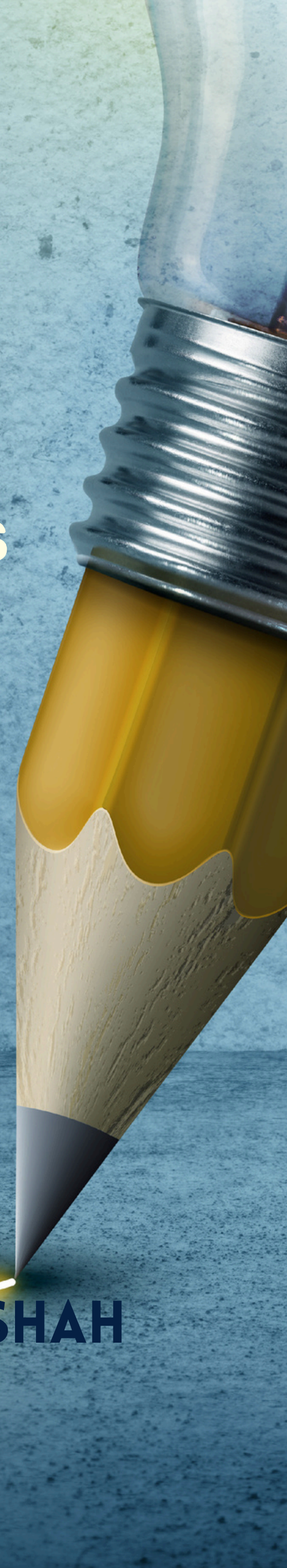
KEMENTERIAN PENDIDIKAN TINGGI

POLITEKNIK MALAYSIA
SULTAN SALAHUDDIN ABDUL AZIZ SHAH

FINAL PROJECT HANDBOOK SHOWCASE

SESSION I:2024/2025

THEME :
SUSTAINABLE FOR GLOBAL COMMUNITIES



DEPARTMENT OF CIVIL ENGINEERING
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

FINAL PROJECT HANDBOOK SHOWCASE

SESSION I:2024/2025

HAKCIPTA TERPELIHARA

Tiada bahagian daripada terbitan buku ini boleh diterbitkan semula, disimpan untuk pengeluaran atau ditukarkan ke dalam sebarang bentuk atau dengan sebarang alat, sama ada dengan cara elektronik, gambar serta rakaman dan sebagainya tanpa kebenaran bertulis daripada Politeknik Sultan Salahuddin Abdul Aziz Shah terlebih dahulu.

Terbitan Pertama 2025

Diterbitkan Oleh:
Unit Penerbitan
POliteknik Sultan Salahuddin Abdul Aziz Shah
Persiaran Usahawan
Seksyen U1
40150 Shah Alam
Selangor

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No. Fax : 03-55691903

PEMBUKA BICARA

Assalamualaikum Warahmatullahi Wabarakatuh,

Alhamdulillah, kita telah sampai ke penghujung pembentangan projek akhir pelajar bagi sesi 1 2024/2025. Saya ingin merakamkan setinggi-tinggi tahniah kepada semua pelajar yang telah berjaya menyempurnakan projek ini. Setiap pembentangan yang telah disampaikan hari ini merupakan cerminan usaha, ketekunan, dan kreativiti yang luar biasa.

Proses menyiapkan projek ini bukanlah mudah. Ia memerlukan komitmen dan kerjasama yang tinggi antara pelajar dan guru. Saya berharap pengalaman ini bukan sahaja memperkukuh pengetahuan dan kemahiran, tetapi juga membentuk sikap proaktif dalam diri pelajar untuk terus berinovasi.

Pembentangan yang juga pertandingan projek ini bukan sekadar platform untuk menunjukkan hasil kerja, tetapi juga satu peluang bagi pelajar untuk belajar, berkembang, dan mengasah kemahiran mereka. Saya percaya bahawa pengalaman yang diperoleh sepanjang proses ini akan memberi impak yang positif kepada perkembangan diri dan akademik pelajar.

Pertandingan projek akhir ini juga diadakan bagi memilih projek yang terbaik dari yang terbaik bagi mewakili jabatan ke pertandingan projek pelajar di peringkat PSA. Saya juga ingin mengucapkan terima kasih kepada para juri yang telah meluangkan masa untuk menilai setiap pembentangan dengan adil. Penghargaan yang sama juga ditujukan kepada semua penyelia projek yang telah memberi bimbingan dan sokongan sepanjang proses ini.

Semoga semua peserta terus bersemangat dan berusaha ke arah kecemerlangan dalam bidang masing-masing. Janganlah kita berhenti di sini,teruskan usaha dan impian untuk mencipta masa depan yang lebih cemerlang. Dengan ini, saya merasmikan penutup pembentangan projek akhir pelajar bagi sesi 1 2024/2025.



Terima kasih atas kehadiran dan sokongan semua.
Wassalamualaikum Warahmatullahi Wabarakatuh.

PUAN NAZRIZAM BINTI AB WAHAB
Ketua Jabatan Kejuruteraan Awam
Politeknik Sultan Salahuddin Abdul Aziz Shah
Kementerian Pendidikan Tinggi

EDITOR



PN. SARAH AFZAN ABD KARIM



TS. DR. AINUL HAEZAH NORUZMAN



PN. MAI AZUNA MEOR YUSUF

KANDUNGAN

BIL	TAJUK	MUKA SURAT
A	NUMBER OF STUDENT PROJECTS	1-13
B	DIPLOMA IN CIVIL ENGINEERING 5A	14-39
C	DIPLOMA IN CIVIL ENGINEERING 5B	40-70
D	DIPLOMA IN CIVIL ENGINEERING 5C	71-91
E	DIPLOMA IN CIVIL ENGINEERING 5D	92-96
F	DIPLOMA IN BUILDING SERVICES ENGINEERING 5A	97-113
G	DIPLOMA IN BUILDING SERVICES ENGINEERING 5B	114-126
H	DIPLOMA IN WOOD BASED TECHNOLOGY 5	127-148
I	SENARAI JAWATANKUASA FPCE	150
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KEMENTERIAN PENDIDIKAN TINGGI

POLITEKNIK MALAYSIA
SULTAN SALAHUDDIN ABDUL AZIZ SHAH

NUMBER OF STUDENT PROJECTS

CIVIL ENGINEERING DEPARTMENT
FINAL PROJECT COMPETITION & EXHIBITION
SESSION II : 2024/2025

DIPLOMA IN CIVIL ENGINEERING

58 GROUPS

DIPLOMA IN BUILDING SERVICES ENGINEERING

16 GROUPS

DIPLOMA IN WOOD BASED TECHNOLOGY

11 GROUPS

01

CIVIL ENGINEERING SMART BOOKING LABORATORY

NUR IMAN IZZATI BINTI ZAHRIN SHARIFF
NUR ANIS NAJWA BINTI MOHD ROKEMEH
SUPERVISOR : TS. DR. AINUL HAEZAH BINTI NORUZMAN

02

EFFECTIVE LEARNING USING FLUIDA MASTER APPS

NUR NAJWA AINAA BINTI RADZNEE
MAUHIBAH BINTI MIFTAHUDDIN
SUPERVISOR : TS. DR. AINUL HAEZAH BINTI NORUZMAN

03

SMART DUSTBIN: REVOLUTIONIZING WASTE COLLECTION EFFICIENCY

NURUL SABRINA BINTI RAMADHAN
AINUR NADHRAH BINTI MOHAMAD ASLAM
SUPERVISOR : PN. SARINA BINTI TALIB

04

APLIKASI PEMANTAUAN PENYELENGGARAAN JALAN (APPJA)

MUHAMMAD HAZEIM SYAHIR BIN HAMDAN
GUSTI EKHWAN ISKANDAR BIN GUSTI ANUAR
SUPERVISOR : PN. SARINA BINTI TALIB

05

CONSTRUCTION STAIRCASE TROLLEY

AIMAN AKID BIN MUHAMMAD FAIZAL
AHMAD HARITH UZAIR BIN MOHD RAHIMI
SUPERVISOR : PN. SUZLIANA BINTI MARSOM

06

T-WASTE CONCRETE

MUHAMMAD TAUFIQ BIN MOHD ARIF
NORFIZRI NAZRIN BIN NORDIN
SUPERVISOR : PN. ISMA AFIZA BINTI ISMAIL

DKA 5A

FINAL PROJECT COMPETITION & EXHIBITION
SESSION I:2024/2025

07

KEBERKESANAN SERBUK TAYAR DALAM BANCUHAN KONKRIT

HASYA HANNANI BINTI MOHD NOR
NUR AIDA QISTINA BINTI RUHAILI
SUPERVISOR : PN. ISMA AFIZA BINTI ISMAIL

08

FASILITIES MAINTENANCE APPLICATION (FAMA)

MUHAMMAD AMIRUL ADAM BIN MOHD DARAWI
NIK AMIR AIMAN BIN NIK MAZLAN
SUPERVISOR : TS. DR. SITI ASMIZA BINTI MUZAFAR

09

APLIKASI LAPORAN KEROSAKAN JALAN RAYA (ROCONDI)

MUHAMMAD AMIN BIN NORDIN
MUHAMMAD TAQIUDDIN MIRZA BIN ABDUL WAHID
SUPERVISOR : EN. FAWI BIN SAMAD

10

RAINPURE PORTABLE WATER FILTRATION SYSTEM

MUHAMMAD MUJAHID BIN MUHAMAD DOM
ZAID RUSLI BIN HAJA MUINUDEEN
SUPERVISOR : EN. FAWI BIN SAMAD

11

KAJIAN KES: CADANGAN PEDESTRIAN CROSSING DI PERSIARAN AKUATIK SHAH ALAM

NURAMIRA NADHIRA BINTI ERIE FARDI
SITI NUR ASYIKIN BINTI ZAIDI AZHAR
SUPERVISOR : TS. NORMASITA BINTI SULAIMAN

12

EXPANDED CLAY AGGREGATE BRICK

NURSYAFIQAH BINTI MOHD SHAHRUL ANUAR
FIKRI NORWAFIQ BIN JASMAN
SUPERVISOR : PN. MASWIRA BINTI MAHASAN

13

INNOVATION OF THE BRICK BINDING TOOL: BRICK WALLTOPPER

MUHAMMAD SHAH AIMAN BIN HERUAN
AMEERUN IZZUDDIN BIN AHMAD ZAILAN
SUPERVISOR : PN. MASWIRA BINTI MAHASAN

01

WOOD ASH CONCRETE

AHMAD IKHWAN SAFUAN BIN AHMAD TAJUDDIN
WAN LUTH ZHAFER BIN WAN KHALIMI AZRIN
MUHAMAD ALIFF HAIQAL BIN AZLI
SUPERVISOR : PN. FARIHAH BINTI MANSOR

02

RECYCLE TYRE POLYMER FIBER AS REPLACEMENT MATERIAL IN PARTITION WALL

ALIEYA SYUHADA BINTI ALINAFIAH
AYUSAFIAH BINTI ADAM
NUR ADILA BINTI HISHAM
SUPERVISOR : PN. DALIELA BINTI ISHAMUDDIN

03

UTILIZATION OF RECYCLED TIRE POLYMER FIBRE TO PRODUCE ECOFRIENDLY BRICKS

AMIRAH NADIAH BINTI AZMI
NUR ADLINA BINTI MOHAMAD NOOR
SUPERVISOR : PN. DALIELA BINTI ISHAMUDDIN

04

SURVEYPALS

NUR AISYAH BINTI MOHAMAD NIZAM
NUR AVILLA BINTI RAMADZAN
SUPERVISOR : PN. JAZLINA BINTI MUHAMMAD

05

SURVEY RAINCOVER (SURAICO)

MEGAT NABIL DANISH BIN MEGAT ABD HALIM
MOHAMMAD DHANISH DHANIEALL BIN HAIRUL ANWAR
SUPERVISOR : PN. JAZLINA BINTI MUHAMMAD

06

CIGARETTE BUTT BRICKS ENHANCEMENT

YUVANESH KATHIRAVAN
PRAVEEN RAO MARAYA
SUPERVISOR : PN. MASRULANITA BINTI MOHAMED & PN MASWIRA BINTI MAHASSAN

07

COOL WALL PANEL

MUADZAN SHAH BIN SHAHBUDDIN
MUHAMMAD SHAZMI BIN MAHDIR
SUPERVISOR : PN. MASRULANITA BINTI MOHAMED &
PUAN ATIKAH FATMA BINTI MD DAUD

08

EMPOWERING CONCRETE WITH SISAL FIBER

KALESHESWARY A/P SRINIVASAN
KAUSHALYA A/P MURUGAN
SUPERVISOR : PN. MAI AZUNA BINTI MEOR YUSUF

09

FLOOD SENSOR

MUHAMMAD IRFAN BIN YAHYA
MUHAMMAD IDLAN WAFFI BIN AZHAR
SUPERVISOR : PN. MAI AZUNA BINTI MEOR YUSUF

10

LOT SIMPANAN BATA MESRA PENGGUNA (LOSMEP)

NUR ASYIQAH BINTI MOHD RAZMAN
ELISA HUMAIRAH BINTI ZULFA ASRI
SUPERVISOR : EN. MUHAPIS BIN A HAKIM

11

SMART CONE

SYAQIR HAIQAL BIN SAZALEE
PUTRA AMIR QAYYUM BIN ZULKAPLI
SUPERVISOR : EN. MUHAPIS BIN A HAKIM

12

EFFECTIVENESS OF A CACTUS TREE AND BANANA PEEL AS A COAGULANT AGENT FOR WATER TREATMENT

WAN AMIRA RAHINI BINTI WAN ROZI
NUR AFIFAH BINTI NADZRI
SUPERVISOR : PN. MAISHARAH BINTI OSMAN

13

WOOD-CONCRETE (INTERLOCKING BLOCK)

WAN AMIRA RAHINI BINTI WAN ROZI
NUR AFIFAH BINTI NADZRI
SUPERVISOR : PN. MAISHARAH BINTI OSMAN

14

ONLINE BOOKING SYSTEM FOR THE LABORATORIES AND LECTURE ROOMS

NURUL NAJWA BINTI ZAMRI
NUR AISYAH NAJIHAH BINTI SHAHRIZAN
SUPERVISOR : PN. SALIZAWATI BINTI KAMARUZZAMAN

15

ECO BURNER

KAVENRAJ A/L MUNIANDY
MUHAMMAD SHAHRUL ILHAM BIN MOHD SHARUDDIN
SUPERVISOR : PN. SALIZAWATI BINTI KAMARUZZAMAN

01

CADANGAN MELETAKKAN PERANGKAP MINYAK DAN SISA MAKANAN DI JALAN MANGGIS, SIJANGKANG

SITI ANIS ARAFAH BINTI ZULKARNAIN
NURUL SYAIRAH MAISARAH BT RAZALI
HADLINA ATHIRA BINTI HUSSIN
SUPERVISOR : EN. MD ALIMI BIN YASINAN @ JASMAN

02

WASTE WATER FILTER FROM THE SINK USING CORN HUSK ORGANIC MATERIAL

MUHAMAD SAIFUL HASNIZAM BIN ABU HASAN
WAN MUHAMMAD ALIF SYAWAL BIN WAN SEMAN
SUPERVISOR : PN. MARLIZA ASHIQIN BINTI KHAZALI

03

USE OF GLASS IN CEMENT BRICK MIX TO PARTIALLY REPLACE THE USE OF SAND

MUHAMMAD ALIFF AIMAN BIN ARSHAD
AFIQ AIZAT BIN SAHARUDIN
KAYLASHINI A/P VELAWTHAM
SUPERVISOR : PN. MARLIZA ASHIQIN BINTI KHAZALI

04

MIRACLE WATER FILTER

NURFATIHAH BINTI ISMAIL
FARINA HUDA BINTI AZHARI
SUPERVISOR : EN. MOHD ZAIDI BIN ABDUL HAMID

05

BRICK BOND ALIGNMENT

NUR ADIBAH BT ASNOLD SUDIBIO
IMAMUNNISA' BT MOHD AMIN
SUPERVISOR : EN. MOHD ZAIDI BIN ABDUL HAMID

06

PENGHASILAN AR MUDBALL SEBAGAI AGEN PENJERNIH AIR TERCEMAR

AMIR ASHRAF BIN MOHAMAD SALEHUDDIN
IRAHIM SLAMAT BIN OLLAH
SUPERVISOR : PN. NORLIZA BINTI MD JAHID

07

POLYSTYRENE MODIFIED BITUMEN

AMIRTAA A/P K SUPPIAH
NILAVAN RAJ A/L KUMARAN
SUPERVISOR : PN. YUSNITA BINTI YUSOF

08

SMART RUBBISH COLLECTERS

MUHAMMAD IZUDDIN BIN MOHD BIN RAZALI
MUHAMMAD SYAKIR AIMAN BIN MOHD SYUKRI
SUPERVISOR : PN. YUSNITA BINTI YUSOF

09

SOLAR WASTE BIN TO TRAP SOLID WASTE AT PSA'S LAKE

MUHAMAD JEFRI BIN UJANG
NOR AIN ATIQAH BINTI ABU BAKAR
SUPERVISOR : PN. NORHAYATI BINTI PALIL

10

PERFORMANCE OF SAND CEMENT SAWDUST ASH BRICK

NUR AINSHA SOFIA BINTI HALIM
DNURUL BATRISHIA AFRINA BINTI AHMAD TARMIZI
SUPERVISOR : PN. ZURINA BINTI SAFEE

01

KEBERKESANAN DAN IMPLIKASI PELAKSANAAN SISTEM PENUAIAN AIR HUJAN (SPAH)

MUHAMMAD DANISH FAKHRULLAH BIN ZULKIFLI
MUHAMMAD AZRULL BIN ABDUL AZMIN
SUPERVISOR : PN. ZARINAH BINTI ZAINI

02

MACKTOSH ENGINEERING LEARNING APPLICATION

ADIB UZAIR BIN ISTAMAM
MUHAMMAD ASHRAF HAKIMI BIN MAHMUD
SUPERVISOR : PN. CHOONG SIEW LAY

01

ZEPHYR WELDING HOOD WITH VENTILATION

TAN YING XIN
AMIER RYAN SHAH BIN ABDUL RAHIM
MUHAMMAD NAZRIN SHAH BIN NASARUDDIN
SUPERVISOR : EN. AZIZI MURSIDY BIN ZAINOL ABIDIN

02

DB BOX GUARDIAN

NUR ATHIRAH HARTINI BINTI ROSDI
AHMAD DZHARFAN ZARIZI BIN FAIZAN ZARIZI
SUPERVISOR : PN. SARAH AFZAN BINTI ABD KARIM

03

SOLARSCULPT FURNICHARGE

DEEBENTHIRA SAI RAO A/L SUBBARAO
NAREEN A/L ANNADURAI
ISMAIL BIN MUHAMMAD BASIR LUBIS
SITI MARYAM BINTI MOHD NASRULLAH
SUPERVISOR : PN. JAMILAH BINTI ABBAS

04

LEVEL LIT STEP LADDER

MUHAMMAD AFIQ BIN MOHD NAZLEE
LUQMANUL HAKEEM BIN ZULFIKRI
MUHAMMAD ISYRAF AMSYAR BIN TAJULAZAM
SUPERVISOR : PN. ROHAZA BINTI MAJID

05

MAG-IQ (VAKUM MAGNETIK PINTAR)

NUR FATIN AZZUA BINTI BHARUDIN
AN NAJIHAH BINTI AZMEE KHAN
FAHRIZAL BIN MUSHALLI
AQIL IRFAN BIN ADNAN
SUPERVISOR : SR. ZARINA MAT SAPRI

06

FAHULYN LEV SYSTEM

AHMAD FAHMIE BIN ABDUL ALIM
ELLYN SYAFIKA BINTI AHMAD ESYAMUDDIN
NUR HUMAIRAH BINTI WAZIR
SUPERVISOR : PN. ROSIDA BINTI AHMAD

07

SCSR MACHINE

MUHAMMAD AIMAN ALHAKIM BIN ABD WAHID
HANIN NADHRAH BINTI SUHARDI
SOFIA NURANISA BINTI JAFRI
SUPERVISOR : PN. MARIAM BINTI ABDULLAH

08

SUNSNIP

AINA SOFEA BINTI HISHAMUDDIN
MUHAMMAD DANIAL SYAZWAN BIN MOHAMAD SHAHRIZAN
HAZIQ BIN HASHEM
MUHAMMAD AZMI
SUPERVISOR : PN. NOOR AZILA BINTI JAMARI

01

AIR GUN VALVE

NUR MAISARAH BINTI MUHAMAD
NUR FARISAH AISYAH BINTI MOHD ALI
AMIRUL HAZIM BIN RAZALI
MUHAMMAD IMRAN BIN ZULKIFLI
SUPERVISOR : EN. MIOR AMRAN NOOR BIN MIOR AHMAD NOOR

02

MAIN STREET FLOOD DETECTOR

MUHAMMAD AFIFUDDIN BIN IDRIS
AZERILL AFZALL BIN AHMAD ZAWAWI
SYAMEIL HAKIM BIN UMOR
SUPERVISOR : EN. MUSTAZHA HAKIM BIN ABU TAHARI

03

AUTOMATIC WASTE SEGRAGATOR USING ARDUINO

MUHAMMAD AZHAR BIN SUFFIAN
SUPERVISOR : TS. ZURENA BINTI LEMEN

04

AIR COND TOOLS VEST

PRATHEV KUMAR A/L KUMARAN
NUR RASHMI INANI BINTI RAHMIN
NURUL HAYATI BINTI ARIS FADZALLAH
SUPERVISOR : EN. MOHD SAFARI B JAAFAR

05

MINI SUPER TREE

MUHAMMAD NAJMI HAFIY BIN NORAFENDI
AFIF IKHWAN BIN RASHIDI
SUPERVISOR : AMIR B ABDULLAH

06

GLOVE VERSATILE

MUHAMMAD IKHWAN BIN JEFRI
MEGAT IZZ DANIAL BIN AB HANIM
SUPERVISOR : PN. SARAH AFZAN BINTI ABD KARIM & EN. ZAKARIA BIN AYOB

01

ANALISA KEPERLUAN PROGRAM DIPLOMA TEKNOLOGI BERASASKAN KAYU DI POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH : SATU KAJIAN

DARSANAA A/P MANOGARAN
NUR ALYA HAYANI BINTI AZRI
NUR ALYA SYUHADA BINTI RADZALI
SOFIA MAISARAH BINTI MOHD REFINDI
SUPERVISOR : PN. RAFIDAH FARAH HANIM BINTI ABD RAZAK

02

ARWOODBASE

AWANG NOR HUZAIRI BIN AWANG ZAKARIA
MUHAMAD DANISH HAIKAL BIN SABARUDDIN
MUHAMMAD HAFIY JAUHAR BIN JAMALULLAIL
NASUHA HANI BINTI MD NIZAM
SUPERVISOR : EN. MUHAMAD FAIRUZZAIRI BIN ABDUL HAMID

03

CONNECT CUBIC / KUBIK SAMBUNGAN

AHMAD FIKRI BIN ABDULLAH
KHAIRUL AZHAR BIN ABDUL RAHIM
NUR ADILAH BINTI ABDUL RAHMAN
NUR ALEEYAH BINTI AZMAN
SUPERVISOR : DR. NORANI BINTI ABD KARIM

04

DAM ULAR BRAILLE

ABDUL MAJID BIN HASHIM
MUHAMMAD HAFIZ HAKIMI BIN MOHD ZAMRI
SUPERVISOR : EN. JEFRI BIN JUSOH

05

DIGITQUEST: ADDITION AND SUBTRACTION SKILLS FOR 5-YEARS-OLD WITH INTERACTIVE LEARNING TOOLS

ADLINA SOFIA BINTI ADNAN
AHMAD RIDZAL BIN JAFERI
MUHAMMAD FAIZ BIN MOHD FAIRUS
SUPERVISOR : EN. ZULLHYZRIFEE ISHRAF BIN ZULKIFLY

06

MONTESSORI AUTISME BOARD (MAB)

ARFAN NAUFAL BIN RAHIM
HAZMAN ADLIE BIN HISHAM
NUR HANISAH BINTI SADZALI
SITI ELYIA MAISARA BINTI MOHD EDRUS
SUPERVISOR : EN. HAMDI BIN HAJI MAWARDI

07

OSB BANANA STEM

ADAM NAUFAL BIN JAFRI
MUHAMMAD AMALUDDIN NAJMI BIN JOHARI
MUHAMMAD NAZIRUL BIN ZULKIFLE
SUPERVISOR : EN. MUHAMMAD KAMAL ARIFFIN BIN HJ.BADRUN

08

PENDIGITILAN PELAN BANGUNAN JKA DAN DEWAN AL- JAZARI

MUHAMAD AZHAD HAIKAL BIN BADROL AKMAM
MUHAMAD HAFIZAM BIN MAZLAN
MUHAMMAD ALIF BIN ISMAIL
MUHAMMAD AZIM BIN MOHD AMIZUL
SUPERVISOR : EN. ABDUL RAZLI BIN ABDUL RAHIM

09

SANiBED: GOLDEN RATIO IN SANITARY BEDS

MUHAMMAD KAMAL IRFAN BIN KAMAL BADRIN
MUHAMMAD LUQMAN HAFIZ BIN MUHD AKHTAR
TEW SHI HONG
SUPERVISOR : EN. TEO ENG YEAW

10

SACCHARUM OFFICINARUM PARTICLE BOARD

ALIF HAIKAL BIN NORHISHAM
AMIRUL ASHRAF BIN NIZAM
MUHAMMAD DANIAL HAIKAL BIN MOHD RAFAIN
SUPERVISOR : EN. HAZLAN BIN ABDULLAH

11

TAJDEED REHAL

ABDUL HAFIZUDDIN BIN ABDUL HALIM
AMIRRASHID BIN MOHD HOD
MUHAMMAD HAZWAN AIMAN BIN CHE KHAMSHAH
MUHAMMAD SYAHIR BIN MUHAMAD KAMAL
SUPERVISOR : PN. TENGKU NUR SYARAH BARIAH BINTI RAJA MOHD YAZID

FINAL PROJECT COMPETITION
& EXHIBITION
SESSION I:2024/2025

DIPLOMA IN CIVIL ENGINEERING

DKA
5A

CIVIL ENGINEERING SMART BOOKING LABORATORY

Nur Iman Izzati Binti Zahrin Shariff, Nur Anis Najwa Binti Mohd Rokemeh,
Ainul Haezah Binti Noruzman

(08dka22f1034@student.psa.edu.my, 08dka22f1028@student.psa.edu.my.,
ainul@psa.edu.my.)

Abstract

The application is intended to facilitate civil engineering laboratory management through improved effectiveness and efficiency. In line with the growth of research and practicum in both academic and industrial laboratories, this specific program presents an all-in-one solution for researchers and academics necessitating laboratory facilities. In this application, users can search for the existing facilities and tools by specifying their attributes, including availability time, quantity, and tool type. Further, an integrated calendar system that displays the availability of the laboratories eliminates the possibility of overbooking and enhances the optimal utilization of the available resources. In addition, as this type of program uses data analysis to inform laboratory use, it can also assist managers in making decisions to improve the overall design and construction of the space. System testing in two academic institutions and one business organization is presented in this paper, showcasing that in these environments this application performs well and significantly improves user satisfaction and the efficiency of the ordering process. The focus of the findings is expected to stimulate constructive change concerning civil engineering laboratory management, serve as a reference to developers of similar apps and strengthen relations between academia and business practitioners.

Keywords : *smartphone, laptop, application, booking, appsheet*



CIVIL ENGINEERING SMART BOOKING LABORATORY

PUAN AINUL HAEZAH BINTI NORUZMAN
NUR IMAN IZZATI BINTI ZAHRIN SHARIFF
NUR ANIS NAJWA BINTI MOHD ROKEMEH

PROJECT DESCRIPTION

- Our application focuses on booking students for the use of brick and concrete laboratories. It is because, originally, students had to fill out a form for the use of the laboratory and had to be taken with the laboratory lecturer. So, we created this civil engineering smart booking lab application to make it easier for students to book the lab wherever they are at any time.

OBJECTIVE

- To produce Civil Engineering Smart Booking Laboratory.
- To test the effectiveness of smart booking lab.
- To study user satisfaction toward smart booking application lab.

COMMERCIAL POTENTIAL

- The growing demand for efficiency, accessibility, and data-driven management in businesses that depend on labs has enormous commercial potential for smart booking lab applications. The need for advanced, user-friendly lab scheduling and management systems is increasing, whether in the fields of environmental testing, corporate R&D, academic research, or healthcare diagnostics.

SUSTAINABLE DEVELOPMENT GOALS

- Preserve the environment from the use of waste paper
- According to the passage of time with increasing technological progress
- Better and efficient information management and services
- Better time management and easy accessibility

IMPACT

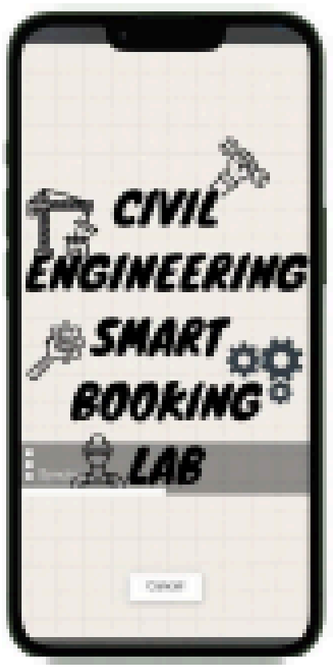
- Security and Safety in managing booking lab reservation
- Improved Access to Lab Services
- Reduction in Waiting Times and Enhanced User Experience
- Use of characters that are easy to read
- Easy accessibility

NOVELTY

- The change from booking done manually on paper to booking done through the application regardless of where you areat any time.

PRODUCT PICTURE





EFFECTIVE LEARNING USING FLUIDA MASTER APPS

Nur Najwa Ainaa Binti Radznee, Mauhibah Binti Miftahuddin,
Ainul Haezah Binti Noruzman

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Abstract

The project, "Effective Learning Using Fluida Master Apps," addresses high failure rates in fluid mechanics among Civil Engineering students at Polytechnic Sultan Salahuddin Abdul Aziz Shah. The "Fluida Master" mobile app was developed to improve accessibility and understanding of fluid mechanics through an engaging, user-friendly interface. With features designed to bridge theoretical knowledge and practical application, Fluida Master allows students to study at their own pace, building a stronger grasp of complex topics. Results indicate that Fluida Master significantly reduces problem-solving time, with users completing calculations in seconds compared to the 10-15 minutes typically required for manual methods. Feedback showed improved comprehension and confidence, with users reporting greater motivation to learn fluid mechanics through the app's interactive modules. Additionally, the app promotes eco-friendly education by reducing the need for physical textbooks. Overall, Fluida Master proves effective in enhancing fluid mechanics learning, supporting both academic performance and student engagement. The app shows promise as a comprehensive resource for Civil Engineering students.

Keywords : *accessible, effective, Fluida Master, mobile learning, apps*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

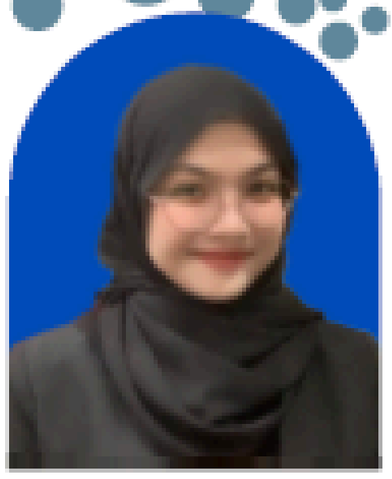
Fluida MASTER

EFFECTIVE LEARNING USING FLUIDA MASTER APPS

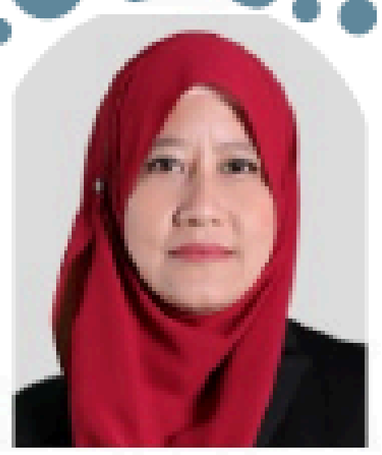
Ts. Dr. AINUL HAEZAH BINTI NORUZMAN
NUR NAJWA AINAA BINTI RADZNEE | MAUHIBAH BINTI MIFTAHUDDIN

PROJECT DESCRIPTION

Fluida Master is a mobile educational app that helps Civil Engineering students learn about fluid mechanics more effectively. The apps helps students to check the answer for complicated concepts such as fluid characteristics, pressure measurement, hydrodynamics, and fluid flow by ownself. Its user-friendly design and tailored learning paths provide an engaging experience, enabling students to bridge the gap between theoretical knowledge and practical application. Fluida Master seeks to boost academic achievement, minimize failure rates, and spark a greater interest in fluid mechanics.



Nur Najwa Ainaa binti Radznee



Ts. Dr. Ainul Haezah binti Noruzman



Mauhibah binti Miftahuddin

OBJECTIVE

- To produce smart application Fluida Master for student effectiveness in learning.
- To evaluate student learning performance using smart application (Fluida Master)
- To determine the satisfaction among the students using smart application (Fluida Master)

NOVELTY

- Developed using new software call **Net MAUI**
- Can develop apps that can run on Android, iOS, macOS, and Windows from a single shared code-base.

IMPACT

- Improving student understanding, reducing failure rates, and enhancing academic performance.
- Its interactive and flexible learning features keep students engaged and accessible to a wider audience, ensuring better preparation for real-world engineering applications.

COMMERCIAL POTENTIAL

- Can be marketed to universities, polytechnics, and students.
- It offers a modern solution for engineering programs.
- Suitable for self-paced learning, benefiting both institutions and individual learners.

SUSTAINABLE DEVELOPMENT GOALS

- **Supports Quality Education (SDG 4):** Helps students learn fluid mechanics more easily, improving academic success and access to quality education.
- **Promotes Innovation (SDG 9):** By using technology, the app enhances learning in engineering, contributing to modern solutions for infrastructure development.

PRODUCT PICTURE



SMARTDUSTBIN: REVOLUTIONIZING WASTE COLLECTION EFFICIENCY

Nurul Sabrina Binti Ramadhan, Ainur Nadhrah Binti Mohamad Aslam,
Sarina Binti Talib

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Abstract

Malaysia faces a critical challenge in managing its waste stream due to a rapidly growing population and widespread improper waste sorting practices. This has resulted in overflowing landfills, with a staggering 82.5% of daily waste (a concerning 38,427 tonnes in 2021 alone) ending up there. This not only presents a significant environmental burden but also highlights the urgent need for innovative solutions to promote sustainable waste management. The smart dustbin project proposes a revolutionary approach to tackling this challenge. This smart dustbin is equipped with advanced automatic waste sorting capabilities, utilizing infrared sensors and capacitors to enhance its sorting efficiency. The project aims to transform waste collection efficiency in Malaysia by facilitating proper waste segregation at the source. By integrating intelligent sorting technology, the smart dustbin will be able to accurately separate recyclables from general waste streams. This not only reduces the burden on landfills but also allows for the proper recovery and recycling of valuable resources. The project goes beyond simply improving waste collection, it actively promotes environmentally friendly practices by supporting the core principles of "Reduce, Reuse, Recycle." By facilitating proper waste segregation and increasing recycling rates, the smart dustbin has the potential to significantly reduce the amount of waste ending up in landfills. This not only benefits the environment by minimizing land pollution but also promotes a more sustainable waste management system for Malaysia's future. The project will assess the effectiveness of the smart dustbin in achieving these goals, paving the way for a cleaner and greener future.

Keywords : *Waste Management, Landfill Overflow, Smart Dustbin, Automatic Waste Sorting, Recycling*



SMARTDUSTBIN: REVOLUTIONIZING WASTE COLLECTION EFFICIENCY

SARINA BINTI TALIB
NURUL SABRINA BINTI RAMADHAN
AINUR NADHRAH BINTI MOHAMAD ASLAM

PROJECT DESCRIPTION

- The project focuses on developing smart dustbins that automatically sort waste, aiming to enhance waste segregation in Malaysian households. This initiative addresses the confusion users face regarding waste sorting, which is a significant barrier to effective recycling practices.

OBJECTIVE

- To create smart dustbin.
- To evaluate the effectiveness of smart dustbin.

COMMERCIAL POTENTIAL

- The smart dustbin technology has significant commercial potential as it can be integrated into existing waste management systems, offering municipalities and businesses a solution to improve recycling rates and reduce landfill waste .

SUSTAINABLE DEVELOPMENT GOALS

- This project aligns with the Sustainable Development Goals (SDGs) by promoting responsible consumption and production patterns, specifically through enhanced waste management and recycling practices.

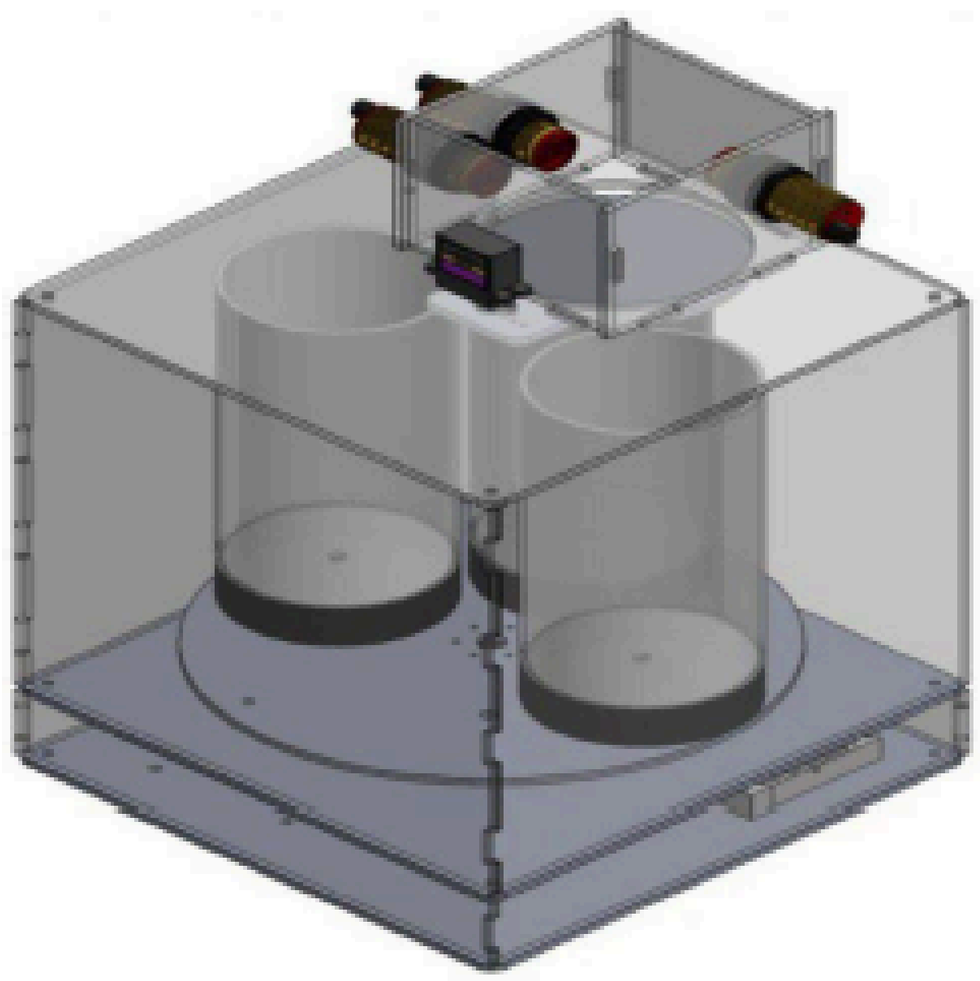
IMPACT

- The anticipated impact of the smart dustbin project includes improved recycling rates, increased user awareness of proper waste disposal, and a cleaner environment, contributing to a more sustainable community.

NOVELTY

- The novelty of this project lies in its culturally appropriate user interface designed specifically for Malaysian households, which enhances user engagement and simplifies the waste sorting process .

PRODUCT PICTURE



APLIKASI PEMANTAUAN PENYELENGGARAAN JALAN (APPJA)

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Abstract

The "Aplikasi Pemantauan Penyelenggaraan Jalan" (APPJa) was developed to address delays in road maintenance reporting and streamline the monitoring of road infrastructure at Sultan Salahuddin Abdul Aziz Shah Polytechnic. This study introduces APPJa as a solution for more efficient data collection and reporting, utilizing a user-friendly interface that allows students and stakeholders to report road damage in real time. The literature review highlighted similar applications, such as Roadroid and MYJalan KKR, supporting the effectiveness of mobile-based monitoring. The APPJa development process incorporated prototyping methodology, enabling iterative design and user feedback integration to refine app functionalities. Survey data from Polytechnic students emphasized the need for a dedicated reporting system, with findings showing that 98.1% found current manual methods ineffective. Upon APPJa's deployment, feedback indicated high user satisfaction, with 80% of users being "very satisfied." Results suggest that APPJa significantly improves reporting accuracy and response times, contributing to enhanced campus safety and infrastructure resilience. Future recommendations include integrating GPS features and urgency-level options to further streamline maintenance responses.

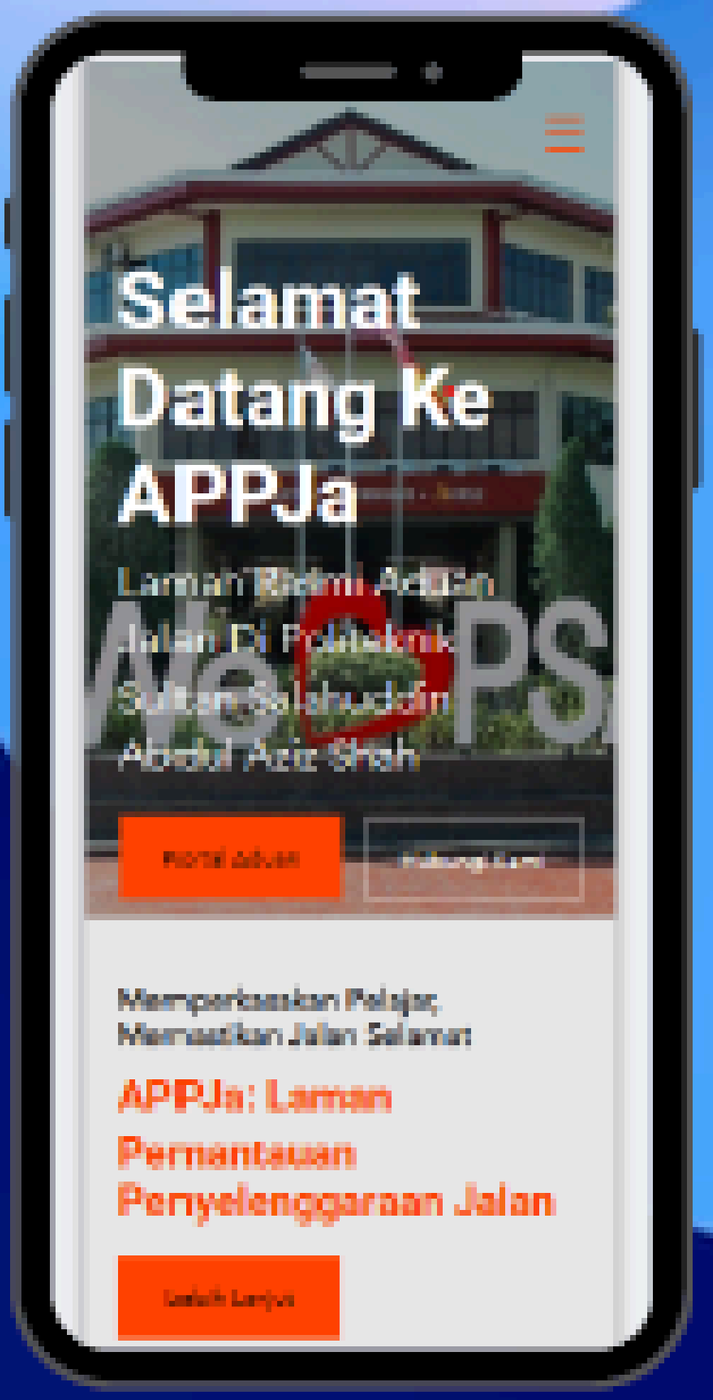
Keywords : *road maintenance, , mobile application, campus safety*

FINAL PROJECT
Competition and Exhibition
SESSION I:2024/2025
CIVIL ENGINEERING DEPARTMENT

APPLIKASI PEMANTAUAN PENYELENGGARAAN JALAN (APPJA)

SUPERVISOR NAME : PUAN SARINA BINTI TALIB
STUDENT NAME: GUSTI EKHWAN ISKANDAR BIN GUSTI ANUAR
MUHAMMAD HAZEIM SYAHIR BIN HAMDAN

Product Picture



Project Description

APPJa is a comprehensive system designed to collect and analyze road condition data, improve maintenance operations, and enhance road safety and infrastructure reliability by streamlining the monitoring process.

Objective

APPJa aims to create a platform for efficient road damage reporting and maintenance. Its goals are to:

- i.Create a platform that allows PSA citizens to report road damage and dilapidated street furniture easily and immediately
- ii. Analyze the complaint data obtained from Appja into the table of data

MAIN MENU

REPORT PORTAL

or visit our website
https://appjapsa.website.com/appja

Commercial Potential

APPJa has significant commercial potential as it addresses a common issue in road maintenance management. Its capabilities for real-time reporting, data centralization, and process streamlining make it an attractive solution for local governments and private road management companies. Additionally, the app could be licensed or customized for different regions, creating a scalable model for widespread implementation

Impact

APPJa empowers students by providing a platform to actively participate in maintaining campus infrastructure. It enhances awareness of civic responsibilities and safety, promoting a culture of shared accountability. Students can gain insights into real-world problem-solving and system design, relevant to careers in engineering and urban planning

Novelty

The novelty of APPJa lies in its integration of real-time reporting, data analytics, and user-friendly interface to address specific road maintenance issues. Unlike existing platforms, APPJa allows for direct user involvement, including the ability to upload images, categorize damages, and track repair progress. This holistic approach to road maintenance management is a novel step towards smarter, safer, and more sustainable infrastructure management

Sustainable Development Goals

"APPJa aligns with:

SDG 9: Industry, Innovation, and Infrastructure by fostering resilient infrastructure through efficient maintenance.

SDG 11: Sustainable Cities and Communities by improving road safety and reducing the environmental impact of prolonged repairs.

EASY HANDLING PLASTIC ROAD BARRIER

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Abstract

This product is known as EHPRB, which is an "Easy Handling Plastic Road Barrier" which was innovated from existing plastic road barriers. This EHPRB was innovated with the addition of “glow in the dark” light using “glow in the dark” spray cans. In addition, the addition which is placed is the use of reflective safety stickers and tires suitable for heavy work.The product aims to enhance road safety through innovations in existing plastic barriers. These barriers play a vital role in reducing accident risks by preventing vehicles from entering high-risk areas. Based on literature research, it is shows that conventional road barriers often face issues such as low visibility at night and difficulty in handling. This finding was support by observation, and questionnaire to identify the limitations of existing barriers. Hence, this is required for innovations to improve the features of barriers. Selected materials include ‘glow in the dark’ technology and 360-degree rotating wheels with brakes, which help improve nighttime visibility and facilitate barrier mobility was used in this pproduct known as EHPRB. The results indicate that the innovative barrier, equipped with *glow in the dark* technology and wheels, can improve road safety. Feedback and recommendations from road users show that 70% of users strongly agree with the implementation of this project, while 25% agree, and 5% believe the project is satisfactory. Therefore, these findings demonstrate that the advantages of this barrier in terms of ease of handling and nighttime visibility are highly effective and can have a positive impact on users. This project successfully proves the effectiveness of the innovative barrier in enhancing safety and raising awareness among road users. The barrier offers advantages in terms of safety and usability compared to conventional plastic barriers. It is recommended to implement these barriers in high-risk road areas, especially in locations with limited visibility. Further improvements could involve the use of more sustainable materials and smart technology to enhance the barrier’s functionality.

Keywords : *Plastic road barrier, road safety.*



EASY HANDLING PLASTIC ROAD BARRIER

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STUDENT'S NAME : 1. MUHAMMAD ANIQ ADAM BIN ABSIRANO 08DKA22F1059
2. MUHAMMAD HASNUL RAHMAT BIN MOHD SALEH 08DKA22F1083

PROJECT DESCRIPTION

INTRODUCTION

Road safety is crucial, and innovative plastic barriers are transforming the landscape! These dynamic solutions not only prevent accidents but also redefine how we protect road users. Join us as we explore the cutting-edge features and objectives driving this exciting evolution in road safety!



PROBLEM STATEMENT

- **Poor Visibility at Night:** Plastic road barriers can be difficult to see in low light, heightening accident risks.
- **Mobility Issues:** Awkward design make heir weight and them hard to move.
- **Awareness Gaps:** Many drivers underestimate the importance of barriers in high-risk areas, leading to negligence.



Existing Issues: Current plastic road barriers suffer from low visibility at night and are difficult to handle due to their weight and design.

Effectiveness Analysis: Compare the innovative Easy Handling Plastic Road Barrier with traditional barriers, focusing on usability and enhanced safety features.

SCOPE PROJECT

Target Area: Addressing safety challenges in poorly lit areas, such as Jalan Kampung Seri Cheding, 42700 Banting, Selangor.

OBJECTIVE

- Innovate road barriers that can glow in the dark and equipped with wheels for easy handling
- Ensure the effectiveness of the product in terms of usage and safety.



COMMERCIAL POTENTIAL

The innovations in the project could attract interest from road safety equipment manufacturers and government agencies responsible for transportation infrastructure. The enhanced usability and safety features could justify a premium price, as they reduce labor costs associated with moving barriers and improve overall safety appealing benefits for commercial and public sector clients.

SUSTAINABLE DEVELOPMENT GOALS

The project aligns well with the UN Sustainable Development Goal (SDG) 9 (Industry, Innovation, and Infrastructure) by promoting resilient infrastructure for safe road use. It also supports SDG 11 (Sustainable Cities and Communities) by enhancing road safety, making communities more secure and sustainable through innovative, low-energy solutions that improve urban transportation safety.

IMPACT

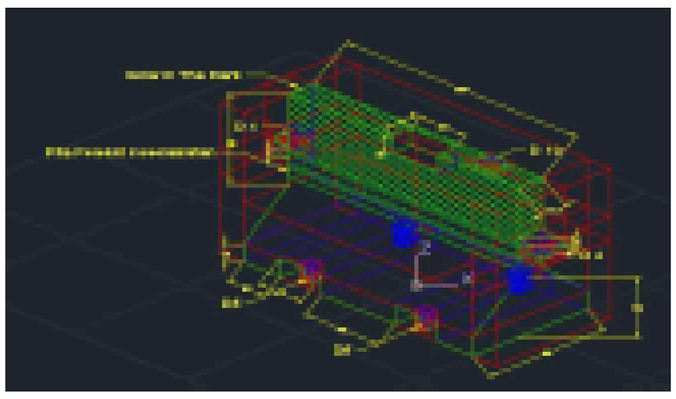
This project addresses critical road safety issues, such as poor visibility at night and difficulty in handling plastic barriers. By introducing glow-in-the-dark technology and wheels, the improved barriers could significantly reduce accidents, making roads safer and increasing awareness of road boundaries, especially in low-light or high-risk areas.

NOVELTY

The addition of glow-in-the-dark technology to road barriers is innovative, as it enhances nighttime visibility without requiring external power sources. The inclusion of wheels also makes these barriers easier to relocate, solving a common ergonomic issue with existing models. This combination of features demonstrates a fresh approach to road safety equipment design.

PRODUCT PICTURE





CamScanner

T-WASTE CONCRETE

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Isma Afiza Binti Ismail

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Abstrak

Kemajuan teknologi yang semakin meningkat turut menyebabkan peningkatan dalam sisa tayar terpakai, yang memerlukan pengurusan yang berkesan untuk mengelakkan pencemaran alam sekitar. Menurut Jabatan Alam Sekitar, jumlah sisa tayar terpakai yang dibuang setiap tahun dianggarkan mencecah ribuan tan. Sisa tayar terpakai ini termasuk tayar kenderaan yang sudah tidak boleh digunakan dan perlu dilupuskan dengan cara yang betul untuk mengelakkan masalah alam sekitar. Oleh itu, kajian ini bertujuan untuk menentukan kekuatan bancuhan konkrit menggunakan sisa tayar terpakai sebagai bahan tambah dalam konkrit gred M15. Dalam kajian ini, campuran 1:2:4 digunakan sebagai bahan asas dalam pengeluaran konkrit. Sisa tayar terpakai digunakan sebagai bahan tambah dengan peratusan campuran 0%, 10%, dan 20%. Kajian ini menyelidiki kesan penambahan sisa tayar terpakai (t-waste) dalam campuran konkrit terhadap kekuatan mampatan konkrit pada tempoh pengawetan yang berbeza (7, 14, dan 28 hari). Sampel konkrit diuji dengan tiga peratusan t-waste (0%, 10%, dan 20%) dan menunjukkan variasi kekuatan mampatan. Keputusan menunjukkan bahawa konkrit tanpa twaste (0%) mencapai purata kekuatan mampatan tertinggi dan konsisten pada setiap tempoh pengawetan, dengan nilai menghampiri atau melebihi 16 N/mm². Sebaliknya, konkrit dengan 10% dan 20% t-waste mengalami penurunan kekuatan yang ketara berbanding sampel tanpa twaste, walaupun terdapat sedikit peningkatan dari hari ke-7 ke hari ke-28. Walaupun penambahan 20% t-waste menunjukkan kekuatan mampatan sedikit lebih tinggi daripada 10% pada hari ke-14 dan ke-28, kekuatan keseluruhan tetap jauh lebih rendah daripada konkrit tanpa t-waste. Dapatan ini mencadangkan bahawa peratusan tinggi t-waste dalam campuran konkrit mungkin kurang sesuai untuk aplikasi yang memerlukan kekuatan mampatan tinggi. Kesimpulannya, konkrit ini sesuai digunakan sebagai bahan pembinaan bukan struktur seperti pagar dan bangunan yang tidak menanggung beban.

Keywords : *Sisa tayar terpakai, Jabatan Alam Sekitar, T-waste, Konkritgred M15*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

T-WASTE CONCRETE

SUPERVISOR'S NAME :
PUAN ISMA AFIZA BINTI ISMAIL

STUDENT'S NAME :
1. MUHAMMAD TAUFIQ BIN MOHD ARIF
2. NORFIZRI NAZRIN BIN NORDIN



PROJECT DESCRIPTION

- Projek ini mengkaji potensi penggunaan serbuk tayar terpakai sebagai bahan tambahan dalam bancuhan konkrit, menawarkan alternatif yang lebih mesra alam dan mengurangkan pencemaran daripada sisa tayar yang tidak dapat dilupuskan dengan mudah. Serbuk tayar dicampur dalam konkrit dengan peratusan 0%, 10%, dan 20% untuk menilai kesan terhadap kekuatan dan ketahanan konkrit. Beberapa ujian dijalankan, termasuk ujian kekuatan mampatan, ujian penyerapan air, dan ujian penurunan, bagi memahami bagaimana campuran ini mempengaruhi sifat konkrit. Hasilnya dapat memberi pandangan mengenai potensi penggunaan sisa tayar dalam industri pembinaan sambil meminimumkan impak negatif terhadap alam sekitar.

OBJECTIVE

- Menghasilkan kiub konkrit dengan campuran serbuk tayar sebagai bahan tambah dalam bancuhan konkrit.
- Mengkaji kekuatan mampatan kiub konkrit campuran serbuk tayar dan membuat perbandingan konkrit sedia ada dengan konkrit yang dicampurkan dengan serbuk tayar

COMMERCIAL POTENTIAL

- **Sebagai konkrit ringan**: pembinaan elemen bukan struktur seperti laluan pejalan kaki, dinding pagar, dan elemen hiasan
- **Bahan Binaan Hijau**: Menghasilkan konkrit yang mesra alam menggunakan serbuk tayar terpakai, mengurangkan impak karbon dalam industri pembinaan.
- **Kos Efektif**: Berpotensi mengurangkan kos bahan dengan menggantikan pasir dan bahan campuran tradisional yang lebih mahal.

SUSTAINABLE DEVELOPMENT GOALS

- **Industri, Inovasi, dan Infrastruktur**: Membina infrastruktur yang kukuh, menggalakkan inovasi industri, dan menyokong teknologi hijau untuk pembangunan mampan.
- **Penggunaan dan Pengeluaran yang Bertanggungjawab**: Memastikan corak penggunaan dan pengeluaran yang bertanggungjawab, serta menggalakkan pengurusan sumber secara berkesan.

NOVELTY

- Projek ini meneroka penggunaan serbuk tayar terpakai dalam konkrit untuk meningkatkan kekuatan dan mengurangkan pencemaran sisa tayar. Inisiatif ini berpotensi menghasilkan bahan binaan lebih lestari, menjimatkan kos, dan mengurangkan kebergantungan pada agregat semula jadi. Tambahan pula, ia menyediakan alternatif mesra alam untuk pengurusan sisa tayar. Dengan kekuatan mampatan yang lebih baik, bahan ini sesuai untuk aplikasi konkrity ringan

IMPACT

- **Mengurangkan Pencemaran Sisa Tayar**: Kajian ini membantu mengurangkan pencemaran dengan memanfaatkan tayar terpakai sebagai bahan dalam konkrit, mengurangkan keperluan pelupusan dan risiko pencemaran alam sekitar.
- **Kesedaran Kelestarian dalam Industri Pembinaan**: Kajian ini meningkatkan kesedaran tentang kitar semula dalam pembinaan, menyokong amalan yang mesra alam dan mampan untuk masa depan industri.

PRODUCT PICTURE



KEBERKESANAN SERBUK TAYAR DALAM BANCUHAN KONKRIT

Hasya Hannani Binti Mohd Nor , Nur Aida Qistina Binti Ruhaili,
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Abstract

Tire granules, a waste material generated from the use of motor vehicle tires, have gainedattention as an additive in concrete mixtures. This study aims to assess the effectiveness of tire granulesas a supplementary material in concrete. An experimental method was employed to compare themechanical and physical properties of concrete containing tire granules with control concrete. Theresults indicate that the addition of tire granules into the concrete mixture can enhance compressivestrength while reducing the weight of the cube. Furthermore, the use of tire granules can also mitigatepollution, thereby potentially reducing the carbon footprint of the construction industry. However, it iscrucial to note that excessive amounts of tire granules can diminish the strength of concrete andcompromise its structural performance. Therefore, utilizing tire granules as an additive in concrete canbe considered a promising alternative for enhancing sustainability in the construction industry.Nevertheless, further studies are required to fully understand their effects on concrete performance andenvironmental impact. In this study, the percentages of tire granules added to the control concretemixture were 10%, 20%, and 30%. The produced concrete mixtures adhered to Malaysian Standards.The concrete grade used was grade 25 with a mixing ratio of 1:2:4. The mold size used was 150mm x150mm x 150mm.

Keywords : *Concrete, Tire granules, Compressive strength testing*



KEBERKESANAN SERBUK TAYAR DALAM BANCUHAN KONKRIT

PUAN ISMA AFIZA BINTI ISMAIL

HASYA HANNANI BINTI MOHD NOR & NUR AIDA QISTINA BINTI RUHAILI

PROJECT DESCRIPTION

This project investigates the effectiveness of incorporating tire powder into concrete mixtures as a sustainable construction material, aiming to improve mechanical properties, durability, and environmental performance while reducing waste from discarded tires.

COMMERCIAL POTENTIAL

Incorporating tire powder into concrete offers significant commercial potential through cost savings, meeting the demand for sustainable materials, diverse applications in construction, effective waste management, and providing a competitive advantage in the green building market.

OBJECTIVE

Studying the compressive strength of concrete cubes mixed with tire powder and discarding the comparison of existing concrete with concrete mixed with tire powder

SUSTAINABLE DEVELOPMENT GOALS

Using tire powder helps manage rubber waste, reduces landfill accumulation, and promotes recycling.

IMPACT

The use of tire powder reduces tire waste and minimizes negative environmental impacts.

PRODUCT





NOVELTY

Weight Reduction: Adding tire powder reduces the weight of concrete, which is beneficial for lightweight construction applications.

Effectiveness Testing: Conduct tests to compare tire powder concrete with conventional concrete, focusing on compressive strength, weather resistance, and permeability.

FASILITIES MAINTENANCE APPLICATION (FAMA)

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Abstract

Facilities Maintenance Application (FAMA) is a digital platform designed to facilitate students and staff at the Civil Engineering Department (JKA), Sultan Salahuddin Abdul Aziz Shah Polytechnic in reporting facility damage. This platform aims to increase the efficiency and effectiveness of maintenance management by the Building and Infrastructure Unit (UBI) through a more transparent and faster digital complaint system. Management and maintenance manuals face challenges such as lost records and inefficient scheduling, which often results in increased repair times. With FAMA, users can report facility issues directly, allowing UBI to perform maintenance more systematically. This project also involves the analysis of other relevant applications and questionnaires to students as well as interviews with UBI lecturers and staff to collect feedback on the effectiveness of FAMA. Based on the results of the study, it is recommended that FAMA be equipped with automatic reminders and real-time status reports to improve proactive functionality and user accessibility. Overall, FAMA has the potential to be a comprehensive digital solution in ensuring safe and conducive facilities for JKA users.

Keywords : *FAMA, facility management, digital maintenance, complaint application, Civil Engineering Department*



Fasilities Maintenance Application (FAMA)

Ts. Dr. Siti Asmiza Binti Muzafar
Muhammad Amirul Adam Bin Mohd Darawi
Nik Amir Aiman Bin Nik Mazlan

PROJECT DESCRIPTION

- FAMA is an innovative platform at Polytechnic Sultan Salahuddin Abdul Aziz Shah, Shah Alam that simplifies maintenance management. It allows students, staff, and other users to easily report and track facility issues, such as equipment or infrastructure malfunctions. FAMA ensures facility problems are addressed promptly and supports effective communication between users and maintenance teams, improving service quality.

OBJECTIVE

- Develop a FAMA facility maintenance application
- Evaluate the effectiveness of the FAMA facility maintenance application

COMMERCIAL POTENTIAL

- FAMA could scale beyond the Polytechnic to other educational institutions, including universities, colleges, and even K-12 schools, which all face similar facility maintenance challenges.

SUSTAINABLE DEVELOPMENT GOALS

- SDG 9: Industry, Innovation, and Infrastructure :
  - Efficient Infrastructure Management
  - Innovation in Facility Management

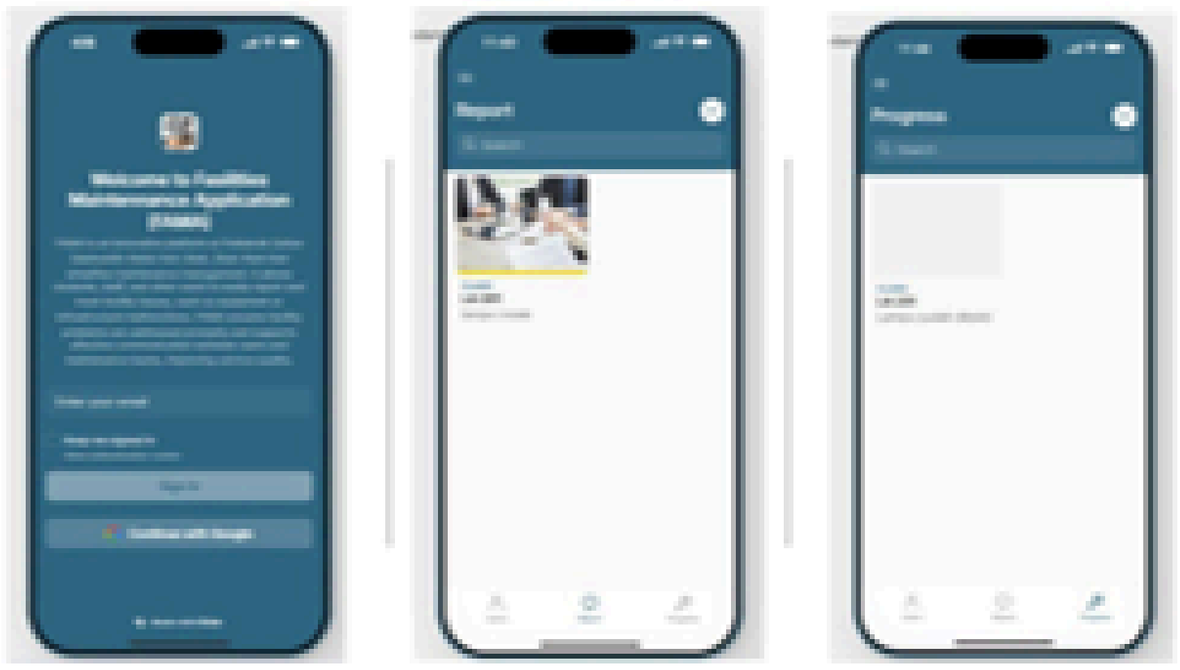
IMPACT

- Quicker issue resolution
- Reduction in maintenance costs
- Sustainable campus environment
- Adaptability for broader markets

NOVELTY

- Upload a picture
- Detailed location
- The user can know the status of work progress

PRODUCT PICTURE



APLIKASI LAPORAN KEROSAKAN JALAN RAYA (ROCONDI)

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(amiruladam685@gmail.com, nikaiman919@gmail.com, fawi@psa.edu.my)

Abstrak

Dalam era digital yang terus berkembang, keselamatan jalan raya merupakan isu kritikal yang memerlukan perhatian berterusan. Rocondi adalah aplikasi berasaskan komuniti yang dibangunkan untuk meningkatkan keselamatan jalan raya dan memperbaiki pengalaman pemanduan. Aplikasi ini membolehkan pengguna melaporkan dan berkongsi keadaan jalan raya secara masa nyata seperti lubang jalan, serpihan, banjir, atau permukaan jalan licin. Dengan menggunakan Rocondi, pemandu dapat menyumbang kepada pangkalan data kolektif mengenai bahaya jalan raya, membantu pengguna lain untuk menavigasi dengan lebih selamat. Rocondi menawarkan pelbagai ciri utama, termasuk sistem pelaporan pengguna yang intuitif, melihat laporan keadaan jalan, kemas kini masa nyata, pemberitahuan dan amaran mengenai bahaya yang baru dilaporkan, serta analisis data untuk mengenal pasti tren dan kawasan berisiko tinggi. Aplikasi ini juga menekankan keselamatan dan privasi pengguna jalan raya.Dengan melibatkan pengguna dalam pelaporan keadaan jalan raya, Rocondi bukan sahaja meningkatkan keselamatan pemandu tetapi juga menggalakkan kerjasama komuniti. Analisis data yang dihasilkan boleh digunakan oleh agensi pengangkutan dan perancang bandar untuk membuat penambahbaikan infrastruktur dan strategi pengurusan trafik.

Keywords : *Rocondi, Jalan raya, risiko, keselamatan, trafik*



APLIKASI LAPORAN KEROSAKAN JALAN RAYA (ROCONDI)

ENCIK FAWI BIN SAMAD
MUHAMMAD AMIN BIN NORDIN | MUHAMMAD TAQIUDDIN MIRZA BIN ABDUL WAHID

PROJECT DESCRIPTION

- Rocondi is a real-time community application for road safety, allowing users to report road conditions such as potholes, unevenness or sand. Users receive live updates on reported hazards, helping them plan trips more safely. The application also uses a community verification system to ensure the accuracy and reliability of reports. Additionally, Rocondi collects data to identify road damage trends, support infrastructure improvements, and contribute to a safer driving experience for everyone.

OBJECTIVE

- Road users can receive information updates related to road damage.
- Develop an application that can report road conditions directly.
- Provides general information about road damage

COMMERCIAL POTENTIAL

- The commercial potential is great, because its function can also cover many places, not limited to a specific place

SUSTAINABLE DEVELOPMENT GOALS

- By enabling rapid reporting of hazards, ROCONDI contributes to healthier living conditions
- ROCONDI promotes the development of safe, resilient and sustainable communities.

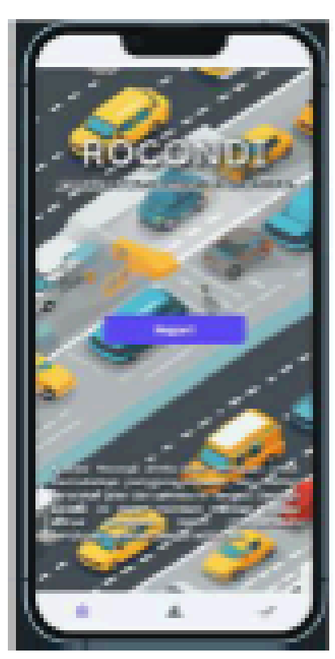
IMPACT

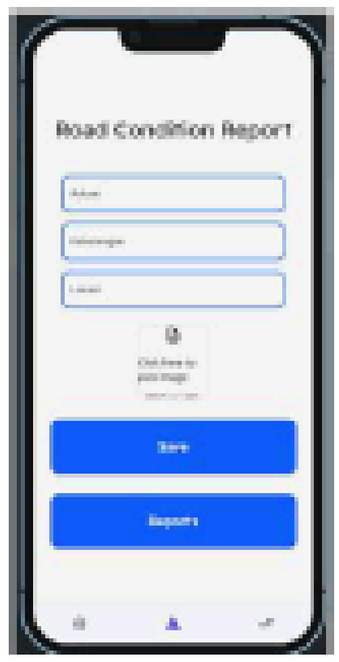
- Give space to the public to highlight the issue of broken roads.
- By identifying hazards early, the app can reduce environmental degradation, contributing to a cleaner and safer environment.
- Early reporting can prevent health risks

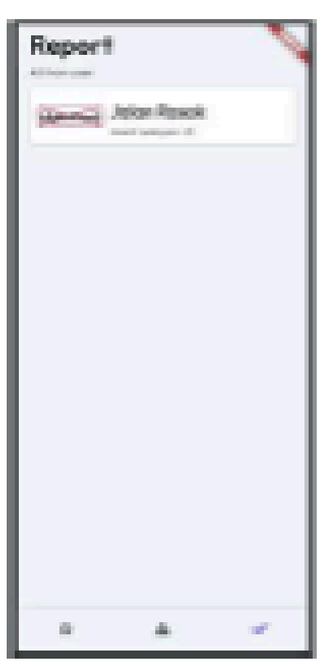
NOVELTY

- ROCONDI is flexible, making it useful for local governments, NGOs, and also community groups

PRODUCT PICTURE







RAINPURE PORTABLE WATER FILTRATION SYSTEM

Zaid Rusli Bin Haja Muinudeen , Muhammad Mujahid Bin Muhammad Dom, Fawi Bin Samad

(08dka22f1023@student.psa.edu.my, 08dka22f1188@student.psa.edu.my, fawi@psa.edu.my)

Abstract

Rainpure Portable Water Filtration System for daily use functions as a rainwater filter to make it cleaner for daily use such as bathing, washing cars and washing clothes. This designed rainwater filter is very easy to produce because the materials used are easily available. The situation we can see rainwater is often used unfiltered and dirty, this creates various health problems such as skin allergies. The main objective of the rainwater filter is to produce a rainwater filter prototype using materials that have been identified. In addition to being able to compare the parameters of rainwater before and after being filtered using the filter that has been produced and comparing the most suitable filter material to be used as a rainwater filter. Rainwater before being filtered and after being filtered will be tested for quality in the laboratory to measure water parameters. The parameters taken are pH value and turbidity. This rainwater filter prototype focuses on testing and analyzing effectiveness with the aim of ensuring it meets water safety standards.

Keywords : *Rainwater filter, pH value, turbidity, filter material*

FINAL PROJECT
Competition and Exhibition
SESSION I:2024/2025
CIVIL ENGINEERING DEPARTMENT

RAINPURE PORTABLE WATER FILTRATION SYSTEM

FAWI BIN SAMAD
ZAID RUSLI BIN HAJA MUINUDEEN
MUHAMMAD MUJAHID BIN MUHAMMAD DOM

PROJECT DESCRIPTION

- Rainpure Portable Water Filtration System untuk kegunaan harian berfungsi sebagai penapis air hujan supaya menjadi lebih bersih untuk kegunaan harian seperti mandi, membasuh kereta dan mencuci pakaian. Penapis air hujan yang direka bentuk ini sangat mudah dah dihasilkan kerana bahan yang digunakan mudah didapati. Situasi yang kita dapat lihat air hujan sering digunakan tidak ditapis dan kotor ini mewujudkan pelbagai masalah kesihatan seperti alahan kulit. Objektif utama penapis air hujan ialah menghasilkan prototaip penapis air hujan menggunakan bahan yang telah dikenal pasti. Selain itu dapat membandingkan parameter air hujan sebelum dan selepas ditapis menggunakan penapis yang telah dihasilkan dan membandingkan bahan penapis yang paling sesuai digunakan untuk dijadikan sebagai penapis air hujan. Air hujan sebelum ditapis dan selepas ditapis akan diuji kualitinya di makmal untuk mengukur parameter air. Parameter yang diambil ialah nilai pH dan kekeruhan. Prototaip penapis air hujan ini menumpukan kepada pengujian dan analisis keberkesanan dengan tujuan untuk memastikan ia memenuhi piawaian keselamatan air.

OBJECTIVE

- Mereka bentuk sistem penapisan mudah alih
- Menghasilkan sistem penapis air mudah alih yang berpatutan
- Menilai kecekapan sistem penapisan air mudah alih

IMPACT

- Mewujudkan Peluang Perniagaan Baharu
- Peningkatan Akses kepada Air Bersih
- Penjimatan Kos Penggunaan Air

COMMERCIAL POTENTIAL

- Alternatif untuk kegunaan harian
- Pasaran peralatan dan teknologi hijau

SUSTAINABLE DEVELOPMENT GOALS

- ØSDG 6: Clean Water & Sanitation
- ØSDG 12: Responsible Consumption and Production

PRODUCT PICTURE



KAJIAN KES: CADANGAN PEDESTRIAN CROSSING DI PERSIARAN AKUATIK SHAH ALAM

Siti Nur Asyikin binti Zaidi Azhar, Nuramira Nadhira binti Erie Fardi,
Normasita Binti Sulaiman

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normasita@psa.edu.my.)

Abstract

Kajian ini mengusulkan penyelesaian bagi permasalahan keselamatan lintasan pejalan kaki di Persiaran Akuatik, Shah Alam. Persimpangan jalan yang sibuk dengan aliran trafik yang laju menyebabkan kesukaran untuk melintas dengan selamat, terutamanya di kawasan yang berdekatan dengan Aeon Mall Shah Alam dan kawasan pembangunan DatumCorp International Sdn Bhd. Melalui kajian literatur, pelbagai jenis lintasan pejalan kaki seperti lintasan zebra, lintasan lampu isyarat, dan jejantas pejalan kaki diteliti bagi menentukan pendekatan terbaik dalam mengurangkan risiko kemalangan. Metodologi kajian ini melibatkan kaedah kuantitatif dan kualitatif, termasuk soal selidik, pemerhatian, dan temubual bagi mendapatkan data lalu lintas dan jumlah pejalan kaki. Kajian ini juga menganalisis corak aliran trafik dan jumlah pejalan kaki sepanjang hari untuk mengenal pasti masa puncak. Dapatan kajian menunjukkan bahawa jumlah kenderaan dan pejalan kaki adalah tinggi pada waktu pagi dan petang, dengan konflik lalu lintas yang ketara di persimpangan tersebut. Sebagai kesimpulan, kajian ini mencadangkan beberapa langkah peningkatan keselamatan, termasuk pembinaan lintasan pejalan kaki yang berlampu, penambahan lorong terus, serta pembinaan jejantas untuk meningkatkan keselamatan dan mengurangkan konflik trafik. Cadangan ini diharapkan dapat menyediakan persekitaran yang lebih selamat untuk pejalan kaki di kawasan ini.

Keywords : *Keselamatan lintasan pejalan kaki, Kaedah kuantitatif dan kualitatif, Konflik aliran trafik dan pejalan kaki, Cadangan peningkatan keselamatan*



KAJIAN KES: CADANGAN PEDESTRIAN CROSSING DI PERSIARAN AKUATIK SHAH ALAM

TS. NORMASITA BINTI SULAIMAN
SITI NUR ASYIKIN BINTI ZAIDI AZHAR
NURAMIRA NADHIRA BINTI ERIE FARDI



PROJECT DESCRIPTION

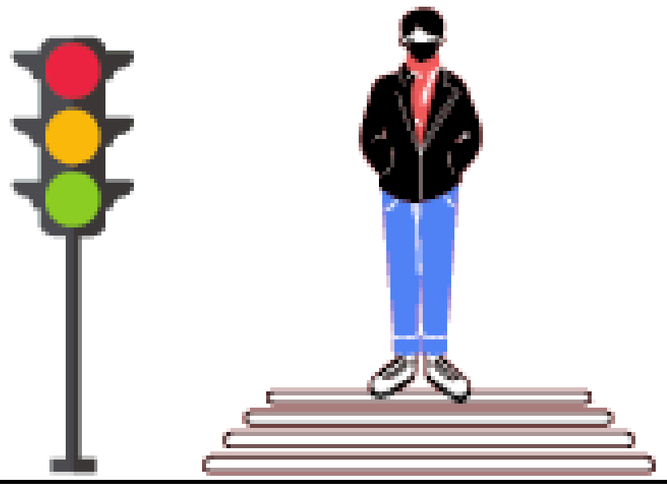
This project addresses the urgent need for enhanced pedestrian safety at the busy intersection of Persiaran Akuatik, Persiaran Olahraga, and Jalan Akuatik 13/64 in Shah Alam. This area sees a high volume of pedestrian and vehicular traffic, with vehicles often traveling at high speeds as they attempt to catch green lights, making it challenging for pedestrians to cross safely. The project aims to assess the current challenges, analyze traffic and pedestrian volume data, and propose solutions that could include marked crossings, signalized pedestrian islands, or pedestrian overpasses. By implementing a safer crossing infrastructure, this project seeks to minimize the risk of accidents, improve traffic flow, and enhance accessibility around key areas such as Aeon Mall Shah Alam, ultimately contributing to a safer, more walkable urban environment.



OBJECTIVE



- To propose a suitable pedestrian crossing solution.
- To gather traffic volume data at Persiaran Akuatik.
- To collect data on pedestrian activity at this location.

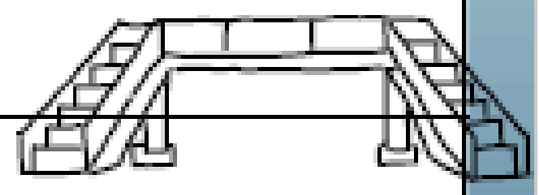


COMMERCIAL POTENTIAL

- Increased Foot Traffic for Businesses
- Support for New Residential and Commercial Projects
- Boost to Educational Institutions
- Improved Traffic and Accessibility for Tourists and Shoppers
- Opportunities for Public-Private Partnerships (PPP)

SUSTAINABLE DEVELOPMENT GOALS

- SDG 11 (Sustainable Cities and Communities) by focusing on creating safe, accessible urban infrastructure.
- SDG 3 (Good Health and Well-being) by reducing the risk of pedestrian accidents and encouraging walking as a mode of transport.



IMPACT

Implementing a safer pedestrian crossing would reduce accident risks, improve walkability in the area, and encourage safer pedestrian movement. It would also foster a more inclusive environment, benefiting both pedestrians and vehicle drivers by reducing traffic conflicts.

NOVELTY

The project combines quantitative and qualitative data to design a pedestrian-friendly environment. This involves using innovative traffic volume analysis and understanding peak activity trends to create optimal crossing solutions like pedestrian islands, zebra crossings, and pedestrian overpasses.

PRODUCT PICTURE





EXPANDED CLAY AGGREGATE BRICK

Nursyafiqah Binti Mohd Shahrul Anuar, Fikri Norwafiq Bin Jasman,
Maswira Binti Mahasan

(08dka22f1010@student.psa.edu.my, 08dka22F1126@student.psa.edu.my,
maswira@psa.edu.my)

Abstract

Lightweight bricks offer significant advantages in construction due to their reduced weight compared to traditional bricks. This characteristic translates to decreased dead loads on structures, potentially leading to improved structural efficiency and reduced foundation requirements. This study explores the key benefits of lightweight bricks and the role of ECA in their production. It highlights the advantages of using lightweight bricks, such as reduced structural loads. Additionally, the study delves into the properties of ECA, emphasizing its low density, which contributes to the valuable characteristics of lightweight bricks. This overview demonstrates the potential of lightweight bricks and the critical role of ECA in achieving their desired properties, making them a valuable option for sustainable and efficient construction practices. To evaluate the effectiveness of ECA in producing lightweight bricks, three different percentages of ECA (0%, 5%, and 10%) were incorporated into the brick mix. The produced bricks, measuring 200mm x 100mm x 50mm, were subjected to compressive strength and water absorption tests according to BS EN 771-1 (for compressive strength test) and BS 1052-1 (water absorption test)standards at 7 and 28 days of curing. The bricks were produced in accordance with British European Standards that are widely used in Malaysian Construction. We use a mix of cement, fine sand, water, and expanded clay aggregate.

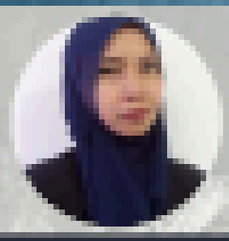
Keywords : *expanded clay aggregate, cement brick, water absorption test, compression strength test*

FINAL PROJECT
Competition and Exhibition
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CIVIL ENGINEERING DEPARTMENT





NURSYAFIQAH BINTI MOHD SHAHRUL ANUAR (08DKA22F1010)



PUAN MASWIRA BINTI MAHASAN (SUPERVISOR)



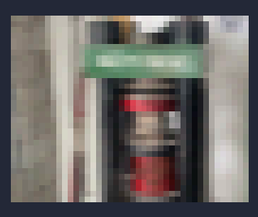
FIKRI NORWAFIQ BIN JASMAN (08DKA23F1126)

EXPANDED CLAY AGGREGATE BRICK

PROJECT DESCRIPTION

The experimental study is to examine the compressive strength and water absorption rate with the added of Expanded Clay Aggregate (ECA) in cement brick. The use of ECA in this study is to make the brick more lighter than traditional brick. This ECA Brick is created from cement, river sand, ECA. The percentage of ECA that will be mixed is 0%, 5%, and 10%. We cast 3 brick each sample. We determine the strength and water absorption under 7, 14, and 28 days. The standard size/dimension of brick is 200mm x 100mm x 50mm. Brick that is lighter and has a higher strength is 10% ECA added.

CONCRETE BRICK	ECA BRICK



OBJECTIVE

01 To determine the strength performance and water absorption of the brick.

02 To determine the efficiency of ECA for making lightweight brick.



NOVELTY

01

Increased strength and durability

02

Environmentally friendly

IMPACT

01

Accelerated Construction Time

02

Improved Durability and Longevity

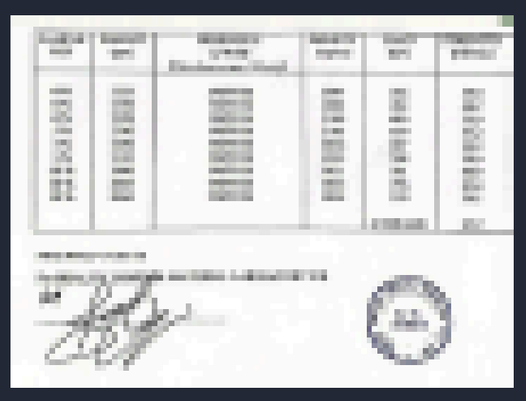
DATA

The graph of compressive strength and water absorption shows that 10% ECA has a good condition within 28 days

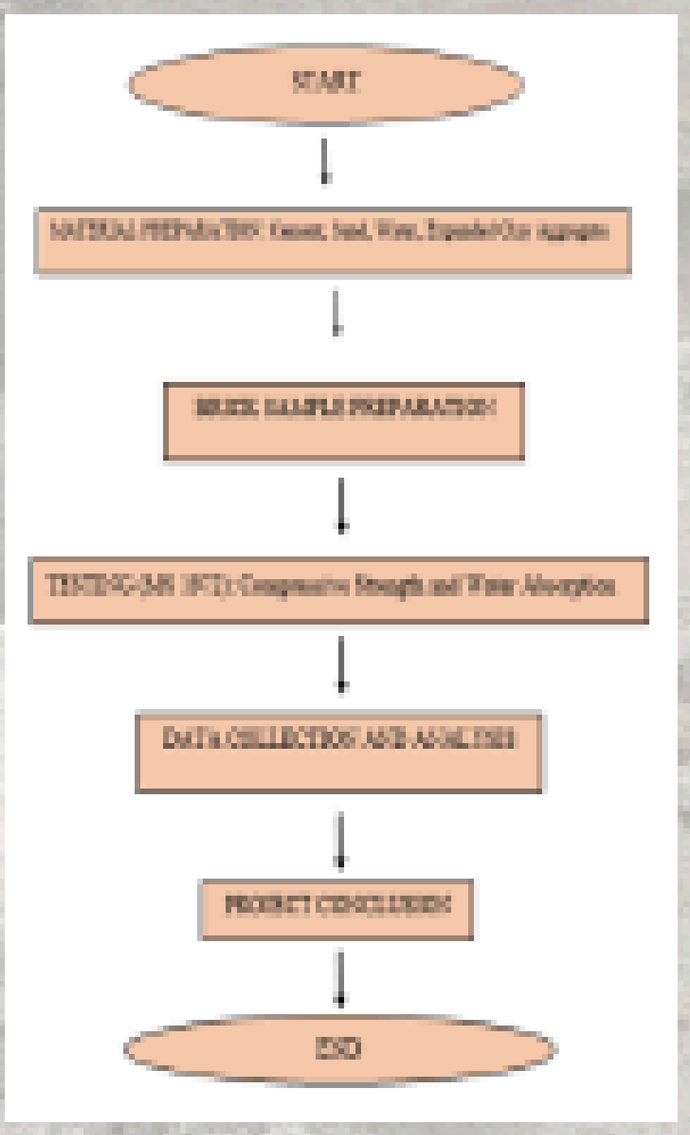




Permit data from external company



FLOWCHART



COMMERCIAL POTENTIAL



01 Reduce construction cost

02 Increased demand for sustainable building materials

03 Versatility - wide range application

SUSTAINABLE DEVELOPMENT GOALS

SDG 11

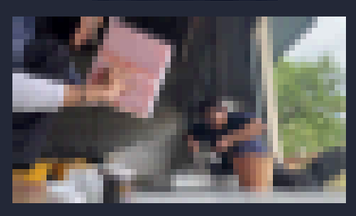
contribute to sustainable urban development by reducing the environmental impact of construction

SDG 12

contribute to climate action by reducing greenhouse gas emissions associated with building construction and operation.

On field:





INNOVATION OF THE BRICK BINDING TOOL: BRICK WALLTOPPER

Muhammad Shah Aiman bin Heruan, Ameerun Izzuddin bin Ahmad Zailan, Maswira Binti Mahasan

(shahaiman1077@gmail.com.my, ameerunizzuddin@gmail.com.my, maswira@psa.edu.my)

Abstract

The method of brick lifting is an important technique in small building and infrastructure construction. This study aims to develop a smart tool that facilitates the arrangement of bricks, focusing on time and cost savings at small construction sites. The methodology involves testing the tool at various construction locations to evaluate its performance in real-world situations. Preliminary findings indicate that this tool overcomes the limitations of previous tools in terms of size and design, making it more user-friendly and easier to operate in confined spaces. The tool is also equipped with a leveling feature to ensure the accuracy of brick stacking. These findings are expected to have a positive impact on worker productivity and work quality at small sites. Thus, this study aims to contribute to innovation in more efficient and effective construction processes, leveraging technology to improve building practices on a smaller scale

Keywords : *Brick lifting, smart tool, construction efficiency, small construction sites, productivity*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT





BRICK WALL TOPPER

SUPERVISOR'S NAME:
PUAN MASWIRA BINTI MAHASAN
STUDENT'S NAME:
1) MUHAMMAD SHAH AIMAN BIN HERUAN (08DKA22F1077)
2) AMEERUN IZZUDDIN BIN AHMAD ZAILAN (08DKA22F1045)

PRODUCT PICTURE



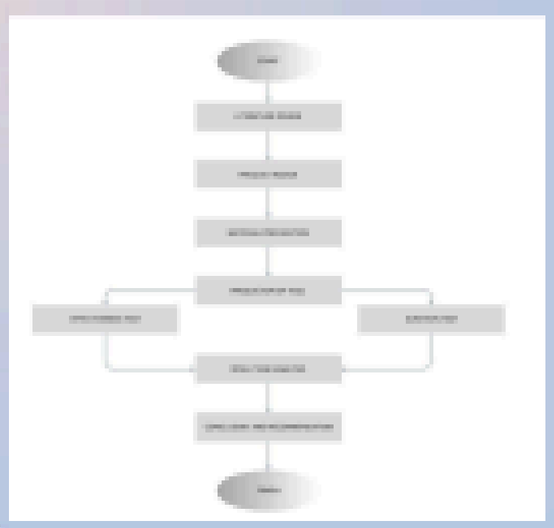
PROJECT DESCRIPTION

- An innovative smart tool designed for efficient brick arrangement at small construction sites. Its user-friendly, ergonomic design ensures ease of handling in confined spaces, while durable wheels enhance mobility across the site.

COMMERCIAL POTENTIAL

- **Efficiency:** Reducing costs and improve productivity.
- **Quality and Sustainability:** Reduce errors and waste.
- **Labor Efficiency:** enhance productivity and reduce labor costs.

FLOW CHART



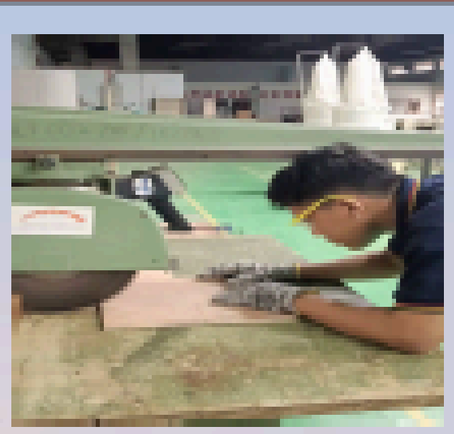
OBJECTIVE

- To develop the innovative bricklaying tool, the Brick Wall Topper.
- To determine the effectiveness of the product in terms of time efficiency.
- To get the review survey from the product tester.

IMPACT

- **On Society:** Enhances worker safety and efficiency.
- **On the Environment:** Reduce the environmental footprint of building projects.

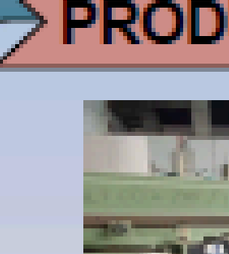
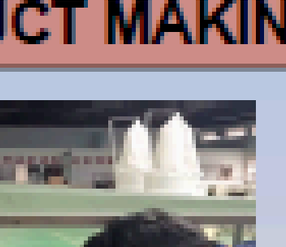
PRODUCT MAKING

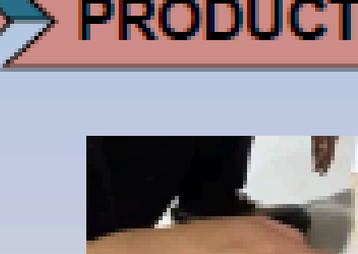
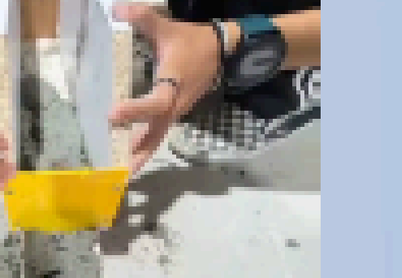


PRODUCT TESTING



DATA RESULTS & RESPONSE

NOVELTY

- This product stands out due to its innovative design, focused on cost and time savings in brick arrangement. Unlike traditional tools, it features an ergonomic design and a built-in leveling mechanism that allows for precise stacking and reduces errors.

ON FIELD TEST




SUSTAINABLE DEVELOPMENT GOALS

- **Responsible Consumption and Production :**
Reduce the material waste and the need for rework.
- **No Poverty**
Help lower housing costs, making it easier for low-income families to access affordable housing.

FINAL PROJECT COMPETITION
& EXHIBITION
SESSION I:2024/2025

DIPLOMA IN CIVIL ENGINEERING

DKA
5B

WOOD ASH CONCRETE

Wan Luth Zhafer Bin Wan Khalimi Azrin, Ahmad Ikhwan Safuan Bin Ahmad Tajuddin,
Muhammad AliffHaiqal Bin Azli,
Farihah Binti Mansor

(luthz2004@gmail.com, ikwansafuan94@gmail.com, aliffpro04@gmail.com.
farihah@psa.edu.my)

Abstrak

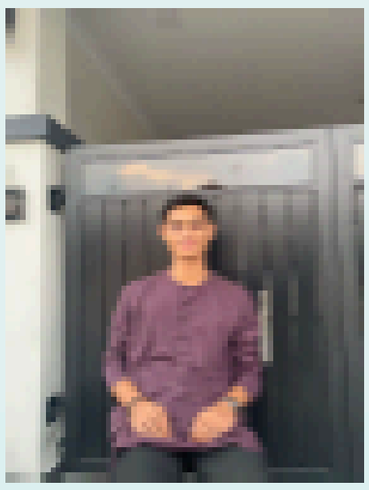
Konkrit abu kayu ialahkonkrit di mana sebahagian simen digantikan dengan abu kayu, bahanbuangan dari pembakaran kayu. Ini bukan sahaja mengurangkan sisa tetapi juga jejakkarbon, menjadikan konkrit lebih mesraalam. Walaupun kekuatan dan ketahanan dikekalkan dengan penggunaan abu kayu secara sederhana, konkrit ini juga sesuai untuk pelbagai projek pembinaan ringan yang mampan. Literatur menunjukkan bahawa abu kayu boleh menggantikan hingga 20% simen dalam konkrit, tanpa mengorbankan kekuatan dan ketahanan yang diperlukan. Metodologi penghasilan blok konkrit abu kayu melibatkan penyediaan bahan utama seperti simen, abu kayu, pasir, dan air, dengan nisbah campuran yang ditentukan berdasarkan ujian awal. Campuran tersebut dipadatkan dalam acuan dan blok dibiarkan mengeras selama beberapa minggu. Ujian mampatan dijalankan pada hari ke-7, 14, dan 28, di mana sampel diukur dan dimasukkan ke dalam mesin uji untuk dikenakan beban hingga pecah. Hasil ujianmenunjukkan bahawa nisbah mampatan yang lebih tinggi berkaitan dengan kekuatan yang lebih lemah, manakala sampel yang mengeras selama 28 hari menunjukkan kekuatan yang lebih baik disebabkan hidrasi yang lebih efektif. Walau bagaimanapun, semua nisbah menunjukkan kualiti yang kurang baik berdasarkan hasil penyerapan air yang melebihi 7%, yang menunjukkan kebolehtelapan tinggi dan masalah ketahanan pada sampel konkrit. Kesimpulan kajian menunjukkan bahawa walaupun penggantian abu kayu dapat meningkatkan keberkesanan konkrit, kajian lanjut diperlukan untuk menyelidik nisbah optimum, penggunaan bahan tambahan, dan analisis aplikasi konkrit abu kayu dalampembinaan secara lebih mendalam.

Keywords : *Konkrit Abu Kayu, Kekuatan Mampatan, Nisbah Campuran, Ujian Mampatan, Ketahanan*

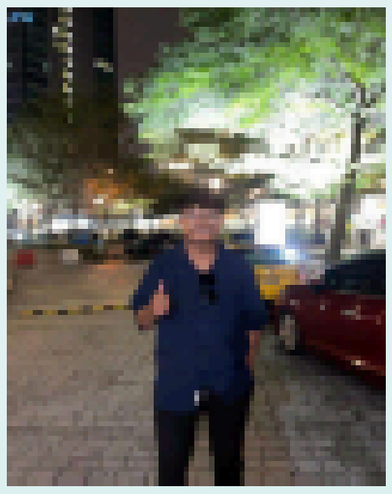


WOOD ASH CONCRETE

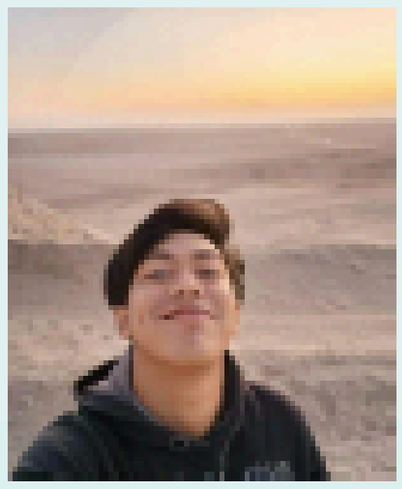
PN FARIHAH BINTI MANSOR



AHMAD IKHWAN SAFUAN BIN AHMAD TAJUDDIN
08DKA23F1144



MUHAMMAD ALIFF HAIQAL BIN AZLI
08DKA22F1111



WAN LUTH ZHAFER BIN WAN KHALIMI AZRIN
08DKA23F090

PROJECT DESCRIPTION

- This project explores the use of wood ash, a byproduct of wood combustion, as a sustainable partial replacement for cement in concrete production. The goal is to reduce cement consumption and promote environmentally friendly construction by incorporating wood ash into concrete mixtures. The project will involve producing concrete with varying proportions of wood ash, testing the compressive strength and water absorption of these mixtures, and comparing their performance to conventional concrete. This research aims to provide valuable insights into the feasibility and benefits of utilizing wood ash in concrete, contributing to a more sustainable and resource-efficient construction industry.

OBJECTIVE

- To produce concrete with wood ash as an partially replacement material
- To test the compressive strength and water absorption
- To compare the strength of additive concrete with the conventional concrete

IMPACT

- This project can inspire further research and development in sustainable construction materials, fostering a culture of innovation and environmental responsibility.
- Reduced material costs due to the use of wood ash can make construction projects more affordable and accessible.

COMMERCIAL POTENTIAL

- Utilizing wood ash decreases reliance on cement production, a significant source of greenhouse gas emissions, aligning with the growing demand for sustainable construction materials.
- Replacing cement with wood ash, often a waste product, lowers material costs, making the final product more budget-friendly.

SUSTAINABLE DEVELOPMENT GOALS

- Goal 9: Industry, Innovation, and Infrastructure

This project promotes sustainable industrialization and innovation in construction materials.

- Goal 13: Climate Action

Using wood ash can reduce the carbon footprint of concrete production, contributing to climate change mitigation.

- Goal 15: Life on Land

Encouraging the recycling of biomass waste supports sustainable land management.

NOVELTY

- By incorporating wood ash, which is often considered waste, this concrete not only reduces environmental impact by minimizing landfill use but also enhances specific properties, such as workability and durability. This approach promotes circular economy principles in construction, as it transforms waste into a valuable resource, ultimately contributing to lower carbon emissions and resource conservation in the concrete industry

PRODUCT PICTURE



RECYCLE TYRE POLYMER FIBER AS REPLACEMENT MATERIAL IN PARTITION WALL

Alieya Syuhada Binti Alinafiah, Nur Adila Binti Hisyam, Ayusafiah Binti Adam, Daliela Binti Ishamuddin

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Abstract

This project abstract discusses the use of polymer fibers from recycled tires as a replacement material in partition walls, focusing on the development of more sustainable materials in construction. In the context of rapid development that requires material innovation, this study tests the durability of the partition wall produced with dimensions of 350mm x 350mm x 10mm, assessing key aspects such as moisture absorption, resilience, strength, and sound insulation. Various tests were conducted, including Moisture Absorption Test, Soundproof Test, and Bending Strength Test. The results indicate that Sample 2, consisting of 80% wood and 20% polymer fibers from recycled tires, is the best choice, recording a moisture absorption of 52%, demonstrating good moisture resistance and ensuring the longevity of the wall. In the sound insulation tests, Sample 2 showed effective performance with readings of 66.57 dB and 57.87 dB at distances of 2m and 6m, respectively, making it highly suitable for applications requiring noise reduction. Additionally, a flexural strength of 1.18 MPa confirms that this sample possesses sufficient mechanical strength to withstand applied loads. In conclusion, this project highlights the potential of using polymer fibers from recycled tires as an effective and sustainable material for partition walls, contributing to environmental preservation efforts and tire waste reduction, with results indicating that Sample 2 is the most suitable material for this application.

Keywords : *Recycled Tire, Polymer Fiber, Partition wall, Durability, Sustainable material*



Recycle Tire Polymer Fiber as Replacement in Partition Wall

SUPERVISOR NAME:
PUAN DALIELA BINTI ISHAMUDDIN

STUDENT NAME:
- **ALIEYA SYUHADA BINTI ALINAFIAH**
- **AYUSAFIAH BINTI ADAM**
- **NUR ADILA BINTI HISHAM**

PROJECT DESCRIPTION

- The production of partition walls using recycle tire polymer fiber derived from decomposed material sourced from used tires, this test wall measuring 350mm×350mm×6mm represents a significant stride towards sustainable construction practices. By repurposing decomposed tire material into recycle tire polymer fiber, this innovative approach minimizes waste and supports the circular economy. The percentage rate to replace wood fiber from MDF partition wall is 10%, 20% and 30% of the whole wood fiber. Three samples will be provided sample 1 (70% wood fiber and 30% recycle tire polymer fiber), sample 2 (80% wood fiber and 20% recycle tire polymer fiber) and sample 3 (90% wood fiber and 10% recycle tire polymer fiber). Next this sample will go through strict tests, including water absorption tests, strength tests and soundproofing tests. This research not only promotes environmental sustainability but also provides valuable insights into the performance of partition walls constructed using recycle tire polymer fiber, ensuring their suitability for practical applications in the construction industry.

OBJECTIVE

- To produce a partition wall with recycle tire fiber polymer as substitute material.
- To study the strength, water absorption and soundproofing of the partition wall using recycle tire polymer fiber.
- To compare the recycle tire polymer fiber partition walls with existing MDF partition walls.

COMMERCIAL POTENTIAL

This project offers commercial potential due to its eco-friendliness, durability, and soundproofing. Its sustainable, cost-effective design is ideal for residential, commercial, and public spaces, aligning well with green building standards and appealing to environmentally-focused construction companies.

SUSTAINABLE DEVELOPMENT GOALS

- **SDG 11: Sustainable Cities and Communities** – Using recycled tire materials promotes eco-friendly construction, contributing to more sustainable, resource-efficient urban development.
- **SDG 13: Climate Action** – By reducing waste and utilizing recycled materials, your project helps lower carbon footprint and supports climate action efforts.

IMPACT

- **Environmental Impact**: By repurposing waste tires, it reduces landfill waste and environmental pollution, supporting a circular economy. This contributes to lower carbon emissions, aligning with sustainable construction practices.
- **Economic Impact**: Recycled materials can lower costs for construction, making eco-friendly building options more accessible and attractive in the market, especially for cost-sensitive projects.
- **Industry Impact**: The project encourages innovation in building materials, setting a precedent for sustainable practices and inspiring others in the industry to explore eco-friendly alternatives.

NOVELTY

This project uniquely repurposes recycled tire fibers for partition walls, enhancing sustainability, soundproofing, and durability in a cost-effective way.

PRODUCT PICTURE



UTILIZATION OF RECYCLED TIRE POLYMER FIBRE TO PRODUCE ECOFRIENDLY BRICKS

Amirah Nadiah binti Azmi, Nur Adlina binti Mohamad Noor,
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Abstract

Sand bricks are the basic building material in Malaysia, used for centuries because of its durability and affordability. However, the production of sand bricks can be a stress for natural resources due to the use of sand which is a lot. In addition, the disposal of used tires increases from year to year following the increase in the number of vehicles that contributed to the increase disposal of recycled tire polymer fibres that can negatively impact the environment. Therefore, this project explores the possibility of combining recycled tyre polymer fibres as an additive material the production of sand bricks to improve environmental sustainability. This study investigates fibre consumption recycled tire polymer at three different content levels (0%, 5%, and 10%) in the production of sand bricks for non-load bearing walls. Sand brick designed to be standardized at 215mm x 100mm x 65mm. Curing done on days 7 and 28. This project aims to achieve three main objectives. First, develop a method to produce sand bricks that combine recycled tire polymer fibres. Second, to evaluate the performance of fibre sand bricks in terms of compressive strength and water absorption. Third, the brick designed bricks will be compared with existing sand bricks to assess the viability of this method for sustainable construction in Malaysia. Testing results indicate that water absorption increases as the fibre content rises, showing the highest absorption rate at 10%. For compressive strength, the bricks reach their highest strength at 5% fibre content, while strength decreases at 10%. However, there are still some improvements that can be made in this project and hopefully will help in future studies.

Keywords : *Sand brick, Recycled Tyre Polymer Fibres, Compressive Strength Test, Water Absorption Test*

FINAL PROJECT

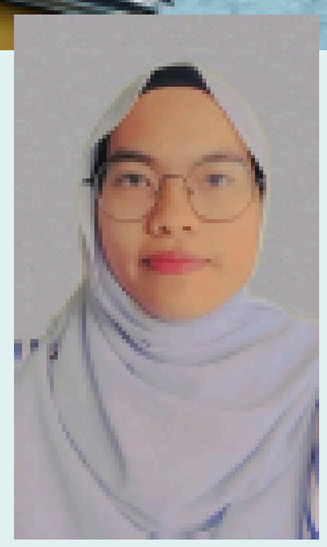
Competition and Exhibition

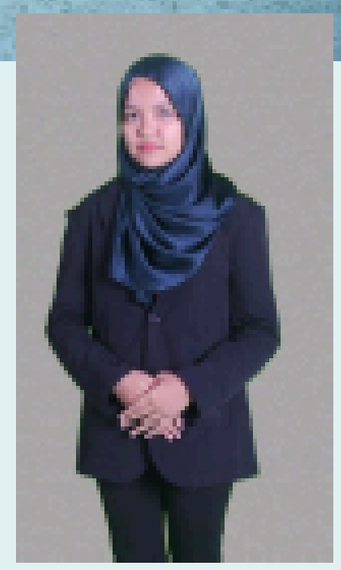
SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

Utilisation of Recycled Tyre Polymer Fibres to Produce Environment-Friendly Bricks

Puan Daliela binti Ishamuddin
Amirah Nadiah binti Azmi
Nur Adlina binti Mohamad Noor





PROJECT DESCRIPTION

- This project explores the possibility of incorporating recycled tyre polymer fibres as an additive in the production of sand bricks to improve environmental sustainability. This study investigated the use of recycled tyre polymer fibres at three different content levels (0%, 5%, and 10%) in the production of sand bricks for non-load bearing walls. The designed sand bricks will be standardised at 215mm x 100mm x 65mm. Curing is done on days 7 and 28. This project aims to achieve three main objectives. First, develop a method to produce sand bricks incorporating recycled tyre polymer fibres. Second, to evaluate the performance of this polymer fibre sand brick in terms of compressive strength and water absorption. Third, the designed bricks will be compared with existing sand bricks to assess the viability of this method for sustainable construction in Malaysia. After the water absorption test, it was found that the higher the value of recycled tire polymer fibres added, the higher the water absorption rate. While for the compression strength test, the conclusion that can be given is that the compression value becomes high at 5% and low at 10%.

OBJECTIVE

- To produce sand bricks that have polymer fibres as additives.
- To study polymer fibre sand brick in terms of strength and water absorption.
- To compare brick from polymer fibre with existing sand brick.

COMMERCIAL POTENTIAL

- Increasing consumer awareness and demand for eco-friendly building materials.
- Reduced material costs due to the utilization of a low-cost, recycled resource

SUSTAINABLE DEVELOPMENT GOALS

- SDG 9: Industry, Innovation and Infrastructure
- SDG 11: Sustainable Cities and Communities
- SDG 12: Responsible Consumption and Production

IMPACT

- Reduces the volume of waste tyres in landfills.
- Conserves natural resources by utilizing recycled materials.
- Decreases greenhouse gas emissions associated with tyre disposal and production of traditional building materials.

PRODUCT PICTURE



SURVEYPALS

Nur Aisyah binti Mohamad Nizam, Nur Avilla binti Ramadzan,
Jazlina Binti Muhammad

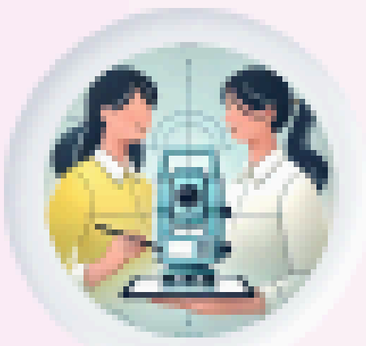
(08dka22f1026@student.psa.edu.my, 08dka22f1024@student.psa.edu.my,
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Abstract

SURVEYPALS is an Augmented Reality (AR) application designed use in Engineering Survey education, aimed at guiding students in learning Total Station component and practical work of traverse . By integrating AR into the conventional teaching method, SURVEYPALS provides an interactive alternative to conventional learning, enabling students to gain new experiences and better visual of complex survey concepts. Developed for Civil Engineering Diploma students at PSA, the application targets three primary objectives: increasing understanding of the traverse procedure, improving practical skills wit total station, and boosting student engagement. The study involved 34 respondents, with 19 current second-semester students and 15 from a previous semester who had experience with survey engineering concepts. Descriptive analysis revealed that over 80% of students provided feedback at good or excellent levels across all objectives, validating the application's potential to enhance learning outcomes. However, areas for improvement were identified, including the need for more detailed data on distance and bearing in traverse work. This study highlights the role of AR as a valuable educational tool, with recommendations for future enhancements to elevate SURVEYPALS' effectiveness in preparing students for professional environments.

Keywords : *Augmented Reality, engineering survey, total station, educational technology, student engagement*



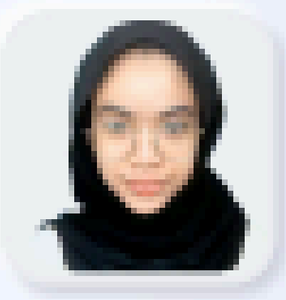


SURVEYPALS

Blender 3D | Unity Hub | Vuforia

Nur Aisyah binti Mohamad Nizam
Nur Avilla binti Ramadzan
Supervisor: Jazlina binti Muhammad






Project Description

SURVEPALS is a cutting-edge educational Augmented Reality (AR) application designed to revolutionize the way civil engineering students learn surveying engineering field work and tool which is Traverse and Total Station.



Commercial Potential

1. Enhances Survey Engineering education with 3D visualization and Augmented Reality (AR).
2. Improves teaching methods for traverse work field and total station.
3. Partners with polytechnics to boost student performance.

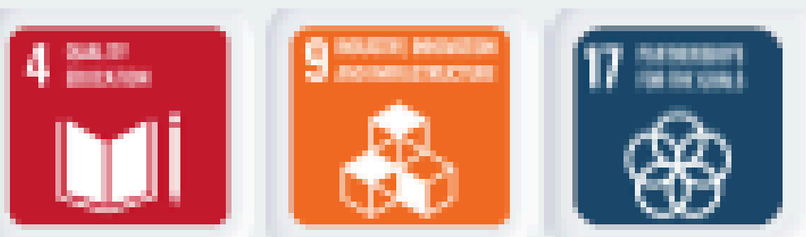
Objective

01 To develop AR technology application in survey engineering lab

02 To test the SURVEYPALS in accessibility & information clarity

03 To compare the conventional delivering method and SURVEYPALS in time consuming and it's effectiveness.

Sustainable Development Goals



Impact

1. Discover 3D total station and traverse work field scenes that connect theory to real-life practice.
2. Quickly access information by scanning the booklet, replacing heavy notes.
3. Stay aligned with the syllabus for effective hands-on training.
4. Improve skills and achieve better grades in traverse work field .

Novelty

SURVEYPALS is an innovative IoT-based Augmented Reality application for Survey Engineering students. It improves traverse work field and knowledge of total station compartments through 3D experiences, making learning more effective.

Product Picture



SURVEY RAINCOVER (SURAICO)

Megat Nabil Danish Bin Megat Abd Halim, Mohammad Dhanish Dhanieall Bin Hairul Anwar, Jazlina Binti Muhammad

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Abstract

Engineering student that have to take surveys course encounter difficulties when completing survey practicals in conditions of mild rain or mist. A cover has been made to shield the Total Station tool from rainfall exposure in order to address these problems. The purpose of this study is to identify and investigate the kinds of materials that are appropriate for use in the creation of the cover. Due to its water sensitivity, the total station was unable to function until the rain stopped. The primary cover material is made of nylon waterproof fabrics. Additional materials including transparent plastic, velcro, garment rubber, velvet fabric, and nylon zipper are also utilized. Following the cover's successful manufacture, the product underwent two tests, a tensile strength test and a humidity test. The first, second, and third goals were accomplished, according to the data analysis results. Twenty respondents agreed with the creation of Survey Raincover (SuRaiCo), according to the questionnaire results. Finally, we can say that our invention, the Survey Raincover (SuRaiCo), has met its goals and can help engineering survey students and anybody else undertaking survey practicals. Survey Raincover (SuRaiCo) is a practical and efficient cover that offers surveying students who encounter erratic weather another option. Because of the cover, it is also possible to do actual survey work in light rain.

Keywords : *Waterproof cover, total station, SuRaiCo, survey practicals, rain protection*



SURVEY RAINCOVER (SuRaiCo)

PUAN JAZLINA BINTI MUHAMMAD
MEGAT NABIL DANISH BIN MEGAT ABD HALIM
MOHAMMAD DHANISH DHANIEALL BIN HAIRUL ANWAR

PROJECT DESCRIPTION

- The Surveys Raincover offers a solution, allowing you to keep working in drizzling rain or shine. This innovative, cover provides complete protection from downpours, ensuring your equipment remains dry and working throughout the workday. The Surveys Raincover eliminates the need for equipment disassembly and reassembly, allowing you to focus on capturing accurate survey data. This will lead to faster project completion times.

OBJECTIVE

- To produce the Survey Raincover
- To run a strength and waterproof test to determine the product's durability and workability
- To compare research product with previous product "TOCO" in its lackness in terms of waterproofness.

IMPACT

- Operational Efficiency: By providing protection for surveying equipment, SuRaiCo likely minimizes weather-related disruptions. This helps surveyors keep working in light rain conditions, reducing downtime and maintaining data collection accuracy without frequent interruptions.

NOVELTY

- **Purpose-Built Design:** Unlike generic rain covers, SuRaiCo is specifically designed for surveying equipment. It offers precise fit and optimal protection for various instruments.

COMMERCIAL POTENTIAL

- Construction and Civil Engineering Firms: Surveyors working on construction sites often need to protect their equipment from environmental exposure. SuRaiCo could ensure reliable performance and data integrity, reducing costly downtime or damage to equipment.

SUSTAINABLE DEVELOPMENT GOALS

- **Sustainable Production:** SuRaiCo can promote sustainable production practices by using eco-friendly materials and minimizing waste during manufacturing.
- **Durable Products:** By designing durable raincovers, SuRaiCo reduces the need for frequent replacements, minimizing waste and resource consumption.

PRODUCT PICTURE



CIGARETTE BUTT BRICKS ENHANCEMENT

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Maswira Binti Mahasan

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Abstract

This project explores the enhancement of cigarette butt bricks as a sustainable building material, addressing the environmental impact of cigarette butt waste, which releases toxins and heavy metals into ecosystems. Literature review findings indicate the potential of cigarette butts (CBs) in construction, but current formulations often lack optimal strength and water resistance. This study aims to develop an improved CB brick by incorporating 2.5% cigarette butts with varying proportions of hydrated lime (0%, 5%, 7.5%, 10%) and quarry dust (0%, 2%, 5%, 3.5%) to enhance structural properties. A combination of experimental and analytical methods assessed compressive strength and water absorption, comparing the enhanced CB bricks to standard versions. Results show that a composition of 2.5% CB, 7.5% hydrated lime, and 3.5% quarry dust yielded a high compressive strength, which is 96.4 Mn/mm2. It also shows the lower water absorption which is 6.3%. These findings demonstrate that incorporating hydrated lime and quarry dust improves durability and environmental viability, supporting the use of CB bricks in construction. This study highlights the feasibility of CB bricks as an innovative and sustainable building material.

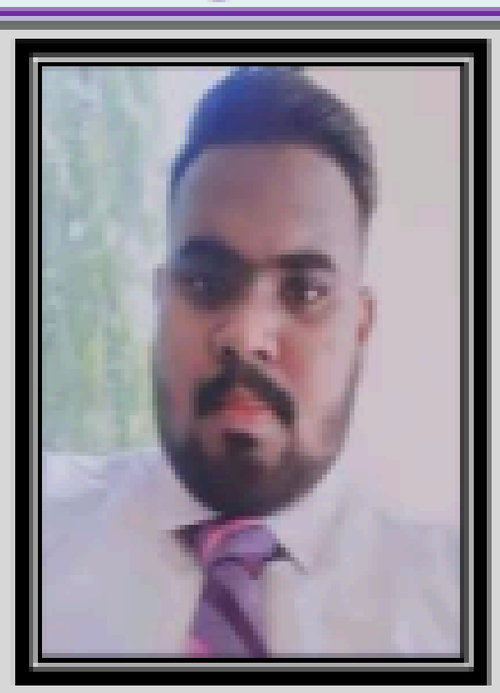
Keywords : *Sustainable building material, cigarette butt waste, compressive strength,w ater absorption, environmental impact*



CIGARETTE BUTT BRICKS ENHANCEMENT



YUVANESH A/L KATHIRAVAN
08DKA22F1040
(TEAM LEADER)



PRAVEEN RAO A/L MARAYA
08DKA22F1046

(SUPERVISOR: PUAN MASWIRA BINTI MAHASAN)

PROJECT DESCRIPTION

- This project aims to further refine the production process of cigarette butt cement bricks, a sustainable building material made from recycled cigarette waste. By optimizing the composition, curing process, and aesthetic properties of these bricks, we seek to enhance their performance and expand their potential applications in construction and design

OBJECTIVE

- **To develop a sustainably enhanced cigarette butt brick with optimized strength and water resistance for reliable construction in diverse environmental conditions.**
- **To test compressive strengths and water absorption tests with the enhanced cigarette butt bricks.**
- **To test compressive strengths and water absorption tests with the enhanced cigarette butt bricks**

IMPACT

- **Improved Air Quality:** Potentially reduces air pollution associated with traditional brick manufacturing processes
- **Public Awareness:** Raises awareness about environmental issues, waste reduction, and sustainable practices

NOVELTY

- **Waste Utilization:** The project leverages a commonly discarded waste product, cigarette butts, and transforms it into a functional building material.
- **Sustainable Building:** It aligns with the growing global trend of sustainable and eco-friendly construction practices

COMMERCIAL POTENTIAL

- **Waste Reduction:** Repurposing a significant waste product, reducing landfill waste and pollution.
- **Cost-Effective:** Utilizes a readily available waste product, reducing production costs.

SUSTAINABLE DEVELOPMENT GOALS

- Responsible Consumption and Production
- Sustainable Cities and Communities
- Industry, Innovation and Infrastructure

PRODUCT PICTURE



COOL WALL PANEL

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Atikah Fatma Binti Md Daud

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Abstract

This report summarizes a Final Year Project (FYP) study aimed at enhancing the thermal efficiency of wall panels by adding wood powder to the concrete mix. The primary goal of this study is to reduce indoor temperature fluctuations and lower electricity costs associated with cooling systems. Wood powder is added in specific ratios to produce wall panels that are tested for structural strength (compression tests) and thermal performance (heat tests).The findings show that wall panels modified with wood powder exhibit better thermal resistance, reducing heat transfer and minimizing the need for energy-intensive cooling. This suggests that adding wood powder to concrete is a promising approach to improving energy efficiency in construction and reducing environmental impact. The percentages of wood powder added to the mix are 5%, 10%, and 15%. The dimensions of the wall panels used are 300mm x 150mm x 37.5mm

Keywords : *Wall panel, Wood powder, Heat test, Compression strength test.*

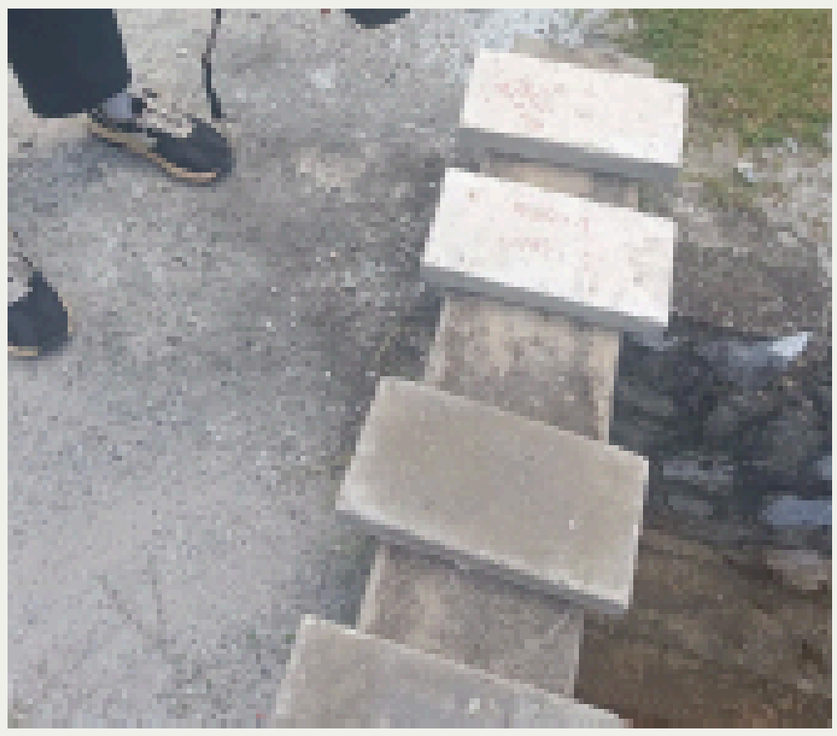


COOL WALL PANEL

Product Description

Introducing the Cool Wall Panel: a blend of concrete and wood dust that enhances aesthetics and sustainability. By adding wood dust into the concrete mixture, these panels reduce heat, offering a stylish and eco-friendly upgrade for your living space.

Product Picture



Objective

- To produce a product that reducing the indoor temperature fluctuations within residential.
- To measure strength and thermal characteristic through compression and heat tests.
- To conduct a comparative analysis between contentional wall panel and cool wall panel to assess their thermal performance and strength.

Commercial Potential

- Eco-Friendly: Made with concrete and wood dust for a greener choice.
- Stay Cool: Reduces heat, perfect for warm climates.
- Versatile Use: Ideal for homes, offices, and remodels.
- Global Appeal: Designed for comfort and sustainability worldwide.

Impact

- Saves Energy: Keeps spaces cooler, reducing air conditioning use.
- Cuts Emissions: Lowers energy needs, reducing carbon footprint.
- Sustainable Materials: Reuses wood dust, minimizing waste.
- Improves Comfort: Creates cooler, more livable indoor spaces.
- Supports Green Building: Aligns with eco-friendly building standards.

Sustainability Development Goals

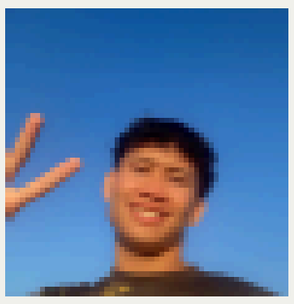
- Affordable & Clean Energy (SDG 7): Reduces indoor heat, lowering energy needed for cooling.
- Sustainable Cities & Communities (SDG 11): Provides eco-friendly materials for better urban living.
- Responsible Consumption & Production (SDG 12): Uses wood dust in concrete, minimizing waste.
- Climate Action (SDG 13): Helps reduce energy demand and greenhouse emissions.

Novelty

- Innovative Material: Combines concrete with wood dust for eco-friendly insulation.
- Natural Cooling: Designed to reduce indoor heat naturally, cutting down on cooling costs.
- Sustainable Solution: Repurposes wood waste, reducing environmental impact.
- Aesthetic Appeal: Offers a stylish look along with functional benefits.

Our Team

Supervisors name : MRS MASRULANITA AND MRS ATIKAH FATMA



MUADZAH SHAH BIN SHAHRUDDIN
DEC22DP1067



MUHAMMAD SYAHDI BIN HAIDIR
DEC22DP1093

EMPOWERING CONCRETE WITH SISAL FIBER

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Abstract

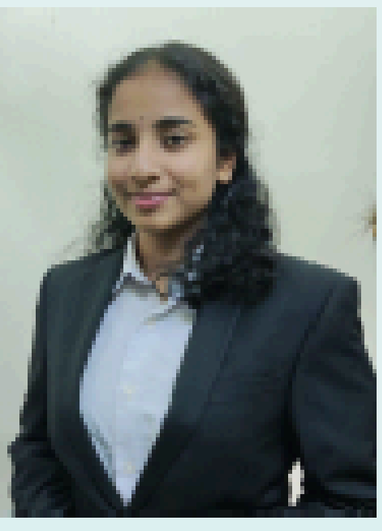
This final year project investigates the production of concrete enhanced with sisal fiber to improve both mechanical properties and environmental sustainability. Sisal fibers, each 30mm in length, were incorporated into Grade M15 concrete mixes at three different percentages: 1%, 1.5%, and 2%. The study examines how these varying fiber ratios influence the concrete's workability, compressive strength, and water absorption properties. Concrete was prepared using a 1:2:4 mix ratio of cement, sand, and aggregate, with testing conducted at Quality Control Material Laboratory Sdn Bhd. Cube molds of 150mm x 150mm x 150mm were used to measure compressive strength, while slump and water absorption tests were performed to assess workability and moisture resistance. The 1% fiber ratio proved optimal, delivering the highest compressive strength alongside acceptable workability and durability. These findings emphasize the potential of sisal fiber to enhance the durability and performance of concrete, offering a sustainable material choice for construction that reduces environmental impact while preserving structural integrity.

Keywords : *concrete with sisal fiber, slump test, compressive strength test, water absorption test*

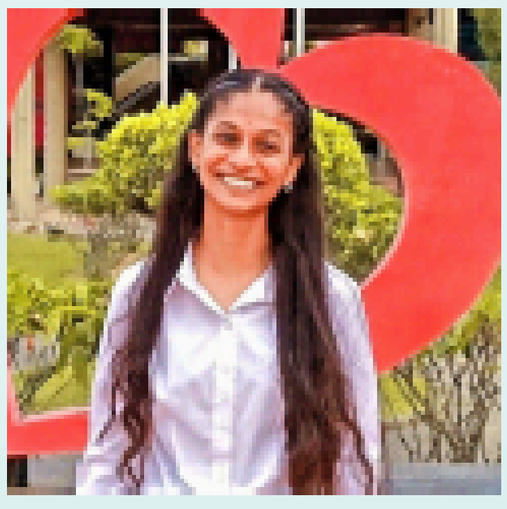


EMPOWERING CONCRETE WITH SISAL FIBER

PN. MAI AZUNA BINTI MEOR YUSUF



KALESHESWARY A/P SRINIVASAN
08DKAZZF1022
DIPLOMA IN CIVIL ENGINEERING
(PROJECT LEADER)



KAUSHALYA A/P MURUGAN
08DKAZZF1099
DIPLOMA IN CIVIL ENGINEERING

PROJECT DESCRIPTION

- Our project, titled "Empowering Concrete with Sisal Fiber," focuses on enhancing concrete's mechanical properties and sustainability by incorporating sisal fibers. The aim is to investigate how different percentages of sisal fiber (1%, 1.5%, and 2%) affect the strength, workability, and durability of concrete. Through a series of experiments, including the slump test, compressive strength test, and water absorption test, the project evaluates the potential benefits of using sisal fibers to improve concrete's performance while promoting eco-friendly construction practices. This research could offer a sustainable alternative to traditional concrete reinforcement methods.

OBJECTIVE

- To produce concrete with sisal fiber.
- To test the concrete samples incorporating sisal fiber of length (30mm) at varying fiber ratios (1%,1.5%, and 2%).
- To define the workability and potential strength of the mix by conducting slump test, compressive test and water absorption test.

IMPACT

- Sisal fiber-reinforced concrete has the potential to improve the tensile strength and crack resistance of concrete. This added durability can extend the lifespan of structures, reducing the frequency of repairs and replacements. For large infrastructure projects, this means fewer resources are used over time, lowering both material consumption and maintenance costs, which can be substantial in large-scale and public infrastructure projects.

NOVELTY

- In research and innovation, we investigate how Sisal fiber affects the compressive strength and durability of concrete adds to the body of knowledge on natural fiber composites. This research could lead to new insights into how organic materials can improve conventional construction materials.

COMMERCIAL POTENTIAL

- Eco-Friendly construction materials market because Sisal fiber is a renewable resource, which could attract companies looking to lower their carbon footprint.
- It could be marketed as an accessible and locally-sourced alternative for improving concrete durability in roads, bridges, and residential structures.

SUSTAINABLE DEVELOPMENT GOALS

Goal 9: Industry, Innovation, and Infrastructure

Goal 11: Sustainable Cities and Communities

Goal 12: Responsible Consumption and Production

PRODUCT PICTURE



FLOOD SENSOR

Muhammad Irfan Bin Yahya, Muhammad Idlan Waffi Bin Azhar,
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Abstract

The project introduces the design, development and evaluation of prototype flood sensors aimed at improving early warning systems for flood detection. Flooding is a natural disaster that poses a significant risk to lives and property, stressing the need for effective monitoring and timely warnings. The proposed flood sensors use a combination of moisture sensors, microcontrollers, and wireless communication technology to detect rising water levels in real time. The prototype is designed to be cost-effective, extensible, and easy to use in flood-prone areas. The system uses hierarchical architecture, which consists of sensor nodes used in strategic locations, central processing units for data aggregation and analysis, and user interfaces for output and distribution of warnings. Assessment tests carried out in simulated flood scenarios showed the effectiveness and reliability of prototypes in detecting and reporting flood events accurately. The findings of this study contributed to the advancement of early warning systems for natural disasters, in reducing the impact of floods on vulnerable communities.

Keywords : *flood sensors, early warning systems, prototype construction, wireless communication, disaster management*

Flood sensor

SUPERVISOR'S NAME : PUAN MAI AZUNA BINTI MEOR YUSUF
MUHAMMAD IRFAN BIN YAHYA
MUHAMMAD IDLAN WAFFI BIN AZHAR

Objectives

- Develop and test a flood detection system using capacitive sensor technology to monitor water levels.
- Integrate capacitive sensors with Internet of Things (IoT) technology to create a real-time flood monitoring system that can be accessed by authorities and affected communities

Impact

- Timely Flood Alerts:The system delivers prompt warnings via Telegram, helping to protect lives and property by allowing early preventive actions.
- Remote Monitoring:Users can monitor water levels and receive updates from any location, enhancing safety and response capabilities.

Commercial Potential

- Wide Market Appeal: Ideal for municipalities, disaster management agencies, and property owners in flood-prone areas, providing timely alerts and enhancing flood preparedness.
- User-Friendly Integration: Integration with Telegram ensures ease of use and accessibility, making it attractive for a broad customer base.

Description

This project aims to create a simple and effective Flood Level Detector prototype using inexpensive and easily accessible materials. Flood levels are a crucial issue in ensuring the safety of communities and property. By utilizing economical detection technology and electronic devices, this prototype will be able to automatically detect water levels and alert users without requiring significant expenses.

The objective of the project is to create a prototype that is simple, cost-efficient, and easy to install. We will use inexpensive yet quality materials to produce a well-functioning prototype. The alert system developed will also be designed to work with simple and low-cost devices.

This project is only a prototype and does not have a large scale. It aims to prove the concept and effectiveness of a flood level detector with minimal costs, as well as provide a foundation for further development if needed. With this prototype, we hope to offer a practical and economical solution to enhance awareness and preparedness for flood hazards in the community

Novelty

This flood sensor system is unique in its use of affordable components and recycled materials, making it both cost-effective and environmentally friendly.

Sustainable Development Goals

This flood sensor system supports Sustainable Development Goals by enhancing disaster resilience for small communities and promoting sustainable and resilient infrastructure, using cheaper components and recycled items, which reduces environmental impact .

Product picture



References

LOT SIMPANAN BATA MESRA PENGGUNA (LOSMEP)

Elisa Humairah Binti Zulfa Asri, Nur Asyiqah Binti Mohd Razman,
Muhapis Bin A Hakim

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Abstract

The efficient and safe utilization of bricks within educational environments necessitates innovative solutions that prioritize both cost efficiency and student safety while embracing sustainable practices. This presents a concept for a brick separator system designed to address these critical requirements by integrating green principles and utilising coconut shell as aggregates in concrete. The proposed brick separator system aims to optimize operational efficiency, minimise waste, and enhance student safety through the implementation of structured storage systems, standardized handling procedures, and streamlined retrieval processes. By leveraging coconut shell aggregates in the construction of the separator system, the project not only reduces environmental impact by repurposing agricultural waste but also offers potential cost savings and improved durability compared to traditional materials. This holistic approach embodies a commitment to sustainability, safety, and efficiency within educational environments, reflecting a forward-thinking mindset towards responsible construction practices. Through collaborative efforts and innovative design solutions, the brick separator system presents a promising opportunity to transform brick management processes, fostering a safer, greener, and more efficient learning environment for students while advancing sustainable development goals within educational institutions.

Keywords : *Brick separator, Student safety, Minimizes waste, Green system*



LOT SIMPANAN BATA MESRA PENGGUNA (LOSMEP)

SUPERVISOR: ENCIK MUHAPIS BIN A HAKIM
STUDENT:
ELISA HUMAIRAH BINTI ZULFA ASRI
NUR ASYIQAH BINTI MOHD RAZMAN

PROJECT DESCRIPTION

- Previous brick storage management in educational settings often poses significant safety risks to students and consumes valuable time for educators and facility managers. The previous sorting and arranging of bricks for various purposes, such as construction projects or educational activities, can lead to accidents and injuries among students, as well as inefficiencies in resource utilization. This project will be conducted with a green system in form of a cube concrete that sizes 210x100x65mm based on research about coconut shell as aggregates in concrete. Designing a project for green system brick cubes utilizing coconut shell aggregates in concrete involves several essential steps to ensure its efficacy and sustainability. Implementing a separator system for one bays within the Brick Workshop Lab at Polytechnic Sultan Salahuddin Abdul Aziz Shah.

OBJECTIVE

- Execute Lot Simpanan Bata Mesra Pengguna (LOSMEP).
- Testing the effectiveness of LOSMEP in brick practice with distributing questionnaires to students and lecturers during the implementation of the workshop.

IMPACT

- Safety: Reduces accident risks at Bricks Lab
- Higher Productivity: Ensures students can saving time on doing lab work efficiently.
- Integrity: Reduces bricks damaged at Brick Lab

COMMERCIAL POTENTIAL

- Construction Companies: Builders need to follow sustainability practices, making the Brick Separator appealing for its waste reduction and efficiency features.
- Green Building Market: The product fits well with the growing demand for eco-friendly construction materials, attracting environmentally conscious clients.

SUSTAINABLE DEVELOPMENT GOALS

- Quality Education : Emphasizes the importance of safe learning environments, contributing to a better educational experience for students.
- Responsible Consumption and Production : Focuses on reducing waste and promoting sustainable practices in production processes, directly aligning with your waste reduction goals.
- Climate Action : Encourages efforts to combat climate change by adopting sustainable practices and reducing the environmental footprint of construction activities.

NOVELTY

Brick Separator project lies in its integrated approach that uniquely combines student safety, sustainable design, and waste reduction within educational construction environments. Unlike traditional methods, this project focuses on creating a dedicated system for the secure separation of bricks, directly addressing safety concerns for students involved in construction activities. Additionally, the project's commitment to using environmentally friendly materials and processes sets it apart by promoting sustainability in educational settings. The emphasis on reducing waste through optimized design and efficient brick separation procedures not only enhances operational effectiveness but also contributes to broader ecological goals.

PRODUCT PICTURE



SMART CONE

Putra Amir Qayyum Bin Zulakpli, Syaqir Haiqal Bin Sazalee,
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Abstract

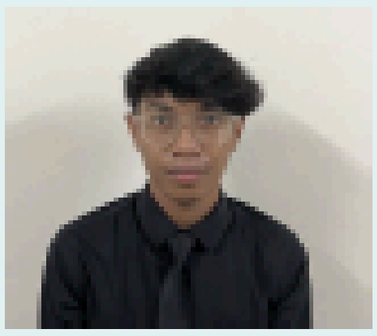
Safety cones are commonly used in various situations to mark hazardous areas, especially in construction projects, authority operations, and traffic management. However, existing safety cones have limitations in terms of safety features and effectiveness in ensuring better control and monitoring of these areas. Therefore, innovation on safety cones is necessary to enhance their functionality and usability in emergency situations.This project aims to introduce an innovation to existing safety cones by adding a feature equipped with a retractable safety belt that can be pulled and locked between one cone and another. This innovation not only increases safety levels but also facilitates the management of spaces requiring more robust and flexible barriers. These smart cones can also be utilized by authorities such as the police and municipal councils for event management or emergency areas, in addition to their use at construction sites. The use of these smart cones is expected to have a greater impact in terms of safety, efficiency, and convenience across various sectors.

Keywords : *Safety Cone, Retractable Belt, Inovation, Efficiency*



SMART CONE

SUPERVISOR: ENCIK MUHAPIS BIN A HAKIM
STUDENT:
SYAQIR HAIQAL BIN SAZALEE
PUTRA AMIR QAYYUM BIN ZULKAPLI





PROJECT DESCRIPTION

- Safety cones are widely used to mark hazardous areas in construction, traffic management, and other operations. However, traditional cones have limitations in safety features and effectiveness. This project proposes an innovative solution: safety cones equipped with a retractable safety belt that can be easily pulled and locked between cones. This design enhances safety and allows for better management of spaces that need flexible barriers. These smart cones can be utilized by police, municipal councils, and construction sites, improving safety, efficiency, and convenience across various sectors.

OBJECTIVE

- To create an innovative cone that has a retractable safety belt.
- To test the time taken to handle the innovative cone.

IMPACT

- Increased Safety: Reduces accident risks at construction sites and roads.
- Higher Productivity: Ensures workers can focus on tasks safely and efficiently.
- Infrastructure Innovation: Introduces a better safety tool for traffic and construction management.

COMMERCIAL POTENTIAL

- This product has strong market potential, particularly in road safety and construction industries, as it provides a faster and more efficient solution for traffic management and safety needs.

SUSTAINABLE DEVELOPMENT GOALS

- Good Health and Well-being :This safety cone helps reduce the risk of accidents at construction sites and on the roads, enhancing safety for workers and road users, thus supporting health and well-being.
- Decent Work and Economic Growth :By Improving safety, this product contributes to a better working environment for construction and traffic management workers, allowing them to perform their tasks more productively and efficiently.
- Industry, Innovation, and Infrastructure:This project represents an innovation in road safety and infrastructure, demonstrating efforts to create improved products for infrastructure and safety needs.

NOVELTY

This project introduces a safety cone with a built-in retractable belt, combining the functions of a cone and a barrier. It provides a quick, efficient way to set up boundaries without needing extra equipment, making it ideal for construction sites and roadwork. This design not only saves time but also improves safety for both workers and the public

PRODUCT PICTURE



EFFECTIVENESS OF A CACTUS TREE AND BANANA PEEL AS A COAGULANT AGENT FOR WATER TREATMENT

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Abstract

This study evaluates the effectiveness of cactus trees and banana peels as coagulant agents in the water treatment process. The use of these two materials was evaluated to determine their ability to filter dissolved particles in water and improve water quality. The importance of water treatment includes providing a safe supply of clean water for daily use, preventing the spread of disease, protecting the environment from pollution, and supporting sustainable development. Banana peels and cactus trees are important because they both have natural coagulant properties that can help in water purification, contribute to environmental protection and water resource sustainability, and provide a cheaper and environmentally friendly alternative to chemical agents in the water treatment process. Experimental methods were used to test the coagulant potential of both materials in decreasing the turbidity using JAR test from lake water samples at Polytechnic Sultan Salahuddin Abdul Aziz Shah. Analysis is done by comparing turbidity water samples before and after the coagulant were added into the sample. The different percentage of banana peel and cactus coagulants were done to get the optimal dosage of the mix for maximum coagulation efficiency in decreasing of water turbidity. The results show that both cactus and banana peels have significant potential as coagulant agents, with cactus providing 65.2% turbidity reduction and banana peel 44.5%. For the mix banana peel and cactus coagulant, 42.2% reduction in turbidity were recorded.This study shows new potential in using natural resources for effective water treatment and potential for practical applications in water purification systems.

Keywords : *natural coagulant, water treatment, cactus coagulant, banana peel coagulant*

FINAL PROJECT
Competition and Exhibition
SESSION I:2024/2025
CIVIL ENGINEERING DEPARTMENT

EFFECTIVENESS OF A CACTUS TREE AND BANANA PEELS AS A COAGULANT IN WATER TREATMENT



SUPERVISOR'S NAME: PUAN MAISHARAH BINTI OSMAN
NOR AFIFAH BINTI NADZRI
WAN AMIRA RAHINI BINTI WAN RAZI



PROJECT DESCRIPTION

This research investigates the effectiveness of cactus tree and banana peel extracts as natural coagulants for water treatment. The study aims to evaluate the impact of different extract volumes on water turbidity and pH levels, determine the optimal dosage, and compare the performance of natural coagulants with traditional chemical coagulants. By exploring the potential of these natural, eco-friendly coagulants, this research seeks to contribute to the development of sustainable and environmentally friendly water treatment technologies.

OBJECTIVES

1. To replace aluminium sulphate in water treatment from a mixture of cactus tree and banana peels .
2. Test the pH of the water sample.

IMPACT

This research can significantly impact water treatment by providing a sustainable and cost-effective solution using natural coagulants derived from agricultural waste.

COMMERCIAL POTENTIAL

Cactus and banana peel coagulants offer a sustainable and cost-effective solution for water treatment. These natural coagulants can be applied in various sectors, including water treatment plants, industries, and agriculture.

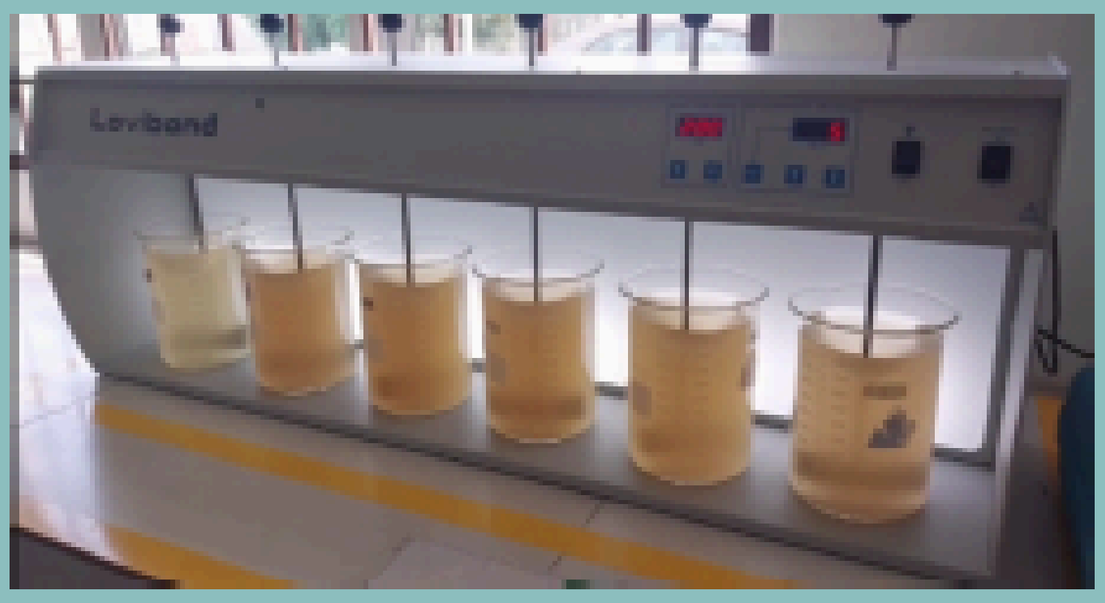
SUSTAINABLE DEVELOPMENT GOALS

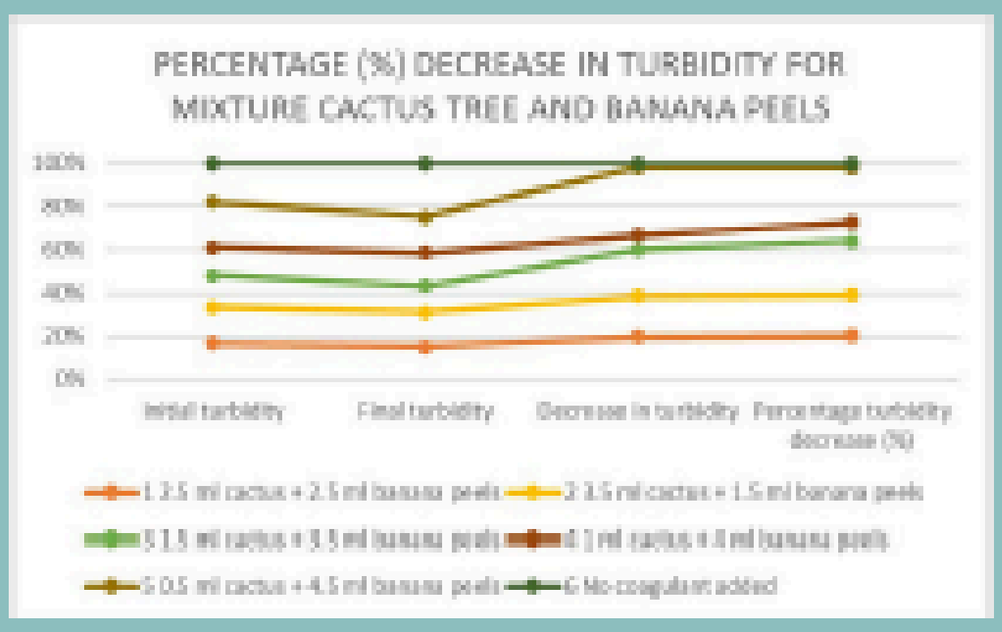
This research contributes to several Sustainable Development Goals, including clean water and sanitation, by developing sustainable and cost-effective water treatment solutions using natural coagulants.

NOVELTY

This research offers a novel approach to water treatment by utilizing sustainable and cost-effective natural coagulants derived from agricultural waste.

PRODUCT PICTURE





WOOD-CONCRETE (INTERLOCKING BLOCK)

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Abstract

Interlocking block making is a technology that has been introduced and used for a long time, according to the passage of time, bricks can not only be used as walls and fortifications, or for making house walls. These block can also be used as pedestrians, by making interlocking blocks, the bricks can be arranged and make the road look beautiful and attractive in the eyes of the users.This report presents the development and analysis of wood concrete interlocking blocks that incorporate sawdust as a partial replacement for sand. The primary objectives of this project were to create interlocking blocks using sawdust, compare the compressive strength of these blocks with conventional concrete blocks, and analyze the weight differences between both block types. A series of experiments were conducted, varying the ratios of sawdust to sand, followed by comprehensive strength testing at 7, 14, and 28 days of curing. The results demonstrated that the incorporation of sawdust not only reduced the weight of the interlocking blocks but also maintained compressive strength within acceptable limits for construction applications. The findings highlight the potential for sustainable construction practices by utilizing wood waste materials, contributing to resource conservation and waste reduction However, there are still several factors that can be improved in measuring the project's data outcomes, and it is hoped that this will help in the project's enhancement.

Keywords : *Interlocking Block, Compressive Strength, pedestrians*



WOOD CONCRETE INTERLOCKING BLOCK

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MUHAMMAD HIJJAZ AIMAN BIN AHMAD HIJAZI
(08DKA22F1050)
AHMAD MURSYID BI N ZAIMUDDIN (08DKA22F1081)

Project Description

The project explores the use of sawdust in concrete for interlocking blocks, aiming to assess its mechanical properties, durability, and environmental impact. The goal is to advance eco-friendly construction practices, reduce waste, and conserve resources.

Product Picture



Objectives

- To make interocking block that using sawdust as a partial replacement for sand.
- To make a comparison in strength between a conventional block and interlocking block that have sawdust in it.
- To compare the weight of conventional block and our block.

Impact

- Reduce wood-waste by product
- Reduce the cost for manufacturing interlocking block.
- Improve construction efficiency.

Commercial Potentials

- Cost-Effective: Interlocking blocks made with wood and concrete could reduce construction time and labor costs, making them attractive to the construction industry
- Wood-concrete blocks offer improved workability due to their lighter weight, making them easier to handle and transport, making them popular in areas with limited infrastructure.

Sustainable Developement Goal

- Industry,Innovation & Infrastructure: The project promotes sustainable industrialization by introducing an innovative building material that combines wood and concrete, enhancing construction efficiency and reducing resource waste.
- Sustainable Cities and Communities: Eco-friendly interlocking blocks promote energy-efficient buildings, waste reduction, affordable housing development, and sustainable urban growth through their modularity and ease of construction.

Novelty

- Combination of Wood and Concrete : Concrete and wood are combined in a unique interlocking block form, creating a strong, eco-friendly composite that combines compressive strength and thermal benefits.
- Interlocking Design For Modular Construction : Interlocking design enhances construction efficiency, reduces mortar and adhesives, and offers easy assembly and disassembly,

ONLINE BOOKING SYSTEM FOR THE LABORATORIES AND LECTURE ROOMS

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Abstract

The manual booking system for laboratories and lecture rooms presents a range of challenges, including inefficiency, data loss, and the difficulty of managing resources across different locations. This study aims to develop a user-friendly online booking system to replace the manual process and assess its usability and efficiency. Using a structured methodology, the project involved requirement analysis, environment setup, and interface design, with HTML templates and standardized booking pages. A MySQL database via XAMPP stores user data, room availability and booking records, seamlessly integrated with PHP for interactivity, while CSS provides a consistent and accessible interface. Testing was conducted with 283 participants, yielding a 100% response rate. The average satisfaction score is 3.44, indicating positive user feedback. The system meets user needs in terms of easy navigation and responsiveness. The system's originality lies in its customization for departmental needs, incorporating real-time room availability, capacity management, and equipment allocation. Future enhancements include mobile accessibility, multi-department support, AI-driven booking recommendations, and an administrative panel, creating a more efficient, accessible, and reliable resource management tool.

Keywords : *Online Booking System, Laboratories, Lecture Rooms, Reservation, Availability , Database*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

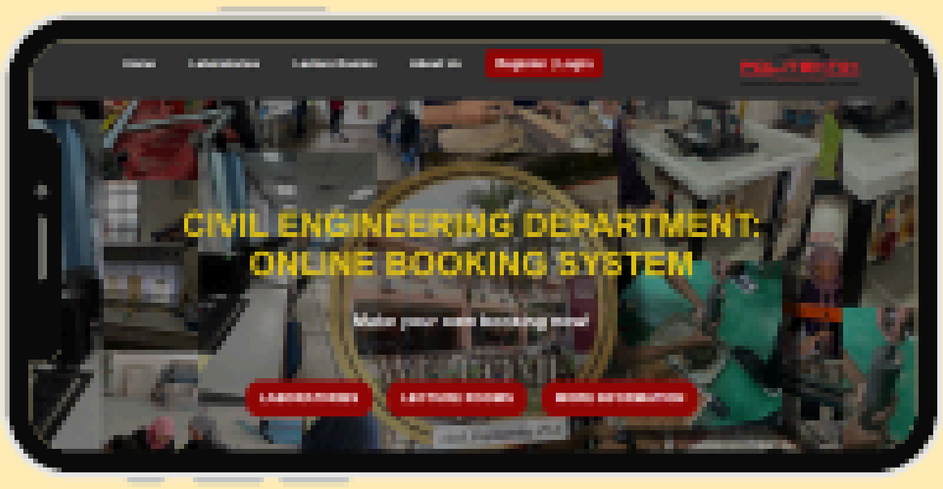
POLITEKNIK MALAYSIA

SULTAN SALAHUDDIN ABDUL AZIZ SHAH

ONLINE BOOKING SYSTEM FOR THE LABORATORIES AND LECTURE ROOM

PROJECT DESCRIPTION

- **Enhanced Efficiency:** Automates booking, saving time and effort.
- **Real-Time Availability:** Offers instant updates on room occupancy for quick decisions.
- **User-Friendly:** Accessible design for easy navigation and booking.
- **Eco-Friendly**: Minimizes paper use, supporting sustainable practices.



OBJECTIVE

1) To develop the booking online system for laboratories and lecture rooms.

2) To test in terms of functional of the online booking system for laboratories and lecture rooms .

IMPACT

- Enhanced Efficiency and Time Savings
- Reduced Risk of Data Loss and Improved Record Accuracy
- Greater Accessibility and Convenience
- Enhanced User Experience and Satisfaction

COMMERCIAL POTENTIAL

- Expansion to other departments and institutions
- Institutions can save on administrative costs by reducing manual scheduling.
- Offering data analytics as a feature can increase the system's value to institutions.

RESULT

- **High User Satisfaction:** The average satisfaction score is 3.44, indicating positive user feedback.
- **Effective Navigation & Responsiveness:** The system meets user needs in terms of easy navigation and responsiveness.

WORK IN PROGRESS

NOVELTY

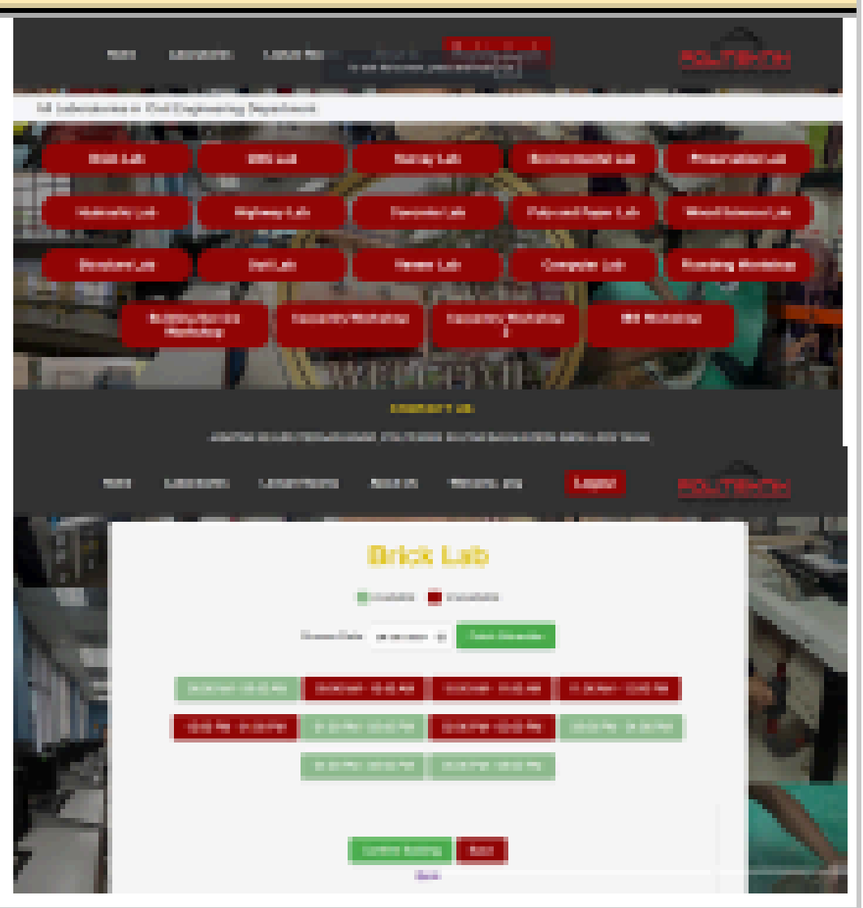
SUSTAINABLE DEVELOPMENT GOAL

Goal 4: Quality Education
Enhances access to educational spaces, allowing students and staff to efficiently manage labs and lecture rooms, thus improving learning and teaching quality.

Goal 9: Industry, Innovation, and Infrastructure
Modernizes campus infrastructure with an online system, increasing efficiency and promoting technological innovation within the department.

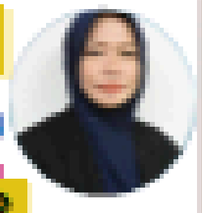
Goal 12: Responsible Consumption and Production
Promotes responsible use of resources by reducing double-booking and ensuring efficient room utilization, supporting sustainable management of spaces.

PRODUCT PICTURE

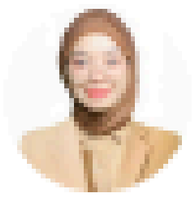


SUPERVISOR

MADAM SALIZAWATI BINTI KAMARUZZAMAN

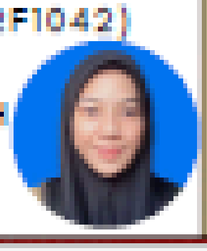


GROUP MEMBER



NURUL NAJWA BINTI ZAMRI (08DKA22F1042)

NUR AISYAH NAJIHAH BINTI SHAHRIZAN (08DKA22F1044)



ECO BURNER

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Abstract

The Eco Burner is an innovative combustion product inspired by incinerators, specifically designed to burn dry leaf waste only. This product aims to reduce air pollution caused by open burning, which can threaten human health, the life of other organisms, and the environment. This study was conducted to address the issue of inefficient dry leaf management in areas around PSA. With this product, waste materials can be minimized, and it has the potential to serve as a small-scale alternative to trash bins, similar to a previous study by Cyril Varghese (2016) titled "Design and Development of Portable Incinerator." The product is made from a metal drum with a height of 79 cm and a diameter of 46.5 cm, equipped with an air filter, metal chimney, metal handle, and wheels. The maximum capacity for dry leaf waste that can be loaded at one time is 1.2 kilograms. For testing purposes, an air quality monitor was used to assess air quality monitor test. Based on test results, data readings from the Eco Burner with an air filter (559 ppm) showed better air quality compared to open burning (4028 ppm).

Keywords : *Eco Burner, Air Filtration, Open Burning, Sustainable Waste Management, Air Quality Testing, API Testing*

POLITEKNIK MALAYSIA

ECO BURNER

Description

The Eco Burner is an innovative combustion product inspired by incinerators, specifically designed to burn dry leaf waste only. This product aims to reduce air pollution caused by open burning, which can threaten human health, the life of other organisms, and the environment.

Objectives

- To design an innovative product for effective waste disposal activities without affecting air quality and the environment
- To determine the level of air quality resulting from innovative products by using Eco Burner

Product



Methodology



Impacts of Innovation

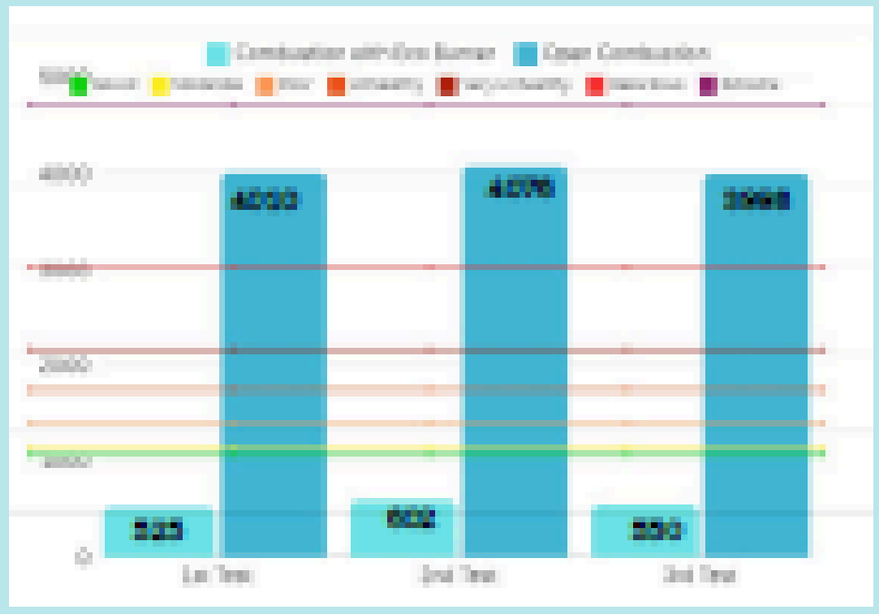
- can help dispose dry leaf waste more easier with closed combustion
- can help reduce the smoke emission during burning waste

Result and Discussion

AIR QUALITY MONITOR TEST

No	Weight of dry leaves (kg)	CO2 values with open combustion (PPM)	CO2 values with Eco Burner using filter (PPM)
1	1.2	4010	525
2		4076	602
3		3968	550
Average		4018	559

The observations from the graph indicate that the readings for two condition which is open combustion and combustion using Eco Burner, showed a significantly reduction of up to 86% (559 ppm) compared to open burning (4028 ppm)



Conclusion

- Eco Burner is functional for the disposal of dry leaf waste
- The Eco Burner able to reduce the amount of smoke released compared to open burning

Supervisor

Puan Salbiawati Binti Kamaruzzaman

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FINAL PROJECT COMPETITION
& EXHIBITION
SESSION I:2024/2025

DIPLOMA IN CIVIL ENGINEERING

DKA
5C

CADANGAN MELETAKKAN PERANGKAP MINYAK DAN SISA MAKANAN DI JALAN MANGGIS, SIJANGKANG

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Abstract

This study aims to address water pollution and drainage blockage issues in residential areas caused by food waste and waste oil. This pollution poses health risks and environmental contamination, and stagnant water creates breeding grounds for mosquitoes. Existing oil and food waste traps are unsuitable for home use due to their large size and are typically used in large industries. Therefore, the objective of this study is to develop a compact and user-friendly oil and food waste trap specifically for residential use. The methodology involves a user satisfaction survey and testing the effectiveness of the trap in filtering oil and grease from wastewater. Findings indicate that the trap successfully removes an average of 99.69% of oil and grease from wastewater samples, proving its effectiveness in reducing pollution at a household level. Recommended improvements include a more durable design and enhanced maintenance features to ensure long-term use.

Keywords : *Blocked drains, Water Pollution, Wastewater*

FINAL PROJECT
Competition and Exhibition
SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

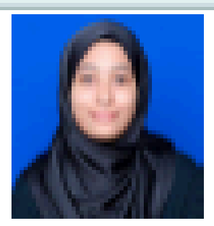
CADANGAN MELETAKKAN PERANGKAP MINYAK DAN SISA MAKANAN DI JALAN MANGGIS, SIJANGKANG



SUPERVISOR
MD ALIMI BIN YASINAN @ JASMAN



SITI ANIS ARAFAH BINTI ZULKARNAIN



NURUL SYAIRAH MAISARAH BINTI RAZALI



HADLINA ATHIRA BINTI HUSSIN

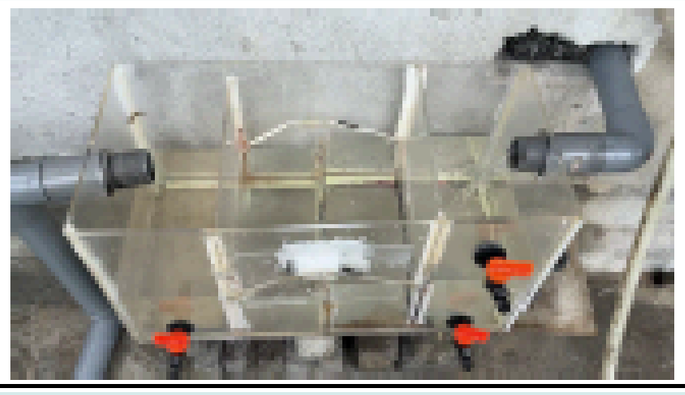
PROJECT DESCRIPTION

- After monitoring the residential area on Jalan Manggis, Sijangkang and found that the drain is clogged and stinks. It is caused by the flow of water directly from the sinks to the drain. Therefore, this oil and food waste trap is designed to separate oil and food waste before enter the drain and help to reduce the risk of clogged drain, maintain the cleanliness of the drain and can reduce the cost of maintenance.

OBJECTIVE

- To produce oil and food waste trap.
- To evaluate the effectiveness of oil and food wate trap before and after use

PRODUCT PICTURE



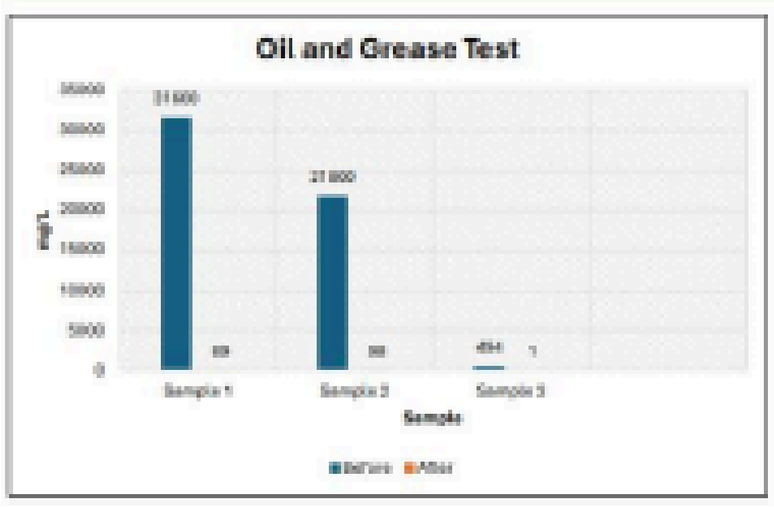
IMPACT

- Reduces water pollution by filtering fats, oils, and grease (FOG), helping to prevent clogs and lower maintenance costs.
- Improves drainage quality, reducing foul odors and mosquito breeding.

NOVELTY

- Compact and easy to install, designed specifically for household sinks.
- Simple to clean and maintain, making it ideal for homes without regular waste services

GRAF



COMMERCIAL POTENTIAL

- Create user-friendly and effective traps for collecting both oil and food waste. Consider features like easy maintenance and monitoring.
- Process food waste into organic fertilizer and sell it to farmers or gardening stores.

SUSTAINABLE DEVELOPMENT GOALS

- Create circular systems where waste oils and food scraps are continuously reused. (Industry, Innovation, and Infrastructure SDG 9)
- Implement efficient waste separation, collection, and disposal practices to prevent methane emissions from decomposing food. (Climate Action (SDG 13)
- Collaborate with local governments, businesses, and community organizations to create awareness campaigns and initiatives that highlight sustainable waste management and recycling practices. (Partnerships for the Goals (SDG 17)

WASTE WATER FILTER FROM THE SINK USING CORN HUSK ORGANIC MATERIAL

Muhamad Saiful Hasnizam bin Abu Hasan, Wan Muhammad Alif Syawal bin Wan Seman, Marliza Ashiqin Binti Khazali

(08dka22f1067@student.psa.edu.my, 08dka22f1055@student.psa.edu.my, marliza@psa.edu.my)

Abstrak

Penapis air adalah sistem yang penting untuk menyingkirkan kekotoran dan bahan cemar dalam air agar iabersih dan selamat untuk digunakan atau dilepaskan ke alam sekitar. Air sisabuangan dari singki sering mengandungi bahan organik, minyak, dan sebatian kimia dari aktiviti harian, yang berpotensi mencemarkan sistem saliran jika tidak ditapis dengan baik. Produk penapis air ini menggunakan kulit jagung sebagai bahan penapis untuk mengurangkan pencemaran air dan bau yang berlaku disebabkan air sisa dari singki tidak ditapis dengan sempurna, khususnya di kawasan yang tidakmengamalkan sistem penapisan sistematik dan di kawasan perkampungan.Tanpasistem penapisan yang berkesan, air sisainibolehmenyebabkan saliran tersumbat, air berbau busuk dan mencemarkan sumber air semula jadi, yang memberi kesan kepada alam sekitar.Kulitjagung dipilih kerana sifatnya yang dapatmenyerap bahan organik dan sebatian kimia, serta membantu mengurangkan tahap kekeruhan air. Terdapat dua sampel penapis air yang diujidalamprojek ini, Sampel A mengandungi (30% kulitjagung) dan Sampel B mengandungi (20% kulitjagung). Hasil ujian yang telahdijalankan ke atas sampel air sisa buangan dari singki,keputusan menunjukkan peningkatan bagi ujian Dissolved Oxygen (DO) sebanyak 23.1% untukSampel A dan -1.1% untukSampel B. Ujian Biological Oxygen Demand (BOD) menurun sebanyak 43.3% untukSampel A dan 33.3% untukSampel B, sementara Ujian Chemical Oxygen Demand (COD) berkurang sebanyak 41.4% untukSampel A dan 29.0% untukSampel B. Ujian Kekeruhan (Turbidity) menurun sebanyak 86.9% untukSampel A dan 85.4% untukSampel B, manakala Ujian pH meningkat sebanyak 16.0% untukSampel A dan 12.0% untukSampel B.Secara keseluruhan, hasil ini menunjukkan bahawa kulit jagung boleh menjadi penapis organik yang berkesan dan mesra alam untuk mengurangkan pencemaran di kawasan tadahan air .

Keywords : *Pencemaran air dan bau, saliran tersumbat, air berbau busuk, kulit jagung*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

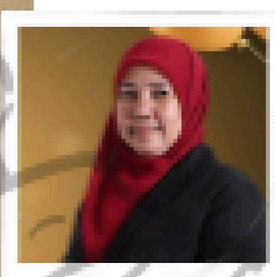
CIVIL ENGINEERING DEPARTMENT

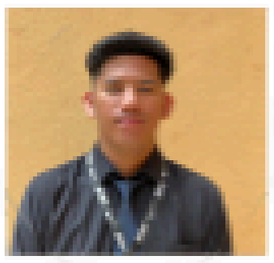
POLITEKNIK MALAYSIA

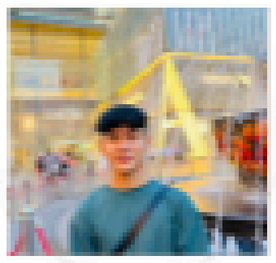
SULTAN SALAHUDDIN ABDUL AZIZ SHAH

WASTE WATER FILTER FROM THE SINK USING CORN HUSK ORGANIC MATERIAL

GROUP MEMBER







Supervisor's Name : Mariiza Ashiqin Binti Khazali

2. Wan Muhammad Alif Syawal Bin Wan Seman

1. Muhamad Saiful Hasnizam Bin A bu Hasan

PROJECT DESCRIPTION

WHAT IS WATER FILTER



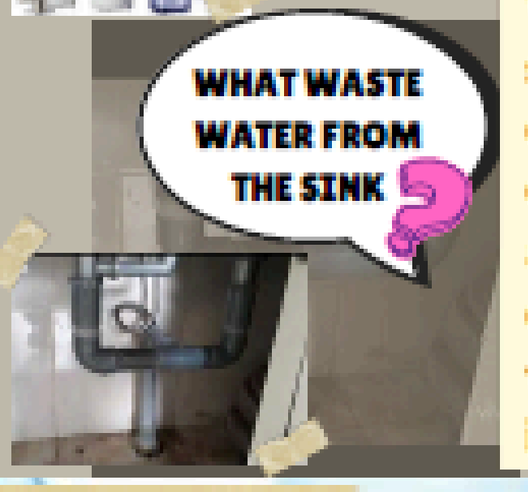
A water filter is a system that works to get rid of impurities and contaminants in water to ensure it is clean and safe for use or released into the environment.

WHY USE CORN HUSK IN WATER FILTER



Corn husks were chosen because of their ability to absorb organic matter and chemical compounds in water, as well as help reduce water turbidity

WHAT WASTE WATER FROM THE SINK



Wastewater from the sink, which often contains organic matter, oil, and chemicals from daily activities such as washing dishes, has the potential to contaminate the drain if not properly filtered.

WHY WATER FILTER IMPORTANT

The waste water filtert from the sink using corn husks was created to reduce environmental pollution that often occurs in areas that do not practice unsystematic filtration systems and rural areas.

OBJECTIVE

1. Producing water filter products using recycled materials which are corn husks.
2. Test the effectiveness of filtered water using a water filter.

COMMERCIAL POTENTIAL

1. Aiming at consumers (home issues) and businessmen who care about the Environment
2. Collaborate with the Farmer to get the material which is corn husks
3. Eco-friendly products can attract consumers and businessmen

SUSTAINABLE DEVELOPMENT GOALS

Goal 6: Clean Water and Sanitation

Goal 11: Sustainable Cities and Communities

NOVELTY

- The use of natural materials that can reduce waste
- Natural absorption and filtration properties without harmful substances
- Use of materials that are low cost and easy to find

IMPACT

#lets save our places

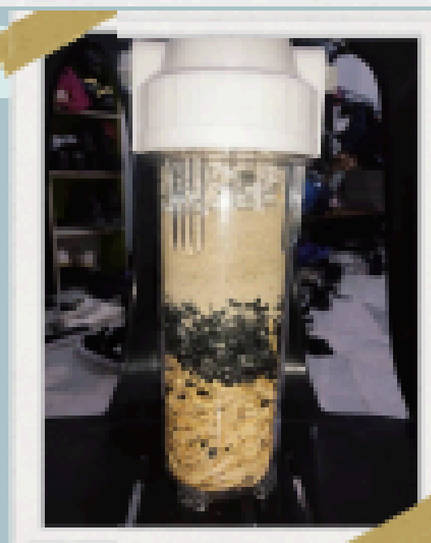
Improves water quality - filters out dirty particles and food waste.

Awareness and education platform - fostering community awareness of the importance of proper waste water management.

Reduces air and odor pollution - by removing organic and chemical pollutants from waste before they are released into drainage systems or rivers. .

PRODUCT PICTURE





USE OF GLASS IN CEMENT BRICK MIX TO PARTIALLY REPLACE THE USE OF SAND

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Abstract

The depletion of natural sand resources and the accumulation of glass waste pose a major challenge to the sustainability of the construction industry. This study aims to include glass powder as a substitute for sand in the manufacture of cement bricks in order to reduce the environmental impact and increase economic progress. Different tests were performed to evaluate the bricks with the proposed mix proportions. In addition, glass powder contain silica (SiO_2) compounds. The percentage of replacement of sand to glass powder is (10%, 15%, 25%). In order to achieve quality in the brick mix, the brick compressive strength and water absorption tests carried out provide insight into the performance characteristics of cement bricks with a glass powder mixture compared to traditional cement bricks according to BS EN 771-1 for determination of compressive strength standards and BS EN 772-11 for initial rate of water absorption of masonry units standards. Curing is done on the 7th, 14th, and 28th day. The bricks produced are according to the Malaysian Standard. The size of the bricks used is 215mm x 102.5mm x 65mm. The ratio of cement to sand in this study is 1:3. By the end of the testing, we are able to analyse that the partial replacement material of sand to glass with the percentage replacement of 10% and 25% of glass gain a significant strength in compression and low water absorption rate in 28th days compares to traditional mix. All in all, this study shows a potential of glass as a material for cement brick mix to reduce glass that were sent into garbage dump. Further research is advised to improve bricks quality, compatible ratio mix and material uses to optimize the study.

Keywords : *Glass, Cement Brick, Environmental Impact, Compressive Strength, Water Absorption*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

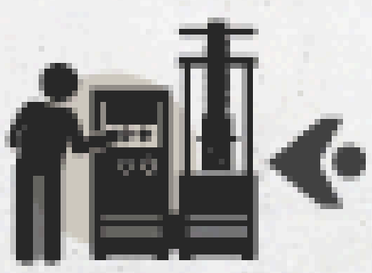
PROJECT DESCRIPTION

This study aims to include glass powder as a substitute for sand in the manufacture of cement bricks. The percentage of replacement of sand to glass powder is (10%, 15%, 25%) in ratio of 1:3, cement to sand. Water Absorption Test and Compressive Strength Test is carried out to evaluate cement bricks characteristics performance with a glass powder mixture compared to traditional cement. The size of the bricks used is 215mm x 102.5mm x 65mm. By the end of the project, the partial replacement of sand to glass of 10% and 25% of glass gain a significant strength in compression strength and low water absorption rate in 28th days compares to traditional mix. All in all, this study shows a potential of glass as a material for cement brick mix to reduce glass waste that were sent into garbage dump.

OBJECTIVE



OBJECTIVE 1
Produce cement bricks containing 10%, 15% & 25% glass powder content (0.85mm)



OBJECTIVE 2
Conduct a test such as Compression Test and Water Absorption Test on cement bricks to evaluate their strengths and porosity.

IMPACT



Waste Reduction: Incorporating glass bottles in cement bricks helps reduce landfill waste. Millions of glass bottles are discarded each year, and repurposing them can significantly decrease waste volume.

Resource Conservation: By using recycled glass, the demand for raw materials in brick production decreases, conserving natural resources like sand and clay.

Lower Carbon Footprint: The production process for conventional bricks is energy-intensive. Using recycled materials like glass can lower energy consumption and greenhouse gas emissions.

COMMERCIAL POTENTIAL

1 Cost Savings:
Glass waste is cheaper or free compared to sand, particularly in areas where glass recycling infrastructure is developed. This can reduce production costs if glass powder is readily available.

2 Environmental Sustainability:
Reducing reliance on sand, a non-renewable resource, can lower the environmental footprint. Using recycled glass also helps reduce landfill waste, aligning with sustainability trends and attracting eco-conscious buyers.

3 Enhanced Strength and Durability:
Studies have shown that glass powder can improve the compressive strength and durability of cement bricks when used in appropriate amounts. This makes the product more appealing for high-quality construction needs.

SUSTAINABLE DEVELOPMENT GOALS

Reducing the Impact of Climate Change (SDG 13: Action on Climate Change)
Carbon Footprint Reduction: By using waste glass, the production of cement bricks can be more environmentally friendly, reducing the use of more energy-intensive raw materials.

Reducing Waste (SDG 12: Sustainable Consumption and Production)
Use of Recycled Materials: Integrating waste glass in the production of cement bricks helps reduce the amount of glass thrown away, supporting a more sustainable use of resources.

PRODUCT PICTURE



NOVELTY

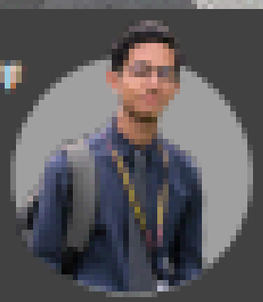
The use of recycled glass in cement bricks offers a novel approach to improving community infrastructure. By integrating glass waste into brick production, we can create safer, more resilient buildings that benefit both urban and rural areas. This initiative not only enhances the quality of construction but also addresses the pressing issue of glass waste pollution.

Bricks made from this innovative material blend are expected to be stronger, more aesthetically appealing, and more durable, reducing the need for frequent repairs over time. Additionally, this strategy promotes sustainable practices by repurposing glass that would otherwise end up in landfills, ultimately contributing to a greener and more sustainable community.

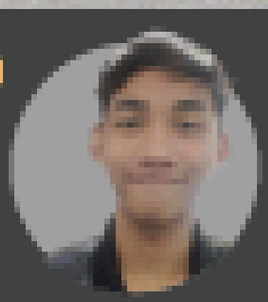
PUAN MARLIZA ASHIQIN BINTI KHAZALI (SUPERVISOR)



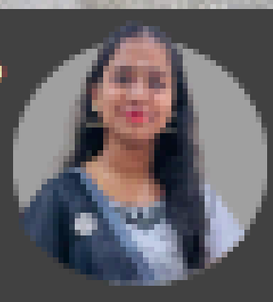
MUHAMMAD ALIFF AIMAN BIN ARSHAD (DSDKA22F1232)



ARIQ AIZAT BIN SAHARUDIN (DSDKA22F1220)



KAYLASHINI A/P VELAWITHAM (DSDKA22F1248)



MIRACLE WATER FILTER

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Mohd Zaidi Bin Abdul Hamid

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Abstrak

Penapis air yang direka untuk air tandak (penulenan air) di kawasan luar bandar adalah penting untuk memenuhi keperluan harian.Komuniti luar bandar sering bergantung kepada sumber semula jadi seperti air bukit, sungai, kolam dan telaga yang boleh tercemar dengan kekotoran dan bahan berbahaya. Pencemar-pencemar ini menimbulkan risiko kesihatan yang besar, menjadikan akses kepada air bersih sangat penting untuk mencegah penyakit bawaan air. Produk penapis air yang direka ini untuk meningkatkan kualiti air bersih dengan menggunakan batu kerikil, batu besar, pasir silica, arang, span dan tawas dalam sebuah bekas akrilik yang dipasang dengan penyambung tangka PVC sebagai saluran air masuk dan keluar. Penapis ‘air tandak’ direka dengan keperluan penyelenggaraan yang rendah, menjadikannya penyelesaian yang mampan dan mesra pengguna untuk keluarga di luar bandar. Menguji produk ini di Kampung Merapoh, Pahang untuk mengukur keberkesanan penapis air ini. Parameter yand diambil ialah nilai Ph, kekeruhan, Dissolved Oxygen dan TSS. Hasil ujian yang telah dijalankan ke atas air tandak, keputusan menunjukkan nilai Ph selepas ditapis ialah 7.0 yang berada di kelas I. Seterusnya, nilai kekeruhan air juga pada kelas I selepas ditapis menunjukkan lebih bersih berbanding sebelum ini adalah 2.75 NTU . Nilai Dissolved Oxygen pula 7.10mg/l berada pada kelas I yang menunjukkan oksigen terlarut yang baik. Akhir sekali, bagi bacaan Total Suspended Solid (TSS) selepas ditapis berada pada kelas I kurang daripada 25mg/l iaitu nilainya 6mg/l. Semua parameter yang diuji telah mencapai standard kualiti air kebangsaan. Oleh itu daripada hasil ujian air, air tandak selepas ditapis selamat digunakan daripada sebelum.

Keywords : *Air Tandak, Kualiti Air, Penyelenggaraan yang rendah, Parameter*



MIRACLE WATER FILTER


ENCIK MOH ZAIDI BIN MOHD HAMID
(SUPERVISOR)


NURFATIHAH BINTI ISMAIL
(08DKA22F1152


FARINA HUDA BINTI AZHARI
(08DKA22F1127)

PROJECT DESCRIPTION

- Water filters are essential devices designed to improve the quality and safely to use by removing impurities and contaminants. This miracle water filter is inspired by the significant problem of having unclean water that from 'air tandak' that they using their for daily. Therefore, this product designed to improve the quality of water for people at Kampung Merapoh, Pahang.

OBJECTIVE

- To produce a product (miracle water filter
- The effectiveness product (miracle water filter) by performing a ph level, turbidity, dissolved oxygen and total suspended solid(TSS)

PRODUCT PICTURE



IMPACT

- Improve water quality by filtering impurities and contaminations
- With low-cost of water filter save money for household and communities, particularly in areas with limited resources

NOVELTY

- The filter features an easy assembly process, allowing users to set it up quickly without the need for specialized tools or expertise
- Using natural materials that easily to find

COMMERCIAL POTENTIAL

- Growing demand for clean water: Clean water become a global priority, this filter meets the rising demand for affordable and effective
- Products guarantee for safer use it, especially for home

COMMERCIAL POTENTIAL

- SDG 6 (CLEAN WATER AND SANITATION: The water filter directly supports to clean water by removing contaminants, which is essential for safe drinking water in both urban and ruaral areas.
- SDG 3 (GOOD HEALTH AND WELL-BEING: By improving water quality, the filter reduces rish of disease and well- being in communities that lack access to purified water

BRICK BOND ALIGNMENT

Nur Adibah Binti Asnold, Imamunnisa' Binti Mohd Amin,
Mohd Zaidi Bin Abdul Hamid

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Abstract

Bricklaying, a fundamental construction skill, often poses challenges for students and non-professionals due to the precision and technique required. Traditional methods can lead to material waste and inconsistent results, hindering learning and practical application. To address these issues, we propose the development of the Brick Bond Alignment (BBA) Tool. The BBA Tool is designed to enhance brick alignment accuracy and minimize mortar usage. Its compact, foldable design ensures portability and durability, making it suitable for various learning environments. Rigorous testing has demonstrated its effectiveness in reducing material waste and achieving alignment compared to manual methods. By empowering individuals with a practical tool, the BBA Tool promotes sustainable practices. It not only reduces material waste but also enhances skill development, aligning with broader sustainability goals. With potential applications in education and beyond, this tool has the potential to revolutionize bricklaying, making it more accessible, efficient, and environmentally friendly.

Keywords : *Brick bond alignment, mortar usage, material waste, hands on learning, technical skills, education, sustainability and skill development*

FINAL PROJECT

Competition and Exhibition

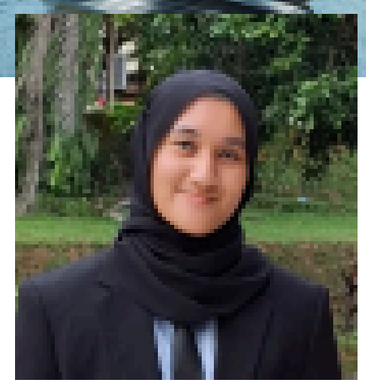
SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

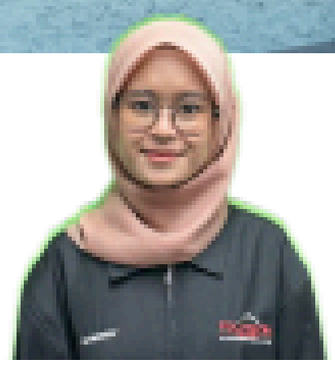
BRICK BOND ALIGNMENT



MOHD ZAIDI BIN ABDUL HAMID [SUPERVISOR]



NUR ADIBAH BT ASNOLD SUDIBIO [8DKA22F1104]



IMAMUNNISA' BT MOHD AMIN [08DKA22F1097]

PROJECT DECRIPTION

To address the challenges faced by students in mastering brick bonding techniques, we developed the BBA tool.

This innovative tool is specifically designed to assist students in achieving precise and accurate brick bonds, reducing material waste, and enhancing their overall learning experience.

By making bricklaying more accessible and manageable, the BBA tool empowers students to develop essential building construction skills.

OBJECTIVES

1. Design and develop the ' Brick Bond Alignment' product.
2. Optimize mortar use and improve the appearance of brick walls built by non-professionals

IMPACT

Enhanced Student Learning: Provides hands-on experience to foster student skill development in bricklaying.

Resource Efficiency: Minimizes material waste, promoting sustainable construction practices for student projects.

Practical Application: Bridges the gap between theory and practice, aiding students in coursework and real-world applications.

COMMERCIAL DESCRIPTION

Market Demand: Highlight potential for adoption in educational institutions and training centers for students learning construction basics.

Scalability: Discuss the potential to expand the tool's market to other areas such as vocational schools or even commercial use for non-professional DIY projects.

Future Enhancements: Mention possibilities for enhancing the tool with different sizes or attachments to suit varying types of brickwork.

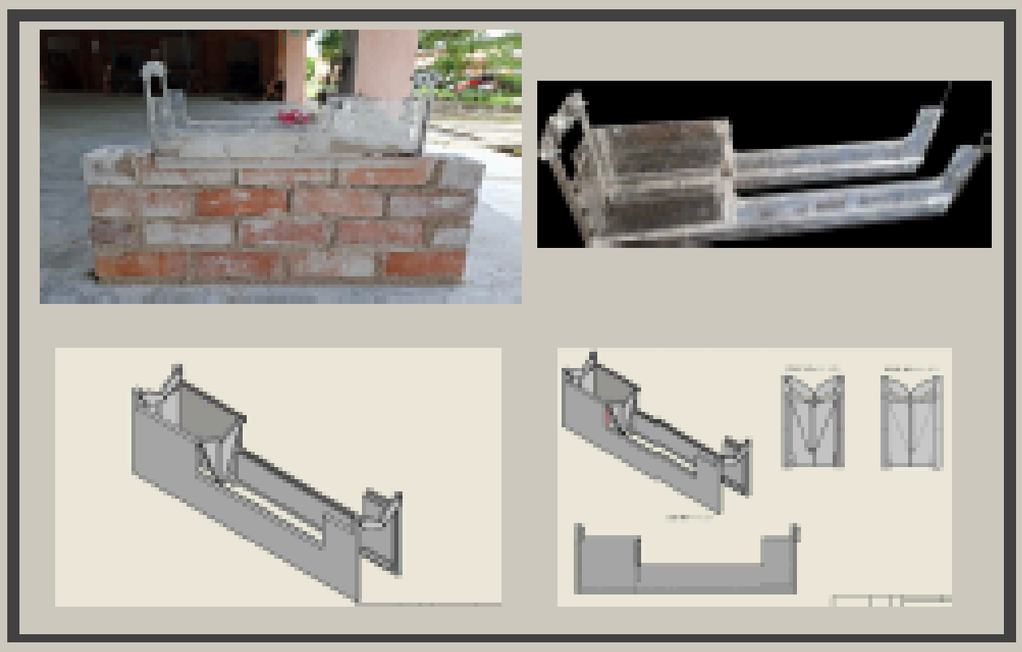
SUSTAINABLE DEVELOPMENT GOALS

SDG 4 (Quality Education): Promotes hands-on learning and skill acquisition for students.

SDG 9 (Industry, Innovation, and Infrastructure): Fosters innovation in construction tools for educational use.

SDG 12 (Responsible Consumption and Production): Reduces mortar waste, encouraging responsible use of building materials.

PRODUCT PICTURE



NOVELTY

Precision for Beginners: Unlike traditional tools, the BBA Tool is specifically designed to guide first-time users and students in achieving professional-level precision.

Folding Space-Saving Design: The tool's innovative foldable design offers easy transport and storage, making it practical for both educational and field settings.

Resource Efficiency: With an integrated mechanism for controlled mortar application, the BBA Tool helps users avoid waste, a feature not typically found in standard bricklaying tools.

PENGHASILAN AR MUDBALL SEBAGAI AGEN PENJERNIH AIR TERCEMAR

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Abstrak

Produk bebola lumpur ini bertujuan untuk mengatasi kekeruhan air di Kolam Ikan Sriamera, Meru, Klang, yang menyebabkan kematian hidupan akuatik akibat pencemaran dan pengumpulan bahan organik serta anorganik. Bebola lumpur ini dibuat daripada kulit pisang dan sekam padi serta diperkaya dengan mikroorganisma EM1 dan EMAS, bebola ini membantu mempercepatkan penguraian bahan organik. Ujian keberkesanan yang melibatkan pemantauan kekeruhan, oksigen terlarut (DO), dan pH menunjukkan bahawa kaedah ini mengurangkan kekeruhan, meningkatkan oksigen terlarut, dan menstabilkan pH air. Kajian kekeruhan air pada Kolam Ikan Sriamera sebelum menggunakan bebola lumpur adalah 102.55 NTU. Selepas seminggu dan dua minggu menggunakan bebola lumpur dengan Larutan EM1, kekeruhan menurun dengan nilai 11.19 NTU dan 16.18 NTU. Manakala, dengan menggunakan Larutan EMAS pula, kekeruhan menurun dengan nilai 12.84 NTU dan 11.13 NTU selepas seminggu dan dua minggu. Kajian produk ini dijalankan secara kualitatif dan kuantitatif di Kolam Ikan Sriamera dan Kolam Bukit Cerakah dengan pemerhatian selama dua minggu. Data menunjukkan bahawa kaedah EM1 memberikan hasil terbaik dalam menurunkan kekeruhan dan meningkatkan oksigen terlarut di kedua-dua kolam, terutama di Kolam Sriamera yang lebih kotor. Bebola lumpur ini diharapkan dapat menjadi alternatif penjernihan air yang mampan untuk menjaga keseimbangan ekosistem akuatik.

Keywords : *Bebolalumpur, Kekeruhan, oksigenterlarut, Larutan EM1 dan EMAS*



PENGHASILAN AR MUDBALL SEBAGAI AGEN PENJERNIH AIR



NORLIZA BINTI MD JAHID
SUPERVISOR



AMIR ASHRAF BIN MOHAMAD SALEHUDDIN
STUDENT



RAHIM SLAMAT BIN OLLAH
STUDENT

PROJECT DESCRIPTION

- **The mudball product, made from banana peels, rice husks, and enriched with EM1 and EMAS microorganisms, targets water turbidity in Sriamera Fish Pond to reduce pollution-related aquatic life loss. Tests on turbidity, dissolved oxygen, and pH in Sriamera and Bukit Cerakah Fish Ponds over two weeks showed that EM1 effectively reduced turbidity and increased oxygen, particularly in the more polluted Sriamera pond. These mudballs offer a sustainable solution to improve water quality and support aquatic ecosystem balance.**

OBJECTIVE

- **To produce AR Mudball using a mixture of banana peels and rice husks as a purifier for polluted water.**
- **To determine the effectiveness of AR Mudball by conducting water parameter tests.**

SUSTAINABLE DEVELOPMENT GOALS



- **(SDG 6: Clean Water and Sanitation) Mud balls help improve water quality by reducing turbidity and pollution. This supports efforts to provide access to clean water and sanitation for communities**
- **(SDG 12: Responsible Consumption and Production) Using organic materials such as banana peels and rice husks in mud balls promotes the sustainable use of resources and reduces reliance on chemicals in water treatment**
- **(SDG 14: Life Below Water) Mud balls help protect aquatic ecosystems by keeping water clean, thus supporting the sustainability of marine life and reducing the impacts of pollution.**



IMPACT

- **Absorbs organic and inorganic materials.**
- **Promotes growth of beneficial microorganisms.**
- **Low cost and easy to use.**
- **Improves water quality naturally.**
- **Reduces chemical impact on ecosystems.**

COMMERCIAL POTENTIAL



- **Enhanced pollutant absorption.**
- **Broader market appeal.**
- **Increased eco-friendly branding.**
- **Potential for premium pricing.**
- **Competitive edge in research and innovation.**

NOVELTY

- **Using two organic materials namely banana peel and rice husk.**
- **The study found that increasing the organic matter in mud balls can increase the cleanliness of the water.**

PRODUCT PICTURE





POLYSTYRENE MODIFIED BITUMEN

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Abstract

This study looks into bitumen mixed with polystyrene as a potential improvement for road construction materials. The research focuses on the effects of varying the quantity of polystyrene added to conventional bitumen (0.25%, 0.5%, and 1.0%) on important performance metrics like penetration and softening point. According to the results, bitumen hardens and increases its heat resistance at 0.25%, making it appropriate for hot climates and high traffic locations. Even yet, the material becomes softer at 0.5% and 1.0% polystyrene concentration and still outperforms bitumen that hasn't been altered. This project also highlights how crucial it is to support sustainability initiatives in road construction by utilizing recycled materials like polystyrene. By recycling garbage, the addition of polystyrene not only lessens the environmental impact but also improves road resilience, which can minimize the need for regular repairs. Although the study shows the potential advantages of bitumen treated with polystyrene, more research is advised to improve adhesion, rutting resistance, and fatigue in order to optimize the material for wider uses.

Keywords : *Polystyrene, Bitumen, Sustainability, Road Construction, Performance Testing*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

POLYSTYRENE MODIFIED BITUMEN



YUSNITA BT YUSOF (SUPERVISOR)

NILAVAN RAJ A/L KUMARAN

AMIRTAA A/P K SUPPIAH

PROJECT DESCRIPTION

In order to increase the sustainability and longevity of roads, this study investigates the addition of polystyrene to bitumen. The project intends to address the problem of plastic waste while improving bitumen's hardness,flexibility, and thermal resistance by adding recycled polystyrene. In order to identify the optimal mix for various road conditions, the study assesses the effects of three different polystyrene concentrations (0.25%, 0.5%, and 1.0%) on key performance metrics, including penetration and softening point.

OBJECTIVES

1. To produce modified bitumen using polystyrene.
2. To measure the hardness and consistency of bitumen through the penetration test.
3. To determine the softening point of bitumen.

IMPACT

Eco-Friendly Waste Management: Uses recycled polystyrene to support sustainable road construction.

Reduced Road Maintenance: Decreases repair frequency, leading to fewer disruptions and less environmental impact.

Enhanced Community Infrastructure: Provides safer, more resilient roads that benefit both urban and rural areas.

PRODUCT PICTURE



COMMERCIAL POTENTIAL

Enhanced Longevity : Roads constructed with polystyrene-modified bitumen are expected to last longer.

Reduced Maintenance: Less frequent maintenance is anticipated, leading to cost savings.

Plastic Waste Solution: Utilizes recycled polystyrene, helping address global plastic waste issues.

Sustainable Product: Creates an environmentally friendly option that supports green initiatives.

SUSTAINABLE DEVELOPMENT GOALS

Improving road building materials for durable and robust infrastructure is part of SDG 9 (Industry, Innovation, and Infrastructure)

Cutting down on plastic waste and road maintenance to support sustainable urban infrastructure is part of SDG 11 (Sustainable Cities and Communities)

NOVELTY

Through the use of recycled polystyrene in bitumen, the initiative presents a novel strategy that hasn't been thoroughly investigated. Improving road quality and tackling the growing issue of plastic pollution are two advantages of using plastic waste as an addition to bitumen.

Roads made of this innovative material combination should be stronger, more heat-resistant, and require fewer repairs over time.

SMART RUBBISH COLLECTERS

Muhammad Izuddin Bin Mohd Razali , Muhammad Syakir Aiman Bin Mohd Syukri, Yusnita Binti Md Yusof

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Abstrak

Projek ini membangunkan “Smart Rubbish Collector,” iaitu alat pengutip sampah manual yang direka untuk menangani pencemaran air dan masalah longkang tersumbat di kawasan Politeknik Sultan Salahuddin Abdul Aziz Shah (PSA). Alat ini bertujuan mengurangkan pencemaran yang menjejaskan ekosistem air dan menyebabkan banjir kilat akibat longkang tersumbat. Direka tanpa memerlukan tenaga elektrik atau bahan bakar, alat ini lebih mesra alam dan menjimatkan kos.Kajian melibatkan reka bentuk, pemilihan bahan, pemasangan, serta ujian keberkesanan alat di kawasan longkang dan tasik. Bahan seperti keluli dan jaring kawat dipilih untuk daya tahan. Pengujian menunjukkan alat ini berfungsi dengan baik dalam memerangkap sampah dan memudahkan pembersihan, dengan 90% responden bersetuju bahawa alat ini efektif. Alat ini berpotensi untuk dikomersialkan sebagai penyelesaian alternatif dalam pengurusan sampah bandar yang lebih lestari.

Keywords : *Smart Rubbish Collector, pencemaran air, longkang tersumbat, Politeknik Sultan Salahuddin Abdul Aziz Shah, pengurusan sampah*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

SMART RUBBISH COLLECTOR

SUPERVISOR : PN. YUSNITA BINTI YUSOF

STUDENT : MUHAMMAD IZUDDIN BIN MOHD RAZALI (08DKA22F1060)
MUHAMMAD SYAKIR AIMAN BIN MOHD SYUKRI(08DKA22F1156)

PROJECT DISCRIPTION

After looking into PSA Lake's drainage problems, it was discovered that too much litter had accumulated, polluting the ecosystem and producing offensive odours. People's reckless behaviour, which involves dumping rubbish into the drains, is the cause of this predicament. As a result, a Smart Rubbish Collector was created to make it easier to maintain these drains, hence lowering maintenance expenses and preventing obstructions.

COMMERCIAL POTENTIAL

This waste collection tool has good commercial potential for use in various places, such as parks, beaches, recreational areas, industries, and factories. With its ability to facilitate efficient waste collection, it can help reduce labor needs and increase cleaning speed. Local governments and cleaning companies could be the primary target market for this tool, especially in supporting cleanliness and environmental preservation campaigns. If the tool is easy to operate and competitively priced, it has the potential to attract a wide market, including individual users who care about environmental cleanliness.

Objective

- Create a simple-to-use tool that doesn't need fuel or energy.
- Evaluate how well the product works in terms of its functionality, design, usability, and market potential.

NOVELTY

Small and easy to use: made to gather waste effectively and with little effort. It provides a sustainable, efficient alternative to current market solutions by streamlining cleaning chores, lowering labour expenses, and encouraging environmental cleanliness.

SUSTAINABLE DEVELOPMENT GOALS

1. SDG 11: Sustainable Cities and Communities - This tool helps maintain cleanliness in cities and communities, which is essential for creating safe, clean, and sustainable living environments.

2. SDG 14: Life Below Water - The tool can be used to clean up waste along beaches and coastal areas, playing an important role in protecting marine ecosystems from pollution, especially plastic waste.

3. SDG 15: Life on Land - The tool is useful for collecting waste in natural areas like parks and urban forests, supporting environmental conservation and protecting biodiversity from the threat of pollution.p

PRODUCT PICTURE



IMPACT

- Ensuring that the product satisfies consumer expectations by developing a garbage collecting instrument that is more user-friendly, ergonomic, and efficient than current alternatives available on the market. This product is a useful tool for efficient waste management since it is made to make waste-cleaning chores easier, upkeep more efficient, and labour needs lower

SOLAR WASTE BIN TO TRAP SOLID WASTE AT PSA'S LAKE

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Norhayati Binti Palil

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Abstract

The Solar Waste Bin is an innovative trash trap product designed to address the issue of waste on the surface of water bodies such as lakes and rivers. This trash trap was inspired by the problem of plastic waste being disposed of in aquatic areas, leading to issues like blockages, breeding grounds for mosquitoes and other diseases, as well as reducing aesthetic value due to dirty surroundings. Therefore, this product is designed to assist in the process of collecting floating waste on the PSA lake surface, simultaneously helping the cleaning staff at the Polytechnic. The Solar Waste Bin uses an automatic system to collect waste. A water pump is used to draw in water, which in turn pulls waste towards the product. Solar panels are used to supply electrical power to the water pump. These solar panels promote an eco-friendly and green concept by converting sunlight into electrical energy. A battery functions as a power source for the water pump when the solar panels are not operational due to the absence of sunlight. A solar charge controller is used to regulate the current and voltage from the solar panel to the battery or system. A quantitative approach is employed by conducting a survey using a questionnaire to test the effectiveness of the Solar Waste Bin.

Keywords : *Solar Panel, Solar Charge Controller, Water Pump, Eco – Friendly, Environmental Issues*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

SOLAR WASTE BIN TO TRAP SOLID WASTE AT PSA'S LAKE



NORHAYATI BINTI PALIL (SUPERVISOR)

MUHAMAD JEFRI BIN UJANG

NOR AIN ATIQAH BINTI ABU BAKAR

PROJECT DESCRIPTION

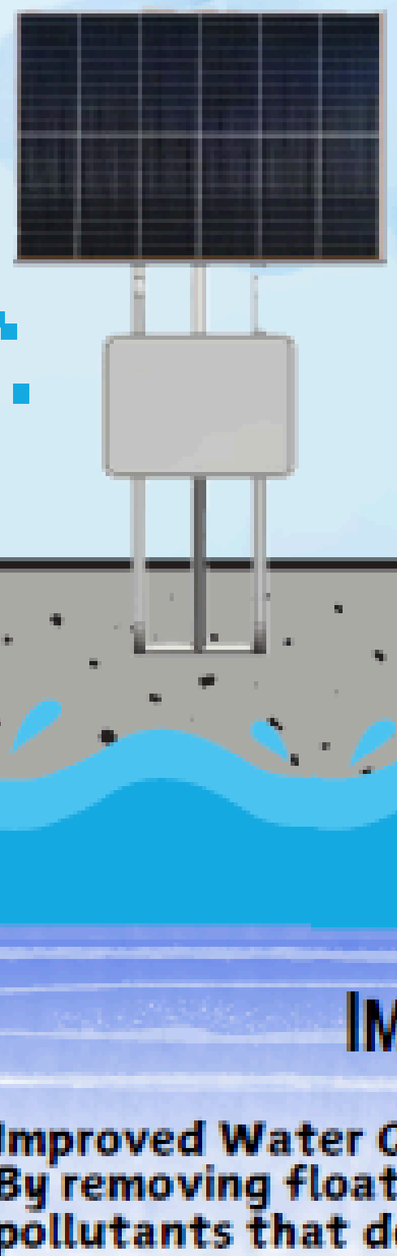
The Solar Waste Bin is an innovative floating waste trap designed to address water surface waste issues in lakes particularly plastic waste and reduces aesthetic value due to pollution. This product is aimed at aiding waste collection in PSA lakes. It operates automatically, using a water pump to draw water and pull waste towards the device. Powered by solar panels, it embodies an eco-friendly design by converting sunlight into electricity. A battery provides backup power when sunlight is unavailable, while a solar charge controller regulates current and voltage. A quantitative survey will assess its effectiveness through a questionnaire.

OBJECTIVE

To create a waste trap for the waste collection process in PSA Lake.

To test the effectiveness of the waste trap in the lake by distributing an online survey form.

PRODUCT PICTURE



SUSTAINABLE DEVELOPMENT GOALS

To improve the cleanliness of water bodies by preventing the accumulation of solid waste in the lake and reducing pollution is part of SDG 6 (Clean Water and Sanitation).

Solar Waste Bin contributes to creating healthier, more sustainable urban environments, which benefit both the community's health and its aesthetic appeal is part of SDG 11 (Sustainable Cities and Communities)

IMPACT

Improved Water Quality :
By removing floating waste, it reduces pollutants that degrade water quality.

Environmental Sustainability :
Powered by solar energy, Solar Waste Bin promotes a green approach to waste management

Enhanced Aesthetic Appeal: Cleaner water bodies improve the visual appeal of the environment

COMMERCIAL POTENTIAL

Municipal Waste Management: Cities and municipalities can use it to maintain cleaner water bodies in public parks, rivers, and lakes.

Industrial and Commercial Waterfronts: Factories and businesses near water bodies can employ the Solar Waste Bin to manage waste runoff.

Tourism and Recreational Areas: Tourist destinations, especially those with water features like beaches, lakes, and rivers, can use it to ensure cleaner water.

NOVELTY

This bin utilizes an automated system to collect floating debris, enhancing efficiency and effectiveness in waste removal compared to traditional methods. By integrating solar panels, the bin is environmentally friendly, relying on renewable energy to operate and reducing dependence on non-renewable electricity sources.

PERFORMANCE OF SAND CEMENT SAWDUST ASH BRICK

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Abstract

This study aims to evaluate the physical and mechanical properties of sand cement bricks modified by the addition of sawdust ash as a replacement material.The inclusion of sawdust ash is intended to enhance environmental sustainability by using waste materials as a partial substitute for cement in brick production. Various percentage of sawdust ash such as 0%,5% and 10% were incorporated into the brick mix to determine is effects on density, water absorption, water permeability and compressive strength. To achieve quality in the brick mix, the compressive strength and water absorption tests were conducted in accordance with BS3921 and BS EN772-1 standards. The curing process was performed on days 7 and 28. The bricks produced conform to Malaysian Standards, with dimensions of 215mm x 102.5mm x 65mm, and a cement to sand ratio of 1:3. Water absorption and permeability tests were conducted to assess the brick moisture resistance, which is crucial for ensuring durability in structural applications. The compressive strength test evaluated the brick's load bearing capacity. Results showed that the addition of sawdust ash significantly impacted brick properties, particularly in terms of durability, weight and water resistance. Findings indicate that while the brick density decreased with higher sawdust ash percentages, water permeability and compressive strength remained within acceptable ranges for light construction applications. This study concludes that sand cement bricks with added sawdust ash hold potential as a sustainable alternative in the construction industry, reducing dependency on non-renewable materials and aiding in the management of wood industry waste.

Keywords : *Cement bricks, Sawdust Ash, Water Absorption Tests, Compressive Strength Tests*

FINAL PROJECT

Competition and Exhibition

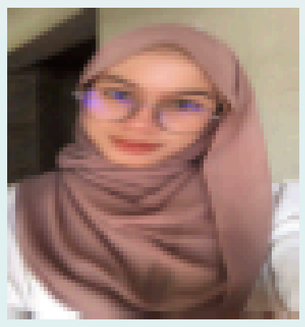
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CIVIL ENGINEERING DEPARTMENT

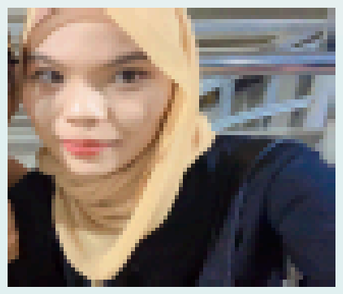
PERFORMANCE OF SAND CEMENT SAWDUST ASH BRICK



PN ZURINA BINTI SAFEE



NUR AINSHA SOFIA BINTI HALIM
08DKA22F1036



NURUL BATRISHIA AFRINA BINTI AHMAD TARMIZI
08DKA22F1136

PROJECT DESCRIPTION

This " Performance of sand cement sawdust ash brick"looks at using sawdust ash to replace some of the cement and cement bricks.By adding 0%,5% and 10% sawdust ash researches tested how it affects the bricks density,water absorption , permeability and strength. They found that adding sawdust ash makes the bricks lighter but still strong and water-resistant enough for light construction. This approach offers a sustainable way to recycle wood industry waste in building materials.

OBJECTIVE

- To produce sand cement brick by replacing part of cement with sawdust ash.
- To performance the brick with compressive strength method and water absorption test.

COMMERCIAL POTENTIAL

- Great commercial have a sustainable and cost effective
- By using less cement, these bricks are cheaper to make, make ideal
- for low income and developing markets.
- Eco friendly as they industrial waste and reduce carbon emision.
- Bricks versatile and can be used in variuous building

IMPACT

- Eco friendly bricks made from sand, cement and sawdust ash.
- Help the enviroment by reusing sawdust ash, reducing waste , cutting down on cement which lower carbon emmision
- Bricks are cheaper to made especially in area wood industries.

SUSTAINABLE DEVELOPMENT GOALS

- Industry, Innovation and Infrastructure
- Sustainable Cities and communities
- Responsible consumption and production
- Climate action
- Life of land

NOVELTY

- Building Innovation (SDG 9)
- Creating Sustainable Cities (SDG 11)
- Reducing waste (SDG 12)
- Helping the climate (SDG 13)
- Protecting forest (SDG 15)

PRODUCT PICTURE



FINAL PROJECT COMPETITION
& EXHIBITION
SESSION I:2024/2025

DIPLOMA IN CIVIL ENGINEERING

DKA
5D

KEBERKESANAN DAN IMPLIKASI PELAKSANAAN SISTEM PENUAIAN AIR HUJAN (SPAH)

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Abstract

Projek ini mengkaji keberkesanan dan implikasi pelaksanaan Sistem Penuaian Air Hujan (SPAH) di Malaysia, dengan tumpuan pada kes di Institut Penyelidikan Air Kebangsaan Malaysia (NAHRIM). SPAH direka untuk mengurangkan penggunaan air terawat dengan menyediakan alternatif bagi kegunaan bukan minuman seperti pembilasan tandas dan penyelenggaraan taman. Dengan perubahan iklim dan permintaan air yang semakin meningkat, SPAH berfungsi sebagai penyelesaian mampan untuk mengurangkan tekanan pada sumber air konvensional. Kajian ini menggunakan pendekatan campuran, melibatkan soal selidik, temu bual, dan analisis penggunaan air di NAHRIM. Hasil kajian menunjukkan pengurangan bil air sebanyak 30% dan penjimatan air purata sebanyak 7,200 m^3 setahun. Ini bukan sahaja mengurangkan kebergantungan pada air terawat tetapi juga mengurangkan penggunaan tenaga dalam rawatan air. Kajian ini turut mempertimbangkan pindaan Undang-Undang Kecil Bangunan Seragam (UKBS) 2022, yang mewajibkan pemasangan SPAH bagi bangunan dengan keluasan bumbung melebihi 100m^2. Berdasarkan keberkesanan SPAH di NAHRIM, pelaksanaan SPAH turut dicadangkan di institusi pendidikan seperti Politeknik Sultan Salahuddin Abdul Aziz Shah dengan menekankan penggunaan komponen berkualiti seperti paip tahan karat dan sistem penapisan untuk memastikan kualiti air yang optimum. Keseluruhannya, SPAH memainkan peranan penting dalam pengurangan kos, pemuliharaan alam sekitar, dan menyokong Matlamat Pembangunan Mampan (SDG) melalui pemuliharaan air dan kesedaran alam sekitar, menjadikannya model pengurusan air mampan bagi institusi lain di Malaysia.

Keywords : *Sistem Penuaian Air Hujan (SPAH), pemuliharaan air, pembangunan mampan, NAHRIM, kecekapan tenaga.*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

KEBERKESANAN DAN IMPLIKASI SISTEM PENUAIAN AIR HUJAN (SPAH).

PENYELIA: ZARINAH BINTI ZAINI

PELAJAR :

MUHAMMAD DANISH FAKHRULLAH BIN ZULKIFLI (08DKA22F1202) II MUHAMMAD AZRULL BIN ABDUL AZMIN (08DKA22F1218)

PENERANGAN PROJEK

- Kajian ini mengkaji keberkesanan Sistem Penuaian Air Hujan (SPAH) di Institut Penyelidikan Air Kebangsaan Malaysia (NAHRIM). SPAH berfungsi untuk mengumpul dan menyimpan air hujan bagi kegunaan alternatif, sekali gus dapat mengurangkan penggunaan air terawat .



OBJEKTIF

- Mengenalpasti status pelaksanaan sistem penuainan air hujan (SPAH) di Institut Penyelidikan Air Kebangsaan Malaysia (NAHRIM)
- Menilai keberkesanan sistem penuaian air hujan (SPAH) sebagai sumber air alternatif di Institut Penyelidikan Air Kebangsaan Malaysia (NAHRIM)

KESAN

- Secara purata SPAH telah terbukti dapat menjimatkan air sehingga 30% dan berpotensi untuk mengurangkan bil air dengan ketara. Langkah ini dapat membantu menangani isu kekurangan air terawat dan turut menyumbang kepada pengurangan penggunaan tenaga di pusat rawatan air.

KEUNIKAN

- SPAH di NAHRIM menghasilkan produk inovatif, seperti air minuman berasaskan air hujan ("Cloud-Rain" dan "Rain-Drop"). Keupayaannya dapat mengurangkan kos dan pergantungan terhadap air terawat menjadikannya sistem alternatif yang praktikal dan berkesan.

POTENSI KOMERSIAL

- Sistem Penuaian Air Hujan (SPAH) menawarkan penyelesaian untuk penjimatan air yang boleh digunakan secara meluas di sektor awam dan swasta, terutama sekali bagi bangunan besar. Dengan menggunakan SPAH, kos bil air dapat dikurangkan, sekali gus dapat memberi impak ekonomi yang positif bagi industri yang memerlukan bekalan air yang berterusan.

MATLAMAT PEMBANGUNAN MAMPAN (SDG)

- Projek SPAH ini selaras dengan SDG 6 (Air Bersih dan Sanitasi) dengan menggalakkan pengurusan air yang mampan dan mengurangkan pergantungan terhadap sumber air konvensional.



MACKTOSH ENGINEERING LEARNING APPLICATION

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Choong Siew Lay

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Abstract

The advancement of smartphone technology ought to be applied in the field of teaching and learning (PdP) as well as internet access and communication. The goal of this project is to create mobile applications that will serve as instructional tools for civil engineering students as they handle machinery and carry out Mackintosh experiments in the lab. The ADDIE instructional design paradigm, which has five phases analysis, design, development, implementation, and evaluation is the model from which this application development method is derived. The YouTube video storage website, which is a component of web 2.0 technology, helped with the composition and development of the material for this application. A few of the factors that have been found to contribute to students not being able to operate the measurement equipment are that the practical session is conducted in groups and that the lecturer finds it challenging to conduct the equipment demonstration session. As a result, this application is made to serve as a teaching tool, giving students access to interactive notes and videos that demonstrate how measurement equipment works. Before or after the class, there is also the option for two-way communication between the instructor and students.

Keywords : *Mackintosh Probe Laboratory equipment and demonstrations, Android Applications*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

TITLE OF PRODUCT

CHOONG SIEW LAY
ADIB UZAIR(08DKA22F1207) AND ASHRAF HAKIMI(08DKA22F1212)

PROJECT DESCRIPTION

- This project involved developing a custom lab learning application from scratch to support students in a laboratory setting. Designed specifically for use in educational labs, the app provides essential guidance on lab safety, procedural steps, and the operation of specialized equipment, such as the Mackintosh Probe Laboratory Instruments. Its goal is to improve students' comprehension, safety practices, and confidence in independently performing lab tasks. The application offers real-time access to step-by-step instructions and safety reminders, reducing students' reliance on instructors and enabling a more self-directed approach to lab work. Key features include safety guidelines, equipment usage tips, and lab procedure. Built entirely from zero, the app was customized to directly meet the needs of lab-based learning, making it a unique and valuable tool for both students and educators.

OBJECTIVE



- To develop an application for Mackintosh Probe test "Macktosh Engineering Learning Application
- To determine the functionality of the application
- To assess students' comprehension of operating Mackintosh Probe Laboratory Instruments and conducting laboratory procedures.

IMPACT

- Enhanced Student Comprehension: The app led to a 18% improvement in quiz scores, showing a strong impact on students' understanding of lab procedures and safety protocols
- Increased Student Confidence and Satisfaction: Students reported feeling more prepared and capable, with greater independence in lab tasks, reducing their reliance on instructors for routine support.

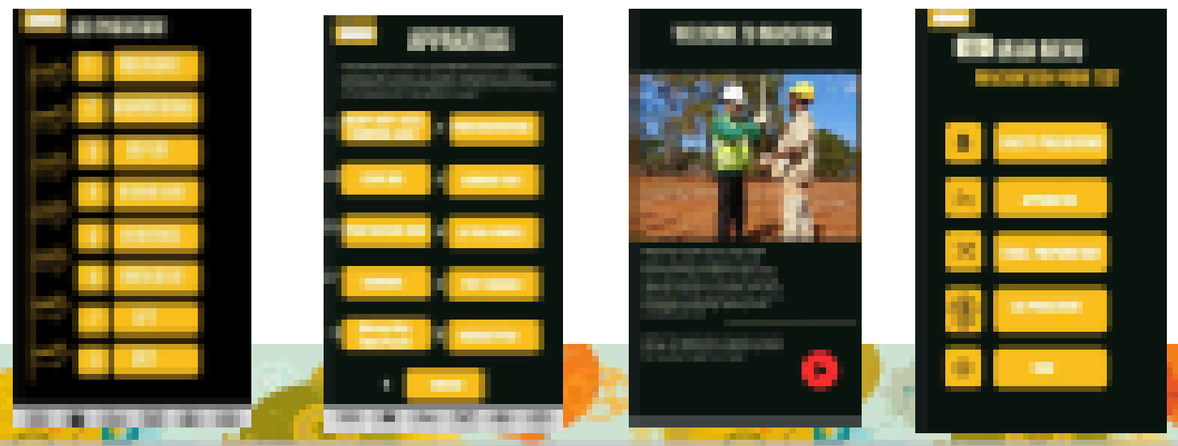
COMMERCIAL POTENTIAL

- Cost: Built from the ground up with zero costmaking it an affordable solution for educational institutions.
- The app can be marketed to a range of institutions, as it directly supports students in lab-based courses
- there is growing demand for low-cost, effective learning tools designed specifically for labs.
- the app reduces instructors' time spent on routine questions, freeing them to focus on more complex teaching needs.

SUSTAINABLE DEVELOPMENT GOALS

- The application directly supports SDG 4 by promoting quality education through accessible, practical learning

PRODUCT PICTURE



NOVELTY

- This lab learning application is unique because it was built entirely from scratch to meet the specific needs of students working in a lab environment. Unlike other educational tools, this app was custom-designed to focus on lab safety, step-by-step instructions, and guidance for using specialized equipment like Mackintosh Probe Laboratory Instruments. Starting from zero allowed the app to be fully tailored to lab tasks, providing students with exactly what they need to work safely and confidently.

FINAL PROJECT COMPETITION
& EXHIBITION
SESSION I:2024/2025

DIPLOMA IN BUILDING SERVICES ENGINEERING

DPB
5A

ZEPHYR WELDING HOOD WITH VENTILATION

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Abstrak

Projek ini membangunkan topi keselamatan kimpalan dengan sistem pengudaraan yang menggunakan bahan utama seperti motor blower dan kipas ekzos. Tujuan utama rekaan inovasi ini adalah penyingkiran asap kimpalan daripada memasuki anggota pernafasan diri pengimpal dan meningkatkan keselamatan mereka semasa kerja-kerja kimpalan serta memberi keselesaan tambahan dalam proses kimpalan. ZEPHYR ini dilengkapi dengan sistem yang mampu menghindarkan asap kimpalan jauh dari pernafasan pengimpal, di samping menurunkan suhu dalam topi keselamatan kimpalan bagi meningkatkan keselesaan semasa kerja. Sorotan literatur merangkumi kandungan asap kimpalan, risiko kesihatan yang berkaitan, serta kajian mengenai peralatan perlindungan peribadi yang ada di pasaran. Metodologi penyelidikan ini terdiri daripada pendekatan kualitatif dan kuantitatif. Kaedah kualitatif melibatkan maklumbalas yang diperoleh dari temubual pengguna. Sementara itu, kaedah kuantitatif melibatkan pengukuran keberkesanan motor blower dalam menghalang asap kimpalan daripada memasuki kawasan pernafasan pengimpal dan mengukur suhu di dalam topi keselamatan kimpalan. Ujian lapangan ini melibatkan tiga kawasan kimpalan yang berbeza menggunapakai pengimpal yang berpengalaman. Secara keseluruhan, rekaan ini memberikan penyelesaian yang praktikal dalam mengurangkan risiko kesihatan yang berpunca daripada asap kimpalan, dan sesuai diaplikasikan di pelbagai industri. Analisa menunjukkan bahawa hampir kesemua pengimpal bersetuju dengan idea dan konsep ZEPHYR. Walaubagaimanapun, beberapa penambahbaikan disarankan, seperti peningkatan aliran udara dalaman untuk penggalakan pengudaraan yang lebih cekap dan dapat menurunkan suhu dalam topi. Mereka berpendapat bahawa ZEPHYR perlu lebih ringan agar selesa semasa digunakan. Akhir sekali, keupayaan kipas dalam menyingkirkan asap kimpalan dari rongga pernafasan perlu dikaji dengan lebih mendalam.

Keywords : *Topi keselamatan kimpalan, sistem pengudaraan, asap kimpalan, masalah kesihatan, kawasan pernafasan*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

ZEPHYR WELDING HOOD WITH VENTILATION

SUPERVISOR: SIR AZIZI MURSIDY BIN ZAINOL ABIDIN

1. AMIER RYAN SHAH BIN ABDUL RAHIM 2. NAZRIN SHAH BIN NASARUDDIN 3. TAN YING XIN

DESKRIPSI PROJEK

Projek ini bertujuan untuk mereka bentuk dan membangunkan helmet kimpalan yang dilengkapi dengan sistem kipas bersepadu untuk meningkatkan keselamatan dan keselesaan pengimpal dengan berkesan mengeluarkan asap kimpalan dari zon pernafasan.

OBJEKTIF

- Meningkatkan kesihatan pernafasan pengguna dengan mengurangkan pendedahan kepada asap kimpalan berbahaya.
- Meningkatkan keselesaan dan produktiviti pengguna dengan menyediakan dan persekitaran kerja yang lebih bersih dan sejuk.

IMPAK

- **Manfaat kepada Pekerja Kimpalan atau Komuniti**

Helmet kimpalan dengan sistem pengudaraan ini membantu pengimpal mengelakkan penyedutan asap berbahaya, meningkatkan kesihatan dan keselamatan mereka. Ini juga mengurangkan beban perubatan kepada keluarga dan komuniti.

- **Kesan kepada Bidang Sistem Pengudaraan**

Projek ini menyumbang kepada inovasi dalam sistem pengudaraan dengan membawa konsep ekzos mudah alih dalam peralatan perlindungan diri, membuka jalan untuk pengudaraan boleh pakai di persekitaran berbahaya.

- **Kesan kepada Penyelidik**

Pembangunan helmet ini memperkukuh kemahiran teknikal dan pengetahuan penyelidik dalam reka bentuk mekanikal dan keselamatan, memberi pengalaman berguna untuk kerjaya masa depan dalam kejuruteraan dan keselamatan alam sekitar.

NOVELTI

- Ciri Unik

Kipas terbina adalah ciri unik yang mambezakan topeng daripada produk sedia ada.

- Potensi Paten

Reka bentuk dan teknologi mungkin layak untuk perlindungan paten.

RAJAH PRODUK



POTENSI KOMERCIAL

- **Pasaran Sasaran**

Sasaran termasuk industri yang memerlukan pengimpalan, seperti sektor pembinaan, automotif, dan perkapalan.

- **Kelebihan Kompetitif**

Menawarkan penyelesaian yang padat dan bebas tangan berbanding dengan sistem pengudaraan tradisional, menggabungkan penapisan asap yang canggih dengan keselesaan pengguna.

MATLAMAT PEMBANGUNAN LESTARI (SDG)

- **SDG 3: Good Health And Well-Being**

Dengan mengurangkan pendedahan kepada asap berbahaya, helmet menyumbang kepada Kesihatan dan kesejahteraan pengimpal.

- **SDG 8: Decent Work And Economic Growth**

Kimpalan boleh meningkatkan keadaan kerja dan produktiviti pengimpal.

- **SDG 9: Industry, Innovation And Infrastructure**

Produk ini mewakili inovasi dalam peralatan kimpalan dan boleh menyumbang kepada peningkatan keselamatan tempat kerja.

KEPUTUSAN

- Analisa menunjukkan bahawa hampir kesemua pengimpal bersetuju dengan idea dan konsep ZEPHYR.

DB BOX GUARDIAN

Nur Athirah Hartini Binti Rosdi , Ahmad Dzharfan Zarizi Bin Faizan Zarizi,
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Abstrak

Kotak agihan kuasa (Circuit Unit) merupakan komponen penting dalam sistem elektrik yang berfungsi sebagai pusat pengagihan kuasa elektrik. Ia bertindak sebagai titik sambungan di mana tenaga elektrik yang masuk daripada sumber bekalan (seperti utiliti kuasa atau penjana) diagihkan ke pelbagai litar dalam bangunan atau rumah. Objektif projek ialah untuk mereka bentuk satu peranti yang mampu memberikan pencahayaan sementara kepada penghuni apabila berlaku gangguan bekalan elektrik akibat terpelantikkan MCB (Miniature Circuit Breaker) dan menginovasikan alat yang boleh mengeluarkan bunyi sebagai isyarat awal kepada penghuni apabila peti agihan kuasa menghadapi masalah. Alat ini berfungsi sebagai sistem amaran yang akan berbunyi apabila terdapat masalah teknikal seperti beban berlebihan atau litar pintas dalam peti agihan kuasa, membolehkan penghuni bertindak dengan segera sebelum masalah bertambah serius. Berdasarkan metodologi kajian yang telah kami lakukan, bangunan atau premis yang kecil, mereka menggunakan consumer unit sebagai peranti agihan elektrik ke litar-litar kecil didalam bangunan.Selain itu, pada tahun 2002 sehingga 2010 terdapat 536 kes kemalangan elektrik yang telah dilaporkan. Kami menggunakan buzzer untuk memberikan signal bunyi kepada penghuni. Oleh hal itu, penghuni akan mengesan bahawasanya terdapat masalah pada kotak agihan kuasa mereka. Dapatan kajian yang telah dianalisa melalui google form yang diedarkan mendapati bahawa 77% penghuni bersetuju sekiranya terdapat satu produk yang boleh memberikan pemberitahuan awal kepada sekiranya terdapat masalah pada kotak agihan kuasa mereka. Walaubagaimanapun, masih terdapat beberapa penambahbaikan yang perlu dilakukan supaya dapat memberikan pemberitahuan kepada telefon penghuni dan diharapkan dapat memudahkan lagi pengguna. Kesimpulannya, kami mendapati bahawa objektif untuk membangunkan satu peranti yang boleh memberikan pecahayaan dan pemberitahuan dari segi bunyi adalah tercapai, namun penambahbaikan masih perlu dilakukan.

Keywords : *Mackintosh Probe Laboratory equipment and demonstrations, Android Applications*



DB BOX GUARDIAN

SUPERVISOR'S NAME: PUAN SARAH AFZAN BINTI ABD KARIM



NUR ATHIRAH HARTINI BINTI ROSDI



AHMAD DZARFAN ZARIZI BIN FAIZAN ZARIZI

PROJECT DESCRIPTION

Projek ini diciptakan untuk mengesan masalah pada peti agihan kuasa dan memberikan notifikasi kepada penghuni. Ia akan berbunyi apabila MCB terpelantik dan memberikan pencahayaan sementara jika bekalan elektrik terputus. Oleh itu, ia memudahkan penghuni untuk mengangkat semula MCB. Buzzer akan mengeluarkan bunyi supaya penghuni dapat mengetahui bahawasanya peti agihan kuasa mempunyai masalah

OBJECTIVE

>>Mereka bentuk satu peranti yang boleh memberi pencahayaan sementara kepada penghuni untuk mengangkat semula MCB yang terpelantik

>>Menginovasikan satu alat yang boleh mengeluarkan bunyi untuk memberi isyarat kepada penghuni bahawa peti agihan kuasa mempunyai masalah

COMMERCIAL POTENTIAL

>>Penduduk yang kurang berkemampuan untuk membeli produk yang sedia ada kerana harganya yang mahal

IMPACT

>>Pemberitahuan

Pemberitahuan yang diberikan dapat membolehkan penghuni rumah mengambil Tindakan awal sebelum masalah kecil menjadi semakin besar

>>Pencahayaan Sementara

Pencahayaan ini dapat memberikan cahaya dalam situasi yang berpotensi berbahaya dan membolehkan penghuni

SUSTAINABLE DEVELOPMENT GOALS



>>SDG7: AFFORDABLE AND CLEAN ENERGY



>>SDG11 : SUSTAINABLE CITIES AND COMMUNITIES

NOVELTY

>>Fungsi Unik

Pencahayaan dan isyarat bunyi yang diberikan membezakan produk yang sedia ada

PRODUCT PICTURE



SOLARSCULPT FURNICHARGE

Siti Maryam binti Mohd Nasrullah, Deebenthira Sai Rao, Nareen A/L Annadurai, Ismail bin Muhammad Basir Lubis, Jamilah Binti Abbas

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Abstrak

SolarSculpt FurniCharge merupakan meja perkelahan yang dibina bersama solar yang dibina bersamanya. Tujuan produk ini dicipta adalah untuk mereka cipta produk yang memberi bekalan tenaga elektrik sewaktu melakukan aktiviti di kawasan yang kurang tenaga elektrik. Walaupun generator yang mengalirkan arus elektrik sudah terjual di pasaran namun ia merupakan alatan yang bising dan berat. Penggunaannya akan menyukarkan pengguna sejurus menyebabkan pencemaran bunyi. Menurut artikel Astro Awani Online (24 Disember 2023), “Tenaga solar perlu diperluas segera, berpotensi jadi sumber penting elektrik negara”, pakar menyatakan bahawa penggunaan tenaga solar di negara ini perlu diperluas segera memandangkan ia berpotensi menjadi antara sumber terpenting untuk tenaga elektrik. Kajian penerimaan produk ini dilakukan kepada hampir 100 orang responden (20 setiap skop) yang terdiri daripada pelajar Politeknik Sultan Salahuddin Abdul Aziz Shah dan orang awam melalui kaedah kuantitatif (soal selidik) dan kualitatif (pemerhatian dan temu bual) . Hasil kajian menunjukkan 87% bersetuju untuk pembinaan produk SolarSculpt FurniCharge memandangkan meraka kerap mengalami masalah ketidakcukupan bekalan tenaga elektrik sewaktu melakukan aktiviti di luar. Seterusnya, 70% daripada responden bersetuju kerana penggunaan produk ini amat cekap kerana cahaya matahari mudah untuk didapati disebabkan oleh negara kita yang berkedudukan khatulistiwa. Ujian juga mendapati bahawa produk kami memerlukan masa yang diperlukan untuk mengecas 18V solar panel kami kepada bateri adalah 7 jam bagi tempoh 2 jam 30 minit penggunaan tanpa solar. Maka, produk ini ditambah baik dengan menggunakan solar panel dengan kuasa yang lebih besar bagi memendekkan waktu mengecas solar panel. Hasil penambahbaikan mengecas 35V solar kepada bateri adalah 4 jam, 3 jam kurang berbanding 18V. Namun begitu, penggunaan meja tanpa solar kekal selama 2 jam 30 minit. Kesimpulannya, meja solar ini dapat menjana elektrik tanpa perlu bergantung kepada tenaga sedia ada. Kita dapat menggunakan meja solar ini pada berbagai fungsi dan aktiviti.

Keywords : *meja solar, cahaya matahari, bekalan elekttik, sumber penting*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

SOLARSCULPT FURNITURE

PUAN JAMILAH BINTI ABBAS
DEEBENTHIRAA SAI RAO A/L SUBBARAO
NAREEN ANNADURAI
SITI MARYAM BINTI MOHD NASRULLAH
ISMAIL BIN MUHAMMAD BASIR LUBIS

PROJECT DESCRIPTION

•SolarSculpt Furniture is an innovative portable solar-powered table designed for outdoor enthusiasts, festival-goers, and mobile vendors. Our product is engineered to be lightweight and easy to carry, making it perfect for camping trips, food truck festivals, and other outdoor events. The table is equipped with a built-in battery, socket, and inverter, allowing users to power essential devices such as smartphones, fans, and small electronics. With a charging capacity that lasts approximately one hour, SolarSculpt Furniture offers convenient, eco-friendly energy on the go, enhancing the outdoor experience without relying on conventional power sources

OBJECTIVE

- they create products that provide electricity while doing activities in areas where it is difficult to get electricity.
- develop an electric generator that generates electricity that is lighter, quieter and multi-functional

IMPACT

- Public can get electricity where they are since the solar is chargeable.
- steps in developing and further increasing the level of the economy so that it is more advanced in the future

NOVELTY

Modular Design with Customizable Panels:

- **Swappable Solar Panels:** Offer the table with interchangeable solar panels that come in different designs or power capacities. Users can choose different aesthetic panels for events or additional power generation.
- **Foldable or Detachable Parts:** Ensure the table is collapsible or has detachable legs, making it more portable and easy to carry. You could also introduce magnetic or clip-on extensions, like built-in lights or extra outlets

COMMERCIAL POTENTIAL

•**Market Trends:**
•**Sustainability Focus:** With the rising demand for eco-friendly products, solar-powered furniture appeals to both consumers and businesses prioritizing sustainability

SUSTAINABLE DEVELOPMENT GOALS

•**Affordable and Clean Energy (SDG 7)**
•**Goal:** Ensure access to affordable, reliable, sustainable, and modern energy for all.
•**Contribution:** SolarSculpt Furniture directly supports clean energy by integrating solar panels into its design, reducing dependence on non-renewable energy sources. It promotes the use of renewable energy in everyday settings like outdoor spaces, homes, or public areas

PRODUCT PICTURE



LEVEL LIT STEP LADDER

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Abstract

The “LEVEL LIT STEP LADDER” represents an innovative idea in ladder design. by addressing common user issues, such as inadequate lighting in surrounding areas, safety concerns regarding step usage, and stability issues withtraditional ladder lockspreaders. The projectaims to developand evaluate a new ladder design to addressing usability and safety concerns associated with traditional ladders. It focuses on producingilluminated steps toenhance visibility andimproving user safetythrough a firmlocking mechanism. The purposeof current researchis to addbeneficial applications suchas lighting playsa crucial role inmaintaining ladder safetyby ensuring thatusers can clearlysee their surroundings,which helps in identifying potential hazards such as uneven surfaces and obstacles. A LI-ION battery 3.7 v with 4200mAH is used for this project and it's able to hold for 5 hours if usingthe prototype continuously and able to be recharged. While for sensor testing, we are using HC--SR501 Body Sensor Module with 23mm diameter. one unit of motion sensor are used to detect the movement of user that it will activate the light until 12second then itwill be deactivatedif there wereno activities ofmovement nearby. Forthe final result, thetest for batteryperformance is thetime taken tocharge (h) is3 hours andthe use of a continuous life of 5 hours. The next performance sensor, the activation sensor for the test(s) is 12 seconds whilethe activation sensorfor the actualtest is 1minute. In conclusion,the project isto addresses the limitations of traditional ladders by integrating innovativefeatures that enhance safety, usability, and user experience. Throughcomprehensive research anduser feedback, thedesign incorporates improved lighting and a robustlocking mechanism, ensuringgreater stability andvisibility in variousworking conditions. This projectnot only contributesto technological advancementin ladder designbut also prioritizes user welfare, making it a valuable addition to both professional and household settings.

Keywords : *Ladder, lighting, Illuminated, Visibility, Falls*

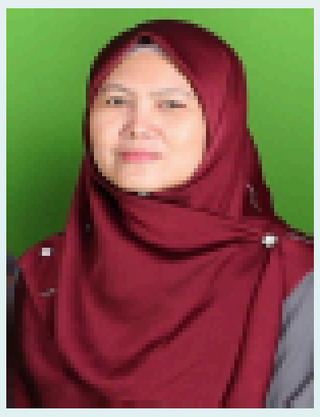
FINAL PROJECT

Competition and Exhibition

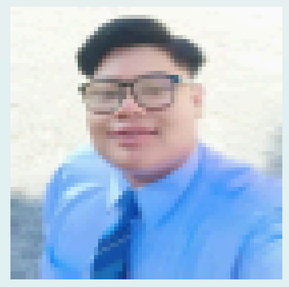
SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

LEVEL LIT STEP LADDER



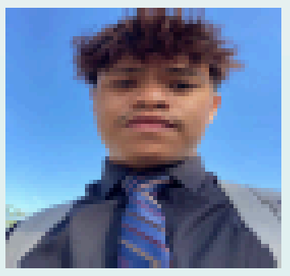
Rohaza Binti Majid
(Penyelia Projek)



Luqmanul Hakeem
Bin Zulfikri



Muhammad Afiq bin
Mohd Nazlee



Muhammad Izyraf
Amayar Bin Tajulazam

PENERANGAN PRODUK

➢ **Level Lit Step Ladder** adalah tangga mudah alih inovatif yang dilengkapi dengan lampu Light Emitting Diode (LED) boleh dilaras sehingga 180°, membolehkan pengguna mengawal arah cahaya sesuai keperluan kerja, terutamanya dalam kawasan kurang pencahayaan seperti tapak pembinaan. Ianya mendapat sumber tenaga daripada 2 unit bateri yang bertahan sehingga 4 jam. Tangga ini bebas dari sambungan kabel, menawarkan kemudahan penggunaan di pelbagai lokasi. Reka bentuk ergonomik dan ringan menjadikannya mudah dibawa, sementara penggunaan LED menjimatkan tenaga dan mesra alam. Dengan pencahayaan yang lebih terang, produk ini juga meningkatkan keselamatan pengguna, mengurangkan risiko terjatuh dalam situasi gelap.

OBJEKTIF

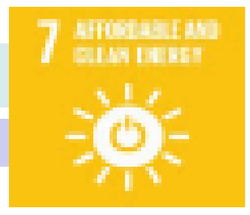
➢ Menghasilkan anak tangga berlampu sebagai penunjuk arah yang jelas serta mengelilingi tangga bagi memudahkan pergerakan pengguna terutamanya dalam keadaan gelap.

➢ Meningkatkan keselamatan kepada penguna dengan tambahan pengunci tangga.

POTENSI KOMERSIAL

➢ Inovasi tangga dengan lampu boleh laras 180 darjah membantu pengguna melihat persekitaran kerja dengan lebih baik, terutamanya di kawasan gelap atau ruang sempit. Ciri keselamatan ini menarik perhatian pengguna yang menitikberatkan keselamatan semasa melakukan kerja di tempat tinggi atau sudut gelap.

MATLAMAT PEMBANGUNAN MAMPAN



➢ **SDG 7: Tenaga Bersih dan Mampan**

- Penggunaan lampu LED adalah lebih cekap tenaga menyokong SDG7 berbanding lampu tradisional kerana menggunakan kuasa yang lebih rendah dan mengurangkan kos elektrik. Ini membolehkan pengguna menjimatkan tenaga dan mengurangkan pelepasan karbon, seterusnya menyumbang kepada alam sekitar yang lebih hijau.

KEUNIKAN

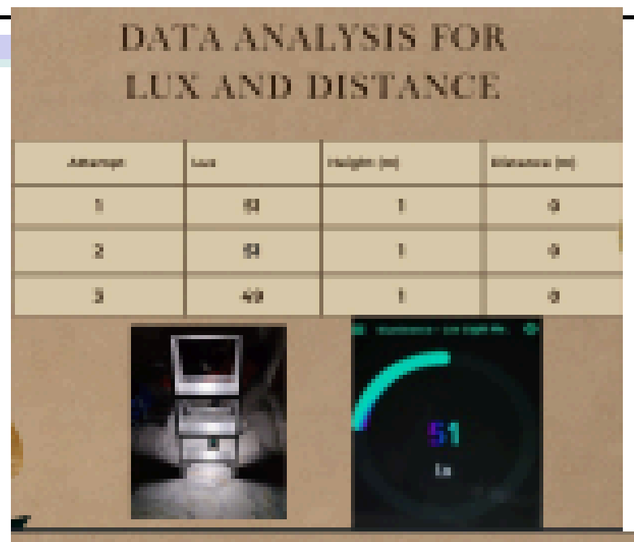
➢ Lampu LED yang boleh dilaras sehingga 180 darjah memberikan fleksibiliti kepada pengguna untuk menerangi sudut yang sukar dicapai dan memastikan ruang kerja sentiasa terang tanpa memerlukan lampu tambahan.

IMPAK

➢ Lampu LED yang dipasang pada tangga meningkatkan kecekapan kerja kerana pengguna tidak perlu memasang lampu tambahan atau mengatur sumber cahaya lain.

GAMBAR PRODUK





MAG-IQ (VAKUM MAGNETIK PINTAR)

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Abstrak

MAG-IQ adalah sebuah produk inovasi yang direka untuk menyedut habuk dan serpihan logam besi menggunakan teori penyedut hampagas dan elektromagnet. Serpihan logam yang dihasilkan daripada proses pemotongan besi di bengkel paip dan kimpalan sering melekat pada berus penyapu dan kain ketika pembersihan, yang menjadikan proses tersebut kurang efisien dan memakan masa yang lama. Menurutartikel Berita Harian Online (6 Februari 2018) bertajuk “Analisis makmal kenal pasti bahaya debu habuk”, proses pembersihan bengkel memerlukan inovasi untuk pengasingan habuk besi dengan lebih cekap. Objektif produk ini adalah untuk mereka bentuk alat penyedut hampagas yang lebih efisien dalam mengumpul habuk dan serpihan logam, menjimatkan masa dan tenaga. MAG-IQ ditambah baik dengan memasang sistem elektromagnet berkuasa 24-volt pada bahagianhadapan alat penyedut habuk. Kajian penerimaan produk ini dilakukan terhadap 52 responden yang terdiri daripada pengguna bengkel dan makmal di Politeknik Sultan Salahuddin Abdul Aziz Shah sertaKolejVokasional Sungai Buloh, Selangor. Ujianproduk dijalankan di empat lokasi bengkel yang berbeza, dengan data dikumpulkan melalui kaedah kuantitatif (soal selidik) dan kualitatif (pemerhatian dan temu bual). Hasil kajian menunjukkan 98.1% responden bersetuju bahawa MAG-IQ berfungsi dengan baik dalam menyedut habuk dan serpihan logam tanpa menjejaskan prestasinya, manakala 90.4% responden bersetuju bahawa ia dapat mengurangkan risiko kesihatan seperti penyedutan debu atau serpihan logam. Ujian juga mendapati purata masa yang diambil untuk membersihkan habuk menggunakan MAG-IQ adalah 2 minit 4 saat, berbanding 4 minit 4 saat dengan kaedah konvensional, serta lebih ergonomik. Kesimpulannya, maklum balas terhadap produk MAG-IQ adalah positif dan inovasi ini berpotensi besar untuk memudahkan pembersihan bengkel secara lebih efisien dan mengurangkan risiko kecederaan serta masalah kesihatan, dengan penambahbaikan yang berterusan.

Keywords : *Vakum magnet, sisabesi, bengkel, habuk*

FINAL PROJECT
Competition and Exhibition
SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

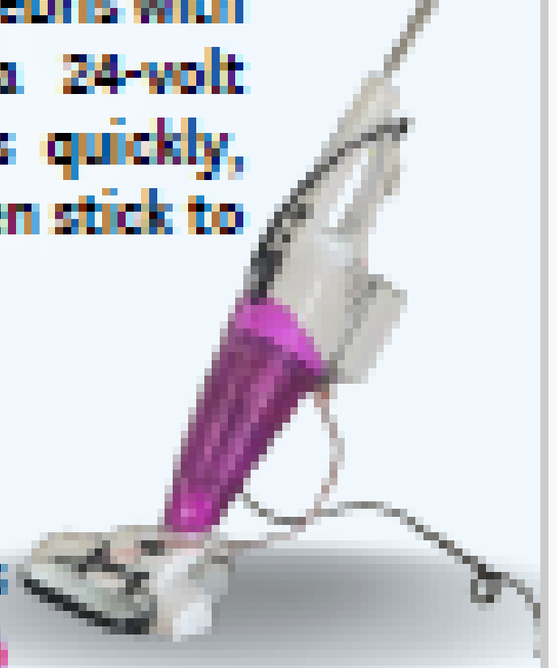


MAG-IQ
"SMART MAGNETIC- VACUUM"



1 INTRODUCTION
"PRODUCT DESCRIPTION"

MAG-IQ is an innovative product designed to remove metal dust and debris with vacuum suction and electromagnetic technology. Powered by a 24-volt electromagnetic system, MAG-IQ collects dust and metal particles quickly, improving cleaning efficiency in workshops where metal particles often stick to broom bristles



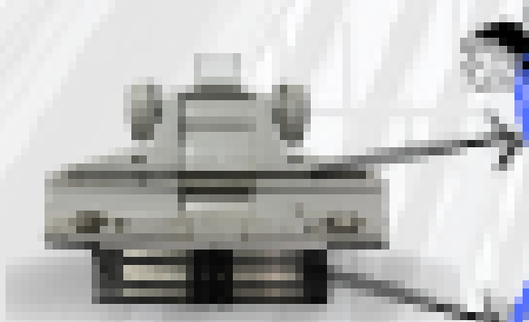
2 WHY?
"PROBLEM STATEMENT"

- Metal shavings and dust in workshops stick to brooms, brushes, and cloths.
- Cleaning takes a long time and is difficult because dust and metal particles mix together.

3 WHAT?
"OBJECTIVES"

1. Designing an innovative vacuum suction device (Vacuum) that can suck dust and metal.
2. Produce a vacuum cleaner more efficiently in terms of saving time and energy.

4 HOW?
"COMPONENT ABILITIES"



The vacuum head removes dust from different surfaces and reaches tight spaces

The electromagnetic system picks up metal debris from the floor.

5 WHERE?
"COMMERCIAL POTENTIAL"

- Ideal for workshops and industries needing quick, easy cleaning of metal dust and debris.
- Combines vacuum and magnet functions to save time and improve cleanliness.
- Suitable for schools, training centers, and factories focused on safety and efficiency.

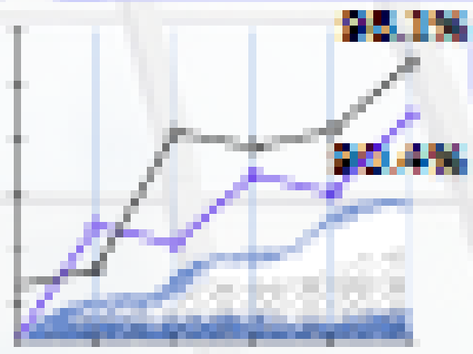
6 BLOCK DIAGRAM?
"WORKING METHODOLOGY"

Power Relay: Sends power to the WiFi board and electromagnetic system.

WiFi Board (ESP 288-01): Turns on the system and logs usage data to Google Sheets.

Electromagnetic System: Activates to pick up metal debris from the floor.

7 RESULT & FINDINGS?



Respondents agreed that the Mag-IQ [illegible] performance.

Respondents agreed that it can help lower health risks, like breathing in dust or metal fragments.

DURING THE RUN TEST

Conventional Methods [illegible] minutes 4 seconds

MAG-IQ ..... 2 minutes 4 seconds

8 IMPACT?
"PROJECT SIGNIFICANCE"

Great Potential - Reduced cleaning time by 49.2%

User Friendly Operation - Improved safety by reducing dust inhalation

Easy to Monitor - Equipped with an Internet Of Things (IOT) system to help users.

FAHULYN LEV SYSTEM

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Abstrak

Proses kimpalan menghasilkan asap dan zarah-zarah halus yang berpotensi membahayakan Kesihatan pekerja jika terdedah dalam jangka masa panjang. Pemasangan system Pengudaraan Ekzos Tempatan (LEV) di bengkel kimpal adalah salah satu langkah penting dalam memastikan persekitaran kerja yang selamat dan sihat. Pemasangan sistem LEV bertujuan untuk memerangkap dan mengeluarkan asap serta bahan cemar sebelum ia tersebar di ruang bengkel. Pencemaran udara yang boleh menjejaskan kesihatan, keselamatan dan kualiti kerja kerana asap dari kerja kimpal ini mengandungi bahan-bahan yang berbahaya kepada Kesihatan seperti PM10 (Particulate Matter 10) iaitu zarah yang bersaiz kurang dari 10 mikrormeter dan formaldehid (HCHO) . Objektif pemasangan sistem LEV di bengkel kimpal adalah untuk mengurangkan tahap pendedahan pepelajar kepada bahan pencemar yang dihasilkan semasa proses kimpalan, serta meningkatkan kualiti udara dalam bengkel. Selain itu, pemasangan ini juga bertujuan untuk mematuhi piawaian keselamatan dan Kesihatan pekerjaan yang ditetapkan, sekaligus mengurangkan risiko penyakit akibat pendedahan kepada bahan toksik. Kipas ekzos yang dipasang akan menyedut udara yang tercemar dan sistem penapis akan membersihkan udara. Hasil ujian ke atas system ini menunjukkan keberkesanannya dalam menapis bahan pencemar secara efisien, sekaligus memastikan kualiti udara yang lebih selamat dan sihat dalam persekitaran kerja kimpalan. Dengan adanya sistem LEV yang berfungsi dengan baik, bengkel kimpal boleh mewujudkan persekitaran kerja yang lebih selamat dan produktif. Sebagai kesimpulan, sistem LEV memainkan peranan penting dalam memastikan kebersihan udara dan keselamatan pekerja di bengkel kimpal.

Keywords : *LEV, pencemaran udara, asap, kualiti udara*

FINAL PROJECT

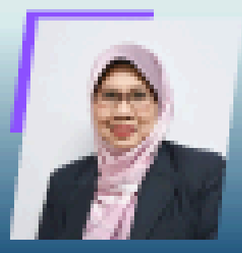
Competition and Exhibition

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FAHULYN LEV System

PENYELIA

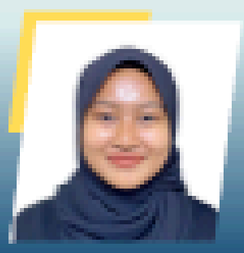


ROSIDA BINTI AHMAD

AHLI KUMPULAN



AHMAD FAHMIE



ELLYN SYAFIKA



NUR HUMAIRAH

01 Penerangan Produk

FAHULYN LEV SYSTEM - Local Exhaust Ventilation System (LEV System).

Kaedah yang mengawal bahan cemar terapung di udara dengan mengalihkan dan memerangkapnya ke tempat berdekatan dengan kawasan penjanaan atau pelepasan dan menghalangnya daripada merebak keseluruh bangunan atau dihidu oleh pelajar yang berada di ruang kerja kimpalan di bengkel paip Politeknik Sultan Salahuddin Abdul Aziz Shah (PSA)

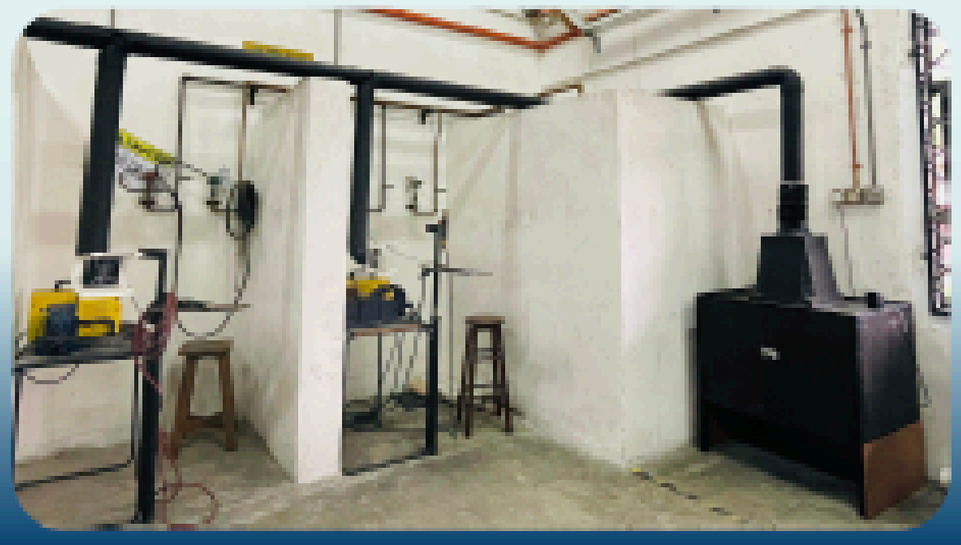
02 Objektif

- Mereka bentuk LEV Sistem untuk kerja-kerja kimpal di bengkel.
- Mengkaji keberkesanan produk pemasangan LEV Sistem.

03 Ketulenan

Penambahbaikan dari segi keselamatan dan kesihatan pekerja

04 Gambar Produk



05 Impak

- Dapat membantu mengurangkan pendedahan kepada asap dan gas berbahaya, mengurangkan risiko masalah pernafasan dan penyakit berkaitan dengan pendedahana jangka panjang.
- Pengguna dapat melihat dengan lebih jelas dan fokus pada kerja, yang meningkatkan ketepatan dan kualiti kimpalan.

1) Bacaan Tanpa Produk

Bacaan Tanpa Produk			
Qualiti Udara	20 Saat	40 Saat	60 Saat
HCHO (mg/m3)	0.017	0.016	0.022
TVOC (mg/m3)	0.047	0.033	0.058
PM2.5 (ug/m3)	029	025	043
PM10 (ug/m3)	040	035	057
CO (ppm)	000	000	000
CO2 (ppm)	0446	0525	0602

2) Bacaan Menggunakan Produk

Bacaan Menggunakan Produk			
Qualiti Udara	20 Saat	40 Saat	60 Saat
HCHO (mg/m3)	0.021	0.012	0.018
TVOC (mg/m3)	0.058	0.033	0.047
PM2.5 (ug/m3)	999	999	999
PM10 (ug/m3)	999	999	999
CO (ppm)	000	000	000
CO2 (ppm)	0598	0446	0444

06 Potensi Pasaran

Sangat luas, terutamanya di sektor industri yang melibatkan pengendalian bahan kimia, debu, asap, dan zarah berbahaya.

07 Matlamat Pembangunan Mapan (SDG)







SCSR MACHINE

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Abstrak

Tebu (Saccharum officinarum) ialah tanaman tropika utama di Malaysia yang digunakan secara meluas untuk pengeluaran gula dan produk minuman seperti air tebu. Projek Sugar Cane Skin Remover (SCSR) Machine ini memberi tumpuan kepada pembangunan alat yang cekap untuk mengupas kulit tebu, khususnya untuk jenis tebu kuning dan hitam. Berdasarkan kajian literatur, tebu kuning lebih mudah dikupas kerana kulitnya lebih lembut berbanding tebu hitam. Dalam kajian ini, “brass wire” digunakan sebagai alat utama untuk mengikis kulit tebu kerana sifatnya yang tahan karat dan fleksibel. Proses pengikisan dijalankan pada pelbagai saiz tebu, dengan masa pengikisan diukur bagi menilai keberkesanan alat ini. Hasil kajian mendapati bahawa masa yang diambil untuk mengupas kulit tebu berbeza mengikut panjang dan diameter batang tebu. Tebu sepanjang 1 meter dengan diameter 20mm berjaya dikupas dalam masa 2 minit menggunakan SCSR Machine. Walaupun alat ini berfungsi dengan baik pada saiz tebu tertentu, penambahbaikan boleh dilakukan, seperti menggantikan “brass wire” dengan bilah yang lebih tajam untuk meningkatkan kecekapan pengupasan. Kajian ini membuktikan potensi SCSR Machine dalam membantu industri tebu tempatan, khususnya dalam proses penuaian dan penyediaan tebu untuk pengeluaran gula serta minuman.

Keywords : *tebu, kupas kulit tebu, industri tebu Malaysia, “brass wire”, kecekapan*

FINAL PROJECT

Competition and Exhibition

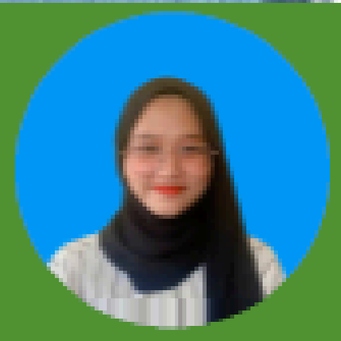
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SCSR MACHINE

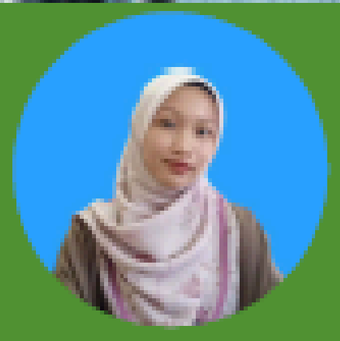


SUPERVISOR :
PUAN MARIAM BINTI ABDULLAH



HANIN NADHRAH BINTI SUHARDI

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SOFIA NURANISA BINTI JAFRI

08DPB22F1086



MUHAMMAD AIMAN ALHAKIM BIN ABD WAHID

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PROJECT DESCRIPTION

SCSR MACHINE - Sugar Cane Skin Remover

- **Membangunkan sebuah mesin yang dapat mengikis kulit tebu dengan berkesan menggunakan brass wire sebagai mata pengikis. Mesin ini direka untuk mempermudahkan proses pengupasan kulit tebu yang biasanya dilakukan secara manual iaitu menggunakan peeler. Mesin ini menggunakan brass wire bagi proses pengikisan kulit tebu dijalankan tanpa merosakkan bahagian dalam tebu.**

OBJECTIVE

- **Merekabentuk mesin mengikis kulit tebu**
- **Mengelakkan risiko berlakunya kecederaan**
- **Meminimakan tenaga kerja sehingga 50%**

COMMERCIAL POTENTIAL

- **Fokus kepada Industri tebu**

SUSTAINABLE DEVELOPMENT GOALS

- **9: Menyumbang kepada peningkatan teknologi dalam sektor industri, membantu meningkatkan kecekapan dan mengurangkan kebergantungan pada tenaga kerja manual**
- **12 : Bahan buangan dapat dikurangkan dan sumber daya dapat dimanfaatkan dengan lebih berkesan**

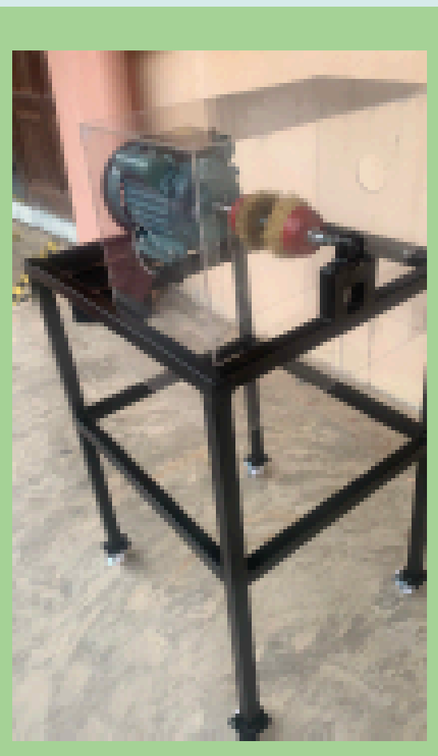
IMPACT

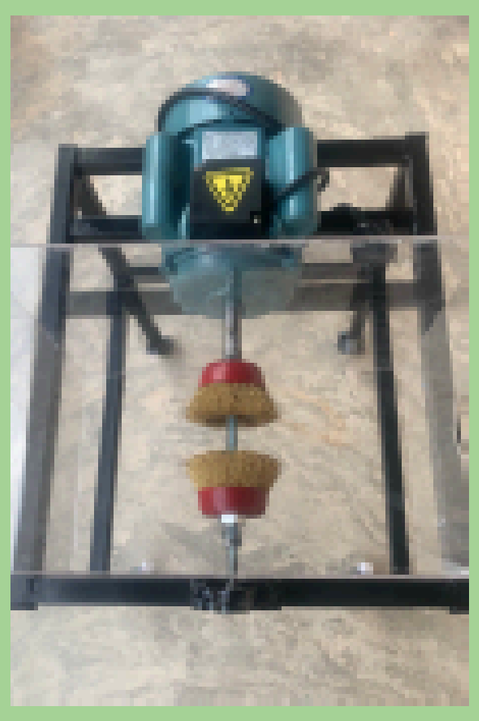
- **Dengan meminimumkan jumlah kulit tebu yang dibuang, ia boleh membantu mengurangkan sisa dalam proses pertanian**

NOVELTY

- **Mesin ini dapat mengupas kulit tebu dengan lebih cepat, dengan lebih sedikit sisa atau kerosakan pada batang tebu, berbanding dengan mesin yang sudah ada di pasaran.**

PRODUCT PICTURE





SUNSNIP

Muhammad Danial Syazwan Bin Mohamad Shahrizan, Haziq Bin Hashem, Muhammad Azmi, Aina Sofea Binti Hishamuddin, Noor Azila Binti Jamari

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Abstrak

Projek ini bertujuan membangunkan pemotong rumput solar yang lestari dan cekap, dikenali sebagai SunSnip. Projek ini menangani masalah alam sekitar yang berkaitan dengan pemotong rumput berkuasa petrol tradisional dan bertujuan menyediakan alternatif yang lebih mesra alam. Satu kajian literatur yang komprehensif telah dijalankan untuk mengenal pasti teknologi sedia ada dan penyelidikan berkaitan dengan pemotong rumput solar. Kajian ini membantu mewujudkan konteks projek dan mengenal pasti potensi cabaran dan peluang. Metodologi melibatkan mereka bentuk dan membangunkan prototaip pemotong rumput SunSnip, menggabungkan panel solar, sistem bateri, dan mekanisme pemotongan. Ujian yang ketat telah dijalankan untuk menilai prestasi, kecekapan, dan kepuasan pengguna pemotong rumput. Dapatan kajian menunjukkan kelayakan dan keberkesanan SunSnip sebagai penyelesaian penjagaan rumput yang lestari. Reka bentuk solarnya mengurangkan pelepasan gas rumah hijau dan pencemaran bunyi secara signifikan berbanding dengan pemotong rumput tradisional. Kecekapan pemotongan dan jangka hayat bateri yang panjang juga adalah ketara.. Kesimpulannya, SunSnip mewakili kemajuan yang menjanjikan dalam teknologi penjagaan rumput yang lestari. Reka bentuk inovatif dan prestasinya berpotensi menyumbang kepada masa depan yang lebih hijau dan mesra alam.

Keywords : *pemotong rumput solar, kelestarian,kesan alam sekitar, kecekapan, kepuasan pengguna*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT



SUNSNIP

SUPERVISOR: PUAN NOOR AZILA BINTI JAMARI



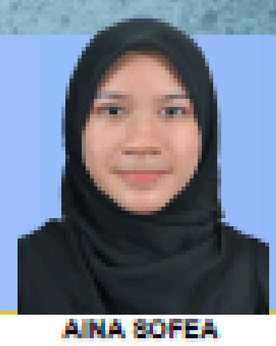
HAZIQ HASHEM
08DPB22F1059



MUHAMMAD AZMI
08DPB22F1106



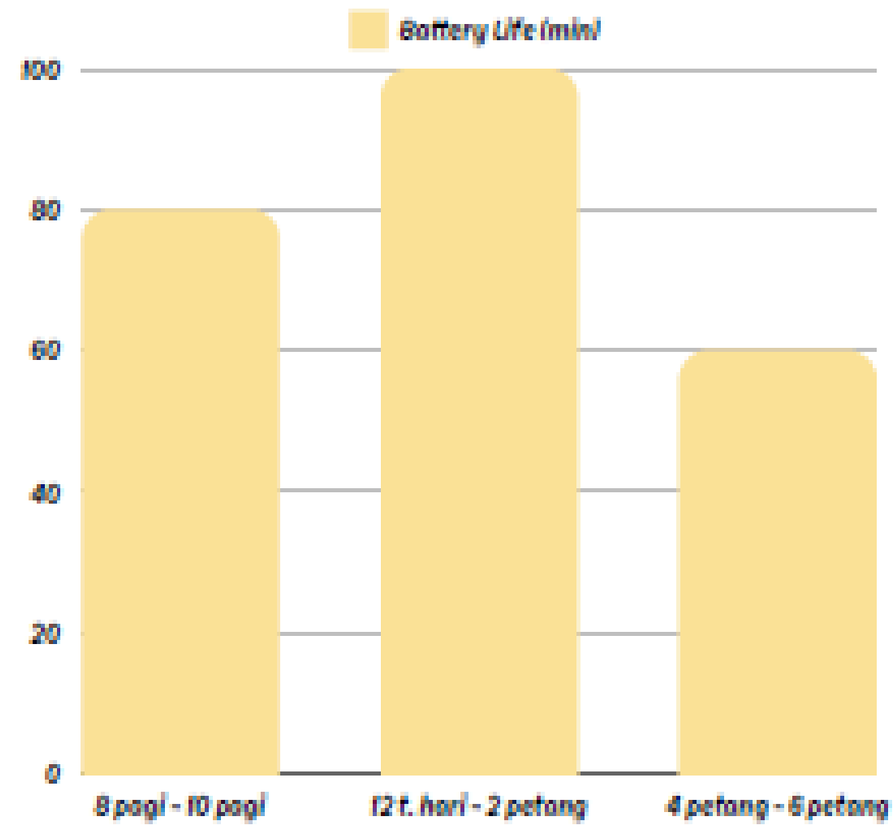
DANIAL SYAZWAN
08DPB22F1071



AINA SOFEA
08DPB22F1103

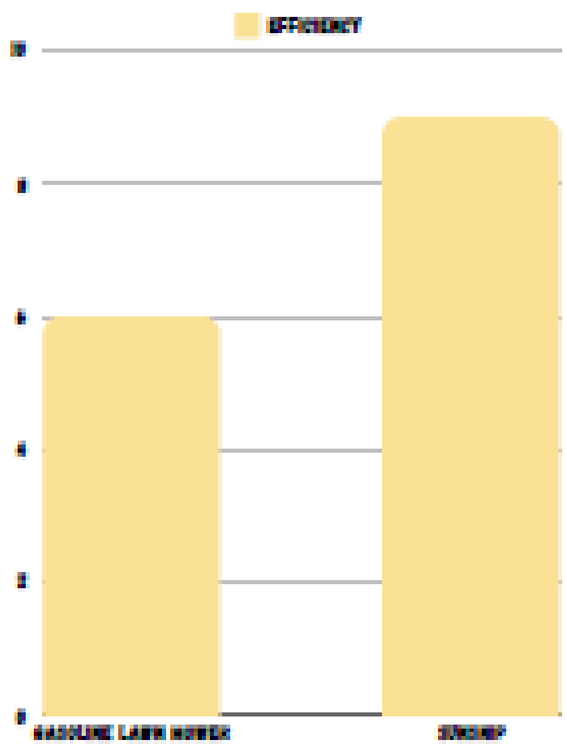
PROJECT DESCRIPTION

- SunSnip is a revolutionary lawn care tool powered by solar energy, offering a sustainable and efficient alternative to traditional gasoline-powered mowers. Equipped with advanced features like remote control, obstacle avoidance, and a user-friendly smartphone app, SunSnip provides a convenient and environmentally friendly solution for maintaining your lawn. Its powerful motor and sharp blades ensure efficient cutting performance, while its quiet operation reduces noise pollution and disturbances to neighbours. With SunSnip, you can enjoy a beautifully manicured lawn while contributing to a greener and more sustainable future.



OBJECTIVE

- To provide a sustainable and eco-friendly alternative to traditional gasoline-powered lawn mowers.
- To reduce noise pollution and carbon emissions.
- To enhance user convenience and efficiency.



COMMERCIAL POTENTIAL

- High demand for environmental friendly products.
- Potential for commercial applications in residential, commercial, and public spaces.
- Opportunity to contribute to sustainable future.

SUSTAINABLE DEVELOPMENT GOALS

- Affordable and Clean Energy:
- Sustainable Cities and Communities
- Responsible Consumption and Production

IMPACT

- Reduces carbon emissions and air pollution.
- Conserves energy and reduces dependence on fossil fuels.
- Provides a quieter and more environmentally friendly alternative to traditional lawn mowers.
- Improves user experience with advanced features and remote control capabilities.

NOVELTY

- Solar power
- Efficient and Quiet
- Smart Features
- Sustainable

PRODUCT PICTURE



FINAL PROJECT COMPETITION
& EXHIBITION
SESSION I:2024/2025

DIPLOMA IN BUILDING SERVICES ENGINEERING

DPB
5B

AIR GUN VALVE

Nur Farisah Aisyah binti Mohd Ali, Nur Maisarah binti Muhamad, Amirul Hazim bin Razali, Mior Amran Noor bin Mior Ahmad Noor

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Abstrak

Projek ini bertujuan untuk menghasilkan produk inovatif yang dinamakan Air Gun Valve, direka untuk mengatasi masalah saluran perangkap lantai dan talang air hujan yang sering tersumbat, terutama di tandas awam dan bangunan komersial. Masalah penyumbatan ini bukan sahaja mengganggu pengaliran air, tetapi juga menyebabkan bau busuk, pembiakan serangga, dan kos pembaikan yang tinggi. Air Gun Valve menawarkan penyelesaian yang lebih efisien dan selamat dengan memanfaatkan tekanan udara untuk mengeluarkan sisa buangan tanpa penggunaan tenaga yang besar atau bahan kimia berbahaya, menjadikannya sesuai untuk pekerja pembersihan. Kajian ini melibatkan analisis terhadap keperluan pengguna, kajian literatur mengenai produk sedia ada, serta eksperimen untuk menguji keberkesanan produk. Produk ini dibangunkan dengan reka bentuk yang ringan dan fleksibel bagi memudahkan penggunaannya serta menjimatkan masa dan kos.Hasil daripada ujilari yang dilakukan adalah pada perangkap lantai dan talang hujan,bacaan tertinggi 80psi mengambil masa 60 saat manakala bacaan terendah 50psi mengambil masa 120 saat Kajian menunjukkan bahawa Air Gun Valve dapat meningkatkan produktiviti dan keselamatan pengguna dengan mengurangkan kebergantungan terhadap kaedah tradisional. Ujian dan soal selidik yang dijalankan membuktikan bahawa produk ini mencapai objektif yang ditetapkan, namun cabaran kos dan pemasaran perlu diatasi agar produk dapat ditawarkan pada harga yang kompetitif, menjadikannya penyelesaian yang praktikal dan berkesan untuk penggunaan jangka panjang.

Keywords : *perangkap lantai, talang hujan, saluran, tersumbat*

FINAL PROJECT

Competition and Exhibition

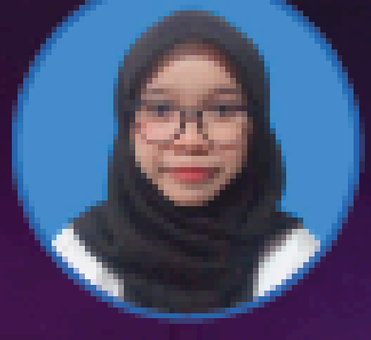
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CIVIL ENGINEERING DEPARTMENT

AIR GUN VALVE



AMIRUL HAZIM BIN RAZALI
08DPB22F1108



NUR FARISAH AISYAH BINTI MOHD ALI
08DPB22F1027



NUR MAISARAH BINTI MUHAMAD
08DPB22F1056



EN.MIOR AMRAN NOOR BIN MIOR AHMAD NOOR

DEFINISI PROJEK

Dalam era globalisasi di Malaysia, terdapat banyak masalah saluran paip perangkap lantai dan talang hujan tersumbat yang menimbulkan kebimbangan serta ketidakselesaan pengguna akibat bau busuk. Kajian ini bertujuan menghasilkan inovasi yang dapat menyelesaikan masalah saluran paip tersumbat secara efisien. Walaupun terdapat pelbagai kaedah di pasaran, namun kebanyakan mempunyai kelemahan tersendiri contohnya bahan yang mengandungi bahan berasid. Kajian ini memperkenalkan alat inovasi yang dapat digunakan pada perangkap lantai dan talang hujan untuk mengatasi masalah sisa yang tersumbat dengan lebih efektif menggunakan Air Gun Valve. Inovasi ini memastikan perangkap lantai dan talang hujan tidak lagi tersumbat, memberikan keselesaan dan kebersihan kepada pengguna. Produk ini juga dapat digunakan di perangkap lantai serta talang hujan di kawasan Politeknik Sultan Salahuddin Abdul Aziz Shah.

MATLAMAT PEMBANGUNAN MAMPAN

SDG6: Air Bersih dan Sanitasi

SDG6 berfokus pada akses sanitasi yang layak termasuk saliran air bersih yang lancar. Ketika saluran tersumbat, ia menggangu sistem pembuangan air.

SDG3: Kesihatan dan Kesejahteraan yang baik

Lingkungan yang tidak bersih akibat gangguan dalam sistem sanitasi boleh meningkatkan risiko penyakit pernafasan dasn masalah kesihatan yang lain

OBJEKTIF

i. Menghasilkan satu produk inovasi untuk mengatasi masalah saluran tersumbat dengan menggunakan tekanan angin

ii. Pengguna dapat melakukan sendiri dengan mudah serta meminimumkan tenaga dan masa pengguna.

POTENSI KOMERSIAL

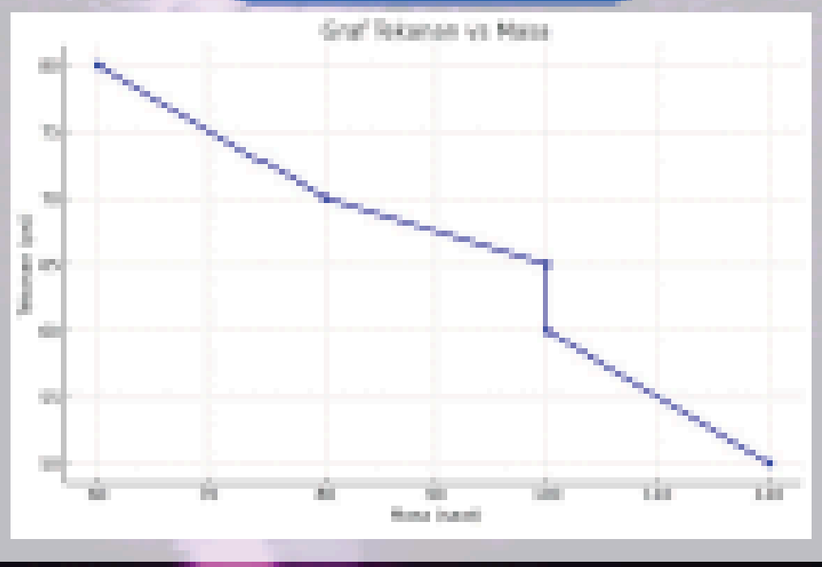
- Produk ini dapat menjimatkan masa
- Produk ini mesra pengguna
- Produk ini dapat meningkatkan produktiviti

KESAN

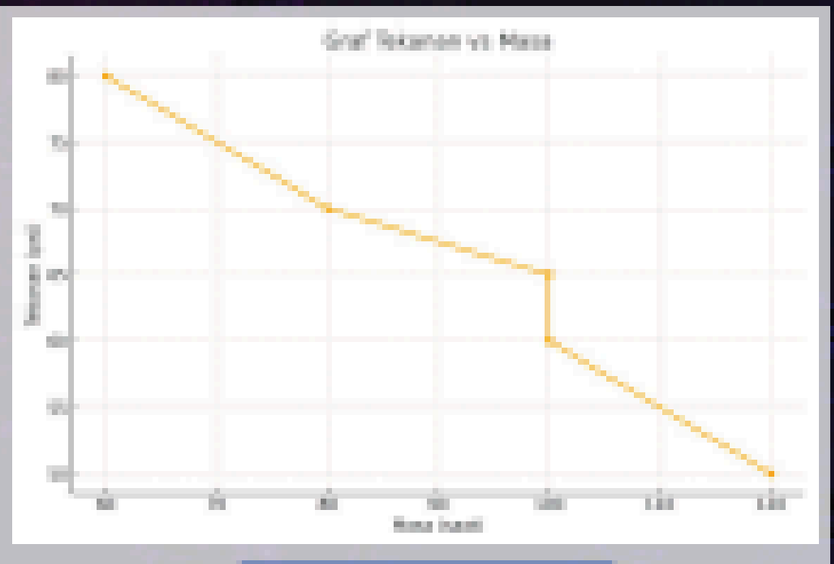
i. Ia mampu menghilangkan bau busuk

ii. Mampu mengurangkan risiko bahaya kepada pengguna tanpa menggunakan produk berasid

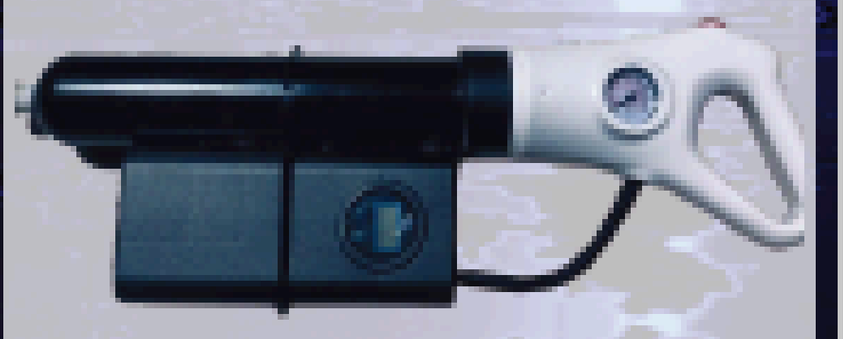
TALANG HUJAN



PERANGKAP LANTAI



PRODUK



MAIN STREET FLOOD DETECTOR

Azerill Afzal Bin Ahmad Zawawi, Syameil Hakem Bin Umor, Muhammad Afiffuddin Bin Idris, Mustazha Hakim Bin Abu Tahari

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Abstrak

Banjir adalah salah satu bencana alam yang kerap melanda Malaysia, berpunca daripada hujan lebat yang berlaku semasa musim Monsun Timur Laut sepanjang November hingga Mac. Akibatnya, air sungai melimpah dan kawasan rendah ditenggelami air. Kenaikan air yang pantas menyebabkan harta benda, kemudahan awam dan kenderaan tidak dapat diselamatkan, seterusnya mengakibatkan kerugian yang besar. Justeru itu, Main Street Flood Detector dihasilkan bagi mengesan kenaikan aras air dengan lebih cepat, di samping mengaplikasikan Internet of Things (IoT) bagi memberi notifikasi kepada pengguna tentang kenaikan aras air. Pengujian dijalankan dengan cara meletakkan Main Street Flood Detector di tapak kajian sama ada di longkang atau saliran, kemudian masa respon akan direkodkan bermula daripada sensor mengesan kenaikan air sehingga pengguna menerima notifikasi melalui aplikasi Blynk di telefon mudah alih. Hasil kajian mendapati bahawa float switch merupakan sensor yang paling efektif dan sesuai untuk digabungkan dengan penggunaan mikropengawal ESP32 dan aplikasi Blynk pada produk ini berbanding ultrasonic sensor, dengan float switch mencatatkan masa respon kurang daripada 2 saat. Ia meningkatkan kesedaran masyarakat tentang risiko banjir, mendorong persediaan yang lebih baik. Kesimpulannya, Main Street Flood Detector berjaya mencapai objektifnya dalam menghasilkan alat pengesan banjir di peringkat awal dan mengaplikasikan IoT dalam mengesan kenaikan paras air banjir. Akhir sekali, cadangan dan penambahbaikan penggunaan tenaga solar sebagai sumber tenaga menggantikan tenaga dari powerbank.

Keywords : *Kenaikan Air, Internet of Things (IoT), Main Street Flood Detector, Mikropengawal ESP32, Aplikasi Blynk*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

MAIN STREET FLOOD DETECTOR



TUANMUSTAZHA HAKIM BIN ABU TAHARI



MUHAMMAD AFIFFUDDIN BIN IDRIS



SYAMEEL HAKEM BIN UMOR



AZERUL AFZALL BIN AHMAD ZAWAWI

PROJECT DESCRIPTION

Main Street Flood Detector adalah peranti yang direka untuk mengesan aras air dengan cepat dan memberi notifikasi kepada pengguna melalui aplikasi Blynk. Ia menggunakan teknologi Internet of Things (IoT) dan dipasang di kawasan berisiko banjir. Kenaikan aras air yang pantas boleh menyebabkan kerosakan kepada harta benda dan kenderaan, yang membawa kepada kerugian besar. Pengujian dilakukan dengan meletakkan peranti ini di langkang atau saliran, dan masa respon dicatat dari saat sensor mengesan kenaikan air hingga pengguna menerima notifikasi di telefon. Hasil kajian menunjukkan float switch adalah sensor paling berkesan bila digabungkan dengan mikropengawal ESP32 dan aplikasi Blynk, dengan masa respon kurang daripada 2 saat. Secara keseluruhan, Main Street Flood Detector berjaya mengesan banjir pada peringkat awal. Sebagai cadangan, penggunaan tenaga solar boleh dipertimbangkan untuk menggantikan tenaga dari powerbank, meningkatkan keberkesanan peranti.

OBJECTIVE

- Merekabentuk satu peranti untuk mengesan kenaikan aras air di peringkat awal
- Mengaplikasikan Internet Of Things (IoT) bagi mengesan banjir dengan cepat

IMPACT

- Meningkatkan tahap keselamatan awam dengan memberikan notifikasi awal mengenai kenaikan paras air.
- Mengurangkan kerugian harta benda akibat banjir dengan tindak balas yang lebih cepat.

SUSTAINABLE DEVELOPMENT GOALS

- Goal 11: Sustainable Cities and Communities – Menyokong pembangunan bandar yang lebih selamat dan tangkas dalam menghadapi bencana banjir.
- Goal 13: Climate Action – Membantu masyarakat bersiap sedia dan bertindak balas terhadap perubahan iklim, terutamanya peningkatan bencana alam seperti banjir.

NOVELTY

- Penggunaan IoT (Internet of Things) untuk menghubungkan sensor kepada aplikasi telefon pintar, membolehkan pengguna menerima notifikasi dalam masa nyata.

COMMERCIAL POTENTIAL

- Boleh dipasarkan kepada kawasan berisiko banjir, seperti bandar-bandar besar, kawasan perumahan rendah, dan kawasan pertanian yang terdedah kepada banjir.
- Berpotensi untuk digunakan oleh pihak berkuasa tempatan, syarikat insurans, serta pemilik perniagaan dan rumah sebagai alat pengesan banjir peribadi yang murah dan efektif.

PRODUCT PICTURE



AUTOMATIC WASTE SEGRAGATOR USING ARDUINO

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Abstrak

Pengurusan sisa yang tidak cekap di banyak bandar telah membawa kepada masalah alam sekitar dan kesihatan awam yang serius. Sistem pengurusan sisa konvensional sering kali gagal mengoptimumkan pengumpulan dan pelupusan sisa dalam masa yang tepat, menyebabkan pengumpulan sisa yang tidak terkawal. Tambahan pula, kekurangan data dan maklumat masa nyata mengenai jumlah sampah di pelbagai lokasi menjadikan pengurusan sisa tidak efisien. Projek ini bertujuan untuk mengatasi cabaran-cabaran ini melalui pembangunan Automatic Waste Segregator menggunakan platform Arduino. Produk ini direka untuk mengasingkan sisa kitar semula secara automatik mengikut kategori, seperti plastik, kertas, dan benda lembab, dengan menggunakan sensor dan algoritma pemprosesan data masa nyata. Objektif utama projek ini adalah untuk merekabentuk sebuah sistem yang dapat mengasingkan sisa dengan cekap dan mengurangkan beban kerja manual dalam proses pengurusan sisa. Selain itu, kajian ini juga bertujuan untuk mengenalpasti kadar keberkesanan sistem pengasingan sisa yang telah direkabentuk. Hasil projek ini adalah salah satu penyelesaian yang lebih efisien dan mampan untuk pengurusan sisa bandar, mengurangkan risiko kesihatan awam, dan mengurangkan kesan negatif terhadap alam sekitar. Keberkesanan pengasingan sisa akan diuji melalui eksperimen dan analisis data, dengan harapan untuk meningkatkan kesedaran dan pelaksanaan pengurusan sisa pintar di masa hadapan.

Keywords : *Pengurusan Sisa, Kitar Semula, Kesan Alam Sekitar, Kesihatan Awam*

FINAL PROJECT

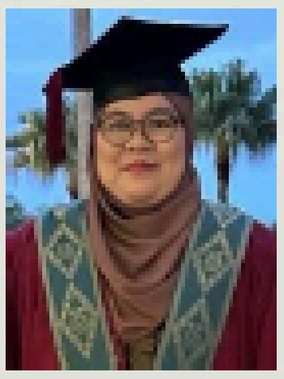
Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

AUTOMATIC WASTE SEGRAGATOR USING ARDUINO

SUPERVISOR:



TS ZURENA LEMEN

STUDENT:



08DPB22F1010 MUHAMMAD AZHAR BIN SUFFIAN

PROJECT DESCRIPTION

AUTOMATIC WASTE SEGREGATOR MENGGUNAKAN ARDUINO DIREKA UNTUK MENGATASI MASALAH PENGURUSAN SISA TIDAK CEKAP YANG MEMBAWA KEPADA ISU ALAM SEKITAR DAN KESIHATAN AWAM. SISTEM INI MENGASINGKAN SISA KITAR SEMULA SEPERTI PLASTIK, KERTAS, DAN BENDA LEMBAB SECARA AUTOMATIK MENGGUNAKAN SENSOR DAN PEMPROSESAN DATA MASA NYATA. PROJEK INI BERTUJUAN MENGURANGKAN BEBAN KERJA MANUAL SERTA MENINGKATKAN KECEKAPAN PENGURUSAN SISA. KEBERKESANANNYA DIUJI MELALUI EKSPERIMEN DAN ANALISIS DATA, DENGAN HARAPAN MENYUMBANG KEPADA PENGURUSAN SISA BANDAR YANG LEBIH EFISIEN DAN MAMPAN.

OBJECTIVE

- MEREKABENTUK BENTUK PRODUK BOLEH MENGASINGKAN SISA KITAR SEMULA MENGIKUT KATEGORI
- MENGENALPASTI KADAR KEBERKESANAN PENGASINGAN SISA KITAR SEMULA YANG TELAH DIREKA BENTUK

IMPACT

- SISTEM PENGASINGAN SISA AUTOMATIK MENGGUNAKAN ARDUINO INI MEMBOLEHKAN PEMPROSESAN SISA YANG LEBIH CEPAT.
- PROJEK INI MEMBANTU MENGURANGKAN JUMLAH SISA YANG DIBUANG TANPA PENGASINGAN YANG BETUL.

NOVELTY

- PROJEK INI DIGUNAKAN UNTUK PENGGUNAAN ARDUINO SEBAGAI SISTEM UTAMA DALAM PENGESANAN DAN PENGASINGAN SISA SECARA AUTOMATIK,YANG MENJADIKAN PROSES INI LEBIH TEPAT DAN EFEKTIF BERBANDING KAEDAH KONVENSIONAL.
- PROJEK INI MENAWARKAN SISTEM AUTOMATIK LENGKAP YANG MEMPROSES DAN MENGASINGKAN SISA SECARA LANGSUNG TANPA CAMPUR TANGAN MANUSIA

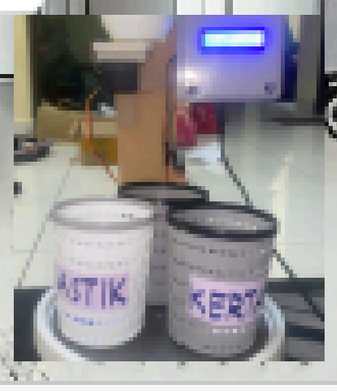
COMMERCIAL POTENTIAL

- PASARAN KOMERSIAL:SISTEM INI SESUAI UNTUK DIGUNAKAN DI PUSAT MEMBELI-BELAH KERANA MENGHASILKAN JUMLAH SISA YANG TINGGI.
- PENYELESAIAN UNTUK INDUSTR : SISTEM PENGASINGAN SISA INI BERPOTENSI DIGUNAKAN OLEH SYARIKAT PENGURUSAN SISA YANG INGIN MENINGKATKAN KECEKAPAN PROSES KITAR SEMULA DAN MENGURANGKAN KOS BURUH.

SUSTAINABLE DEVELOPMENT GOALS

- PROJEK INI MEMBANTU MEWUJUDKAN BANDAR YANG LEBIH BERSIH DAN MAMPAN DENGAN MENGURANGKAN JUMLAH SISA YANG TIDAK DIURUS DENGAN BETUL.
- SISTEM PENGASINGAN SISA YANG EFEKTIF MENYOKONG AMALAN KITAR SEMULA DAN MENGURANGKAN KEBERGANTUNGAN TERHADAP TAPAK PELUPUSAN SAMPAH.

PRODUCT PICTURE



AIR COND TOOLS VEST

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Abstract

Projek "Aircond Tools Vest" dibangunkan sebagai penyelesaian inovatif untuk meningkatkan kecekapan dan keselesaan juruteknik HVAC semasa menjalankan tugas harian mereka. Matlamat utama projek ini adalah untuk mengurangkan masa dan tenaga yang diperlukan oleh juruteknik dalam membawa pelbagai peralatan. Vest ini direka khusus untuk menyepadukan alat-alat penting seperti pemutar skru, tolok tekanan, dan meter ke dalam satu vest yang mudah diakses, menghapuskan keperluan untuk beg alatan yang berasingan. Kajian literatur menunjukkan bahawa teknologi pakai semasa dalam industri HVAC lebih menumpukan pada keselamatan, produktiviti, dan kecekapan. Walau bagaimanapun, terdapat kekurangan alat yang menggabungkan kemudahan penyimpanan peralatan dengan pengurusan haba yang sesuai dalam persekitaran kerja yang panas. Metodologi kajian ini merangkumi reka bentuk dan pengujian vest terhadap 13 juruteknik HVAC dari pelbagai syarikat. Kajian melibatkan soal selidik mengenai kecekapan, keselamatan, dan keselesaan dalam penggunaan vest tersebut. Hasil kajian menunjukkan bahawa 85% responden melaporkan peningkatan kecekapan kerja serta pengurangan masa yang dihabiskan untuk mencari peralatan. Selain itu, 70% responden menyatakan peningkatan keselesaan dan pengurangan keletihan fizikal semasa bertugas. Kesimpulannya, Aircond Tools Vest telah berjaya meningkatkan produktiviti dan kesejahteraan juruteknik HVAC. Cadangan untuk penambahbaikan termasuk rekaan penyejukan dalaman yang lebih baik untuk persekitaran suhu tinggi dan memperluaskan penggunaan vest ini ke dalam industri lain yang melibatkan kerja lapangan yang berat.

Keywords : *HVAC, vest serbaguna, kecekapankerja, ergonomik, keselamatan pekerja, penyelenggaraan, inovasi alat pakai*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

AIRCOND TOOLS VEST

AHLI KUMPULAN



08DPB22F1003
NURUL HAYATI BINTI ARIS FADZALLAH



08DPB22F1047
NUR RAHSMI INANI BINTI RAHMIN



08DPB22F1088
PRATHEV KUMAR A/L KUMARAN

PENYELIA



TS. HJ. MOHD SAFARI BIN JAAFAR

PROJECT DESCRIPTION

Vest Peralatan Membaiki Penghawa Dingin adalah satu inovasi terkini yang direka khusus untuk juruteknik HVAC (Pemanas, Pengudaraan, dan Penyaman Udara). Vest ini bertujuan meningkatkan kecekapan, keselesaan, dan keselamatan juruteknik semasa menjalankan kerja-kerja pembaikan dan penyelenggaraan penghawa dingin. Ia memudahkan juruteknik mengakses peralatan dengan cepat, mengurangkan keperluan membawa beg alat yang berat, serta memaksimumkan produktiviti di lokasi kerja.

OBJECTIVE

- Menginovasi produk vest peralatan sedia ada dengan mencipta produk baharu yang mempunyai fungsi yang lebih baik dan dikhaskan untuk peralatan membaiki penghawa dingin sahaja.
- Membangunkan vest peralatan yang berfungsi sebagai alternatif kepada penggunaan tool box atau toolbag, yang sering kali sukar dibawa semasa kerja-kerja pembaikan.

IMPACT

- Meningkatkan kecekapan juruteknik HVAC dengan menyediakan penyelesaian boleh pakai yang mengatur peralatan dengan mudah diakses. Ini mengurangkan masa yang dihabiskan untuk mencari alat atau kembali ke kotak alat, membolehkan juruteknik menyelesaikan kerja dengan lebih cepat dan cekap.
- Reka bentuk ergonomik vest ini boleh mengurangkan hari sakit dan masa henti akibat keletihan atau kecederaan pekerja, secara tidak langsung meningkatkan produktiviti keseluruhan tenaga kerja.

NOVELTY

- Keunikan utama produk ini terletak pada pengurusan alat yang lebih teratur dan efisien.
- Vest ini membolehkan peningkatan aliran kerja yang lebih lancar kerana pekerja tidak lagi perlu berhenti dan kembali ke tempat penyimpanan alat untuk mengambil peralatan.

COMMERCIAL POTENTIAL

- Juruteknik HVAC: Pasaran utama bagi Aircond Tools Vest ialah industri HVAC (Pemanasan, Pengudaraan, dan Penyaman Udara). Dengan menawarkan vest khusus yang menyepadukan alat-alat penting, produk ini boleh menyelaraskan operasi bagi juruteknik, meningkatkan produktiviti dan keselamatan.
- Sektor Pembinaan & Penyelenggaraan: Selain HVAC, vest ini boleh menarik perhatian profesional dalam industri pembinaan, elektrik, paip, dan penyelenggaraan am yang sering menggunakan alat yang sama dan bekerja dalam persekitaran yang mencabar.

SUSTAINABLE DEVELOPEMENT GOALS

- Penghasilan vest dari peralatan yang efisien dapat meningkatkan pendapatan juruteknik dan menyokong pertumbuhan ekonomi tempatan.
- Peralatan moden dan efisien untuk membaiki penghawa dingin, seperti alat diagnostik yang canggih, menyokong inovasi dalam industri. Ini meningkatkan kualiti servis dan mempermudah proses pembaikan, menjadikan perkhidmatan lebih cekap.

PICTURE PRODUCT



MINI SUPER TREE

Afif Ikhwan bin Rashidi, Muhammad Najmi Hafiy bin Norafendi,
Amir bin Abdullah

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amirabdullah@psa.edu.my)

Abstrak

Penggunaan air merupakan aspek penting dalam kajian kami kerana di JKA , sering mengalami masalah bekalan air bersih. Hasil daripada pemantauan kami mendapati bahawa hampir setiap hari air digunakan di kawasan landskap JKA untuk menyiram tanaman. Hasil pemerhatian kami, para petugas pembersihan disekitar JKA mereka kerap menggunakan bekalan air bersih untuk membersihkan lantai dan menyiram tanaman di kawasan landskap JKA . Antara masalah yang sering berlaku ialah ketiadaan sumber bekalan air , dan tiada bekalan air sewaktu kecemasan. Dengan ini para petugas pembersihan tidak dapat meneruskan tugas membersih dengan mudah . Oleh itu , untuk mengelakkan terjadinya lagi masalah ini , kami mewujudkan “Mini Super Tree” iaitu arca yang menyerupai pokok yang diilhamkan oleh Garden by the bay Singapura . Mini Super Tree ini berupaya menampung air hujan dalam kuantiti yang besar bergantung pada besar payung penadah yang digunakan . Seterusnya air yang ditadah akan disimpan ke dalam tangki simpanan yang disambungkan daripada payung penadah . Dengan adanya penghasilan projek kami ini , dapat memudahkan petugas pembersihan menggunakan air untuk kerja pembersihan pada waktu ketiadaan air dan juga dapat mengurangkan kos pengoperasian air bulanan di JKA.

Keywords : *Air , Menyiram Tanaman, Petugas Pembersih, Air Hujan , Penadah, JKA , Tangki*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

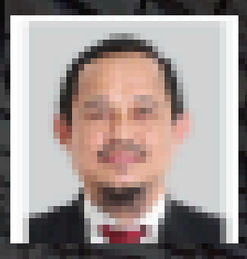
CIVIL ENGINEERING DEPARTMENT

MINI SUPER TREE

SUPERVISOR



PUAN NAZRIZAM BINTI AB WAHAB



ENCIK AMIR BIN ABDULLAH

AHLI KUMPULAN



0XDPB22F1019 AFIF IKHWAN BIN RASHIDI



0XDPB22F1088 MUHAMMAD NAJMI HAFIY BIN NORAFENDI

HURAIAN PROJEK

Projek ini adalah untuk memudahkan pengguna untuk menggunakan air hujan dgn produktif, berdasarkan kajian saya iaitu di kawasan sekitar Jabatan Kejuruteraan Awam di Politeknik Sultan Salahuddin Abdul Aziz Shah, kerana di sekitar kawasan politeknik ini sering berlaku ketiadaan air dan bekalan air kecemasan yang mencukupi untuk digunakan untuk penyiraman pokok di laman JKA.Dengan produk kami ini pekebun dapat menggunakan air hujan untuk menyiram pokok dan tidak menggunakan sumber air yang bersih,dengan itu penggunaan air bersih dapat dikurangkan dan menjimatkan bil air di politeknik.Selain itu dapat memudahkan pekebun untuk menyiram pokok kerana produk kami mempunyai tangki penyimpanan air hujan yang dikumpul dari Mini Super Tree kami ini.Bukan itu sahaja produk kami juga dijadikan sebagai arca di laman JKA kerana ia seperti pokok yang diinspirasikan dari Supertree di Singapore dengan itu ia dapat menambahkan lagi seri landskap JKA.

OBJEKTIF

- Untuk mengoptimumkan penggunaan sumber air tadahan hujan bagi penggunaan siraman pokok tanpa melibatkan kos pengoperasian bulanan.
- Merekabentuk satu produk pengumpulan air hujan yang menarik serta pelbagai fungsi bagi pengaplikasian konsep penuaian air hujan.

IMPAK

- Menyokong usaha pemuliharaan alam sekitar dengan mengurangkan penggunaan air yang dirawat dan sumber tenaga yang diperlukan untuk penyelenggaraan bekalan air.
- Dapat mengurangkan masalah larian air hujan yang mungkin membawa kepada hakisan tanah atau banjir kecil.
- Reka bentuk yang diinspirasikan daripada Supertree menambah nilai estetik dan inovatif kepada kawasan sekitar JKA, menjadikannya lebih menarik dan futuristik.

NOVELTI

- Berfungsi sebagai sistem pengumpulan air hujan, tetapi juga berperanan sebagai arca landskap. Reka bentuk yang diinspirasikan daripada Supertree di Singapura menjadikannya lebih daripada sekadar tangki air atau sistem pengairan biasa. Ia menambah nilai estetika dan mempercantik kawasan Jabatan Kejuruteraan Awam (JKA) di Politeknik Sultan Salahuddin Abdul Aziz Shah.
- Belum lagi diwujudkan di mana mana institusi.
- Reka bentuk modular membolehkan produk ini disesuaikan untuk pelbagai skala, dari taman kecil hingga kawasan landskap yang lebih besar.

POTENSI KOMERSIL

- Bangunan pejabat, institusi, atau halaman rumah yang mempunyai kawasan landskap boleh menjadi sasaran untuk sistem ini.
- Pihak berkuasa tempatan, taman awam, dan sekolah yang sering mempunyai kawasan hijau yang luas boleh menjadi sasaran projek ini. Kerajaan semakin mencari penyelesaian lestari, dan produk ini boleh dipromosikan sebagai pilihan kos efektif dan mesra alam untuk ruang awam.

MATLAMAT PEMBANGUNAN LESTARI

SDG 6: Clean Water and Sanitation
SDG 11: Sustainable Cities and Communities
SDG 12: Responsible Consumption and Production

GAMBAR PRODUK



GLOVE VERSATILE

Adib Uzair Bin Istamam , Muhammad Ashraf Hakimi Bin Mahmud,
Sarah Afzan Binti Abd Karim, Zakaria Bin Ayob

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Abstract

Sarung tangan serbaguna adalah inovasi alat pelindung tangan yang dirancang untuk memberikan perlindungan , keselesaan bagi penggunanya dalam pelbagai pekerjaan yang berkaitan dengan “ wireman “. Sarung tangan ini biasanya diperbuat dengan bahan yang tahan terhadap berbagai keadaan seperti cuaca panas , bahan kimia , elektrik yang membolehkan ia tahan dan cekal sewaktu pekerja menggunakannya. Penggunaan sarung tangan serbaguna ini dapat diterapkan dalam bidang industri khususnya pada “ wireman “ dalam berbagai lingkungan kerja kerana ketahanannya sewaktu menggunakan sarung tangan ini semasa membuat kerja. Tujuan utama sarung tangan ini adalah untuk mewujudkan suasana yang selesa untuk kegunaan pekerja dan untuk menginovasikan sarung tangan yang sedia ada di pasaran. Selain itu , sarung tangan serbaguna ini juga dapat meningkatkan lagi kualiti sarung tangan yang sedang dibuat di pasaran. Reka bentuknya yang berkualiti tinggi dapat memberikan daya tahanan yang lebih lama dan mewujudkan keselesaan yang optimal terhadap pekerja sehingga pekerja berasa selesa dalam melakukan sesuatu pekerjaan pada waktu malam.

Keywords : *Serbaguna , Inovasi , Bidangindustri, Berkualiti Tinggi , Wireman*

FINAL PROJECT

Competition and Exhibition

SESSION I 2024/2025

CIVIL ENGINEERING DEPARTMENT

TITLE OF PRODUCT

ENCIK ZAKARIA BIN AYOB & PUAN SARAH AFZAN BINTI ABD KARIM

GLOVE VERSATILE

PROJECT DESCRIPTION

Projek sarung tangan serbaguna bertujuan untuk menghasilkan sarung tangan yang mempunyai pelbagai fungsi bagi memudahkan aktiviti harian dalam pekerjaan. Sarung tangan ini direka khas untuk " wireman " dan industri yang memerlukan perlindungan dan kemudahan bekerja pada waktu malam. Matlamat projek ini adalah untuk menggabungkan fungsi dan keselesaan dalam satu produk yang serba guna dan menjadikannya alat penting untuk pelbagai pengguna.

OBJECTIVE

- Mewujudkan suasana yang selesa untuk kegunaan pekerja.
- Untuk menginovasikan sarung tangan yang sedia ada di pasaran.
- Menguji keberkesanan alatan yang digunakan.

COMMERCIAL POTENTIAL

- Pasaran yang luas.
- Rekaan inovatif dan pelbagai fungsi.
- Kos yang efektif.

SUSTAINABLE DEVELOPMENT GOALS

- Meningkatkan produktiviti pekerja.
- Penghasilan teknologi inovatif.
- Meningkatkan keselamatan dan perlindungan pekerja.

IMPACT

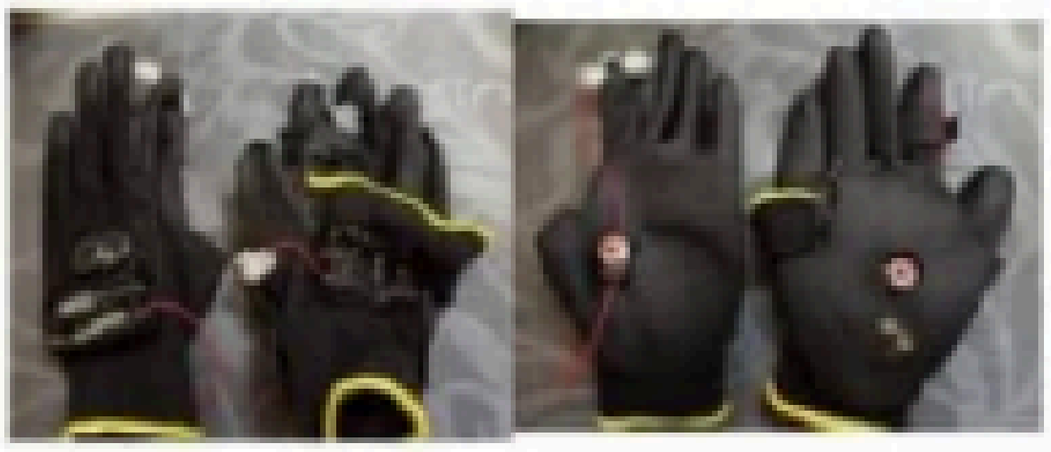
Kesan kepada industri dan ekonomi

- Peluang komersial

Kesan kepada sosial

- Keselamatan dan kesejahteraan pekerja.

PRODUCT PICTURE



NOVELTY

- Penggunaan bahan inovatif.
- Teknologi termaju.
- Reka bentuk modular.

FINAL PROJECT COMPETITION
& EXHIBITION
SESSION I:2024/2025

DIPLOMA IN WOOD BASED TECHNOLOGY

DBK
5

ANALISA KEPERLUAN PROGRAM DIPLOMA TEKNOLOGI BERASASKAN KAYU DI POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH : SATU KAJIAN

Darsanaa Manogaran , Nur Alya Hayani Binti Azri , Nur Alya Syuhada Binti Radzali , Sofia Maisarah Binti Mohd Refindi, Rafidah Farah Hanim Binti Abd Razak

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Abstrak

Program Diploma Teknologi Berasaskan Kayu (DBK) diwujudkan di Politeknik Sultan Salahuddin Abdul Aziz Shah (PSA) dan Politeknik Kota Kinabalu (PKK) untuk melengkapkan pelajar dengan pengetahuan teori, kemahiran teknikal, dan tingkah laku profesional dalam bidang teknologi perkayuan. Walau bagaimanapun, terdapat penurunan kemasukan pelajar ke program ini, yang mencetuskan keperluan untuk mengkaji perspektif terhadap program DBK, mengenal pasti punca penurunan tersebut, serta mencari langkah-langkah penambahbaikan. Kajian ini menggunakan pendekatan penyelidikan campuran dengan soal selidik yang disebarkan kepada alumni, industri, ibu bapa, dan pelajar SPM untuk mendapatkan pandangan menyeluruh mengenai keperluan dan daya tarikan program ini. Data dianalisis secara statistik untuk mengenal pasti trend dan persepsi utama.Hasil kajian menunjukkan bahawa industri menyokong pengekalan program DBK dan menganggapnya sebagai program penting untuk memenuhi keperluan tenaga kerja. Pandangan positif turut disuarakan oleh pelajar SPM dan alumni yang melihat program ini sebagai pilihan yang relevan dan sejajar dengan keperluan pasaran. Bagaimanapun, ibu bapa berpendapat bahawa kurangnya pendedahan dan promosi menyebabkan program ini kurang dikenali. Oleh itu, mereka mencadangkan penggunaan platform media sosial seperti TikTok dan Instagram untuk meningkatkan kesedaran dan menarik minat lebih ramai pelajar.Kesimpulannya, program DBK mempunyai potensi untuk menyediakan peluang kerjaya yang mampan dan berdaya saing dengan sokongan yang kuat daripada pihak industri dan kerjasama strategik dalam promosi. Antara cadangan utama adalah membina laman sosial khusus untuk program DBK bagi menonjolkan aktiviti dan prospek kerjaya yang ditawarkan, sekaligus menarik minat generasi muda dan meningkatkan penglibatan ibu bapa.

Keywords : *Diploma TeknologiBerasaskan Kayu (DBK) , Politeknik Sultan Salahuddin Abdul Aziz Shah (PSA) , penurunan kemasukan pelajar , industri perkayuan , perspektif program*



ANALISA PROGRAM

PENYELIA: PN RAFIDAH FARAH HANIM BT ABD RAZAK

- DARSANAA MANOGARAN
- NUR ALYA HAYANI BT AZRI
- NUR ALYA SYUHADA BT RADZALI
- SOFIA MAISARAH BT MOHD REFINDI

PENERANGAN KAJIAN

Latar Belakang Kajian



Industri Perkayuan merupakan antara industri penyumbang tertinggi kepada pembangunan ekonomi Malaysia pada era kini. Tambahan pula, program Teknologi Berasaskan Kayu ini mula diperkenalkan di Politeknik Sultan Salahuddin Abdul Aziz Shah pada tahun 1999 dan disusuli oleh Politeknik Kota Kinabalu pada tahun 2005.

Namun, **sumber** kepada **tenaga mahir** yang boleh dibekalkan kepada industri perkayuan negara **kini merosot** apabila program Diploma Teknologi Berasaskan Kayu kini mengalami **penurunan** dalam **kemasukan pelajar ke program** tersebut yang pada akhirnya menyebabkan warga asing telah menjadi sumber tenaga utama dalam sektor perkayuan negara.

Kajian ini dilaksanakan untuk mengambil tahu apakah kemungkinan kemungkinan yang mungkin menjadi **asbab** kepada **penurunan kemasukan pelajar** ke program ini sejak daripada penubuhan program ini tersendiri.

OBJEKTIF

Untuk mengambil tahu akan **punca punca** yang membawa kepada trend penurunan kemasukan pelajar ke program TBK

Untuk mencari inisiatif atau **langkah langkah** penambahbaikan program TBK

POTENSI KOMERSIAL

Menjadikan program lebih menarik kepada pelajar yang berminat terhadap bidang teknologi dan inovasi

Inisiatif kajian ini menyumbang kepada SDG4 dengan meningkatkan kualiti hasil pendidikan, menyelaraskan program dengan keperluan industri dan memupuk kemahiran yang memperluaskan laluan kerjaya pelajar.

IMPAK

- Membawa impak yang besar kepada perubahan dalam program Diploma Teknologi Berasaskan Kayu
- Dengan adanya inisiatif atau langkah langkah penambahbaikan yang diambil

PENGBAHARUAN

Kajian ini mengandungi tinjauan persepsi pelajar mengenai peluang kerjaya, tahap pendapatan, atau pengetahuan tentang potensi industri kayu, yang memberikan gambaran baru tentang mengapa minat pelajar menurun.

GAMBAR KAJIAN

ARWOODBASE

Muhammad Hafiy Jauhar bin Jamalullail, Nasuha Hani binti Md Nizam, Awang Nor Huzairi bin Awang Zakaria, Muhamad Danish Haikal bin Sabaruddin, Muhammad Fairuzzairi bin Abdul Hamid

(08DBK22F1023@psa.edu.my, 08DBK22F1027@psa.edu.my, 08DBK22F1029@psa.edu.my, 08DBK22F1051@psa.edu.my, fairuzzairi@psa.edu.my)

Abstract

Kajian ini meneroka integrasi teknologi Augmented Reality (AR) dengan bidang dendrologi, anatomi kayu, dan pangkalan data untuk membangunkan satu kaedah pembelajaran yang lebih interaktif dan visual dalam memahami pokok dan kayu. Dengan menggabungkan teknologi AR 3D dan pangkalan data berinformasi, kajian ini membolehkan pembinaan model 3D pokok yang boleh dipaparkan secara interaktif. Melalui AR, pengguna dapat melihat struktur fizikal kayu dan memahami anatomi pokok dengan lebih mendalam, termasuk ciri-ciri fizikal, komposisi, dan kegunaan setiap jenis kayu. Pangkalan data yang dibangunkan dalam kajian ini menyimpan maklumat terperinci mengenai pelbagai jenis pokok, ciri-ciri, dan sifat kayu, memudahkan pengguna untuk mengakses maklumat tersebut dengan lebih sistematik. Pendekatan ini bertujuan untuk meningkatkan kefahaman pengguna terhadap sifat fizikal dan anatomi kayu melalui medium visual yang lebih menarik dan mudah difahami. Hasil kajian ini diharap dapat menyumbang kepada pelajar dengan menyediakan maklumat yang mencukupi, lebih mudah diakses, dan mudah difahami. Dengan adanya pendekatan berasaskan AR ini, pengguna berpeluang memanfaatkan visualisasi yang lebih jelas dan terperinci, sekali gus memperkayakan pengalaman pembelajaran dan penghayatan terhadap ilmu dendrologi dan anatomi kayu.

Keywords : *AR 3D*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

AUGMENTED REALITY

AUGMENTED REALITY DENDROLOGY DATABASE

E-POSTER



Project Description

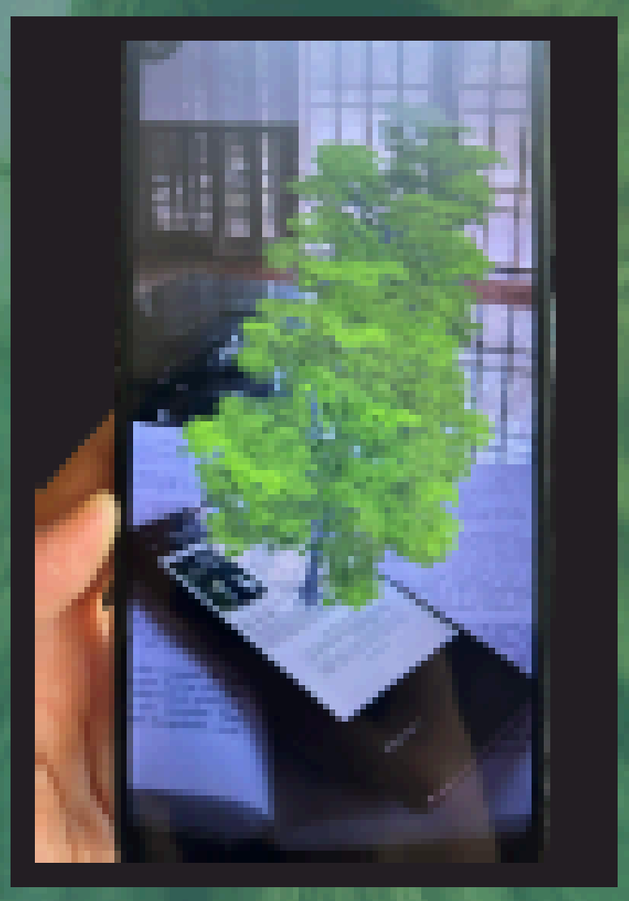
This study aims to integrate 3D augmented reality (AR) technology with dendrology . By using AR, interactive 3D tree models can be displayed, allowing users to view the physical structure of wood and understand tree anatomy in greater detail. Data on various tree species, including physical characteristics and uses, will be stored in a database for easy access and reference.

Objective

1. Develop a database containing the characteristics and properties of wood.
2. Create Augmented Reality (AR) as visual aid tool to display the physical structure of trees.

Impact

- Enhances knowledge in dendrology and wood anatomy.
- Assists users in understanding the diversity of commercial wood types and their applications.



Commercial Potential

This application has commercial potential for use in education, research, logging industries, and wood-based product manufacturing, as it provides interactive and easily accessible information about wood structure and tree species.

Novelty

- Unique approach for in-depth understanding of tree structure and wood properties.
- Innovative method rarely applied in the field of dendrology.

Sustainable Development Goals

The project supports Sustainable Development Goal 15: Life on Land, by enhancing understanding of the biological diversity of trees and wood properties, which can aid in conservation and sustainable wood usage.

Group:

- Muhammad Hafiy Jauhar Bin Jamalullail (08DBK22F1023)
- Nasuha Hani Binti Md Nizam (08DBK22F1027)
- Awang Nor Huzairi Bin Awang Zakaria (08DBK22F1029)
- Muhamad Danish Haikal Bin Sabaruddin (08DBK22F1051)

CONNECT CUBIC / KUBIK SAMBUNGAN

Ahmad Fikri bin Abdullah, Nur Aleeyah binti Azman, Khairul Azhar bin Abdul Rahim, Nur Adilah binti Abdul Rahman, Norani binti Abd Karim

(08DBK22F1032@psa.edu.my , 08DBK22F1015@psa.edu.my , 08DBK22F1041@psa.edu.my, 08DBK22F1067@psa.edu.my , norani@psa.edu.my)

Abstract

This report introduces Connect Cubic is an innovative educational toy designed to enhance early childhood development by integrating four interactive puzzles—shape, animal, clock, and solar system—into a single cube. Each puzzle focuses on critical developmental skills: spatial recognition through the shape puzzle, early categorization with the animal puzzle, foundational time-telling abilities from the clock puzzle, and an introduction to basic astronomy concepts via the solar system puzzle. Constructed primarily from wood, Connect Cubic reduces plastic usage and aligns with sustainability goals. In trials conducted at preschools, survey results revealed that 90% of educators observed significant improvements in children's cognitive abilities, including enhanced spatial awareness, memory retention, and a growing interest in scientific exploration. Additionally, Connect Cubic features a Snakes and Ladders game on the base, encouraging cooperative play and social interaction. Its unique, multi-functional design makes Connect Cubic a valuable tool for holistic learning in early educational settings, effectively merging play with essential learning outcomes.

Keywords : *Connect Cubic, educational toys, brain development, solar system, interactive, kids, puzzle*

FINAL PROJECT

Competition and Exhibition

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CONNECT CUBIC

Child Education Toys



SCAN FOR OVERVIEW

PROJECT DESCRIPTION

An educational toy enhancing cognitive and motor skills. That combines shape, animal, clock, and solar system puzzles in one cube. Supports spatial recognition, categorization, time-reading, and basic astronomy. Makes early education interactive and effective.

PROBLEM STATEMENT

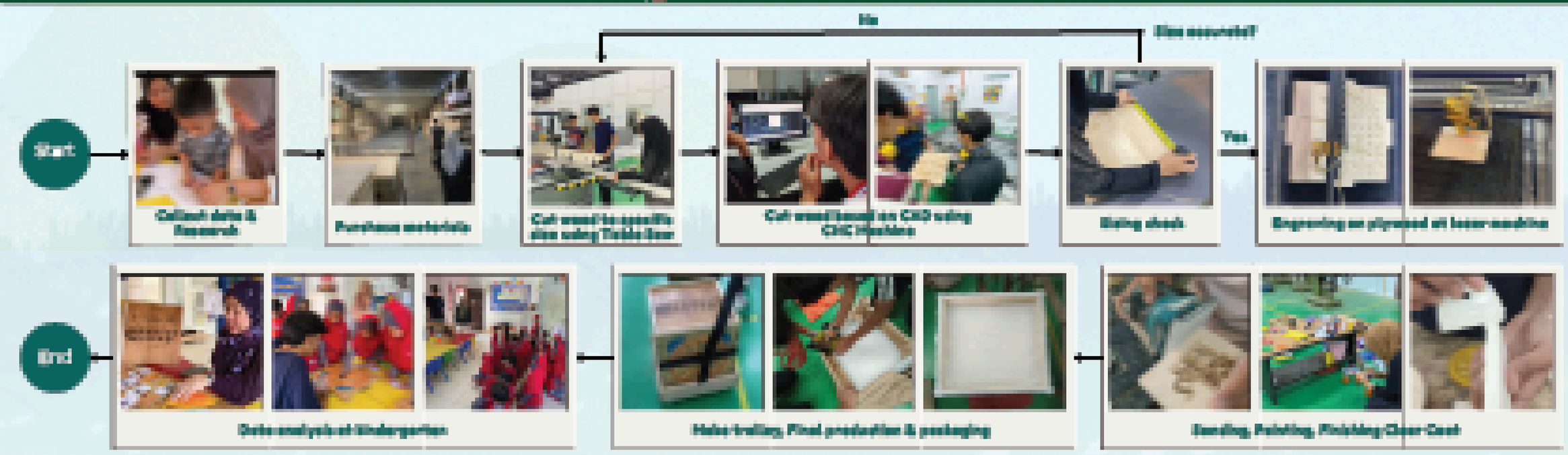
- Children cannot focus during the learning session because the learning material cannot attract their attention.
- Children find it difficult to understand what their teachers teach because they cannot feel and see.



OBJECTIVE

- Produced Connect Cubic for children in kindergarten.
- Testing the effectiveness of Connect Cubic by kindergarten children through the observation method.

METHODOLOGY



IMPACT

- Supports holistic child development in cognitive & sensory skills.
- Bridges early learning gaps in math, science, and language.
- Encourages curiosity and critical thinking from a young age.

COMMERCIAL POTENTIAL

- Versatile tool for preschools, kindergartens, and families.
- Multi-functional, appealing to parents and educators.
- High market potential as a quality educational product globally.

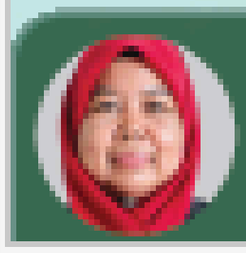
SUSTAINABLE DEVELOPMENT GOAL

SDG 4: Quality Education

Provides engaging tools for early childhood development.

NOVELTY

- Combines multiple learning modules into one compact cube.
- Unique, user-friendly design with integrated puzzles and games.
- Enhances early education through an interactive, modular approach.



Supervisor

Ts. Dr. Norani binti Abd Karim



Nur Alaeyah binti Azman

0808K22F1015



Ahmad Fikri bin Abdullah

0808K22F1032



Khairul Azhar bin Abdul Rahim

0808K22F1041



Nur Adilah binti Abdul Rahman

0808K22F1067

DAM ULAR BRAILLE

Abdul Majid Bin Hashim, Muhammad Hafiz Hakimi Bin Mohd Zamri, Jefri Bin Jusoh
(amajid8877@gmail.com, matpihh0408@gmail.com, jefri@psa.edu.my)

Abstrak

Dam Ular Braile adalah reka bentuk dam ular yang menggunakan sistem Braille untuk menjadikannya lebih mudah diakses oleh pemain yang mempunyai masalah penglihatan. Papan permainan tradisional telah diubah suai dengan ciri-ciri taktil Braille, termasuk penanda timbul untuk petak, buah dam serta tempat meletakkan buah dam, penomboran Braille, dan tekstur unik untuk mewakili ular dan tangga. Dadu khas dengan nombor Braille taktil juga disediakan untuk memastikan permainan yang bebas dan inklusif. Dengan menyesuaikan Ular dan Tangga untuk pengguna Braille, projek ini memupuk interaksi sosial, kebolehcapaian, dan hiburan bagi individu yang kurang upaya penglihatan, sekali gus menunjukkan potensi permainan tradisional untuk direka semula secara inklusif.

Keywords : *Dam Ular, Braille.*

FINAL PROJECT
Competition and Exhibition
SESSION I:2024/2025
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SUPERVISOR: JEFRI BIN JUSOH
GROUP MEMBER:
ABDUL MAJID BIN HASHIM
MUHAMMAD HAFIZ HAKIMI BIN MOHD ZAMRI

TAJUK: DAM ULAR BRAILLE

PENGENALAN
Dam Ular Braille ialah penyesuaian inklusif permainan papan klasik yang digemari, direka khusus untuk memenuhi keperluan pemain cacat penglihatan.

OBJEKTIF
Menghasilkan papan permainan dam ular serta dadu menggunakan sistem Braille.

IMPAK
Galakkan Pembelajaran Braille :
Menggunakan Braille membantu meningkatkan kepekaan taktil dan celik huruf Braille pemain, yang dapat memberikan manfaat pendidikan yang lebih luas selain daripada permainan.

Nilai Pendidikan:
Bermain permainan seperti Ular dan Tangga dapat menyokong pembelajaran tentang nombor, pengiraan, dan kesedaran ruang.

POTENSI KOMERSIAL
Institusi dan Organisasi Pendidikan
Sekolah dan institusi untuk orang cacat penglihatan mungkin berminat dengan pembelian pukal.

Sokongan daripada Geran dan Pembiayaan Kebolehcapaian
Banyak kerajaan dan organisasi bukan untung menawarkan geran atau subsidi untuk menyokong produk kebolehcapaian

Pasaran Eksport dan Antarabangsa
Memandangkan permintaan untuk permainan yang boleh diakses tidak terhad kepada mana-mana satu negara, versi Dam Ular Braille juga boleh dipasarkan di peringkat antarabangsa

MATLAMAT PEMBANGUNAN MAMPAN
Pendidikan berkualiti dan mengurangkan ketidaksamaan dengan menjadikan pembelajaran dan permainan boleh diakses oleh individu cacat penglihatan.

KEBAHARUAN
Keunikan dalam mencipta versi Braille untuk permainan Ular dan Tangga terletak pada transformasi permainan papan visual klasik ini kepada pengalaman taktil yang boleh diakses oleh pemain kurang penglihatan, dengan label Braille pada petak-petak serta penunjuk taktil untuk tangga dan ular. Pendekatan ini bukan sahaja menyesuaikan permainan tradisional tetapi juga mencipta persekitaran permainan yang inklusif, membolehkan individu dengan pelbagai kelupayaan berkongsi pengalaman rekreasi yang sama secara interaktif.

GAMBAR PRODUK


DIGITQUEST: ADDITION AND SUBTRACTION SKILLS FOR 5-YEARS-OLD WITH INTERACTIVE LEARNING TOOLS

Adlina Sofia binti Adnan, Muhammad Faiz bin Mohd Fairus, Ahmad Ridzal bin Jaferi, ZullhyzrifeeIshraf bin Zulkifly

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Abstract

An interactive learning tool is any educational resource designed to actively engage learners by involving them in the learning process through hands-on activities, problem-solving, or real-time feedback. Mathematics encompasses the study of numbers, quantities, shapes, patterns, and their interrelationships (Cambridge Dictionary, n.d.). On October 7th, 2024, a concerning report revealed that over 100,000 Year One pupils lack essential foundational skills in reading, writing, and counting, collectively known as the "3M skills." Education Minister FadhlinaSidek attributed this learning deficit to the impacts of the COVID-19 pandemic, poverty, and the specific needs of children with disabilities (Bernama, 2024). This project, DigitQuest, aims to achieve two primary objectives: (i) to establish DigitQuest as an effective educational tool, and (ii) to serve as a teaching aid for parents and educators of 5-year-olds. The majority of the project involved utilizing a laser cutting and engraving machine, with minimal reliance on a table saw, guiding the process from initial sketches to the prototype and final product. Data was collected through qualitative interviews and quantitative surveys. The results demonstrate that DigitQuest has successfully met its objectives; however, feedback from participants will inform future enhancements. Ongoing refinement of the tool will address identified limitations and improve overall functionality.

Keywords : *mathematics, education, interactive learning tool, 3M skills, early childhood education*

FINAL PROJECT

Competition and Exhibition

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CIVIL ENGINEERING DEPARTMENT



ADLINA SOFIA (F1019)

AHMAD RIDZAL (F1055)

MUHAMMAD FAIZ (F1050)

EN. ZULLHYZRIFEE ISHRAF (SV)

DIGITQUEST: ADDITION & SUBTRACTION SKILLS FOR 5-YEARS-OLD WITH INTERACTIVE LEARNING TOOL

This project develops DigitQuest, an interactive tool to teach basic addition and subtraction to 5-year-olds. Built primarily using laser cutting and engraving, with minimal table saw use, the project was shaped by insights from educators and parents gathered through interviews and surveys. Findings show DigitQuest effectively engages young learners and serves as a helpful aid for teachers and parents. Feedback highlights its potential in early childhood education, with planned refinements to further improve functionality.

OBJECTIVES

1. To establish "DigitQuest" as an educational tool.
2. Make DigitQuest as a teaching aid for teachers and parents of 5-year-old.

PROJECT DESCRIPTION

SUSTAINABLE DEVELOPMENT GOALS

DigitQuest supports SDG 4: Quality Education, by offering a tool that enhances early childhood numeracy. The use of interactive learning can reduce the reliance on screen-based learning, promoting more engaged and hands-on education.

IMPACT



DigitQuest is expected to have a significant impact on early childhood education by improving children's understanding of basic mathematics through inferactive learning. By fostering a love for learning at a young age, the tool aims to lay a solid foundation for future academic success.



NOVELTY

The novelty of DigitQuest lies in its combination of physical interaction with mathematical concepts. Unlike traditional educational tools that rely heavily on digital media, DigitQuest engages children with hands-on activities, which is beneficial for early childhood development.

COMMERCIAL POTENTIAL

DigitQuest has strong commercial potential as a teaching aid for educators and parents. Its interactive and tangible design is appealing for early childhood education, especially for schools and kindergartens looking to incorporate hands-on learning. The product can be marketed to educational institutions and parents who seek innovative tools for improving children's math skills.



MONTESSORI AUTISME BOARD (MAB)

Nur Hanisah binti Sadzali, Arfan Naufal bin Rahim, HazmanAdlie bin Hisham, Siti Elyia Maisara binti Mohd Edrus, Hamdi bin HjMawardi

(08dbk22f1011@student.psa.edu.my,08dbk22f1037@student.psa.edu.my,08dbk22f1058@student.psa.edu.my, 08dbk22f1072@student.psa.edu.my, hamdi.mawardi@psa.edu.my)

Abstrak

M.A.B adalah satu ringkasan kepada Montessori Autisme Board. M.A.B merupakan alat bantu mengajar berkonsepkan pengalaman deria yang lebih tersusun serta mudah alih untuk memenuhi keperluan pembelajaran kanak-kanak autisme ringan (mild autisme). M.A.B dibangunkan dengan memberi fokus kepada konsep 3M IP. Konsep 3M ialah aktiviti melibatkan membaca, mengira dan menulis. Manakala IP adalah pengurusan diri yang mana ia memfokuskan berkenaan aktiviti harian seperti membuka penutup botol, mengikat tali kasut, menyalakan lampu, menarik zip serta menyelak kunci rumah. M.A.B adalah produk yang dihasilkan menggunakan pelbagai jenis bahan antaranya plywood, kayu kasah, kayu MDF, kayu getah, bahan pengikat dan aksesosi perabot. Dapatan analisi produk ini mendapat maklum balas 100% bersetuju menyatakan bahawa produk ini mampu meningkatkan perhatian atau fokus kanak-kanak autisme dalam pembelajaran. Kesimpulan dengan terhasilnya M.A.B ini dapat meningkatkan pengetahuan, kemahiran dan perhatian kanak-kanak autisme ringan dalam aktiviti pembelajaran serta aktiviti harian mereka.

Keywords : *Kanak-kanak autism ringan (mild autism)*

FINAL PROJECT

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POTENSI KOMERSIAL

Produk ini berpotensi dikomersialkan sebagai alat bantu mengajar di institusi pendidikan khas, sekolah, dan pusat terapi autisme untuk meningkatkan fokus dan kemahiran harian kanak-kanak autisme



MONTESSORI AUTISME BOARD

(M . A . B)

MATLAMAT PEMBANGUNAN LESTARI (SDG)

- SDG 4: Menyediakan alat bantu pembelajaran untuk kanak-kanak autisme.
- SDG 10: Menyokong akses pendidikan inklusif bagi kanak-kanak autisme

IMPAK

M.A.B meningkatkan fokus, kemahiran harian, dan motor halus kanak-kanak autisme ringan, menyumbang kepada pembelajaran yang lebih berkesan bagi kanak-kanak berkeperluan khas.

ABSTRAK

M.A.B adalah satu ringkasan kepada Montessori Autisme Board. M.A.B menupakan alat bantu mengajar berkonsepkan pengalaman deria yang lebih tersusun serta mudah dih untuk memenuhi keperluan pembelajaran kanak-kanak autisme ringan (mild autism). M.A.B dibangunkan dengan memberi fokus kepada konsep 3M tp. Konsep 3M ialah aktiviti melibatkan membaca, mengira dan menulis. Manakala tp adalah pengunjaan diri yang mana ia memfokuskan berkenaan aktiviti harian seperti membuka penutup botol, menglkat tali kasut, menyelakan lampu, menark zip serta menyelak kund rumah. M.A.B adalah produk yang dihasilkan menggunakan pelbagai jenis bahan antaranya plywood, kayu kasah, kayu MDF, kayu getah, bahan pengikat dan diseesasi perabot. Dapatan analisis produk ini mendapat maklum balas 100% bersetuju menyatakan bahawa produk ini mampu meningkatkan perhatian atau fokus kanak-kanak autisme dalam pembelajaran. Kesimpulan dengan terhasilnya M.A.B ini dapat meningkatkan pengetahuan, kemahiran dan perhatian kanak-kanak autisme ringan dalam aktiviti pembelajaran serta aktiviti harian mereka.

OBJEKTIF

Meningkatkan fokus, kemahiran, dan pengetahuan kanak-kanak autisme ringan dalam pembelajaran dan aktiviti harian melalui pengalaman pembelajaran deria yang tersusun



KEUNIKAN

- Menawarkan pendekatan baru sebagai alat bantu mengajar berasaskan pengalaman deria.
- Pendekatan deria yang digunakan lebih tersusun dan mudah dih.
- Menggunakan konsep 3M tp
- Direka khusus untuk memenuhi keperluan kanak-kanak autisme ringan.



OSB BANANA STEM

Muhammad Nazirul bin Zulkifle, Adam Naufal bin Jafri, Muhammad Amaluddin Najmi bin Johari, Muhammad Kamal Ariffin bin Hj.Badrun

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Abstrak

Papan Partikel Berlapis (OSB) adalah panel kayu buatan yang mempunyai ciri kekuatan dan ketahanan yang hampir serupa dengan papan lapis. Gabungan kayu dan pelekat pada OSB menghasilkan panel yang kuat, stabil secara dimensi, dan tahan daripada lenturan, pengelupasan, serta perubahan bentuk. Berbanding dengan kekuatannya, panel OSB ringan, mudah dipegang, dan mudah dipasang. Pada masa kini, terdapat banyak sisa pertanian yang tidak digunakan dan dibuang tanpa penyelesaian, sebahagiannya dibakar yang boleh meningkatkan pencemaran udara. Projek ini menggunakan batang pisang sebagai bahan asas untuk menghasilkan OSB, dengan tujuan mengurangkan sisa pertanian yang biasanya dibakar dan menyumbang kepada pencemaran udara. Kajian ini melibatkan ujian fizikal seperti ujian penyerapan air, pengembangan ketebalan, dan ujian ketumpatan pada OSB yang dihasilkan. Proses penghasilan OSB daripada batang pisang merangkumi pengeringan partikel, pemotongan bahan, mengira kandungan lembapan serta penambahan resin Urea Formaldehyde (UF) sebanyak 3% mengikut standard BS EN 319. Diharapkan hasil kajian ini dapat menyediakan alternatif penggunaan sisa pertanian sebagai bahan pembinaan yang mesra alam dan akan diuji lebih lanjut dalam bidang Teknologi Komposit Kayu.

Keywords :*Papan partikel berlapis (OSB), pencemaran, batang pisang, sifat fizikal, serapan air*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

OSB BANANA STEM

MUHAMMAD KAMAL ARIFFIN BIN HJ BADRUN
MUHAMMAD NAZIRUL BIN ZULKIFLE
MUHAMMAD AMALUDDIN NAJMI BIN JOHARI
ADAM NAUFAL BIN JAFRI

PROJECT DESCRIPTION

This study aims to utilize banana stems, an agricultural waste material, to produce Oriented Strand Board (OSB). Generally, OSB is made using wood chips and adhesive, but this research explores a more sustainable approach by using banana stems. The motivation behind this study is to address several environmental and economic issues related to the disposal of banana stems.

OBJECTIVE

- Producing Oriented Strand Board (OSB) from banana stem
- Make a testing of physical properties such as, water absorption, thickness swelling test and density testing with banana stem OSB

COMMERCIAL POTENTIAL

- OSB products based on banana stems can attract customers who prioritize sustainability and environmentally friendly practices.
- The production of OSB from banana stems may open new markets in the construction industry, which increasingly demands sustainable products.

SUSTAINABLE DEVELOPMENT GOALS

- The expected outcome for OSB (Oriented Strand Board) from banana stems is that it will be successful and suitable for producing OSB boards.
- We also hope that its strength and durability will be comparable to conventional OSB.
- Based on this idea, we hope there will be no limitations in obtaining raw materials, and research on this OSB will continue in the future.

IMPACT

- Provides a more sustainable material alternative for the construction industry.
- Utilizes local resources (banana stems) in an innovative and productive way.

NOVELTY

- Utilizing banana stems, an agricultural waste material, to produce OSB.

PRODUCT PICTURE





PENDIGITILAN PELAN BANGUNAN JKA DAN DEWAN AL-JAZARI

Muhammad Alif bin Ismail, Muhammad Azim bin Mohd Amizul, Muhamad Hafizam bin Mazlan,Muhamad Azhad Haikal bin Badrol Akmam,
Abdul Razli Bin Abdul Rahim, Norani binti Abd. Karim

(alifismail116@gmail.com, azimamizul3@gmail.com, muhahafizam@gmail.com, azhadhaikal10@gmail.com, arazli@psa.edu.my, norani@psa.edu.my)

Abstrak

Pendigitalan pelan bangunan JKA dan Dewan Al-Jazari merupakan projek mendigitalkan pelan yang sedia ada menggunakan Autodesk Revit yang merupakan perisian bagi Building Information Modelling (BIM). Projek ini dilaksanakan melalui kajian kerja lapangan yang dijalankan di pejabat Unit Bangunan dan Infrastruktur (UBI) bagi mengenal pasti masalah yang terdapat pada pelan yang sedia ada. Berdasarkan kajian yang dijalankan, didapati pelan asal berada di dalam keadaan yang kurang memuaskan. Oleh itu, inisatif yang diambil ialah mendigitalkan pelan tersebut. Inisiatif ini dapat membantu Unit Bangunan dan Infrastruktur (UBI) dalam membuat perancangan penyelenggaraan serta mengurangkan penyimpanan pelan. Responden yang terlibat di dalam projek ini ialah penolong jurutera Jabatan Kejuruteraan Awam (JKA). Penggunaan BIM dapat menjimatkan masa, mengurangkan kos serta mengekalkan data sedia ada pelan asal semasa proses pembinaan, merancang kos penyelenggaraan, meningkatkan kecekapan tenaga serta memaksimumkan jangka hayat bangunan. Walaubagaimanapun, terdapat beberapa perkara yang boleh ditambah baik di dalam projek ini seperti simulasi bangunan asal yang mempunyai pembaharuan warna yang lebih moden dan kod QR bagi pelan yang telah didigitalkan.

Keywords :*Pelan Bangunan, Building Information Modelling (BIM), Jabatan Kejuruteraan Awam (JKA), Dewan Al-Jazari (DAJ)*

FINAL PROJECT

Competition and Exhibition

SESSION I:2024/2025

CIVIL ENGINEERING DEPARTMENT

POLITEKNIK MALAYSIA

SULTAN SALAHUDDIN ABDUL AZIZ SHAH

PENDIGITALAN PELAN BANGUNAN JKA DAN DEWAN AL-JAZARI

PENERANGAN PROJEK

AUTODESK

RVT

- Projek mendigitalkan pelan bangunan JKA dan Dewan Al-Jazari menggunakan Autodesk Revit bertujuan untuk meningkatkan efisiensi melalui penggunaan Building Information Modeling (BIM). Kelebihan BIM termasuk pengurangan kemungkinan senario reka bentuk semula, penjimatan masa dan kos, serta penyelenggaraan data aset yang tepat. Kajian lapangan di Unit Bangunan dan Infrastruktur (UBI) mendapati pelan asal dalam keadaan kurang memuaskan, mendorong inisiatif pendigitalan. Ini membantu perancangan penyelenggaraan dan mengurangkan penyimpanan pelan. Responden dari Jabatan Kejuruteraan Awam (JKA) memberikan maklumbalas yang positif, walaupun terdapat ruang untuk penambahbaikan.

OBJEKTIF

- Untuk menghasilkan lukisan digital 2D dan 3D bagi seluruh bangunan JKA dan Dewan Al- Jazari



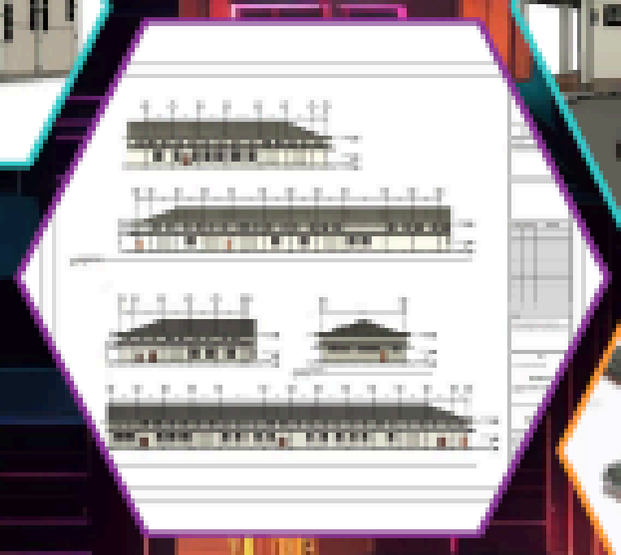


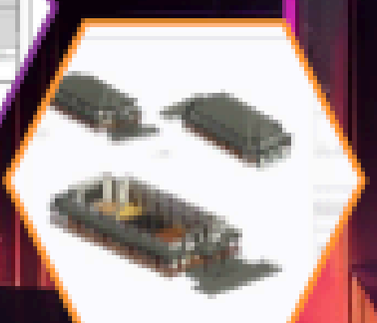
IMPAK

- Memudahkan pengurusan Unit Bangunan dan Infrastruktur.
- Pihak Ubi tidak perlu lagi hanya bergantung pada pelan asal JKA dan Dewan Al-Jazari yang lusuh dan koyak.









NOVELTY

- Projek BIM ini hanya terdapat pada Jabatan Kejuruteraan Awam dan juga Dewan Al – Jazari di mana hanya kedua bangunan itu memiliki pelan secara digital dari segi arkitektur dan struktur.
- Mengaplikasikan VR untuk visualisasi projek, membolehkan semua pihak dapat melihat reka bentuk bangunan secara digital seakan–akan berada di dalamnya.

MATLAMAT PEMBANGUNAN MAMPAN (SDG)

No 9 Industri, Inovasi dan Infrastruktur:

- Dengan penggunaan BIM, projek ini dapat membantu meminimumkan sisa bahan. Ini menyumbang kepada perindustrian yang mampan dengan memastikan sumber digunakan dengan cekap semasa pembinaan, yang mengurangkan kesan alam sekitar

POTENSI KOMERSIAL

- Penggunaan QR code di mana pihak tertentu hanya perlu mengimbasnya untuk mendapat maklumat terperinci tentang bangunan JKA dan Dewan Al-Jazari.
- Buku pelan digital untuk kedua bangunan tersebut boleh dijual untuk dijadikan sebagai rujukan kepada pelajar atau pensyarah.

AHLI KUMPULAN



MUHAMMAD ALIF BIN ISMAIL



MUHAMMAD HAFIZAN BIN NAZLAN



MUHAMMAD AZIM BIN MOHD AMIZUL



MUHAMMAD AZHAD HAIKAL BIN BADRUL AKHAM

BIM BUILDING INFORMATION MODELING

PENYELIA



ABDUL RAZLI BIN ABDUL RAHIM



Ts. DR. NORANI BINTI ABD KARIM

SANiBED: GOLDEN RATIO IN SANITARY BEDS

Tew Shi Hong, Muhammad Kamal Irfan Bin Kamal Badrin, Muhammad Luqman Hafiz Bin Muhd Akhtar, Teo Eng Yeaw

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Abstract

Bedridden individuals often face challenges related to hygiene and comfort, which can complicate their care and quality of life. SANiBED is an innovative, affordable, and portable sanitary bed designed to address these challenges, particularly focusing on ease of cleaning and patient comfort. The design incorporates the golden ratio to enhance aesthetics and ergonomics. Through this project, two prototypes of SANiBED were developed and tested with real-world volunteers: a 70-year-old bedridden woman and a 20-year-old male with lower limb paralysis. Each prototype underwent a series of evaluations involving feedback from caregivers and patients, as well as observational analysis of the bed's functionality. Improvements were made based on initial feedback, especially in terms of size and mattress thickness. The results show that SANiBED significantly enhances the overall care experience by providing a more comfortable and hygienic solution for both patients and caregivers, making it a viable option for long-term use in home care settings.

Keywords :*SANiBED, sanitary bed, bedridden individuals, Golden Ratio, affordable and portable*



SANiBED

GOLDEN RATIO IN SANITARY BED DESIGN

SV TEO ENG YEAW
TEW SHI HONG (F1064)
MUHAMMAD KAMAL IRFAN BIN KAMAL BADRIN (F1053)
MUHAMMAD LUQMAN HAFIZ BIN MUHD AKHTAR (F1036)

PROJECT DESCRIPTION

- SANiBED is a bed with a sanitary function.
- Design using Golden Ratio principle.

OBJECTIVE

- Applying Golden Ratio in sanitary bed design.
- Produce low cost sanitary bed.
- Have basic function such as adjustable back rest, sanitary drawer and storage area.

IMPACT

- Exposed to the mathematical beauty found in nature and architecture.
- Ease caregivers to take care of patient.

NOVELTY

- Bed design.
- Sanitary drawer design patent.

COMMERCIAL POTENTIAL

- SANiBED has strong commercial potential, emphasizing functionality and affordability.
- This product is designed specifically for low-income individuals.

SUSTAINABLE DEVELOPMENT GOALS

- This project emphasize on 6th SDG which is "Ensure availability and sustainable management of water and sanitation for all".

PRODUCT PICTURE





SACCHARUM OFFICINARUM PARTICLE BOARD

Muhammad Danial Haikal Bin Mohd Rafain, Amirul Ashraf Bin Nizam, Hazlan Bin Abdullah
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hazlan@psa.edu.my)

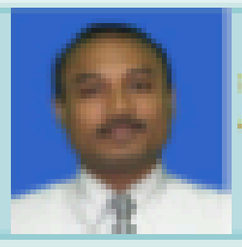
Abstract

Hampas tebu, sebagai sisa buangan berlignoselulosa yang dihasilkan daripada proses pengekstrakan air tebu, memiliki potensi besar sebagai bahan mentah dalam pembuatan papan partikel yang mesra alam. Kajian ini bertujuan untuk mengenal pasti kulit tebu dan hampas tebu sebagai bahan utama dalam penghasilan papan partikel. Dengan lebih daripada 100 ribu tan hampas tebu dibuang setiap tahun di kilang gula Felda Perlis, penyelidikan ini menunjukkan bagaimana sisa ini dapat dikitar semula dan digunakan dalam pembuatan bahan binaan komposit yang berpotensi menggantikan papan kayu konvensional. Proses penghasilan melibatkan penggunaan resin Urea Formaldehyde dan Ammonium Chloride sebagai bahan pengikat, dengan ujian ketahanan dilakukan mengikut piawaian Malaysia. Hasil penyelidikan ini diharapkan dapat mengurangi sisa buangan dan menyumbang kepada kelestarian alam sekitar.

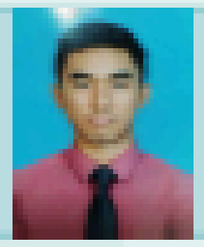
Keywords :*kulit tebu, hampas tebu, papan partikel, bahan berlignoselulosa, kitar semula*



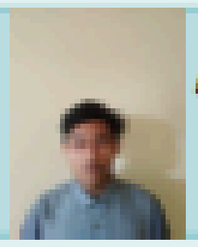
SACCHARUM OFFICINARUM PARTICLE BOARD



SUPERVISOR: HAZLAN BIN ABDULLAH



MUHAMMAD DANIAL HAIKAL BIN MOHD RAFAIN(08DBK22F1004)



AMIRUL ASHRAF BIN NIZAM(08DBK22F1035)

PRODUCT PICTURE





PROJECT DESCRIPTION

- Pengunaan hampas tebu dan kulit tebu sebagai sumber utama untuk membuat papan partikel, ingin memberi kesedaran kepada orang sekelling agar tidak membuang merata-rata sisa tebu yang telah diproses dan menyedarkan bahawa selain dari pengunaan membuat air dan gula, boleh juga digunakan sebagai sebuah papan.

OBJECTIVE

- Untuk menghasilkan papan partikel dengan menggunakan hampas dan kulit Saccharum Officinarum sebagai bahan utama.
- Untuk menyelidik sifat-sifat fizikal komposit termoset Saccharum Officinarum untuk dijadikan sebagai papan.

IMPACT

- Alam sekitar lebih Lestari
- Tiada berlaku pemaziran tebu
- Pengurangan maslah egen perosak

COMMERCIAL POTENTIAL

- Mudah didapati
- Kos bahan mentah murah
- Kos pembuatan murah

SUSTAINABLE DEVELOPMENT GOALS

- Pengurangan maslah tebu dibuang secara merata-rata
- Pengurangan masalah egen perosak dan masalah pencemaran bau

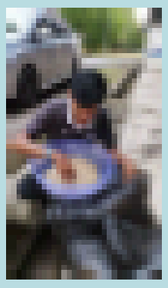
NOVELTY

- Pengunaan bahan lebihan
- Penukar bahan mentah yang mudah didapati

METHODOLOGY



PENCARIAN BAHAN MENTAH



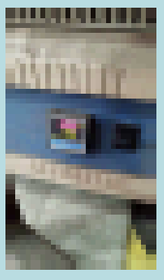
MEMISAHKAN ANTARA KULIT DENGAN HAMPAS TEBU



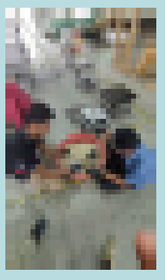
RENDAM UNTUK MENGELUARKAN KANDUNGAN GULA



PENJEMURAN SELAMA SEMINGGU



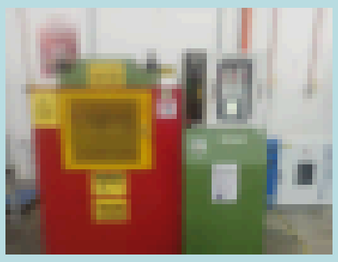
MENGAMBIL BACAAN MC MENGGUNAKAN OKYSIS OVEN



CAMPURAN BAHAN PENGIKAT DENGAN HAMPAS DAN KULIT TEBU



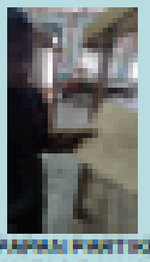
ACUAN MENGIKUT UKURAN



HOT PRESS SELAMA 8 MINIT



PENGHASILKAN 8 PAPAN PARTIKEL



HASIL PAPAN PARTIKEL DARI HAMPAS DAN KULIT TEBU

TAJDEED REHAL

Amirrashid Bin Mohd Hod, Muhammad Hazwan Aiman Bin Che Khamshah, Abdul Hafizuddin Bin Abdul Halim, Muhammad Syahir Bin Muhamad Kamal, Tengku Nur Syarah Bariah Binti Raja Mohd Yazit

(rashidamir270@gmail.com, haz1117aiman@gmail.com, hafizabdulhalim65@gmail.com, syahirkamal09@gmail.com.my., nur_syarah@psa.edu.my)

Abstract

Rehal or the Quran stand is a traditional wooden structure that plays an important role in religious activities, providing a special place for Al-Quran while reading or memorizing it. Users often face difficulties bringing both the rehal and the Quran together to the reading or memorization area. The ability to carry these two items depends on the size of the Quran, the rehal, and while using it. This study aims is to produce “Tajdeed Rehal,” an innovative multifunctional rehal that not only serves as a support for the Quran but also features a holder and additional storage space for the Quran, stationery, and notebooks.The scope of the study is evaluating the effectiveness of Tajdeed Rehal through a questionnaire on product usage effectiveness to ensure it is practical and efficient for tahfiz students. The project materials include rubberwood, hinges, formica, and flat iron strips. The study findings indicate that Tajdeed Rehal provides convenience, especially for tahfiz students who require easy mobile access to the Quran, stationery, and notebooks.In conclusion, Tajdeed Rehal meets practical, mobility, and attractive design features for tahfiz students. However, the product needs modifications, such as increasing the height of the rehal legs and reducing the weight to enhance user comfort and ease of use. Recommendations for this product include creating a more flexible and lightweight ergonomic design and exploring marketing opportunities for educational institutions and mosques to promote widespread use within the community.

Keywords : *Tajdeed Rehal, innovation, multifunctional, Al-Quran, mobility*

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CIVIL ENGINEERING DEPARTMENT

TAJDEED REHAL



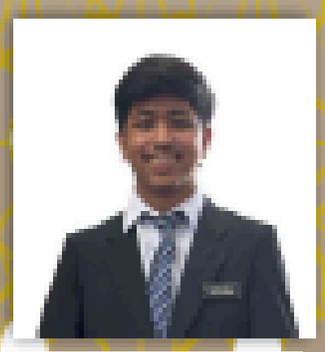
TG. HUR SYASHA SARAH BINTI SAJA MOHD YAZIT
(PENYELIA PROJEK)



AMIRASHID BIN MOHD HOD (DEB22109018)
(KETUA)



MUHAMMAD HAZWAN AIMAN BIN CHE DHARMAH (DEB22F1018)



ABDUL HAFIZUDDIN BIN ABDUL HALIM (DEB22F1041)



MUHAMMAD SYAHIR BIN MUHAMAD KAMAL (DEB22109018)

PENERANGAN PROJEK

➢ **TAJDEED REHAL** ialah rehal yang telah diperbaharui dengan pemegang dan ruang simpanan untuk Al-Quran. Rehal ini praktikal dan mudah dibawa di institusi tahfiz.



➢ Pengguna sering menghadapi kesukaran untuk membawa rehal dan al-Quran serentak ke ruangan membaca atau menghafal AlQuran. Keupayaan membawa kedua-dua item ini bergantung kepada saiz al-Quran, rehal dan waktu penggunaan.

OBJEKTIF

➢ Menghasilkan rehal yang mempunyai pemegang dan juga tempat meletakkan Al-Quran



POTENSI KOMERSIAL

➢ Terdapat potensi pasaran yang kuat dalam institusi pendidikan, masjid, dan kediaman, terutamanya dikalangan mereka yang mementingkan pengajian Al-Quran.

MATLAMAT PEMBANGUNAN LESTARI (SDG)

➢ SDG 4: Pendidikan Berkualiti – Menyediakan alat yang praktikal untuk pembelajaran Al-Quran.

➢ SDG 12: Penggunaan dan Pengeluaran Bertanggungjawab – Direka untuk tahan lama dan menggunakan bahan lestari.

IMPAK

➢ Produk ini menggalakkan pembacaan Al-Quran secara konsisten dan memudahkan pelajar membawa dan menyimpan Al-Quran.

KEUNIKAN

➢ Gabungan unik rehal tradisional dengan fungsi moden, termasuk keupayaan mudah alih dan ruang simpanan yang tidak terdapat dalam rekaan rehal biasa.

GAMBAR PRODUK



SENARAI JAWATANKUASA FINAL PROJECT COMPETITION & EXHIBITION (FPCE)

SESSION I:2024/2025

JAWATANKUASA PROGRAM

Pengerusi

PN ZAINAH BT RUJIHAN

Timbalan Pengerusi I

TS. DR. AHMAD AFTAS BIN AZMAN

Timbalan Pengerusi II

TS. MOHD FIRDAUZ BIN MHD RADZI

Penasihat Program

PN NAZRIZAM BINTI AB. WAHAB

Penyelaras

PN ROSIDA BINTI AHMAD

Pengarah Program

EN MIOR AMRAN NOOR BIN MIOR AHMAD NOOR

Setiausaha I

PN NOORULAZWA AYUNI BINTI MAT NOOR

Setiausaha II

PN MAISHARAH BINTI OSMAN

Bendahari

PN HAFIZAH RINA BINTI ABAS

FINAL PROJECT COMPETITION & EXHIBITION
SESSION I:2024/2025

JAWATANKUASA PROGRAM

JK Penjurian dan Pemarkahan

PN NORLIZA BINTI MD JAHID
PN ROHAZA BINTI MAJID

TS. ZURENA BINTI LEMEN
TG NUR SYARAH BARIAH BINTI RAJA MOHD YAZIT

JK Penyambut Tetamu

PN NUR AQILA BT KAMAROL ZAMAL
PN HAZRUWANI BINTI A.HALIM

En Mustazha Hakim Bin Abu Tahari

JK Liason Officer

PN DALIELA BINTI ISHAMUDDIN
PN NOOR AZILA BINTI JAMARI

EN ZAKARIA BIN AYOB

JK Persiapan Tempat

EN MUHAPIS BIN A. HAKIM
EN TEO ENG YEAW

EN MUHAMMAD KAMAL ARIFFIN BIN HJ. BADRUN

JK Teknikal & Multimedia

Pn Mai Azuna bt Meor Yusuf
Pn Norlaila Bibi bt Altamiah

EN ZULLHYZRIFEE ISHRAF B ZULKIFLY

JK Jemputan Panel Luar

PN NUR HAZLINA BINTI LAMLI
PN NURIN HAFILAH BINTI HAMZAH

PN MASWIRA BINTI MAHASAN
PN SUZLIANA BINTI MARSOM

JAWATANKUASA PROGRAM

JK Cenderahati

Pn Jamilah Binti Hj Abbas
Pn Siti Norazlina Binti Abd Rahman

JK Pendaftaran & Sijil

SR. ZARINA BINTI MAT SAPRI
PN ATIKAH FATMA BINTI MD DAUD

PN ZURAIDAH BINTI MOIN

JK Buku Program

TS. DR. AINUL HAEZAH BINTI NORUZMAN
PN SARAH AFZAN BT ABD KARIM

JK Teks Ucapan & Pengacara Majlis

PN RAFIDAH FARAH HANIM BINTI ABDUL RAZAK
PN WAHIDA BINTI MOHAMAD NOOR

JK Makanan

PN MARLIZA ASHIQIN BINTI KHAZALI
PN JAZLINA BINTI MUHAMMAD

JK Pertandingan Poster

PN ZURINA BINTI SAFEE
PN ISMA AFIZA BINTI ISMAIL

PN NORHAYATI BINTI PALIL

JAWATANKUASA PROGRAM

Panel Penilai Dalaman

PROGRAM DIPLOMA KEJURUTERAAN AWAM (DKA)

1. PN YUSNITA BT YUSOF
2. PN CHOONG SIEW LAY
3. EN FAWI BIN SAMAD
4. EN MD ALIMI BIN YASINAN@JASMAN
5. EN MOHD ZAIDI BIN ABDUL HAMID
6. PN NOR ZARINI BINTI ISMAIL
7. TS. NORMASITA BINTI SULAIMAN
8. TS. DR SITI ASMIZA BINTI MUZAFAR
9. PN ZARINAH BINTI ZAINI
10. PN SALIZAWATI BINTI KAMARULZAMAN
11. PN FARIHAH BINTI MANSOR
12. PN SARINA BINTI TALIB
13. PN HAZRUWANI BINTI A.HALIM
14. EN MUHAMAD FAIRUZZAIRI BIN ABDUL HAMID
15. EN HAZLAN BIN ABDULLAH
16. TS. RAJA NURUL WAHEEDA BINTI RAJA ZILAN
17. SR. TS. NIK ZETY AKHTAR BINTI ABDUL AZIZ
18. TS. SHAHIDA BINTI SHARUDDIN
19. GS. MOHD ROZAIMIN BIN ABDUL HAMID
20. TS. NOR HAZLIN BINTI MD GHARIP
21. SR. NOREZAN BINTI ASMANGI
22. SR. TS. ROHAIZANA BINTI RAMLI
23. TS. SUMAINI BINTI CHE MAID
24. PN ZURIATI BINTI ABD MAJID

PROGRAM DIPLOMA KEJURUTERAAN PERKHIDMATAN BANGUNAN (DPB)

1. EN AMIR BIN ABDULLAH
2. PN MARIAM BINTI ABDULLAH
3. EN MOHD SAFARI BIN JAAFAR
4. EN AZIZI MURSIDY BIN ZAINOL ABIDIN
5. EN MUSTAZHA HAKIM BIN ABU TAHARI
6. PN NUR HAFIDZAH BINTI MUHAMADAN

PROGRAM DIPLOMA TEKNOLOGI BERASASKAN KAYU (DBK)

1. EN JEFRI BIN JUSOH
2. PN NUR AQILA BT KAMAROL ZAMAL
3. TS. DR. NORANI BINTI ABD KARIM
4. EN HAMDI BIN HJ MAWARDI

JAWATANKUASA PROGRAM

Panel Juri Poster

1. ARDUNIWATI AHMAD (KKSA)
2. ENARNEYNANEY IBRAHIM (KKSA)
3. FIRDAUS BIN GHAZALI (KKSA)
4. MOHD FIRDAUS BIN SEDET (UIDM)
5. AHMAD FADIATUDDIN B. MAT TAHIR (FITAC)
6. MOHD NOR AQMAL BIN RAZALI (UIDM)

FINAL PROJECT COMPETITION & EXHIBITION
SESSION I:2024/2025

PENGHARGAAN

Barisan Ahli Jawatankuasa dengan ikhlas merakamkan ucapan setinggi-tinggi penghargaan dan terima kasih kepada semua yang terlibat sama ada secara langsung atau tidak langsung bagi menjayakan program FPCE.

FINAL YEAR PROJECT COMPETITION & EXHIBITION
SESSION 1: 2024/2025

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