SCALE 1:25
 300MM x 50MM FACIA BOARD
 20MM ASBESTOS CEILING
 SPACEFRAME STRUCTURE
 30MM COPPER ROOF
 50MM GREEN WALL
 2200MM x 900MM TIMBER DOOR WITH MANUF'S DETAIL
 300MM x 150MM CONCRETE BEAM
 200MM x 150MM CONCRETE FLOOR BASE
 110MM THK BRICKWALL WITH 20MM PLASTER ON BOTH SIDE

DETAIL SECTION 2
 SCALE 1:25
 10MM TIMBER FLOOR FINISHED
 50MM GREEN WALL FRAME HOLDER
 400MM x 400MM TIMBER CASEMENT WINDOW TO MANUF'S DETAIL
 1300MM x 400MM TIMBER CASEMENT WINDOW TO MANUF'S DETAIL
 150MM x 150MM CONCRETE COLUMN
 1200MM x 1200MM x 400MM CONCRETE FOOTING

TYPICAL SECTION
 SCALE 1:50

SECTION X - X
 SCALE 1:100

SECTION Y - Y
 SCALE 1:100

Laundry Area and Hallway
 Dorm
 Pastry and Bakery
 Administration Office
 3R and Workshop Room

Multiple and big opening allowing more natural sunlight thus reducing the electric bill

Opening on both side of the wall allowing cross ventilation

High ceiling giving more space for cold air and allowing more hot air dissipate

Multilayer roof with overhang creating more shade thus reduce indoor temperature

Rainwater harvesting for agriculture use and reduce water bill

NAME NAZARUL IMAN BIN MOHD ZAMAWI | DCA40155 DESIGN STUDIO 4 | MDM.RAFIDAH BT SUIB | MDM.NORLIZA BT JOHAN | MDM.BADARIAH BT DAUD

GENESIS HOMELESS SHELTER AND TRAINING CENTER IN PORT DICKSON WATERFRONT

**Muhammad Harith Zaqwan bin Shaharudin¹,
 Mariam Diyana binti Mohd Taha¹**

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This project, entitled “GENESIS”, focuses on the design and development of a three-storey homeless shelter and training center located at the Port Dickson waterfront. The aim is to provide a secure, supportive, and empowering environment for the homeless population, offering temporary accommodation, skill-based training, and sustainable food production through urban agriculture. The project addresses the lack of integrated shelters that offer long-term support and rehabilitation for the homeless community. A combination of site analysis, user requirement studies, and architectural design principles were employed. Autodesk Revit and Lumion were used for building modeling and visualization. The design includes dormitory spaces, a training center, an agricultural room, and communal areas that promote social interaction and self-development. The integration of passive design strategies such as natural ventilation and daylighting reduces energy consumption, while rooftop farming enhances food security and sustainability. The results demonstrate that a well-planned, multifunctional shelter can contribute significantly to social reintegration and personal transformation of homeless individuals. It is recommended that future development of such facilities involve collaboration with government agencies and NGOs to ensure practicality, funding, and long-term impact.

Keyword: Homeless Shelter, Urban Farming, Sustainable Design, Social Rehabilitation, Training Center



INTRODUCTION

Genesis is more than just a shelter—it is a place of growth and renewal. We provide vocational training, personal development, and sustainable agriculture to help the homeless regain independence and stability. It was located at Medan Selera, Kampung Bahasa Kapor, **PORT DICKSON**, Negeri Sembilan.

AIM

To reduce the homelessness rate in Port Dickson and encourage the homeless to continue living without feeling **WORTHLESS**

OBJECTIVE

Building a transit center that aligns with homeless lifestyle and providing some trainings to help them to continue life more comfortably and secure a better **FUTURE**.



DESIGN CONCEPT

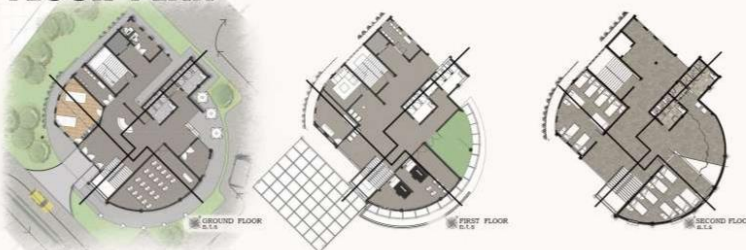
EPIPHYTE- Plant that grows on another plant for physical support but does not take nutrients from it, unlike parasites.



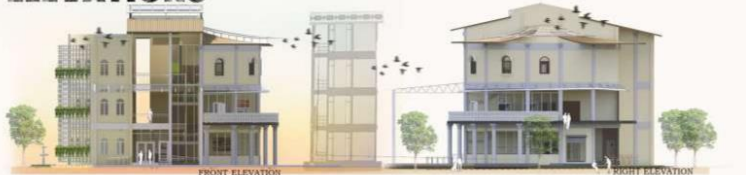
KEY AND LOC PLAN



FLOOR PLAN



ELEVATIONS



SECTIONS



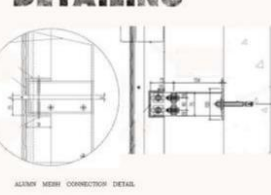
SUSTAINABLE



SPACE EXPLORED



DETAILING



GENESIS

NEW DAWN, NEW JOURNEY, NEW YOU
 STUDENT : MUHAMMAD HARITH ZAQWAN BIN SHAHARUDIN
 SUPERVISOR : PN MARIAM DIVANA BT MOHD TAHA



SITE PLAN



RUMAH WARISAN LATIFAH

Fahanim Abdul Rashid¹, Nur Athirah Ibrahim¹, Muhammad Fazrick Ashraf Mohd Faisal¹, Fadhlihana Hanis Mohd Fadzli¹, Syaizreen Erina Syaiful Anuar¹

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Abstract

Rumah Warisan Latifah is an old traditional Malay house with distinctive features that reflect architectural features deeply rooted in local cultural and social values. Situated in Rembau, Negeri Sembilan, this heritage house offers valuable insights into the region's vernacular architecture and the influence of cultural practices on built forms. This research investigates the architectural design, environmental and cultural significance of *Rumah Warisan Latifah* through a combination of site visits, detailed building measurements, interviews with the homeowner and local community, and review of relevant literature. The study found that this old traditional timber house possesses architectural elements that help it resist the hot and humid climate, including raised floors, high roof, vented side walls, and openings. These features align with society values and beliefs, including social hierarchy, privacy, and environmental sustainability. The research emphasizes cultural, historical, and social value of *Rumah Warisan Latifah*, which has been preserved and passed down for many years. The house embodies the Adat Papatih of Negeri Sembilan's customs, beliefs, and artistic expressions, creating a distinct sense of communal identity. It emphasizes the importance of preserving architectural history, cultural heritage and promoting traditional house as a part of Malaysian identity.

Keyword: Rumah Warisan Latifah, Rembau, Traditional Malay House, Measured Drawing



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RUMAH WARISAN PUAN LATIFAH

Rumah Warisan Latifah merupakan rumah kayu lama tradisional yang telah diwarisi oleh Puan Latifah Binti Omar. Rumah Melayu Tradisional ini telah berusia 113 tahun, terletak di Kampung Gadong, Rembau, Negeri Sembilan. Pemilik rumah warisan ini berasal dari suku biduanda. Rumah ini dibina dan dipengaruhi elemen rekabentuk rumah tradisional Negeri Sembilan, iaitu berbumbung sedikit melintik, beranjung dan mempunyai ruang serambi. Rekabentuk rumah warisan ini mempunyai lebar layar yang terdapat di bahagian bumbung ruang serambi dan juga bahagian loteng. Rumah ini mempunyai 18 tiang kayu dan dibina menggunakan kayu cengal agar kukuh dan tahan lama.

AHLI KUMPULAN

Muhammad Fazrick Ashaf Ts. Fahanim (SV)
 Fadhiyana Hanis Pn. Nur Athirah (SV)
 Syaizreen Erina (Politeknik Port Dickson)



GAYA SENI BINA

Dalam seni bina, gaya adalah ciri-ciri yang membezakan sesebuah bangunan yang mempunyai elemen rekabentuk atau binaan dari segi keutamaan serta sejarah. Gaya seni bina boleh merangkumi pelbagai unsur seperti bentuk, kaedah pembinaan, bahan binaan, dan juga ciri-ciri unik seperti kedaerahan. Kebanyakan gaya seni bina boleh diklasifikasikan berdasarkan kronologi, yang menggambarkan perubahan unsur, kepercayaan dan keagamaan, kemunculan idea-idea baharu, serta teknologi atau bahan binaan yang baru. Contohnya, beberapa gaya seni bina yang dulu menggunakan kaedah pasak & langgam tetapi kini menggunakan paku.



PELAN KUNCI
 SKALA : NTS



PELAN LOKASI
 SKALA : NTS



RUMAH WARISAN INDUK SALBIAH

Fahanim Abdul Rashid, Nur Athirah Ibrahim¹, Farah Anisah Kamarul Ariffin¹, Nurul Ain Syahirah Ahmad Nazri¹, Nurlaili Sabrina Mohstapah¹

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Abstract

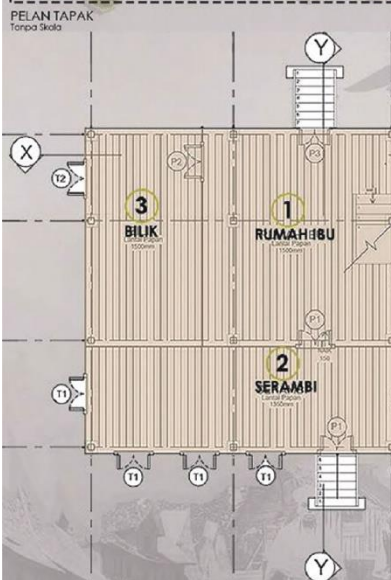
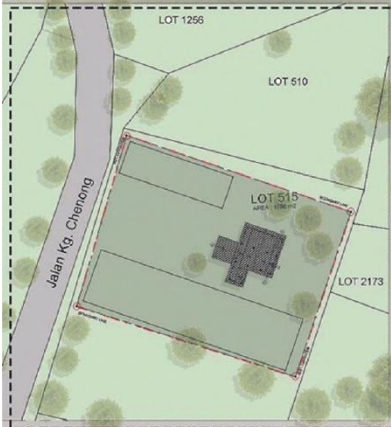
In the context of vernacular architecture, the traditional Malay house represents a vital element of Malay cultural identity and heritage. *Rumah Warisan Induk Salbiah* located in Rembau, Negeri Sembilan, is a heritage house due to its architectural and cultural significance. This research aims to document and preserve the uniqueness of this traditional timber house by examining its design principles, spatial organization, cultural symbolism, and timber construction techniques. The study involved site surveys, detailed building measurements, and interviews with the house owner and the local community. The findings reveal that *Rumah Warisan Induk Salbiah* is not only a mere dwelling but also a living cultural narrative that embodies the Adat Perpatih, the custom practiced in Negeri Sembilan. The spatial hierarchy, functional zoning, and ornamental details of the house reflect deep-rooted social structures and traditional values. Furthermore, the timber construction techniques, which utilize traditional joinery without the use of nails, showcase a high level of indigenous craftsmanship and sustainable building practices. The documentation of *Rumah Warisan Induk Salbiah* contributes to ongoing heritage conservation efforts and provides a valuable reference for future research in vernacular architecture and cultural studies.

Keyword: Rumah Warisan Induk Salbiah, Rembau, Traditional Malay House, Measured Drawing



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RUMAH INDUK SALBIAH



SEJARAH ASAL USUL

Negeri Sembilan merupakan antara segelintir negeri yang keturunannya dan zuriatnya mempunyai suku kaum yang diversi daripada nenek moyang mereka. Kami ditugaskan untuk menyiasati Rumah Induk Salbiah, Waris Dato' Gempu Maharaja, Negeri Sembilan, untuk kajian ini. Lokasi pilihan kami adalah di Rembau, Kampung Penajah Negeri Sembilan. Sekitar tahun 1800, rumah ini telah dibina. Rumah ini telah dibina lebih 150 tahun yang lalu oleh tukang tempatan dengan hanya 100% kepakaran lenaga. Kayu premium seperti seraya dan kumis digunakan untuk membina keseluruhan rumah.

GAYA DAN PENGARUH SENI BINA

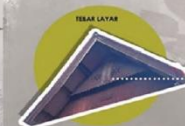
Rupa bentuk seni bina adalah manifestasi pengaruh sejarah, budaya, cara kehidupan seharian, kepercayaan, adat dan alam sekitar atau keadaan sesuatu tempat. Di Negeri Sembilan misalnya, adat dan budaya di negeri itu didominasi oleh pengaruh Minangkabau lalu membentuk hubungan yang berkekalkan dan ia terlihat jelas dalam reka bentuk dan seni bina yang unik. Perubahan budaya dan pengaruh luar dari masyarakat Minangkabau sedikit sebanyak mempengaruhi reka bentuk seni bina di Negeri Sembilan. Selain itu, keadaan tanah atau setempat serta sebab alam tulul memainkan peranan penting dalam membentuk tipologi rumah di Negeri Sembilan selain daripada pengaruh kedudukan sosial dan adat istiadat. Hal ini menjelaskan perbezaan rumah warisan negeri Sembilan dengan negeri-negeri lain. Selain daripada struktur yang kekal dari satu negeri ke negeri yang lain, setiap negeri mempunyai keistimewaan dan ciri tersendiri. Nilai estetika bangunan, yang sering ditekankan melalui reka bentuk dan ukiran, mewakili keperibadiannya.



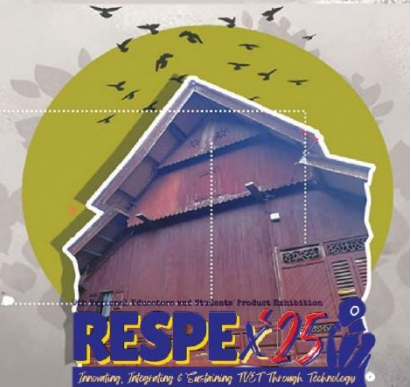
- Dibina tanpa menggunakan paku tetapi hanya menggunakan pasak dan langgam kepakaran Minangkabau bertukangan melayu dahulu kala



Corak yang berada di atas tingkap ini mempunyai maksud yang berbeza-cabang membezakan seperti rumah yang mana.



Mempunyai kegunaan sebagai perantara bagi kayu yang dipotong bagi membolehkan aliran udara mengalir dengan sempurna dan bumbung tidak.



NURUL AIN SYAHIRAH AHMAD NAZRI, FARAH ANISAH KAMARUL ARIFFIN, NURLAILI SABRINA MOHSTAPAH, PN. FAHANIM ABDUL RASHID, PN. NUR ATHIRAH IBRAHIM (POLITEKNIK PD)

IMPIAN EMAS-STOREY HOMELESS SHELTER AND TRAINING CENTER IN PORT DICKSON WATERFRONT

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Abstract

The “IMPIAN EMAS” is an innovative initiative aimed at addressing homelessness by providing homeless individuals with essential vocational skills to enhance their employability and foster social reintegration. The program offers hands-on workshops in tailoring and farming, providing participants with marketable skills that promote self-sufficiency and economic independence. By focusing on both practical skills and personal development, the center equips participants with the tools necessary for stable employment and improved well-being. The tailoring workshop teaches garment-making techniques, while the farming workshop emphasizes sustainable agricultural practices, thus fostering both environmental awareness and self-sufficiency. Beyond skill development, the program also includes personal grooming and hygiene workshops, helping individuals build confidence and self-esteem. The report explores the background of the project, its objectives, implementation methods, and the challenges faced during its execution. It also highlights the significant impact the initiative has had on both the participants and the broader community, contributing to reducing homelessness and improving the local economy. The innovation demonstrates the value of empowering individuals with the skills they need to succeed, offering a sustainable model for addressing homelessness and creating long-term positive change.

Keywords: Homelessness, short-term training, empowerment, community support, urban intervention



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IMPIAN EMAS HOMELESS TRAINING CENTRE

A Place to Heal, A Place to Begin Again.

INTRODUCTION

The Impian Emas Homeless Training Centre is designed as a safe, welcoming space for individuals seeking a fresh start. The building features dedicated areas for training, workshops, living facilities, and community activities, creating an environment that supports learning, growth, and healing. Every part of the centre is thoughtfully built to promote dignity, comfort, and empowerment for all who enter.



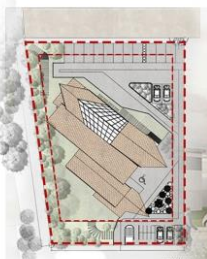
AIM

The Impian Emas Homeless Training Centre aims to empower individuals experiencing homelessness by providing skills, resources, and support to help them achieve independence and stability.

OBJECTIVE

- Offer practical workshops in tailoring and farming.
- Provide access to resources that foster self-reliance.
- Support participants in securing sustainable employment and housing.
- Create a safe, supportive environment for personal growth and community connection.

PLANNING & STRATEGIES



ELEVATION



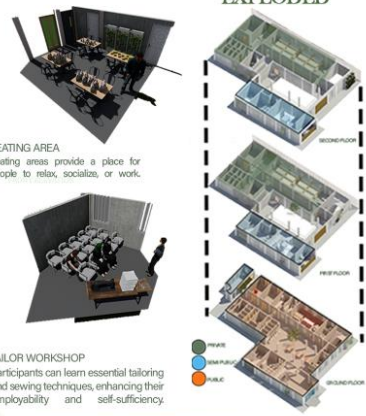
DESIGN CONCEPT

Traditional Style with a Modern Twist

The Impian Emas Homeless Training Centre is designed as a true haven more than just a place to stay. It offers dignity, safety, and hope. Inspired by Adat Perpatih, a cultural tradition that values community support and shared responsibility, the centre reflects the belief that everyone deserves care and a second chance.

The umbrella form symbolizes protection, while elements of traditional communal houses represent unity and belonging. Together, these features create a warm, supportive space where individuals can heal, grow, and start again surrounded by a community that stands with them.

EXPLODED



SEATING AREA
 Seating areas provide a place for people to relax, socialize, or work.

TAILOR WORKSHOP
 Participants can learn essential tailoring and sewing techniques, enhancing their employability and self-sufficiency.



SECTION



SUSTAINABLE



STUDENT : ANIEA RAISHA BINTI MOHAMMAD IKHWAN
 SUPERVISOR : PN NORNAWAR LAILI BINTI NORDIN



MEASURED DRAWING OF RUMAH WARISAN PUAN JALILAH

Nur Athirah binti Ibrahim¹, Fahanim binti Abd Rashid¹, Muhammad Nasir bin Munshi Abdullah¹, Zaleha binti Zainuddin¹, Nur Syafiqah Hanim binti Abdul Rahim¹

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Abstract

This research focuses on an old traditional timber house, in Jelevu, Negeri Sembilan, known as the Rumah Warisan Puan Jalilah, which is estimated to be 84 years old. The research was conducted as part of a measured drawing study. This research aims to document and analyse the architectural, cultural, and historical significance of this traditional Malay house. Various data collection methods were employed, including on-site measurements, interviews with building owner and comprehensive site surveys. The study explores key architectural aspects such as spatial organization, structural building systems, building materials, and traditional timber construction techniques. Special attention is given to the influences of local cultural heritage on architectural elements, including ornamentation, roof design, and spatial hierarchy rooted in the Adat Perpatih tradition unique to Negeri Sembilan. The house's construction primarily features timber as a sustainable and culturally symbolic material, reflecting indigenous craftsmanship and knowledge passed down through generations. Beyond architectural documentation, this research serves a broader cultural purpose by contributing to the preservation of traditional Malay timber houses, which are rapidly declining due to urbanization and neglect. The findings highlight the importance of preserving architectural heritage not only for public awareness but also cultural continuity. By documenting and analyzing the Rumah Warisan Puan Jalilah, this study advocates greater appreciation, conservation efforts, and educational initiatives related to traditional Negeri Sembilan architecture. Through this research, the intrinsic value of traditional houses in Negeri Sembilan is emphasized not only as physical structures but as living representations of identity, history, and community heritage. This study aims to inspire renewed interest in heritage conservation and to promote sustainable preservation practices within the local and wider context.

Keyword: Architectural Heritage, Traditional House, Measured Drawing, Preservation



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

Ahli Kumpulan :
 Muhammad Nasir Bin Munshi Abdullah (K)
 Zaleha Binti Zainuddin
 Nur Syafiqah Hanim Binti Abdul Rahim
 Nur Athirah Binti Ibrahim (SV)
 Fahanim Binti Abd Rashid (SV)

Rumah Warisan Puan Jalillah

Rumah Warisan Puan Jalillah telah dibina sekitar tahun 1920. Ia terletak di Lot 493, Jalan Ulu Jelebu, Kampung Sarin Mukim, Kuala Klawang, Jelebu. Keunikan rumah ini dapat dilihat pada bentuk bumbung yang sedikit melentik di hujung serta ukirannya yang bermotifkan flora pada dinding, tiang, papan cantik dan kepala pintu

Ruang di dalam rumah ini juga terbahagi kepada beberapa bahagian utama seperti ruang serambi tengah, serambi pangkal, serambi hujung, rumah ibu, kelek anak, dan dapur. Namun, terdapat beberapa ruang tambahan yang ditambah mengikut keperluan penghuni dari semasa ke semasa.

Objektif Kajian Lukisan terukur

Untuk memelihara warisan rumah tradisional dengan melakukan kajian terukur serta menyimpan segala maklumat dokumentasi bagi rujukan pelajaran serta komersil

Pelan Lantai NTS



Isu / Masalah

Signifikan Kajian

Kekurangan sumber dokumentasi dan rekod yang menjejaskan usaha oemiliharaan kerana tiada panduan yang jelas.



Kehilangan identiti dan penghargaan dimana elemen-elemen pembangunan kini lebih dinayati berbanding rumah tradisional

Ketidakpedulian terhadap warisan budaya melayu oleh generasi kini yang mudah terpengaruh dengan budaya seni luar seiring peredaran zaman

Isometrik Terpecah

Menggunakan perisian Sketchup bagi membangun model 3d

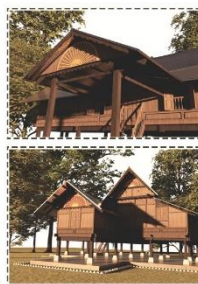


Metodologi Kajian

Terdapat beberapa kaedah yang digunakan :

- i) Kerja Lapangan
Kaedah kumpul data yang dijalankan secara "in-situ" (Interaksi bersemuka/ temu bual)
- ii) Lakaran
Lakar ukuran setiap komponen rumah seperti struktur lantai, tiang bumbung & lain - lain.
- iii) Merekod data
Dalam bentuk lukisan teknikal, video serta dokumentasi dan dijadikan buku serta model nyata

Perspektif Model 3 Dimensi



Bahan dan Ukiran / Motif

Bahan Binaan yang digunakan:

- i) Kayu Cengal - dinding & tingkap
- ii) Kayu Penak - Struktur utama
- iii) Kayu Merbau - papan lantai



Ukiran Motif & Ragam Hias



Kerawang bermotif flora (sebagai lubang angin)

Kekisi Tingkap berfungsi sebagai laluan masuk angin mengekalkan keselesaan tema serta nilai estetika

Tebar Layar Terdin daripada papan cantik dan kiasan matalahan yang menunjukkan arai kiblat



Coffee Table Book



Video Dokumentari



IN AREA WE GROW: INSPIRING THE BEGINNING OF ENGAGE

Muhammad Nasir bin Munshi Abdullah¹, Zaleha binti Zainuddin¹, Nur Syafiqah Hanim binti Abdula Rahim¹, Muhammad Denis Putra bin Shahrullnizam¹, Nur Hidayah binti Rosman¹

¹ Department of Civil Engineering, Politeknik Port Dickson Negeri Sembilan, Malaysia

muhammadnasirbinmunshiabdullah@gmail.com

Abstract

In Area We Grow: Inspiring the Beginning of Engage, the pavilion project that proposed to bring the connection as community in Malaysia that consist different type of people background, connect as one community which is part of sustainable development goal (SDG Point 11). On the other hand, our pavilion also can enhance the culture impact for tourism in Malaysia as well since it connects with one of tourism spot (our proposed site location at Pasar Seni, Kuala Lumpur). Throught out the design process, we found that one of the issues is the site context only focused on man-made development such as building, hospitality and more, but forgot to have a community space to engage and communicate, plus a place for people to release their stress. Talk about the climate problem, we proposed and put to our pavilion some area have a shading area and some not to keep the air circulate well. Move to the approaches and concept, throughout the design process, we think on word “ Plug-in Architecture” means our pavilion using the approaches as it blend well with the site context, which is consist of culture context, which is it connect to our purpose of we proposed the pavilion. Then, our idea comes out to use on of the Malaysia Traditional House, “Tanggam” as our main construction work (using modular architecture-more practical, cost-effective and sustainable approve). Our space program consists of Malaysia’s Traditional games and gardening area to give the immersive experience to the user. We did some research regarding our project, we found that nowadays, there is less space or area that focuses on community development and engages as nowadays only focus on other development like building, hospitality and more, but not for community. They only focus on how we living in that one space but forgot to experience and engage together as community. With our pavilion, they can have all in one, which is to engage, to communicate, to hang out and play at the same time. In conclusion, by proposed this pavilion into nowadays development, we will be the country not only focus on man-made development, but we will create a strong image in community development and keep the sustainability sector for future development. For our recommendation, as long with the future-forward timeline, we do believe that our proposed project can get better approaches and innovations that develop our project into the next level of community project.

Keyword: Community, Pavilion, Sustainability, Culture, Architecture

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

In Area We Grow : Inspiring The Beginning of Engage
Pavillion Project
 Communicate • Gather • Engage

Group Members: Nur Hidayah Binti Rosman (SV), Nur Syaifiqah Hanim Binti Abd Rahim (K), Muhammad Nasir Bin Munshi Abdullah, Zaleha Binti Zainuddin, Muhammad Denis Putra bin Shahrullizam

As our Pavillion name, we created a spaces to bring the connection among various background of people in one spaces. Bring the old culture and touch into our pavillion since the proposed site was located at Central Market, Kuala Lumpur. We want our pavillion connect to the surrounding site as well. With our aim, to proposed a pavillion not only focus on engagement, but also to overcome stress problem such as work-related stress and also to promoting Malaysian Culture by having this traditional touch pavillion

+ Target Marketing
 User Study



+ Urban Community

Many young people like teen, adult, or even children passing the area frequently for the attraction there.



+ Pedestrian & Tourist

The area attract pedestrian and tourist since its near the tourism attraction and working space

+ Issue & Intention



As future timeline toward innovation, lead to have all the innovation stuff such as Smartphone that lead us to focus on individual instead of focus on how to communicate and engage each other.

Other than that, since the site surround mostly of the office building, the workers might be have work-related stres and dont have space to release



+ Technical Part



+ Section x-x NTS



+ Front Elevation NTS



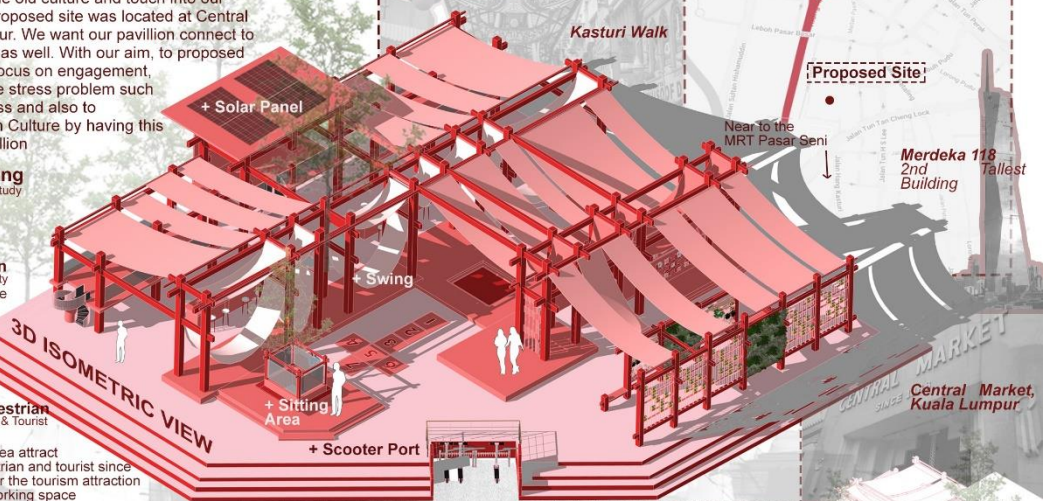
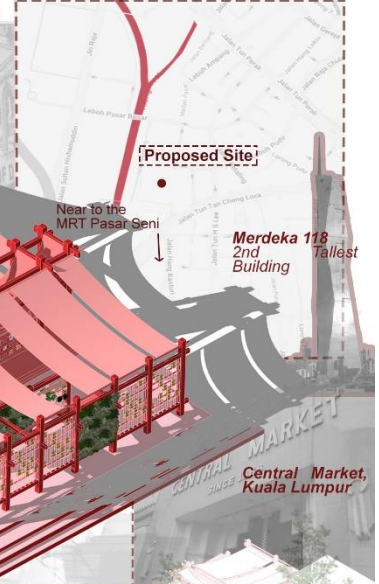
+ Gardening Area



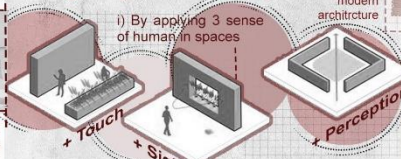
+ Site Abstract

Proposed site located at Pasar Seni, Kuala Lumpur. Formerly known as Pasar besar, which sold all wet goods. Now as one of the main attraction in Kuala Lumpur (domestic and internationally).

+ Location Plan Nts



+ Design Objective & Concept



- i) By applying 3 sense of human in spaces
- ii) Applying various activities to promote engage activities and culture
- iii) Spread Awareness how important is engagement by doing the activities in the pavilion

+ Innovation Highlight

- Having solar panel to generate the power for night light and fan
- E-Scooter Charging Port for Sustainable

By having a typology of Malay's Traditional House Ventilation

+ Activities

- + Hangout Area**
Hangout or chill area is part of the space in the pavillion to have a chit-chat together
- + Playing Area**
Batu Seremban Teng-teng Trendy Activity



Engage by doing the planting seeding together as people with different background see the progress of the plant growing time by the Gardening Area

+ Commercial Value

- Can be an exhibition area for any exhibition purpose.
- Consist E-scooter charging port to generate income
- Activities spaces like Teng-teng, Batu seremban and more

ARCHI-KIT: AN INNOVATIVE 3D AND AR-BASED LEARNING TOOL FOR TIMBER CONSTRUCTION EDUCATION

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Abstract

This study evaluates the effectiveness of ARCHI-KIT, an innovative digital learning tool that integrates 3D modelling and augmented reality (AR) to enhance timber construction education in Technical and Vocational Education and Training (TVET). The research aims to determine how immersive technologies influence students' understanding, engagement, and skills acquisition in learning environments. A mixed-methods approach was employed, involving a cohort of TVET students who used ARCHI-KIT during the timber construction topic in the DA30123 Working Drawing 2 syllabus. Quantitative data were collected using the User Experience Questionnaire (UEQ), while qualitative insights were obtained through open-ended surveys and classroom observations. Findings indicate that students consistently rated ARCHI-KIT highly in terms of attractiveness, efficiency, and stimulation on the UEQ scale. Observational data further revealed increased student motivation, improved conceptual understanding, and greater independence during practical learning sessions. Students reported that the 3D models helped them visualize construction steps more clearly, while the AR features enhanced their interaction with virtual components in real-world settings. These improvements were particularly noticeable among students with limited prior exposure to timber construction. In conclusion, the study supports ARCHI-KIT's potential as an effective educational innovation that promotes active learning, conceptual clarity, and hands-on competence in vocational training. The integration of 3D and AR technologies was shown to enhance not only user experience but also practical learning outcomes. These findings contribute to the growing evidence base supporting immersive technologies in TVET and suggest that tools like ARCHI-KIT can be scaled and adapted for wider implementation in the field of technical and vocational education.

Keywords: Timber Construction, Technical and Vocational Education and Training (TVET), 3D Modelling, Augmented Reality (AR), Digital Learning Tools, Immersive Learning

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

ARCHI-KIT

**REVOLUTIONIZING
 TIMBER CONSTRUCTION
 EDUCATION WITH AR &
 3D LEARNING TOOLS**

**FROM TIMBER TO TECHNOLOGY:
 EMPOWERING TVET THROUGH IMMERSIVE**

INTRODUCTION

In traditional TVET programs, timber construction is often taught using static 2D diagrams and lecture-based instruction, offering limited opportunities for hands-on engagement or timber joinery understanding. This approach has proven insufficient for developing the practical skills and deep conceptual clarity required in contemporary timber construction practices. There was a clear need for an innovative, interactive solution to enhance student learning, engagement, and motivation. In response to this gap, ARCHI-KIT was developed as a 3D model-based learning tool with integrated Augmented Reality (AR), designed to transform timber construction education by providing immersive, real-world simulations within a learner-centered framework.



RASIONALE

PROBLEM STATEMENT

OUTDATED TEACHING METHODS
 Timber construction is still taught using static 2D diagrams and lectures, offering limited hands-on practice and passive learning experiences.

SKILL & ENGAGEMENT GAP
 Students struggle to grasp complex timber joinery due to the lack of interactive, immersive tools, leading to poor practical skill development and low motivation.

DISCONNECT BETWEEN THEORY & PRACTICE
 Current methods fail to bridge theoretical knowledge with real-world application, leaving a critical gap in effective vocational training for modern construction needs.



SIGNIFICANCE OF THE STUDY

EDUCATIONAL IMPACT
 Transforms TVET with 3D and AR for faster learning and greater engagement.

SKILL DEVELOPMENT
 Builds practical skills with guided simulations for self-paced learning.

PRACTICAL AND FINANCIAL VALUE
 Cost-effective, scalable, replaces physical materials and works offline.

SUSTAINABILITY
 Eco-friendly and versatile, reduces waste and fits various learning spaces.



OBJECTIVE

TRANSFORM TIMBER EDUCATION
 Introduce a modern, tech-driven approach to teaching timber construction in TVET using 3D models and Augmented Reality (AR) tools.

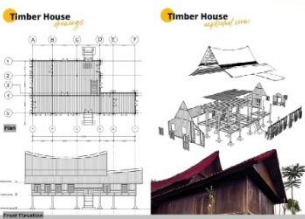
BRIDGE THEORY AND PRACTICE
 Enhance the connection between theoretical knowledge and hands-on application through immersive, real-world simulations.



BOOST ENGAGEMENT AND SKILL DEVELOPMENT
 Improve student visualization, motivation, and practical skills with interactive, learner-centered content and experiences.



BRIDGE THEORY AND PRACTICE
 Enhance the connection between theoretical knowledge and hands-on application through immersive, real-world simulations.



USER MANUAL



Scan the QR code for the user manual

TEAM MEMBERS



NORUL FAZLINA, ZURIKA AMNAH, AHMAD QUSYAIRI

METHODOLOGY

UX EVALUATION
 Mixed Methods Approach: quantitative + qualitative methods = provides richer insights and supports evidence-based improvements (Delgado et al., 2020).

NEEDS ANALYSIS
 Reviewed current TVET timber construction teaching methods and identified gaps in student engagement, understanding, and skill development.

AR DEVELOPMENT
 Created 3D models of timber joinery and integrated them with mobile-friendly Augmented Reality (AR) tools.

PROTOTYPE
 Build a user-friendly ARCHI-KIT prototype optimized for mobile use.

PILOT TESTING
 Tested ARCHI-KIT with TVET students in construction and architecture to compare with traditional learning methods.

DATA COLLECTION
 Used tests, surveys, and interviews to measure learning improvement and student engagement.

IMPROVEMENT
 Refined the tool based on feedback and prepared recommendations for future upgrades and expansion.

TECHNOLOGY PLATFORM
 • 3D modelling software (e.g., SketchUp, Blender, Ultimaker)
 • AR software (Geenee AR)
 • AR devices (smartphones/tablets)

USER TESTIMONIAL

"This kit made timber joinery finally make sense!" -Muhammad
 "I finally understand how timber joints actually work! The AR animation makes it so much clearer than just looking at drawings." -Nuraini
 "This kit really aligns with IR 4.0 in the education system." -Nurul
 "Very good and make learning process more fun." -Hazreeq

INNOVATION HIGHLIGHT

RESULTS & IMPACT

Showing a high level of support for AR-KIT implementation in TVET settings.
76%

92% said AR-KIT was more engaging than traditional classes and helped them stay interested and motivated.

4.1.1 USABILITY (NAVIGATION, EASE OF USE)
 4.1.2 HELPFULNESS OF 3D MODELS
86%
 Students said the 3D models were very helpful for understanding timber construction.

4.1.3 LEARNING ENGAGEMENT
82%
 ARCHI-KIT was more effective than traditional tools for learning and applying timber construction concepts.

4.1.4 LEARNING EFFECTIVENESS
LEARNING COMPARISON
 Before vs After ARCHI-KIT Innovation

INSTRUCTOR TRAINING INTEGRATION
 Custom workshops and training modules for TVET lecturers to ensure effective use of ARCHI-KIT in timber construction courses.

INTERACTIVE EDUCATIONAL TOY
 A physical mini timber set with AR app for hands-on learning—ideal for schools or as a commercial educational toy.

CULTURAL & PUBLIC USE
 Perfect for museums and galleries to digitally showcase and preserve traditional timber techniques with interactive experiences.

FUTURE EXPANSION

• Plan to include other construction methods (e.g., concrete, steel).
 • Potential for integration with VR/AI in the future.
 • Interest from institutions or pilot partnerships.

CONCLUSION

ARCHI-KIT successfully demonstrates the potential of integrating 3D modeling and Augmented Reality (AR) into timber construction education within TVET settings. It addresses key challenges in traditional instruction by improving visualization, enhancing student engagement, and supporting hands-on skill development. The innovation has proven to be an effective, affordable, and scalable tool for modernizing vocational training. Looking ahead, future improvements could include expanding ARCHI-KIT to cover a wider range of construction topics, incorporating multilingual support, and adding assessment features for tracking student progress. Collaboration with industry stakeholders and further user testing will also support continuous refinement and broader adoption across vocational education systems.



KHAZANAH ART AND CULTURE CENTRE

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Abstract

Khazanah is a cultural innovation project aimed at preserving and revitalizing the rich heritage of Negeri Sembilan, a state known for its matrilineal traditions and distinctive vernacular architecture. Prompted by the growing disconnect between younger generations and traditional culture, as well as threats posed by modernization, the project addresses the need for a sustainable, engaging platform for cultural education and expression. The project employs a hybrid design approach, combining architectural modelling, user engagement analysis, and prototyping of interactive exhibits. Key methods include digital simulations of spatial flow, material sustainability analysis, and community co-creation workshops to inform program development. Preliminary results show that Khazanah's immersive and participatory experiences significantly enhance cultural awareness and intergenerational interaction, outperforming conventional static museums in terms of engagement and educational value. The project demonstrates how architecture and interactive design can work symbiotically to preserve intangible heritage. As a result, changes to original plans included expanding the educational hub and incorporating more user-generated content in digital storytelling zones. Future research should explore the long-term social impact of cultural centres like Khazanah on community resilience, and evaluate scalable models for rural or marginalized heritage sites.

Keyword: Cultural Heritage Preservation; Art and Culture; Interactive Design; Community Engagement; Sustainable Design.



MINISTRY OF HIGHER EDUCATION
 DEPARTMENT OF POLYTECHNIC AND COMMUNITY COLLEGE EDUCATION

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 TVET For All



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RESPEX25

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

KHAZANAH ART AND CULTURE CENTRE

OVERVIEW

INTRODUCTION

KHAZANAH Art and Culture Centre, a new landmark nestled in Negeri Sembilan, is itself an eloquent narrative of culture in its very architecture. More than just a vessel housing art and culture, it stands as a modern interpretation and tribute to the unique "Nine Identities" of Negeri Sembilan.

Our design philosophy is deeply rooted in profound understanding of the architecture wisdom of Negeri Sembilan's traditions, particularly the iconic "Rumah Bumbung Panjang" (long roof house) and the essence of other traditional timber structures. We draw inspiration from their adaptation to nature, their emphasis on spatial flow, and their focus on community connection, reimagining these elements through modern architectural language and innovative craftsmanship.

PROGRAMME



The Nine Identities of Negeri Sembilan were also launched including customs (Adat Perpatih), architecture (Rumah Tradisional Bumbung Panjang), traditional food (gulai kuning), flowers (pepper flowers), dances (stomach plate dance), music (cakiemping), fashion (kebaya half pole, baju kurung ibu soko, baju pengrin, baju melayu complete cekak musang) and traditional games (tiger dam and gasing Negeri Sembilan).

DESIGN INTENTION

KHAZANAH's design intends to evoke a strong sense of place rooted in Negeri Sembilan's cultural identity, reinterpreting traditional architectural wisdom through contemporary forms and materials to foster cultural engagement.

AIM

- To protect and promote the cultural identity of Negeri Sembilan, establish a sustainable cultural ecosystem, and foster cultural exchange and appreciation.
- To build the center as a community cultural landmark and promote sustainable architecture, carrying forward traditional wisdom.

OBJECTIVES

- To create a space for exhibition showcasing traditional art forms, such as architecture, textile and craft.
- To design a workshop and a place to performance or learning traditional music dance, song and food.
- To sustainably restore and preserve existing cultural heritage buildings.

ISSUES



Culture Erosion

Younger generations may be losing touch with traditional art forms, practices & the Adat perpatih

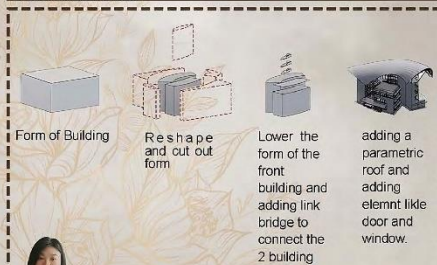
Lack of Exposure

Limited access to art and culture education, especially in countryside areas

Architectural Sustainability

Integrate traditional architectural styles and materials into modern building design while ensuring environmental friendliness and sustainability

IDEA DEVELOPMENT



Form of Building

Reshape and cut out form

Lower the form of the front building and adding link bridge to connect the 2 building

adding a parametric roof and adding element like door and window.

USER



Local Residents of Negeri Sembilan

Tourists (Domestic and International)

Educators and Researchers

Arts and Culture Organisasi



YAP XIN YEE

06DSB22F2028

PUAN NORUL FAZLINA BINTI KHASHIM

DR. SETIAWAN BIN HARDONO



KHAZANAH

ART AND CULTURE CENTRE

Khazanah, meaning "treasure," symbolizes the precious nine cultural identities of Negeri Sembilan. Our design vision is to create a vibrant and culturally rich space that safeguards, inherits, and showcases these unique legacies, inviting the community and visitors to immerse themselves in Negeri Sembilan's cultural allure. Drawing inspiration from the traditional Negeri Sembilan house (Rumah Bumbung Panjang) architecture and matrilineal customs, Khazanah will integrate iconic elements of the traditional Negeri Sembilan house with a modern architectural language. The centre will feature diverse cultural experience spaces, including exhibition areas displaying rich art forms like traditional wood carvings, using interactive exhibits and digital media to vividly introduce the cultural heritage. Simultaneously, Khazanah will house workshops and education centres, fostering the inheritance and learning of traditional arts and crafts, encouraging intergenerational exchange. A performing arts theatre will regularly stage traditional performances, while open cultural plazas and serene gardens will serve as gathering places for community interaction and cultural exchange. In material selection, we will prioritize sustainable and local materials, maximizing natural light and ventilation. The Khazanah Art and Culture Centre aims to be a beacon of Negeri Sembilan's cultural identity, inspiring creativity, promoting cultural exchange, and preserving precious heritage, ensuring the enduring legacy of Negeri Sembilan's unique cultural charm, becoming a living cultural ecosystem.



PRECEDENT STUDY



Pragiedruliai Panevėžys Creativity Center

A historic manor in Panevėžys, Lithuania, has been revitalized as an art residency and creativity center following a meticulous reconstruction. The protected red-brick homestead was carefully renovated, with historical details restored, and a new, modern, spacious extension was built to harmonize with the natural terrain of the surrounding park.

User Behaviour



Diagram

Reconstruction of the old brick building, preserving the historic character of the homestead, and the new extension which takes advantage of the terrain differences between the homestead and the stream.

The curved glass extension easily blends in with the trees and terrain of Skaistakainis Park and does not overshadow the historic farmhouse, through the windows, the landscape of the park blends into the interior spaces of the building.

Green spaces play an important role in relieving stress and anxiety, restoring concentration and enhancing the emotional connection between people and nature.



Malaysia Energy Commission Headquarters (ST Diamond Building)

The Diamond Building is the headquarters of Malaysia's Energy Commission. The building is designed to showcase technologies that reduce building energy and water consumption, promote use of sustainable building materials and provide enhanced indoor environmental quality. Strategies include self-shading facades, daylighting and floor slab radiant cooling.



Shou County Culture & Art Center

The buildings within the city are constructed in the courtyard house typology, which differs from those in northern China and the Huizhou houses in southern Anhui. The typology of the buildings in the old town of Shou County strongly reflects the characteristics of the region's climate, as well as the local culture and way of life.

Conceptual Idea



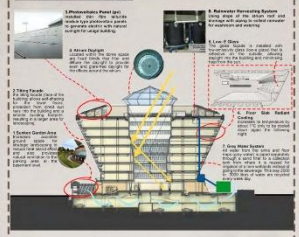
Building Form



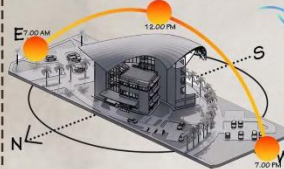
Ventilation



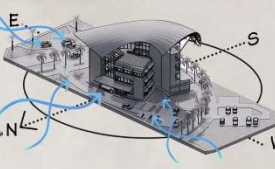
Sustainable Design



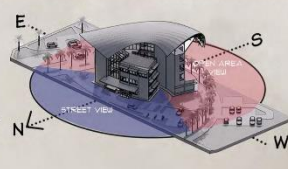
SITE ANALYSIS



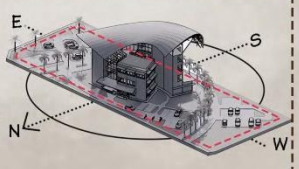
SUN PATH
 The sun path will affect the orientation of building to reduce more heating into the building.



WIND DIRECTION
 The wind direction most is from the North, East and West.



VIEW
 North of the site is street view and the South is open area.



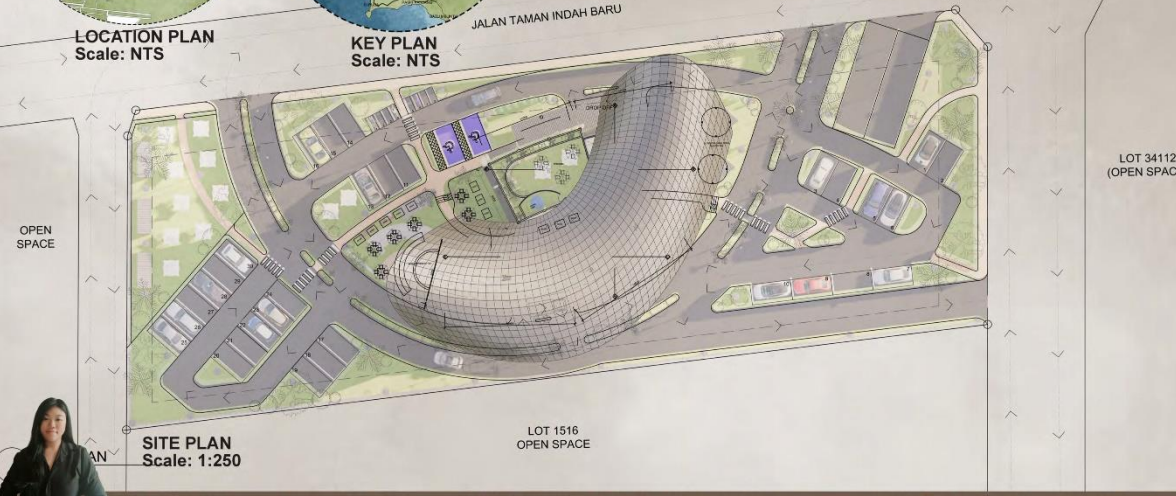
SETBACK
 According to town planning act, 6m from the front & 3 m on each side & back of the land lot.



LOCATION PLAN Scale: NTS



KEY PLAN Scale: NTS



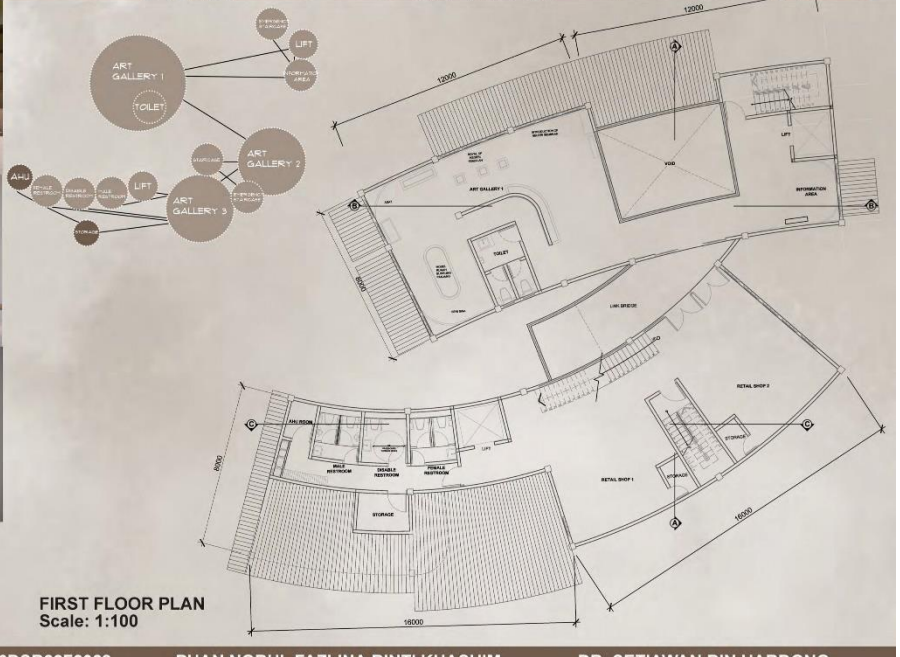
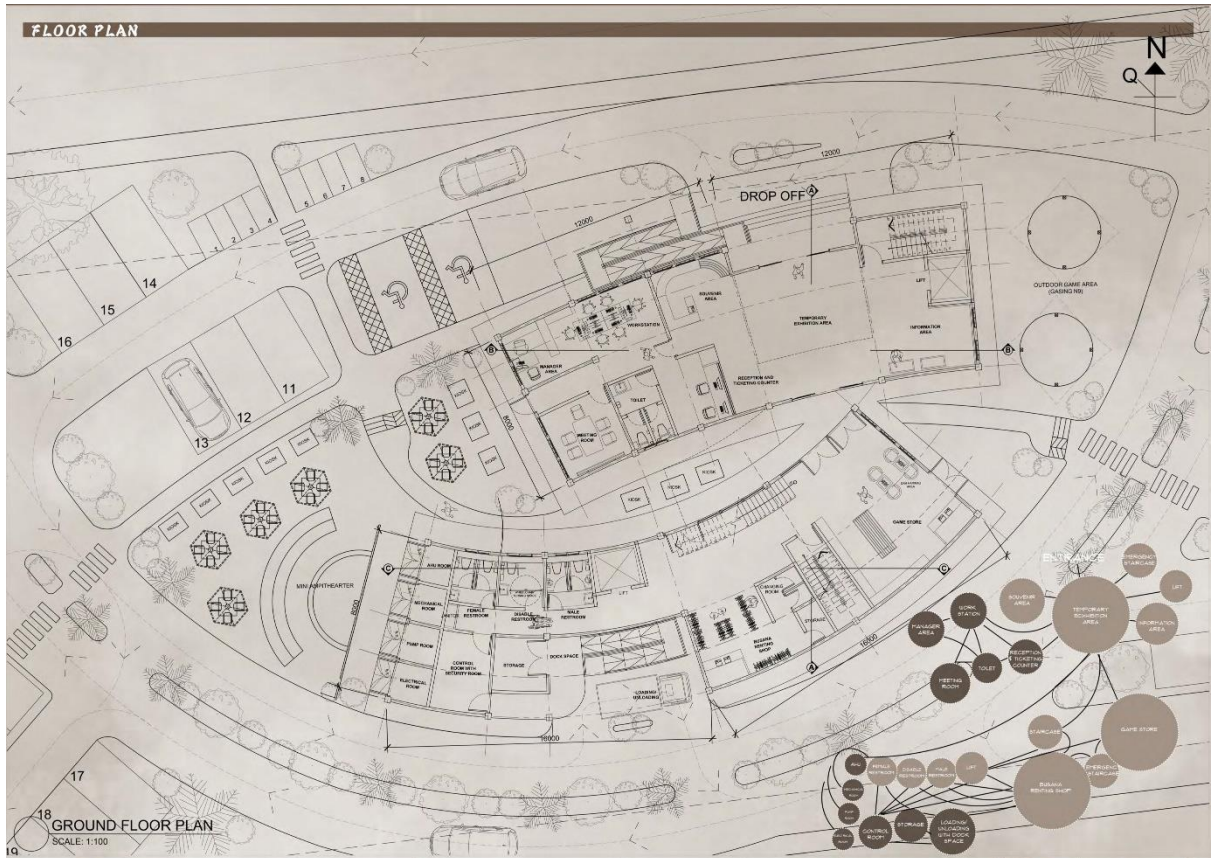
SITE PLAN Scale: 1:250

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ELEVATIONS



SOUTH ELEVATION
Scale: 1:100



NORTH ELEVATION
Scale: 1:100



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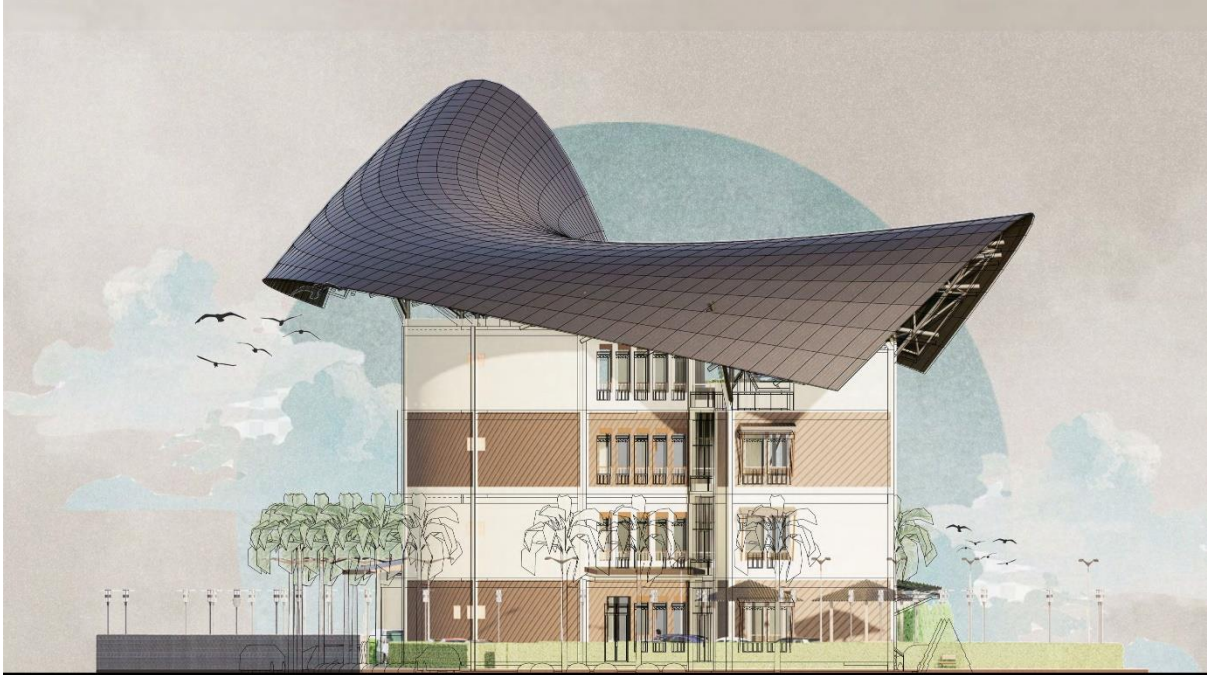
MINI AMPHITHEATER

PUAN NORUL FAZLINA BINTI KHASHIM

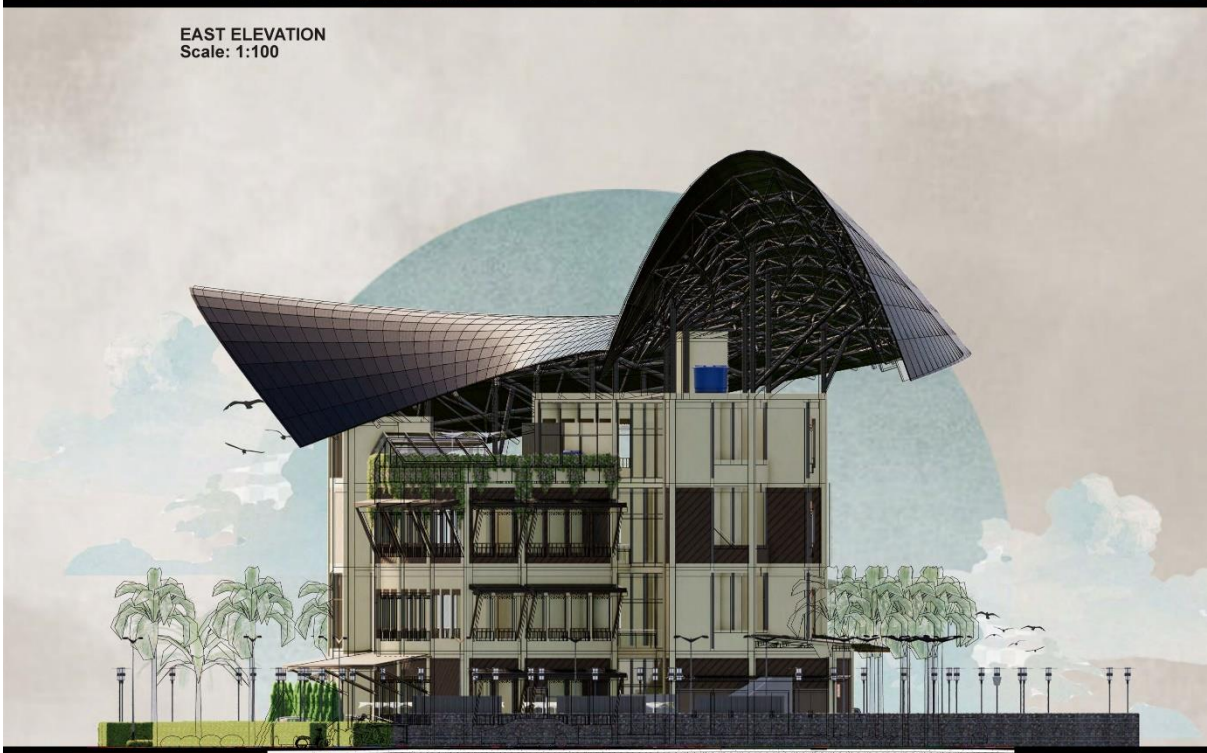
KIOSK

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ELEVATIONS



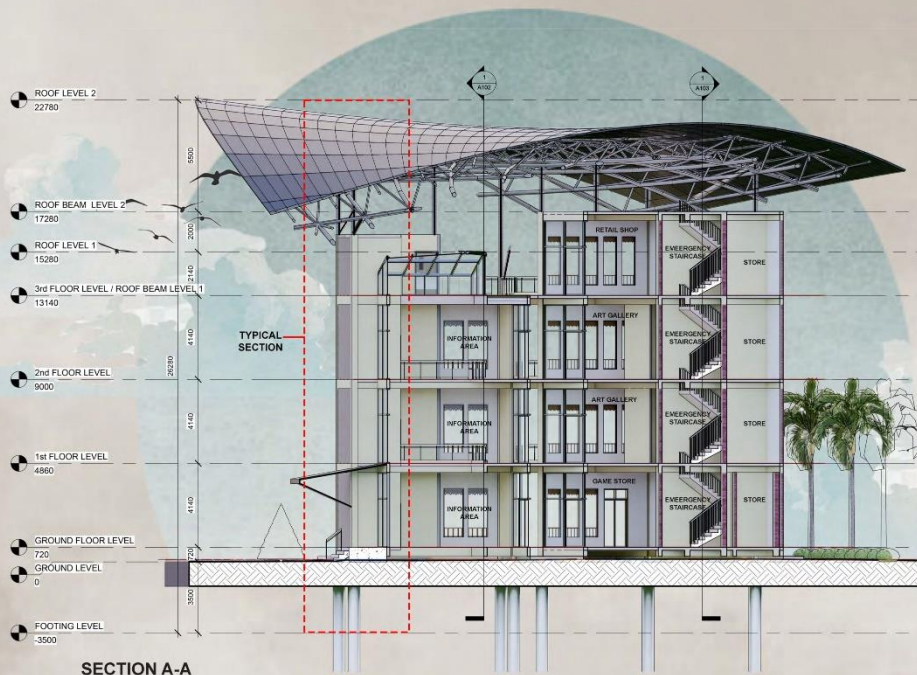
EAST ELEVATION
Scale: 1:100



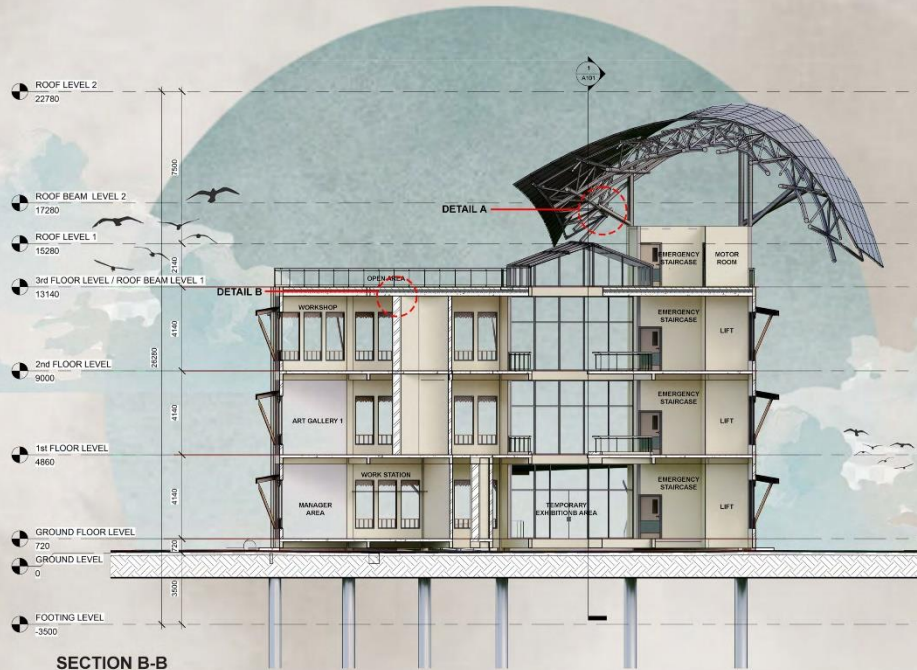
WEST ELEVATION
Scale: 1:100

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SECTIONS



SECTION A-A
 Scale: 1:100



SECTION B-B
 Scale: 1:100

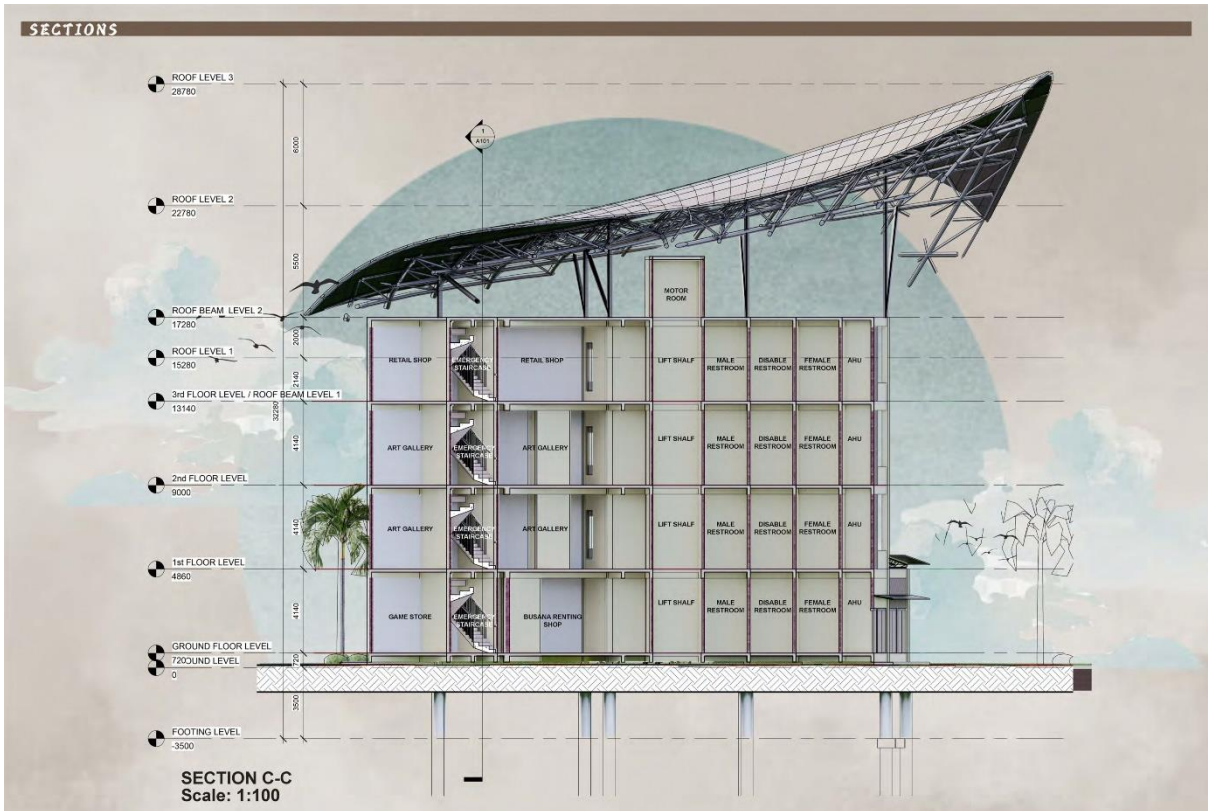


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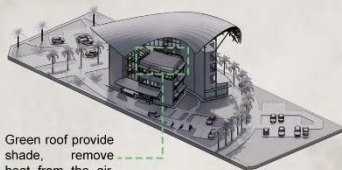
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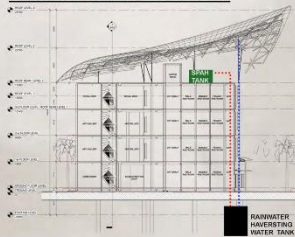
SUSTAINABLE DESIGN

GREEN ROOF



Green roof provide shade, remove heat from the air, and erduce temperatures of the roof surface and surrounding air.

RAINWATER HARVESTING SYSTEM

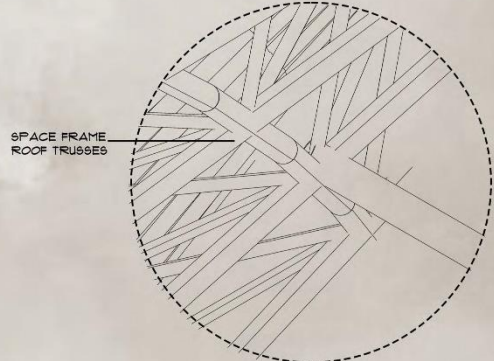


Rainwater Haversting System in volves the collection of rainwater that falls onto the roof, which then would be channelled to water storage tanks before being used. It can use for daily use such as flushing and planting.

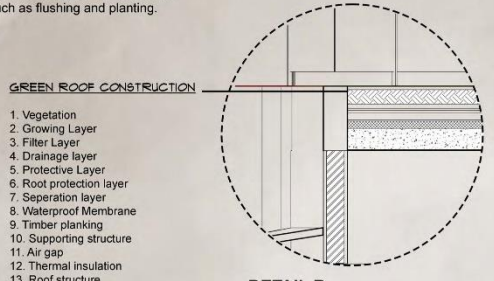
LIGHT SHELF



Light Shelf is using in the office area to allow light to penetrate through the building.

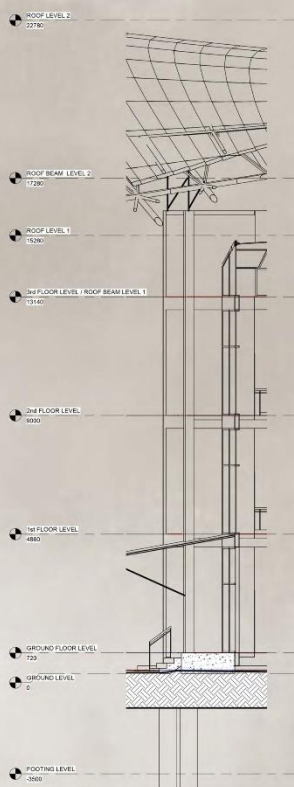


DETAIL A
 Scale: 1:10



DETAIL B
 Scale: 1:10

1. Vegetation
2. Growing Layer
3. Filter Layer
4. Drainage layer
5. Protective Layer
6. Root protection layer
7. Separation layer
8. Waterproof Membrane
9. Timber planking
10. Supporting structure
11. Air gap
12. Thermal insulation
13. Roof structure



YAP XIN YEE

06DSB22F2028

PUAN NORUL FAZLINA BINTI KHASHIM

DR. SETIAWAN BIN HARDONO

POTATO AGRO TOURISUM CENTER

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Abstract

This project aims to design a Kentang Agro-tourism center in Kuala Linggi, Baru Alor Gajah, Melaka. It also meets the needs of the local and international community. Its location is strategic because it is close to residential and industrial areas. It is also famous for its stunning panoramic views and adjacent to the Melaka coast which is a tourist attraction. By focusing on the path from tropical architecture to technological advancement or vice versa, it also aims to convey a message to tourists about nature through technology. Transition is the design strategy used in this project. It addresses the concerns of the specific site and creates a local point that will help in the socio-economic growth of the local and international community. The design strategy used is a combination of nature and technology, namely tropical which gives awareness to tourists to love nature and make technology able to move in line with nature.

Keywords: Agro Tourism Center, Baru Alor Gajah, Tropical Architecture, Technology



POTATO Agro Tourism center

In recent years, agro-tourism has emerged as a powerful and innovative approach to bridge the gap between urban and rural environments. By combining agriculture with tourism, agro-tourism centers offer a unique experience that allows visitors to learn about farming practices, connect with nature, and appreciate rural life. This project aims to establish an Agro-Tourism Center that provides visitors with a firsthand experience of sustainable agriculture, environmental stewardship, and the rural way of life



AKAR MERAH STRAWBERRY AGRO-TOURISM CENTRE

Muhammad Afif Wildan bin Jamaluddin¹, Ts. Siti Amiran binti Mohtaram¹,

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Abstract

The Akar Merah Strawberry Agro-Tourism Centre on Jalan Kuala Sungai Baru in Kuala Linggi, Melaka is to be designed as part of this project. Additionally, it meets the demands of both the local and global communities. Due to its proximity to both residential and commercial districts, the position is strategic. It is renowned for both its close proximity to the Linggi River, a popular tourist destination, and its breathtaking panoramic views. It also seeks to teach visitors about Kuala Linggi using both traditional and modern methods, with an emphasis on the transition from historical to modern architecture, or vice versa. The design approach employed in this project is Circulation. It tackles particular site issues and creates a easier thus straightforward way to move within the site and building. The main spaces are Gallery, Jam-making lab, and Vertical Garden. Organic elements are also used to deliver the materials and certain components that are available there. The building was created with a modern architectural concept, as seen by the building material, design and technique. Additionally, there is a lot of technology used, which enhances the uniqueness of the building.

Keyword: Agro-Tourism Centre, Kuala Linggi, Modern, Organic Strawberry

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

A Strawberry Agro-Tourism Centre

Akar Merah

MUHAMMAD AFIF WILDAN BIN JAMALUDDIN
 SUPERVISOR: TS. PN. SITI AMIRAH BINTI MOHTARAM

DESIGN ABSTRACT

The proposed project is a Agro-Tourism Centre located at the heart of Kuala Linggi, a historic coastal town in Malaysia, known for its cultural blend of Malay, Chinese, and Portuguese influences, reflecting a vibrant multicultural history. Located at the Malacca and Negeri Sembilan border. Today, Kuala Linggi's rich cultural heritage and scenic coastline continue to attract visitors.

Therefore, Akar Merah, a Strawberry Agro-tourism Centre would provide visitors with an immersive experience in agriculture and tourism. The facility could offer educational tours on eco-friendly farming practices, farm-to-table dining, and hands-on picking activities. This unique attraction would boost local tourism, provide income to the community, and promote sustainable farming awareness.

DESIGN AIM & OBJECTIVE

To propose a Modern-Organic Strawberry Agro-Tourism Centre that specializes integration with nature in design and utilizing good circulation.

INTEGRATING NATURE



VEHICULAR CIRCULATION

INTERIOR CIRCULATION

DESIGN ISSUES

Accessibilities, such as insufficient parking spots, ramps or lifts, for users with disabilities.



Problems with emergency exits not being functional, lifts and insufficient fire escape staircase.



Issues with energy efficiency and sustainability that exacerbate the environment.



SPECIAL DETAILS



M16 steel bolt
 Laminated steel
 30mm THK
 Red plated glass
 15mm THK

DETAIL A-A

TECHNICAL DRAWING



FRONT ELEVATION



SECTION X-X

DESIGN STATEMENT

This Agro-Tourism Centre is located in Kuala Linggi with site area 950msq. The centre's design is a combination of sleek and simple modern architecture whilst blending organic elements in terms of material. The centre also offers visitors an immersive experience in strawberry farming, eco-friendly design, and local culture, fostering education and hold exhibition to advocate the importance of agriculture. It consists of workshop, office, gallery and cafe.

THE PRODUCT : STRAWBERRY JAM



CONCEPT OF DESIGN

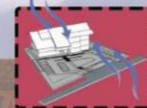


Design concept inspired by strawberries can integrate organic forms, red and green hues, and textures reminiscent of strawberry seeds and leaves. The building can embody the essence of growth, freshness, and vitality through rounded structures, natural materials, creating an immersive

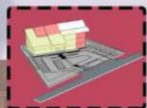
SUSTAINABILITY



SITE ANALYSIS



WIND MOVEMENT
 Wind travels from beach, on the west side creating cool breeze.



PUBLIC & PRIVATE
 Gallery, workshop, cafe are public spaces whilst office and control room are private.



SUN PATH
 Sun moves from east to west increasing heat gain of the proposed site.

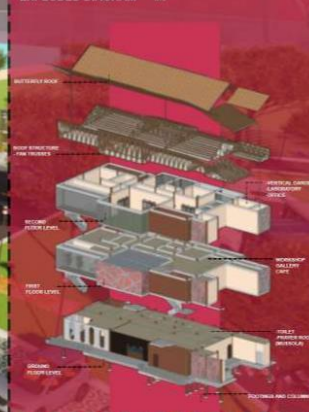


NATURAL VEGETATION
 Tall natural vegetation provides natural shade from sunlight and hot weather.

OUTDOOR EATING AREA



EXPLODED DIAGRAM





ELECTRICAL & ELECTRONICS ENGINEERING & INFORMATION TECHNOLOGY

1. RESPEX25-004
EZ SOCKET
POLITEKNIK PORT DICKSON
2. RESPEX25-009
RESERVE PARKING SYSTEM VIA OCR
POLITEKNIK PORT DICKSON
3. RESPEX25-010
DUAL AXIS SOLAR TRACKER
POLITEKNIK PORT DICKSON
4. RESPEX25-011
WIRE MEASUREMENT MACHINE
POLITEKNIK PORT DICKSON
5. RESPEX25-014
CHILD MONITORING WITH IOT
POLITEKNIK PORT DICKSON
6. RESPEX25-015
I-UIDM MANAGEMENT SYSTEM,
POLYTECHNIC MUADZAM SHAH
POLITEKNIK MUADZAM SHAH,
PAHANG
7. RESPEX25-020
AUTO DIM STREET LIGHT
POLITEKNIK PORT DICKSON
8. RESPEX25-025
LEARN2DRIVE: VIRTUAL DRIVING
EDUCATION USING IMMERSIVE
TECH
POLITEKNIK METRO KUALA
LUMPUR
9. RESPEX25-027
HAZARD ON-SITE
POLITEKNIK METRO KUALA
LUMPUR
10. RESPEX25-036
THE SMART LECTURER
PIGEONHOLE
POLITEKNIK SULTAN HAJI AHMAD
SHAH
11. RESPEX25-038
BACKPACK WATER FILTER
POLITEKNIK PORT DICKSON
12. RESPEX25-039
HAND GESTURE CONTROL
LUGGAGE
POLITEKNIK PORT DICKSON
13. RESPEX25-047
E-ALUMNI
PSMZA SYSTEM
POLITEKNIK SULTAN MIZAN ZAINAL
ABIDIN
14. RESPEX25-052
ASETPOKET
KOLEJ KOMUNITI JELEBU
15. RESPEX25-055
ENERGY HARVESTING SHOE
POLITEKNIK PORT DICKSON
16. RESPEX25-059
FILTER BEFORE SHARING AUTOMATIC HOAX
CONTENT FILTER INNOVATION ON SOCIAL MEDIA
POLITEKNIK NEGERI MEDAN
17. RESPEX25-060
BUZZERS ON SOCIAL MEDIA
POLITEKNIK NEGERI MEDAN
18. RESPEX25-061
OPTIMIZING TIME ACCURACY IN SPORTS USING
SESWAR (SENSOR STOPWATCH RUSH)
KOLEJ KOMUNITI JEMPOL
19. RESPEX25-070
APLIKASI INOVASI EZ TRAINER
POLITEKNIK PORT DICKSON
20. RESPEX25-075
LPG GAS LEAK SENSOR SYSTEM WITH HUMAN
IMAGE DETECTION CAPABILITY BASED ON CLOUD
SERVER AND MICROCONTROLLER
POLITEKNIK NEGERI MEDAN
21. RESPEX25-076
ENERGY MANAGEMENT SYSTEM FOR BATTERY
CHARGING USING SOLAR PANELS AND GRID
ELECTRICITY INTEGRATED WITH THE INTERNET OF
THINGS
POLITEKNIK NEGERI MEDAN
22. RESPEX25-084
MULTI-HEAD AXIS PRO (M-HAP) ENGRAVER
MACHINE
POLITEKNIK MERSING
23. RESPEX25-088
ECARETRACK: ELDERLY CARE TRACKER MOBILE
APPLICATION FOR ENHANCED ALZHEIMER'S
PATIENT MANAGEMENT
POLITEKNIK MERSING
24. RESPEX25-093
DIGITAL TRANSFORMATION OF E-LEARNING
COMMITTEE MANAGEMENT VIA AN INTERACTIVE
PORTAL AT POLITEKNIK MELAKA
POLITEKNIK MELAKA
25. RESPEX25-096
SISTEM PENGURUSAN TEMPAHAN &
PENYELENGGARAAN KENDERAAN POLITEKNIK
METRO BETONG SARAWAK (PMBS)
POLITEKNIK METRO BETONG

EZ SOCKET

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Abstract

The EZ Socket project addresses a critical gap in electrical installation practices by offering a solution tailored for colour-blind individuals and inexperienced technicians—groups often overlooked in conventional wiring tasks that rely heavily on color-coded wires. This dependency on colour not only creates accessibility barriers but also increases the risk of wiring errors, safety hazards, and inefficiencies. EZ Socket introduces a user-friendly alternative featuring clearly labelled terminals, visual indicators, and simplified connection points that reduce reliance on colour perception and make the wiring process more intuitive. Through a wooden display simulating two common socket wiring scenarios, the project demonstrates how EZ Socket enhances accuracy, boosts user confidence, and supports independent work. Among its key strengths are its inclusive design, ease of use, and potential to reduce mistakes during installations. However, limitations include a current focus on only two scenarios, potential size incompatibilities with standard fittings, and the need for basic user familiarization. To further enhance its impact, suggested improvements include expanding the number of demonstrated use cases to cover more complex wiring needs, refining the design for compactness and modularity, and incorporating digital aids such as QR codes linking to multilingual video tutorials. Beyond its technical functionality, EZ Socket contributes meaningfully to the vision of sustainable cities and economies (aligned with UN Sustainable Development Goals 8 and 11) by promoting safety, accessibility, and resource efficiency. By reducing installation errors, it minimizes material waste and rework, leading to more sustainable building practices. Furthermore, it empowers a wider group of individuals—including those with disabilities, to engage in technical work, fostering inclusive employment opportunities and encouraging lifelong learning. In essence, EZ Socket not only improves the safety and efficiency of electrical installations but also champions equity and sustainability in urban development, making it a practical and socially responsible innovation.

Keyword: Inclusive Design, Electrical Safety, Sustainable Development



INSTITUTION NAME: POLITEKNIK PORT DICKSON
PRODUCT ID : 3191
PRODUCT NAME : EZ SOCKET

TEAM MEMBER:
MUHAMMAD AKIF BIN MAZRI
(06DET22F2031)

SUPERVISOR:
AMILIA @ EMIL BINTI HASAN

BACKGROUND:

The EZ Socket project aims to make electrical socket installation easier and safer, especially for people who are colour-blind and those with little experience. Many sockets use color-coded wires, which can be confusing for colour-blind users and hard to understand for beginners. EZ Socket solves this by using clear visual guides and a simple design to help users connect wires correctly. The goal is to reduce mistakes, prevent accidents, and make socket installation more accessible for everyone.

PROBLEM STATEMENT:

- Makes socket installation easier and safer for colour-blind users and beginners.
- Replaces confusing colour-coded wires with clear visual guides and a simple design.
- Helps reduce mistakes, prevent accidents, and improve accessibility for everyone.

OBJECTIVES:

- Design a socket system that doesn't rely on color-coded wires, helping colour-blind users work safely.
- Improve safety and accuracy with clear visual guides and easy connection methods for beginners.
- Promote inclusivity and confidence by supporting learning and real-world electrical tasks.

INNOVATION HIGHLIGHT:

- Uses shapes or symbols instead of colours to guide wire connections for colour-blind users.
- Simplifies wiring to help beginners avoid mistakes and stay safe.
- Adds clear labels and layout cues to ensure correct and safe connections.

DESIGN SOLUTION:

- Replaces color-coded wiring with symbols, shapes, and labels for easier, more inclusive use.
- Has fixed wire positions (live, neutral, earth) to reduce confusion and mistakes.
- Helps colour-blind and beginner users install safely and efficiently, lowering accident risks.

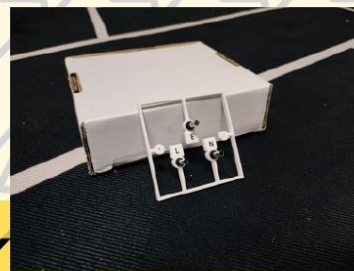
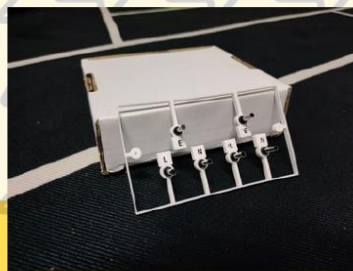
COMMERCIAL VALUES:

- Reduces wiring errors and electrical risks to improve safety.
- Easy to use for beginners and colour-blind users.
- Makes electrical work more accessible, opening up new market opportunities.

CONCLUSION:

The EZ Socket offers a safer, simpler, and more inclusive solution for electrical socket installation. By replacing color-coded wiring with intuitive visual guides and structured layouts, it empowers both colour-blind individuals and beginners to complete installations with confidence and accuracy. With its user-friendly design, the EZ Socket not only reduces the risk of wiring errors and accidents but also promotes greater accessibility in everyday electrical work.

PICTURES:



RESERVE PARKING SYSTEM VIA OCR

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Abstract

In urban environments, parking shortages often result in illegal parking, which disrupts operations and inconveniences authorized users. This system introduces the Reserve Parking System via Optical Character Recognition (OCR), designed to monitor reserved parking spaces and alert authorities of unauthorized vehicles. Illegal parking in spaces designated for VIPs, emergency vehicles, or reserved users leads to logistical issues and sometimes life-threatening consequences, especially in hospitals or fire zones. The main objective of this system is to automate the process of identifying vehicles parked in reserved areas by recognizing their license plates. The system consists of a Raspberry PI connected to a camera that captures vehicle license plates, which are then processed using OCR. If the license plate does not match the pre-approved database, an alarm is triggered, notifying security personnel. An ultrasonic sensor is used to detect vehicle presence, ensuring only parked vehicles are processed. The system results testing indicates an 80% success rate in accurately detecting license plates within a 10 to 60 cm range. The accuracy decreases in lower light conditions or at greater distances, but the system shows promise in controlled environments. Conclusion, this OCR-based parking monitoring system enhances the efficiency of parking management by automating the detection of unauthorized parking. Future improvements include upgrading the camera resolution and refining the system to handle diverse environmental conditions.

Keywords: Optical Character Recognition (OCR), Raspberry PI, Reserve Parking, Illegal Parking Detection, Smart Parking System.



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

RESERVE PARKING SYSTEM VIA OCR: AUTOMATING PARKING SECURITY



Politeknik Port Dickson

Group Members	<ul style="list-style-type: none"> • TS. SITI ZALINA BINTI MOKHTAR (SUPERVISOR) • MUQRI HAZIQ DARWISY BIN MOHAMAD ZAKI (LEADER) • MUHAMMAD ALI IMRAN BIN ZAMRI • MUHAMMAD ISKANDAR ZULKARNAIN BIN MOHD NAIM
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INTRODUCTION 1

Problem	Illegal parking in reserved spots (ambulance/VIP zones) disrupts emergency services and inconveniences authorized users, while manual enforcement is inefficient and costly. ❗
Solution	Our automated system uses OCR technology (Raspberry Pi & camera) and ultrasonic sensors to detect unauthorized vehicles in real-time, triggering instant alarms and alerts. 🚨
Impact	<ul style="list-style-type: none"> • Ensures emergency access and faster response times ✅ • Reduces manual patrol costs by 24/7 monitoring ✅ • Improves compliance through consistent enforcement ✅

PROBLEM 2

- **Illegal Parking Epidemic** 🚫 Drivers frequently occupy reserved spots (VIP/ambulance/fire zones) due to limited parking, blocking emergency access and causing safety risks.
- **Failed Enforcement** ❌ Manual patrols and physical barriers are inefficient, allowing violations to go unchecked.
- **Systemic Consequences** ⚠️
 - Delays emergency response times
 - Wastes authorities' resources
 - Creates parking chaos in high-demand areas

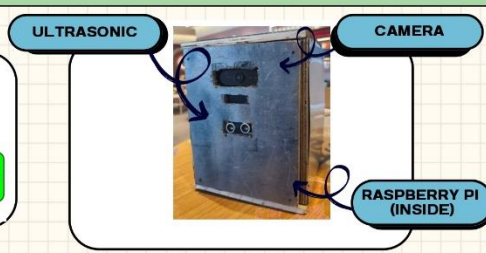
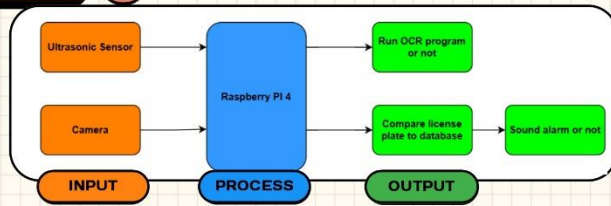
OBJECTIVE 3

- To develop a camera-based license plate recognition system using a **Raspberry Pi microcontroller** to capture and identify vehicle license plate numbers. 📷
- To design and implement a reservation-based parking management database using **phpMyAdmin** to store and manage recognized license plate data. 🗄️
- To integrate an audio alert system utilizing a **Bluetooth speaker** to notify security personnel upon vehicle detection or unauthorized access. 📢
- To deploy an **ultrasonic sensor** module to accurately detect the presence of vehicles within designated parking zones. 📏

INNOVATION HIGHLIGHT 4

- | | |
|--|--|
| Instant Violation Detection ⚡ + 📢
• Triggers alarms <2 seconds after unauthorized parking
• Uses dual verification (ultrasonic sensor + OCR) | 24/7 Self-Operating System ⭐
• Zero human intervention needed
• Processes 50+ plates/hour continuously |
| Budget-Friendly Design 💰
• 1/10th the cost of commercial systems
• Uses recycled components (Android cameras, Web camera, Camera Module) | |

METHOD 5



SIGNIFICANCE OF THE STUDY 6

- | | | |
|--|--|---|
| ⚡ Faster Emergency Response
• Real-time OCR monitoring keeps emergency zones/fire hydrants clear
• Instant alerts enable immediate towing/fines for unauthorized vehicles | 🚫 Eliminates Manual Patrols
• Replaces costly, inefficient human patrols with 24/7 automated scans
• Processes 50+ plates/hour (vs. 10-15 manually) | 📢 Improved Compliance
• Drivers more likely to obey rules under OCR surveillance
• Creates lasting cultural shift toward parking accountability |
|--|--|---|

COMMERCIAL POTENTIAL 7

- Cost Savings**
 - Replaces manual patrols
 - Offline system avoids cloud subscription fees
- High-Demand Applications**
 - Hospitals (emergency zone protection)
 - Universities (VIP/faculty parking)
 - Smart cities (integration with parking apps)

CONCLUSION 8

Illegal parking, especially in reserved zones like VIP and emergency areas, creates major disruptions. The Reserve Parking System offers an effective solution by combining license plate recognition, phpMyAdmin database, ultrasonic sensors, and a siren alert system to detect and deter unauthorized parking. This integrated approach enhances parking enforcement and can be widely implemented in places such as hospitals, universities, and government buildings to promote order and improve urban mobility.

NOVELTY

Reserve Parking System Via OCR is the original creation from the combined result of ideas and creativity based on the monitoring and parking automation. Has been protected by Intellectual Property Corporation of Malaysia (MyIPO) with registration number: LY2025M02660



DUAL AXIS SOLAR TRACKER

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Abstract

The integration of solar energy into moving vehicles such as cars and boats plays a significant role in promoting renewable energy and reducing dependence on fossil fuels. However, static solar panels mounted on such vehicles face the critical challenge of inconsistent sunlight absorption due to constantly changing directions during movement. This limitation leads to reduced energy efficiency and an unstable power supply to internal components. To address this problem, the main objective of this project is to design and develop a dual-axis solar tracking system that enables solar panels to automatically adjust their orientation based on the sun's position in real time. The proposed system uses Light Dependent Resistor (LDR) sensors to detect the direction of sunlight. An Arduino microcontroller processes this data and controls two servo motors that adjust the panel along both the horizontal and vertical axes. In addition, the system is integrated with the Blynk mobile application, allowing users to monitor key performance indicators such as voltage, current, panel angle, and light intensity in real time. The project methodology involves circuit design, component integration, programming of control logic, and field testing under real-world conditions. The system successfully demonstrated improved sunlight tracking and energy output compared to a static panel setup. The novelty of this project lies in its compact design tailored for moving platforms, dual-axis movement, and real-time smartphone monitoring. In conclusion, this solar tracking system offers a practical and energy-efficient solution for mobile vehicle applications and holds strong potential for future enhancement with energy storage and advanced remote features.

Keyword: Solar panel, Dual-axis, Arduino, Servo Motor



9TH REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION



DUAL AXIS SOLAR TRACKER



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SUPERVISOR :
 PUAN AMIZA BINTI YAMAN
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MUHAMMAD AMIRUL HAZIQ BIN NOOR KAMARULZAMAN
 POLYTECHNIC PORTDICKSON

INTRODUCTION

Today, many vehicles like cars and ships are starting to use solar panels to save energy. But normal solar panels are fixed and can't follow the sun, so they don't get as much energy. To solve this, the Dual Axis Solar Tracker was created. It can move the solar panel to follow the sun automatically, even when the vehicle is moving. It can turn up to 180°.

SIGNIFICANCE OF THE STUDY

This project helps increase the use of clean energy in vehicles. It's perfect for providing power to additional electrical systems in cars or ships, such as lights, chargers, or small electronics.

INNOVATION HIGHLIGHTS

- The system can move in two directions (X & Y axis).
- Automatically detects the brightest light.
- Designed to fit in vehicles.
- Digital display showing voltage and current.

MATERIALS / METHOD

Materials Used: Arduino Uno, 4x LDR, 2x Servo Motors, Solar Panel

Method: This system uses LDR sensors to detect the brightest light. The Arduino controls two servo motors to rotate the solar panel towards the light. As the vehicle moves, the solar panel always faces the sun. The LCD display shows real-time voltage and current readings.

COMMERCIAL VALUE

This system can be commercialized for cars, ships, boats, or motorhomes. It can be sold as an additional system for users who want to save energy and make better use of solar power in their vehicles.

PICTURE



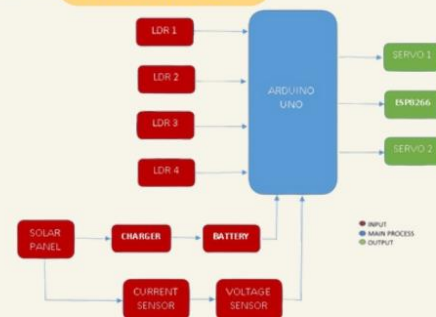
PROBLEM STATEMENT

When vehicles are moving, static solar panels can't follow the direction of sunlight properly. This causes low solar energy absorption, making it difficult to power electrical components in the vehicle.

OBJECTIVES

- To design a dual-axis solar tracking system that accurately aligns solar panels based on real-time sunlight detection through sensor circuits and control mechanisms.
- To develop a control system that allows the solar panels to move automatically toward the brightest sunlight.
- To implement IoT to dual axis solar system that uses an app that is Blynk.
- To shows real-time data of voltage ,current ,light intensity and solar angle produced by the solar panel.

METHODOLOGY



CONCLUSION

The Dual Axis Solar Tracker allows more efficient solar energy harvesting even when the vehicle is moving. This system helps us use solar energy better while supporting sustainability by using renewable energy.

HOW THE PROJECT OPERATING



WIRE MEASUREMENT MACHINE

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Abstract

This project focuses on the design and development of a Wire Measurement Machine to enhance efficiency, accuracy, and safety in wire processing operations, especially within educational and small to medium-scale workshop environments. Traditional manual wire measuring and cutting is often slow, inconsistent, and poses safety risks due to repetitive handling of sharp tools. The core problem addressed by this innovation is the inefficiency and lack of precision in conventional wire length preparation processes. To solve this, a compact and cost-effective prototype was developed using an Arduino Nano microcontroller, a stepper motor for controlling wire feeding, and a mechanical blade system for cutting. The Arduino Nano serves as the central controller, managing precise motor movements to ensure consistent wire lengths during each cycle. To enhance functionality, the system is integrated with an ESP8266 Wi-Fi module, enabling connectivity to a mobile phone hotspot. Through the Blynk application, users can monitor the system remotely and receive real-time notifications about operation status or faults. This wireless feature not only adds convenience but also introduces students to basic Internet of Things (IoT) concepts. System testing involved various wire lengths and types, showing a 50% reduction in processing time and a 95% improvement in length precision compared to manual methods. This project offers significant educational benefits. It simplifies practical work for teachers and students during laboratory sessions and reduces the risk of injuries from repetitive manual tasks. More importantly, it encourages students to explore electronics, microcontroller programming, motor control, and wireless technologies in a real-world application. The inclusion of Arduino Nano and ESP8266 provides a hands-on learning experience in both embedded systems and IoT. In conclusion, this innovation is a safe, efficient, and educational solution for improving productivity and learning outcomes in technical institutions. For future development, enhancements such as automatic wire-type detection, a user-friendly touchscreen interface, and cloud-based performance logging can be explored to increase the system's versatility and educational value.

Keyword: Wire Measurement Automation, Arduino Nano, IOT in Technical Education, ESP8266 Wireless Monitoring, Embedded System for Workshops

WIRE MEASUREMENT MACHINE

ID:Respex25-011



STUDENT 1
MUHAMMAD IQBAL BIN
MARSUM
06DET22F1067



STUDENT 2
MUHAMMAD SAFWAN BIN
JAMAL NASIR
06DET22F1079



SUPERVISOR
ENCHIK ZURAIIDI BIN
MD TAHIR

BACKGROUND

A WIRE MEASUREMENT MACHINE is widely used in industries such as electronics, manufacturing, and automation. It is designed to streamline the process of cutting wires accurately, quickly, and consistently, reducing manual labor and minimizing human error. The system is often managed by a microcontroller or a small computer, which can be programmed to cut the wire to specific lengths and quantities.

OBJECTIVE

- To consistently cut wires 1.0mm to the exact specified lengths with minimal deviation.
- To help user from wire wastage by using precise cutting techniques, reducing excess material and scrap.
- To Reduce the risk of injury associated with manual wire cutting, providing a safer working environment
- Minimize material waste by cutting wires precisely, reducing the cost of scrap materials.

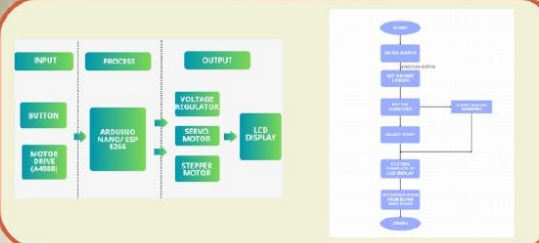
PROBLEM STATEMENT

The manual process of cutting wires, particularly for small-diameter wires like 1 mm, is time consuming, labor-intensive, and prone to inconsistencies and human error. The lack of such automation can result in operational delays, higher costs, and safety risks associated with manual handling.

INOVATION HIGHLIGHT

- Component are easy to identify if damage and easy to make a replacement because not permanently connected to the PCB board.
- Using Wireless Connectivity its allows for remote control and monitoring via a smartphone or tablet, enabling users to adjust settings and check progress from anywhere.

METHODOLOGY



SIGNIFICANT OF THE STUDY

Educational Value

The WIRE MEASUREMENT MACHINE project serves as an effective educational tool for students, especially in the fields of engineering, electronics, and automation technology. It allows learners to apply theoretical knowledge in a hands-on setting, bridging the gap between classroom learning and real-world application. Through the design, programming, and assembly process, students gain valuable experience in areas such as: Circuit design and microcontroller programming

CONCLUSION

In conclusion, the WIRE MEASUREMENT MACHINE is a tool designed to speed up and simplify the wire-cutting process with precision and consistency. Its main advantages include high efficiency, reduction in human errors, and increased productivity, particularly in industries that require large volumes of wire cutting with high accuracy.

RESULT / ANALYSI

- The wire cutter shows excellent precision, with of cuts falling within the acceptable tolerance.
- Precision in cutting, where less excess material is discarded due to inaccurate cuts. Cost savings on raw materials.
- Fewer physical interactions required with sharp objects and repetitive movements, creates a safer work environment, significantly the chance of accidental cuts or strain injuries.

COMMERSIAL VALUE

- The initial investment for a WIRE MEASUREMENT MACHINE may be high, but for this project the cost is really low. The long-term savings on labor and reduced material wastage contribute to significant cost reductions. These savings make the equipment a valuable asset for companies focused on high-volume production.
- Industries such as electronics, and telecommunications rely heavily on precise wire cutting, increasing the commercial value of automatic wire cutters in these sectors.

CHILD MONITORING WITH IOT

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71050 Port Dickson, Negeri Sembilan, Malaysia

ABSTRACT

In today's fast-paced world, child safety in public spaces is a growing concern, especially in crowded areas where children can easily wander off. This project proposes a child monitoring system based on the Internet of Things (IoT) to assist parents in keeping track of their children's location and prevent potential separation. The system utilizes GPS technology embedded in a wearable device for the child, which is connected to a mobile application on the parent's phone. When a preset distance threshold set at 10 meters is breached, the system triggers an alert through a buzzer on the child's device, allowing both the child and parent to recognize the situation and take prompt action. The proposed system leverages the Blynk IoT platform, providing an accessible and user-friendly interface for real-time monitoring and control via smartphone. The Blynk App, easily available on Android devices, enables parents to set the distance limit, receive instant alerts, and continuously track their child's location. This project aims to offer parents peace of mind by reducing the risk of separation and enhancing safety in crowded or unfamiliar environments. In shopping mall, when parents lost their children, parents need to go security counter to find their children. That cause a waste of energy and time. So, a project was created that will make the process easier. This innovative solution aims to alleviate parental worries and streamline the process of locating lost children, thereby reducing energy and time wasted at security counters. Make a program of GPS Module that will go through an app (Blynk App). To detect a distance of their children, use the GPS Module to detect their child latitude and longitude through the parents' phone. The hardware part is at the buzzer, GPS Module and OLED while the software part is at the TTGO Lilygo ESP32 and apps (Blynk App).

Keyword: Child Safety Monitoring, GPS-Based Tracking System, IOT for Parental Control, TTGO ESP32 with Blynk, Wearable Safety Device

POLYTECHNIC PORT DICKSON

SUPERVISOR :
PUAN NUR SUHANA BINTI SUHADI

PROJECT MEMBERS :
TUAN NURALYA SYAMIMI BINTI TUAN ZUZAI [06DEP22F1007]
NUR ELLYANA BINTI ANUAR [06DEP22F1028]



CHILD MONITORING WITH IOT

BACKGROUND

The project name is "Children Monitoring with IOT". This project was design for parents to monitor their children. It be a great advantage to parents and children. This project also show the longitude and the latitude where is the children. This project was design by using TTGO LILYGO ESP32 microcontroller, GPS module, OLED, Li-Po battery, switch, and piezo buzzer.

PROBLEM STATEMENT

Nowadays, many cases involve missing children in shopping mall. Because of that, it will be a problem for the parents because of the lost of a children. Parents need to go security counter to find their children. That cause a waste of energy and time. So, a project was created that will make the process easier.

i. To set up a GPS module that can detect the latitude and logitude of the children from their parents.

ii. To develop a program of TTGO ESP32 microcontroller.

OBJECTIVES

iii. To monitor the distance limit of children from their parents using GPS module and buzzer.

iv. To measure the distance of children from their parents using GPS module.

SIGNIFICANT OF STUDY

In this project, caregivers can track and ensure the safety of children, providing peace of mind in crowded environments like shopping malls.

With this system in place, parents can have peace of mind knowing that if their child moves more than ten meters away, the system will detect it and trigger buzzers at the child.

Shows the latitude, longitude and the location at the blynk apps of parent's phone to react promptly.

INNOVATION HIGHLIGHT

Portable Design :
Designed by 3D printing and powered by a Li-Po battery, making it easy for children to wear or carry around.

Real Time Location Tracking :
The system tracks 10 meter distance the child's exact location using GPS module by showing longitude and latitude.

COMMERCIAL VALUE

Real-Time Monitoring Convenience :
Using IoT technology, parents can get immediate updates about their child's location by Blynk App.

Cost-Effective Design :
Using components like an OLED display and ESP32 microcontroller makes this project advanced yet affordable. By optimizing production, the product can be sold at a competitive price.

MATERIAL / METHOD

Material :
This product is made using PLA 3D printing.

Method :
1) Use computer modeling software to create a model first.
2) Then copy it to the 3D printer via USB flash drive. After the printing settings, the printer can print it. The exploded diagram of the working structure is as follows.

CONCLUSION

In conclusion, the purpose of this project is to help parents monitor their children in shopping malls, especially in public places. To do this, we will create a child safety system using IoT technology. The input is TTGO LILYGO ESP32, which will program a GPS module to detect the distance of the child. If the child goes too far away, a buzzer will sound to alert them. This way, parents will be notified immediately if their child goes missing. By providing this child monitoring system, parents can have peace of mind and will be warned if their children are unattended. It will also improve child safety in public places to address concerns about children's safety.

i-UIDM MANAGEMENT SYSTEM, POLYTECHNIC MUADZAM SHAH

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Mohammad Faiz Hakimi Bin Md Azmi², Danish Naufal Bin Samsulkahar³

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Abstract

The “i-UIDM Management System” is an innovative web-based platform created to streamline applications for public broadcasting services at the Instructional and Multimedia Unit (UIDM), Muadzam Shah Polytechnic, Pahang. As Malaysia experiences a significant rise in digital connectivity, with internet penetration surpassing 96 percent in 2023 and reaching 97.4 percent in 2024, along with smartphone usage at around 90 percent in 2022 and expected to continue increasing, access to online systems via mobile phones has become highly convenient for most people. This inclination implicitly highlights the need for an online based system and mobile accessibility for these systems. Currently, all service applications at UIDM are done manually, which delays the verification and approval processes. This development marks the beginning of a new era where traditionally filling out forms is replaced with an efficient, time-saving digital platform. This system provides easy and quick access for all users. Capable of real-time data checking and automatic information saving, this system reduces blunders, optimizes the workflow, and accelerates the entire process. According to a poll of UIDM service customers, 98% of them support replacing the current manual method with this web-based approach. As there will be no need to keep or print tangible documents, this form system should enhance user interaction and help the company manage resources effectively. The System is created through Software Development Life Cycle (SDLC), ensuring that each part of the project is executed in a systematic way and properly planned. This also reduces the risks of the project by planning to further and align the software with client requirements during both the design phase and later. Finally, this innovation reflects the vast capacity of web technology in terms of improving organizational processes and diversifying user communication methods. The I-UIDM management system is an attempt to update UIDM services for increased stability, convenience and efficiency.

Keyword: i-UIDM Management System, Web-Based Platform, Online Application, Efficiency and User Interaction



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

MUHAMMAD AZAM BIN JAMALUDIN
(SUPERVISOR)

MOHAMMAD FAIZ HAKIMI BIN MD. AZMI
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DANISH NAUFAL BIN SAMSULKAHAR
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(19DDT22F1102)



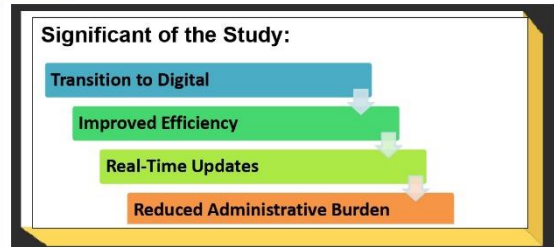
<https://www.iuidmpms.com>

I UIDM
MANAGEMENT SYSTEM



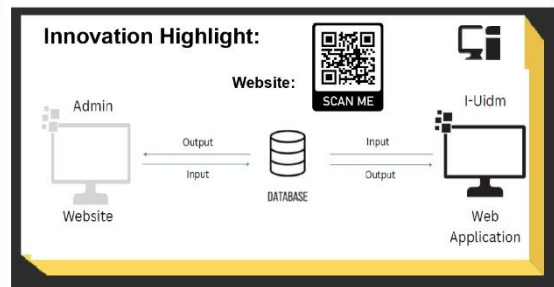
Introduction:

Muadzam Shah Polytechnic currently has no online system for submitting equipment or PA system service loan applications. This forces users to rely on old manual methods, which cause delays and make it hard to track and manage equipment. There is also no proper system to keep track of equipment, making it difficult to ensure it is maintained and available when needed. This results in confusion and wasted time. A digital platform is needed to make the process faster, easier, and more efficient for everyone.



Objective:

- 🌐 **Create an Easy-to-Use Web Application** - Develop a user-friendly web application to streamline the management of service bookings at UIDM, making the entire process faster and more efficient.
- 📄 **Move from Manual to Online** - Transition from outdated manual methods to an efficient online system through the I-UIDM web platform, reducing delays and errors.
- 📊 **Provide Real-Time Service Updates** - Build a system that delivers real-time updates on service and equipment rental statuses, giving staff at Muadzam Shah Polytechnic easy access to the information they need, whenever they need it.



Problem Statement:

- 🚫 **No Online Platform:** Users currently have to submit equipment or PA system service loan requests manually, leading to delays and inefficiency. ⌚
- 📅 **Outdated Methods:** Without an online system, tracking and managing equipment loans becomes a hassle, affecting both users and management.
- 🚨 **Result:** Citizens of Muadzam Shah Polytechnic face confusion and delays due to this disorganized process.

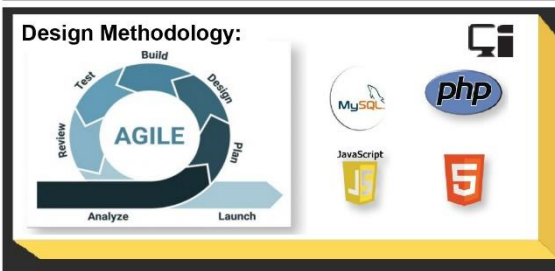
Commercial Values:

- Increased Productivity
- Reduced Errors and Operational Costs
- Improved Customer Satisfaction
- Scalable Solution
- Data-Driven Insights

Conclusion:

This study focuses on creating a user-friendly web application to improve service booking and management at UIDM. By shifting from manual to digital processes, it will increase efficiency, reduce errors, and provide real-time updates, helping staff work faster and more accurately.

Commercially, this solution offers increased productivity, lower operational costs, and better customer satisfaction. It has potential for expansion to other institutions, creating new revenue opportunities. Overall, this study enhances both operations at UIDM and opens doors for future commercial growth.



AUTO DIM STREET LIGHT

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Abstract

This study presents the design and implementation of a smart auto-dimming street lighting system that utilizes ultrasonic sensors and an ESP32 microcontroller, with the added capability of sending real-time fault notifications via Telegram. The main objective is to improve energy efficiency and facilitate streetlight maintenance through automation and IoT integration. The system dims the light when no motion is detected and restores full brightness when movement is sensed by the ultrasonic sensor, thereby optimizing energy usage in low-traffic conditions. A key innovation of this project is the fault detection feature, where any malfunction or failure in the lighting system triggers the ESP32 to send an automated message to a designated Telegram channel, alerting maintenance personnel instantly. The hardware setup includes the ESP32 development board, ultrasonic sensors for motion detection, and LEDs to simulate streetlights, while the software is developed using Arduino IDE, with integration to the Telegram Bot API for real-time notifications. The system connects to a Wi-Fi network to enable continuous monitoring and communication. Testing and validation were conducted to ensure accurate motion detection, reliable dimming behavior, and consistent message delivery during simulated lamp failures. Results confirmed that the system successfully adjusted lighting based on real-time motion inputs and promptly sent fault alerts through Telegram, proving its effectiveness for both energy management and remote monitoring. This project demonstrates a cost-effective and scalable approach to smart city infrastructure, particularly in enhancing the efficiency and responsiveness of public lighting systems. The study recommends further development by incorporating renewable energy sources such as solar panels and expanding the notification system to include a centralized dashboard for large-scale deployments in urban areas.

Keyword: Smart Street Lighting, Energy Efficiency, IoT Integration, Real-Time Fault Notification, Ultrasonic Motion Detection



AUTO DIM STREET LIGHT (3187)

STUDENT 1



MUHAMMAD AIMAN BIN WAHID
06DET22F2014

STUDENT 2



NORAZUMI BIN NORAZALI
06DET22F2028



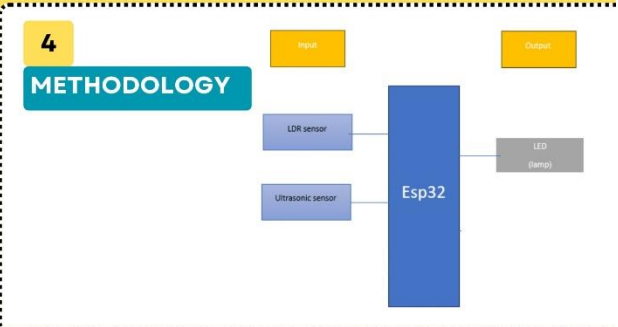
1 BACKGROUND

The Auto Dim Street Light system is designed to reduce energy consumption and increase efficiency in street lighting. Traditional systems remain fully lit even in the absence of vehicles or pedestrians, leading to energy waste. This system uses motion sensors to detect movement and adjust brightness accordingly, providing illumination only when needed.

2 PROBLEM STATEMENT

Street lights use a lot of energy, especially in urban areas. Sometimes street lights are not turned on and off at the right time. This situation will directly shorten the life of the lights and increase the cost of maintaining street lights. The use of street lights is not limited to urban areas only but also in rural areas.

- 3 OBJECTIVE**
- Detecting vehicle movement using an ultrasonic sensor and an ESP32 microcontroller.
 - To create a program that adjusts streetlight brightness based on detected movement.
 - Detecting streetlight faults using an ESP32 microcontroller.
 - To analyze faults to the auto dim light management system



- 5 INNOVATION HIGHLIGHTS**
- Use of ultrasonic sensors to detect movement, allowing dynamic adjustment of light intensity.
 - Integration with ESP32 microcontroller for efficient data processing and control.
 - Eco-friendly and cost-saving technology.

- 6 COMMERCIAL VALUE**
- Reduces energy bills and carbon footprint.
 - Ideal for municipalities and housing areas.
 - Enhances street safety while promoting smart city infrastructure.
 - Lower maintenance frequency due to reduced operational hours of the lights.

7 CONCLUSION

The Auto Dim Street Light project contributes to a sustainable urban development initiative by combining motion detection and light control. It not only saves energy but also improves road safety and lowers costs, making it an effective solution for modern cities.



LEARN2DRIVE: VIRTUAL DRIVING EDUCATION USING IMMERSIVE TECH

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Abstract

Learn2Drive is an innovative Virtual Reality (VR) simulation game developed to enhance driving education by providing an immersive and engaging learning experience. This project aims to engage and motivate players throughout their learning journey and improve users' understanding of the driving track used in actual driving tests. This project addresses the problem of low enthusiasm and lack of confidence among individuals with limited driving experience. Learn2Drive provides a safe, virtual alternative to traditional methods, allowing learners to build familiarity with driving before operating a real vehicle. The development was carried out using the Agile methodology, which promotes flexibility, collaboration, and iterative progress. Tasks were divided into manageable phases, and team members contributed to idea generation and development through discussions and evaluations of feasibility and effectiveness. Project progress was monitored using a Gantt chart, ensuring clear task division and timely completion of milestones. This structured approach allowed for continuous improvement of the simulation throughout the development cycle. Key techniques employed in the project included 3D modeling, game engine development, and VR integration, enabling a realistic and responsive driving experience. The immersive nature of VR technology helped simulate real-world driving environments, making the learning process more intuitive and effective. Findings indicate that Learn2Drive significantly increases learner motivation and helps players gain a clearer understanding of how driving test tracks look. In conclusion, Learn2Drive is a hybrid of entertainment and education, effectively bridging the gap between gaming and real-world driver training. Future improvements may include expanded test track modules and integration with official licensing standards to elevate its real-world application further.

Keyword: Virtual Reality, Driving Simulation, Gamification, Driver Education, Educational Technology



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

LEARN2DRIVE

VIRTUAL DRIVING EDUCATION USING IMMERSIVE TECH

SUPERVISOR

Ts.Sathya A/P Manoharan, Politeknik METrO Kuala Lumpur

PROJECT MEMBERS

Nur Saidatul Ashiqah, Airin Farisha, Ng Ka Huei, Politeknik METrO Kuala Lumpur



INTRODUCTION

"Learn2Drive" is a 3D PC/VR game that helps users prepare for their driving test. It offers a virtual environment that simulates real-life driving situations in Malaysia. By using Learn2Drive, users can practice and build confidence in navigating the driving track before their actual test.

SIGNIFICANT OF THE STUDY

- **Boosts Confidence:** Helps beginner drivers build confidence in a safe, virtual environment before facing real-world driving situations.
- **Enhances Understanding:** Improves users' familiarity with actual Malaysian driving test tracks.
- **Increases Motivation:** Uses immersive VR technology and gamification to make learning more engaging and enjoyable.

PROBLEM STATEMENT

Many new drivers lack confidence and motivation when preparing for their driving tests. Traditional methods do not provide a safe or engaging way to practice, leading to poor understanding of real test environments. There's a need for an interactive and realistic training tool to bridge this gap.

COMMERCIAL VALUES

- Growing demand for virtual learning tools in driving schools.
- Increasing adoption of VR in education and training sectors.
- Aligns with e-learning trends and government initiatives on road safety.

OBJECTIVES

- To **enhance driving education** through an immersive VR experience that simulates real-world driving environments, helping users gain familiarity with actual driving test tracks.
- To **enhance learner motivation and confidence** by providing a safe, engaging, and interactive platform for practicing essential driving skills before attempting the real test.

CONCLUSION

Learn2Drive successfully bridges the gap between traditional driver education and immersive technology by providing a safe, engaging, and realistic learning environment. Through the use of Virtual Reality, learners can familiarize themselves with driving test tracks, build confidence, and gain essential driving knowledge before entering real-world scenarios.

METHODOLOGY

- **Agile Development:** Iterative planning, development & review.
- **Tools Used:** 3D modeling, Unity game engine, VR headsets.
- **Progress Tracking:** Gantt chart for clear task monitoring.



HAZARD ON-SITE

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Abstract

"Hazard On-Site" appears as a revolutionary educational computer game someone specifically made to address the urgent demand for available and engaging safety instruction across a broad audience, including young kids plus grown-ups. Conventional safety training has limitations coupled with being often perceived as monotonous. Since this training tends not to effectively translate into a practical application, this project offers a compelling solution. "Hazard On-Site," being a secure, virtual environment, empowers the learners through more engaging experiences so they may internalize important safety measures and actively engage. Fundamentally, the project makes varied mini-games that simulate realistic hazard scenarios through design. Since this kind of interactive gameplay encourages such a dynamic and memorable learning process, it enables players to be able to not only identify possible dangers but also practice appropriate responses without having to face any real-world repercussions. Simulation integration and also iterative prototyping ensure the educational content creation. Such content is of informative and naturally engaging kind. This gamified approach, incentivized further by a virtual salary reward system acknowledging player progression, has the potential to greatly outperform customary learning methodologies regarding user engagement, practical knowledge acquisition, also long-term retention, according to anticipated outcomes. "Hazard On-Site" exists and this underscores the transformative power of gamification within safety education since game-based learning adapts remarkably to cater to a spectrum of educational requirements and motivational elements improve the overall learning adventure. Looking ahead, future research, the scope of "Hazard On-Site" could be broadened through the development of additional mini-games addressing a wider array of potential hazards and safety protocols. The incorporation of social interaction or competitive elements presents another promising avenue for future enhancement, potentially fostering a more collaborative and stimulating learning environment. Ultimately, exploring the adaptability of this game-based learning paradigm for specialized industry or professional safety training holds significant potential for extending its impact and reach.

Keyword: Computer game, Safety, Hazard, Gamification

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

HAZARD ON-SITE?

INTRODUCTION

This project entitled "Hazard On-Site" is a thrilling and educational game that emphasizes the importance of safety in various environments. We chose this game idea to raise awareness about the critical role safety plays, be it on a construction site, in a workshop, or even in a bustling kitchen. By integrating safety elements into gameplay, we aim to engage players of all ages while imparting valuable knowledge.

OBJECTIVE

- To design a diverse range of mini games that stimulate real-life scenarios about potential hazards.
- To develop a prototype about simulation game on safety awareness.

PROBLEM STATEMENT

As reported by Department of Statistics of Malaysia (DOSM), the rate of workers suffers from injuries, illnesses, and even fatalities each year, emphasizing the urgent need for improved safety measures (Mohd Firdaus Zaini, Munira Balkis Mohd Bakri, Nauli Abdul Razak, et. al., 2022). Furthermore, as Tan Sri Lee Lam Thye says, 'it has been proven that failure to adopt and implement safety rules and procedures will be detrimental to those at the workplace' (April 28,2023). These led to project's problem statement that is:-

- Lack of understanding on potential hazard that affected to injuries and illness.
- Lack of awareness regarding workplace safety.



METHODOLOGY



By adopting the Agile Scrum methodology, "Hazard On-Site" aims to deliver a captivating and educational gaming experience that raises awareness about safety hazards and fosters a culture of safety consciousness.

- Plan; research on safety hazards in the workplace the game concept of educational game, target audience, and code selection. Creating a storyboard and storyline based on the initial game concept facilitated the game's development.
- Design phase, crafted the game's art style, including sprites and backgrounds, resulting in a visually appealing 2-dimensional art with side views according to the theme.
- Development on building mini games, designing the user interface (UI/UX), programming, and sound design using Unity, Adobe Illustrator, Adobe Audition, Adobe Photoshop and Maya
- Testing the game's quality, ensuring smooth controls and functionality. Any identified issues were addressed, striving for a flawless user experience.
- Deployment phase involved publishing and promoting the game through posters, advertisements, and other marketing strategies.
- Review on the players' feedback, and ensuring the game's continued presence in the gaming community and industry.

INNOVATION HIGHLIGHT



The Hazard On-Site game project aligns with this objective by providing immersive, risk-free learning experiences to deepen players' safety understanding and reduce the likelihood of occupational accidents.

INNOVATION HIGHLIGHT

The Hazard On-Site game project is of utmost importance as it raises awareness about safety in various work environments.

CONCLUSION

the game project "Hazard On-Site" offers an engaging and educational experience that emphasizes the importance of safety in various environments. Overall, "Hazard On-Site" endeavours to foster a culture of safety consciousness, promoting practical safety knowledge that extends beyond the virtual realm. Through this virtual adventure, players are encouraged to take safety seriously in their daily lives, making a positive impact in real-world environments.

PROJECT MEMBERS

THE SMART LECTURER PIGEONHOLE

Tuan Nur Syazana Najwa Binti Tuan Zulaini¹, Muhammad Faid Hakimi Binti Abdul Aziz², Bakiss Hiyana Binti Abu Bakar³

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Abstract

In today's modern world, the demand for Internet of Things (IoT) technologies continues to grow across various sectors. However, many existing mailbox and locker systems remain inefficient and rely heavily on manual checking by users, resulting in time-consuming and error-prone processes. The main objective of this project is to enhance the traditional lecturer mailbox system used at Politeknik Sultan Haji Ahmad Shah in Kuantan, where lecturers are each assigned a locker to receive letters or student assignments. This project, titled the Smart Lecturer Pigeon Hole, aims to increase efficiency and reduce manual intervention by integrating smart features. The system is built using an ESP32 microcontroller and infrared sensors, with a Wi-Fi module enabling real-time notifications to lecturers through Telegram. The ESP32 is programmed to process data from the sensors, detect assignment submissions, and continuously monitor the locker's status. Students can submit assignments directly into the pigeon hole without needing face-to-face interactions. A front-facing infrared sensor detects any documents inserted into the slot. Uniquely, the system features two dedicated compartments: an "early" slot for on-time submissions and a "late" slot that activates automatically after the deadline set by lecturers has passed. This functionality helps lecturers track student punctuality with ease. Preliminary testing of the system showed it performed reliably, providing timely alerts and reducing the need for lecturers to physically check the lockers. The project demonstrates novelty through its dual-compartment structure and automated communication system. In conclusion, the Smart Lecturer Pigeon Hole presents a secure, intelligent, and effective solution for modernizing assignment management in academic institutions, promoting both efficiency and accountability. Future improvements could include integration with institutional academic systems for automatic deadline tracking, expansion to support various document sizes, and enhancements to the user interface for better accessibility.

Keyword: Smart Mailbox System, IoT in Education, ESP32 Microcontroller, Automated Assignment Tracking

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION



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**MUHAMMAD FAID
 HAKIMI BIN ABDUL
 AZIZ**
 040302-16-0103

SMART LECTURER PIGEON HOLE

OBJECTIVE

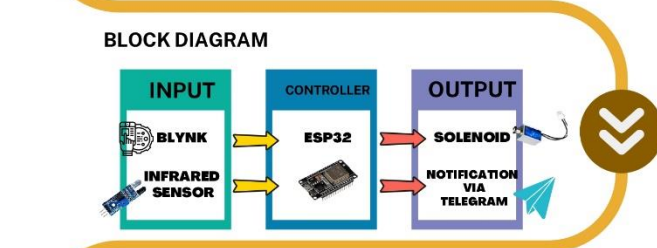
- Automatic pigeonhole system using ESP32 and Blynk.
- An automatic SOLENOID-Operated Door with Blynk Control as output
- Automatic notification system via telegram base on IR SENSOR input detection

ABSTRACT

This project improves the traditional locker system for lecturers at Politeknik Sultan Haji Ahmad Shah, Kuantan. The Smart Lecturer Pigeon Hole utilizes ESP32, infrared sensors, and Blynk to efficiently receive student assignments and letters. It detects incoming documents and sends notifications to the lecturer via Telegram. When the set date and time have passed, students can submit late assignments through a designated slot for late submissions.

PROBLEM STATEMENT

- Discipline Issues Among Students:** Students fail to submit assignments on time, Lecturers face difficulties in identifying assignments submitted on time
- Lack of Awareness for Lecturers on Assignment Submissions:** To trace the late submissions student, result in unfair treatment of students who submit their assignments on time.
- Time Wasted in Rechecking Submissions:** Lecture monitoring & waste time rechecking assignment.

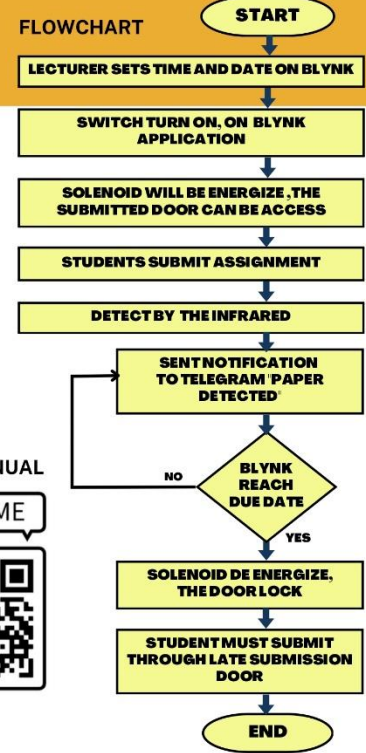


CONCLUSION

The Smart Lecturer Pigeon Hole system addresses real challenges in assignment management at educational institutions. Utilizes tools like ESP32, Blynk, infrared (IR) sensors, and Telegram notifications to enhance communication & Encourages students to consistently meet deadlines.

- ### RECOMMENDATION

 - Use durable and secure materials for the pigeon hole hardware to ensure it protects submissions effectively.
 - Add notification options like email and SMS in addition to Telegram, so users can choose their preferred update method.



BACKPACK WATER FILTER

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Abstract

The Backpack Water Filter project focuses on the development of a portable water filtration system, offering a practical solution for individuals in outdoor environments or emergencies, where access to clean water is limited. This project was conceived in response to the logistical challenges of carrying bottled water in remote areas and the growing demand for an efficient, compact, and eco-friendly water purification solution. The Backpack Water Filter aims to provide clean, safe drinking water by effectively removing contaminants from natural water sources such as rivers and lakes, ensuring that users are able to maintain hydration and health in the wild. The primary problem this project addresses is the difficulty of carrying and accessing safe drinking water in remote, off-grid environments. Many outdoor enthusiasts and individuals in emergencies are forced to carry heavy water bottles or rely on unreliable water sources, posing risks to their health. The innovation of this backpack-based water filtration system eliminates these challenges by offering a lightweight, user-friendly, and sustainable solution. To solve these problems, the project employs a range of technologies including solar energy for power, an ultrasonic water level sensor for monitoring, and a pH sensor to ensure water safety. The system is designed with a compact, efficient filtration process that provides clean water with an optimal pH range of 6.5 to 9.5. The system operates by filling a pre-filter tank at a flow rate of 0.5 liters per minute, allowing it to filter 1.5 liters of water in approximately three minutes. The findings demonstrate that the Backpack Water Filter provides an efficient, reliable solution for outdoor users by removing harmful contaminants and ensuring water quality with minimal effort. It offers users a simple, sustainable way to access clean water, particularly in remote or emergency scenarios. The results also suggest that the filter's integrated technology, such as real-time monitoring and pH adjustment, significantly enhances its utility. In conclusion, the Backpack Water Filter offers a significant advancement in portable water purification. The product not only improves access to clean water in various settings but also contributes to environmental sustainability by reducing reliance on single-use plastic bottles. Future research and development could focus on improving the filter's efficiency, reducing its weight, and incorporating more user-friendly features. It is recommended that the product be marketed to outdoor enthusiasts and humanitarian organizations, with future improvements aimed at enhancing its performance and accessibility.

Keywords: Portable water filter, Outdoor water purification, pH-balanced water, Eco-friendly filtration

BACKPACK WATER FILTER

POLITEKNIK MALAYSIA
PORT DICKSON

RESPEX 25
Secondary, Polytechnic & University Product Exhibition



LEADER

MOHD ANIQ BIN
MOHD ASAARI

PROJECT MEMBER

MUHD FAKRUSYI
SYAKIRIN BIN
SHAHIMI

SUPERVISOR

DR. NUR AQILAH
BINTI MOHAMAD
AMIN

Institution Name: POLITEKNIK PORT DICKSON

BACKGROUND

Traditional filters are fixed in one location, limiting their functionality to specific buildings or areas. This static nature poses a challenge for users who seek versatility and flexibility in their filtration solutions. Consumers prefer filters that **can adapt to different environments**. The Backpack Water Filter addresses this demand by introducing **portability as a key feature**.

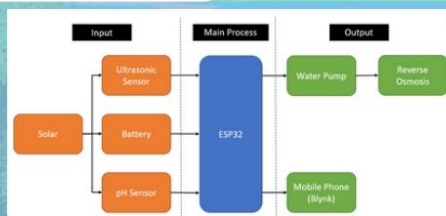
PROBLEM STATEMENT

- Difficulty to get clean water sources when in an **area far from clean water sources**.
- Having **restrictions** to get an **unlimited source of clean water**.
- Problems in identifying the **level of cleanliness** of water that can be drink.

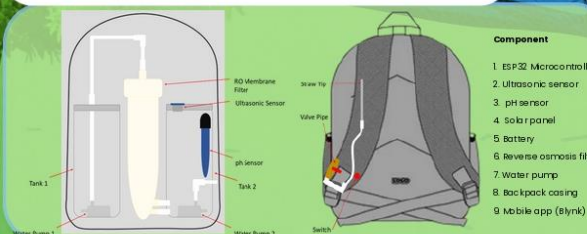
OBJECTIVE

- To **develop** the filter efficiently, it **removes maximum of contaminants** from various water sources.
- To **design** a user-friendly filtration system that requires minimal effort to operate, with **easy cleaning or replacement of parts** to extend its life and usability.
- To **create** a compact, lightweight water filter system that includes **pH values from 6.5 – 9.5**.
- To **integrate** an ultrasonic water level sensor after the filtration process, enabling users to **monitor the water level** in the filter's reservoir in real-time.

METHODOLOGY



DESIGN SOLUTION



Component

1. ESP32 Microcontroller
2. Ultrasonic sensor
3. pH sensor
4. Solar panel
5. Battery
6. Reverse osmosis filter
7. Water pump
8. Backpack casing
9. Mobile app (Blynk)

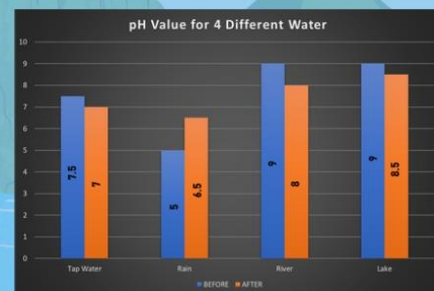
SIGNIFICANT OF THE STUDY

- This project supports access to safe drinking water during recreational, outdoor, and emergency situations. It promotes sustainable practices, increases environmental awareness by reducing plastic waste, and encourages the development of smart filtration technologies. The portability of the design enhances usability across various terrains and communities.

RESULT & ANALYSIS

Clean Water Before/After FILTER	RESULT
Before	The clean water storage area of 1.5L takes 3 minute to fill
After	The amount of water below is 150ml

- The water from before filtering tank take 3 minutes to fill 1.5L which the rate is 0.5L/1 minute.
- Water that have the best pH value to drink after filtering is tap water with a pH value of 7 while river water have a pH value 8.5 which is too high. So the water will be alkaline.



INNOVATION HIGHLIGHT

- Backpack water filter **can filter from dirty water to clean water using reverse osmosis** system besides being able to identify the current water level.
- Backpack water filter can filter water as much as **1.5l** at a time and **can filter many times up to 25 gallons**.
- Using a pH sensor to **measure the pH level of the water** to ensure that the filtered water is **safe and clean** to drink.

COMMERCIAL VALUE

- Keeping an eye on outdoor recreation trends and health concerns can **help gauge future demand and pricing**.
- As consumers become more environmentally conscious, filters that are sustainable or **reduce plastic waste can have increased value**.
- With the rise in outdoor activities like hiking and camping, the demand for portable water filtration solutions has increased. Consumers are **increasingly concerned about access to clean water**, especially in remote areas.

CONCLUSION

In conclusion, the Project Backpack Water Filter serves as an **innovative and practical solution** for providing **clean drinking water in various environments**, particularly in **outdoor and emergency** situations. By emphasizing portability, ease of use, and effective filtration, this project addresses critical needs for accessibility to safe water.

HAND GESTURE CONTROL LUGGAGE

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Abstract

This project introduces a gesture-controlled smart luggage system aimed at improving the convenience and accessibility of travel. Managing traditional luggage, especially in crowded or fast-moving environments, can be difficult and physically demanding. This challenge is even more significant for individuals with limited mobility or those carrying multiple belongings. To address this issue, the objective of this project is to develop a prototype of a smart luggage system that can be controlled using hand gestures, eliminating the need for physical contact or manual handling. The system is built using a gyroscope sensor (MPU6050) and an ESP32 microcontroller, which works together to detect and interpret specific hand movements. These gestures are processed through motion recognition software that directs the luggage to move forward, backward, or stop. The hardware and software were designed, integrated, and tested to ensure accurate gesture detection and responsive movement in various environments, including tight or crowded spaces where traditional luggage is harder to maneuver. Testing results indicate that the gesture-controlled luggage provides smooth and reliable operation, offering a more intuitive and hands-free experience compared to conventional or remote-controlled luggage systems. Its ability to respond accurately to user gestures highlights its potential to enhance user comfort and mobility during travel. The novelty of this system lies in its use of contactless control through natural hand movements, making it a more accessible and user-friendly solution. In conclusion, the gesture-controlled luggage system presents a significant step forward in smart travel technology. Future improvements could focus on refining gesture recognition accuracy, integrating obstacle avoidance features, and improving battery efficiency to support longer usage. These advancements could further revolutionize the luggage industry, making travel more seamless for a wide range of users.

Keyword: Gesture Control, Smart Luggage, ESP32, MPU6050, Travel Technology

HAND GESTURE CONTROL LUGGAGE

BACKGROUND

The hand gesture luggage control system is designed to enhance travel convenience by allowing users to **move** their **luggage** using **simple hand movements**. It utilizes **sensors** and **motion** recognition technology to detect and interpret **gestures**, enabling the luggage to respond accordingly. This innovative approach offers travelers an effortless, seamless, and user-friendly way to manage and control their luggage hands-free.



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NIZAM BIN MOHD YAZID**
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SUPERVISOR

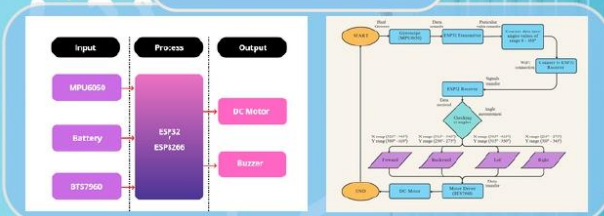
PROBLEM STATEMENT

- **Traditional luggage** systems require **manual handling**, which can be inconvenient and physically demanding
- The **physical effort** and **frustration** of managing luggage through **handles or buttons** can be challenging in transit areas.
- Current luggage systems often **lack usability**, leading to **strain and inconvenience**.

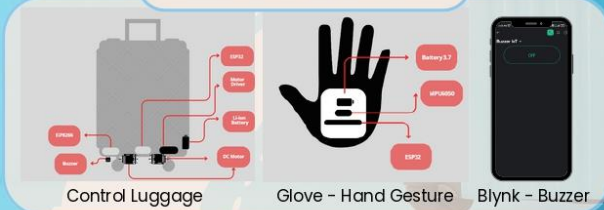
OBJECTIVE

- To **design** a **hand gesture** control system for **luggage** that reduces reliance on physical handles using the **MPU6050 sensor**.
- To **implement** a remote-controlled **buzzer** system using **Blynk**, allowing users to activate a buzzer via a **smartphone** application.
- To **develop** a recognition high efficiency accuracy for **hand gestures** in real-world travel scenarios using **BTS7960 sensor**.
- To **achieve** the maximum rating for user satisfaction in a customer **feedback survey** within a month of product release.

METHODOLOGY



DESIGN SOLUTION



SIGNIFICANT OF THE STUDY

What makes this system unique is its **hands-free control**, so users don't need to touch or pull their luggage. It also includes an **IoT-based mobile app**, making it easier and more flexible to use. The design focuses on comfort and is especially **helpful** for travelers who find regular luggage hard to manage. Its modular setup allows for future improvements, like better **gesture detection** and **obstacle avoidance**, making it a smart and future-ready travel solution.

RESULT & ANALYSIS

- Q1: How easy is it to control the luggage with hand gestures?
 Q2: How accurate is the luggage in interpreting your hand gestures?
 Q3: How reliable is the luggage's movement when using hand gestures?
 Q4: How comfortable do you feel using hand gesture to control the luggage?
 Q5: How satisfied are you with the hand gesture control feature of the luggage?



The survey results show that users generally had a positive experience with the hand gesture-controlled luggage. Most users found it easy to use, accurate in recognizing gestures, and reliable in movement. They also felt comfortable using the gesture control and were satisfied with the overall feature. This suggests that the system is user-friendly and works well, with only minor areas for improvement.

INNOVATION HIGHLIGHT

- Gesture control, allows users to direct luggage with simple hand movements.
- Sensor technology, MPU6050 sensors is used for precise motion recognition.
- User friendly, intuitive interface makes it easy for anyone to use.
- Increased mobility, enhances convenience in travel environments

COMMERCIAL VALUE

- Unique features by **allowing hands-free** control through **simple gestures** (forward, left, right, and reverse), it offers a level of convenience that modern travelers desire.
- The study showcases the application of **motion recognition** and **sensor technologies** in a new domain, highlighting the potential of **smart systems** in everyday activities.
- By enabling hands-free control of luggage through simple **hand gestures**, the system **reduces the physical burden** on travelers, especially in crowded or busy environments like airports.

CONCLUSION

In conclusion, hand gesture luggage control represents a significant advancement in travel technology, offering a user friendly and efficient way to manage luggage. By allowing travelers to navigate their bags with simple hand movements. As technology continues to evolve, such innovations can transform the travel experience, making it more seamless and enjoyable for everyone.

E-ALUMNI PSMZA SYSTEM

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Abstract

E-ALUMNI PSMZA system is a web-based system that provides an online service to manage Politeknik Sultan Mizan Zainal Abidin (PSMZA) alumni. This initiative was developed to replace manual methods for ALUMNI management. This system used the Waterfall model during the project development. We chose the waterfall model as our methodology because the project is divided into sequential phases, with some overlapping and splash back acceptable between phases. The project's objectives are to convert a manual system to be more systematic to manage alumni information and provide a safe and reliable platform that protects personal data and helps share knowledge. This system has a central database to manage alumni details easily and accurately for everyone. This project involved two user scopes, including admin and alumni. This system allows alumni to create and update personal profiles, view success stories, and view job opportunities and events. This system has been developed using PHP as its language programming, Javascript as its scripting, and MySQL as its database platform. Both white-box testing and User Acceptance Testing (UAT) were conducted, and the results were positive, indicating that the system performed as expected. In conclusion, E-ALUMNI system helps PSMZA effectively manage alumni records and information in a well-organized, accessible, and reliable manner. This project aims to enhance the alumni's experience and strengthen the relationship between the institution and its graduates.

Keywords: E-ALUMNI, web-based system, well-organized, accessible



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

AZHEEM FAKHRI
Project Members



MUHAMMAD ASYRAF
Leader Of Group



MADAM MAZLINA
Supervisor



E-ALUMNI PSMZA SYSTEM

<<Introduction>>

The E-Alumni PSMZA System is an online platform designed to keep Polytechnic Sultan Mizan Zainal Abidin graduates connected. It helps alumni stay updated on news, events, and job opportunities after graduation. Admins can manage alumni profiles, announcements, events, job listings, and gallery content (Success Story).

Alumni can register, update their profiles, and access announcements, events, and job offers — all in one place.

The system strengthens the bond between the polytechnic and its graduates by providing important updates and services.

<<Problem statement>>

• MANUAL DATA MANAGEMENT

Alumni information is stored using manual methods such as physical files or outdated and can cause the data to be lost or corrupted. For example, former students will get less exposure to information about events, job opportunities.

• DIFFICULT TO SEARCH OR UPDATE DATA

The process of finding specific alumni data becomes slow and not efficient because it has to be checked one by one in manual files.

• RISK OF DATA LOSS

Physical files can be affected by natural disasters, fires or other damage, which can cause important information to be lost.

<<Objective>>

- To identify system requirements for the e-alumni website to store alumni data, events, job information, and success stories in a centralized database.
- To design and develop the platform for managing alumni data, viewing events, job opportunities, and success stories.
- To conduct testing on E-Alumni PSMZA System to make sure it works successfully.

<<Project Significant>>

The Alumni System is important because it helps both alumni and the institution stay connected and work together:

- 1. Easy to use:** The system is user friendly for users who are easy to use and understand the system.
- 2. Quick access:** This platform will allow admin and alumni to quickly find and access important information anytime, anywhere, using a computer or mobile device.
- 3. Save cost:** By using this system, institutions can reduce the cost of printing, mailing and manual record keeping, which helps save costs.

<<Methodology >>

The website was created using Waterfall model.

- Requirement Gathering:** Initially, I gathered all necessary requirement for the website, including alumni registration, job listing and administration features.
- Design and Planning:** Next, I designed the layout and organized the database structure.
- Development:** After that, I began constructing the website using HTML, CSS, PHP and MySQL.
- Testing:** Once development was complete, I thoroughly tested all features to ensure everything functioned correctly.
- Launch:** Finally the website was ready to use and can be updated or enhanced in the future as needed.

Conclusion>>

This system helps PSMZA effectively manage alumni records and information in a well-organized, accessible, and reliable manner. This project aims to enhance the alumni's experience and strengthen the relationship between the institution and its graduates.

ASETPOKET

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Abstract

This innovation introduces a mobile phone application for the management of organizational movable assets based on asset registration numbers, asset information and filing damage complaints via mobile phone applications. This system was developed to address the problem of inefficiency in existing asset management that relies on records on the Asset Management Monitoring System (SPPA) website. SPPA is a system developed by the Ministry of Finance that can only be accessed within institutions and often experiences disruptions. Through a digitalization approach, this system allows for quick searches of comprehensive asset information in less than 30 seconds anywhere with internet access. This study uses qualitative and quantitative methodologies, namely interviews with 20 staff and questionnaires to officers who manage assets at Jelebu Community College. This system also increases user satisfaction and reduces staff workload. The uniqueness of the system lies in the ability to use data through the existing SPPA and its scalability for various types of assets, whether capital assets or low-value assets. This innovation not only solves current problems but also lays a solid foundation for the digital transformation of organizational asset management as a whole.

Keyword: Digital Search System, Movable Asset Management, Quick Search, Easy Access, Organizational Efficiency

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION



ASETPOKET

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Product Description

Keterangan Produk

Produk aplikasi Aset Poket ini adalah aplikasi yang memudahkan dalam pengurusan aset alih institusi di mana:

1. Menggunakan **aplikasi telefon** serta juga boleh digunakan dalam web
2. Hanya memerlukan pengguna **memasukkan nombor pendaftaran aset** di dalam aplikasi *Aset Poket* untuk mendapatkan maklumat aset tersebut, **pencarian maklumat aset** dengan memasukkan pegawai bertanggungjawab, status dan masa belian, dan seterusnya mengisi **borang kerosakan aset KEW-PA 10** hanya melalui aplikasi
3. Memudahkan bagi **pengurusan aset alih** yang banyak disesembah institusi

Significant of the Study

Signifikan Kajian

1. **Mengurangkan masa** pencarian maklumat sesuatu aset alih
2. Maklumat aset yang diperolehi **lebih tepat** berpandukan data sedia ada
3. Kos pembangunan juga dapat dijimatkan kerana **tidak memerlukan sumber kewangan** daripada institusi untuk melantik konsultan atau perkhidmatan daripada luar kolej komuniti
4. **Mengurangkan kesulitan** kakitangan dalam menguruskan aset terutama semasa proses pemeriksaan aset
5. **Meningkatkan penggunaan aplikasi** bagi memudahkan urusan organisasi

Problem Statement

Penyataan Masalah

1. Inovasi ini dibuat adalah bagi menguruskan cabaran dalam pengurusan aset alih yang melibatkan **kesukaran mendapatkan maklumat aset** yang tersimpan dalam sistem SPPA kerana laman web ini **tidak dapat diakses diluar institusi**.
2. Kekerapan sistem sedia ada **diselenggara dan tidak dapat digunakan**.
3. **Perbezaan peranan** bagi setiap pengguna menyukarkan **mendapat maklumat aset alih**.

Innovation Highlight

Potensi Inovasi

1. Tempoh **masa** untuk pencarian data lebih singkat iaitu antara 6-10 saat
2. **Kos** lebih jimat kerana tidak memerlukan pergerakan ke sesuatu tempat bagi membolehkan membuat pencarian data. Hanya memerlukan telefon bimbit.
3. **Kualiti data** yang sama diperolehi bagi maklumat asas data yang sama
4. Memudahkan dan melancarkan **proses pengurusan tadbir urus aset alih** di institusi

Objective

Objektif

Aplikasi ini dibuat adalah bertujuan untuk:-

1. Memudahkan pencarian data aset menggunakan nombor pendaftaran, pengguna, status mahupun tarikh terimaan aset tersebut
2. Menjimatkan masa pencarian data aset serta mengisi borang aduan kerosakan
3. Mengurangkan kos pengurusan kerana capaian boleh dibuat hanya di telefon bimbit dan tidak perlu hadir ke institusi bagi mendapatkan capaian tersebut melalui web sedia ada
4. Meningkatkan keupayaan organisasi dalam pengurusan aset alih kerajaan dengan maklumat aset boleh diperolehi daripada capaian lain selain sistem sedia ada

Commercial Value/ Conclusion

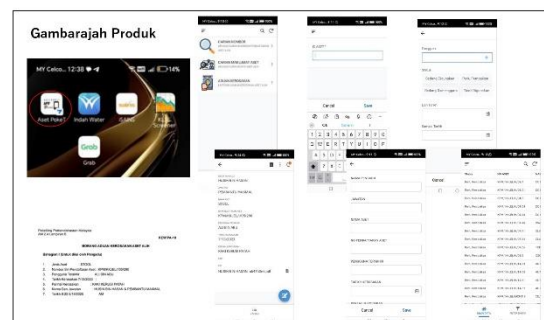
Nilai Komersial/ Kesimpulan

1. Nilai komersial yang tinggi kerana aplikasi hanya menggunakan telefon bimbit yang **mudah dan mesra pengguna**
2. Aplikasi Aset Poket ini amat bermanfaat untuk digunakan di institusi dalam **membantu pegawai atau organisasi pengurusan aset alih** institusi untuk menjalankan kerja sehari-hari
3. **Kajian dan penyelidikan akan diteruskan** pada masa akan datang bagi memastikan ianya **kekal relevan** dan mengikut peredaran masa dan kegunaannya dapat memenuhi kehendak pengguna

Materials/ Method

Bahan/ Kaedah

1. Sumber utama untuk aplikasi ini adalah **maklumat data aset alih** sebagai sumber rujukan/ carian yang sah
2. **Modul penggunaan dan penerangan penggunaan** bagi memudahkan penggunaan aplikasi.
3. Bagi e-AssetTracker dan e-Filter, **carian aset** adalah berdasarkan data aset alih dalam aplikasi.
4. Manakala, bagi pengisian e-Aduan, borang akan disimpan dalam format **borang sebenar KEW-PA 10** untuk memudahkan unit pengurusan aset alih menyimpan rekod serta mengambil tindakan seterusnya.



ENERGY HARVESTING SHOE

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Abstract

This project focuses on developing a Renewable Energy Harvesting Shoe Insole that generates electricity from foot pressure during walking. The aim is to provide a sustainable, portable power source for charging small electronic devices such as smartphones and wearables, especially in outdoor or remote environments where conventional charging is difficult. The project solves critical challenge faced by hikers, outdoor workers, and military personnel which is limited access to conventional electricity sources for recharging essential gadgets such as mobile phones, GPS devices, or health monitors. Existing solutions like portable power banks require pre-charging and become ineffective once depleted, while most wearable technologies lack self-charging capabilities. The project employed a structured engineering design process, ergonomic considerations for user comfort, and material selection to ensure durability and efficiency. Aside from that, the project includes prototype testing with different users performing walking, jogging, and running activities to evaluate performance. Data shows that walking is the most efficient activity for energy harvesting, and heavier users generate higher voltage gains. In one test, a 7-minute walk resulted in a voltage increase of 0.11V and a battery gain of up to 5.28%. On average, 30–50 steps are required to generate 1% battery charge. The system also integrates with the Blynk app for real-time voltage monitoring, battery percentage, and step count. Overall, the prototype demonstrates the potential of wearable energy harvesting technology to support eco-friendly and practical power generation, contributing to sustainability and convenience for users in active or rural lifestyles. The project concludes that integrating piezoelectric materials into everyday footwear is a promising step toward sustainable energy solutions for wearable technology. Improvements made during the project include selecting a higher-efficiency sensor and enhancing soldering techniques to minimize energy loss. For future research, it is recommended to explore advanced materials, multi-layer insole designs, and flexible circuits to further boost energy output and user comfort.

Keyword: Energy Harvesting shoe, piezoelectric sensor, Renewable energy, Blynk app, eco-friendly



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

ENERGY HARVESTING SHOE

PRESENTED BY: POLITEKNIK PORT DICKSON



THEVA DARSHAN VASUTHEVAN
(06DKM22F2009)



YASHWANT TAMILSELVAM
(06DKM22F2015)
(LEADER)



MR RAGUNATHAN A/L JAYARAMAN
SUPERVISOR



KEVIN RAJ
(06DEM22F2003)



KIRTHANA SIVAKUMAR
(06DEM22F2001)

INTRODUCTION

This project creates a Renewable Energy Harvesting Shoe Insole that turns foot pressure into electricity using piezoelectric transducers. The energy is stored in a 3.7V lithium-ion battery via a TP4056 module and can charge small devices. Walking is the most efficient, with 30–50 steps adding about 1% battery charge. The Blynk app provides real-time monitoring. This eco-friendly wearable offers portable power for outdoor or remote use.

METHODOLOGY

Mechanical pressure on the piezoelectric sensor generates AC voltage, which is converted to DC using a bridge rectifier. A boost converter then amplifies this voltage before it's regulated by a TP4056 charging module. The module charges a 3.7V 850mAh lithium battery, storing the energy for later use. This system efficiently converts foot pressure into usable electrical energy.

INNOVATION HIGHLIGHT

- Converts human footsteps into usable electricity using piezoelectric sensors.
- Real-time energy monitoring enabled through the Blynk app.
- Portable, eco-friendly charging system embedded within the shoe.
- Supports sustainable power generation for outdoor and emergency use.

CONCLUSION

The shoe converts pressure into usable energy, showing potential for powering devices in low-power or off-grid situations.



Figure 1: Actual Product



Figure 2: Shoe Overview

PROBLEM STATEMENT

- Limited Access to Power Sources in Remote Areas
- Dependency on Power Banks
- Lack of Self-Sustaining Wearable Devices
- Inconvenience During Prolonged Outdoor Activities

OBJECTIVE

- To design and develop an energy harvesting shoe insole
- To charge devices such as smartphones, using renewable energy

SIGNIFICANT OF STUDY

- Provides renewable energy on-the-go for charging small devices.
- Reduces reliance on power banks, especially in remote areas.
- Promotes eco-friendly, self-sustaining wearable technology.

COMMERCIAL VALUES

- Ideal for outdoor users like hikers, joggers, and campers.
- Can be marketed as an eco-friendly, wearable charging solution.
- Useful in rural or off-grid areas with limited electricity.
- Has potential for mass production in the renewable and wearable tech market.

ACHIEVEMENT

- Awarded bronze medal at Innovex 2025 competition
- Best Project in Mechaday, Mechanical Eng. Dept., POLIPD



FILTER BEFORE SHARING AUTOMATIC HOAX CONTENT FILTER INNOVATION ON SOCIAL MEDIA

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Abstract

The rapid development of social media as a primary source of information has brought about serious challenges, particularly the widespread dissemination of hoaxes and false information. The fast and massive spread of misinformation not only misleads the public but can also trigger social unrest and conflict. Although efforts to promote digital literacy have been made, they are insufficient to counter the speed at which unverified content spreads. The main problem lies in the absence of an automatic, real-time prevention system that can filter hoax content before it is shared by users. This study aims to develop an AI-based automatic filtering system capable of detecting potential hoaxes in content intended for sharing on social media platforms. The methodology involves collecting verified datasets of hoax and non-hoax content, data labeling, and training a machine learning model using Natural Language Processing (NLP) techniques. The system is designed to analyze both text and links, then provide a credibility score and alert to the user before the content is posted. Initial testing shows promising accuracy in distinguishing between hoax and legitimate content and demonstrates the system's potential for integration as a browser extension or plugin. The novelty of this research lies in its proactive approach and client-side operation, differing from conventional systems that typically act reactively after misinformation has spread. Therefore, this innovation offers a practical solution to interrupt the hoax distribution chain at its source, while also raising user awareness about the importance of verifying information. In conclusion, the proposed automatic filtering technology can serve as a crucial component in fostering a healthier and more responsible digital ecosystem.

Keyword: Hoax Detection, Social Media, Artificial Intelligence, Real-Time Filtering.



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

INOVASI FILTER OTOMATIS KONTEN HOAKS Di MEDIA SOSIAL

Latar Belakang
 Meningkatnya penyebaran informasi palsu (hoaks) di media sosial menjadi ancaman serius terhadap literasi digital masyarakat Indonesia.

Bahan Materi & Metode

- Studi literatur hoaks 5 tahun terakhir
- Algoritma NLP & machine learning
- Uji coba pada platform simulasi media sosial

Pentingnya Penelitian
 Memberikan solusi preventif, bukan hanya reaktif, serta meningkatkan kesadaran dan literasi digital pengguna

Kesimpulan
 Inovasi ini berpotensi memutus rantai penyebaran hoaks di hulu dan mendidik pengguna secara tidak langsung

Pernyataan Masalah
 Bagaimana mengurangi penyebaran hoaks secara efektif di media sosial, terutama oleh pengguna awam?

Tujuan
 Mengembangkan sistem filter AI untuk membantu pengguna untuk menyaring informasi hoaks sebelum membagikannya

Sorotan Inovasi
 Penerapan filter real-time yang menilai kredibilitas konten sebelum dibagikan oleh pengguna

Nama Pemimpin
 Rifqi Hasyim Dalimunthe

Anggota Proyek:

1. Dr. Arif Ridho Lubis, B. IT., M.Sc.IT
2. Dr. Ferry Fachrizal, S.T., M.Kom
3. Ulfa Hasnita

Lembaga
 Politeknik Negeri Medan (Polmed)



SARING SEBELUM SHARING



BUZZERS ON SOCIAL MEDIA

**Cut Melinda¹, Dr. Ir. Idham Kamil², S.T., M.T, Agus Edy Rangkuti,
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Abstract

In the contemporary digital era, social media has emerged as the principal arena for shaping—and often polarizing—public opinion. A significant driver of this phenomenon is the proliferation of buzzers: individuals or accounts that are financially compensated or strategically coordinated to propagate specific narratives. While buzzers can serve constructive purposes, such as disseminating positive information, raising public awareness, and enhancing brand visibility, their activities also raise critical ethical concerns, including the spread of misinformation and the manipulation of public perception. This study evaluates the dual impact of buzzer activity on social media, examining its implications for media integrity and digital democracy. Employing a qualitative-descriptive methodology, the research analyzes secondary data from authoritative sources, including the PPIM UIN Jakarta Report (2024), the Cheq.ai Cybersecurity Report (2024), and the Morning Consult Survey (2024). Key findings reveal that political buzzer engagement has become a lucrative economic opportunity for Indonesian youth, with monthly earnings ranging from IDR 2 million to 3.5 million. However, fraudulent engagement orchestrated by buzzer networks contributes to global economic losses of approximately \$1.3 billion annually due to misallocated advertising expenditures. Furthermore, 58% of Generation Z consumers have purchased products based on buzzer endorsements, often unaware that these promotions were paid. The novelty of this study lies in its conceptualization of buzzers not merely as instruments of digital communication but as influential social actors capable of either reinforcing or eroding democratic values, contingent upon regulatory oversight. In conclusion, while buzzer activity harbors both beneficial and detrimental potential, its responsible governance necessitates comprehensive digital literacy initiatives and stringent regulatory frameworks. Such measures are essential to ensuring that buzzer practices align with the public interest while mitigating societal harm.

Keyword: Social Media, Buzzers, Digital Literacy, Public Opinion.

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION



PROS

- ➕ Dissemination of Positive Information
- ➕ Raising Public Awareness
- ➕ Mobilizing Support
- ➕ Enhancing Branding
- ➕ Encouraging Public Participation

CONS

- ➖ Erosion of Authentic Public Discourse
- ➖ Propagation of Misinformation and Manipulation
- ➖ Ethical and Legal Concerns
- ➖ Amplification of Social Division
- ➖ Exploitation of Public Sentiment
- ➖ Degradation of Media Integrity

DID YOU KNOW...?

- Being a political buzzer can be an economic opportunity for young individuals in Indonesia, with reported monthly earnings ranging from IDR 2 million to 3.5 million. (PPIM UIN Jakarta, Sep 2024)
- Fake engagement from buzzer networks costs businesses \$1.3 billion annually in wasted ad spend (Cheq.ai 2024 Cybersecurity Report)
- 58% of Gen Z have purchased products based on buzzer recommendations without realizing it was paid promotion (Morning Consult 2024 Survey)

BUZZERS

ON SOCIAL MEDIA

Recently, social media has emerged as the primary arena for polarizing public opinion. However, the use of buzzers—accounts that are compensated or orchestrated to propagate specific narratives—has sparked ethical debates within digital communication. These actors play a significant role in influencing public perceptions across various domains, including social, political, and economic issues.

The use of buzzers on social media presents a dichotomy of effects. On one hand, they serve as effective instruments for rapid information dissemination and heightened user engagement. On the other hand, in the absence of proper oversight, they risk evolving into vehicles for large-scale manipulation, potentially eroding democratic foundations.



CONCLUSION

To mitigate these risks, it is imperative to implement robust regulatory frameworks alongside comprehensive digital literacy initiatives for the public. Such measures will ensure that the benefits of buzzer activities are harnessed responsibly while minimizing their potential for harm.

OPTIMIZING TIME ACCURACY IN SPORTS USING SESWAR (SENSOR STOP WATCH RUSH)

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Abstract

SENSOR STOP WATCH RUSH (SeSWaR) is an automatic stopwatch system based on the Arduino Uno, developed using the E18-D80NK NPN infrared sensor to enable non-contact obstacle detection. This project was initiated in response to the need for a more efficient, accurate, and touchless time measurement system, particularly for mini racing events, laboratory experiments, and educational applications. The primary problem addressed is the inaccuracy and inefficiency of conventional manual stopwatch systems, which rely on physical button pressing that can lead to inconsistent and unreliable timing results. To solve this issue, the project employed a prototyping approach, integrating Arduino components, an IR sensor, buzzer, and LCD display, followed by a series of real-environment test runs to ensure functionality and accuracy. Findings indicate that SeSWaR provides faster and more stable time readings, significantly reducing human error. Additionally, the system uses modulated infrared technology to minimize interference from ambient light, including sunlight, thereby increasing detection precision and usability across various environments. In conclusion, SeSWaR successfully overcomes the limitations of traditional stopwatch systems through a practical and cost-effective design, making it an ideal solution for education-related projects and lightweight industrial applications. As a recommendation for future improvement, the system may be enhanced with IoT connectivity and automated data storage, allowing for real-time performance analysis and integration with mobile platforms for extended usability.

Keyword: Arduino, Infrared Sensor, E18-D80NK, Automatic Stopwatch, Non-Contact Detection, Educational Innovation

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

SENSOR STOP WATCH RUSH (SESWAR)

KOLEJ KOMUNITI JEMPOL



1. Introduction/Background

The E3F-DS10C4 is a Diffuse Reflection Infrared Switch sensor that detects objects at a distance of up to 10 cm.

It operates within a DC voltage range of 6–36V and utilizes an NPN Normally Open (NO) output.

This sensor is ideal for automatic object detection applications, including timer-based systems.



5. Significant of the Study

This project focuses on the development of an automatic timing system using an infrared sensor (E3F-DS10C4) and Arduino Uno to detect objects and measure elapsed time automatically, accurately, and without manual input.

The innovation significantly improves efficiency and reduces human error in time measurement.

The integration of non-contact sensing technology with programmable microcontroller logic enables hands-free operation, making it suitable for sports, educational experiments, and precision-based industrial applications.

2. Problem Statement

The objective of this project is to develop an automated timer system using Arduino Uno and the E3F-DS10C4 sensor,

capable of measuring time with high accuracy without manual input, and to evaluate its performance across various applications.



6. Innovation Highlight

An automatic timer system using infrared sensor (E3F-DS10C4) and Arduino Uno to detect objects and measure time accurately without manual input.

Improves efficiency and minimizes human error in time-based activities.



3. Objectives

1. To design and develop an automatic stopwatch system using Arduino Uno and E3F-DS10C4 infrared sensor.
2. To enhance timing accuracy without manual input by implementing a fully automated system.
3. To integrate an infrared object detection sensor that triggers the start and stop of the timer.

7. Commercial Values (if Any)

This product has strong commercialization potential in the sports, education, and automation industries as it offers an automated, accurate, and low-cost timing system.

By utilizing easily available infrared sensors and user-friendly components such as Arduino, the system can be produced economically and maintained with minimal effort.

It is suitable for widespread use in schools, laboratories, sports training centers, gymnasiums, and even in industrial settings where precise time measurement and control are required.

4. Materials/Method

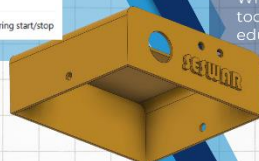
The following components and tools were used to develop the SESWAR system:

No.	Component/Material	Description
1	Arduino Uno	Microcontroller to control input and output logic
2	E3F-DS10C4 IR Sensor	Infrared proximity sensor to detect object motion
3	16x2 I2C LCD Display	To display real-time timing and system status
4	Active Buzzer	Provides audio notification during start/stop

8. Conclusion

This project successfully developed an automatic stopwatch system using Arduino Uno and the infrared sensor. The system accurately detects object movement and triggers the timer to start and stop without any manual input.

It offers a low-cost, user-friendly, and effective solution for various applications including sports, laboratory experiments, and training simulations. With potential use as a teaching aid or performance monitoring tool, SESWAR stands out as an innovation well-suited to current educational and technical demands.



APLIKASI INOVASI EZ TRAINER

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Abstract

The effective learning and teaching process between teachers and students can be improved with the use of Teaching Aids Tools (TAT) and Teaching Aids Material (TAM). TAT is effective when it is used as a simple facilitation tool that can attract interest, is easy to use and understand also can improve user performance. A more planned, organized and effective elective PdP process requires appropriate teaching aids with current technology. Face-to-face learning time in the classroom can be optimized with reinforcement activities while supporting the empowerment of student-centered learning. There are also students who do not understand how to connect circuits in a breadboard. In addition, components such as resistor is small-sized make it difficult to see. Another problem is that the position of ammeters and voltmeters is not fixed and requires crocodile clip connections, often not connected in the circuit. The use of EZ Trainer is hoped to have a positive impact on the PdP process as an alternative to conventional methods. EZ Trainer can also facilitate the teaching process, especially for Electrical Technology courses. EZ Trainer as a new era learning medium in line with current technological developments through a practical approach. EZ Trainer is practical and has the potential to be commercialized for widespread use in the education sector.

Keyword: Trainer, Teaching Aids Tools, series-parallel circuits



APLIKASI INOVASI EZ TRAINER



Rahayu Binti Jonit



Fadzlida Binti Shamsudin



Norlie Yuzzana Ibrahim

1 Introduction/Background

ABM yang berkesan bila ianya dijadikan sebagai alat pemudahcara ringkas yang dapat menarik minat, mudah dalam penggunaannya dan difahami serta dapat meningkatkan prestasi pengguna. Proses PdP yang elektif lebih terancang, teratur dan berkesan memerlukan alat bantu mengajar berteknologi semasa yang bersesuaian.

2 Problem Statement

- pelajar tidak memahami konsep penyambungan litar siri-selari
- pelajar tidak dapat bayangan litar yang sebenar
- pelajar tidak faham penyambungan litar di dalam breadboard
- komponen bersaiz kecil menyukarkan
- ammeter & voltmeter tidak tetap



3 Objectives

- Membangunkan sebuah kit untuk litar siri selari supaya sapat memudahkan proses amali Electrical Technology.
- Mengenalpasti tahap keberkesanan penggunaan EZ Trainer, sebagai alat bantu mengajar.



4 Materials

- variable reseator
- Lucite
- Perspex
- Acrylic
- banana Plugs
- Female



5 Significant of the Study

- Meningkatkan Kefahaman Pelajar
Pengalaman PnP secara hands-on mampu meningkatkan kefahaman pelajar terhadap teori yang telah dipelajari dalam bilik kuliah.
- Menyokong Proses Pengajaran Pensyarah
Penggunaan Ez Trainer membantu pensyarah dalam PnP dengan lebih berstruktur, berkesan serta menjadikan PnP menarik & interaktif.

6 Innovation Highlight

- RekaBentuk Modular
Komponen mudah disambung
- Ciri Pencegahan Ralat
mengelakkan belaku litar pintas
- Antaramuka Mesra Pengguna
terminal berwarna dan label jelas
- Rekabentuk kompak tahan lasak sesuai bagi makmal atau pengajaran bergerak



7 Commercial Values

- Rekabentuk Ringkas
mudah, selamat digunakan serta ruang simpan yang kecil
- Proses Pemasangan Minimum & Mesra
Pengguna, pemasangan dilakukan secara manual dengan masa penyambungan litar yang minimum.
- Lebih Ekonomi
Penggunaan bahan dan komponen yang ekonomi serta mudah diperolehi.



8 Conclusion

- penggunaan EZ Trainer dapat memberi impak positif kepada proses PdP sebagai alternatif selain kaedah konvensional.
- memudahkan pengajaran terutama kursus Teknologi Elektrik.
- satu medium pembelajaran era bahru sejajar perkembangan teknologi kini melalui pendekatan amali.
- praktikal dan berpotensi di komersialkan untuk kegunaan meluas dalam sektor pendidikan.



LPG GAS LEAK SENSOR SYSTEM WITH HUMAN IMAGE DETECTION CAPABILITY BASED ON CLOUD SERVER AND MICROCONTROLLER

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Abstract

The appearance of the ESP32-CAM now adds to the diversity of previously existing microcontroller variants. ESP32-CAM was a microcontroller that has features such as Bluetooth, WiFi, camera, and even a micro SD slot. The feature can be activated when there is a command. This was accommodated by a program embedded in its microcontroller. So it can be developed based on the desired needs. One of the ESP32-Cam developments that has been realized is an LPG gas leak sensor system with human image detection capabilities based on a cloud server and microcontroller. This system is capable of detecting LPG gas leaks while also being able to visually see the surrounding conditions and detect the presence of human objects. This system consists of a device in the user and server. The device in the user is assembled into one part using the MQ-2 module as an LPG gas sensor that connected to the ESP32-CAM microcontroller as an image capturer via the ADS1115 I2C module. For the device on the server uses a rented cloud server like a virtual private server (VPS) equipped with a Public IP, Ubuntu Server operating system and Node- Red application. This functions is as a deliver of information via a website for users in the form of a display of gas sensor data and image captures that are stored when a human object is detected. The connection between the user's device and the server uses MIFI (modem internet wifi). In general, the process that occurs begins with analog signal generated by the MQ-2 module which will be converted to digital signal by the ADS1115 I2C module and then forwarded to the ESP32-Cam and at that time the image capture is done. So that the ESP32-Cam accommodates numeric data from the gas sensor and image data from the ESP32-Cam's built-in camera. Then the ESP32-Cam's built-in wifi will connect to the MIFI SSID that has been set. Because it is connected, that data are sent to the server via websocket. Websocket activation is carried out by Node-Red and assisted by the tensorflow framework as a human object detection engine. What can be concluded in this study is the use of a VPS in the process of object human detection (in this case tensorflow) can be done and requires an average time of 76 seconds. In addition, the image of the detection results is stored on the server and can be viewed again. The future plan is to complete the system that is able to record and detect human objects with live video streaming and the results can be accessed via the website. And the camera is equipped with infrared lighting so that it can capture objects clearly at night.

Keyword: Microcontroller, Data, Module, Detection, Server



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

SISTEM SENSOR KOBOCORAN GAS LPG BERKEMAMPUAN DETEKSI CITRA MANUSIA BERBASIS CLOUD SERVER DAN MIKROKONTROLER

Julham, ST., M.Kom; Hikmah Adwin Adam, S.Kom, M.Kom

Latar Belakang

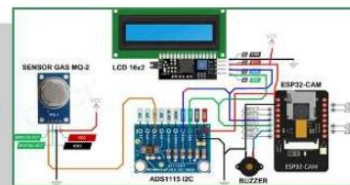
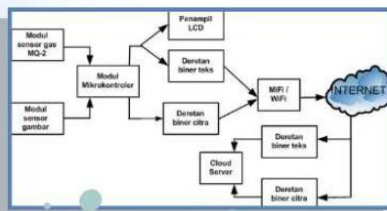
Kehadiran ESP32-CAM sekarang ini menambah keberagaman dari varian-varian mikrokontroler yang sudah ada sebelumnya. ESP32-CAM merupakan salah satu mikrokontroler yang memiliki fitur berupa bluetooth, WiFi, kamera, bahkan sampai ke slot MicroSD. Fitur tersebut dapat diaktifkan ketika ada perintah. Hal tersebut diakomodir oleh suatu program yang ditanamkan ke mikrokontrolemya. Sehingga dapat dikembangkan berdasarkan kebutuhan yang diinginkan.

Rumusan Masalah

Bagaimana data berupa angka dari sensor gas dan data berupa visual gambar dari kamera bawaan mikrokontroler terkirim dan diterima di cloud server yang dilanjutkan dengan proses deteksi citra manusia melalui gambar yang diterimanya.

Tujuan

Mendesain sistem yang berkemampuan untuk mendeteksi kebocoran gas LPG sekaligus mampu melihat visual kondisi sekitarnya serta mendeteksi keberadaan objek manusia



Kesimpulan

Cloud server yang digunakan dalam penelitian ini adalah berupa virtual private server (VPS) dengan ip publik yang terpasang. Kemampuan deteksi objek manusia diolah dengan bantuan framework Tensorflow Lite yang diaktifkan dengan Node Red pada VPS.

ENERGY MANAGEMENT SYSTEM FOR BATTERY CHARGING USING SOLAR PANELS AND GRID ELECTRICITY INTEGRATED WITH THE INTERNET OF THINGS

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Abstract

In an effort to optimize the efficiency and reliability of battery charging, the research aims to develop a battery charging system that utilizes a combination of energy sources from solar panels and Grid Electricity with integrated Internet of Things (IoT) monitoring. The system is designed with the specific target of overcoming dependence on a single energy source that can cause charging instability due to weather fluctuations or unavailability of electrical energy. This research involves designing a system architecture that integrates solar panel components, Grid Electricity, batteries, sensors, and an IoT platform. Sensors are used to monitor voltage, current, and battery in real-time, while a microcontroller controls the charging process based on the data collected. The IoT platform allows continuous monitoring of charging conditions and provides notifications in case of abnormal conditions such as overcharging or overheating. The method used combines hardware and software systems to produce a system that works according to its function. This system is able to increase battery charging efficiency, reduce energy consumption from Grid Electricity during optimal conditions, and ensure stable and safe charging through automatic control so as to make a significant contribution to the use of renewable energy and better energy management through the integration of IoT technology. From the tests that have been carried out, the system can work well as a battery charging energy management system with integrated Internet of Things monitoring.

Keyword: Battery Charging, Internet of Things, Solar Panels, Grid Electricity, Energy Management

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

Energy Management System for Battery Charging Using Solar Panels and Grid Electricity Integrated with the Internet of Things

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1 Introduction

In an effort to optimize the efficiency and reliability of battery charging, this study aims to develop a battery charging system that utilizes a combination of energy sources from solar panels and grid electricity, with monitoring integrated through the Internet of Things (IoT). The system is designed to overcome dependency on a single energy source, which can lead to charging instability due to weather fluctuations or power outages. The system architecture includes solar panels, grid power, batteries, sensors, a microcontroller, and an IoT platform. Sensors monitor battery voltage, current, and temperature in real-time, while the microcontroller controls the charging process based on the collected data. The IoT platform enables continuous monitoring and sends notifications in the event of abnormal conditions. This system integrates hardware and software components to enhance charging efficiency, reduce reliance on grid electricity, and ensure stable and safe operation through automated control.

2 Problem Statement

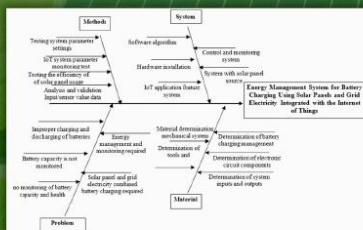
This research addresses the design of a system that combines two energy sources, namely solar panels and grid electricity, and examines the effectiveness of energy management in determining the optimal combination of these sources based on power availability for battery charging. In addition, this study explores the application of real-time IoT-based monitoring to accurately track battery parameters such as voltage, current, capacity, state of charge, temperature, and voltage from solar panels and grid electricity, including notifications for abnormal conditions. The study also investigates efforts to improve battery charging efficiency and reliability through optimal energy utilization, as well as the design of effective user interfaces for system monitoring and control.

3 Objectives

The objective of this study is to design an energy management system for battery charging with integrated Internet of Things (IoT) monitoring, combining two energy sources, namely solar panels and grid electricity. This research also aims to evaluate the effectiveness of energy management in determining the optimal combination of sources based on power availability, implement real-time monitoring to accurately track battery parameters, and provide notifications for abnormal conditions. Furthermore, the study examines improvements in charging efficiency and reliability through energy optimization, as well as the design of an effective user interface for system monitoring and control.

4 Method

This research method combines hardware and software design, as illustrated in the fishbone diagram.

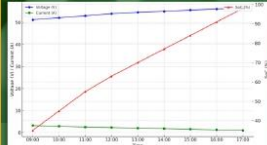


5 Process and Results

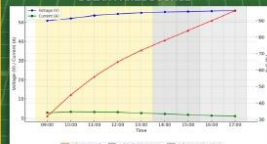
This research includes four tests: battery charging management using grid electricity and solar power, battery cut-off system testing, and battery charging monitoring integrated with the Internet of Things. The research process is illustrated in the block diagram below.

RESEARCH TESTING RESULTS

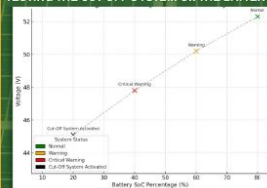
BATTERY CHARGING MANAGEMENT TESTING USING GRID ELECTRICITY



BATTERY CHARGING MANAGEMENT TESTING USING SOLAR PANEL SOURCE



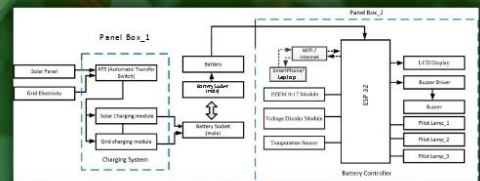
TESTING THE CUT-OFF SYSTEM ON THE BATTERY



RESEARCH RESULT INNOVATION



RESEARCH PROCESS



6 Significant of the Study

This research is essential for developing an efficient, reliable, and sustainable energy management system by integrating solar panels and grid electricity with IoT-based monitoring. The system optimizes the use of renewable energy, reduces dependence on grid electricity, and enhances battery charging reliability through real-time supervision and automated management. IoT integration enables remote monitoring and control, making the system adaptive to fluctuations in energy sources. This study is relevant for implementing renewable energy at a small scale, such as in households and schools, and supports the transition toward smarter and more environmentally friendly energy systems.

7 Innovation Highlight

This research presents an innovation in battery charging energy management systems by integrating renewable energy sources with Internet of Things (IoT) technology. The system is designed as a hybrid charging solution that combines solar panels and electricity from the public power grid to enhance reliability and flexibility. IoT-based real-time monitoring enables accurate and remote observation of battery parameters. Charging is automatically controlled by a microcontroller based on sensor data, ensuring system efficiency and safety. Additionally, the system includes early detection and notification of abnormal conditions and is developed through the synergy of hardware and software. This innovation supports a smarter, more adaptive, and sustainable adoption of renewable energy.

8 Commercial Values

This battery charging energy management system holds strong commercial potential by offering an energy-efficient solution through the use of solar panels and reduced reliance on the general power grid. The integration of IoT and real-time monitoring positions it as a marketable smart energy controller product. Its scalable design allows for mass production, with flexible applications in households, integrated farming, and public facilities. With features such as automation, energy efficiency, and remote monitoring, the system is competitive in the smart energy market and offers cost savings for users.

9 Conclusion

This study concludes that the implementation of an IoT-based energy management system enhances the efficiency of battery charging. The system optimizes power usage, enables real-time monitoring of key parameters, and provides early detection of potential issues such as overcharging and overheating. Remote control features improve energy management flexibility, while integration with renewable energy sources supports cost efficiency and environmental sustainability.

MULTI-HEAD AXIS PRO (M-HAP) ENGRAVER MACHINE

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Abstract

The Multi-Head Axis Pro (M-HAP) engraver is an advanced dual head laser engraving, and drawing system designed to revolutionize precision manufacturing, creative fabrication, and STEM education (focused on souvenir keychain engraving). Unlike conventional single head laser engravers, which are limited by slow production speeds and inability to do engraving simultaneously, the M-HAP integrates two independently controlled laser units, alongside with an interchangeable drawing tool attachment (compatible with markers, pens, or pencils), enabling simultaneous engraving, cutting, or sketching on two separate souvenir keychains. The system leverages a high-performance dithering algorithm embedded within LaserGRBL firmware, augmented by AI driven image optimization, to convert intricate designs into precise G-code instructions for flawless execution on materials ranging from wood, acrylic, and leather to metals and glass. This software adaptation ensures detailing, gradient shading, and adaptive power control. Beyond speed and precision, the M-HAP prioritizes accessibility and scalability. Its modular design allows users to swap between lasers and drawing tools, making it ideal for small businesses, makerspaces, and educational labs, with cost effective, and multi-functional solutions. By reducing production time for batch orders, the machine empowers entrepreneurs and educators, bridging the gap between industrial grade technology and grassroots innovation. Furthermore, its open-source firmware and compatibility with standard design software (Inkscape, LightBurn) encourage hands on STEM learning, fostering technical proficiency in automation, and material science. With its compact design, and high accuracy, the M-HAP redefines affordability in digital fabrication, unlocking new possibilities for creators, engineers, students, and for small entrepreneurs.

Keyword: Laser Engraving, Souvenir Keychain, LaserGRBL, Image Optimization



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

Multi-Head Axis Pro (M-Hap) Engraver Machine

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INTRODUCTION

- Engraving with a single laser can be time-consuming, especially when dealing with high volume order, these could lead to bottlenecks in the workflow.
- No machine in the market that integrates both engraving and drawing capabilities in a single device.

OBJECTIVES

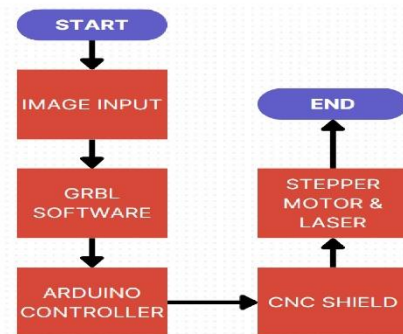
- Become the first laser engraving machine exist in the wood keychain souvenir industry running in dual head mode.
- Increase productivity in the wood keychain souvenir industry by twice the production in half the time by running dual head laser engraving simultaneously.
- Integrates both engraving and drawing capabilities in a single device.

COMPONENTS

- Arduino Uno board
- CNC shield & A4988
- Laser module
- Stepper motor
- Servo motor
- Aluminium profile (2020A/2040A)
- Screws and cables



WORKFLOW



ADVANTAGES

- Increased Speed and Throughput
- Enhanced Productivity
- Simultaneous Processing
- Scalability
- Cost Efficiency

COMMUNITY IMPACT

- Increased Production Capacity
- Cost-Effective Production
- Job Creation
- Skilled Employment Opportunities
- Encourages Innovation
- Support for Local Economies

SUSTAINABLE DEVELOPMENT GOALS ELEMENTS



(MYIPO NO)

CRLY2024J00225



ECARETRACK: ELDERLY CARE TRACKER MOBILE APPLICATION FOR ENHANCED ALZHEIMER'S PATIENT MANAGEMENT

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Abstract

Malaysia stands to become an aging nation in 2030, creating critical demand for innovative solutions for caring for the elderly, particularly Alzheimer's patients who require ongoing monitoring and intensive care. This project aims to address serious issues that caregivers at Laman Khaira Aged Care Centre in Putrajaya are facing, where 40 Alzheimer's elderly patients are cared for by a mere 16 nurses and attendants with ineffective paper-based systems for record-keeping. The manual legacy processes create disorganized records, missed appointments, delayed access to medical information, and compromised emergency response functionalities, ultimately compromising care quality and patient safety. The eCareTrack mobile application was developed on Flutter framework with the Dart programming language for the Android platform, supplemented with Supabase for real-time and secure backend data handling. The process was crafted through Agile methodology in six phases: requirement collection, design, development, testing, deployment, and review to ensure ongoing enhancement and user-driven implementation. The software provides extensive capabilities with patient management systems, symptom recording tools, appointment scheduling, medication tracking, health note taking, and emergency contact lookups. Carers and administrators each have separate interfaces, with carers managing day-to-day patient care activities and administrators managing user account administration, patient registration, and system setup. The innovation efficiently translates paper-based procedures into streamlined digital workflows, significantly improving care coordination, reducing operational burdens, and enhancing overall quality of care for Alzheimer patients. eCareTrack has attracted phenomenal accolades with Outstanding Project and Best Project honors at PIEx v17, Silver Award at SPEX 14, Gold Award at ICIIC 2025, and 6th place at DICRATHON 2024, which speaks to its market value and innovative worth. The app is United Nations Sustainable Development Goals-aligned, promoting improved health outcomes (SDG 3), reduction of inequality in access to ageing care (SDG 10), and sustainable caregiving communities (SDG 11). Upcoming updates should include notification capabilities, improved analytics, family portal integration, calendar sync, and enhanced platform support to iOS and web apps for increased reach and effectiveness in Malaysia's growing ageing care market.

Keyword: Elderly Care Management, Mobile Application Development, Alzheimer's Patient Care, Healthcare Technology Innovation, Digital Transformation

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

ELDERLY CARE TRACKER (eCareTrack)

TEAM MEMBERS

SUPERVISOR

CO SUPERVISOR



LIM CHI ZHEN



FATIN FARHANA BINTI ROSZI



AIMAN YUSRIE BIN MD FAIRUL NIZAM



MDM ZURAIDAH BINTI MOHD RAMLY



Ts. NOOR HAYATI BINTI BASAN

INSTITUTION

Politeknik Mersing, Johor
 Politeknik Mersing, Jalan Nitar,
 86800, Mersing Johor.



INTRODUCTION

Elderly Care Tracker is a mobile app that designed to help caregivers and manage the health and well-being of elderly individuals, especially those with memory issues like Alzheimer's.

PROBLEM STATEMENTS

Limited platform that helps caregiver in taking care of the elderly with Alzheimer.

Caregivers struggle to manage symptoms and appointments for elderly care. |

Caregivers lack quick access to emergency contacts in urgent situations.

OBJECTIVES

Design a mobile apps that help caregivers in taking care of elderly health care.

Develop mobile app that can record symptoms, health, and appointment to simplify care.

Add an emergency contact feature for easy access.

INNOVATION HIGHLIGHT



SIGNIFICANCE

Promotes digital health solutions.

Helps caregivers manage elderly care. |

Improves emergency response.

METHODOLOGY & MATERIALS



CONCLUSION

eCareTrack helps caregivers to track health, symptoms, and appointments. It also helps manage and organize elderly care data more easily.

DIGITAL TRANSFORMATION OF E-LEARNING COMMITTEE MANAGEMENT VIA AN INTERACTIVE PORTAL AT POLITEKNIK MELAKA

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Abstract

This innovation project aimed to create a digital one-stop-shop supporting and integrating work of the e-Learning Committee at Politeknik Melaka as they go through their processes (decision-making, organizing, communication, etc.). Previously, communication and coordination were shared through a mixture of memos, email, WhatsApp, and Telegram. Each system/function had its strengths and weaknesses, and inevitably resulted in information being scattered, inefficient tracking, and a generally unorganised effort to manage tasks and processes like booking the Technology Enabled Collaborative Classroom (TECC) rooms and reporting chair damage. With the present need for address of this type of application, an interactive e-learning portal was created using a variety of existing freely available tools (Google Sites, Forms, Drive, etc.) all under the confines of the institution brand as possible. The concept was to simplify committees' processes, provide easier access to information, and provide a central communication help for any type of digital learning resource, and above all, maintain transparency with any variability in outcomes to their learning. The background of the e-learning portal is purely focused on the ease of access to an online booking system, and damage reporting, and shared resources for teaching materials and committee documentation. The new portal is responsive and allows both engaged and general accessibility across devices and levels of knowledge and effectiveness about the digital's created resource materials. A survey was conducted and distributed to 89 lecturers to investigate the portal's effectiveness, to assess the impact of the new e-learning portal innovation project. Participants responded positively to the new portal, with an emphasis on the access to resources, easy booking processes, and organisation for the annual CIDOS Inspiring Learning Awards (eDOLA) competition together. With tracking capability for Key Performance Indicators (KPI's) and occupational engagement devices built it, the need was made possible of centralising all e-Learning digital centre activity and progress.

Keyword: Interactive Portal, Educational Innovation, e-Learning Committee, Digital Learning Management, Technology Integration in Education



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

Digital Transformation of E-Learning Committee Management via an Interactive Portal at Politeknik Melaka

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Introduction/Background

The e-Learning Committee at Politeknik Melaka plays a key role in coordinating digital teaching initiatives. Previously, processes such as communication, documentation, and facility booking were managed using various disconnected tools, leading to inefficiencies and scattered information. Recognizing the need for centralized digital governance, an interactive e-learning portal was proposed and developed.

Problem Statement

Disjointed communication tools (memos, email, WhatsApp, Telegram) and manual room bookings created challenges in tracking, documentation, and transparency, affecting committee performance and information access.

Materials / Method

The portal was built using Google Sites, Forms, and Drive—free tools available through institutional accounts. A user-centered design was applied with responsive layout, integrated forms, and digital repositories. A survey with 89 lecturers was conducted to evaluate effectiveness.

Commercial Values

The system is scalable and adaptable across other departments or institutions using free and accessible digital tools, requiring no specialized hardware or software investment.

Intellectual Properties

Copyright: Laman Portal e-Pembelajaran Politeknik Melaka, CRL Y2025M02804



Market Validation



Conclusion

This portal effectively resolves long-standing administrative challenges, promotes transparency, and supports digital transformation in higher education. Future enhancements include mobile integration and analytics for better insight and continuous improvement.

Objectives

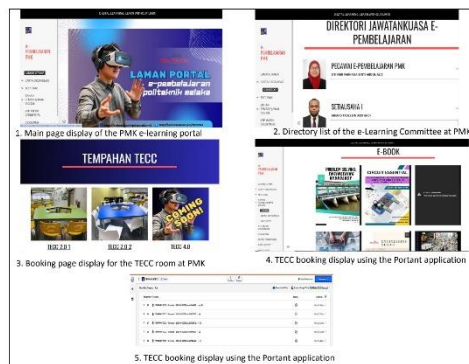
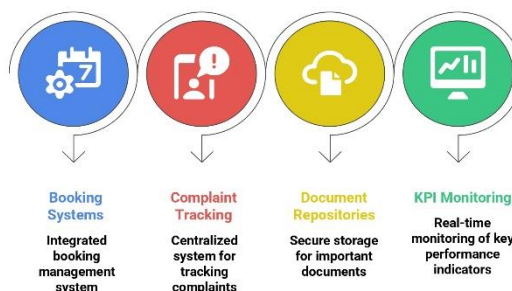
- To streamline e-learning committee workflows
- To centralize access to learning materials and documentation
- To digitize TECC booking and damage reporting
- To increase transparency and user engagement

Significance of the Study

The portal enhances administrative efficiency, simplifies committee operations, and aligns with Malaysia's education digitalization goals. It also empowers staff with easy access to digital tools and structured processes.

Innovation Highlight

Digital Portal Features



SISTEM TEMPAHAN DAN PENYELENGARAAN KENDERAAN

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Abstract

The Politeknik METrO Betong Sarawak (PMBS) has developed the Vehicle Reservation and Maintenance System, which was developed to replace manual processes previously used in managing official vehicle bookings and maintenance. This system aims to improve efficiency, transparency, and operational effectiveness by introducing a structured digital solution that aligns with the institution's administrative needs. The key problem addressed is the inefficiency of traditional methods, which often lead to delays in approval, miscommunication, and lack of proper documentation. We developed a web-based system and hosted it on PMBS's internal server to ensure data security and controlled access. The system allows users to submit vehicle booking requests online, with an approval process involving the Head of Department, Vehicle Officer, and Director. The Vehicle Officer assigns a suitable vehicle and driver based on availability and trip details. Key features include recording odometer readings before and after travel, uploading odometer images, submitting user complaints, and tracking vehicle use. The implementation of this system has shown improved efficiency in managing bookings and maintenance, reduced reliance on paper-based documentation, and enabled more systematic monitoring. It contributes to PMBS's digitalization efforts and has strong potential for replication in other institutions under the Ministry of Higher Education. In conclusion, the system provides a more organized, secure, and efficient approach to institutional vehicle management. Future recommendations include mobile integration, real-time notifications, and predictive maintenance features to enhance usability and scalability.

Keyword: Vehicle Management System, Digital Transformation, Institutional Automation, Maintenance Scheduling, Public Sector Innovation



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

SISTEM TEMPAHAN DAN PENYELENGGARAAN KENDERAAN



PENGENALAN

Pembangunan dan pelaksanaan Sistem Tempahan dan Penyelenggaraan Kenderaan merupakan satu bentuk inovasi digital dalam pengurusan kenderaan jabatan di Politeknik METRO Betong Sarawak (PMBS). Sistem ini dibangunkan bagi menggantikan penggunaan borang manual kepada sistem dalam talian yang lebih efisien serta mengurangkan kos operasi seperti pencetakan dan penyimpanan dokumen fizikal.

OBJEKTIF

- Mempermudahkan pengurusan perjalanan kenderaan melalui sistem dalam talian yang pantas dan efisien.
- Mengurangkan kos operasi dengan mendigitalkan proses tempahan dan penyimpanan data.
- Menyediakan rekod penggunaan dan penyelenggaraan kenderaan secara sistematik dan boleh dilapor.
- Meningkatkan kecekapan pengurusan aset kenderaan secara berpusat dan tersusun.

PERNYATAAN MASALAH



Pengurusan tempahan kenderaan di institusi kerajaan lazimnya dijalankan secara manual menggunakan borang bercetak. Kaedah ini bukan sahaja memerlukan penggunaan sumber fizikal seperti kertas dan dakwat, malah turut melibatkan proses kerja yang memakan masa dan berisiko terhadap kehilangan atau kerosakan dokumen (Jabatan Perkhidmatan Awam Malaysia, 2020). Sejalan dengan perkembangan teknologi digital serta tuntutan kecekapan perkhidmatan awam, terdapat keperluan untuk menukar kaedah tradisional ini kepada pendekatan yang lebih sistematik dan berasaskan teknologi maklumat (Unit Pemodenan Tadbiran dan Perancangan Pengurusan Malaysia [MAMPU], 2021).

KEPENTINGAN KAJIAN

- Proses tempahan, kelulusan, dan penjadualan kenderaan dilakukan secara dalam talian, mempercepatkan urusan dan mengurangkan masa menunggu.
- Mengurangkan penggunaan kertas, cetakan dan penyimpanan dokumen fizikal.
- Penyelenggaraan berkala mengelakkan kos pembaikan tinggi akibat kerosakan besar.
- Data direkod secara sistematik dan boleh dijejak, mengurangkan kesilapan manusia serta memudahkan pemantauan dan audit yang lebih telus.
- Mengurangkan penggunaan kertas dan dakwat, serta membantu kawalan penggunaan bahan api kenderaan yang menyokong amalan mesra alam.



KAEDAH PELAKSANAAN



- Analisis Keperluan Sistem
- Reka Bentuk Sistem
- Pembangunan dan Ujian Sistem
- Pelaksanaan Rasmi dan Latihan
- Pemantauan dan Penambahbaikan

KESIMPULAN

Sistem Tempahan dan Penyelenggaraan Kenderaan PMBS telah menyelesaikan kelemahan proses manual dimana ia mempertingkatkan kecekapan dari segi masa dan sumber, mengurangkan risiko kesilapan manusia dalam menyumbang kepada sistem tadbir urus yang lebih baik serta memperkukuhkan budaya digitalisasi dalam pengurusan institusi.

NILAI KOMERSIAL

- Digitalisasi (modern trend)
- Kos Efektif
- Kandungan mudah diubah mengikut keperluan



AHLI KUMPULAN



WINNE ANAK CHENGAI
 (KETUA) POLITEKNIK METRO BETONG SARAWAK
 IMELDA ANAK RICHARD FUCHAU
 POLITEKNIK METRO BETONG SARAWAK
 ROSSI GUNDIE ANAK JULIUS
 POLITEKNIK METRO BETONG SARAWAK

SOROTAN INOVASI

- Digitalisasi
- Sistem tadbir urus di dalam organisasi
- Sistem Tempahan & Penyelenggaraan Kenderaan





HOSPITALITY

1. RESPEX25-066
NOMAD TABLE
POLITEKNIK METRO BETONG SARAWAK
2. RESPEX25-069
JENGA ESCAPADE
POLITEKNIK METRO BETONG SARAWAK

NOMAD TABLE

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Abstract

The Nomad Table is a multifunctional, portable table designed to enhance outdoor leisure and tourism experiences by addressing the limitations of conventional furniture. In today's experience-driven travel culture, there is a growing demand for compact, functional, and engaging products that promote both convenience and interaction. The Nomad Table meets this need with innovative features such as dual-side storage drawers and an interactive table top with traditional games like Damaji, Chess, and Dam, fostering cultural appreciation and social bonding. This study aimed to assess user perceptions and market viability of the Nomad Table through a quantitative research approach. Data was collected via Google Forms from 120 respondents comprising students, lecturers, and support staff at Politeknik METrO Betong Sarawak, utilizing stratified, random, convenience, and systematic sampling techniques. Findings revealed that the majority of respondents were male students enrolled in Tourism-related programs. Most participants had not previously owned a similar product but expressed strong agreement on the Nomad Table's compactness, ease of setup, portability, multifunctionality, and suitability for outdoor use. The accompanying bag was also well-received, noted for being catchy, unique, versatile, and reasonably priced at RM200. These results indicate a clear alignment between product features and user expectations, affirming the table's potential in the tourism and recreation market. The study implies that integrating cultural elements and practical features into portable furniture enhances user experience and market appeal. Moreover, the positive response from the target demographic supports further development of such innovative products in alignment with sustainable tourism goals. Recommendations for future research include expanding the sample to external user groups, testing product durability in real outdoor environments, adopting eco-friendly materials, exploring modular design elements, and benchmarking against similar products in the market. These steps can help refine the Nomad Table and increase its adaptability for diverse tourism and recreational settings, both locally and internationally.

Keywords: Nomad Table, Portable furniture, Tourism innovation, Multifunctional design, Outdoor recreation.



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION



NOMAD TABLE

POLITEKNIK METRO BETONG SARAWAK

Leader : BOB CALVIN ANAK HENARY
Member : SHIRLYNA SARA BINTI ABDULLAH MOHD SUFFIAN
 BRITNEY INTEK ANAK JUA
 JASMINE EMILLY ANAK BIDAHA



1 BACKGROUND

Designed for modern travelers, students, and outdoor lovers, the Nomad Table combines storage, traditional games (Damaji, Chess, Dam), and portability. Lightweight, compact, and culturally engaging—perfect for parks, beaches, and campsites.

2 OBJECTIVES

To assess the market acceptance and user satisfaction of the Nomad Table among young tourism students and recreational users, focusing on features such as portability, multifunctionality, and design appeal.

To determine the potential of the Nomad Table in supporting meaningful leisure and tourism experiences through culturally integrated, interactive, and travel-friendly design elements.

3 PROBLEM STATEMENT

In response to the demand for portable, multifunctional, and culturally engaging furniture, the Nomad Table offers a smart solution. Designed for tourists, students, and digital nomads, it features storage drawers, traditional games, lighting, and cultural motifs—all in a compact, durable, and travel-friendly design. Ideal for parks, beaches, and campsites, it enhances comfort, interaction, and cultural appreciation on the go.

4 MATERIALS / METHOD

Our development process includes market research, design planning, material selection, and testing. The table is designed for portability, durability, and user comfort—featuring foldable parts, built-in storage, and weather-resistant materials. Every component is evaluated for strength, ease of use, and performance in outdoor settings to ensure a reliable and engaging recreational experience.

5 NOMAD TABLE HIGHLIGHTS

The Nomad Table is an all-in-one portable solution that merges dining, workspace, and gaming with unique features like a Pua Kumbu-inspired design, built-in traditional board games, a dual-function chair-shovel, and durable, weather-resistant materials—offering both cultural value and multifunctional outdoor utility.

5 COMMERCIAL VALUES

The Nomad Table meets high market demand for multifunctional, portable, and stylish outdoor furniture. With built-in games, storage, and cultural design, it appeals to tourists, students, and digital nomads. Its unique features and eco-friendly materials offer strong retail value and branding potential in the growing travel and leisure market.

6 CONCLUSION

The Nomad Table showcases how innovation in design can enhance tourism experiences by combining functionality, cultural value, and sustainability. Its multifunctional features meet the needs of modern travelers and outdoor enthusiasts, while promoting cultural appreciation and eco-tourism. With strong potential for market growth, future development should focus on broader testing, modular enhancements, and sustainable materials to further strengthen its appeal and impact in the tourism sector.

Product ID : Respex25-066

JENGA ESCAPADES

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 Aiyani Syazwani Mohd Zairie⁴, Alexson Lerry Johnny⁵

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Abstract

This study presents the development and evaluation of *Jenga Escapades*, an educational tool creatively adapted from the traditional Jenga game, aimed at increasing tourism awareness in Sarawak students in Politeknik METrO Betong Sarawak. Despite the state's rich cultural heritage, natural beauty, and its potential as a top tourism destination, promotional efforts remain limited, especially among the younger generation. Various current tourism campaigns lack interactive and engaging methods capable of effectively capturing the interest of youth and educational communities. Hence, *Jenga Escapades* addresses this issue by incorporating tourism-related content into a familiar and enjoyable game format, making learning about local attractions more accessible and memorable. Each game block is labelled with questions or facts related to Sarawak's tourism hotspots, thus transforming a recreational activity into an interactive learning experience. The study involved 147 respondents, comprised of students and staff of Politeknik METrO Betong Sarawak (PMBS), who evaluated the product based on design, durability, content, engagement, and promotional potential. The findings indicate positive feedback across all aspects, with respondents commending its creativity and effectiveness in promoting tourism knowledge. Additionally, social media has been identified as a powerful tool to enhance visibility and outreach. The study concludes that *Jenga Escapades* has strong potential as an innovative and impactful educational medium. Future recommendations include enhancing packaging design, expanding game content, and exploring digital integration to further increase engagement and long-term learning outcomes.

Keywords: Educational Game, Tourism Awareness, Interactive Learning, Sarawak Tourism



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT

JENGA ESCAPADES



INTRODUCTION

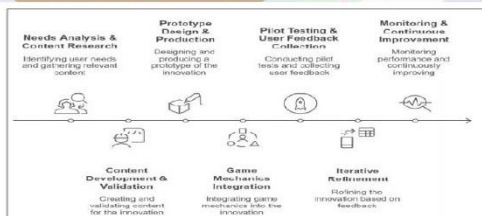
Jenga Escapades is an educational game inspired by the classic Jenga, designed to teach facts and trivia about Sarawak's Tourism. It transform traditional learning into a dynamic and participatory experience, increasing Tourism awareness among students of Politeknik METRO Betong Sarawak. This innovations addresses the gap in localized, culturally relevant Tourism education tools and aims to enhance appreciation for Sarawak's Tourism assets through interactive learning.



OBJECTIVE

- To increase tourism awareness among students PMBS
- To develop an innovative Jenga-based product that promotes tourism in Sarawak

PROCESS / METHODS



CONCLUSION

Jenga Escapades innovatively boosts Sarawak tourism awareness through interactive learning. It effectively engages users with fun, localized educational content, addressing a gap in current promotion tools for younger audiences. Its success suggests strong potential for widespread use in education and tourism promotion.

PROBLEM STATEMENT



Despite Sarawak's rich cultural heritage and natural beauty, current tourism promotional tools often fail to connect with younger audiences in engaging ways, limiting their awareness and knowledge of the region's tourism offerings. Existing tourism education tools often lack interactivity and fail to actively engage students, thereby limiting their effectiveness. Furthermore, there is limited research on how physical games like Jenga can be adapted as learning media for regional tourism promotion.

INNOVATION HIGHLIGHT

- Educational Gamification
- Tourism Themed Game Blocks
- Localised content
- Interactive Learning
- Dual Functionality
- Portability and Durability
- Cost-Effective and Sustainable



COMMERCIAL VALUE


- Wide market appeal: Appeals broadly to schools, tourism groups and families, serving as both educational tools and a promotional item.
- Cost-Effective Production: Low production cost per unit (Rm30-Rm50) make mass production and wide distribution feasible.
- high Scalability & Adaptability: Content can be easily customised.
- Align with Modern trends: fits well with current "edutainment" and experiential marketing trends.



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NOR KHAIRUNNISA BINTI JAMALI
ALEXSON LERRY ANAK JOHNNY
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DEPARTMENT OF TOURISM AND HOSPITALITY





06 MECHANICAL ENGINEERING & AUTOMOTIVE

1. RESPEX25-006
VEHICLE CABIN CARBON MONOXIDE DETECTOR
POLITEKNIK PORT DICKSON
2. RESPEX25-008
ALAT BANTU MENGAJAR (ABM) SISTEM STERENG KUASA HIDRAULI
POLITEKNIK PORT DICKSON
3. RESPEX25-012
REAL-TIME WEATHER MONITORING & PLC-BASED DECISION
POLITEKNIK MUADZAM SHAH, PAHANG
4. RESPEX25-078
BIODIESEL PRODUCTION TOOL THROUGH ESTERIFICATION AND
TRANSESTERIFICATION PROCESS USING AIR HEATING SYSTEM
POLITEKNIK NEGERI MEDAN

VEHICLE CABIN CARBON MONOXIDE DETECTOR

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Abstract

This project is applied from observations based on the case of death involving three pharmacy students aged 21 that resulted from carbon monoxide poisoning in George Town, Malaysia on September 17, 2020. The objective of this project is to design a system that is able to detect the presence of carbon monoxide gas in the vehicle in addition to issuing warnings to drivers and passengers. All of these are set to prevent the driver and passengers of the vehicle from being poisoned by the dangerous gas and can improve the safety and comfort of both the driver and passengers. The components used for this project also need to have special characteristics that are able to detect and distinguish types of gas such as carbon monoxide gas, based on the literature study conducted, the MQ-7 sensor is the most suitable type of sensor to use. While for the selection process of other components such as the type of programmer used, methodological studies are used to plan the project production process by using flow charts as a guide for project production planning and testing. As a result, this entire project was successfully produced to deal with the problem of the presence of carbon monoxide gas in the vehicle cabin. Based on the results of the analysis and discussions that have been carried out, it can be concluded that this Vehicle Cabin Carbon Monoxide Detector has achieved the objectives that have been discussed.

Keywords: Cabin Carbon Monoxide Detector, Safety, MQ-7 Sensor



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION CABIN CARBON MONOXIDE DETECTOR



RESPEX25-006



06DAD22F1057



06DAD22F1061



06DAD22F1051



06DAD22F1090

SUPERVISOR

CODING TEAM

DESIGNING TEAM

Introduction

Carbon monoxide is a deadly gas that can cause symptoms like headache, dizziness, and fatigue. It's found in vehicle exhaust and can build up in enclosed spaces. Early detection is key.

Target Customer

- Individual cars that do not come with carbon monoxide detection safety system

Problem Statement

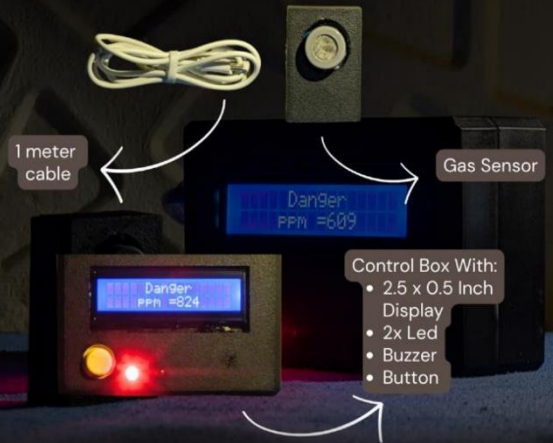
Four victims were involved in carbon monoxide poisoning while sleeping inside a vehicle. 3 died while 1 was critical.

Objective

- To build a safety system that able to detect the presence of carbon monoxide inside the vehicle cabin
- To warn the passengers of the vehicle with the presence of carbon monoxide

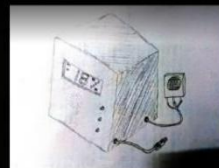


WHAT'S IN THE BOX

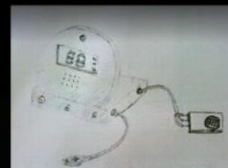


FINDINGS

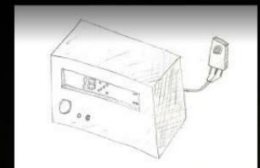
Proposal	Advantages	Disadvantages
Proposal Design 1	a) Stable b) Does not prevent the entry of air conditioning c) 'Plug and Play' concept	a) Heavy b) Bigger size c) Height design d) Obstruct the driver's vision e) Not durable
Proposal Design 2	a) Unique Design b) Light c) 'Plug and Play' concept d) Small size	a) Prevent the entry of air conditioning b) Height design c) Hard to design d) Not Stable e) Not durable
Proposal Design 3	a) Stable b) Does not prevent the entry of air conditioning c) Light d) 'Plug and Play' concept e) Small size f) Short design	a) Not durable



DESIGN 1

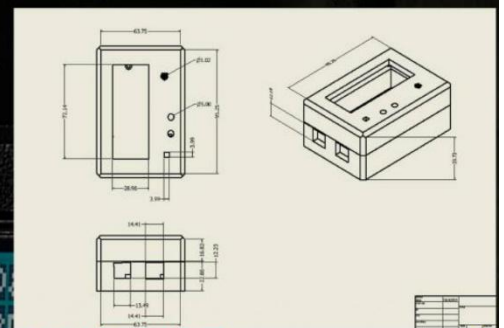


DESIGN 2



DESIGN 3

CONSIDERING THE OVERALL PERFORMANCE AND BALANCE OF ASPECTS, DESIGN PROPOSAL 3 IS RECOMMENDED AS THE PREFERRED OPTION. IT OFFERS A STRONG COMBINATION OF STABILITY, COMMERCIAL APPEAL, READABILITY, AND CONVENIENCE FOR THE DRIVER, WHILE MAINTAINING A REASONABLE COST OF MATERIAL.



No.	Aspect	Design Proposal 1	Design Proposal 2	Design Proposal 3
1	Stability	4	3	4
2	Commercial Design	2	4	4
3	Cost of Material	3	1	4
4	Convenience For the Driver	2	3	4
5	Ability to Read	4	4	4
	Total	15	15	20

NOTE: SCALE (1) REPRESENTS VERY DISSATISFIED, SCALE (2) DISSATISFIED, SCALE (3) SATISFIED, SCALE (4) VERY SATISFIED

ALAT BANTU MENGAJAR (ABM) SISTEM STERENG KUASA HIDRAULIK

Ab Hakim bin Ab Halim ¹, Mohd Nahar bin Ahmad ², Raja Noorzihan bin Raja Ab
 Kadir ³

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Abstract

Teaching and learning in automotive engineering demand effective strategies, particularly for complex technical topics such as hydraulic power steering systems, which are often difficult to grasp through theory alone. In response, a Teaching Aid (ABM) for the Hydraulic Power Steering System was developed to enhance instructional delivery for the DJA42012 – Mobile Hydraulic subject, undertaken by Semester 5 students in the Diploma in Mechanical Engineering (Automotive) programme at Polytechnic Port Dickson. The ABM was constructed using actual hydraulic steering components, including a pump, rack and pinion, and fluid reservoir, integrated with an electric motor and variable speed control to simulate engine operation. This design enables instructors to demonstrate real-world scenarios safely, while students engage in hands-on activities such as pressure measurement, flow observation, and component function analysis in a visual and interactive manner. Implementation outcomes indicate that the ABM significantly improved students' conceptual understanding, promoted active engagement, and strengthened experiential learning. Its low development cost, modular construction, and long-term usability make it a practical and effective teaching innovation. Furthermore, the project exemplifies the lecturer's commitment to continuous improvement in line with academic excellence and pedagogical innovation criteria.

Keyword: Teaching Aid, Steering, Hydraulic, Teaching and Learning



KEMENTERIAN PENDIDIKAN TINGGI
 JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI



ABM SISTEM STERENG KUASA HIDRAULIK

Ab. Hakim | Mohd Nahar | Raja Noorzihan

PENGENALAN

PENYATAAN MASALAH

- Teori sukar difahami tanpa alat sebenar.
- Media kurang interaktif.
- Prestasi pelajar menurun.

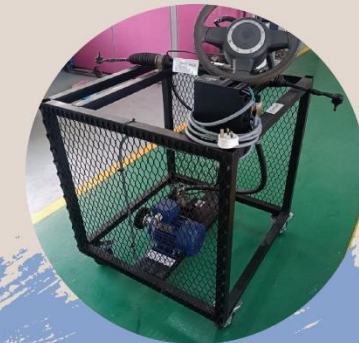
OBJEKTIF

- Hasilkan ABM untuk DJA42012 - Mobile Hydraulics.
- Memudahkan kerja amali.



KAEDAH KAJIAN

- Kajian keperluan.
- Rekabentuk.
- Pemilihan bahan.
- Fabrikasi.
- Pengujian.



HASIL DAPATAN

KESIMPULAN

- Memberikan pemahaman yang mendalam tentang cara sistem ini berfungsi dalam kenderaan.
- Memudahkan proses PdP - Pensyarah dapat memberi penerangan dengan lebih jelas dan pelajar dapat memahami sistem stereng kuasa hidraulik ini dengan lebih baik.
- Kerja amali DJA42012 - Mobile Hidraulics dapat dijalankan dengan lebih berkesan.

REKOMENDASI

- Tambah baik ABM dengan elemen interaktif digital. Sebagai contoh, integrasi sistem sensor dan paparan digital yang lebih canggih.
- Menyediakan panduan pengajaran komprehensif dan modul pembelajaran berpandu untuk pensyarah menggunakan ABM.

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REAL-TIME WEATHER MONITORING AND PLC BASED DECISION

Faris Irfan Bin Saiful Anuar^{1,2}, Gan Lian Zhe²,
Muhammad Adam Hakimi Bin Abd Hamid³

¹ Department of Mechanical Engineering, Politeknik Muadzam Shah,
Pahang Malaysia

Abstract

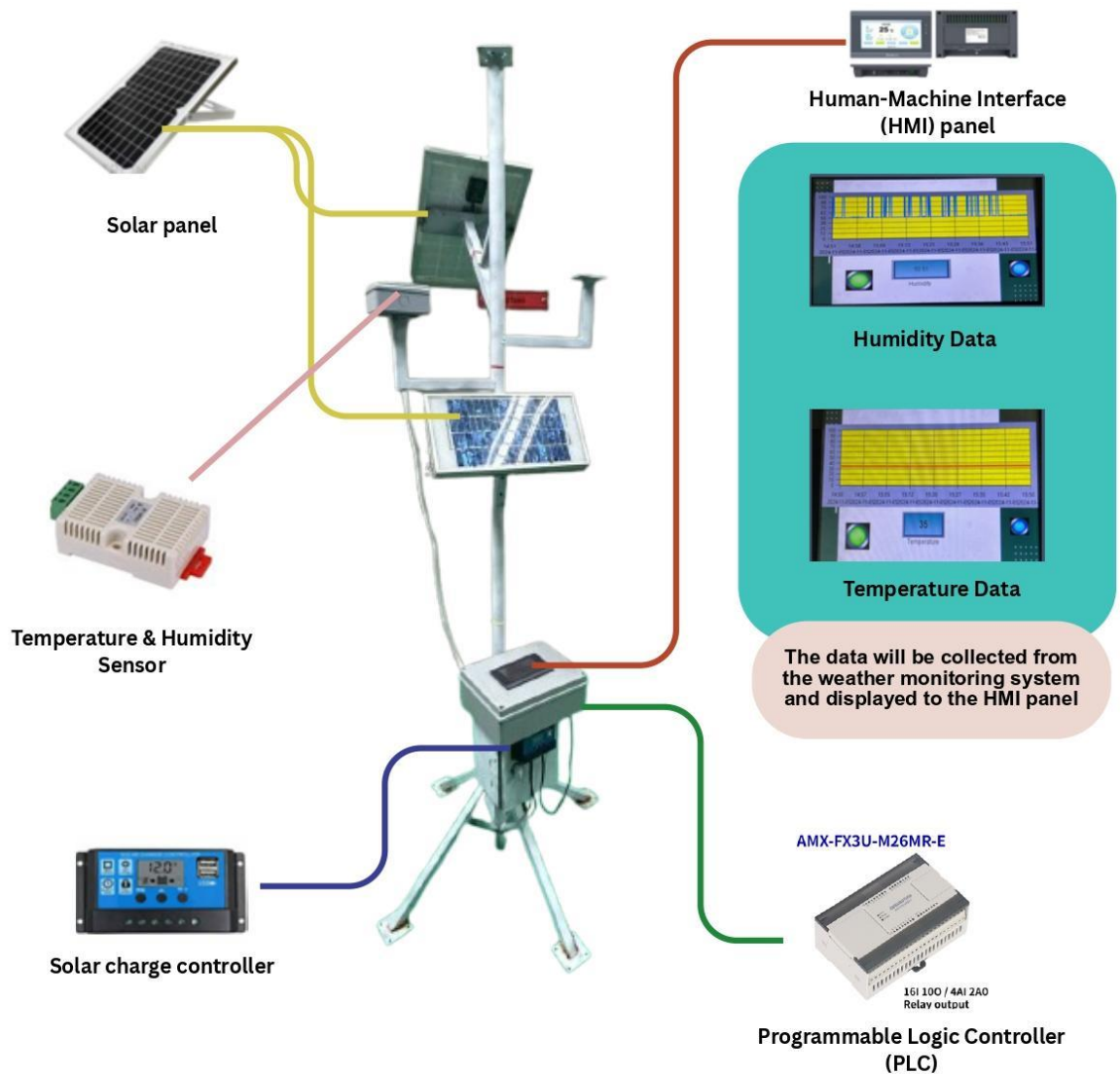
This project focuses on creating a weather monitoring system using Programmable Logic Controllers (PLC) and Human-Machine Interface (HMI) technology, powered by a solar panel and battery setup. The main goals were to study weather monitoring systems, design one using PLC and HMI, and build a working model. A review of existing systems was done to understand how weather data is collected and displayed. The project used sensors to measure temperature and humidity, which were connected to the PLC for controlling data collection. The system utilized solar energy to charge the battery, ensuring continuous operation even during power outages, making it environmentally friendly and sustainable. The HMI was used to display real-time weather information for easy monitoring. Data was collected and analyzed to evaluate the system's performance. The results showed that the system successfully monitored and displayed weather data. In conclusion, the project achieved its goals, providing a reliable and sustainable weather monitoring system with potential for future improvements like adding memory, IoT features, and additional sensors.

Keyword: Weather Monitoring System, Programmable Logic Controller (PLC), Human-Machine Interface (HMI), Solar-Powered System, Temperature and Humidity Sensors



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

**REAL-TIME WEATHER MONITORING SYSTEM
 MAIN COMPONENTS ;**



BIODIESEL PRODUCTION TOOL THROUGH ESTERIFICATION AND TRANSESTERIFICATION PROCESS USING AIR HEATING SYSTEM

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Abstract

The increasing use of fossil fuels, especially oil fuels, has led to increased levels of Carbon Dioxide (CO₂) emissions and contributed to global warming. To overcome this problem, biodiesel, a renewable energy source, can be produced from various raw materials including used cooking oil. This study uses crude oil, an unused ingredient commonly known as waste cooking oil, as its raw material. Used cooking oil is an ideal source for biodiesel production because it is abundant, cheap and environmentally friendly. The process of converting used cooking oil into biodiesel involves filtration, chemical treatment and transesterification. Transesterification is a chemical process where triacylglycerides (TGA) in oil are reacted with alcohol and a catalyst to produce biodiesel. There are various methods for producing biodiesel, and the authors tried a new method using hot air jets to control the temperature during transesterification. This new method is cost-effective, utilizes readily available raw materials, and reduces the environmental impact of waste cooking oil disposal. To evaluate the effectiveness of this method, the properties of the biodiesel produced will be compared with biodiesel quality standards. In conclusion, this analysis shows the potential of using used cooking oil to produce biodiesel and the effectiveness of using hot air jets in the transesterification process. This approach not only offers a sustainable solution to reduce fossil fuel consumption and greenhouse gas emissions, but also addresses the problem of waste cooking oil disposal. To evaluate the effectiveness of this method, the properties of the biodiesel produced will be compared with biodiesel fuel standards including viscosity, density and acid number using ASTM D6751 and EN 14214.

Keyword: biodiesel, waste cooking oil, air heater method, characteristics

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

ALAT PRODUKSI BIODIESEL MELALUI PROSES ESTERIFIKASI DAN TRANSESTERIFIKASI MENGGUNAKAN SISTEM PEMANAS UDARA

Surya Dharma
 Idham Kamil | Rahmawaty | Rihat Sebayang | Ulfa Hasnita | Efri Debby Ekinola Ritonga
 POLITEKNIK NEGERI MEDAN

LATAR BELAKANG

Sumatera Utara memiliki potensi besar dalam pengembangan energi terbarukan, salah satunya adalah biodiesel. Biodiesel dapat diproduksi dari berbagai bahan baku, termasuk minyak goreng bekas atau minyak jelantah, yang sering kali terbuang dan menjadi limbah yang mencemari lingkungan. Di sisi lain, minyak jelantah dapat diolah menjadi biodiesel melalui proses transesterifikasi. Salah satu tantangan dalam proses ini adalah kebutuhan energi panas untuk mengoptimalkan reaksi kimia.

PERNYATAAN MASALAH

1. Bagaimana potensi minyak goreng bekas di Sumatera Utara sebagai bahan baku biodiesel.
2. Bagaimana pemanfaatan udara panas dapat meningkatkan efisiensi dan keberlanjutan dalam proses produksi biodiesel.
3. Apa dampak lingkungan dan ekonomi dari penggunaan teknologi udara panas dalam produksi biodiesel.

HAL PENTING DALAM PENELITIAN

Kombinasi antara pemanfaatan minyak jelantah sebagai bahan baku biodiesel dan penggunaan udara panas dalam proses produksinya diharapkan dapat mengatasi dua masalah utama sekaligus:

1. Pengurangan limbah minyak goreng bekas yang mencemari lingkungan.
2. Efisiensi energi dalam produksi biodiesel melalui teknologi ramah lingkungan.

TUJUAN

1. Menganalisis potensi minyak goreng bekas di Sumatera Utara sebagai bahan baku biodiesel.
2. Mengkaji pemanfaatan udara panas dalam proses produksi biodiesel.
3. Menilai dampak lingkungan dan ekonomi dari penerapan teknologi udara panas dalam produksi biodiesel.

SOROTAN INOVASI

Penggunaan pemanas udara memiliki potensi untuk meningkatkan efisiensi energi dalam reaksi kimia, yang pada gilirannya dapat mengurangi konsumsi bahan bakar dan biaya operasional. Dengan efisiensi termal yang lebih baik, proses produksi menjadi lebih cepat dan stabil, berkontribusi pada peningkatan kapasitas produksi serta penurunan biaya per liter biodiesel.

METODE

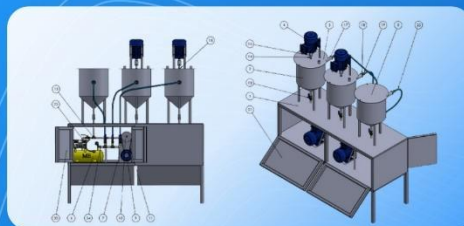


NILAI KOMERSIAL

Penggunaan minyak jelantah sebagai bahan baku biodiesel membantu menekan ketergantungan pada minyak sawit, sehingga dapat menurunkan biaya produksi dan meningkatkan keberlanjutan industri biodiesel. Dari perspektif ekonomi makro, penerapan teknologi ini berpotensi menciptakan lapangan kerja di sektor pengolahan limbah minyak jelantah serta manufaktur komponen pemanas udara.

KESIMPULAN

Masukan (input) dalam penelitian adalah minyak goreng bekas (minyak jelantah), methanol, katalis, dan udara panas sebagai media dalam membantu proses esterifikasi dan transesterifikasi dalam produksi biodiesel.





07 TEACHING & LEARNING

1. RESPEX25-005
SMARTBANK: EBOOK SOALAN FORMATIF
KURSUS DMK40163 QUALITY ASSURANCES

POLITEKNIK TUN SYED NASIR SYED ISMAIL,
PAGOH, JOHOR
2. RESPEX25-016
MOMENT KIT
POLITEKNIK PORT DICKSON, NEGERI
SEMBILAN
3. RESPEX25-021
ACCOUNTVENTURE
POLITEKNIK PORT DICKSON, NEGERI
SEMBILAN
4. RESPEX25-030
MD TRAINER
POLITEKNIK PORT DICKSON, NEGERI
SEMBILAN
5. RESPEX25-031
STAXCEL
POLITEKNIK PORT DICKSON, NEGERI
SEMBILAN
6. RESPEX25-035
DESIGNING 3D OF A PORTABLE CNC
MILLING MACHINE USING CAD SOFTWARE

POLITEKNIK PORT DICKSON, NEGERI
SEMBILAN
7. RESPEX25-040
BINGO MAKROEKONOMI
POLITEKNIK PORT DICKSON, NEGERI
SEMBILAN
8. RESPEX25-071
NETBALL PLAYZONE SIMULATOR KIT
(NETPSIM KIT)
POLITEKNIK KUCHING SARAWAK
9. RESPEX25-073
FIRES (FINANCIAL REPORTING SOLUTION)
POLITEKNIK PORT DICKSON, NEGERI
SEMBILAN
10. RESPEX25-080
EMBBOT TRAINER
POLITEKNIK PORT DICKSON, NEGERI
SEMBILAN
11. RESPEX25-083
PV SOLAR TRAINER WITH COOLING SYSTEM
(PVST)
POLITEKNIK PORT DICKSON, NEGERI
SEMBILAN
12. RESPEX25-089
MAHANG GOLD: ORNAMENTAL FISH EXPERT

KOLEJ KOMUNITI TAMPIN, NEGERI SEMBILAN
13. RESPEX25-092
ENHANCING ENGLISH LANGUAGE
VOCABULARY ACQUISITION THROUGH
DIGITAL FLASHCARD APPLICATIONS: A
STUDY ON MALAYSIAN COMMUNITY
COLLEGE STUDENTS
KOLEJ KOMUNITI SHAH ALAM, SELANGOR
14. RESPEX25-095
INOVASI SYARIENET: PLATFORM
PEMBELAJARAN FIQH SECARA DIGITAL
POLITEKNIK SEBERANG PERAI, PULAU
PINANG

SMARTBANK: EBOOK SOALAN FORMATIF KURSUS DMK40163 QUALITY ASSURANCES

Atikah Binti Mansor¹, Siti Rasidah Sapie¹ & Maratun Najiha Abu Tahari¹

1 Jabatan Kimia dan Teknologi Makanan,
Politeknik Tun Syed Nasir Syed Ismail, Pagoh, Johor

ABSTRAK

Inovasi dalam pengajaran dan pembelajaran (PdP) semakin penting dalam memastikan keberkesanan penyampaian ilmu, khususnya dalam bidang teknikal seperti Teknologi Kimia (Lemak dan Minyak). SmartBank: eBook Soalan Formatif Quality Assurances dibangunkan sebagai inisiatif digital yang menyokong pelaksanaan kursus DMK40163: Quality Assurances di peringkat Diploma, dengan menekankan elemen penilaian formatif secara sistematik dan berstruktur. eBook ini menghimpunkan koleksi soalan formatif pelbagai bentuk seperti soalan objektif dan aplikasi berbentuk senario, yang direka berdasarkan hasil pembelajaran kursus serta silibus semasa. Proses pembangunan eBook ini merangkumi tiga fasa utama iaitu analisis keperluan pengguna, perancangan kandungan berasaskan silibus, serta pembangunan bahan digital interaktif yang turut dilengkapi dengan elemen kod QR bagi akses kuiz dalam talian. eBook ini bukan sahaja memudahkan pensyarah dalam penyediaan penilaian berkualiti, malah memberi ruang kepada pelajar untuk mengulangkaji secara sendiri dengan lebih fleksibel dan menarik. Inisiatif ini menyokong aspirasi Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013–2025 melalui integrasi teknologi, pemantapan pembelajaran abad ke-21 dan pendekatan pembelajaran berpusatkan pelajar. SmartBank eBook diharapkan mampu meningkatkan kefahaman pelajar terhadap konsep kualiti serta menggalakkan pembelajaran yang lebih aktif, sendiri dan bermakna.

Katakunci: *ebook, Quality Assurances, SmartBank, Penilaian Formatif*

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

SMARTBANK: EBOOK SOALAN FORMATIF KURSUS DMK40163 QUALITY ASSURANCES



ATIKAH MANSOR



ChM. SITI RASYIDAH SAPIE



MARATUN NAJIHAH ABU TAHARI

DEPARTMENT OF CHEMICAL AND FOOD TECHNOLOGY, POLITEKNIK TUN SYED NASIR SYED ISMAIL, PAGOH

PENDAHULUAN

SmartBank: eBook Soalan Formatif Quality Assurances ialah inisiatif digital untuk menyokong kursus DMK40163 Quality Assurances di peringkat Diploma. Ia menghimpunkan soalan formatif objektif dan aktiviti pembelajaran yang menarik berdasarkan hasil pembelajaran dan silibus semasa, bagi meningkatkan keberkesanan PaP dalam bagi Program Diploma Teknologi Kimia (Lemak dan Minyak). Inisiatif ini menyokong aspirasi Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013-2025 melalui integrasi teknologi, pemantapan pembelajaran abad ke-21 dan pendekatan pembelajaran berpusatkan pelajar.

PENYATAAN MASALAH

1. Kurangnya bahan bantu mengajar yang sistematik dan berstruktur bagi Kursus DMK40163 Quality Assurances.
2. Kesukaran pensyarah menyediakan penilaian formatif yang selaras dan berkesan kerana ketiadaan sumber digital interaktif.
3. Kurangnya pendekatan pembelajaran yang berpusatkan pelajar dan mudah diakses oleh pelajar dan tenaga pengajar.

OBJEKTIF

1. Membangunkan bahan bantu mengajar digital yang sistematik dan berstruktur dalam bentuk eBook.
2. Menyediakan koleksi soalan formatif interaktif yang berkualiti, selaras dengan hasil pembelajaran dan silibus kursus.
3. Meningkatkan pembelajaran berpusatkan pelajar dengan memperkenalkan pendekatan pembelajaran kendiri dan interaktif yang selaras dengan keperluan pembelajaran abad ke-21

REKA BENTUK INOVASI

SMARTBANK: EBOOK FORMATIVE ASSESSMENT QUALITY ASSURANCES

CROSSWORD ACTIVITY

QUIZZ ACTIVITY

Let's do this!

QR Code

MAKLUMBALAS PENGGUNA



IMPAK INOVASI

1. Meningkatkan Keberkesanan Pengajaran dan Pembelajaran (PaP)
2. Menggalakkan Pembelajaran Kendiri dan Aktif dalam Kalangan Pelajar
3. Menyokong Aspirasi Pendidikan Negara seiring dengan Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013-2025 dalam memperkukuh penggunaan teknologi dalam pendidikan.

SOROTAN INOVASI

1. Pembangunan eBook Digital Interaktif Berasaskan Penilaian Formatif
2. Integrasi Teknologi Kod QR untuk Akses Kuiz Dalam Talian
3. Pendekatan Pembelajaran Abad Ke-21 yang Berpusatkan Pelajar
4. Memudatkan Pensyarah dalam Penyediaan Penilaian Berkualiti

KESIMPULAN

SmartBank: eBook Penilaian Formatif ini mampu meningkatkan kualiti PaP, memperkukuh literasi digital, dan mewujudkan pengalaman pembelajaran yang lebih aktif dan kendiri dalam kalangan pelajar bidang teknikal. Ia juga dapat menyelaraskan soalan formatif bagi penggunaan pensyarah kursus.



MOMENT KIT

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Syafarizan binti Nasroddin¹ Siti Morni binti Ab Rahman¹**

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ABSTRACT

The Engineering Science course (DBS10042) requires students to understand fundamental concepts, perform calculations, and complete practical work based on the prescribed syllabus processes. The Moment Kit was created as a Teaching and Learning Material (TLM) for first semester engineering students enrolled in the Engineering Science course (DBS10042) at Politeknik Port Dickson (PPD). This invention focuses on enhancing teaching and learning (T&L) strategies to help students better understand the concept of Moment of Force. This is part of Topic 3 (Force), with a focus on determining the equilibrium point of an object based on the position of an applied load. The ADDIE concept was used as a reference in the development of the Moment Kit. This methodology consists of five key phases: Analysis, Design, Development, Implementation, and Evaluation. The Moment Kit comprises two components: a physical training kit for student use, and a moment calculator application for lecturers to validate student results based on data collected during practical exercises. This training kit also includes a user manual to assist users in operating it effectively. A pilot test was conducted involving 25 first semester students from Session I 2024/2025 and Session II 2024/2025 who enrolled in the Engineering Science course (DBS10042), to evaluate the effectiveness of the Moment Kit before full implementation. Results from the questionnaires distributed to participating students showed that 95.2% of respondents provided positive feedback, describing the Moment Kit as lightweight, neat, simple, and easy to handle. The Moment Kit has the potential to enhance students' skills and understanding of the Moment of Force topic. It was developed based on the concept of "Fun & Easy Learning". For future development, the functionality of the Moment Kit can be enhanced by developing a mobile moment calculator application. This would allow students to verify their moment of force calculations more easily and efficiently, in line with the theories they have learned. In conclusion, the Moment Kit has the potential to improve the quality of both theoretical and practical (T&L) delivery, while also assisting in effective time management.

Keyword: Teaching and Learning Material (TLM), Moment Kit, Moment of Force, DBS10042

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

"MOMENT KIT"

ID-016



1. NOORAZLINA BINTI ABD.KARIM (KETUA)
2. MOHD SAIFUL BIN PAHRUDIN
3. SYAFARIZAN BINTI NASRODDIN
4. SITI MORNI BINTI AB RAHMAN

MyIPO no:LY2025M03424

LATAR BELAKANG

Moment Kit merupakan Alat Bahan Bantu Mengajar (ABBM) yang dibangunkan untuk pelajar kejuruteraan semester satu bagi Kursus Sains Kejuruteraan (DBS10042) di Politeknik Port Dickson. Inovasi ini menyokong kaedah pengajaran dan pembelajaran (PdP) yang lebih berkesan dalam memahami konsep Momen Daya, iaitu subtopik di bawah Topik 3: Daya. Fokus utamanya ialah membantu pelajar menentukan titik keseimbangan sesuatu objek berdasarkan kedudukan dan beban yang dikenakan.

PERINCIAN INOVASI

PENYATAAN MASALAH

Permasalahan yang telah dikenal pasti menjadi asas kepada pembangunan kaedah baharu ini, seperti berikut:

- 01 Pelajar menghadapi kesukaran memahami teori dan konsep Momen Daya, terutamanya hubungan antara jisim dan jarak serenjang daya terhadap titik putaran.
- 02 Pelajar mengalami kesukaran untuk memahami secara logik kedudukan titik pusat graviti bagi sesuatu objek yang berada dalam keadaan seimbang.

OBJEKTIF

- 1 Menyediakan satu kaedah pembelajaran yang interaktif dan menyeronokkan.
- 2 Membantu pelajar memahami konsep Momen Daya dengan lebih berkesan
- 3 Meningkatkan kualiti dan keberkesanan proses pengajaran dan pembelajaran (PdP) secara teori dan praktikal
- 4 Memudahkan pensyarah membuat semakan jawapan pelajar secara sistematik.



Let's Start!

KEPENTINGAN KAJIAN

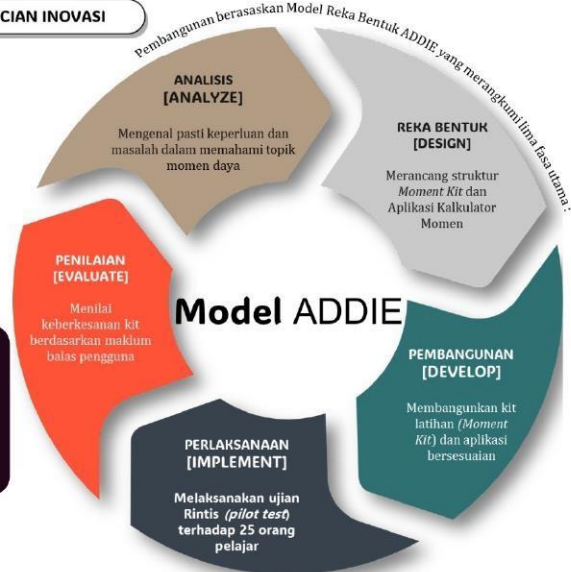
INSTITUSI	<ul style="list-style-type: none"> ✓ Membantu institusi bagi mencapai KPI (Teras 6: Penyelidikan & Inovasi) ✓ Melaksanakan penambahbaikan berterusan (CQI) bagi kursus Engineering Science (DBS10042) ✓ Sebagai alat bantu mengajar (ABBM) dalam pengajaran dan pembelajaran
PENSYARAH	<ul style="list-style-type: none"> ✓ Meningkatkan ilmu dan kemahiran pensyarah ✓ Memberi keupasan dalam pengajaran melalui pembuktian konsep teori secara praktikal
PELAJAR	<ul style="list-style-type: none"> ✓ Memantapkan pemahaman konsep Momen Daya dan pemikiran kritis pelajar ✓ Meningkatkan pencapaian pelajar dalam kursus DBS10042, khususnya topik Momen Daya

KESIMPULAN

Moment Kit yang dibangunkan berdasarkan konsep "*Fun & Easy Learning*" telah menunjukkan keberkesanan yang tinggi dalam membantu pelajar memahami Momen Daya. Penggunaan ABBM ini bukan sahaja mempertingkatkan kualiti PdP, malah turut membantu dalam pengurusan masa dan pemahaman konsep secara teori dan praktikal.

CADANGAN

Bagi pembangunan masa hadapan, **Moment Kit** berpotensi dipertingkatkan melalui pembinaan aplikasi kalkulator momen mudah alih, bagi memudahkan pelajar menyemak kiraan Momen Daya dengan lebih pantas dan selaras dengan teori yang dipelajari.



UJIAN RINTIS - MOMENT KIT



ACCOUNT VENTURE: A JOURNEY THROUGH THE WORLD OF ACCOUNTING

¹Nur Aishah Zainal Abidin, ¹Siti Aishah Mohd Yaman & ¹Norjannah Abu Bakar

¹Jabatan Perdagangan, Politeknik Port Dickson

In the evolving landscape of education, engaging learners especially in technical and abstract subjects like accounting requires innovative and student-centered approaches. Traditional methods often result in passive learning and low motivation among students in understanding basic accounting concepts such as transactions, classifications, and the double-entry system. Many accounting students struggle to retain basic accounting principles due to a lack of interaction and hands-on practice in traditional classroom settings. There is a need for a creative learning tool that transforms theory into an active, meaningful experience. This innovation aims to develop a fun, engaging, and interactive game board “Account Venture” to help students enhance their understanding of basic accounting transactions, classification, and double-entry principles through experiential learning. Initial implementation with diploma accounting students showed significant improvement in post-test scores compared to pre-tests. Unlike typical classroom tools, “Account Venture” gamifies accounting basics into a physical, interactive journey. It incorporates elements of educational psychology, gamification, and constructivist learning theory, emphasizing student engagement and active knowledge construction.

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

AccountVenture:

“A journey through the world of accounting”

**NUR AISHAH ZAINAL ABIDIN, SETI AISHAH MOHD YAMAN & NORJANNAH ABU BAKAR
 POLITEKNIK PORT DICKSON**

1 PENGENALAN

AccountVenture merupakan set permainan interaktif yang dicipta sebagai alat bantu mengajar (ABM) dalam meningkatkan kefahaman pelajar dalam konsep asas perakaunan dengan cara yang menyeronokkan, mudah dan berkesan.

Mengadaptasi perjalanan kerjaya seorang individu dalam bidang perakaunan, pelajar akan mengembara dari satu petak ke satu petak sambil menyelesaikan pelbagai cabaran perakaunan.

2 PERNYATAAN MASALAH

- ☑ Kaedah kuliah konvensional sering menyebabkan pelajar hilang tumpuan & minat (Alias et al., 2020)
- 🌱 Sukar memahami konsep abstrak perakaunan (Ibrahim & Yusof, 2019)
- ✗ Gagal menguasai asas perakaunan dengan berkesan.

3 OBJEKTIF

- 📊 Menilai kemampuan pelajar untuk membuat pengelasan akaun dan sistem catatan bergu dengan tepat.
- 🔍 Mengukur kemahiran pelajar dalam merekodkan transaksi perakaunan dengan tepat.
- 🗨 Menggunakan kaedah pengajaran dan pembelajaran (PdP) yang kreatif dan interaktif.

4 KAEDAH PELAKSANAAN

- 🎮 Pelajar diberi permainan AccountVenture dan diuji sebelum dan selepas sesi pembelajaran.
- 📄 Borang soal selidik skala Likert untuk menilai maklum balas pelajar.
- 📚 Kandungan permainan disusun mengikut sukatan pelajaran, merangkumi:
 - 📄 Pengelasan akaun
 - 📄 Kesan transaksi
 - 📄 Penyediaan catatan bergu

5 KEPENTINGAN KAJIAN

- 👤 **PELAJAR:** Meningkatkan kefahaman dan penguasaan asas perakaunan dengan kaedah yang lebih interaktif.
- 👥 **PENSYARAH:** Meneroka kaedah PdP yang lebih berkesan dengan penggunaan ABM yang kreatif dan inovatif.
- 🏢 **POLITEKNIK:** Meningkatkan reputasi institusi dalam pembudayaan inovasi.

6 KEUNIKAN INOVASI

- 🧠 Permainan Interaktif Dinamik
- 📖 Tahap Kesukaran Berperingkat:
 - Level 1: Pengelasan Akaun
 - Level 2: Persamaan Perakaunan
 - Level 3: Catatan Bergu
- 🔒 Kotak Misteri Pintar
- ⚙ Simulasi Cabaran

7 NILAI KOMERSIAL

- ✅ Fleksibel & mesra pelajar
- ✅ Selari dengan silibus semasa
- ✅ Menyokong PDPC abad ke-21
- ✅ Potensi tinggi untuk pemasaran komersial

8 KESIMPULAN

- 🎮 Membuktikan gamifikasi mampu memudahkan pemahaman topik asas perakaunan
- 😊 Menjadikan pembelajaran lebih menyeronokkan dan interaktif
- 💡 Mencetuskan minat terhadap subjek perakaunan
- 📚 Berpotensi untuk digunakan secara meluas dalam pendidikan vokasional dan tinggi



MDTRAINER

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Abstract

The MD Trainer is an educational innovation project designed to enhance student's practical learning in the DEE10133 Measurement Devices course at Politeknik Port Dickson. This device was developed as a solution to issues such as the shortage of laboratory equipment, high maintenance costs, and the limited flexibility of conventional breadboards. The MD Trainer offers a more economical, durable and practical option for a large-scale teaching. The MD Trainer is constructed from durable thermoplastic materials and equipped with basic electronic components. Circuit connections use banana sockets to improve stability, safety and experimental accuracy. Additionally, the MD Trainer features an integrated internal DC power supply that provides adjustable voltages, enabling students to conduct variety of experiments without relying on external power sources. To promote self-directed learning, the device includes an interactive QR code linking users to video based practical guides, experiment notes and online quizzes for self-assessment. Its modular and flexible design supports a wide range of experiments including voltage, current and resistance measurements as well as the use of advanced measuring instruments such as multimeters and oscilloscopes. Moreover, the MD Trainer facilitates the learning of basic electronic circuit such as voltage dividers, signal tracing and internal resistance analysis of power sources. The use of the MD Trainer allows students to apply theoretical knowledge more effectively through hands-on practice, master psychomotor skills and build confidence in the field of electrical engineering. It also fosters entrepreneurial tendencies among students through a cost-effective educational product innovation approach. Overall, the MD Trainer provides an innovative, holistic and high-impact solution for strengthening practical learning in electrical engineering, supporting the implementation of a more interactive and effective 21st - century education framework.

Keyword: Educational Innovation, Self-Directed Learning, Practical Learning, Modular Design, Entrepreneurial Tendency

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

PENDAHATAN MASALAH

'Breadboard' - Mudah longgar dan tidak stabil

Kos tinggi dan kekurangan alat kerja amali

Pelajar sukar memahami teori tanpa sokongan praktikal

Tiada akses kepada bahan pembelajaran sendiri

MD

TRAINER

Sisi Kiri Atas Sisi Kanan

Nombor Notifikasi Harta Intelek: CRLY2024M08862

1 PENGENALAN

(1) PELAJAR MENGHADAPI KESUKARAN DISEBABKAN OLEH KEKANGAN PERALATAN

(2) KAEDAH PEMBELAJARAN TRADISIONAL - PENDEDAHAN PRAKTIKAL YANG TIDAK MENCUKUPI

(3) SOLUSI INOVATIF YANG KOS EFEKTIF - MENYOKONG KEPADA PEMBELAJARAN KENDIRI

2 OBJEKTIF

(1) MENINGKATKAN KEMAHIRAN PRAKTIKAL PELAJAR

(2) PENJIMATAN MASA DALAM PENGAJARAN DAN PEMBELAJARAN

(3) MENGURANGKAN KOS PERBELANJAAN

3 BAHAN & KAEDAH

(1) BAHAN: 'BANANA SOCKET', PERINTANG, KAPASITOR, METER ARUS MIKRO, PERUMAH TERMOPLASTIK

(2) KAEDAH: FASA REKABENTUK DAN PEMBANGUNAN, PENGUMPULAN KOMPONEN, PEMASANGAN DAN PENGUJIAN, PEMBANGUNAN KANDUNGAN DIGITAL, UJIAN LAPANGAN DAN KEFUNGSIAN

4 KEPENTINGAN KAJIAN

(1) MENINGKATKAN KEFAHAMAN & KEYAKINAN PELAJAR

(2) SISTEMATIK & INTERAKTIF

(3) PEMBELAJARAN KENDIRI & FLEKSIBEL

(4) SESUAI PENGGUNAAN SECARA INDIVIDU

5 KEISTIMEWAAN INOVASI

(1) SAMBUNGAN MODULAR

(2) REKA BENTUK TAHAN LASAK

(3) INTEGRASI KOD QR

(4) MENYOKONG PELBAGAI KERJA AMALI

(5) KOS YANG LEBIH RENDAH

6 NILAI KOMERSIAL

(1) PASARAN SASARAN: POLITEKNIK, KOLEJ KOMUNITI, SEKOLAH MENENGAH TEKNIK

(2) PENGGUNA SASARAN: PENSYARAH & PELAJAR TVET

(3) KOS PENGELUARAN: RM90.70

(4) HARGA JUALAN: RM110 - RM130

(5) SKALABILITI: MODUL BOLEH DIUBAHSUAI

QR Video

VIDEO PW4

QR Kuiz

QUIZ 2

DC-VOLTMETER

Kajian Tahap Keberkesanan

Kategori	Nilai
Kebertahanan	4.3
Pelaksanaan	4.2
Kefahaman Pelajar	4.24

7 KESIMPULAN

(1) INOVASI TEMPATAN MAMPU MENYELESAIKAN CABARAN PENDIDIKAN TEKNIKAL

(2) JIMAT KOS & MASA; TINGKATKAN KEBERKESANAN PDP

(3) IMPAK TERHADAP KELESTARIAN DAN PENJIMATAN SUMBER

(4) POTENSI PENGKOMERSIALAN & PERLUASAN KEPADA KURSUS LAIN

"Alat ini memudahkan saya untuk menjalankan kerja amali bagi subjek Measurement Devices"

Asyraff, Pelajar DET, PolIPD

"MD Trainer menyenangkan kita untuk dipakai di dalam makmal....objektif kerja amali senang untuk dicapai"

Nor Ridzuan, Pensyarah JKE, PolIPD

Jabatan Kejuruteraan Elektrik
 Politeknik Port Dickson
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 Negeri Sembilan

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STAXCEL

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Abstract

Statistics studies is a significant subject matter within the academic curriculum of Malaysian polytechnics. Typically, teaching statistical topics demand a substantial amount of time for tedious validation of extensive mathematical computations, analyses, and graphs. Thus, constructing statistical questions and assessing statistical answers can be an overwhelming task for lecturers of engineering mathematics courses. Existing online statistical applications usually only provide the final answer without demonstrating the necessary calculation steps. Some applications even charge substantial fees for providing calculation steps. StaXcel is a user-friendly, free offline statistical application developed using functions, Visual Basic Applications (VBA) and macros in Microsoft Excel. It provides rapid, detailed, and step-by-step statistical solutions without the need for software installation. It comprises four primary components: Ungrouped Data, Grouped Data, Grouped Frequency Table, and Construct Chart. Users' data was calculated based on the midpoint, frequency distribution function, cumulative frequency, boundaries, and presented in a well-organized frequency table. Descriptive statistics analysis, including measures of central tendency and dispersion (mean, mode, median, mean deviation, variance, standard deviation, quartiles, deciles, percentiles, and interquartile range), was presented in detail with an accuracy of two decimal places. A range of graphical representations, including line charts, histograms, polygons, bar charts, pie charts, less-than-ogive, and more-than-ogive, were promptly generated for the purpose of serving as a marking scheme for lecturers. Security features include password protected worksheets to safeguard the integration and integrity of the VBA scripts. StaXcel is an essential tool for lecturers in evaluating students' mathematical reasoning and problem-solving proficiency during the assessment of assignments and case studies. Furthermore, StaXcel presents a valuable tool that simplifies and expedites the process of reviewing and validating question stems prior to assessments being administered. Future recommendations include the development of mobile applications of StaXcel for tablets. Additionally, expanding the user base to include students from other institutions of higher learning is suggested.

Keyword: Statistics, Polytechnic, Teaching & Learning Aid

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

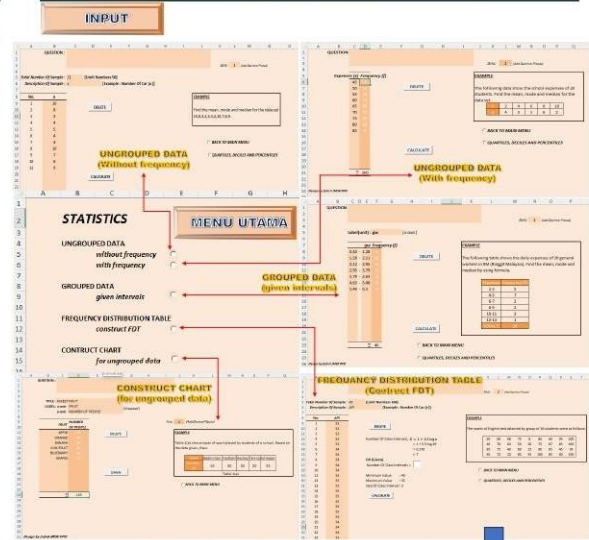
StaXcel
 Statistical App In Excel

Zahril Bin Harun (Leader)
 Hoo Mow Heng
 Department of Mathematics, Science & Computer
 Politeknik Port Dickson

LATAR BELAKANG

StaXcel merupakan program statistik yang dibangunkan menggunakan aplikasi *Microsoft Excel*. Menu utama memaparkan 4 bentuk data statistik dengan 5 butang pilihan iaitu *Ungrouped Data (without/with frequency)*, *Grouped Data (given intervals)*, *Frequency Distribution Table (construct FDT)*, *Construct Chart (for ungrouped data)*. Dengan memasukkan data-data mengikut klasifikasi, satu paparan akan dikeluarkan pada lembaran *OUTPUT* seperti *mean, median, mode, mean deviation, variance, standard deviation, quartiles, deciles, percentiles*, jadual-jadual yang penting serta graf semasa proses persembahan data.

APLIKASI StaXcel



PENYATAAN MASALAH

1. Subjek statistik melibatkan data yang agak banyak dan memerlukan masa yang lama oleh pensyarah untuk melakukan pengiraan dan analisis data.
2. Bentuk data yang pelbagai dan sentiasa berubah setiap semester terutama semasa pengubalan dan menyemak soalan.
3. Aplikasi statistik yang sedia ada (percuma) dilapangan hanya memaparkan jawapan dan tidak disertakan langkahkerja yang diingini seperti yang ditunjukkan dalam buku kerja atau skema pemarkahan.

OBJEKTIF

StaXcel dapat memberi kemudahan kepada pensyarah –pensyarah politeknik khasnya yang mengajar Kursus Matematik Kejuruteraan 3 supaya mereka dapat membina dan menyemak soalan – soalan yang melibatkan topik Statistik. Ia juga boleh digunakan untuk melaksanakan pengajaran dan pembelajaran di bilik kuliah.

KAEDAH PEMBINAAN

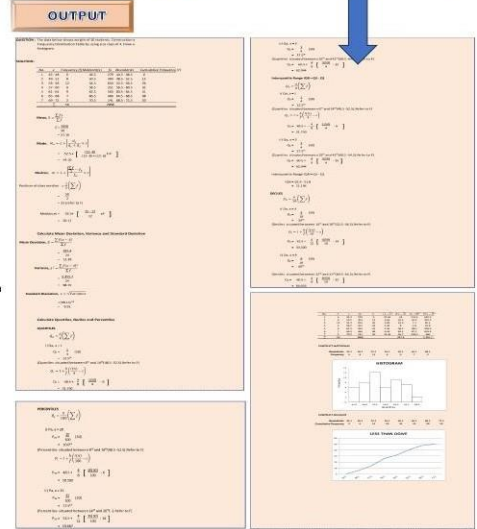
StaXcel dibangunkan menggunakan aplikasi *Microsoft Excel* di mana menggunakan arahan-arahan seperti formulas (*function library*), *Short & Filter*, *Macros*, mengubah arahan-arahan *Visual Basic & Code* dan lain-lain. Program ini telah disekuritkan dari segi nama fail dan kata kunci (*password*) bagi setiap lembaran kerja (*worksheet*). Bertujuan untuk mengelakkan pengguna daripada mengubah atau dengan tidak sengaja terpadam arahan – arahan ataupun formula – formula sedia ada yang boleh menyebabkan program tersebut tidak berfungsi.

KEPENTINGAN KAJIAN



PENEKANAN INOVASI

- Statistik Analisis**
- Input data yang mudah sama ada *copy & paste* atau *keyin*
 - Pengiraan yang cepat hanya menekan butang *Calculate*
 - Output yang lengkap beserta langkah-kerja, jadual dan graf
- Storage**
- Saiz *storage* yang kecil kurang 800kb
- Microsoft Excel**
- Kebanyakan pengguna Celik Excel
 - Setiap komputer riba atau *desktop* telah disediakan aplikasi excel
 - Tidak memerlukan pengemaskinian aplikasi
 - Penggunaanya secara *offline*
- Kawalan**
- Setiap lembaran kerja dilindungi dengan kata kunci
 - *Rename* dan *Save As* tidak dibenarkan dan *filename* menggunakan singkatan nama pendaftar
- Penambahbaikan**
- Menyediakan ruang komen dan cadangan
 - Setiap percanggahan data dan jawapan akan diperbetulkan segera



KESIMPULAN

StaXcel merupakan aplikasi statistik yang amat sesuai dan berguna khas bagi mereka yang faham dan pernah mengajar subjek statistik. Pengiraannya amat cepat dengan paparan pada ruang lembaran *Output*, adalah seperti Mean, Mode, Median, Mean Deviation, Variance, Standard Deviation, Quartiles, Deciles, Percentiles dan IQR. Manakala untuk Jadual-jadual adalah *Expenses (x)*, *Frequency (f)*, *fx*, *Midpoint*, *Boundries*, *Cumulative Frequency (F)*, $|x - \bar{x}|$, $f|x - \bar{x}|$, $|x - \bar{x}|^2$ dan $f|x - \bar{x}|^2$ beserta dengan jumlah-jumlah yang berkaitan dengan formula. Menghasilkan persembahan data seperti Graf Histogram, Ogive dan lain-lain. Selain itu langkahkerja – langkahkerja beserta dengan formula beresesuaian untuk digunakan semasa proses pembelajaran dan pengajaran dan juga proses pengubalan soalan.

PENCAPAIAN

Telah digunakan oleh pensyarah-pensyarah yang mengajar kursus Matematik kejuruteraan 3 yang melibatkan di Jabatan Matematik, Sains dan Komputer Politeknik Port Dickson, seorang pensyarah dari Politeknik Balik Pulau dan Politeknik Sultan Mizan Zainal Abidin.

DESIGNING 3D OF PORTABLE CNC MILLING MACHINE TO ENHANCE STUDENTS' LEARNING EXPERIENCE

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Abstract

Technology have experienced tremendous advancements as part of Industrial 4.0 and received high demand in the industry. As technology evolved at the fingertips, a new teaching and learning approach is needed to cater the advancement of technology as well as to provide interactive learning experiences. Due to high cost of attaining Computer Numerical Control (CNC) machine and its complexity, thus is paper was initiated to address the limitations that intended to enhance students' understanding of CNC machine language through practical and hands-on experiences with augmented reality assisted apps. In this project, we design, develop and fabricate a mini-CNC milling machine as teaching kit to helps students understand and have access to this machine as often students have limited access to it. The mini-CNC machine was engineered using affordable, locally sourced components and integrated with open-source control software, ensuring both cost-efficient and user accessibility. The design focused on safety, ease of use and compatibility with common teaching materials and workpieces. The mechanical components such as the frame, spindle, linear guides and stepper motors were carefully selected and assembled to maintain precision and reliability in machining operations. This project also introduce student the basic operation of the mini-CNC milling machine as well as the basic g and mcodes used to operate the machine. Through this project, students able to experience hands-on training of the machine to have better understanding of CNC milling as it aligned with the Industrial 4.0 and technical education goals.

Keyword: Portable CNC, CAD Design, 3D Modelling, Milling Machine, Mechanical Design



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Nur Hazwani binti Nasruddin



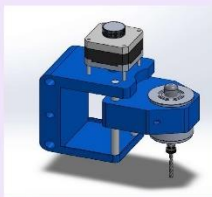
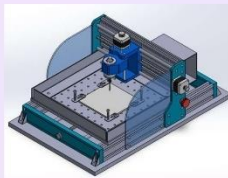
Deenesh Kumar a/l Nalathambi



Dr. Nurul Adillah Ariffin bt Muhamad Arif

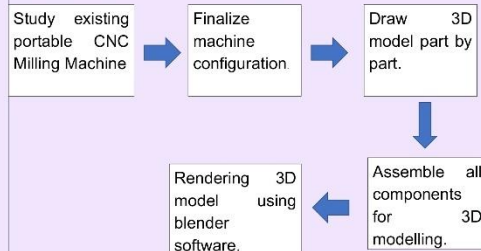
DESIGNING 3D OF A PORTABLE CNC MILLING MACHINE USING CAD SOFTWARE

1.0 INTRODUCTION

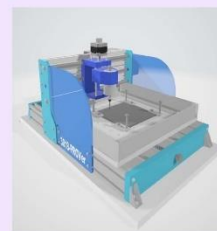


CNC machine usually large, stationary and expensive, make them inaccessible to small-scale industries, education institution and individual hobbyists. Hence there were a demand for a compact, cost effective and portable CNC milling machines, driven by the need for flexibility, space efficiency, and affordability. The design of portable CNC milling machines involves several critical consideration, including mechanical stability, weight optimization, ease of assembly, and compatibility with standard components. Thus, integrating CAD in the design process are essential to refine the machine's performance and reliability. This paper presents a comprehensive design and development of a 3D modelling for a portable CNC milling machine using SolidWorks.

3.0 METHODOLOGY



4.0 RESULT AND DISCUSSION



SCAN ME



2.0 PROBLEM STATEMENTS

- Industrial CNC machines are stationary machine which can only be used at a designated area only
- High cost of buying a new Industrial CNC machine
- Difficulties in promoting about manufacturing based TVET studies to school students

5.0 CONCLUSION

- This study demonstrated the conceptual and 3D modelling of a portable CNC milling machine using SolidWorks.
- This 3D modelling provides solid foundation for future development.
- Future work may include fabrication and integrate the design into AI-assisted machining.



BINGO MAKROEKONOMI

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Abstract

The teaching of macroeconomics often faces challenges in capturing students' interest and facilitating mastery of the subject. To address this issue, the **Bingo Macroeconomics** game was introduced as an innovative, game-based learning approach integrated with digital technology, aligned with 21st-century skills requirements and based on the latest curriculum standards. For the course **SPP 30263 Macroeconomics** at Kolej Komuniti Bagan Serai, the main problem identified was that students failed to achieve **Course Learning Outcome (CLO 1)** — the ability to state macroeconomic concepts and theories related to national economic development. Furthermore, students were observed to struggle with answering test and final examination questions effectively. The primary objective of this innovation is to enhance students' mastery of macroeconomic concepts through engaging, interactive activities, supported by the use of modern digital applications, while fostering a learning environment that is both stimulating and enjoyable. The implementation of this game has shown a significant impact: students can grasp macroeconomic concepts more easily through a play-based learning approach; lecturers are able to deliver teaching and learning processes in a more dynamic, interesting, and student-centred manner; and the institution demonstrates its commitment to national education agendas by promoting technological and SPG-driven pedagogical innovations. Overall, **Bingo Macroeconomics** proves that a creative approach combined with technological integration can revolutionize the teaching and learning of macroeconomics, making it more engaging, meaningful, and aligned with contemporary global needs. This innovation holds great potential to be expanded for national and international use and commercialized as an effective and modern teaching aid. In addition, this innovation fosters critical thinking, teamwork, and digital literacy skills among students, preparing them better for future academic and professional challenges in the ever-evolving global economy.

Keyword: Bingo Macroeconomics, Macroeconomics Education, Game-based Learning, Digital Education, Technological Pedagogy

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Bingo

MAKROEKONOMI

125
OBJECTIVES
QUESTION



NUR HIDAYAH BINTI JAAFFAR
 KOLEJ KOMUNITI BAGAN SERAI



NOOR IDDA BINTI IDRIS
 KOLEJ KOMUNITI BAGAN SERAI



MOHD FIRDAUS BIN ZAKARIA
 KOLEJ KOMUNITI BAGAN SERAI

<h3 style="text-align: center; color: orange;">INTRODUCTIONS</h3> <ol style="list-style-type: none"> 1 The BINGO card is a game focused on the subject SPP 30263 Macroeconomics. 2 It contains FIVE (5) topics, covering Introduction to Macroeconomics, Aggregate Demand and Supply, National Income Accounting, Money in the Economy, and Government Policy. 3 It incorporates digital elements to support the objectives of Industrial Revolution 4.0 (IR 4.0). 4 This game also includes five BINGO boards, each with a different arrangement. 	<h3 style="text-align: center; color: orange;">PROBLEM STATEMENTS</h3> <ol style="list-style-type: none"> 1 For the SPP 30263 Macroeconomics course, students did not achieve Course Learning Outcome (CLO 1), which is to explain macroeconomic concepts and theories related to national economic development. 2 The achievement rate for CLO 1 was below the target of 80%. 3 Students were unable to answer the questions in both the test and the final examination. 4 As a Continuous Quality Improvement (CQI) initiative, it is proposed to develop game-based teaching materials and this game will cover all topics in the course comprehensively.
<h3 style="text-align: center; color: orange;">OBJECTIVES</h3> <p>Lecturer:</p> <ul style="list-style-type: none"> Diversify teaching strategies as a means to encourage students to remain focused in class. Provide affordable materials as part of an alternative learning method. Explore the potential of game-based approaches to motivate students. <p>Students:</p> <ul style="list-style-type: none"> Enhance their understanding through the specially designed educational game. Improve mastery of the Macroeconomics subject. Apply transferable skills, particularly communication and interpersonal skills. 	<h3 style="text-align: center; color: orange;">SIGNIFICANTS OF THE STUDY</h3> <ul style="list-style-type: none"> Contains clearly defined Course Learning Outcomes (CLOs). Includes clear and concise instructions. Features simple and accessible game rules. Utilizes color coding to differentiate between topics. Offers a wide variety of question choices. Provides challenge and a sense of satisfaction through winning.
<h3 style="text-align: center; color: orange;">COMMERCIAL VALUES</h3> <p style="text-align: center; background-color: #e0e0e0; padding: 5px;">Time-saving, cost-effective, and user-friendly.</p> <p>Has the potential to be expanded, commercialized, and marketed to targeted audiences to facilitate teaching and learning (T&L) sessions.</p> <p style="text-align: center;">TARGET GROUP:</p> <ul style="list-style-type: none"> Community College and Polytechnic students Matriculation students Secondary school students Teachers and lecturers teaching the subject of Macroeconomics 	<h3 style="text-align: center; color: orange;">CONCLUSIONS</h3> <ol style="list-style-type: none"> 1 The teaching and learning (T&L) process becomes easier and more enjoyable. 2 Macroeconomics BINGO promotes interactive learning and helps capture students' interest. 3 This game also diversifies the teaching methods and materials used by the lecturer.



NETPSIM KIT

NETBALL PLAYZONE SIMULATOR KIT

Ts. Nurul Liyana binti Mahmud¹, Zaihan binti Sulaiman¹, Nor Azreen binti Ayub¹

¹ Department of Mathematics, Science & Computer, Politeknik Kuching Sarawak Km 22, Jalan Matang, Petra Jaya, 93050 Kuching, Sarawak

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ABSTRACT

Various delivery methods can be applied in the teaching and learning (TnL) aspect, one of which is using Teaching Aids (TA) to provide understanding of the concepts being conveyed. Basically, the lecturer delivers the TnL process by explaining to students based on notes, slides, and demonstration videos. Students need to focus on what's being taught. However, there is concern that students may remain silent and be too shy to ask about topics they don't understand. The different backgrounds of the students, where only a few are skilled in netball. The lecturer faces difficulties in conducting practical demonstrations and game simulations. Conventional methods such as verbal explanations fail to provide a true picture of the game's dynamics and player positions. Netball Simulator Playzone Kit or NetPSim Kit was created as a facilitator for the TnL process for the MPU24031 Sports 1 Netball course at Malaysian Polytechnics. The innovation based on Arduino Uno hardware is a simulation of the lecturer's teaching process in conveying the real picture of netball on the field. It is flexible with a lightweight briefcase concept for easy transport and portability. This kit uses LED lights to indicate player zones, coin counter for strategy simulation, interactive quizzes, e-books, and Augmented Reality videos using an Artificial Intelligence (AI) platform. The development process involves circuit design, coding using Arduino IDE software, prototyping, and iterative testing. A set of questionnaires was developed to gather student perception feedback on the use of the innovation. A total of 30 students were selected as the sample. Descriptive analysis as well as pre and post tests were conducted to obtain the results. Perception findings are based on mean scores, while the differences before and after are interpreted using percentage and graph methods. Overall, all items are in a high position with a mean between 4.00 and 5.00, while pre and post results recorded an increase of 68%. NetPSim Kit has obtained a copyright certificate from the Intellectual Property Corporation of Malaysia. The use of innovation has been widely disseminated to all POLYCC as a reference in the delivery of the TnL process. This simultaneously bridges the gap between theory and practical implementation. In conclusion, this innovation successfully addresses the main challenges in netball coaching by enhancing visualization, interactivity, and accessibility. Improvement suggestions include adding a buzzer for zone violations and developing an application to expand usage and provide a more in-depth interactive learning experience.

Keywords: Netball, Simulation, Teaching and Learning (TnL)

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Pengenalan / Latar Belakang

Pada dasarnya, pensyarah menyampaikan proses PdP dengan menerangkan kepada pelajar berdasarkan nota, slaid dan video tunjuk cara. Walaubagaimanapun, dikuatiri pelajar bersikap berdiam diri dan malu bertanya tentang topik yang mereka tidak faham. Latar belakang pelajar yang berbeza di mana hanya segelintir sahaja yang mahir dalam sukan bola jaring. Pensyarah menghadapi kesukaran untuk membuat demonstrasi praktikal dan simulasi permainan khususnya kepada pelajar yang tiada asas dalam bola jaring. Kaedah konvensional seperti penerangan lisan dan penggunaan video asas gagal memberi gambaran sebenar mengenai dinamika permainan dan kedudukan pemain.

Objektif

- Memenuhi keperluan penyampaian PdP bagi kursus MPU 24031 Sukan (Bola Jaring) di Politeknik.
- Memudahkan pelajar memahami dengan lebih mendalam mengenai permainan bola jaring.
- Menunjukkan simulasi permainan, posisi pemain dan peraturan permainan bola jaring dengan mudah.
- Menarik minat pelajar mempelajari kemahiran asas bola jaring.



Kesimpulan

- NetPSim Kit telah terbukti berkesan sebagai ABM yang inovatif dan interaktif bagi menyokong proses PdP kursus MPU24031 Sukan Bola Jaring di Politeknik.
- Dengan gabungan teknologi terkini seperti Augmented Reality (AR) serta komponen elektronik Arduino, kit ini berjaya meningkatkan tahap pemahaman pelajar terhadap konsep, strategi dan posisi permainan bola jaring.

NetPSim Kit - NETBALL PLAYZONE SIMULATOR KIT

KETUA : Ts. NURUL LIYANA BINTI MAHMUD
AHLI KUMPULAN : ZAIHAN BINTI SULAIMAN
AHLI KUMPULAN : NOR AZREEN BINTI AYUB

Pernyataan Masalah

Netball Simulator Playzone Kit atau NetPSim Kit dicipta sebagai pemudahcara bagi proses PdP bagi kursus MPU24031 Sukan Bola Jaring, Politeknik Malaysia. Inovasi yang berasaskan perkakasan Arduino Uno merupakan satu simulasi PdP pensyarah dalam menyampaikan gambaran sebenar permainan bola jaring di lapangan. Ianya bersifat fleksibel berkonsepkan beg bimbit yang ringan supaya mudah dibawa dan bersifat mudah alih. Kit ini menggunakan lampu LED untuk menunjukkan zon pemain, coin counter untuk simulasi strategi, kuiz interaktif, e-book serta video berunsur Augmented Reality menggunakan platform Artificial Intelligence (AI).

Ciri – Ciri Produk

Mudah alih – ringan dan mudah dibawa ke mana-mana

Mudah digunakan

Kos efektif – kos penghasilan produk yang rendah

Interaktif – dilengkap dengan kuiz, video dan penerangan suara

Jimat masa & tenaga – Aspek penyampaian PdP menjadi lebih cepat dan senang

Carta Bar Dapatan Pre dan Post Menggunakan Inovasi



DAPATAN PRE DAN POST	
Sebelum Inovasi	Selepas Inovasi
26.7%	94.7%

Satu set soalan kuiz dibangunkan untuk mendapatkan maklumbalas mengenai pengetahuan asas pelajar dalam sukan bola jaring. Pelajar diberi sepuluh (10) soalan aneka pilihan menggunakan google form bagi mendapatkan keputusan sebelum dan selepas menggunakan inovasi.

Nilai Komersial

Disasarkan kepada politeknik seluruh Malaysia bagi kursus MPU 24031 (Sukan – Bola Jaring).

Boleh diperluaskan ke sekolah menengah, institusi latihan guru, dan kolej lain

Beg bimbit, ringan dan mudah dibawa – sesuai untuk aktiviti lapangan, pameran & sesi PdP interaktif.

Menggunakan Augmented Reality (AR) & Artificial Intelligence (AI).

Disertakan dengan kuiz interaktif, e-book digital dan suara panduan

Mempunyai sijil hakcipta rasmi (CRLY2025Q02981)

Boleh mencuba berulang kali tanpa bimbingan penuh pensyarah (self-learning).

Tiada lagi inovasi khusus untuk MPU sukan Bola Jaring di POLYCC. Potensi sebagai Produk EdTech (Educational Technology)

“Tell me and I forget, teach me and I remember, involve me and I learn”
 – Benjamin Franklin

FINANCIAL REPORTING SOLUTION (FiReS)

Nor Ariefah Hafidza binti Kadir¹, Ku Ahmisuhaiti binti Ku Ahmad¹, Mohd Fouzi bin Mustafa¹

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ABSTRACT

The DPM50113 Marketing Plan course is mandatory for fifth-semester Marketing Diploma students in Malaysian Polytechnics and is a prerequisite for attending Industrial Training. Comprising eight topics, including the Financial Report (Topic 8), students are required to prepare a Financial Report demonstrating the business's financial position for the product that they produced. It involves Sales Forecast, Break-even Analysis, Projected Profit and Loss and Projected Cash Flow. Due to time constraints, students face challenges in manually preparing these reports, leading to calculation errors and prolonged record-keeping. Lack of prior financial report-related courses and minimal entry qualifications contribute to students' struggles, requiring innovative tools like FiReS (Financial Report Solution). FiReS, an Excel-based teaching aid, aims to simplify and streamline financial reporting, reducing errors and fostering a clearer understanding of the financial documents' interrelationships. The template automates calculations accurately, aiding non-accounting students and expediting report generation compared to manual methods. Specifically designed for the Marketing Plan course, FiReS enhances learning experiences, facilitating quick report generation and nurturing financial skills. The innovation was evaluated positively through surveys on effectiveness, ease of use, student attitudes and behaviours. FiReS proves cost-effective, expedites learning and saves time in financial reporting. Its effectiveness enhances the teaching-learning process, making it more interactive and efficient. Survey results revealed students' positive responses across all queried aspects including effectiveness, userfriendliness, student attitudes and behaviors. In conclusion, FiReS significantly benefits students by easing learning, generating interest and reducing errors in Financial Report preparation.

Keyword: Financial Report, Marketing Plan, Projected Profit and Loss, Projected Cash Flow, Sales Forecast

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

PRODUCT ID :
Respex25-073
FiReS (FINANCIAL REPORTING SOLUTION)

POLITEKNIK
PORT DICKSON

INVENTORS :
NOR ARIEFAH HAFIDZA BINTI KADIR
KU AHMISUHAITI BINTI KU AHMAD
MOHD FOUZI BIN MUSTAFA

INTRODUCTION:

FiReS innovation is a product developed by lecturers at Port Dickson Polytechnic for the DPM 50113 (Marketing Plan) course. In this course, students are required to produce a "Financial Report" for a business, a crucial component necessary to fulfill the requirements for the final report and obtain certification for the Marketing Diploma. The financial report is divided into four main sections: Break-even Analysis, Sales Forecast, Projected Profit and Loss, and Projected Cash Flow.

Before the introduction of **FiReS**, students were provided only with manual documents, prepared by lecturers. **FiReS** represents an improvement over these manual documents, which offered general, brief, less engaging, and non-detailed information related to the required financial reports.

FiReS has streamlined the process by consolidating all necessary report documents into a single EXCEL file, interlinking each document. Calculation activities have been formatted to minimize errors, especially considering the large-scale businesses involved in the Marketing Plan, which often entail dealing with substantial numerical data.

Through the FiReS innovation, every detail of the document is presented clearly, in color, and more comprehensively than in manual documents. The use of color enhances visibility and attracts students, making it easier for them to understand the content of each report document.

OBJECTIVES :

- ✓ Expose students to the easy, comprehensive and high-quality production of "Financial Reporting"
- ✓ Develop innovative ideas in Teaching and Learning methods among educators/lecturers.
- ✓ Enhance students' understanding of fundamental calculation concepts necessary for generating complete "Financial Reporting".
- ✓ Ensure students comprehend the interrelation of each financial report document and guarantee that a business does not operate at a loss (the template will indicate if the business is incurring losses and has a negative cash flow).

MATERIALS/ METHODS :

- ❑ *CREATED USING MICROSOFT EXCEL APPLICATION*
- ❑ *EACH OF THE DOCUMENTS CREATED IS FORMULATE AND CONNECTED (ACCURATE CALCULATIONS ALREADY FORMULATED FOR MINIMIZE THE ERRORS)*

SIGNIFICANT OF THE STUDY:

- ❑ Can help increase student interest, reduce boredom and drowsiness in class compared to teaching techniques that use documents manually.
- ❑ The documents provided are more attractive, colorful, organized and according to business suitability.
- ❑ Save time because the financial report template has been prepared and organized with the appropriate items under it
- ❑ More student-friendly because students can directly view the financial report template in FiReS.
- ❑ More understandable to students because the relationship between one document to another is generated automatically.

CONCLUSION:

- This innovation project not only **benefits students in improving the quality of "Financial Reporting"** produced in the final Marketing Plan report but also proves **successful** in assisting students without an accounting background in **easily creating financial reports** that are more understandable and user-friendly.
- In addition to FiReS being condensed to **match the Financial Statement format used in the industry**, the use of digital teaching materials can serve as a useful strategy to enhance students' understanding of the content and components of "Financial Reporting."
- This innovation also has the **potential to be utilized by business owners outside academia** to generate the necessary financial reports for their business.

PROBLEM STATEMENT:

- ✓ Topic 8, "Financial Reporting," was taught as the last topic and before the existence of this innovation, students had to manually produce reports and independently consider the items in the financial report with the assistance of the lecturer.
- ✓ Students are also in the field of Marketing (majority of them have very limited knowledge in the field of accounting and are less interested in learning in the form of numbers).
- ✓ Therefore, it gave rise to the idea for lecturers to help students by facilitating the learning session with the production of this digital document, which is the development of FiReS innovation. This aims to help simplify, summarize, and further empower students' level of understanding related to financial reports for businesses and subsequently produce quality "Financial Reporting" in line with the requirements of the final student project report.
- ✓ This is in line with Barbosa and Vale's (2021) study, which states that the use of more interactive technology in learning compared to traditional methods is proven to increase student motivation and achievement.
- ✓ Therefore, the production of FiReS is expected to help students better understand and produce quality "Financial Reporting" reports in line with the needs of the industry.

INNOVATION HIGHLIGHT:

- ✓ Developed **SPECIFICALLY** for the DPM50113 Marketing Plan course.
- ✓ It is developed for **FREE** and involves **no costs (ZERO COST)**.
- ✓ Each document is **INTERCONNECTED** through **FORMULATED LINKS**. The generated documents are formatted with accurate calculations to ensure no calculation errors.
- ✓ The "Financial Report" format is **CONSTRUCTED BASED ON REAL BUSINESS FORMATS**, meeting industry report requirements.
- ✓ **User-friendly, easy to use, reduces calculation errors and produces high-quality financial reports** for the Marketing Plan.

COMMERCIAL VALUE:

- FiReS can be shared with students and disseminated to fellow Course Lecturers in Polytechnics/Other Higher Education Institutions, as well as to business owners, to generate "Financial Reporting."
- Facilitate both lecturers and students during learning and teaching sessions, especially in the production of "Financial Reporting" reports.
- In line with the current technological advancements towards the use of technology in education.
- **HAS BEEN AWARDED SILVER AWARD** IN **INTERNATIONAL CREATIVE & INNOVATIVE PRODUCT EXHIBITION (ICRIPE 2024)**

EMBBOT TRAINER

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Abstract

The EmBot Trainer is a new innovative product developed to meet the practical needs of the Embedded Robotic course for students of the Department of Electrical Engineering at Politeknik Port Dickson. It offers a more accessible, effective, and self-directed learning approach. This trainer is integrated with Augmented Reality (AR) technology and features explanations of each component's function, interactive notes, practical simulation videos, online quizzes, and a training module. The idea for this innovation emerged from frequent component damage caused by the lack of effective and practical Teaching Aids (TA) for hands-on sessions. Additionally, students' weak understanding of circuit connections and frequent wiring errors often led to component failures, requiring lecturers to repeatedly conduct demonstrations. This not only disrupted time management but also hindered project implementation within the allocated timeframe. Design Thinking approach for solution actions used in the development of EmbBot Trainer. The EmBot Trainer incorporates key elements such as practicality, time efficiency, effectiveness, engagement, motivation, and self-directed learning. By using this trainer, the issues mentioned above can be effectively addressed. As a result, it offers a more dynamic learning experience aligned with current technological trends.

Keyword: Embedded Robotic, Self Learning, Augmented Reality (AR)

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

EmbBot Trainer



Dr. Rosmilawati binti Ab Rahman
 (Group Leader)
 Politeknik Port Dickson



Masnora binti Haji Sepikun
 Politeknik Port Dickson

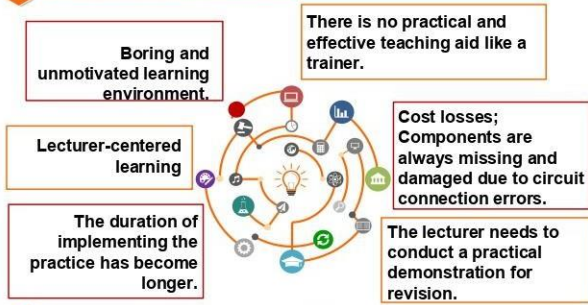


Mohd Jahidi bin Rosdi
 Politeknik Port Dickson

01 PRODUCT DESCRIPTION

The EmbBot Trainer was developed to meet the practical needs of the Embedded Robotic Course at Politeknik Port Dickson through techniques that are easier and more effective and promote self-learning. This trainer is integrated with Augmented Reality (AR) technology, characterized by interactive notes, practical simulation videos, online quizzes, and training modules to enhance students' understanding and capabilities for this course.

02 PROBLEMS / ISSUES



03 OBJECTIVE

- 1 Developing a practical trainer for the Embedded Robotics course integrated with AR technology as teaching aids.
- 2 Creating a self-learning resource mechanism based on current technology that is easy to use and user-friendly.
- 3 Enhancing students' understanding and practical skills through self-directed learning with a stronger concept of 'do it yourself.'
- 4 Reducing the loss of management expenses, the rate of loss, and damage to components to a minimum level.
- 5 Saving time in teaching and learning and conserving the lecturer's energy without repeated practical demonstrations.
- 6 Enhancing student motivation in carrying out Embedded Robotics practical work more effectively and engagingly.

04 IMPLEMENTATION LEVEL

The product has been successfully designed and functionality has been tested. The EmbBot Trainer works well and is used as an Interactive teaching material in the Embedded Robotics Course training class.



05 PROJECT IMPACT

- Efficiency**
Interactive teaching materials; a combination of trainers and AR digital technology. Students can carry out practical work individually without needing to share components. Students can add/select appropriate input/output for a process/project being carried out.
- User-friendly and Up-to-Date Technology**
User-friendly with self-learning and the latest technology. No expertise in circuit design or programming is required; you just need to plug and play with the basic components on the trainer.
- Practical Skills**
Enhancing students' practical skills in circuit connections and programming.
- Cost-saving**
Financial savings for anticipating risks of component failure and minimal maintenance costs.
- Save Time**
The concept of self-directed learning can save time in teaching sessions and reduce students' dependence on lecturers.

06 APPLICATION & NOVELTY PRODUCT



07 COMMERCIAL POTENTIAL

- 1 **Easy & User-Friendly;** Not limited to polytechnic users but available for the needs of teachers and students from primary school to public universities .
- 2 **Flexible Project Module;** the project module can change according to the creativity of teachers and students to be produced in empowering students' talents.
- 3 **Reasonable Costs;** Reasonable costs of production and sales in line with the technology used.
- 4 **IR4.0 technology;** Maximizing the use of technology towards integration and synergy.

PV SOLAR TRAINER WITH COOLING SYSTEM

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Abstract

The PV Solar Trainer with Cooling System is a comprehensive educational innovation aimed at enhancing both the efficiency of photovoltaic (PV) systems and the quality of technical education in the field of renewable energy. Specifically designed for application in tropical climates such as Malaysia, this trainer system addresses a common limitation of PV technology—reduced efficiency due to high panel surface temperatures. By integrating a solar energy generation setup with an automated active cooling system comprising fans and water pumps, the innovation effectively stabilizes panel temperature and improves energy conversion efficiency. This project not only introduces students to fundamental solar energy principles but also emphasizes the practical application of automation technologies through microcontroller programming (Arduino). Learners gain firsthand experience with sensor integration, data acquisition, and automated system control. The system includes real-time monitoring and feedback capabilities using temperature and humidity sensors, allowing users to observe performance variations with and without cooling mechanisms. Moreover, the PV Solar Trainer is designed to be modular, portable, and user-friendly, making it suitable for use in classrooms, laboratories, and educational exhibitions. The trainer provides a valuable platform for educators to demonstrate the real-world impact of environmental factors on solar power output, while simultaneously nurturing students' technical, analytical, and problem-solving skills. As such, this innovation supports sustainable education practices and aligns with global goals for clean and affordable energy.

Keywords: PV Solar Trainer, Renewable Energy, Cooling System, Arduino, Technical Education



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION



ZULKURNAIN BIN HASSAN
 RAZIMAH BINTI ABDUL RAHIM
 NUR HIDAYAH BINTI MOKTAR

POLITEKNIK PORT DICKSON,
 NEGERI SEMBILAN

PV SOLAR TRAINER WITH COOLING SYSTEM (PVST)

Inovasi Pendidikan Tenaga Boleh Diperbaharui

Product ID : Respex25-083

1 LATAR BELAKANG

- Sistem fotovolta (PV) semakin banyak digunakan untuk menjaga tenaga bersih.
- Namun, dalam iklim tropika seperti Malaysia, suhu tinggi pada permukaan panel mengurangkan kecekapan tenaga.
- Inovasi ini dibangunkan bagi mengatasi isu tersebut dan sebagai alat bantu mengajar yang interaktif untuk kursus DEG 40023

3 OBJEKTIF

- Sebagai Trainer PDP untuk kursus DEG40023 – Renewable Energy System
- Menstabilkan suhu panel PV menggunakan sistem penyejukan aktif.
- Meningkatkan kecekapan tenaga yang dijana.
- Memberi pengalaman praktikal kepada pelajar dalam bidang tenaga boleh diperbaharui dan automasi.

6 SOROTAN INOVASI

- Sistem penyejukan automatik (kipas + pam air)
- Pemantauan masa nyata suhu & prestasi
- Reka bentuk modular dan mudah alih
- Sesuai untuk bilik kelas, makmal,

2 PERNYATAAN MASALAH

- Kecekapan PV berkurang akibat suhu panel yang terlalu tinggi.
- Kekurangan alat latihan yang menggabungkan teknologi penyejukan dan automasi untuk pendidikan teknikal.

4 BAHAN/KAEDAH

- Panel PV
- Kipas & Pam Air
- Sensor Suhu & Kelembapan
- Mikropengawal Arduino
- Pemantauan & Kawalan Masa Nyata

7 NILAI KOMERSIAL

- Potensi digunakan di institusi pendidikan TVET & politeknik.
- Boleh dipasarkan sebagai kit latihan solar + automasi.
- Kos pembangunan rendah dan mesra pengguna.



5 KEPENTINGAN KAJIAN

- Menangani isu kecekapan PV dalam iklim panas.
- Meningkatkan kemahiran pelajar dalam automasi & pengurusan tenaga.
- Menyokong pembelajaran aktif dan berasaskan masalah (PBL).

7 KESIMPULAN

- Inovasi Pendidikan +Integrasi Pelbagai Bidang
- Memperkukuh Pemahaman Teori Melalui Praktikal
- Menjimatkan Masa & Kos penyediaan bahan PDP
- Menyumbang kepada Kelestarian & Penjimatan Sumber Tenaga
- Reka Bentuk Modular & Kebolehskalaan Tinggi (Pendidikan, Vokasional, Industri)
- Menyokong Pembangunan Modal Insan Berkemahiran Tinggi

9 KAJIAN KEBERKESANAN



KOD QR KERTAS AMAISISTEM IOT UNTUK KAWALAN AUTOMATIK



MAHANG GOLD: ORNAMENTAL FISH EXPERT

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ABSTRACT

The ornamental fish industry is one of Malaysia's high-impact aquaculture sectors. In 2019, production reached 287,531,539 ornamental fish, with a total industry value of RM506.45 million. This growth is driven by the lucrative market value of high-demand species such as arowana, betta fish, goldfish, and guppies. However, chemical fish care products are extensively used in line to this ornamental fish production. To overcome this problem, Mahang Gold was introduced as a natural supportive product to help breeders maintain high-quality aquatic environments. Mahang Gold: Ornamental Fish Expert is a TVET-based innovation that combines natural product application, hands-on aquaculture learning, and entrepreneurial training for students and community participants. It was developed to address the lack of sustainable, locally relevant tools in the field of ornamental fish care education, especially in the TVET *Sijil Khas Ikan Hiasan* Program. The innovation focuses on the use of *Macaranga* spp. (mahang) leaf extract to formulate an eco-friendly, plant-based aquarium water conditioner. Mahang Gold supports a practical approach to learning by allowing students to be involved in the full process of extraction, formulation, product testing, and direct observation of water quality effects on ornamental fish. By improving water conditions, reducing fish stress, and enhancing coloration and health, this innovation aids breeders aiming to increase their income through the production of premium ornamental fish. Results from lab testing and field trials showed Mahang Gold to be effective in lowering pH, mimicking natural blackwater conditions, and promoting fish vitality. Beyond its educational use, Mahang Gold holds strong commercial potential. It is scalable, cost-effective, and globally relevant, particularly as demand increases for natural, sustainable aquarium products. Future development includes digital learning modules, community-based manufacturing, and export certification to position Mahang Gold on the international market.

Keywords: Ornamental Fish, Green Product, *Macaranga*, TVET, Sustainability



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

MAHANG GOLD: ORNAMENTAL FISH EXPERT

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TEAM LEADER



NURUL JOHANNA BINTI JEMAIN
MEMBER



SITI HAJAR BINTI SULAIMAN
MEMBER



NORASHIKIN BINTI OTHMAN
MEMBER



TENGGU MOHD FAIZUL BIN TUAN ISMAIL
MEMBER

INTRODUCTION

- ❖ The ornamental fish industry is one of Malaysia's high-impact aquaculture sectors, recording 287 million ornamental fish in 2019 valued at RM506.45 million.
- ❖ However, the widespread use of chemical-based fish care products has raised sustainability concerns.
- ❖ **Mahang Gold** was introduced as a natural product innovation based on local *Macaranga* spp. leaves to support safe, eco-friendly fish care practices while enhancing TVET-based teaching and learning in ornamental aquaculture fish.

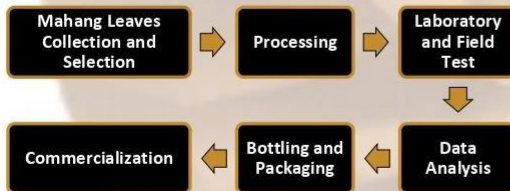
PROBLEM STATEMENT

- ❖ Overuse of chemical-based aquarium products poses risks to fish health and the environment.
- ❖ Lack of effective natural product for TVET ornamental fish care learning tools.
- ❖ Poor water quality in captivity contributes to fish stress, disease, and reduced coloration and vitality, affecting fish quality and survival.

OBJECTIVE

- ❖ To develop a natural, eco-friendly aquarium water conditioner
- ❖ To provide an effective, nature-based product
- ❖ To meet the demand of ornamental fish lovers.

MATERIALS / METHOD



COMMERCIAL VALUE

- ❖ IP Registered and funded by T-ACGS Grant Scheme
- ❖ This product is being commercialized
- ❖ High potential for domestic and international markets
- ❖ Growing global demand for sustainable aquarium products
- ❖ Low production cost and accessible raw materials
- ❖ Supports local breeders and community entrepreneurship under TVET

SIGNIFICANT OF THE STUDY

- ❖ Promote nature-based product and sustainability
- ❖ Optimizes ornamental fish health
- ❖ Maintain and control water quality condition
- ❖ Enhances students' critical thinking, creativity, and entrepreneurship
- ❖ This innovation align with SDG4, SDG8, SDG12 and SDG14

INNOVATION HIGHLIGHT

- ❖ **Mahang Gold** has been proven effective in regulating water pH, creating conditions more suitable for ornamental fish farming.
- ❖ The Mahang tree (*Macaranga* spp.) is widely distributed across Malaysia, making the raw material easy to source.
- ❖ Its leaves are rich in phytochemicals that help improve water quality by preventing bacterial infections and promoting a calm, stress-free environment for fish, enhancing their health, coloration, and survival rate.
- ❖ The product is packaged in a convenient dropper bottle, allowing for easy storage and precise usage.
- ❖ With just a few drops, **Mahang Gold** can be added directly into fish tanks to maintain clean, stable water conditions naturally.



CONCLUSION

Mahang Gold revolutionizes ornamental fish care by integrating natural technology into TVET learning. It reduces chemical use, enhances fish health, empowers students with sustainable, hands-on innovation and advancing TVET through eco-smart solutions.



ENHANCING ENGLISH LANGUAGE VOCABULARY ACQUISITION THROUGH DIGITAL FLASHCARD APPLICATIONS: A STUDY ON MALAYSIAN COMMUNITY COLLEGE STUDENTS

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Abstract

This paper explores how digital flashcard apps help students in Malaysian community colleges learn everyday English words. It focuses on whether these apps help students remember vocabulary better, improve pronunciation, and enhance communication skills. This is particularly useful for students who rarely use English outside school. The research involves classroom tests, surveys, and interviews to gather both numbers and detailed insights. Results show that flashcard apps significantly aid language learning by making it engaging and interactive. The findings suggest that integrating these apps into language classes can be a valuable addition, offering students the opportunity to learn at their own pace and encouraging greater independence in their learning process.

Keywords: English Vocabulary, Communication Skills, Digital Flashcard



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

Enhancing English Language Vocabulary Acquisition through Digital Flashcard Applications: A Study on Malaysian Community College Students



Nama ketua : KARTHIK THIAGARAJAN
 Institusi : KOLEJ KOMUNITI SHAH ALAM

Introduction
 English is very important for communicating with people worldwide let it be for the purpose of education and job opportunities or merely basic necessity communications. In Malaysia, English serves as the second language, playing a crucial role in succeeding academically and professionally. However, students in community colleges often struggle with learning and using English vocabulary effectively. This is mainly due to not getting enough practice and not being exposed to English regularly. This study aims to explore how digital flashcards might help students improve their English vocabulary for everyday use.

Problem Statement
 Despite the recognized importance of English as a second language in Malaysia for academic and professional success, many students in Malaysian community colleges struggle with acquiring and retaining English vocabulary. This challenge is primarily due to limited exposure to English outside of the classroom and insufficient practice opportunities. Traditional teaching methods may not fully engage learners or support long-term vocabulary retention. Therefore, there is a need to explore whether digital tools—specifically flashcard applications—can effectively support vocabulary acquisition and enhance students' confidence and communication skills in English.

Objectives of the Study
 1. To examine the effectiveness of digital flashcard applications in enhancing English vocabulary acquisition among Malaysian community college students.
 2. To evaluate students' improvement in vocabulary retention and usage before and after using a digital flashcard app (VocApp) over an 11-week period.
 3. To explore students' perceptions and motivation towards learning English vocabulary through digital flashcards.
 4. To determine whether the use of digital flashcards contributes to better pronunciation and communication skills in English for daily use.

Research Method Used
 This study employed a **quantitative research method** to investigate the effectiveness of digital flashcard applications in improving English vocabulary among Malaysian community college students.
•Participants:
 34 students from the SESI II 2024/2025 batch at a Malaysian community college participated in the study. They were enrolled in two compulsory English subjects:
 • SUE10011 Communicative English (Semester 1)
 • SUE20021 Workplace English (Semester 3)
•Duration:
 The study was conducted over a period of **11 weeks**.



Research Method Used (Cont)
•Intervention Tool:
 The students used a **digital flashcard application** called **VocApp**, installed on their smartphones, to learn **54 common English words and phrases** used in daily conversation.
•Data Collection Instruments:
 • **Pre-test and Post-test:** Administered to measure students' vocabulary knowledge before and after using the flashcard app.
 • **Surveys and Interviews** (implied from the abstract): Used to gather students' feedback, engagement, and perceptions.
•Analysis:
 The students' performance on pre-tests and post-tests was analyzed to determine improvement in vocabulary knowledge. The comparison helped assess the impact of the digital flashcard intervention.

Significance of the Study
1.Improves Vocabulary Acquisition:
 It demonstrates that digital flashcard applications like **VocApp** can effectively enhance English vocabulary acquisition among Malaysian community college students, especially for daily communication.
2.Supports Underperforming Learners:
 It provides a practical solution for students who have limited exposure to English outside the classroom and who struggle with traditional vocabulary learning methods and helps to build their confidence in using English at their own pace and convenience.
3.Enhances Teaching Practices:
 The findings offer valuable insights for English language instructors, suggesting that incorporating digital tools into the classroom can increase student engagement, participation, and motivation.

Innovation Highlight
 The key innovation of this study lies in the **integration of a mobile-based digital flashcard application (VocApp)** into the English language learning process for community college students in Malaysia. Unlike traditional recall memorization techniques, this study introduces:
1.Technology-Enhanced Vocabulary Learning:
 The use of **VocApp** allows students to engage with vocabulary through interactive, multimedia-supported flashcards that include audio pronunciation, and gamified features.
2.Spaced Repetition and Active Recall Techniques:
 The flashcard app is designed based on cognitive science principles such as spaced repetition and active recall, which are proven to enhance long-term memory retention.
3.Practical Application in Low-Resource Educational Settings:
 By using free or low-cost mobile apps, this approach provides an **affordable, scalable, and easy-to-implement** innovation for language education

Conclusion
 This study has shown that **digital flashcard applications**, specifically **VocApp**, are effective tools for enhancing English vocabulary acquisition among Malaysian community college students. Through the use of pre-tests and post-tests, significant improvements in vocabulary retention, usage, and student motivation were observed. The interactive and flexible nature of digital flashcards encourages **self-directed learning**, supports **repetition and recall**, and helps students build **confidence in everyday English communication**. Incorporating digital flashcards into English language instruction not only makes learning more engaging but also offers a **cost-effective and scalable solution** for language educators.



THE SYARIENET INNOVATION: A DIGITAL PLATFORM FOR LEARNING FIQH

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Abstract

SyarieNet is a web-based learning innovation developed to assist students and the general public in understanding Shariah terms and fiqh rulings related to menstruation (haid) and irregular bleeding (istihadhah) in a more systematic and interactive manner. Preliminary studies indicate that a significant number of students face difficulties in comprehending the true meanings of Arabic terms found in classical fiqh texts and chapters concerning women's blood. This confusion negatively impacts their understanding and performance of daily religious obligations such as prayer and fasting. The main objective of this innovation is to provide a comprehensive and user-friendly learning platform that integrates three main components: (1) a bilingual Arabic–Malay Shariah Terminology Dictionary with concise and easy-to-understand definitions; (2) an interactive explanation module on menstruation (haid) and istihadhah from a fiqh perspective; and (3) a Menstrual Cycle Tracking App (Haid Tracker) that enables users to regularly record and monitor their cycles. The development process adopts a usercentered design approach, involving needs analysis, content development with fiqh experts and usability testing with the target group. Initial findings show that students find it easier to grasp Islamic legal terms when presented in a simplified digital format, supported by practical examples and an intuitive, userfriendly interface. What sets SyarieNet apart is its integration of a fiqh terminology dictionary with a menstrual tracker in a single, unified learning platform—an approach rarely found in contemporary Islamic education tools. This innovation holds strong potential to be further expanded as a digital teaching aid in educational institutions and as a mobile application accessible to the wider Muslim community. Ultimately, SyarieNet aims to enhance Shariah literacy among students and users, thereby strengthening their understanding of women's fiqh issues based on authentic and contemporary references.

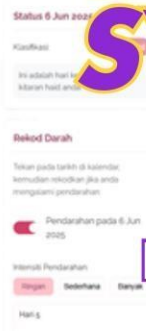
Keyword: Syarienent, Fiqh Haid, Haid Tracker, Digital Learning, Shariah Terminology



08 YOUTH STEM

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NEUROBRIDGE
SEKOLAH MENENGAH SAINS REMBAU, KAMPUNG PILIN
2. RESPEX25-029
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INOVASI SYARIENET



INOVASI SYARIENET

Platform

Pembelajaran Fiqh Secara Digital

PENGENALAN

- ✓ SyarieNet ialah sebuah platform digital inovatif yang dibangunkan bagi membantu umat Islam, khususnya wanita dalam memahami fiqh haid dan istihadhah secara sistematik, sahih dan mudah di akses. Ia boleh dimanfaatkan oleh remaja, wanita, guru, pendakwah dan ibu bapa pada bila-bila masa dan di mana sahaja tanpa had ruang dan waktu.



KEUNIKAN

- Produk pertama yang menggabungkan kamus syariah dan haid tracker
- Platform web fleksibel dan mudah akses
- Gabungan elemen Fiqh dan Teknologi Visual
- Pengiktirafan MyIpo

MANUAL PENGGUNA

- Layari laman rasmi SyarieNet.com.
- Paparan utama akan menunjukkan 2 komponen utama:
 - ◆ Kamus Syariah
 - ◆ Kitaranku (Kalendar Haid)
- Muncul paparan Track pengenalan dan fahami kitaran Haid dengan panduan Islam yang sahih
- Log in masuk ke menu Haid Tracker dengan menggunakan username dan password.
- Sistem penjejak haid akan merekod dan memantau kitaran haid mengikut panduan Syariah

OBJEKTIF

- ✓ Memberi kefahaman yang tepat kepada pengguna tentang fiqh haid dan istihadhah.
- ✓ Menyediakan platform digital yang sahih, fleksibel dan interaktif dalam isu fiqh wanita.
- ✓ Membantu pengguna membuat keputusan ibadah yang betul berdasarkan jenis darah yang dialami.
- ✓ Menyokong pengajaran dan pembelajaran Pendidikan Islam serta dakwah berkaitan fiqh wanita.

APA YANG MENARIK MENGENAI SYARIENET?

Kamus Syariah

- Menghimpunkan istilah fiqh Arab-Melayu dengan maksud yang mudah difahami
- Boleh menjadi rujukan para pelajar, guru dan masyarakat awam

Kitaranku (Kalendar Haid)

Mengandungi :

- Pengenalan konsep haid dan istihadhah
- Perbezaan antara kedua darah haid dan istihadhah
- Mengenal sifat-sifat darah
- Hukum-hukum fiqh berkaitan
- Permasalahan Haid dan Istihadhah

Haid Tracker

- Membantu mengenal pasti status darah dan hukum yang terpakai secara automatik
- Merekod dan memantau kitaran haid mengikut panduan Syariah
- Membantu dalam panduan ibadah berkaitan solat, puasa, mandi wajib dan membaca Al-Quran

MASALAH KAJIAN

- Kekeliruan dalam kalangan pelajar dan masyarakat mengenai perbezaan haid dan istihadhah
- Tiada rujukan digital yang sahih bagi memudahkan pemahaman tentang fiqh haid dalam konteks semasa
- Kajian rintis mendapati ramai wanita tidak yakin dengan status ibadah mereka akibat kekeliruan jenis darah

IMPAK

- Meningkatkan Kefahaman Fiqh Wanita
- Akses mudah dan mesra pengguna
- Menyokong peranan dakwah dan pendidikan
- Memberi keyakinan kepada wanita dalam melaksanakan ibadah dengan sah dan yakin

KESIMPULAN

- ✓ Inovasi SyarieNet telah berjaya dibangunkan sebagai sebuah platform digital yang khusus membantu masyarakat memahami fiqh haid dan istihadhah dengan lebih mudah, sistematik dan berkesan

CADANGAN PENAMBAHBAIKAN

- ✓ Memasukkan video panduan atau animasi interaktif sebagai bahan bantu belajar
- ✓ Menyediakan versi aplikasi mudah alih (mobile app) untuk penggunaan tanpa talian
- ✓ Mewujudkan ruang forum dalam platform untuk membolehkan pengguna bertukar pendapat, bertanya soalan dengan pakar fiqh dan pengguna lain

Dibangunkan oleh

NURSHAHIZA BINTI MOHAMAD ISA
 NURULHUDA BINTI ISHAK
 SALINA BINTI MAT SEHOR

Institusi

POLITEKNIK SEBERANG PERAI,
 PULAU PINANG, MALAYSIA

NEUROBRIDGE

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Abstract

Spinal cord injuries (SCIs) leave thousands of people paralyzed each year, not because their muscles are damaged, but because the brain's signals can no longer reach them. Current treatments often rely on risky surgical implants or offer only limited recovery through physical therapy. This project introduces NeuroBridge, a non-surgical system designed to help restore movement by creating an external bridge for brain signals to bypass the damaged spinal area. The system uses a wearable EEG headset to detect brain activity when someone thinks about moving. These signals are then interpreted by an artificial intelligence model and translated into electrical pulses that stimulate the spinal cord below the injury. This reconnects the brain's intention with actual muscle movement. The prototype of this project combines open-source EEG hardware with custom-built stimulation circuits and local processing units, allowing for fast and reliable performance. In early testing using simulated data, the system achieved about ninety-two percent accuracy in recognizing different movement types. This is significantly higher than traditional EEG systems, which typically achieve seventy to seventy-five percent accuracy. The system also responds more quickly, with only one hundred fifty milliseconds of delay, and has successfully triggered both small and large muscle movements using controlled electrical stimulation between zero and ten milliamperes. What makes NeuroBridge unique is its completely noninvasive design. It avoids the risks of surgery while still delivering effective results. The wireless system can adapt to a wide range of spinal injury levels, from the neck (C4) to the lower back (L1), and could reduce treatment costs by up to sixty to seventy percent compared to implanted alternatives. Looking ahead, this project will plan to improve the system by making the artificial intelligence model more adaptive to users, reducing the size of the hardware for better comfort, and testing the system with real patients in clinical environments. NeuroBridge offers a safer, more accessible path toward helping people with SCIs regain movement and independence.

Keyword: Spinal Cord Injury (SCI), Non-Invasive Neurotechnology, Brain-Computer Interface (BCI), Electroencephalography (EEG), Motor Function Restoration



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

**AZRINA BINTI BADARUDIN (SV)
 MUHAMMAD AQIEL BIN MUHAMMAD
 FAUZIE (L)
 WAN AQIL HAZRIQ BIN WAN MOHD
 FAIZOL
 TUAH ISKANDAR BIN EMMY**

SM SAINS REMBAU

NEUROBRIDGE



INTRODUCTION

AI-Powered Movement Restoration for Spinal Cord Injuries

Spinal cord injuries (SCIs) affect over 300,000 people in the U.S. alone, leaving many with partial or total paralysis—not due to damaged muscles, but because the brain's signals can't reach them. Traditional treatments like physical therapy offer limited results, while surgical implants are risky and expensive.



PROBLEM STATEMENTS

- 300,000+ people in the U.S. live with SCI; 60% suffer permanent paralysis
- Invasive implants (high cost/surgery risks)
- Physical therapy often limited.



OBJECTIVES

- Develop a non-surgical system to restore voluntary movement in SCI patients.
- Use brainwave signals (EEG) to detect movement intent.
- Apply AI to interpret brain signals in real-time.
- Stimulate spinal regions below the injury to trigger muscle movement.



MATERIALS

- Wearable EEG Headset
- Processing & AI Unit
- Spinal Stimulation Unit



SIGNIFICANT OF THE STUDY

NeuroBridge introduces a non-invasive alternative to surgical neural prosthetics, making movement restoration more accessible and safer. The system democratizes neurorehabilitation by reducing cost, eliminating surgical risk, and adapting to a range of SCI levels (C4-L1). It demonstrates how AI and wearable tech can bridge lost motor functions—restoring not just movement, but independence.



INNOVATION HIGHLIGHT

- Real-time EEG-to-movement system (150 ms latency)
- AI model trained on simulated motor intention (CNN-LSTM)
- Modular, wireless, and fully non-invasive hardware



COMMERCIAL VALUES

- Cost-efficient: 60-70% cheaper than implant-based systems
- Portable & Scalable: Easily deployed in clinics or home settings
- Patent potential: AI-stimulation interface and BLE stimulator design
- Market: Neurorehabilitation, assistive mobility, wearable tech



CONCLUSION

NeuroBridge successfully connects brain signals to spinal stimulation using AI, offering a safe, effective, and affordable path to motor recovery. With further clinical trials and hardware miniaturization, this technology could redefine treatment for spinal cord injuries globally.

BIODEGRADABLE PALM CONTAINER

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Abstract

As we know, Malaysia is the second largest oil palm producer in the world which means Malaysia has many palm estates. Day by day, garbage is increasing all the time which has caused the need for more space for garbage disposal. According to the article released by The Star on 5 December 2024, it is estimated that solid waste production in 2024 will be 15.2 million tonnes as compared to 12.63 million tonnes in 2012. With the projected increase of 0.9% to 1.2% per year, Malaysia is estimated to produce 15.38 million tonnes of solid waste in 2025 and 17.03 million tonnes by 2035 said Housing and Local Government Minister Nga Kor Ming. Most of the garbage is made of plastic which is difficult to dispose of. According to articles released by The Malaysian Insight on 22 April 2024, Malaysia is one of the worst offenders in plastic waste mismanagement, with each person in the country guilty of mismanaging 25.49kg per year, research conducted by Utility Bidder showed. This places Malaysia at 10th spot in the Plastic Polluters report, which profiles countries with the most mismanaged waste. According to the article released by the United Nations, plastics generated 1.8 billion tonnes of greenhouse gas emissions in 2019 – that's 3.4 percent of the world's total emissions, a number that is set to grow considerably as the production of plastics is expected to triple by 2060. The rise in plastic pollution is not only extremely harmful to the planet's biodiversity but also contributes to climate change. Therefore, we created a Biodegradable Palm Container (BioPaC) that combines palm fronds with a mixture of yam flour and rice flour to form a multi-purpose container according to the shape created. The ingredients used are only natural ingredients such as palm fronds, water, yam flour and rice flour. The use of this natural material will certainly facilitate the disposal process of the product when it is no longer used because it will not pollute the environment. BioPaC will replace the use of commonly used plastic containers such as stationery containers, plastic pots and trash cans. This will reduce the production of plastic items at the same time reduce waste that cannot be disposed of. In conclusion, BioPaC will minimize the increase in waste disposal space and provide options to users to move towards a better world by supporting green technology innovation products.

Keyword: Palm Frond, Climate Change, Waste Production



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

BIODEGRADABLE PALM CONTAINER (BIOPAC)

AZRINA BINTI BADARUDIN (SV)
 MUHAMMAD IRFAN HADI BIN MAZLAN
 ADAM FAKHRI BIN MUSA

SEKOLAH MENENGAH SAINS REMBAU



INTRODUCTION

Our product which is a Biodegradable Palm Container (BioPaC) will use palm fronds as its main material to make an eco friendly container.

OBJECTIVES



BioPaC will reduce the production of plastic waste, reduce greenhouse gas release and make an alternative product for plastic usage.

MATERIALS



BioPaC will use palm frond as its main material, tapioca flour, rice flour and water. All of the materials used for the production of BioPaC are natural substances.

PROBLEM STATEMENT



Trash is increasing rapidly and many of it takes a very long time to decompose. We also will need a larger space for the trash to decompose and a pollution of soil, air and water will happen. The trash also will affect our earth's temperature and will lead to global warming.

SIGNIFICANT OF STUDY



BioPaC will reduce trash production due to its biodegradable purpose. It can slow down global warming as its are the alternative of plastic products.

INNOVATION HIGHLIGHT



BioPaC will decompose easily and not harm nature. It will reduce the production of plastic waste and reduce global warming.

COMMERCIAL VALUES



BioPaC can be commercialized easily because the time to produce BioPaC is fast and the main substances to make it have a lot of suppliers.

CONCLUSION



Palm oil fronds can be used to produce biodegradable products. BioPaC is eco-friendly and helps to reduce plastic waste. This product will make sure our environment and ecosystem are safe without giving us deficiency. So, no one will get harmed if we use this product. BioPaC just uses natural substances to ensure it is eco-friendly and sustainable. BioPaC will make our nature, earth and most important, our life safe and better.

HYDROSPARK

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Abstract

An inventive water-based battery called HydroSpark was created to provide an economical, ecologically responsible, and sustainable answer to energy storage issues. Conventional batteries frequently use costly materials and dangerous chemicals that are bad for the environment and human health. HydroSpark, on the other hand, generates electricity through a straightforward electrochemical reaction using readily available, non-toxic ingredients like water, salt, and common metal electrodes (such as copper and zinc). The goal of this project is to show how fundamental scientific ideas may be used to develop a useful energy source that can be used for low-power gadgets or LED lights, among other small-scale uses. In addition to lessening its negative effects on the environment, HydroSpark offers an accessible and reasonably priced alternative energy source, particularly in rural or underdeveloped areas. HydroSpark has demonstrated potential as a practical learning tool in science education and an emergency energy source in locations with limited infrastructure. This innovation demonstrates our dedication to advancing green technologies and promoting sustainable behaviours for future generations.

Keyword: Eco-Friendly Innovation, Electrochemical Reaction, Green Technology, Spark watts, Nature Supercharge



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

HYDROSPARK

INTRODUCTION

Sustainable and effective storage technologies are essential as the globe moves toward renewable energy. This water battery idea stores and releases energy in a safe and environmentally responsible manner using water-based technology. It provides a more environmentally friendly substitute for conventional batteries, promoting clean energy objectives while reducing its negative effects on the environment.

METHODS AND MATERIALS

Method:

1. Prepare the container and fill it with distilled water.
2. Add the electrolyte (e.g., salt or vinegar) to allow ion flow.
3. Insert two different metal electrodes (e.g., copper and zinc) into the solution without touching each other.
4. Connect wires to each electrode and link them to a low-power device (like an LED) to test current flow.
5. Measure voltage and current using a multimeter.
6. Modify electrolyte concentration or electrode materials to improve performance.

Materials:

- Distilled water
- Electrodes (e.g., graphite or zinc and copper plates)
- Electrolyte solution (e.g., salt, baking soda, or weak acid like vinegar)
- Plastic or glass container
- Wires and connectors
- LED light or small device (for testing output)

SIGNIFICANT OF THE STUDY

1. **Environmental Impact:** AquaVolt uses water-based electrolytes, offering a more sustainable alternative to traditional batteries, reducing environmental harm from toxic materials like lithium and cobalt.
2. **Cost-Effectiveness:** By utilizing abundant and inexpensive materials such as sodium or zinc, AquaVolt aims to lower the costs of energy storage, making clean energy more accessible.
3. **Safety:** Water-based batteries are inherently safer than lithium-ion batteries, being less prone to overheating, fires, or explosions, which is crucial for high-risk applications like electric vehicles.
4. **Renewable Energy Support:** AquaVolt can store energy from renewable sources like solar and wind, helping to stabilize the grid and promote the transition to greener energy systems.
5. **Large-Scale Deployment:** The study explores how AquaVolt can be scaled for use in grid storage, providing a viable solution for large-scale energy storage needs.
6. **Technological Advancements:** The study advances understanding of water-based battery chemistry, helping to improve efficiency and open new possibilities for energy storage technologies.

LEADER: HAYFA HAMANI BINTI AHMAD NAZIM

PROJECT MEMBERS :

NUR IRSYA BINTI SAPIAN

SITI UMAIRAH BATRISYIA BINTI MOHD SUHAIZAM

PUTRI NUR ERYZA BINTI MUHD HAIRI SHAH

INSTITUTION : SEKOLAH MENENGAH SAINS REMBAU

OBJECTIVE

Why HydroSPARK?

- **Eco-Friendly:** HydroSPARK harnesses the power of water, a natural and non-toxic resource, to create a battery that minimizes environmental impact.
- **Cost-Effective:** By utilizing abundant and low-cost materials, HydroSPARK provides a more affordable energy storage solution compared to traditional batteries, making it accessible to a wider range of users.
- **Safe and Reliable:** Water-based batteries are less prone to overheating, fires, or explosions, ensuring a safer energy storage option.
- **Sustainable Energy Storage:** HydroSPARK aims to address the growing need for sustainable solutions in grid storage and renewable energy applications, ensuring that energy from sources like solar and wind can be stored effectively and used when needed.

PROBLEM STATEMENT

The majority of batteries made today contain hazardous chemicals and are difficult to recycle, which pollutes the environment and raises disposal expenses. The demand for a water-based energy storage technology that is safer, cleaner, and more sustainable is fulfilled by this invention.

INNOVATION HIGHLIGHT

"A battery that uses water and basic components that is safe, affordable, and environmentally friendly. It promotes green energy solutions because it is reusable and perfect for minimal energy needs.

CONCLUSION

This water battery offers a sustainable, cost-effective way to store energy, making it a promising solution for cleaner and greener technology in the future.



ECO-STOOL

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Abstract

The Eco Stool is a creative and eco-friendly solution to help reduce waste and pollution caused by traditional furniture making. This innovation focuses on building a strong, light, and low-cost stool using 98% recycled and biodegradable materials such as used shuttlecock casings, plastic bottles, old writing boards, and other waste items. The main goal is to turn trash into useful furniture that can be used in offices or at badminton courts. Many furniture products today are made using new materials that harm the environment and cost a lot to produce. The Eco Stool shows that it is possible to make something practical and good-looking from items that would otherwise end up in the trash. To innovate this Eco Stool, used materials collected, created several prototypes, and tested the stool for strength, stability, and comfort. The innovated Eco Stool is easy to carry, affordable for everyone, and strong enough for everyday use. It helps reduce pollution and supports the idea of reusing and recycling. The design is simple but smart, showing that even waste can be turned into something valuable. The Eco Stool also helps raise awareness about how we can make better choices in what we use and throw away. This innovation proves that we do not always need new materials to create high-quality products. In the future, the project can grow by improving the stool's comfort, using other types of recycled materials, and producing it on a larger scale. The Eco Stool is more than just a piece of furniture it is a step toward protecting our planet and encouraging others to do the same. By choosing to reuse and recycle, we can reduce pollution and save natural resources. This innovation is a great example of how simple ideas can make a big difference for the environment and inspire more green innovations.

Keyword: Sustainable Design, Recycled Materials, Eco-Friendly, Waste Reduction



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION
SJKT KEM ASKAR MELAYU DIRAJA
ECO STOOL

INTRODUCTION

According to WHO, in 2022, we consumed 400 billion plastic bottles around the globe and the trash and rubbish thrown in rubbish bins only 9% recycled and 91% is never recycled. So using products made from recycled materials helps to reduce waste by giving old materials a new life and new look. This helps to conserve natural resources and reduce the environmental impact of manufacturing new products.

PROBLEM STATEMENT

Mostly, badminton players or audience always go for tournaments, don't have enough place to sit to watch the game and after the end of the tournament can find shuttlecock casings and plastic bottles in a rubbish bin. So, we invented a stool using these recycled things to provide a sitting place for players and audience.

OBJECTIVE

The main objective of this innovation is to design an eco-friendly stool with recycled things to provide a sitting place for players and audience in badminton courts or office uses.

NOVELTY

- Products are made from 98% waste and recycled things.
- Our product acts as a stool for sitting.
- The base of this stool is made from water-resistant material which is made from plastic bottle caps.
- The rectangular shape of this stool provides more strength, stability, and easy storage.
- The stool is light weight where we can carry it wherever we go.

COMMERCIAL VALUES & SOCIAL RESPONSIBILITIES

- It is made from recycled resources, generally safer and more environment-friendly.
- It is durable and cost-effective to purchase.
- Ideal for schools, offices, badminton courts who use a lot of benches and stools.
- This stool is a low-cost product and affordable for B40 communities.

WAYS TO DESIGN

- Collect about 25 shuttlecock casings with the same height.
- The place used writing board at the bottom and top and arranged shuttlecock casings.
- Glue it.
- Arrange and glue bottle caps at the bottom of the writing board as a water-resistant base.
- Surround the structure with glue.
- To provide comfortable sitting, we used cotton rope on the design.
- Finally, cover the stool with a cushion cover.

SPECIALITIES



AFFORDABLE



PORTABLE



WASTE PRODUCT



ECO FRIENDLY



REUSABLE



COURT USAGE

ECO STOOL



'BUY OUR ECO STOOL SAVE OUR NATURE'

EFFECTIVENESS OF STEP IN ENHANCING MOTOR SKILLS FOR STUDENTS WITH AUTISM IN INCLUSIVE PE PROGRAMS

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ABSTRACT

Students with Special Educational Needs (SEN), particularly those diagnosed with autism, often face significant motor behaviour challenges, including difficulties with coordination, agility, and attention during learning activities. In Adaptive Physical Education (APE) classes, these limitations can hinder both learning outcomes and social participation. This study aimed to explore the effectiveness of an assistive teaching tool—the Smart Teaching Enhancement Platform (STEP)—in supporting teachers within Inclusive Special Education Programs (PPKI) during the APE teaching and learning process. Special education teachers frequently encounter challenges in classroom management and delivering effective instructions to students with autism. Traditional teaching methods often fail to address the unique sensory and cognitive needs of these students. The STEP innovation was introduced to bridge this gap by enhancing instructional engagement and promoting physical interaction. A mixed-methods approach was used for this study. Quantitative data were collected via teacher surveys to assess perceptions and readiness, followed by descriptive statistical analysis. Qualitative data were obtained through classroom observations, behavioural assessments, and semi-structured interviews with teachers. Five teachers from three states were selected using cluster sampling to capture real-time classroom interactions: Negeri Sembilan (1 teacher, 5 students), Federal Territory of Kuala Lumpur (2 teachers, 10 students), and Selangor (2 teachers, 10 students). The STEP tool was integrated into the introduction and development phases of the lessons and documented in each teacher's Individualized Education Plan (IEP). Findings showed noticeable improvements in students' motor coordination, agility, and attention span. Teachers reported increased student engagement, smoother transitions between activities, and reduced behavioural disruptions. Compared to conventional methods, the use of STEP facilitated a more inclusive, responsive, and effective learning environment. This study confirms that assistive tools like STEP can significantly enhance the quality of APE instruction for students with autism. It effectively addresses pedagogical and behavioural challenges faced by teachers, contributing to more inclusive educational practices. Future research should examine the scalability of STEP across diverse educational settings and disability types. Further studies are also recommended to evaluate its long-term impact on students' academic and social development. It is advised that teacher training programs incorporate the use of assistive technologies such as STEP to better prepare educators for inclusive classrooms.

Keywords: Assistive Tool, Inclusive Special Education Program (PPKI), Adaptive Physical Education (APE), Special Educational Needs (SEN), Autism.



The Smart Teaching Enhancement Platform:

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

IZZAT FADHLI . SURAYA JASMIN . AISYAH HUMAIRA' TASNEEM . SK NILAI IMPIAN

STEP:
In Improving Motor Skills, Agility and Focus Among Students With Autism In Inclusive Physical Education Programs
 WE LEARN STEP BY STEP

TABLE OF CONTENT

- Introduction
- Objectives
- Significant of the Study
- Research Method
- Theoretical Framework / Innovation Highlight
- Demographic / Sample
- Data Collection and Analysis Procedure
- Conclusion

INTRODUCTION
 Highlight faced by students with autism (motor coordination, agility, focus) and teachers (classroom management, inst. delivery)

OBJECTIVE

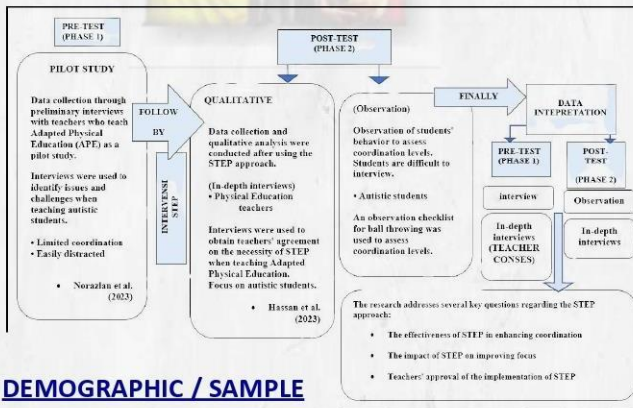
- Enhance Coordination and Agility
- Utilizing the STEP Tool in Adaptive PE Lessons
- Impact of STEP on autistic students' focus

SCAN FOR INFO

Innovation Highlight
Commercial Values
Conclusion



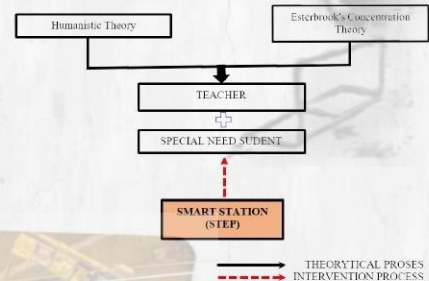
RESEARCH METHODOLOGY



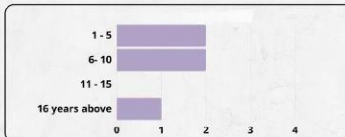
SIGNIFICANT OF THE STUDY

- Improved motor coordination, agility, attention span
- Increased engagement

THEORYTICAL FRAMEWORK



DEMOGRAPHIC / SAMPLE



SAMPLE	SCHOOL	AGE
RP1	SK Kuates KUA, Seremban	30
RP2	SK Kuates KUA, Seremban	34
RP3	SK Feida LBI, Seremban	28
RP4	SK Feida LBI, Seremban	34
RP5	SK Pendidikan Khas, Seremban	45

DATA ANALYSIS PROCEDURE

DATA COLLECTION PROCEDURE



ENHANCING ALGEBRAIC PROFICIENCY AMONG MALAYSIANS SECONDARY SCHOOL STUDENTS: EVALUATING THE EFFECTIVENESS OF BASIX INTERVENTION

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Abstract

This study evaluated the effectiveness of the Basic Algebra Skills Instrument for Excellence (BASIX) in addressing persistent algebraic proficiency gaps among secondary school students in Fully Residential Schools (SBP) in Malaysia. Algebra remains a critical yet challenging component of mathematics education, with many students struggling to master foundational topics such as factorization, algebraic formulae, algebraic fractions, and linear equations. The BASIX module was developed as a structured, mastery-based intervention guided by trained mathematics teachers. Using a quasi-experimental design, 9,534 students across various SBPs were assessed through a cycle of pretests, intervention modules, and post-tests. The intervention featured six units of scaffolded drills tailored to students' initial proficiency levels. Data were collected through diagnostic assessments, interviews with teachers, and focus groups with students, and were analyzed using paired-sample t-tests and thematic coding. The results revealed a significant increase in the percentage of "Strongly Competent" students, notably from 22.3% to 44.4% in Unit 1 and from 29.2% to 49.7% in Unit 2. Concurrently, the "Not Yet Competent" category decreased sharply—for example, from 35.9% to 8.7% in Unit 3. Correlational analysis indicated that improvements were not confined to high-performing students, demonstrating the intervention's inclusivity. The findings affirmed that BASIX is effective in enhancing student outcomes, reducing performance gaps, and promoting algebraic mastery across all proficiency levels. The study concluded that mastery-based modular interventions can serve as a scalable solution for improving mathematics education nationwide. It recommended the national expansion of BASIX and further exploration of similar frameworks for other mathematical domains.

Keyword: Algebra, Intervention Module, Secondary School, Quasi-Experimental, Student proficiency



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

Enhancing Algebraic Proficiency Among Malaysian Secondary School Students: Evaluating the Effectiveness of BASIX Intervention

This study investigates algebraic skill gaps among students in Fully Residential Schools (SBP) in Malaysia. Using pre-tests, BASIX intervention modules, and post-tests, it identifies challenges in factorization, formulae, fractions, and linear equations. Findings show that BASIX significantly improves student proficiency and offers effective strategies for teaching algebra.

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Problem Statement

Low proficiency, negative attitudes, ineffective teaching methods, and curriculum gaps have contributed to weak algebraic skills among students, hindering progression in STEM fields.

Significance of the Study

Findings provide insights to enhance teaching practices, improve curriculum design, support educational equity, and align with Malaysia's STEM goals.

Methodology

Quasi-experimental study with 9,534 SBP students using pre-tests, BASIX modules, post-tests, teacher interviews, and student focus groups. Analysis included t-tests and thematic analysis.

Objective

- Assess students' algebraic proficiency.
- Identify key learning barriers.
- Implement targeted interventions (BASIX).
- Measure improvement post-intervention.

Innovation Highlight

The BASIX module uses structured mastery-based drills guided by trained teachers and monitored through a dashboard, effectively boosting algebra skills at all levels.

Commercial Value

Potential for national adoption in other schools as a standard algebra intervention tool, scalable for other math topics.

3/5 of 9,534 students showed notable improvement in algebra competency

Table 1 Students' competency levels in the pre-test

Pre Test Competency Level	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Strongly Competent	22.32	29.21	7.66	5.06	4.38	15.25
Competent	27.89	35.95	23.81	18.46	21.09	28.43
Emerging	32.99	28.41	32.63	51.68	52.08	24.50
Not Yet Competent	16.80	35.88	35.88	27.40	22.45	31.82

Table 2 Students' competency levels in the post-test

Post Test Competency Level	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Strongly Competent	44.40	45.79	33.07	27.85	22.09	38.59
Competent	23.95	26.86	22.36	21.68	16.50	24.73
Emerging	11.41	9.66	14.37	21.45	23.43	11.24
Not Yet Competent	3.94	1.63	8.72	6.37	12.94	8.49

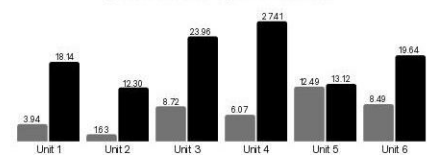
Analysis

The BASIX intervention significantly improved algebraic competency across all units. Post-test data showed a substantial increase in "Strongly Competent" students, such as Unit 1 (from 22.3% to 44.4%) and Unit 2 (from 29.2% to 49.7%). Simultaneously, the "Not Yet Competent" category sharply declined, with Unit 3 dropping from 35.9% to 8.7%, and Unit 2 reaching a low of 1.6%.

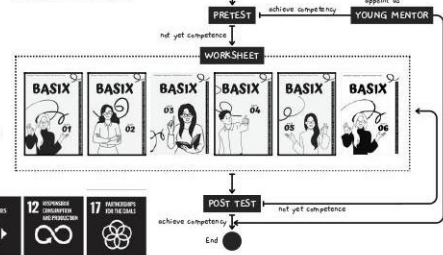
The "Emerging" group also saw a major reduction, indicating that many students progressed to higher competency tiers. For example, Unit 5 saw a decrease in emerging learners from 52.1% to 25.4%.

A paired-sample t-test confirmed statistical significance, while correlation coefficients (Pearson's $r = 0.32$, Spearman's $\rho = 0.31$) showed improvement was not limited to high-performers, but benefited weaker students substantially. This demonstrates that BASIX is inclusive and effective, addressing diverse learner needs through structured, mastery-based drills.

Legend: Not Yet Competent (Grey), Mastery Improvement (Black)



Flow Chart



BASIX /ber.ziks/ n.
 Basic Algebra Skills Instrument for Excellence

SDG



Related Literature

- Chikwa, C. & Schäfer, M. (2022). Exploring students' errors in algebra. *Scandinavian Journal of Educational Research*, 66(5), 802-816.
- Wiberg, M. (2019). Students' algebraic thinking and performance in TIMSS.
- Zhang, Y. (2023). Strategies and effects of problem-solving instruction in secondary school mathematics. *Open Journal of Social Sciences*, 11(4), 233-246.

Conclusion

The BASIX intervention significantly improved students' algebra skills, reduced performance gaps, and demonstrated the value of structured, targeted modules in enhancing math education in Malaysia.



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MOSQUI-REPELLENT CANDLE

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ABSTRACT

Mosquitoes and flies are more than just annoying they can also carry diseases that put people at risk, especially in warmer climates. This innovation introduces a natural, eco-friendly candle that helps keep these pests away using a blend of cinnamon, lemongrass, cloves, and lavender. These ingredients were chosen because they are well-known for their insect-repelling properties and smell great. The Mosquiflies candle is made with soy wax and infused with essential oils from the four plants. When the candle is lit, it slowly releases natural compounds like cinnamaldehyde (from cinnamon), citronellal (from lemongrass), eugenol (from cloves), and linalool (from lavender). These scents confuse the insects and keep them at bay without the need for harsh chemicals. We also made sure to use a sustainable wick and eco-friendly packaging, so the candle is safe for both people and the planet. Initial testing shows that the candle works well in both indoor and outdoor spaces, making it a great option for homes, patios, camping trips, and even restaurants or cafés with outdoor seating. Besides keeping bugs away, the candle fills the air with a relaxing, pleasant herbal scent, making it a two-in-one product: a repellent and an air freshener. This natural repellent candle is a great example of how we can use simple, plant-based solutions to solve everyday problems in a healthy and sustainable way. It is a safer alternative to chemical sprays and coils, especially for families with kids or pets. We are currently working on ways to make the candle last longer and be even more effective at repelling bugs. Overall, this innovation offers a smart and natural way to enjoy bug-free spaces without harming the environment or your health.

Keyword: Natural Repellent, Essential Oils, Eco-Friendly Candle



9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

NATURAL MOSQUI-FLIES REPELLENT CANDLE

MOSQUITOES AND FLIES CAN TRANSMIT DISEASES LIKE MALARIA, DENGUE, AND ZIKA, AND TRADITIONAL CHEMICAL REPELLENTS OFTEN CONTAIN HARMFUL INGREDIENTS SUCH AS DEET. TO ADDRESS THIS, OUR ECO-FRIENDLY REPELLENT CANDLE USES NATURAL INGREDIENTS LIKE LEMONGRASS, CINNAMON, CLOVES, AND LAVENDER. THIS SAFE AND PLEASANT SOLUTION EFFECTIVELY REPELS INSECTS WHILE BEING KIND TO BOTH PEOPLE AND THE ENVIRONMENT.

OBJECTIVES

- TO INNOVATE EFFECTIVE INSECT REPELLENCY BY USING NATURAL INGREDIENTS SUCH AS CLOVES, CINNAMON, LEMON GRASS, AND LAVENDER OIL WHICH IS MADE FROM NATURAL AND NON-TOXIC SOLUTION.
- TO INNOVATE REPELLENT WHICH IS SAFE FOR HUMANS AND PETS, AVOIDING HARMFUL CHEMICALS FOUND IN SYNTHETIC REPELLENTS.
- TO CREATE MULTI-FUNCTIONAL CANDLE WHERE BEYOND REPELLING MOSQUITOES AND FLIES THE CANDLE SERVES AS A DECORATIVE ITEM AND A SOURCE OF LIGHT, ADDING TO ITS UTILITY.

COMMERCIALIZATION POTENTIALS

GROWING DEMAND FOR NATURAL PRODUCTS
 HEALTH AND SAFETY CONCERNS OF CHEMICAL FREE PRODUCTS
 DUAL FUNCTIONALITY PRODUCT
 ECO-FRIENDLY PACKAGING
 EASY TARGET MARKETS- HOUSE OWNERS, CAMPERS, RESTAURANTS

NOVELTY

- NATURAL INGREDIENTS
 - COMBINATION OF SCENTS
 - DUAL FUNCTIONALITY
 - ECO-FRIENDLY AND CHEMICAL-FREE
 - MARKET DIFFERENTIATION
 - VERSATILITY AND MULTI-FUNCTIONAL USE
- DIY APPEAL**

CLOVES: EMITS A STRONG AROMA THAT REPELS FLIES

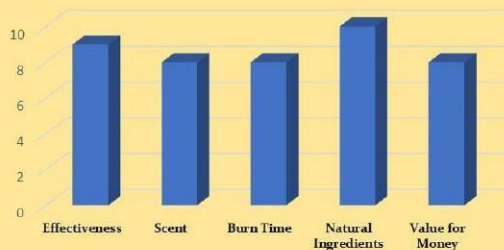
CINNAMON: ACTS AS A DETERRENT FOR MOSQUITOES AND FLIES.

LEMONGRASS: CONTAINS CITRONELLA, A NATURAL INSECT REPELLENT.

LAVENDER OIL: KNOWN FOR ITS CALMING PROPERTIES AND INSECT REPELLENT CAPABILITIES.



10 CUSTOMERS FEEDBACK ON MOSQUI-FLIES REPELLENT CANDLE



RESULT

OVERALL, CUSTOMERS APPRECIATE THE COMBINATION OF EFFECTIVENESS, NATURAL INGREDIENTS, PLEASANT SCENT, GREAT BURN TIME AND ADDED AMBIANCE THAT THESE MOSQUI-FLIES REPELLENT CANDLES PROVIDE.



VENTGAS: PENGESANAN AWAL, TINDAKAN PANTAS – RUMAH LEBIH SELAMAT

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Abstract

VentGas merupakan satu sistem pengesanan kebocoran gas bersepadu dengan mekanisme pembukaan tingkap automatik yang dibangunkan khusus bagi meningkatkan keselamatan domestik. Inovasi ini menggunakan sensor gas (MQ-2) untuk mengesan kebocoran gas petroleum cecair (LPG) di ruang tertutup seperti dapur. Apabila pengesanan melepasi ambang keselamatan, sistem ini secara automatik akan mengaktifkan relay motor tingkap untuk membuka laluan pengudaraan serta membunyikan amaran buzzer sebagai isyarat awal kepada penghuni rumah. Sistem ini turut diperkasa dengan papan mikro Arduino UNO yang diprogram khas bagi mengawal logik operasi, manakala modul paparan LCD digunakan bagi menunjukkan status kebocoran secara langsung. Berbanding sistem sedia ada yang hanya memberi amaran bunyi, VentGas menawarkan penyelesaian aktif dengan tindakan fizikal automatik yang meningkatkan tahap mitigasi risiko kebakaran atau letupan akibat gas bocor. Ujian awal sistem menunjukkan keberkesanan tindak balas dalam masa kurang 2 saat selepas pengesanan, dengan kadar kejayaan pembukaan tingkap melebihi 95% dalam simulasi kawalan. Dengan reka bentuk ringkas, kos rendah, dan mudah dibangunkan, VentGas sesuai digunakan dalam rumah kediaman, taska, atau dapur komersial berskala kecil. Inovasi ini diharap dapat menjadi sebahagian daripada budaya keselamatan rumah pintar pada masa depan.

Katakunci: Keselamatan Rumah, Gas LPG, Arduino, Sistem Pengudaraan Automatik, Pengesanan Kebocoran

9th REGIONAL EDUCATORS AND STUDENTS' PRODUCT EXHIBITION

VENTGAS: PENGESANAN AWAL, TINDAKAN PANTAS – RUMAH LEBIH SELAMAT

SEK MEN BATU KIKIR (MODEL KHAS)



1. Introduction/Background

VentGas ialah sistem pengesanan kebocoran gas pintar yang berfungsi secara automatik membuka tingkap apabila kebocoran dikesan.

Menggunakan sensor gas, Arduino Uno, dan motor servo, sistem ini direka untuk meningkatkan keselamatan di rumah dan premis dengan memberi amaran awal dan pengudaraan segera.

2. Problem Statement

Kebocoran gas LPG yang tidak dikesan dengan segera boleh mengakibatkan letupan, kebakaran, dan kehilangan nyawa.

Sistem pengesanan tradisional selalunya hanya memberi amaran bunyi tanpa sebarang tindakan automatik, menyebabkan risiko kekal tinggi sekiranya pengguna tidak berada berdekatan.

Oleh itu, satu sistem automatik dan responsif amat diperlukan untuk bertindak balas segera terhadap kebocoran gas.



3. Objectives

- 1. Mengesan Kebocoran Gas Secara Automatik**
Membangunkan sistem pintar yang menggunakan sensor gas untuk mengesan kebocoran gas secara tepat dan real-time.
- 2. Pengudaraan Segera Menggunakan Motor Servo**
Mengawal motor servo bagi membuka tingkap secara automatik apabila kebocoran gas dikesan.
- 3. Menyediakan Sistem Pengawasan Gas yang Mudah dan Efisien**
Menggunakan platform Arduino Uno untuk kawalan dan integrasi sistem yang mudah.

4. Materials/Method

- 1. Sensor Gas MQ-2**
Untuk mengesan kehadiran gas berbahaya seperti gas LPG, gas alk. atau asap. Sensor ni sensitif dan sesuai untuk aplikasi keselamatan rumah.
- 2. Arduino Uno**
Otak sistem yang akan membaca data dari sensor gas dan kawal motor servo berdasarkan bacaan sensor.
- 3. Motor Servo**
Digunakan untuk membuka tingkap secara automatik apabila sistem detect kebocoran gas.
- 4. Power Supply**
Untuk bekalkan kuasa pada Arduino dan motor servo.
- 5. Buzzer / LED (optional)**
Sebagai amaran audio dan visual tambahan bila gas bocor dikesan.



5. Significant of the Study

1. Meningkatkan Keselamatan Penghuni

VentGas membantu mengurangkan risiko kebakaran atau keracunan gas dengan mengesan kebocoran gas awal dan membuka tingkap secara automatik untuk pengudaraan segera.

2. Alternatif Sistem Keselamatan Kos-Efisien

Menggunakan komponen elektronik yang murah dan mudah diperolehi seperti Arduino dan sensor MQ-2.

6. Innovation Highlight

1. Automasi Pengudaraan Pintar

VentGas bukan sekadar pengesanan gas biasa, tapi dia automatik buka tingkap guna motor servo bila detect kebocoran

2. Integrasi Sensor Gas dengan Arduino Uno

Gabungan sensor MQ-2 yang sensitif dengan microcontroller Arduino Uno buat sistem ni sangat responsif

3. Sistem Tindak Balas Masa Nyata (Real-time Response)

Kebocoran gas dikesan dan tindakan membuka tingkap berlaku dalam masa singkat.

7. Commercial Values (if Any)

1. Produk Keselamatan Rumah Pintar yang Makin Diminati

Dengan trend rumah pintar dan automasi, VentGas ada potensi besar dalam pasaran smart home devices sebab ia gabungkan keselamatan dengan automasi mudah.

2. Kos Rendah, Harga Kompetitif

Menggunakan komponen elektronik murah dan senang dapat, VentGas boleh dijual pada harga mampu milik

3. Pasaran Luas — Dari Rumah ke Premis Komersial

Bukan setakat rumah je, premis kedai, restoran, bengkel dan makmal yang guna gas pun boleh jadi pelanggan utama.

8. Conclusion

VentGas ialah sistem pengesanan kebocoran gas yang automatik membuka tingkap untuk pengudaraan segera, meningkatkan keselamatan rumah dan premis.

Ia menggunakan komponen kos rendah seperti sensor MQ-2, Arduino Uno dan motor servo. Sistem ini bukan sahaja praktikal dan mudah dibina, malah berpotensi untuk dikomersialkan dalam pasaran rumah pintar.

VentGas menawarkan solusi keselamatan yang efisien, mesra pengguna, dan scalable untuk masa depan.

SCAN AND WATCH: LIFE BEGIN!

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Abstrak

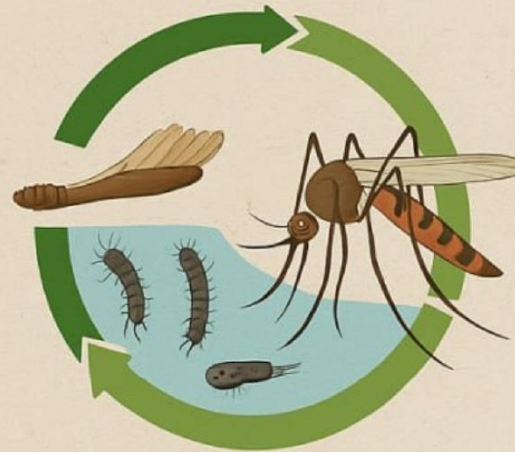
Projek ini bertujuan memperkenalkan konsep kitaran hidup haiwan kepada murid sekolah rendah dengan cara yang lebih interaktif dan menyeronokkan melalui penggunaan teknologi Augmented Reality (AR). Melalui poster atau kad imbas yang direka khas, murid dapat mengimbas imej menggunakan peranti mudah alih dan menyaksikan animasi 3D yang memaparkan proses perubahan haiwan seperti kupu-kupu dan katak – daripada telur hingga menjadi dewasa. Dengan pendekatan visual dan digital, projek ini memupuk minat murid terhadap Sains serta membantu meningkatkan pemahaman terhadap konsep pertumbuhan dan perubahan bentuk dalam kehidupan haiwan. Selain itu, ia menyokong kemahiran abad ke-21 seperti pembelajaran sendiri, kreativiti, dan penerokaan teknologi baharu. Selain menyokong Pembelajaran Abad ke-21 (PAK21), projek ini juga sejajar dengan aspirasi Kurikulum Standard Sekolah Rendah (KSSR) dalam bidang Sains yang menekankan pendekatan inkuiri dan penerokaan. Melalui penggunaan teknologi AR, murid bukan sahaja melihat perubahan secara visual, malah dapat berinteraksi dengan elemen digital yang memperkukuh kefahaman mereka terhadap proses biologi yang abstrak dan dinamik. Secara keseluruhan, projek ini menyasarkan peningkatan penguasaan konsep kitaran hidup haiwan secara efektif, mewujudkan suasana pembelajaran yang menyeronokkan dan bermakna dan menggalakkan penerapan teknologi dalam pengajaran dan pembelajaran. Dengan gabungan bahan fizikal (poster/kad) dan digital (AR), murid dapat mengalami pembelajaran yang lebih holistik, aktif, dan berpusatkan pelajar. Inovasi ini bukan sahaja memberi impak positif kepada pencapaian akademik, malah menyokong perkembangan kognitif dan teknologi murid sekolah rendah secara menyeluruh.

Katakunci: Pembelajaran, Kitaran Hidup, Augmented Reality (AR), Animasi 3D

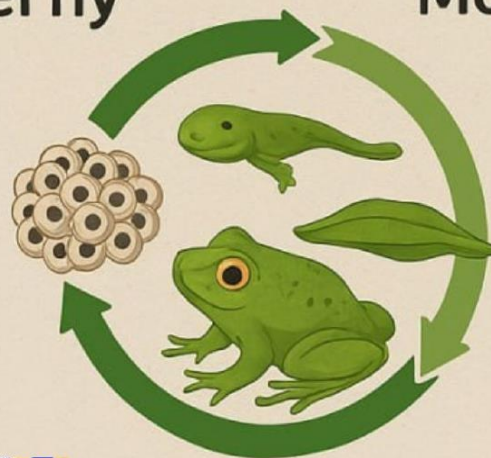
SCAN & WATCH: LIFE BEGIN



Butterfly



Mosquito



Frog



SMK BATU KIKIR (MODEL KHAS)

The 9th Regional Educators and Students'

CLOSING REFLECTIONS AND WAY FORWARD

RESPEX 2025 has successfully gathered 99 participations across 8 categories from institutions in Malaysia, Indonesia, Korea, and Brunei, with the highest involvement coming from Electrical and Electronics Engineering & Information Technology (25.25%), followed by Civil Engineering & Architectural (23.23%) and Teaching and Learning (20.20%). To commemorate and celebrate all contributions, the compilation book “Designing the Futures” has been published, featuring abstracts and posters that reflect the passion, creativity, and innovation of every participant. With this remarkable achievement, RESPEX 2025 not only marks a significant milestone in advancing innovation and collaboration but also sets the stage for greater impact in the years ahead—see you again at RESPEX next year!

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 Dr. Diana binti Ahmad Busra
 Noor Darliza binti Mohamad Zamri
 Dr. Norazean binti Miswat
 Noraini binti Kamrudin
 Noorazlina binti Abd Karim

CLOSING CEREMONY COMMITTEE

BANQUET COMMITTEE

Rohana binti Mat
 Ku Ahmisuhaiti binti Ku Ahmad
 Nurulhuda binti Aziz
 Raja Nazima binti Raja Ahmad
 Nurismah Binti Ibrahim
 Zuliana binti Zainal Abidin
 Siti Nurbaya binti Mat Rofa

Norliza binti Johan
 Mahanim binti Abdullah Sadali
 Rafidah binti Suib
 Wan Nadhirah binti Abd Wahab
 Nordiana binti Nordin
 Fahanim binti Abdul Rashid

CERTIFICATE COMMITTEE

PRIZES & SOUVENIRS COMMITTEE

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 Sarinah binti Ali
 Jothy Rany a/p Latchmanan
 Yusra binti Saion
 Hanizatul Natasha binti Hashim
 Noorziawati binti Mohd Sahap

Dr. Ruslawati binti Abd Wahab
 Tn. Hj. Fahrurrazi bin Hj. Mahyun
 Nor Hashimah Binti Ab Hamid
 Rozaini binti Rahi
 Sinatu Sadiah binti Shapie
 Norliza binti Johan

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ACCOMMODATION & TRANSPORTATION COMMITTEE

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 Nooralwani binti Alias
 Siti Zabedah binti Abd Hamid
 Siti Nurbaya binti Mat Rofa
 Mohd Zubir bin Amir
 Mohd Firdaus bin Abu Bakar
 Mohd Rizam bin Endut

Norhazlina binti Amon
 Ts. Mohd Jalil bin Ahmad
 Azhar bin Rostani
 Khairun Syatirin bin Md Salleh
 Raja Noorzihan bin Raja Ab Kadir
 Mad Hafis bin Mohamed Yusof
 Mohamad Mokhtar bin Padeli
 Mohd Sallehuddin bin Yazid
 Siti Hajar binti Mohd Noh
 Suhaila binti Mohd Sharif
 Siti Ruziati binti Tomin

EXHIBITION COMMITTEE

ICT COMMITTEE

Komathi a/p Krishnan
 Tc. Mohd Noor bin Khalid
 Muhammad Asri bin A Bakar
 Shakinah binti Saad
 Noryasniza binti Mohd Yassin
 Mohd Fuad bin Daud

Izwan Kamal bin Abdul Wahab
 Nor Salasiah Binti Mat Rashid
 Mimi Suhana Binti Abd Aziz
 Aida Normardiana Binti Ayob

WEBSITE & PROMOTION COMMITTEE

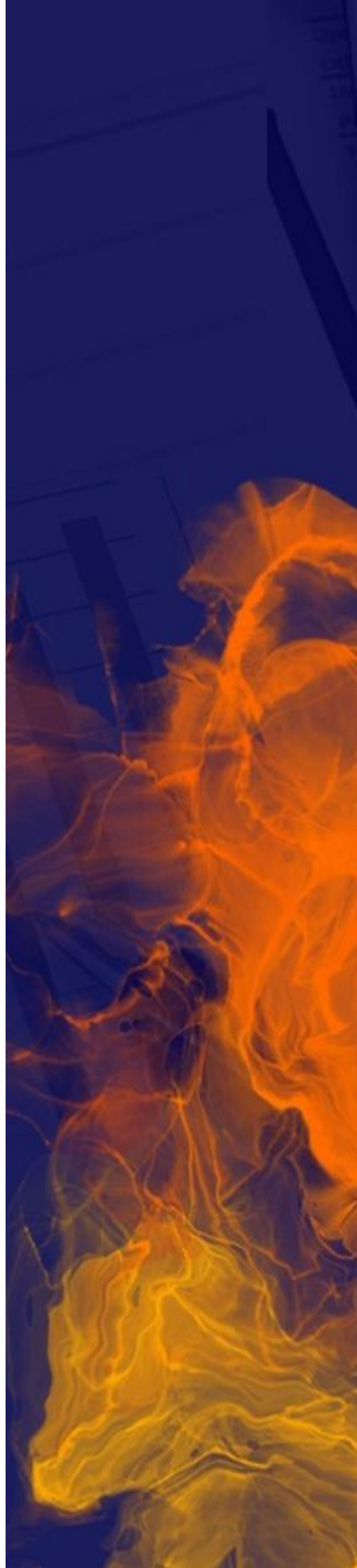
TECHNICAL & FACILITIES COMMITTEE

Payman Prasad a/l Pahgmat Parsad
 Mohammad Suhairi bin Sulaiman
 Mohd Ridhuan bin Othman
 Aziah binti Muhamad
 Hailrul Anuar bin Mahaod
 Mohammad Helmi bin Mahmud
 Muhamad Shazmin bin Muhamad Zaki
 Revathy a/p Balakrishnan
 Ahmad Faris Halimi bin Jamalullail
 Siti Zubaidah binti Mukhtar



Event Highlights

RESPEX 2025



WELCOMING SPEECH

TUAN HAJI WAN ZULKIFLY BIN WAN ZAKARIA

DIRECTOR OF POLITEKNIK PORT DICKSON



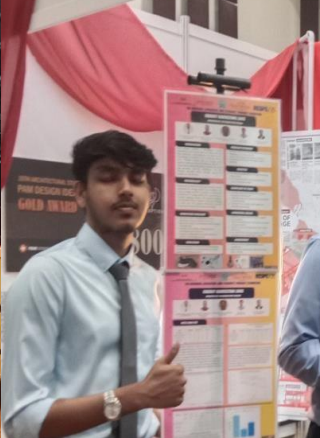
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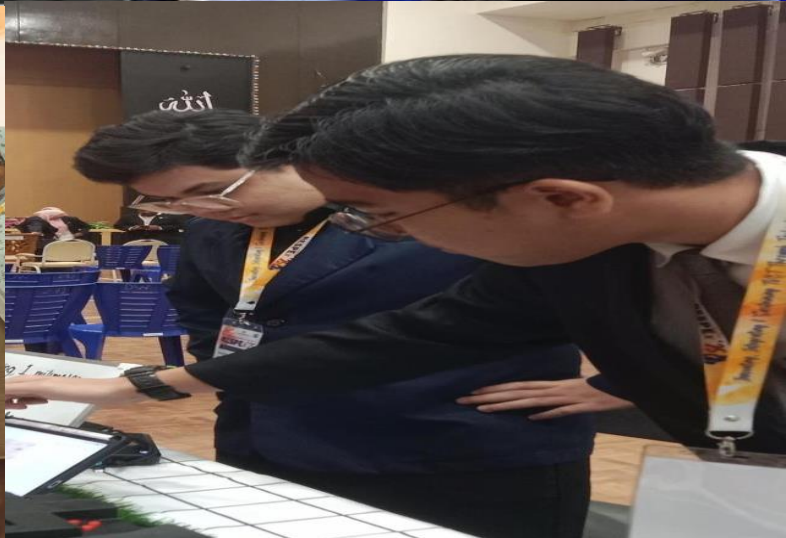


RESPEX 25

Innovating, Integrating & Sustaining TVET Through Technology







*Bunga mauar harum baunya,
Indah mekar di taman luas.
Akhir majlis tiba masa,
Moga temu jumpa ikhlas.*

*Duduk semeja menimba ilmu,
Bersama kawan seiring haluan,
Majlis berakhir dengan restu,
Moga bertemu di lain kesempatan.*

9th Regional Educators and Students' Product Exhibition

RESPEX 25 

Innovating, Integrating & Sustaining TVET Through Technology

RESPEX 2025: Designing The Future

9th Regional Educators and Students' Product Exhibition

Designing The Future:
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