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VOLUME 10 2024

APS Proceedings Volume 10

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Published 14 May 2024

e ISBN 978-629-99506-0-8

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Published by:

Academica Press Solution ^{003428568-X} Batu 23, Kg Jias, 17000 Pasir Mas, Kelantan, MALAYSIA Email: contact.digit360@gmail.com

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Research Article

Smart Community Access: AI-Enhanced License Plate Recognition for Resident-Verified Visitor Integrated Management System

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Abstract: In today's rapidly evolving technology environment, most communities and apartment buildings use RFID, smart cards, or worse, traditional manual recording methods. It turns out that these methods cannot prove the identity of cars and visitors, posing security risks. This article proposes the integration of mobile applications and web-based security systems to address contemporary security and management challenges. The system encompasses a range of crucial features, leveraging state-of-the-art AI detection capabilities, the application extends its functionality to verify car license plates providing real-time confirmation of a car's registration status. The license plate identification technology enables residents to pre-register guests, expediting entry through automated license plate recognition and simplifying the security process. An advanced visitor identification system enhances visitor authentication and prevents unwanted intrusions by allowing access only with a resident's explicit approval. If a registered visitor enters the community, the system will record the registered visitor's name, license plate, and accurately record the timestamp of the visitor's arrival and departure to effectively track and manage visitor access. Furthermore, an incident management system enables administrators to easily manage community activities, security protocols, maintenance expenses, and outstanding payments. The access control system allows administrators to modify residents' access privileges in cases of unpaid maintenance fees, ensuring equitable resource allocation. An emergency response system improves overall security by allowing residents to quickly activate alarms, requiring on-site security personnel to respond quickly during crises. The system also allows for robust data analysis and reporting by integrating resident information, emergency contacts, and payment records to identify outstanding payments quickly. Moreover, the payment management system allows administrators to customize payment records, meticulously documenting residents' financial history, arrears, and timestamps, while providing residents with a clear picture of their financial situation. This integrated system improves security, streamlines management, and promotes a safer living environment, representing a significant advancement in modern residential community management in this technologically advanced era.

Keywords: AI Detection; Community Security; Community Management



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1. INTRODUCTION

Computers have become an essential component of our everyday life in today's technologically sophisticated world. It is impossible to deny that most communities and apartments still rely on manual methods. Despite the ease of high-tech solutions, several communities and condominiums continue to

physically record and fill out daily activities. This strategy is being tested as the security and management difficulties of neighbourhoods and flats grow.

1.1 Background Research

1.1.1 Background Research on Community Security Guard Systems



Figure 1. Taman Ehsan Jaya 2

The neighbourhood association Taman Ehsan Jaya 2 in Johor Bahru is in charge of preserving the inhabitants' safety and wellbeing. The committee use a range of security measures, including as entry control systems, guard patrols, surveillance cameras, and patrols, to keep the neighbourhood safe. Additionally, the group was founded by mutual trust and collaboration between residents and neighbours to work together to resolve community safety issues to ensure the safety and security of the neighbourhood. In order to collect information about the association's daily operations and procedures, neighbourhood committee members, residents and other relevant personnel of the association were questioned and interviewed.

When visitors arrive at the community entrance, visitors must register their information at a security booth. The staff will next ask the visitor what their goal for visiting before verifying their identity and ask the visitor's whereabouts such as address for visiting and check the visitor's identity. Before permitting visitors into the community, staff will record their name, contact information, number plate number, and time of entry.

The neighbourhood committee has systems in place to give resident access control cards so committee and resident can use the security system. Each resident who is a member has a special access card that resident can use to enter the community. Non-members, on the other hand, can only access the community through the guest channel after staff personnel have verified their identification.

Community security systems also involve surveillance cameras installed in key areas of the community for visitor and resident monitoring. These cameras can keep an eye on and record activities in public places in real time, which can help prevent crime and, if required, aid investigations.

Furthermore, to increase the security system's efficacy, MS Office Excel is also used by the community to record resident data, contact information, emergency contacts, and any other unique security requirements. Security professionals can now promptly respond to security problems and emergencies because to this database's comprehensive perspective of resident. Additionally, the

association uses Excel to keep track of all resident membership statuses, maintenance fee amounts and payment schedules and so forth.

Security guards also conduct routine patrols as part of community security systems to maintain visibility and promptly react to any suspicious activity. To ensure a safe and secure environment for inhabitants, security officers also collaborate with local law enforcement organisations to share information and coordinate operations.

Overall, the design and implementation of this community safety system reflects a high priority for the safety and well-being of residents, creating a safer and more secure environment for the community.

1.1.2 Background Research on Apartment Security Guard Systems

Molek Pine apartment in Johor Bahru is selected for background research on apartment security systems. This administrator is responsible for maintaining the safety and comfort of residents. The committee employ various security measures, including access control systems, security patrols, surveillance cameras, and cooperation with local law enforcement, all to ensure the security of the apartment complex, which is similar to Taman Ehsan Jaya 2.

When visitors arrive at the apartment entrance, the visitors need to register with the security guard. The staff on duty will ask about the purpose of the visit, verify their identity, and record the visitor's name, contact information, license plate number, entry time and other information. Only after these checks have been completed will visitors be able to enter and exit the apartment without having to be authenticated as a resident.

Residents of Molek Pine use access cards to enter and exit the community or apartment just like Taman Ehsan Jaya 2. In addition, each resident has a personalized access card for easy access. However, the difference between Molek Pine and Taman Ehsan Jaya 2 is that the community do not have non-membership. This is because all residents must sign a contract that the maintenance fee will be paid along with some property taxes before buying an apartment.

Surveillance cameras are strategically placed throughout the apartment complex, focusing on key areas to monitor visitors and residents. Capable of monitoring and recording in real time, these cameras help deter potential criminal activity and assist with investigations if required. In addition, security personnel conduct regular security patrols to ensure a visible security presence and respond quickly to any suspicious activity.

To improve the efficiency of security measures, the condominium association has purchased simple application management software to manage, which contains resident details, contact information, emergency contacts and any special security requirements. The app helps security guards promptly address security concerns and emergencies, as well as rent payments and the status of some public facilities.

1.2 Objective

The objective of Community Security Systems is to improve safety and security by proposing practical solutions. The system is designed to achieve the following objectives:

• Prevent unauthorized entry to premises and ensure that all visitors are for the sole purpose of visiting residents.

- Allows pre-register visitors to go through security quickly.
- Increasing the number of maintenance fees paid by residents for apartments or communities.
- Allows security personnel to efficiently collect all information and purpose of visits from all visitors and allows management to efficiently locate information when needed.

1.3 Scope

The Community Security System is an Android application, the subsystem contains the following functions:

1.3.1 Account Information Management

Every resident is required to sign up and log in to the system. Personal data can be added to and modified after logging into the system. The administrator can see the user's information in an emergency so can quickly get in touch with the inhabitants.

1.3.2 Event Management System

Community activities and safety information, community maintenance fees, arrears records and so forth. That can be added, edited, and deleted by the administrator.

1.3.3 Visitor Authentication System

When a visitor drives into the community and wants to enter, the system will allow the visitor to enter the community after obtaining the permission of the designated resident, so that the resident can reconfirm that he is indeed here to visit the resident.

1.3.4 Visitor Management System

This system helps to effectively manage and track visitors entering the community. It has the functions of visitor registration, identity verification, license plate recognition, time stamp of entry and exit and so forth.

1.3.5 Access Control System

If the resident defaults or fails to pay the maintenance fee, the administrator can modify the access control card usage authority. Due to the advantages enjoyed by member users who have access control cards to use member passes to enter the community.

1.3.6 Emergency Response System

To efficiently manage emergencies, the system includes emergency response modules. Residents can use it to sound the emergency alert, which prompts the security officers in the guard room to quickly go to their aid.

1.3.7 Data Analysis and Reporting

All resident data, emergency numbers, and records of maintenance payments are combined in the system. The administrator can collect all the residents who have not paid the maintenance fee in a short time.

1.3.8 Payment Management System

The administrator can customize the payment amount recorded for each payment of residents. The administrator can record which resident has paid, such as payment amount, arrears record, date and time. Residents can also easily check their arrears records and make accurate repayments.

1.3.9 Car Plate Recognition

Residents can make appointments for visitors in advance. Residents need to fill in the time of visit, the personal information of the visitor and the license plate number. In addition, when the system automatically recognizes the registered license plate number, visitors will be allowed to pass, so that visitors who have made an appointment in advance can quickly pass through the security check.

1.3.10 Notification

Notification is important in security guard systems because this system provide real-time warnings, improve situational awareness, improve reaction time, facilitate efficient communication, and centralise information.

2. METHOD & MATERIAL

The creation of an initial, scaled-down version of a system or programme in order to gather input, confirm requirements, and make adjustments prior to producing the final product is known as the "prototype methodology," which is a prominent strategy in software development.



Figure 2. Prototype Model Diagram

The Prototyping model is focused on improving the development team's comprehension of the needs and wishes of the client by producing prototypes. Miscommunications or misunderstandings can be cleared up prior to complete development by building a functional small-scale copy of the intended software programme.

Developers first design a prototype of what they think the consumer would desire before starting to work on the finished product. The prototype is created, evaluated, and improved based on

consumer input. According to Mallaidh Mleziva, the group starts creating the final product as soon as the prototype is approved. (Mallaidh Mleziva, 2022)

2.1 Phases Within the Chosen Methodology

2.1.1 Requirement Gathering

The requirements phase of gathering and analysing a product entail being aware of the project's objectives, functionality, user expectations, and restrictions. The direction of prototyping must be guided by requirements documentation. To define the necessary functionality, such as visitor management, visitor logging, administrative notifications, and resident information, the development of security system applications necessitates user engagement, surveys, and analysis of current security system applications.

2.1.2 Design

A high-level design or conceptual model for the product to be made based on the requirements received, the prototype's overall structure, user interface, and primary functionality are all defined during the design process. The developer can create a quick design of the application to get an understanding of its capabilities and provide a basis for prototypes. Wireframes of the application screens, such as login screens, account overview, account status, and other related features, will be created during the design phase for security system applications.

2.1.3 Prototype Building

A functional prototype of a product is constructed utilising rapid development methods. Prototypes used for testing and assessment are subject to prototyping. Although a prototype might not contain all the final features, it nonetheless shows how the application's essential features work. The functional prototypes of security system apps utilising tools like JavaScript, CSS, and HTML. Implementations should, for instance, concentrate on implementing fundamental features like user authentication and guest reservation status. Moreover, the prototype might not yet have complete security protections or reliable backend systems.

2.1.4 Customer Evaluation

Prototypes are thoroughly tested to find any problems, usability problems, or places for improvement. During this stage, user and stakeholder feedbacks are gathered to determine how well the prototype accomplishes the specified objectives. A usability test is conducted, where prospective users interact with a prototype to complete routine tasks like confirming the availabilities of the guest system, the membership status of resident accounts, and visitor pre-registration status. Additionally, pay attention to how users behave, get feedback on the interface, and note any user issues or suggestions for enhancements.

2.1.5 Refinement

The prototype is improved and iterated upon in response to comments and test results. Making the necessary adjustments, improvements, and tweaks throughout this phase will help the prototype's functionality and address any concerns that have been found. Review the results of usability testing, for instance, and pinpoint any places where the prototype needs to be enhanced. To fix reported problems, customise the user interface to the preferences of the user, improve error handling, and include missing functionality.

2.1.6 Deployment

The prototype can move on to this step if it is deemed successful and meets the necessary requirements. This entails putting prototypes into production, enhancing, and expanding designs, adding necessary functionality, and guaranteeing the stability and dependability of the final products. As an illustration, start developing a fully functional, production-ready safety system application from a tested prototype. User authentication methods were introduced, the user interface was enhanced, and the required backend systems such as license plate recognition were merged. Before being made available to end users, the app undergoes extensive testing.

2.1.7 User Acceptance Survey

Users must carry out testing, that is user acceptance tests, prior to the actual implementation. Surveys of user approval must be conducted to test the produced system with management members and users. This acceptance investigation's primary objective is to validate the system in light of the user's operational needs. In the final testing, the system's functionality is assessed to determine whether it fulfils its intended purpose.

2.1.8 Implementation and Maintenance

Prior to entering the production phase, the system undergoes thorough testing using the final prototype as a foundation. This testing process is essential to ensure the system's functionality, reliability, and performance. Additionally, regular maintenance is performed to minimize downtime and proactively prevent any potential critical failures.

2.2 Materials and Technology Used

The technology and tools utilised for application development might vary based on the development team's individual needs and preferences. However, the following are some regularly used technologies and tools in several development domains:

2.2.1 Android Studio

Android Studio is the official Integrated Development Environment (IDE) for developing Android applications. Android Studio, which is based on IntelliJ IDEA's sophisticated code editor and developer tools, adds further functionality to boost efficiency when developing Android applications.

2.2.2 Dart Language

On any platform, Dart is a client-optimized language for creating quick apps. With a configurable execution runtime platform for app frameworks, it aims to provide the most productive programming language for cross-platform development.

2.2.3 Git

A distributed version control system for monitoring source code changes and collaborating among developers. Hosting and collaboration services are provided by platforms such as GitHub, GitLab, and Bitbucket.

3. FINDINGS

The safety of community is crucial in today's environment of rapid change. Community security systems have become a crucial component of upholding a secure living environment as concerns about crime rates and the demand for efficient protection measures for inhabitants have grown. This Literature review intends to examine the idea, execution, and impact of community security systems in particular domains and to highlight their value. Even though there is a lot of study on safety devices and manpower training nowadays, the security safety systems have not received as much attention.

3.1 Current System Analysis

The section on literature reviews examines works on community safety system analysis. Research on similar security systems is advantageous to both researchers and proponents since the insights gained from these related systems substantially aid in the development of new features and enhancements. Furthermore, to increase the effectiveness of the system, the data gathered from the study of pertinent community security systems contributes to the creation and validation of the suggested solutions. According to Smith, community safety systems encompass a range of measures, including physical infrastructure, surveillance technologies, community engagement programs and law enforcement collaboration, aimed at preventing and res ponding to safety threats (Smith, 2013).

Tebrau's Harp Homes has implemented a security system. For pre-register visitors, the resident will forward a dedicated form for the visitor to manually fill in the visitor information. After filling, the visitor will get a QR code. When arriving at the Harp Homes Guard House, the visitor must show the QR code to the security guard. The security guard must manually use the mobile phone to scan the QR code obtained by the previous visitor and manually fill in the visitor's license plate number, colour, and entry time. In addition, the visitor must perform facial recognition to enter and exit the home to ensure the visitor's departure.

Sub-System	
Visitors Management	Use this visitor management app to grant visitors permission.
Pre-register visit	Confirm visitor identity with QR code
Helpdesk Administration	By assigning concerns automating the distribution of information easily manage neighbourhood problems and resident complaints.
System Features	
Accounting	The document will be kept up to date using built-in computations, automatic reporting, third-party connectors, and much more.
Bill Payments	Easy payment options for Maintenance Dues, Utility Bills
Notification	The app automatically notifies the community of relevant current affairs news and offers to read.

Table 1. Current System Analysis

3.2 Comparison between Three (3) Existing Systems

The table's goal is to highlight the distinctive qualities of the suggested system in comparison to other systems or past studies. This research's advancement greatly benefits from similar systems, but

it also reveals some disparities. The suggested approach by seeks to boost overall efficiency while adding more functionality.

Eden, MyTaman, and i-Neighbour are all security systems that employ their own unique ways and technology to produce more convenient and secure solutions for all users. Furthermore, these security systems incorporate several fundamental services such as access control, surveillance monitoring, invoicing, facility booking, pre-registration for guests, and notification capabilities, among others.



Figure 3. Eden Website

Eden is a community management system for apartments, condominiums, gated communities, and commercial buildings that uses a single integrated platform to deliver digital convenience to residents and property managers. This will simplify and automate much of the tedious work, making property management easier and providing the online convenience that property owners and tenants need.



Figure 4. iNeighbour Website

I-Neighbour is a subsidiary of TimeTec, a company that started out with biometric technology and focuses on employee time and attendance and office access control systems. I-Neighbour is the go-to app for all property management needs. I-Neighbour also the most feature-rich software, with over 30 features for managing, automating, and connecting people, activities, and gadgets deployed in residential communities. In addition, i-Neighbour also offers cloud, IoT, and artificial intelligence capabilities and devices.



Figure 5. MyTaman Website

MyTaman is a community-driven smartphone application that aims to improve neighbourhood quality of life and develop closer ties among inhabitants. The app is a complete platform that allows users to engage, cooperate, and keep updated about local events, services, and relevant updates in their area. MyTaman is more than simply a neighbourhood app, it is a tool that encourages citizens to actively engage in the development of vibrant, safe, and connected neighbourhoods. It strives to bring people together, support local businesses, and enhance overall neighbourhood quality of life.



Figure 6. Eden, MyTaman and iNeighbour application home page

Table 2.	Comparison	Between	Eden,	MyTaman	and i-Ne	ighbour	Systems
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Features	Eden	MyTaman	i-Neighbour
Visitor approval	Cableless Intercom	Intercom via app	Resident QR Code
Pre-register visit	Register by resident	Register by resident	Resident sent the invite code to visitor and register by resident
Data visitor collection	Security Guard fills the details in application	Security Guard fills the details in application	Visitor fills the form digitally and security guard will double check the information
Notification		Yes	
Event Management	No	Yes	Yes
E-bill & E-pay	E-pay only	E-bill and E-pay	E-pay only
Tenant Management	No	No	Yes
Calendar of Reminders	No	No	Yes

Emergency contact	No	SOS alert	Online and Offline Panic Button
Emergency contact person	No	Security guard	Security guard, family members, close friends

4. DISCUSSION

The process of confirming and validating whether a piece of software or an application is free of bugs, satisfies technical requirements as dictated by its design and development, and satisfies user requirements effectively and efficiently by managing all exceptional and boundary cases is known as software testing. Software testing looks for ways to enhance the program's accuracy, efficiency, and usability in addition to identifying bugs in the currently available version. The article's main topic is a thorough discussion of software testing.

No.	Features	Description
1	Login	Login as authenticate user.
2	Logout	Logout from the system.
3	Register	Register as a user
4	Add Profile	Add account information
5	Edit profile	Edit account information
6	Add Pre-register Car	Add appointment information and car license plate
7	Edit Pre-register Car	Edit appointment information and car license plate
8	Delete Pre-register Car	Delete appointment information and car license plate
9	Booking Facility	Add appointment information facility
10	Edit Booking Facility	Edit appointment information facility
11	Delete Booking Facility	Delete appointment information facility
12	Booking Public Space	Add appointment information public space
13	Edit Booking Public Space	Edit appointment information public space
14	Delete Booking Public Space	Delete appointment information public space
15	Add Notification	Add notification information
16	Edit Notification	Edit notification information
17	Delete Notification	Delete notification information
18	Add Emergency Detail	Make emergency notification
19	Edit Emergency Detail	Edit emergency notification

Table 3. Software Testing

20	Delete Emergency Detail	Delete emergency notification
21	Add Payment Detail	Update payment status
22	Edit Payment Detail	Edit payment status
23	Delete Payment Detail	Delete payment status
24	Add Family Detail	Update family status
25	Edit Family Detail	Edit family status
26	Delete Family Detail	Delete family status
27	Add Card Detail	Update card information
28	Edit Card Detail	Edit card information
29	Car License Plate Detection	Detect the car license plate recognize is same with data

User testing is a comprehensive practice of inviting personal representatives of the target audience to actively participate in a product or service. Through their interactions and subsequent feedback, this approach helps identify potential issues, preferences, and areas for improvement, thereby improving the product's usability and overall user experience.

In this post-test discussion, the general understanding of the heuristics, the overall goals of the system, the consistent design, and the imagery were all well received. It is just that the design needs further improvement.

In addition, in terms of content, whether the title is easy to read, whether the text information is simple to present, terminology, etc. have also been well received by users. In addition, it also gets quite high ratings in terms of navigation.

Regarding the license plate recognition system, the accuracy is slightly medium. Because there are many types of fonts on license plates in Malaysia, it may take a small amount of time to read again. This does not affect the latency and does not have any latency-related reactions.

4.1 Recommendation

4.1.1 Add Payment Functionality

Payment function can be added, it is used for residents to pay membership fees, and it also facilitates administrators to charge fees and residents do not have to go out to pay.

4.1.2 Systems Improvement

Enhance the license plate recognition system so that the system can also identify the car colour and model. Although the license plate symbolizes the identity of a car, it prevents people from stealing other people's license plates and pretending to be residents to access the community.

5. CONCLUSION

The security guard system provides an integrated strategy for enhancing safety and security in communities. The system creates a strong security infrastructure by integrating different components like the account information management system, event management system, visitor management system, access control system, incident reporting and management system, emergency response system, data analysis and reporting system, payment system and chat system.

The primary goals of these systems are to improve community and apartment safety, provide more power and convenience to residents and managers, and facilitate rapid response and efficient handling of security incidents. The system provides security measures to prevent unauthorized entry, enables security personnel to quickly collect and retrieve visitor information, simplifies the procedure for residents to pay maintenance fees, allows management personnel to access resident information.

Through continuous improvement and data-driven decision-making, community and apartment safety systems help create safer living environments and respond to changing safety concerns. These systems leverage technology and integration to improve safety, empower communities, and guarantee rapid and effective responses to security incidents.

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BreezeRide Cooling Gear

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Abstract: The need to come up with new ideas and create a special instant cold pack for riders during intensely hot weather is becoming increasingly essential. This kind of solution is crucial for successfully dealing with the intense heat, ensuring that riders can stay focused, and safe during their journeys, as well as improving their overall riding experience. The goal is to develop an instant cold pack that is easy to use, ensuring it does not hinder the rider's movement or overall riding experience. Other than that, to maintain a comfortable body temperature for riders, especially during hot weather conditions, by effectively cooling the body's surface and ensuring the instant cold pack provides a sustained and long-lasting cooling effect, allowing riders to enjoy extended relief during their journeys. There are a few materials of this product including the instant cold pack which consists of two bags, one containing water and inside a bag containing ammonium nitrate. Another material is the cooling gear strap which uses 60% nylon and 40% nylon for the instant cold pack holders. It includes adjustable straps for the shoulders, stretchable straps with buckles on the sides for a firm hold on the body. This product can protect the riders from the potentially harmful effects of heat exhaustion and dehydration. Plus, it will be heavily promoted on social media (Facebook, Instagram, and TikTok). By hiring content marketers to create blog posts, videos, and infographics that educate riders on the importance of keeping hydrated while riding and the steps this product might assist, this may contribute to the product's audience growth. BreezeRide, a product designed specifically for professionals on the go, guarantees an enjoyable and comfortable ride even in the sweltering sun.

Keywords: cooling; instant; hydrated; comfortable; riding gear.



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1. INTRODUCTION

BreezeRide Cooling Gear is the ultimate solution for online food delivery riders seeking relief in the scorching heat. This innovative cooling patch strap is designed to provide excellent comfort during rides. As a dedicated product for professionals on the go, BreezeRide ensures a refreshing and enjoyable experience even under the sweltering sun. The objectives of the product are to maintain a comfortable body temperature for riders, especially during hot weather conditions, by effectively cooling the body's surface, to ensure it does not hinder the rider's movement or overall riding experience, and to ensure the cooling patch provides a sustained and long-lasting cooling effect, allowing riders to enjoy extended relief during their journeys. The stretchable and adjustable strap offers a secure fit, while the instant cold pack, infused with refreshing menthol, provides instant relief to tired muscles effectively reducing heat and enhancing overall comfort. It is important to understand the effects of heat stress on workers engaged in outdoor activities to emphasise the need for them and the mental stressors faced by cyclists during prolonged exposure to high temperatures (Hosokawa et al., 2019; Hillman et al., 2011).

The novelty of BreezeRide Cooling Gear comes in its innovative design and features designed specifically for the comfort and well-being of riders. Key aspects that contribute to its uniqueness are that the product introduces a novel and user-friendly approach with its hands-free operation and secure attachment features. Unlike traditional cold packs that require users to hold them in place, BreezeRide stands out by incorporating a dedicated compartment for instant cooling packs and secure straps. This innovative design not only allows for a hands-free cooling experience but also ensures a stable and comfortable attachment during motorcycle riding. Besides that, another novelty of the product is the standout design, which is the comfortable neck pillow-shaped bag. This special innovation gives riders' necks comfort and coolness by acting as a functional compartment for the instant cold pack. BreezeRide Cooling Gear stands out as an unmatched solution for riders' comfort on the road because it addresses the potential discomfort and muscle aches frequently felt during rides.

In the pursuit of commercializing BreezeRide Cooling Gear for greater reach in Malaysia, cooperative marketing initiatives with one of the food delivery industry leaders, GrabFood, are necessary. These initiatives include personalised rewards for their riders to redeem a BreezeRide Cooling Gear for free after they finish a certain number of orders. Moreover, this product will be heavily promoted on social media, including Facebook, Instagram, and TikTok, by setting up a page to promote it, which may help in expanding the audience. Other than that, hiring content creators to produce blog posts, videos, and infographics that educate riders about the importance of staying cool during rides and how this product can help will ensure that the content created will reach a broad audience of potential riders, increasing brand visibility and engagement for BreezeRide Cooling Gear.

2. METHOD & MATERIAL

Engineered for ultimate comfort, this cooling patch features an innovative design infused with instant cold packs, which consist of two bags, one containing water and the other containing ammonium nitrate, which is designed to effectively cool the body's surface. Adjustable straps for the shoulders, stretchable straps with buckles on the sides for a firm hold on the body, and neck cold pack holders use a clip mechanism to attach to the shoulder straps, which are made from 60% nylon and 40% nylon for the instant cold pack holders. Below are the simple steps outlining how to use the BreezeRide Cooling Gear.



Figure 1. BreezeRide Cooling Gear Outline



Table 1. Instructions for BreezeRide Cooling Gear Utilization



7. Care and Maintenance

- The instant cold packs can only be used once. After it has been used, users need to throw it away by:
 - Removing the cold packs from the BreezeRide Cooling Gear compartments.
 - Empty the instant cold pack by gently squeeze it over a sink or a designated container to release any remaining liquid.
 - Ensure that the contents flow into the sink or container, as they are not toxic and can be safely disposed of down the drain.
 - Place the prepared plastic packaging in the appropriate recycling bin.
- The cooling gear strap can be washed if needed but must only be hand-washed.

3. FINDINGS

BreezeRide Cooling Gear revolutionizes the experience for online food delivery riders by offering advantages including optimizing rider's comfort and seamless experience. BreezeRide Cooling Gear instant cold pack, enriched with refreshing menthol, ensures both comfort and relief during demanding rides. The adjustable strap provides a secure fit, while the innovative cooling technology significantly reduces heat, delivering an unmatched level of refreshment. BreezeRide emerges as a game-changer, elevating overall comfort and redefining expectations for people navigating the challenges of heat climates especially faced by the riders in Malaysia compared to four-season countries. The use of menthol, a common cooling agent, in topical applications for pain relief and temperature regulation (Pergolizzi et al, 2018).

3.1 Malaysia Prolonged Hot and Humid Climate

A comprehensive study indicates that Malaysia consistently encounters a high and humid climate throughout the year, which presents an enduring challenge for riders (Jawi et al., 2009). Therefore, the findings underscore the relevance of BreezeRide Cooling Gear in reducing prolonged exposure to heat and providing riders with an effective solution for sustained comfort during rides in Malaysia. This is particularly crucial in comparison to countries with four seasons, where climatic conditions may vary and the demand for continuous cooling solutions might be smaller (Li et al., 2012). While riders in four-season countries may face occasional warmth during the summer, Malaysia's year-round tropical climate necessitates a consistent and reliable cooling solution, making BreezeRide Cooling Gear specially designed to address the specific challenges faced by Malaysia's climate.

3.2 Optimised Rider Comfort: Cooling in Hot Weather with Seamless Experience

BreezeRide Cooling Gear is dedicated to optimising rider comfort in hot weather. The straps ensure that the patch does not impede movement or compromise the overall riding experience. By prioritising simplicity and functionality, the goal is to offer a hassle-free solution that enhances rider comfort without any obstruction, making it a valuable and effortless addition to the riding routine. Additionally, the neck pillow-shaped design for the neck not only enhances overall comfort but also addresses the common problem of neck muscle aches during extended rides. The significance of user experience in the adoption of wearable devices emphasises the positive correlation between ease of use and user satisfaction (Park, 2020).

4. DISCUSSION

BreezeRide Cooling Gear ensures a refreshing and enjoyable experience even under the sweltering sun. Create a cooling patch especially for riders, keeping in mind aspects like breathability, moisture-wicking capabilities, application simplicity, and compatibility with riding equipment (McCan, 2023). BreezeRide Cooling Gear comes with an innovative design and features designed specifically for the comfort and well-being of riders and helps to maintain a comfortable body temperature for riders, especially during hot weather conditions, by effectively cooling the body's surface. Other than that, this product provides a sustained and long-lasting cooling effect, allowing riders to enjoy extended relief during their journeys.



Figure 2. BreezeRide Cooling Gear Logo

5. CONCLUSION

BreezeRide Cooling Gear is an extraordinary gadget for riders that offers immediate relief from extreme heat. The product comes with an adjustable strap on the shoulders and stretchable straps on the side for a secure fit and the cooling effect comes from an instant cold pack, which is a single-use device that consists of two bags, one containing water, inside a bag containing ammonium nitrate. When the inner bag of water is squeezed to rupture, an endothermic reaction will happen and immediately lower the pack's temperature, which will help to make the riders feel cool and can help in lowering their body temperature. This solution resolves the issue of not being able to maintain a comfortable body temperature and hence, can improve overall riding experience even in hot weather conditions.

Acknowledgements: Appreciation to team members that has propelled the BreezeRide Cooling Gear project to success and special appreciation to the supervisor, Mr. Alvin Gatu for his invaluable guidance and support.

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Research Article

Pixel Adventure 2D Platform Game System

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Abstract: A game system is a kind of application that is used not only for entertainment but also for serious purposes that can apply to different domains such as business, health care, and competition. The proposed gaming system uses the Unity engine to create a 2D horizontal parkour adventure game. The game ideas are to use several classic parkour games to inspire and incorporate the writer's ideas to complete the game. Based on research, most of the existing game systems do not provide the onboarding experience to the user play, are too singular, do not goal for interactive user play, have complex control characters, and put too much computation and caching into the system making the game system too lagging. This proposed game system is aimed at a 2D game system to train players to think and react with timing, allow the users to play with simple operations to control characters, and make a more casual game system to solve the fatigue of high graphics games. User interface interaction has been evaluated based on the following elements: game heuristics, game content, game navigation, and game experience. Based on the results, it shows 67% of respondents agreed with the heuristics design of the game, 81% of respondents were satisfied with the content of the game design, 75% of the respondents agreed with the consistency of the game navigation and lastly 90% were satisfied with the game experience.

Keywords: Unity 2D; Game Development; Game Design.



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1. INTRODUCTION

Gaming was also known as an electronic game or video game. Until now, the game has been grouped into two groups, traditional gaming, and modern gaming. Traditional gaming was a pastime like hopscotch, jump roping, and hide-and-seek that were typically passed down from one generation to the next. Modern gaming was developed with video games as the main axis of development and support of many platforms, such as PC games, mobile phone games, household games, virtual games, and commercial games. This project is a two-dimension platformer runner game. This game was made by a game engine and functional using programming language. This gaming application provided on PC-based, to let users to download on PC. Parkour Adventure game was a 2D Pixel Horizontal Parkour Adventure game. This game uses 2D modules as the underlying framework of the game and pixel style for the graphic style of the game. Based on the underlying framework and graphics style, the team used the Unity game engine as the game design and development, and with the editing code to complete the game system operation.

The story of the game was about a man who likes to throw away fruits and suddenly enters a pixel world while he is sleeping. In this world, the character must eat a certain amount of fruit to pass

the level. When the character feels finished, the character will continue a new path like an endless level, until the character wakes up and realizes was a dream. The game uses two-dimension pixels because pixel games will soon disappear and pixel the style for presenting it. Also, the game will have some stories and historical background to support it to let the game have much better-interacting users. With the rapid progress of computer technology, the significance of software engineering in daily life was increasing. Technology affects every aspect of our lives today, including work, life, learning, and education. Now cultural, and technological accessibility has become more convenient. People enjoyed playing games and were also motivated to design their games. This system is a game application and requires one or more players to make decisions by controlling game objects and resources, in the pursuit of its goal.

2. METHODOLOGY

At the start of any project, proper planning regarding the project's goals is crucial; for achieving success in the project development. To ensure that a game is playable and interesting, it must have a proper game design, graphics, and gameplay. With the assistance of a game engine, along with proper planning and a clear vision, it becomes easier to create a simple yet interesting game. This game system development followed the game development life cycle model by (Ramadan & Widyani, 2013) as illustrated in Figure 1.



Figure 1. Proposed Project Framework.

This project framework has three stages of development tasks. The first stage consists of three activities to identify the requirements for the initial design development of the game system. During this stage, the process of identifying the existing game system such as Super Mario, Sonic, and

Mercurial Story to design and develop the proposed game system. This phase is also dedicated to understanding the gameplay, story background, features, iterations, and gameplay styles of these existing games. Subsequently, after observing and comprehending these existing game systems, the process of extracting the features to adapt with insights drawn from the gameplay, and storytelling. The design activity was based on the initial game system design. The design incorporates character artwork, game background, game story, game sounds and music, game character animations, game settings, and menus. After designing the game, the development stage became crucial, marking the transition to subsequent activities. This stage involves translating the designs from the design phase into actionable steps. The development activity entails transforming the designs into code to animate characters, backgrounds, interactions, and gameplay elements such as character movement, jumping, trap activation, enemy AI, mirror movement, and other actions. The game system development has initiated their task after completing the initial requirements identification activities.

After completing the activities in Stage One, the tasks will proceed to Stage Two. During this stage, there are two main important activities. This process involved evaluating various aspects of the game, including game data, draft game, game proposal, draft design, alternate proposals, game metrics, game views, and future development plans. The evaluation aimed to assess the quality and suitability of each version of the game developed in both the design and development stages. Testing will commence from the functional design of the game and continue through the evolution of each game version. Starting with the functional requirements and extending to the non-functional ones, each feature of the game will be systematically tested to ensure its proper functionality. Any detected errors will be documented, and the respective functions will be modified accordingly at a later stage.

Stage Three starts with release activity. After thorough testing to ensure it is error-free and functions successfully, a tested version of the game is released for people to play. However, the beta version may differ slightly from the official version in aspects such as game design, settings, level count, interface layout, dynamics, subsequent versions, and new features. As part of the review and release stage, at least three beta versions of the game will be issued to fine-tune its parameters. The release activity marked the culmination of the game's development, either as a final beta version or an initial release. The official release represented a culmination of iterative improvements aimed at optimizing the game content for an enjoyable player experience. These enhancements were in response to player feedback gathered during the review and release stages, ensuring the game delivered the best possible gameplay experience. Furthermore, the game's evolution doesn't cease with its initial release; continuous updates and optimizations are essential to maintain and enhance the player experience as the game is played.

3. IMPLEMENTATION

The game utilizes 2D modules as its foundational framework and employs a pixel art style for its graphics. Leveraging this framework and graphic style, we opted for the Unity game engine for both design and development, utilizing coding edits to refine the game's operations. Primarily available for PC-based platforms, the storyline revolves around a man who, while asleep, unwittingly enters a pixelated realm after discarding fruits. Within this realm, the character must consume a specific quantity of fruit to advance through each level. Upon feeling sated, the character embarks on a new path akin to an endless level until awakening and realizing the entire experience was but a dream.

In the development phase, the author begins by selecting a game concept and then proceeds to design its mechanics and graphics, gradually building the game system until the final product takes shape. However, the journey is not without its challenges. Upon initiating production, the groundwork for the game's framework is laid out, followed by the preparation of necessary materials and software.

For software, Unity Engine is chosen as the platform to construct the game's framework and structure, while Visual Studio Code is utilized to code game functions using the C# programming language, known for its widespread usage and user-friendliness within the Unity Engine environment. Unity Engine supports various programming languages, including Java, C/C++, Rust, Lua, and more.

The game's development involves extensive time dedicated to drawing, designing mechanics, and fine-tuning game values. Conversely, attention is given to crafting sound effects and graphics. Sound elements, including music and effects, are sourced from the internet and commonly used in mainstream games. As for graphic design, the decision is made to employ two-dimensional pixel art, a deliberate choice aimed at both capitalizing on the nostalgic appeal of 2D-pixel graphics and evoking memories of 80s-90s gaming aesthetics.

3.1 Theme

The theme of the Parkour Adventure game revolves around a mischievous child named Alexzander who has a disdain for eating fruits. Despite his mother's repeated attempts to encourage healthy eating habits, Alexzander consistently disregards the fruit by tossing it aside. However, one fateful day, after falling asleep, Alexzander finds himself transported to a fantastical eco-world. There, he is confronted by a mysterious voice urging him to consume the fruit scattered throughout the world and reach a portal. Initially resistant, Alexzander eventually embraces the challenge, adjusting his mindset and following the voice's guidance to reach the finishing line.

3.2 Map Settings and Design

The maps' settings and designs focus on utilizing a diverse range of scenarios and ensuring continuity across levels. This choice is driven by the need to alleviate visual fatigue during prolonged map exploration. To enhance player engagement and foster a sense of accomplishment, a level-based system has been incorporated. Certain maps feature traps strategically placed before level exits, prompting players to anticipate obstacles, while others introduce new challenges, such as launching eggs, in specific areas. The design of map mechanisms aims to provide players with clear progression paths, and strategically positioning elements to facilitate successful completion.

3.3 Character

The character known as "Pixel Guy" can be referred to as "Alexzander." In real life, Alexzander is a 12-year-old boy, but as Pixel Guy, he exists without an age. Alezander has a strong aversion to eating fruits and often rejects them when his mother offers them after meals, opting instead to discard them onto the floor. In his Pixel Guy form, he possesses boundless energy for running and jumping. Additionally, he can execute a double jump, allowing him to reach higher platforms.



Figure 3. Character movement.

3.4 Environment Art

The Environment Art was created by utilizing a 16x16 pixel square terrain, incorporating various material elements such as grass, dirt, background scenery, iron bars, stone, and bricks. Each element was meticulously arranged to construct the environment for the maps. This approach ensured that the environment could be customized and adapted according to the specific requirements of each map and level, creating a cohesive and tailored experience for the players. The example of terrain for the environment is shown in Figure 4.



Figure 4. Terrain for environment.

4. EVALUATION TESTING

Evaluation testing of this game system has been evaluated based on three important elements. Which is the heuristics design of the game system, the consistency of the game navigation, and the game experience. There are 43 respondents were randomly picked among the Southern University College students to be involved in this evaluation testing. As shown in Figure 5, 67% of respondents were satisfied with the heuristics design applied in this game system. The heuristics design element was measured based on the five items; which aimed to identify the problems in the use of a system during its development or when its interface is in interaction with the user (Sobrino-Duque et al., 2022) The second element of evaluation testing was assessed based on the content of the game system to study the heuristics of the game interface. The results show that 81% of respondents were satisfied with the content of the game system as shown in Figure 6.



Figure 5. Heuristics Evaluation Testing Results.



Figure 6. Content Evaluation Testing Results.

5. CONCLUSION

In conclusion, the weaknesses of the system can be attributed to two main factors: the outdated concept of the game system and the writer's editorial code aspect. Firstly, while the initial concept of the game was promising, the system itself seems out of sync with the gaming trends of the current era. The gap between the system's values and those of contemporary games has become evident, particularly as advancements in image quality, performance, and game design have evolved. Game companies have shifted towards higher quality experiences, abandoning older 2D formats for more immersive 2.5D or beyond. Moreover, the increasing demands and expectations of players have not been adequately addressed by the system, failing to align with contemporary gaming preferences and standards. These external factors highlight a need for a system that better caters to the evolving needs and desires of today's gaming community.

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Research Article

ChatPK (Chatbot Cara Menjadi Pegawai Kadet Berjaya)

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Abstract: Generally, the National Defence University of Malaysia (NDUM) consists of three groups of students: Cadet Officers, PALAPES Cadets and civilian students. To be selected as a Cadet Officer at UPNM, each student must meet certain criteria to qualify as a Cadet Officers. Among the criteria to be met are academic, physical health and curriculum achievement. A requirement questionnaire has been circulated to UPNM cadets and civilians. The findings from this survey revealed that 33 respondents agreed that the ChatPK could help the community to recognize Cadets in depth. A chatbot system needs to be developed to give early exposure to cadet officers about the guidelines covering military life. Disclosure of this specific information can help Cadet Officers succeed in both academic and military fields. A chatbot called ChatPK (Chatbot Cara Menjadi Pegawai Kadet Berjaya) is a system capable of delivering information through queries. This is because chatbots react in two-way communication. A questionnaire to obtain detailed information about Cadet Officer has been distributed to senior cadets and officer instructor at the Military Training Academy (MTA). The information obtained from the survey will be inserted into the system's chatbot. This chatbot uses the Agile methodology as a guide. While the software used was HTML, PHP and chatbase.co in the development process. The Agile methodology was chosen because it fits the style of the system's development. This ChatPK is expected to give benefit to all Cadet Officers to graduate on time and be entrusted to the Malaysian Armed Forces (MAF).

Keywords: Chatbot; Cadet Officers; cadet officers database.



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1. INTRODUCTION

Chatbots are artificial intelligence (AI) applications that are widely used in learning. These chatbots can replace human tasks such as customer support, creative writing, and programming. A computer program that mimics human communication with a user is a definition of a chatbot (IBM, 2023). Among the chatbots used today are ChatGPT accessed in Google Chrome. This ChatGPT can deliver a lot of information quickly. The information obtained by ChatGPT is from Internet access sources such as websites, journals, online news, Wikipedia and so on. According to the Cadet Officer's Permanent Order, a cadet officer is defined as a trainer who undergoes military training at the Military Training Academy (MTA) and academic studies at the National Defence University of Malaysia (UPNM) in accordance with the prescribed period. The public still doesn't recognize the UPNM Cadet Officer by giving the wrong reaction and only hearing the sensational news about the Cadet Officer. Now there is no place or platform for the public to ask questions about these cadets except to get information from the UPNM's official website and private blogs.

The use of chatbots has become a trend to get information quickly. Most of the public inside and outside UPNM do not have much and accurate information about Cadet Officers at UPNM. Negative perspectives also apply to UPNM Cadet Officers because of the lack of accurate information. The life of a Cadet Officer is little known to the public. The lack of accurate information about Cadet Officers on the internet causes the public to be uninterested in becoming a Cadet Officer. Through the exposure of Cadet Officers, applicants who wish to join UPNM Cadet Officers can prepare mentally and physically. This preparation avoids experiencing culture shock to the military world. The existing ChatGPT is only able to provide general information about UPNM Cadet Officers. There are personal blogs about the life of Cadet Officers, but the information found is not comprehensive or meets what users want. Compared to the existing ChatGPT, this ChatPK focuses on revealing the life of an ATM Cadet Officer at UPNM accurately and in detail. Users can ask questions related to Cadet Officers on ChatPK from various angles. This includes general information about Cadet Officers, information about the way of life as well as information about the Cadet Officer's personal skills. The existing ChatGPT is only able to explain about Cadet Officers in general. Therefore, this project will propose a chatbot system called ChatPK (Chatbot cara Menjadi Pegawai Kadet Berjaya) to solve the problems that occur.

ChatPK (Chatbot Cara Menjadi Pegawai Kadet Berjaya) has several goals to achieve in its development. The main goal of this project can be achieved through three objectives. first, propose a ChatPK system that provides detailed information about Cadet Officers. secondly, develop a chatbot system called ChatPK as a place for information about academic achievements, skill evaluation and personality of Cadet Officers. Third, design a database for ChatPK that contains user information and is validated by the administration.

Basically, this ChatPK covers the academic aspects, skills, and way of life of Cadet Officers. The existence of this ChatPK can further facilitate the search for information for students who will become Cadet Officers. The information obtained can make it easier for students to understand the lifestyle of Cadet Officers. This ChatPK helps provide information on what needs to be done to maintain an overall grade point average (GPA) each semester above 2.70 and above to prevent Officer Cadets from not graduating on time. Therefore, this ChatPK can help Cadet Officers become more successful and be commissioned as Malaysian Armed Forces Officers later.

2. METHOD & MATERIAL

To give a better understanding, this section describes the materials and methods used in the development of this project. For the working process to go smoothly, having the right method and materials is essential.

2.1 Method

The Agile Software Development (ASD) methodology approach has been chosen as the methodology to be used in the development of this ChatPK system. Figure 1 shows the ASD method for ChatPK. Agile Software Development (ASD) methodology is software development based on system changes made by developers for rapid adaptation (Teknika et al., n.d.). This methodology was selected based on several criteria such as technical excellence and good design to help the ChatPK system Development process be more organized. This Agile Software Development (ASD) methodology model has six phases consisting of the planning, design, development, testing, implementation, and feedback phases (Hutabarat Yafonia, 2020) which are as follows:

2.1.1 Planning

The planning phase involves the preliminary investigation process. This phase ensures that the development of the ChatPK system can run smoothly. This phase is also implemented to give a clear picture of the goals and objectives to be achieved. Figure 1 showed that the sample question that distributed to the user.

AMPIRAN B (Soal Selie	lik Keperlu	ian)		
1. Mengikut pandangan anda, a	pakah rutin haria	an Pegawai Kadet ya	ing anda tahu? *	
🔲 Baris pagi				
🔲 Menghadiri Kuliah				
🔲 Bersukan				
Menjalani Latihan Ketenteraa	n Umum			
Berkhemah di dalam lutan				
Bersukan				—36 (83.3%)
Umum			-	3 (78.6%)
Derivierran di datam husin	10	20	30	40
1070.0				5.28
2. Sekiranya anda berminat untu mendapatkan maklumat tentan	uk menjadi Pega g Pegawai Kade	tti wai Kadet, dari man 17	akah anda boleh	
O Rakan				
🔘 Jiran				
🔿 Ibu bapa				
O Media sosial				
Guru				
O Other_				

Figure 1. Questionnaire that distributed to users

2.1.2 Design

In the design phase, the actions taken often involve the appearance of the system. This phase is an important phase in the whole project. This phase is also focused on the structure of the software and the functions provided (Shaharuddin et al., 2023). This ChatPK system can identify the process and ensure that the design results are of high quality and comply with the user's wishes.

This design phase will involve the development of the interface design of the ChatPK system. The design chosen must be compatible with the scope of the project. The development of this system interface uses Visual Studio Code. This system interface display has some information about Cadet Officers.

This system uses help from chatbase.co which is the software for the chatbot platform on this ChatPK system. Figure 2 shows the prototype of the developed ChatPK system website.



Figure 2. Prototype of the ChatPK system website

2.1.3 Development

The objective of this construction phase is to achieve the project's goal in realizing the basic sketch of a flexible key system and capable of carrying out interactions between users and ChatPK smoothly as an intelligent information delivery system.

2.1.4 Testing

The testing phase is the phase where the system that has been built needs to go through the testing process before being distributed to users. In this testing phase, the ChatPK system is tested whether it can answer any question related to Cadet Officers or not. If there is information that needs to be added, the administrator needs to enter the relevant information into this system.

If there are bugs or problems during testing, the administrator needs to overcome the problem. Re-examination of the codes in Notepad++ whether they are arranged correctly, or the coding is wrong. The interface needs to be more interactive where the use of colours and the type of writing needs to be changed if it looks dull or the colour is too bright.

2.1.5 Implementation

In this phase, the system is fully accessible to users. Any question can be answered bilaterally. This system is maintained by an administrator who can upload and delete data or information related to Cadet Officers. The objective of this phase is to enable users to learn the ChatPK system that has been developed. Users can provide any feedback related to the system to the administrator or developer of the ChatPK system if there are any problems.

2.1.6 Feedback

Feedback from users can also be taken and used as a benchmark for the status of the built system. For the improvement of this ChatPK system, an interface will be provided for users to enter data or give feedback on satisfaction with the use of this ChatPK system. The data obtained can also be used as data in the chatbot itself.



Figure 3. Agile Software Development (ASD) method for ChatPK

2.2 Material

The scope and materials that being used for developing the ChatPK (Chatbot Cara Menjadi Pegawai Kadet Berjaya) are as follows:

2.2.1 User

There are two user type for this system which are user and administrator.

- a. User consists of future cadet officers, UPNM students as well as civilians who are curious about the life of cadet officers at UPNM.
- b. Administrator Admin can add information related to cadet officer into the chatbot or into the website. Admin manages any feedback receive from the user and choose whether to add the information into the chatbot or not.

2.2.2 Software, Language, and Database

Notepad++ is being used in the development of the website interface. Hypertext Pre-processor (PHP), Hypertext Markup Language (HTML), and Cascading Style Sheets are the programming language formats (CSS). XAMPP with MySQL as the system database.
3. FINDINGS

Figure 4 describes the ChatPK system analysis phase which consists of requirements modeling phase, data and process modeling, object modeling and transition to system design. In the data and process modelling phase, Use-case, Sequence and Class diagrams were used to explain all the processes related to the ChatPK system. In the object modelling phase, the relationship between the administrator and the user is depicted with an Entity Relationship diagram. Figure 2 also shows the behaviour of an entity whether it can do one or more activities.



Figure 4. Analysis phase of ChatPK

This Use Case Diagram allows explaining the possible use scenarios (use cases) for the developed system (Seidl Martina, 2015). There are three interactions that students can do with this ChatPK system. Figure 5 shows a Use-Case diagram. Students and the public are components of users who interact with the ChatPK system. Basically, users consisting of students and the public use this system to obtain information related to Cadet Officers. Among the main activities carried out by users are such as opening the ChatPK website, asking questions related to Cadet Officers, receiving answers, and receiving feedback from chatbase.co.



Figure 5. Use Case diagram of ChatPK

Sequence Diagram is the second UML diagram used to represent objects interacting and exchanging messages over time (Al-Fedaghi, 2021). Based on Figure 6, users who are students or members of the public only need to browse the ChatPK website and can continue to ask questions on the available chatbot. Once the question is asked, the information from chatbase.co will be displayed on the query interface of the question in the form of a sentence.

Administrators need to log in by pressing the log in button on the system interface. Information about the administrator is stored in the ChatPK database which uses MySQL as the database. Once the administrator has successfully logged in, the administrator can add data related to Cadet Officers into the ChatPK system via chatbase.co.



Figure 6. Sequence diagram of ChatPK

This system hierarchy chart is built to show the process flow of the system to be developed. This chart will show a summary of all the information regarding the ChatPK system used. Figure 7 shows the hierarchy chart of this ChatPK system. This hierarchy chart is divided into two main components namely users and administrators. This chart shows the ChatPK system processes in sequence.



Figure 7. Hierarchy chart of ChatPK

Figure 8 shows the main page for the ChatPK system (Chatbot How to Become a Successful Cadet Officer). This main page has several functions of its own. There is a PKDT Feedback/Add Information button that allows users to channel information they have about Cadet Officers as well as comments on the system provided. There is also a button for admin login. At the bottom there is a chatbot that is ready to receive any questions. This main page provides all the basic information about Cadet Officers.

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Figure 8. ChatPK main page interface view

Figure 9 shows the interface display for the ChatPK System Administrator Login. The administrator needs to enter the registered email and password into the space provided. If the login is successful which means the email and password are correct, pressing the LOGIN button will bring the administrator to the administrator's home page.



Figure 9. ChatPK system administrator login interface view

Figure 10 shows the main page for the administrator after successfully logging in. On this display, there are three things that the administrator can do, namely add posts, see user feedback, and add information to the chatbot. As for the add post button, it will take the administrator to the Add Post display in Figure 11.



Figure 10. ChatPK system admin home interface view

Figure 11 shows the Add Post page where the administrator can write any article or any additional information about Cadet Officers into the space that has been provided. After pressing the 'Send' button, the information written in the space provided will be displayed on the main page of ChatPK as shown in Figure 12.



Figure 11. ChatPK system admin home interface view

Figure 12 shows the information area added through the post add view. Information to add to this post is obtained from feedback or comments from users. Before adding information to this display, the administrator needs to validate first.

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Figure 12. Interface display of information added through the add post page

Once the admin presses the 'Add Chatbot Info' button, the admin will be taken to the chatbase.co website. Figure 13 shows the chatbase.co website where administrators can add information about Cadet Officers to this chatbot. Added information can be transmitted in the form of files as well as text.

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Figure 13. Chatbase.co website interface view where admin can add information to chatbot

4. DISCUSSION

The ChatPK (Chatbot Cara Menjadi Pegawai Kadet Berjaya) has been successfully developed. There are several achievements that can be measured through the objectives that have been stated before. In summary, the objectives that were successfully achieved are:

- a. Propose a ChatPK system that provides accurate and detailed information about Cadet Officers. A chatbot platform has been chosen as the chatbot for this system, which is chatbase.co. This chatbot is placed on the ChatPK website.
- b. Develop a chatbot system called ChatPK as a place to get information about academic achievements, skill assessment and personality of Cadet Officers. This developed system has an interface that displays basic information related to Cadet Officers. For more in-depth questions about Cadet Officers, users can ask the chatbot that is available. This information is collected through the distribution of Google Forms to Cadet Officers and Officer Trainers. The results of this Google Form distribution will be entered into the chatbot.
- c. Designing a database for ChatPK that contains user personal information and is validated by administrators. The database that was built contains data related to chatbots and administrators. Information that can be entered into the ChatPK homepage is also stored in this database.

This ChatPK (Chatbot Cara Menjadi Pegawai Kadet Berjaya) system has given many advantages and benefits to each of its users. Among the advantages are:

- a. This developed system can provide detailed information about the life of Cadet Officers that is not available on any blog or website.
- b. This system can be used by anyone who wants to know about the life of a Cadet Officer as well as anyone who is interested in becoming a Cadet Officer.
- c. This system allows users to provide comments regarding the system as well as add any information they know about Cadet Officers that is not specified in the system.
- d. This system allows administrators to add information about Cadet Officers to the administrator interface and display it on the main page of the system.
- e. This system also allows administrators to validate feedback or comments received from users before being added to the chatbot.

5. CONCLUSION

The ChatPK (Chatbot Cara Menjadi Pegawai Kadet Berjaya) system has achieved its objectives. Although there are various constraints in the development of this system, modifications, and new innovations to ensure that this system remains relevant must be done progressively. This system is also expected to be used by the public as well as Cadet Officers at UPNM to know the steps to achieve success as an Officer in the Malaysian Armed Forces. There are several suggestions to improve the effectiveness and practicality of this system. This improvement effort can be done in the future so that this system remains relevant. Among the suggestions that can be highlighted is adding an interface that can load the Cadet Officer information obtained before the information is added to the chatbot. Improvement by developing this system into an application for Android and iOS smartphone users can be done in the future. Method for adding the information into the chatbot can be made by variety selections including .jpg, .mov, .3gp and .pptx.

Acknowledgments: Thank you so much to the Faculty of Science and Defense Technology, National Defense University Malaysia (NDUM) for supporting the ChatPK (Chatbot Cara Menjadi Pegawai Kadet Berjaya) project. Also, thanks to the Student Affairs Department and the faculty for the financial support given. Finally, thank you to all the parties who are involved in this study. Your support, guidance, and assistance have been invaluable in making this project a success.

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Research Article

Highest Administrative Voting Security System in FSTP using Advanced Encryption Standard (AES) – SKPPT FSTP

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Abstract: The manual voting method to select top management positions in the Faculty of Defense Science and Technology (FSTP) through Google Form has raised concerns regarding the security, transparency, and integrity of the process. This manual voting process is vulnerable to manipulation and fraud which affects the integrity of the voting process. Ensuring a reliable voting process depends on secure authentication and voter credentials. Traditional methods of voter verification are not reliable and efficient enough. Therefore, an electronic voting system for top management positions in FSTP is proposed to address this challenge. Therefore, the main objective of the development of the Highest Administrative Voting Security System at the Faculty of Defense Science and Technology at FSTP, which is based on a website, has security features. The development of SKPPT in FSTP that is secure by using Cryptographic techniques namely Advance Encryption Standard (AES) is proposed. In addition, design SKPPT FSTP that has the characteristics of a database that contains voter data. Next, vote to ensure data can be accessed quickly, safely and easily. Furthermore, the security of SKPPT in FSTP system is ensured through AES encryption. The methodology used is a prototype that can be built, tested, and improved as best as possible until it is accepted by users and meets all criteria. In conclusion, this system can simplify the voting process in SKPPT in FSTP.

Keywords: Electronic Voting System; Advance Encryption Standard (AES); Prototype Development Methodology.



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1. INTRODUCTION

The Faculty of Defense Science and Technology (FSTP) at the National Defense University of Malaysia (UPNM) practices a democratic system in the faculty administration selection process. However, there are some issues with the old voting method using Google Form. Among the issues are security, transparency, and process integrity. Problems of possible vote manipulation, mistrust in voting results, and leakage of data information that can affect voter privacy. Therefore, a proposal to build a secure electronic voting system is proposed to deal with this problem. The well-known and secure AES cryptographic technique will be the basis of this system. This study will look at possible solutions and methods that can improve the reliability, security, and integrity of the voting process in FSTP.

The proposed system is the Highest Administrative Voting Security System in FSTP using Advanced Encryption Standard (AES) – SKPPT FSTP to overcome the problems discussed. It is expected to increase efficiency in addition to increasing the level of security through the use of strong cryptographic methods such as AES. Voter registration, candidate and vote management, and announcement of results can all be done using this system. In addition, good encryption and security systems will ensure that the integrity of the vote is maintained and voter privacy is protected. As a result, this proposal is expected to improve the security and efficiency of voting management in FSTP.

The use of technology in the voting process also allows the process to be transparent and effective (Abandah et al, 2014). This includes reducing the need for manual sorting, which is timeconsuming and prone to human error. Voters will find the election process to be easy, fast, and safe with this electronic voting system process. In this context, data security will be a priority. This system will ensure that voter data and voting results are stored securely. Therefore, this project has the ability to improve the integrity and quality of the democratic process in FSTP.

2. METHOD & MATERIAL

The scope of the project study developed is as follows:

2.1 Admin

The admin is responsible for managing user accounts, including creating, updating, deleting lecturer information and voting result.

2.2 FSTP Lecturer

FSTP lecturers act as voters in the system. They participate in the voting process for candidates in various categories.

2.3 Candidates (FSTP Lecturer)

Candidates, who are also FSTP lecturers, can submit their manifestos outlining their goals and plans.

Based on the results of the study, it was found that the appropriate methodology used in the development of the SKPPT FSTP is to use the Prototype Model methodology. This prototype model provides flexibility to make changes and improvements throughout the development process. It ensures that the end system is in line with the needs of the users and the organization. Among the factors of this Prototype Model selected are:

- a) Prototype models have the flexibility for any changes and improvements over time.
- b) Each phase in the Prototype Model can be seen clearly and easily understood during the construction of the system.
- c) Each phase in the Prototype Model can be completed in an orderly manner, as each phase is completed one by one.

Figure 1 shows SKPPT FSTP prototype methodology. In general, the Highest Administrative Voting Security System in FSTP using Advanced Encryption Standard (AES) is web-based to allow all data to be sent and stored on the database. This aims to ensure the security of the data is more guaranteed. This system specializes in the use of Advanced Encryption Standard (AES) for more secure

storage of voting data. System security is the defense of digital information against internal and external, malicious and accidental threats.



Figure 1. SKPPT FSTP Methodology

Advanced Encryption Standard (AES) is used to protect data from unauthorized access. The longer the key, the more difficult the encryption is. As studied by (Yinyeh et al, 2016) the disadvantage of AES is that it is difficult to know the process information because it also patents the encryption and it is difficult to decrypt the data if the private key is lost while the advantage of AES is faster implemented in both hardware and software and also more secure to be used. It supports larger key sizes than other algorithms (Wadi et al, 2013). AES encryption is fast and flexible. Figure 2 shows how AES works.



Figure 2. AES Works

3. FINDINGS

Modeling the requirements for this system several ways in the collection of data for the development of this system. Among them is an interview with the administrator of the Assistant Register at FSTP. Next, research on the internet about equivalent systems. Finally, a discussion with the supervisor who helps in information and a clearer picture of the system to be developed. Next, data and process modeling that has a Context Diagram, Data Flow Diagram Level and Data Flow Diagram Level 1 which provides an initial overview and understanding of the system to be developed. The modeling of objects that have an Entity Relation Diagram determines the development of the system so that each function of the entity involved can be understood. Finally, a system design that has a hierarchy chart, a data dictionary that explains more clearly the system design to be developed. Figure 3 shows the analysis phase for SKPPT FSTP.



Figure 3. Process in Analysis Phases

In addition, the context diagram is used as a prefix diagram. This diagram is used to express the role of entities in the system. This is illustrated as in Figure 4, which is the SKPPT FSTP context diagram that illustrates the interaction between the system and the entity. The entities are Lecturers and Candidates consisting of Lecturers and Administrators among assistant register at FSTP. Figure 4 shows the context diagram, and the data flow diagram of SKPPT FSTP is shown in Figure 5.



Figure 4. Context Diagram of SKPPT FSTP

The Data Flow Diagram Level Zero can show more clearly every process that occurs in SKPPT FSTP. Figure 5 shows a picture of the Zero Level Data Flow Diagram. This diagram shows SKPPT FSTP which has 3 user modules namely Administrator, Lecturer and Candidate. This diagram contains 8 processes for SKPPT FSTP which is the same Login used by Candidates and Lecturers. Updating Lecturer Information, Updating Information, Notifying Candidates, Displaying Candidate Lists, Candidate Manifesto, Candidate Voting and Voting Results can be seen in the SKPPT FSTP Level One Data Flow Diagram.



Figure 5. Data Flow Diagram Level Zero of SKPPT FSTP

Figure 6 shows the hierarchy diagram for SKPPT FSTP. The three users involved are the administrator, candidate, and lecturer modules. All three users involved need to enter their User ID and Identification Card Number to access the system. After the Login process for the administrator, the administrator can choose to do the candidate registration process, update lecturer and candidate information, display the voting status and voting results. Meanwhile, after the Login process for voters, lecturers can vote for their respective Deans and Heads of Departments. While the candidate can also include a manifesto.





Figure 7 shows the Interface Voting. Lecturer can choose their candidates. It ensures that the interface is intuitive and easy to navigate. Users should be able to understand how to cast their votes without confusion.

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Figure 7. Interface Voting

Figure 8 shows Interface of Result of Voting. Admin can see the result of voting for the Dean and the head of department. It includes details about which candidate or option received how many votes, percentages.



Figure 8. Interface of Result Voting

Table 1 shows the results of system testing accordance with user needs. This testing focuses on evaluating the usability, functionality, and overall user experience of the interface.

Participant	Login User	Lecturer Info	Candidates Info	Voting Status	Voting Result
Admin	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Succeed	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Result	100%	100%	100%	100%	100%

 Table 1. User Interface Test Result

4. DISCUSSION

SKPPT FSTP been successfully developed. There are several achievements that can be measured through the objectives. The objectives of this system were successfully achieved which are:

- a) Propose a system of voting for the Highest Administration in FSTP that has security features. The SKPPT system at FSTP is developed with security features. The use of AES ensures system data integrity.
- b) Developing SKPPT FSTP that is secure by using Cryptographic techniques namely Advanced Encryption Standard (AES). This system is designed to have security features to guarantee data quality. Having security features, this system meets the CIA triad, namely, confidentiality, integrity and availability. This can allow stored data to be more secure.
- c) Designing the Highest Administrative Voting Security System at FSTP which has the characteristics of a database that contains the data of lecturers and votes to ensure that the data can be accessed quickly, safely and easily. The developed system has a database for lecturer and voting data that can be reached by the administrator, with a stored database that can be accessed easily.

SKPPT at FSTP is able to give advantages to system users. This is because the system was developed to overcome the problem of the Google Form method used. Among the advantages of SKPPT in FSTP are;

- a) The system developed is to replace the manual method which is Google Form which has been used before. Now the developed system is a computer system that has a database and is user-friendly.
- b) This system has security features such as the use of Advanced Encryption Standard (AES), the use of https and using the captcha code method in the check-in process to prevent the system from being invaded by bots.
- c) This system also stores lecturer information, candidate information and voting data more securely than the previous method. This is because all information and voting results are stored in the PHP MyAdmin database.
- d) This system uses the Staff ID that has been set. This process is to limit the use of the system which is limited to lecturers in FSTP at UPNM only.

- e) This system simplifies the voting process for lecturers. This is because lecturers can vote anywhere.
- f) This system allows candidates to upload manifestos. This process can provide an overview of the candidates to the lecturers who will vote,
- g) This system also allows administrators to see the lecturer's voting status and voting results at any time.

5. CONCLUSION

In conclusion, the development of the Sistem Keselamatan Pengundian Pentadbiran Tertinggi di FSTP (SKPPT FSTP) using Advanced Encryption Standard (AES) for electronic voting in the Faculty of Defense Science and Technology (FSTP) addresses the shortcomings of the manual voting method through Google Form. The proposed system aims to enhance the security, transparency, and integrity of the voting process. By implementing AES encryption, the system ensures the confidentiality and integrity of voter data, providing a secure platform for the election of top management positions. The Prototype Model methodology was employed for the system development, allowing flexibility for adjustments and improvements. The successful implementation of SKPPT FSTP brings several advantages, such as replacing the outdated manual method, incorporating security features like AES encryption, and providing a user-friendly experience for both administrators and voters. The system's ability to store information securely, limit access to authorized users, and simplify the voting process contributes to an overall enhancement of the democratic process within FSTP.

Acknowledgments: Thank you so much to the Faculty of Science and Defense Technology, National Defense University Malaysia (NDUM) for supporting the SKPPT FSTP project. Also, thank you to the Student Affairs Department, cland the faculty for the financial support given. Last but not least, thank you to all the parties who are involved in this study. Your support, guidance, and assistance have been invaluable in making this project a success.

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Research Article

Turmeric Oatmeal 2 in 1

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Abstrak: Kecantikan kulit perlu dititikberatkan amalan penjagaannya. Memiliki kulit yang cantik , bersih dan mulus adalah impian. Pada peringkat awal remaja, kebanyakannya akan mengalami pelbagai masalah kulit terutama kulit kusam, tona tidak sekata, kering, berminyak, berjerawat, pori-pori tersumbat serta sel – sel kulit mati terkumpul. Masalah ini sering berlaku disebabkan oleh masalah hormon yang tidak stabil. Bagi kalangan dewasa pula, akibat faktor umur yang semakin meningkat, mengundang banyak masalah kulit seperti kulit kering, kusam, tanda-tanda penuaan dan pigmentasi. Sinaran UV salah satu faktor yang menyebabkan kulit kita menjadi kusam dan boleh menyebabkan hiperpigmentasi. Turmeric Oatmeal 2 In 1 merupakan gabungan skrub dan pupur yang diformulasikan daripada 100% bahan semulajadi iaitu kunyit, oat, tepung beras, epsom salt dan pure menthol crystal. Ianya membantu merawat masalah seperti kulit kusam, kering, berminyak, tona tidak sekata, sel - sel kulit mati terkumpul, tanda - tanda penuaan, pigmentasi dan kulit rosak. Tujuan produk ini juga adalah untuk mengenal pasti jenis – jenis masalah kulit dalam kalangan remaja dan dewasa akibat tidak mengambil berat tentang penjagaan kulit muka serta untuk mengetahui tahap keberkesanannya. Keberkesanan produk yang dihasilkan dalam menyelesaikan masalah kulit ini dapat meningkatkan kesedaran terhadap penggunaan bahan semulajadi yang selamat bagi mengatasi masalah pelbagai kulit muka dengan kos yang lebih murah dan lebih mesra alam. Pengumpulan data dibuat dengan menggunakan set soal selidik melalui google form kepada responden merangkumi lingkungan umur 13 sehingga 45 tahun yang terlibat dalam kajian ini. Data-data dianalisis dengan menggunakan jumlah dan peratusan responden tentang mengenalpasti tahap keberkesanan produk Turmeric Oatmeal 2 In 1 terhadap masalah kulit muka dalam kalangan remaja dan dewasa. Hasil kajian mendapati tahap penerimaan dan pengamalan produk kosmetik berasaskan bahan semulajadi dalam golongan remaja dan dewasa adalah pada tahap setuju dan kebanyakan mereka mengamalkan produk kosmetik berasaskan bahan semulajadi dengan betul.

Kata kunci: Natural; Treats; Beauty.



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1. PENGENALAN

Skrub dan pupur yang berasaskan bahan semula jadi dapat membantu merawat masalah kulit seperti liang-liang pori tersumbat, berjerawat, berjeragat, kulit kusam dan lain-lain. Skrub yang mempunyai tekstur biji-biji halus yang dapat bertindak menyingkirkan sel kulit mati dan kotoran yang tersumbat di liang-liang kulit supaya kulit dapat bernafas dan menyerap manfaat daripada produk kecantikan seperti pelembap, pelindung matahari, losyen, bedak dan sebagainya. Manakala, pupur pula mempunyai tekstur yang halus dan lembut yang berfungsi meredakan keradangan kulit dan melembapkan kulit.

"Turmeric Oatmeal 2 in 1" yang diformulasikan menggunakan bahan-bahan semula jadi seperti kunyit, oat, tepung beras, biji anggur, garam epsom dan mentol kristal asli yang berkesan untuk merawat masalah kulit seperti berjerawat, berjeragat, kulit kusam dan lain-lain. Kunyit yang mempunyai bahan aktif iaitu "curcumin" diperkaya dengan vitamin C selain bahan antiseptik dan anti radang yang merupakan bahan utama dapat merawat pelbagai masalah kulit.

2. KAEDAH & BAHAN

"Turmeric Oatmeal 2 in 1" yang dihasilkan dengan mencampurkan bahan semula jadi, iaitu kunyit, oat, tepung beras, biji anggur, garam epsom, mentol kristal asli. Bahan-bahan tersebut disukat mengikut kuantiti yang dikehendaki. Kemudian, bahan-bahan tersebut dikisar sehingga menjadi tekstur yang diperlukan. Seterusnya, dicampur dan digaul kesemua bahan sehingga sebati.



Rajah 1. Proses dan kaedah penghasilan produk

3. DAPATAN KAJIAN

Berdasarkan dapatan kajian untuk mengetahui penghasilan dan keberkesanan produk *"Turmeric Oatmeal 2 in 1"* 16.7% mengalamai masalah kulit berjerawat , 43.3 % menghadapi kulit kusam / tona tidak sekata. Seterusnya 10% yang mempunyai masalah pigmentasi (berjeragat) , kulit muka berparut sebanyak 33.3% , kulit yang mempunyai bintik hitam / putih (whitehead / Blackhead) sebanyak 43.3% dan *sunburn* sebanyak 33.3%. Sebanyak 80 % responden mengetahui tentang kelebihan produk *"Turmeric Oatmeal 2 in 1"* ini dapat membantu dalam merawat masalah kulit yang dihadapi pada kulit muka dan badan kerana produk ini mengandungi kunyit sebagai bahan utama dan bahanbahan lain dalam produk ini yang mempunyai pelbagai manfaat .

Penghasilan produk *"Turmeric Oatmeal 2 in 1"* ini dapat memberi kesedaran kepada golongan remaja dan dewasa tentang kepentingan produk ini yang menggunakan 100% bahan yang berasaskan bahan semulajadi dan bebas bahan pengawet. Produk ini juga dapat menjimatkan masa dan kos pengguna kerana tindakan dwifungsinya secara serentak.

4. PERBINCANGAN

Penghasilan *"Turmeric Oatmeal 2 in 1"* berkait rapat dengan kajian mengenal pasti tahap keberkesanan produk *"Turmeric Oatmeal 2 in 1"* terhadap masalah kulit muka dalam kalangan remaja dan dewasa. Kebanyakan remaja dan dewasa mempunyai masalah kulit akibat tidak mengambil berat tentang penjagaan kulit. Selain itu, kebanyakan golongan remaja dan dewasa mengabaikan tentang bahayanya penggunaan produk terlarang yang mengandungi bahan kimia.

"Turmeric Oatmeal 2 in 1" yang mempunyai bahan semula jadi yang membantu merawat masalah kulit dan sesuai digunakan kepada remaja dan dewasa. Kunyit, oat, tepung beras, biji anggur, garam epsom dan mentol kristal asli sangat berkesan untuk merawat masalah kulit seperti berjerawat, berjeragat, pori-pori tersumbat dan lain-lain lagi.

Kajian penghasilan *"Turmeric Oatmeal 2 in 1"* ini banyak memberi pendedahan tentang kebaikan dan keberkesanan bahan semula jadi dalam merawat masalah kulit seperti berjerawat, berjeragat, poti-pori tersumbat dan lain-lain lagi. Ia dapat menarik minat pengguna kerana dapat menjimatkan masa dan kos penggunaan kerana tindakan dwifungsinya serta bebas daripada bahan kimia.

5.KESIMPULAN

"Turmeric Oatmeal 2 in 1" merupakan pupur dan skrub yang terbaik untuk remaja dan dewasa bagi merawat masalah kulit seperti berjerawat, berjeragat, pori-pori tersumbat, kulit kusam dan lainlain. *"Turmeric Oatmeal 2 in 1"* merupakan gabungan skrub dan pupur yang telah diinovasikan daripada dua produk yang berbeza kepada satu produk yang berfungsi secara serentak dan dapat menjimatkan masa dan kos pengguna. Produk ini juga berasaskan 100% bahan semula jadi dan bebas daripada bahan pengawet.

Penghargaan: Terima kasih kepada semua pensyarah program kosmetologi atas bantuan, sokongan, dan panduan mereka dalam pelaksanaan projek ini.

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Research Article

Smart Home Automation and Monitoring System

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Abstract: In the latest modern IoT era, the development of science, technology and engineering is the main driver of the evolution of human life. The use of the word "smart" is now widely used in various contexts that carry the meaning of intelligence. Among the technologies that are gaining attention among the community is the "Smart Home". The concept of "smart home" is becoming more popular today because people's lives are now packed with daily work schedules, and they are rarely at home. Therefore, there is a need from user to have a house that is equipped with a "Smart Home Automation system and a Monitoring System" to automate selected electrical appliances at home and monitor the condition of their home. In addition, this system helps those who will be away from home for a long period of time such as traveling, where it will constantly monitor the condition of the home and will notify the host if there is a dangerous situation occurring in the home. This Smart Home Automation and Monitoring System is controlled by an Arduino uno and an ESP 8266 MCU node where it helps users to control the use of electricity sources where it operates by automatically controlling the system depending on the user's presence in the house. The system also is equipped with various sensors that are placed in the home for security purposes. The status can also be monitored and control its function through the apps that developed by using Blynk. Besides, it also can be controlled by using the "voice recognition". A notification will be sent to user when something happens at home. This project makes user lives easier, organized, safer and helps users manage their energy resources. By integrating both automation and monitoring aspect, this can reduce and conserve the energy consumption, and helps user to save the utility bills and other expenses.

Keywords: smart home; home automation; monitoring system.



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1. INTRODUCTION

The rapid transformations in the 21st century's technological landscape, economic sectors, and social structures and rituals as a result of improved communication and Smart automation have led to the term "Industry 4.0" being used to characterize this period (Sayeduzzaman et al., 2023). The development of communications technology has attracted considerable attention to smart home automation systems. Home automation system is an Internet of Things (IoT) which utilizes the Internet technology to connect and manage home devices using a smart home automation system. A system consists of internet of things technology interconnected sensors and home appliances can communicate independently with a bit or no human interaction (Abdulraheem et al., 2020).

This smart home is equipped with actuators, sensors, software and smart network systems that are able to produce a system that provides convenience to its users. These systems that connect to the Internet and interact with those home devices will be an important component of the Internet of Things (IoT). All those devices and sensors are easily controlled and monitored from a smart device. With the addition of features like Google Assistant, home automation is easier than ever,

The proposed project is a low-cost home automation system with safety features that will use Arduino Uno ATmega328P and ESP8266 as a microcontroller. With IP connectivity via local Wi-Fi, the accessing process for all home appliances are easier by using smart devices such as a Smartphone, laptop or Google Assistant application. This system also capable of controlling all electrical equipment that specified in the system.

Therefore, smart home automation technology is an important development in the era of the latest revolution because it provides comfort to its users. In addition to helping users complete work outside the home calmly and without having to worry about home security, it also can manage the home virtually and is easier than using conventional methods.

2. METHOD & MATERIAL

The initial process is an important starting point for the production and development of a system. Some methods and materials are identified and planned to ensure that the system and product development process can be accomplished.

2.1 Project Model

By using the Waterfall model in Figure 1, the work process is divided into five parts which are requirement analysis, design, implementation, testing and maintenance.



Figure 1. Waterfall Model

Requirement analysis: The beginning of the phase where the process to identify the goal that should be achieved. Besides, analysis was carried out in relation to the problems that led to this title. In this phase, the process of identifying the problem is carried out, then strategies and plans are developed to solve the problem.

Design: Some solutions are designed and developed to meet the project's requirements. It is divided into 2 main parts which are hardware and software design. In this section, the verification process will be carried out if there are any issues and return to the previous process.

Implementation: Some project planning was executed and designed in this phase to produce the desire product or system. The software and hardware development process are carried out in stages and undergoes a verification phase to meet the project's requirements.

Testing: This is the last phase that will ensure the requirement of the project are satisfied. If all project requirements are met, then it will proceed to the next phase.

Maintenance: In this final phase, the product is fully completed and involves interaction from the user and the product. Few changes and modifications of features are identified and made for improvement based on the needs of the user or the environment.

2.2 Materials

Each component is different and has a specific function. Hardware and software are major components in developing this project. For hardware components, it is divided into four parts where the selection of available microcontrollers, the selection of sensors to be used, the selection of motors involved in system control as well as additional components such as light bulbs and fans. For software part, it involves the selection of integrated development environment (IDE), the selection of the programming languages.

3. FINDINGS

The combination of software and hardware can be designed to do a specific task. It develops an architecture of the whole system that will help in the process of finding the desired results.

3.1 System Architecture

The overall architecture of the Smart Home Monitoring and Automation System is shown in Figure 2. The architecture is divided into four blocks where the first part is the signal taken from the sensor that can be seen in the orange block. Next, the system controller which consists of several microcontrollers that are placed in the blue block. Then, the outputs such as fans, lights and servo motors are shown in the green box. The last one is the Internet of Things (IoT) which is in the white block. The architecture consists of the main system of Smart Home Automation and Monitoring System, system activation via mobile apps and system activation via voice recognition.



Figure 2. Block Diagram of "Smart Home Automation and Monitoring System"

3.1.1 Main system of Smart Home Automation and Monitoring System

Figure 3 shows the main system of the whole project. This system operates when there is wireless fidelity (Wi-Fi) at home. Once it connects to the Wi-Fi, all sensors are in a ready state to receive any possible signal. The system will activate and operate automatically when detecting the presence of people in the house. It will also shut down automatically when it detects no one is in the house. The status of electrical appliances can be monitored through an app on a smartphone. furthermore, it also shows the conditions in the house and its surrounding area through the readings from the temperature, humidity and rain sensors.



Figure 3. Flowchart of Main system

3.1.2 System activation via mobile apps.

Other than the automatic system activation mode, this system can also be activated through mobile apps. Figure 4 shows the flowchart of system activation via mobile apps. User needs to open the apps to activate the appliances. Some of the selected appliances are displayed in the apps along with their respective statuses whether they are OFF or ON. Simultaneously by pressing the OFF or ON button, the appliances status will be displayed on the apps display.



Figure 4. Flowchart of system activation via mobile apps

3.1.3 System activation via voice recognition.

The system is also equipped with voice recognition activation mode. By using the help of "Google Assistance" in smartphone, user can control the operation either ON or OFF for certain electrical appliances via voice. When the user opens "Google assistant", then presses a button and tells a certain phrase, the "Google assistant" system will check and compare the phrase. When the system finds the phrase matches, the appliances will operate as instructed. The status also displays and can be monitored on the apps.



Figure 5. Flowchart of system activation via voice recognition

3.2 Result

The results that can be achieved are the findings and development of prototypes based on the objectives and scope of the project. It divides into several parts.

3.2.1 Prototype Design

During the design phase, where the project development process is carried out, the project model is designed to obtain the desired results. Figure 6 shows the model plan for the whole system that has been designed and identified.



Figure 6. Smart Home Automation and Monitoring System Model plan

Once the model is developed, the process of installing components and connecting the circuit is carried out in stages until the entire system is completed as shown in the Figure 7. The circuit will undergo a testing and verification phase part by part to obtain results based on the scope and goals of the project until it is all completed.



Figure 7. Smart Home Automation and Monitoring System Circuit Diagram

3.2.2 Mobile application and alert notification

Besides, the physical output that obtained from the built system where the system equipped with IoT features, the output can also be monitored and controlled from the developed Blynk apps. The apps also will send an alert notification if emergency occurs. Figure 8 shows monitoring and controlling mode and notification via mobile apps.



Figure 8. Monitoring, controlling and alert notification via mobile apps.

4. DISCUSSION

Some aspects that need to be considered when developing this project to ensure that the project or system is carried out successfully. Among of the aspects is the number of microcontrollers used for the system. This will be related to the capacity of the power source. The selection of the suitable operating system is one of the important aspects to ease the project development process. Since this system involves many types of sensors, the process of testing and installing components and circuits takes time and needs to be done in stages.

5. CONCLUSION

In brief, this project has high potential to be commercialized. It coincides with the current situation where human lifestyles are now experiencing changes in terms of technological development. By introducing a smart system as follow, it can improve the quality of the daily life of today's society. Especially for those who have a hectic lifestyle and have to spend more time either in the office or on the road due to being stuck in traffic. However, some features need to be improved and added to increase the efficiency of the system.

Acknowledgments: The authors would like to thank the Faculty Kejuruteraan & Teknologi Elektronik, Universiti Malaysia Perlis, team members and family for their support.

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Research Article

Sistem Ramalan Stok Peruncit Menggunakan Algoritma *Moving Average*

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Abstrak: Masalah yang dihadapi oleh peruncit ialah ramalan stok oleh mereka adakala salah dan tidak mengikut keperluan dalam memesan barangan. Ini menyebabkan stok barangan melebihi keperluan dan apabila mencapai tarikh luput, barangan ini tidak boleh dijual dan merugikan peruncit. Isu lain yang terjadi ialah barangan yang dipesan tidak mencukupi dan permintaan pelanggan tidak dapat dituruti. Kedua-dua situasi ini boleh menyebabkan kerugian yang terpaksa ditanggung oleh peruncit. Bagi menyelesaikan isu tersebut, Sistem Ramalan Stok Peruncit (SRSP) ini dibangunkan dengan menggunakan algoritma Moving Average. Algoritma ini mengambil jumlah stok daripada bulan sebelumnya dan membuat purata bagi mendapatkan jumlah stok yang perlu dipesan pada hari tersebut. Sistem ini dibangunkan menggunakan model prototaip. Temu bual bersama tiga peruncit di Sungai Petani telah dijalankan bagi mengkaji keperluan sistem untuk memudahkan dan menyelesaikan masalah yang dihadapi oleh mereka, antaranya penggunaan buku log, keperluan untuk ramalan stok semasa dan sebagainya. SRSP ini berasaskan web-based application dan menggunakan perisian php, MySQL dan pengaturcaran html. Dengan terbinanya SRSP ini, diharapkan dapat menggunakan masalah yang dihadapi peruncit serta menambah baik operasi perniagaan pada masa akan datang

Kata kunci: Ramalan; Purata; Jumlah Stok.



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1. PENDAHULUAN

Masalah yang timbul ialah penggunaan buku log atau *stock card* hanya membantu dalam menguruskan jumlah stok tetapi kurang tepat untuk ramalan kerana tiada pengiraan yang khusus bagi mengetahui ketepatan ramalan tersebut. Penggunaan buku log juga mempunyai kekangan dalam menguruskan stok yang banyak. Kelemahan yang dapat dikesan adalah penggunaan buku log yang dilihat tidak teratur oleh peruncit. Ini menyebabkan stok yang dipesan daripada pembekal tidak mencukupi dan mempengaruhi *supply and demand chain.* Konsep *supply and demand* bermula dengan adanya permintaan, terhasil lah satu keperluan untuk menyediakan barangan tersebut. Berdasarkan penulisan Steve Keen, demand equals supply in equilibrium bermaksud apabila adanya permintaan maka adalah pengeluaran (Keen, 2011).

Secara praktikalnya, banyak perniagaan menggabungkan elemen permintaan dan pengurusan rantaian bekalan untuk mencipta strategi operasi yang komprehensif. Mereka menyedari bahawa untuk mencapai kejayaan memerlukan pemahaman dan kawalan ke atas kedua-dua iaitu permintaan pengguna (rantaian permintaan) dan pengeluaran dan penghantaran barangan yang cekap (rantaian bekalan) (Carbonneau et al., 2008).

Ketiadaaan sistem yang teratur oleh peruncit juga menimbulkan masalah dalam menguruskan stok semasa dan kesukaran untuk peruncit dalam meramal stok barangan dan cuma memesan mengikut barangan yang ada di rak-rak barangan mereka. Peruncit juga menghadapi masalah dalam menguruskan pembekal kerana perlu merekodkan stok barangan yang diambil dari pembekal, termasuk jenis barangan dan kuantiti yang berbeza.

2. METODOLOGI

Teknik ramalan yang popular ialah *moving average*, yang digunakan untuk mencari corak dan arah aliran dalam data. Ia melibatkan ramalan titik data masa hadapan dengan menggunakan purata set titik data yang dikumpul dalam tempoh masa tertentu. Ramai individu masih percaya bahawa kaedah purata bergerak adalah yang terbaik kerana kesederhanaan, objektiviti, kebolehpercayaan dan penggunaannya (Hansun, 2013).

Sistem ini dibina menggunakan metodologi prototaip kerana ia lebih sesuai dalam pembangunan sistem ini. Model Prototaip kurang memberikan tumpuan kepada dokumentasi dan lebih kepada fasa-fasa pembangunan sistem itu sendiri. Penyertaan lebih banyak pengguna diperlukan untuk prototaip, kerana ia membolehkan pengguna melihat dan berinteraksi dengan prototaip sistem dan membolehkan mereka menawarkan maklum balas dan spesifikasi yang lebih teliti dan tepat (Ganpatrao Sabale, 2012).



Rajah 1. Fasa dan Aktiviti yang Dilakukan Semasa Pembangunan Sistem

Rajah Konteks bagi Sistem Ramalan Stok Peruncit (SRMP) melibatkan dua pengguna sistem, iaitu peruncit yang berfungsi sebagai pengguna dan pentadbir sistem dan pembekal. Peruncit akan mendaftar pada sistem dan akan memasukkan ID dan kata laluan untuk log masuk ke dalam sistem.

Pengguna akan memasukkan butiran stok barangan dan pengiraan ramalan stok akan dijalankan oleh sistem. Sistem akan mengeluarkan laporan mengenai stok yang perlu dipesan dan juga akan menghantar notifikasi kepada pembekal apabila stok perlu dipesan oleh peruncit.



Rajah 2. Rajah Konteks Bagi Sistem Ramalan Stok Peruncit (SRMP)

Terdapat enam proses utama di dalam Sistem Ramalan Stok Peruncit Menggunakan Algoritma *Moving Average.* Proses pertama ialah proses pendaftaran bagi pengguna baharu. Maklumat yang dimasukkan akan di simpan di dalam pangkalan data bagi digunakan pada proses seterusnya iaitu proses log masuk. Pada proses ini, peruncit akan mendaftarkan maklumat peruncit di dalam sistem. Peruncit juga akan memasukkan maklumat pembekal ke dalam pangkalan data dan akan digunakan untuk proses notifikasi.

Proses kedua pula merujuk kepada proses log masuk. Peruncit akan memasukkan *ID* dan *password* yang telah didaftarkan pada proses pendaftaran bagi pengesahan identiti bagi tujuan keselamatan.

Proses ketiga ialah proses yang penting di mana proses ini melibatkan peruncit memasukkan data stok barangan dan jumlah stok ke dalam sistem untuk disimpan kedalam pangkalan data. Data itu akan digunakan untuk proses seterusnya.

Proses keempat adalah proses pengiraan bagi ramalan stok barangan. Data-data stok barangan akan di kira melalui kod yang mengandungi formula dan pengiraan untuk mendapatkan ramalan yang tepat. Proses ramalan adalah menggunakan data jumlah stok barangan dan *safety stock* untuk mendapatkan jumlah stok barangan yang perlu dipesan mengikut data enam bulan kebelakang.

Proses terakhir ialah proses notifikasi. Pada proses ini, stok barangan yang kurang dan amaran akan diberikan kepada peruncit mengenai stok yang tidak mencukupi. Stok barangan yang tidak cukup akan dikenalpasti mengikut *safety stock* yang ditentukan oleh peruncit. Notifikasi pemesanan akan dihantar kepada pembekal sebagai notis kepada mereka berdasarkan masa dan jadual penghantaran yang berbeza-beza.



Rajah 3. Rajah *DFD Level 0* Bagi Sistem Ramalan Stok Peruncit (SRMP)

3. HASIL

Untuk keperluan pengumpulan data, beberapa sesi temu bual diadakan bersama peruncit dan pembekal .Seramai tiga orang peruncit dan pembekal di temu bual bagi mendapatkan gambaran dan mencari permasalahan yang timbul di kalangan mereka. Hasil dapatan daripada temu bual yang telah diadakan, kebanyakan peruncit hanya menggunakan pengalaman lampau dalam menguruskan stok untuk memesan stok barangan. Ketiga-tiga responden yang telah di temu bual telah menjalankan perniagaan selama puluhan tahun dan mempunyai pengalaman yang luas di dalam perniagaan yang membolehkan mereka menguruskan stok mereka dengan dalam kapasiti sedia ada. Barangan yang berlebihan sekiranya dipesan akan mengakibatkan kerugian kepada peruncit itu sendiri.



Rajah 4. Hasil Temu Bual

Antara muka merupakan perantara bagi pengguna dan sistem yang menerima input dan menghasilkan kandungan dengan mencipta halaman web yang dihantar melalui Internet dan diakses oleh pengguna melalui pelayar web. Dalam konteks *web-based application*, faktor-faktor seperti pengalaman visual dan daya tarik laman, kualiti organisasi navigasi (terutamanya di laman-laman besar), penempatan objek dan masa muat halaman juga mempengaruhi pengalaman pengguna secara keseluruhan dan kepuasan dan boleh digunakan oleh mekanisma penyesuaian untuk menyesuaikan antara muka pengguna web (Partarakis et. al, 2009).

3.1 Reka Bentuk Antara Muka Log Masuk Sistem

Rajah di bawah menunjukkan paparan antara muka bagi proses log masuk pengguna. Peruncit akan memasukkan nama pengguna dan kata laluan bagi proses log masuk seperti yang didaftarkan oleh peruncit sendiri.



Rajah 5. Paparan Antara Muka Log Masuk

3.2 Reka Bentuk Antara Muka Menu Utama

Laman utama sistem direka bagi memudahkan peruncit mengakses laman-laman penting seperti laman pembekal dan laman barangan. Pada laman utama, navigasi laman-laman lain seperti laman kemasukan barangan dan kemasukan jumlah stok harian. Analisis stok barangan dipaparkan pada antara muka sebagai penambahan ciri-ciri untuk sistem ini.



Rajah 6. Paparan Antara Muka Laman Menu Utama

Rajah seterusnya menunjukkan paparan antara muka laman barangan. Peruncit akan memasukkan nama barangan dan kategori barangan. Stok simpanan dan *minimum order quantity* (*MOQ*) akan di isi oleh peruncit bagi setiap barangan tersebut.

iama Barangan:	
lategori Barangan:	
Barangan Bosah	
itok Simparan:	
100:	

Masukkan Data Barangan

Rajah 7. Paparan Antara Muka Pengisisan Data Barangan

Informasi stok mula dan stok akhir mesti dimasukkan oleh peruncit. Data ini akan digunakan bagi proses ramalan stok.

Masukkan Data Barangan

Barang Basah Barang Karing	
BARANG BASAH Nama Barangan:	
ayam	v
Stok Mula:	
Stok Akhir:	
Note: Returning will erase current product data	
Submit	

Rajah 8. Paparan Kemasukkan Data Barangan Bagi Kategori Barangan Basah

Masukkan Data Barangan

Burang Basah Barang Karing	
BARANG KERING Nama Barangan:	
tithus	*
Stok Mula:	
Stok Akhir:	
Note: Refurning will enese current product data.	
Submit	

Rajah 9. Paparan Kemasukkan Data Barangan Bagi Kategori Barangan Kering

Pada paparan ini, stok yang perlu dipesan akan dipaparkan mengikut kategori dan jumlah barangan yang telah dimasukkan oleh peruncit di antara muka kemasukan data barangan

No	Nama Barangan	Stok Semas		Stok Yang Perlu Dipesan	
ti.	avam	0		0	
Ken	naskini				
and the second se	malan				
T\a					
No	Nama Barangan	Stok Simpanan	Tahap Amaran	Stok yang Perlu Dip	esan
No	Nama Barangan	Stok Simpanan	Tahap Amaran	Stok yang Perlu Dip	esan

Rajah 10. Paparan Antara Muka Ramalan Stok

Data pembekal seperti nama dan alamat email akan diisi oleh peruncit. Data ini akan dipaparkan oleh sistem. Notifikasi akan dihantar kepada pembekal melalui email mengenai maklumat stok yang akan dipesan oleh peruncit.
ID Panibakal	
Name	
Patricipal Destination	
(Burangan Basah Y)	
Email portbokat	
Alamat	

Rajah 11. Paparan Antara Muka Pengisian Informasi Pembekal

ID Nama Pembekal Kategori Barangan Email Pembekal Alamat Pembekal 23 AHMAD LUQMAN kategori T ahmaduke04@gmail.com A104, jalan sinar mentan.A5, taman sinar mentan, bedong, kedah 240 -paik kategori 7 testere/Formation BD J				Data Pem	bekal
ID Nama Pembekal Kategori Barangan Email Pembekal Alamat Pembekal 23 AHMAD LUQMAN kategori ahmaduke04@gmail.com A104, jalan sinar mentan. A5, taman sinar mentan, bedong, kedah 340 pakk kategori? testeo/Pamail.com BD1					
23 AHMAD LUQMAN katogori ahmaduke04@gmai.com A104, jalan sinar mentan.A5, taman sinar mentari, bedong, kedah 340 - pakk kategori? testeo/Pernal.com BD1	ID	Nama Pembekal	Kategori Barangan	Email Pembekal	Alamat Pembekai
240 sala kataon? tation@amai.com BD1	23	AHMAD LUQMAN	kalogori1	ahmadiuke04@gmail.com	A104, jalan sinar mentan, A5, taman sinar mentan, bedong, kedah
ean hann annände mandäffenneren en a	24	0 pakk	kategor/2	testing@gmail.com	BPJ

Rajah 12. Paparan Antara Muka Data Pembekal

4. PERBINCANGAN

Pencapaian bagi sistem ini dapat diukur melalui tahap capaian objektif sistem ini dibangunkan dan impak sistem ini kepada pengguna berdasarkan tujuan sistem ini dibangunkan;

a. Mengkaji model ramalan yang bersesuaian dengan sistem pengurusan stok peruncit untuk mendapatkan hasil ramalan stok barangan.

Sistem ini menggunakan algoritma "*simple moving average*" bagi meramalkan stok barangan peruncit selepas kajian terhadap teknik-teknik ramalan dibuat. Teknik ini dipilih kerana pengiraan yang mudah dan sesuai untuk ramalan stok barangan

b. Membangunkan sebuah Sistem Ramalan Stok Peruncit (SRSP) yang dapat membantu peruncit dalam menguruskan stok barangan

SRSP yang dibangunkan dapat meramal stok barangan dan membuat penghantaran notifikasi stok yang perlu dipesan kepada pembekal secara terus kepada alamat email mereka.

c. Merekabentuk pangkalan data untuk menyimpan data-data barangan untuk tujuan ramalan dan pengurusan.

Keselamatan data yang disimpan ke dalam pangkalan data dapat dijamin dengan penambahan ciri-ciri keselamatan kepada sistem. Sistem ini telah menyertai beberapa pertandingan di peringkat antarabangsa termasuk ICIIC dan I3DC. Projek ini berjaya memenangi pingat gangsa di dalam pertandingan ICIIC.

Sistem Ramalan Stok Barangan ini dapat digunakan kepada pengguna dengan mudah dan memberi pelbagai faedah kepada peruncit. Faedah-faedah tersebut ialah:

- a. Sistem ini mudah diakses oleh peruncit kerana menggunakan laman sesawang sebagai platform web
- b. Keselamatan data-data penting di dalam pangkalan data adalah terjaga
- c. Penambahan ciri-ciri keselamatan ke atas sistem pada proses pendaftaran dan log masuk
- d. Ramalan data barangan yang memudahkan peruncit mengurus dan menentukan stok barangan yang perlu dipesan

Selepas analisa terhadap Sistem Ramalan Stok Peruncit ini, kelemahan sistem ini dapat diselesaikan dengan beberapa cara iaitu:

- a. Menambah dan mengaplikasikan *"multi role access control"* di mana pentadbir sistem dan pengguna sistem mempunyai nama pengguna dan kata laluan yang berbeza berserta antara muka yang berbeza begantung kepada akses yang diberikan.
- Penggunaan teknik ramalan yang berbeza mengikut kerumitan data dapat diaplikasikan mengikut kegunaan sistem
- c. Penambahan fungsi muat naik data barangan selama tiga bulan bagi menormalisasi pengiraan ramalan
- d. Penghantaran notifikasi kepada pembekal secara terus melalui sistem ataupun penghantaran melalui mesej kepada nombor telefon pembekal dilihat lebih mudah.

5. KESIMPULAN

Secara kesimpulannya, Sistem Ramalan Stok Runcit (SRSP) telah berjaya mencapai objektifnya dengan melaksanakan algoritma purata bergerak mudah untuk meramalkan stok barangan runcit. Sistem ini menyediakan akses mudah bagi peniaga runcit melalui platform berasaskan web, memastikan keselamatan data dan menggabungkan ciri keselamatan semasa proses pendaftaran dan log masuk. Perlu diperhatikan bahawa SRSP telah menerima pengiktirafan dalam pertandingan antarabangsa dengan memenangi pingat gangsa bagi projek ini.

Kelebihan sistem ini terletak pada antaramuka yang mesra pengguna, keselamatan data yang kukuh, dan keupayaan meramalkan stok yang tepat, memudahkan pengurusan inventori bagi peniaga runcit. Walau bagaimanapun, kelemahan yang dikenal pasti termasuk sistem kawalan akses tunggal, had dalam teknik ramalan yang digunakan untuk data kompleks, dan ketidak tepatan yang berpotensi apabila data stok berbeza dari algoritma yang telah ditetapkan. Untuk menangani kelemahan ini, penambahbaikan masa depan mungkin melibatkan pelaksanaan kawalan akses pelbagai peranan, mengadaptasikan pelbagai teknik ramalan berdasarkan kepelbagaian data, menambah fungsi muat naik stok selama tiga bulan untuk meningkatkan ketepatan ramalan dan merangka kaedah pemberitahuan yang lebih cekap kepada pembekal.

Secara ringkasnya, SRSP telah terbukti bermanfaat bagi peniaga runcit tetapi penambahbaikan berterusan penting untuk menjaga sistem supaya kekal fleksibel dan memenuhi keperluan pengguna yang berkembang. Kelemahan yang dikenal pasti berfungsi sebagai panduan berharga untuk peningkatan masa depan, memastikan kesinambungan kejayaan dan relevansi Sistem Ramalan Stok Runcit.

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Research Article

Habbatussauda Natural Soap by NuFea

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Abstrak: "Habbatussauda Natural Soap by NuFea" adalah produk inovasi yang dihasilkan untuk mengurangkan masalah kulit muka dan badan. Objektif utama inovasi ini adalah untuk mengenal pasti tahap kelebihan penggunaan dalam menangani masalah kulit seperti ekzema, kulit sensitif, gatal-gatal dan berjerawat dalam kalangan wanita dan lelaki. "Habbatussauda Natural Soap" diformulasikan berasaskan biji dan minyak habbatussauda, minyak zaitun, minyak bunga matahari, menthol crystal, peppermint, gliserin dan ekstrak bunga telang. Sabun ini dihasilkan secara "homemade". Habbatussauda yang terkandung dalam sabun yang dihasilkan dapat mengurangkan keradangan pada badan dan bersifat dwifungsi serta harga mampu milik. Oleh yang demikian, diharap "Habbatussauda Natural Soap" dapat memenuhi keperluan pasaran dan dapat dikomersialkan secara meluas.

Keywords: Natural soap; Safe; Homemade soap.



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1. PENGENALAN

"Habbatussauda Natural Soap" adalah projek inovasi yang menggunakan biji dan minyak habbatussauda untuk mengurangkan masalah kulit muka dan badan. Objektif utama inovasi adalah untuk mengenalpasti tahap kelebihan "Habbatussauda Natural Soap" dalam menangani masalah kulit seperti ekzema, kulit sensitif, gatal-gatal dan berjerawat yang dihadapi di kalangan wanita dan lelaki. Selain itu, dapat menghasilkan produk sabun yang bersifat dwifungsi dengan kos yang rendah. Penggunaan sabun berasaskan biji dan minyak habbatussauda iaitu bahan semula jadi dapat menjamin keselamatan tahap penggunaannya. Hal ini demikian kerana sabun ini dihasilkan secara "homemade" dan melalui proses saponifikasi. Habbatussauda mengandungi pelbagai nutrisi yang sangat kaya dengan pelbagai khasiat seperti karbohidrat, protein, lemak sihat seperti asid oleat dan asid linoleat, kalsium, serat, zat besi, natrium, kalium dan antioksidan. Setiap vitamin yang terdapat dalam bijian ini menjadikan habbatussauda sangat istimewa dan sesuai dengan kulit. Minyak habbatussauda juga mengandungi lebih 5 kali ganda bahan aktif dan antioksida berbanding produk lain di pasaran.

2. KAEDAH & BAHAN

"Habbatussauda Natural Soap" dihasilkan dengan mencampurkan bahan semula jadi, iaitu minyak habbatussauda, minyak zaitun dan minyak bunga matahari. Gliserin dicairkan dan dikacau di dalam *wax heater*. Manakala biji habbatussauda dan *menthol crystal* dikisar halus. Ketiga-tiga minyak dicampurkan ke dalam gliserin dan digaulrata. Ekstrak bunga telang pula ditapis untuk mendapatkan warna semulajadi. Kemudian, air tapisan ekstrak bunga telang dimasukkan bersama *peppermint* ke dalam *wax heater* dan digaul rata. Taburkan biji habbatussauda ke dalam acuan silikon sebelum di tuang ke dalam acuan.



1. Sediakan alat dan bahan.



2. Campurkan ketigatiga minyak.



3. Satukan biji habbatussauda dan *menthol crystal*



4. Kemudian kisar halus.



5. Kacau sebati.



6. Tuang ke dalam acuan silicon.

Rajah 1. Proses pembuatan "Habbatussauda Natural Soap"



Rajah 2. Logo "Habbatussauda Natural Soap"



Rajah 3. Pembungkusan sabun dalam bentuk kotak

3. DAPATAN KAJIAN

Berdasarkan dapatan kajian terhadap penghasilan dan keberkesanan "Habbatussauda Natural Soap By Nufea", 6.7% responden mempunyai masalah kulit ekzema dan 33.3% mempunyai masalah kulit sensitif. 60% responden menyedari masalah kulit sensitif pada kulit badan dan muka mulai berkurang setelah menggunakan sabun ini. 73.3% responden mendapati sabun ini dapat mengekalkan kelembapan pada kulit muka dan badan kerana mengandungi minyak zaitun. 50% responden akan terus membeli produk ini kerana ia menjimatkan perbelanjaan.

Penghasilan " Habbatussauda Natural Soap " ini dapat memberi kesedaran kepada golongan wanita dan lelaki tentang kepentingan menggunakan sabun yang berasaskan bahan semula jadi yang dihasilkan secara "homemade" dan bebas bahan daripada kimia. Penggunaan produk ini mengambil sedikit masa untuk pemulihan. Selain berkesan secara semulajadi, "Habbatussauda Natural Soap By NuFea" boleh didapati dengan harga yang lebih murah kerana ia dihasilkan secara "homemade".

4. PERBINCANGAN

Penghasilan "Habbatussauda Natural Soap" berkait rapat dengan kajian tahap keberkesanan sabun berasaskan bahan semula jadi terhadap kulit muka dan badan dalam kalangan wanita dan lelaki. Kebanyakkan wanita dan lelaki mengabaikan pemakaian sabun muka dan badan dalam rutin penjagaan kuit harian dan memakai sabun muka dan badan yang tidak bersesuaian dengan kulit. Tambahan pula, mereka tidak mengetahui cara penggunaan sabun yang betul di samping amalan gaya hidup yang turut mempengaruhi kesihatan kulit muka dan badan.

"Habbatussauda Natural Soap" mengandungi bahan-bahan semula jadi yang sangat sesuai dan selamat untuk wanita dan lelaki. Minyak habbatussauda, minyak zaitun, minyak bunga matahari, ekstrak bunga telang, biji habbatussauda dan papermint sangat berkesan dalam merawat masalah ekzema, kulit sensitif dan berjerawat.

Kajian penghasilan "Habbatussauda Natural Soap" ini banyak memberi pendedahan tentang kebaikan dan kelebihan bahan semulajadi dalam merawat masalah ekzema, kulit sensitif, berjerawat pada muka dan badan. Kajian ini juga mampu menarik minat ramai wanita dan lelaki menggunakan sabun badan dan muka yang dihasilkan secara "homemade" tanpa bahan kimia.

5. KESIMPULAN

"Habbatussauda Natural Soap" merupakan sabun yang terbaik untuk wanita dan lelaki bagi merawat masalah ekzema, kulit sensitif dan berjerawat. Sabun ini diinovasikan menggunakan bahan semulajadi yang mudah didapati dengan kos yang lebih murah dan bebas bahan kimia.

Penghargaan: Terima kasih kepada semua pensyarah program kosmetologi atas bantuan, sokongan, dan panduan mereka dalam pelaksanaan projek ini.

Rujukan

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Research Article

Contact Alert App - Smooth Features to Detect Scammers

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Abstract: Scam crimes are on the rise, impacting people globally, particularly the elderly and tourists. Existing anti-scam apps lack of accessibility, comprehensiveness, and real-time updates. By seeing these opportunities, the team came up with "Contact Alert," a user-friendly app that includes three features categories which are elderly, tourists, and general features. As for the elderly, the team have provided simplified interfaces such as large fonts, voice control, and an emergency SOS button. For tourist features, the team developed "Contact Alert" with pretravel scam information, emergency contact details, offline maps, navigation, currency converter, and transportation booking. As for the general features, the team have come up with real-time scam alerts, multi-layered defence, userpowered community, phone/text/email/website protection, scam reporting, and educational resources. "Contact Alert" was designed with these three categories to cater with diverse user needs, and simplified interface for everyone, including those with disabilities. Besides, "Contact Alert" also has automated call recording, emergency SOS button, and multi-language support. These features can help the user when they are facing a scammer. Other than that, in order to make sure that the app can also be used by the foreign, the team made an initiative plan to collaborate with local providers for safe transport and activities. This app will give the impact in economics such as minimizing consumers' spending through comprehensive free features. Besides, it also has social impact by enhancing accessibility and safety for all users, especially elderly and tourists. Lastly, in term of technological impact, "Contact Alert" can promote digital security awareness and education. "Contact Alert" offers a ground-breaking solution to combat scams by empowering users with real-time information, robust protection tools, and a user-centric design. This comprehensive app fosters a safer digital environment for individuals of all ages and abilities, reducing susceptibility to fraud and empowering informed online interactions.

Keywords: contact alert app; travel scam information; scam alerts



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1. INTRODUCTION

The scam crime is becoming worse due to the increasing numbers of scammer victims every year. In Malaysia, one of the worst parts is that most of the scammer victims are from the older generation. According to Harian Metro (2021), people aged 51 and over tend to be cheated by scammers. According to Pengarah Jabatan Siasatan Jenayah Komersial (JSJK) Bukit Aman, Datuk Mohd Kamarudin Md Din, his team recorded 5,527 Macau Scam fraud cases involving losses of more

than RM 327 million for the period of 2019 to last June. "In 2019, a total of 2,466 cases were reported with a loss of more than RM 121 million, but the number of cases last year decreased when 2,247 cases were recorded but the value of the loss increased to more than RM172 million. He added that "for the period from January to June, a total of 814 cases were recorded involving loss of more than RM33 million". Not only in Malaysia, but this crime is also one of the critical crimes in many countries.

In order to prevent the increase in cases of the scammer, the team have come up with an application called "Contact Alert App - Smooth Features to Detect Scammers". This app is designed with many features that can help and protect the users from the scammer. As the team is focusing on all groups of people, this app features were also designed in three main categories, consist of elderly, tourist and general features to make it easier for the users to use the app according to their needs.

1.1 Product Objectives

The objectives of Contact Alert development are as follows;

- To reduce financial loss and personal information compromise especially for elderly users through proactive scam detection and prevention features.
- To enhance safety, security, and provide peace of mind for users; both local and tourist, through location-based features and emergency assistance.
- To provide knowledge to all segments of society using technology to identify, prevent, and apprehend scammers rather than becoming their victims.

1.2 Product Uniqueness

Contact Alert are different from other apps since it has three categories of features which are elderly features, tourist features, and general features that can be chosen by the user according to their needs. The team also find that other existing apps in the market have a few shortcomings such as limited scam detection and lack of accessibility features. Thus, the team were taking this opportunity to develop Contact Alert, which is an app that has specialized features that can overcome those weaknesses. This app contains simplified interface; it is designed with large fonts, clear icons, and minimal texts to be easily readable and navigable for elderly and users with vision impairments. Nevertheless, youngsters, teenagers and adults can also use this app by adjusting the fonts according to their preference in the setting. This app also has the automated call recorded function and emergency SOS button; a feature that implements a one-click emergency button that instantly connects users to local emergency services or trusted contacts if the users want to take action on their own.

Contact Alert also has pre-travel scam information that provide targeted scam alerts and safety tips relevant to the chosen tourist destination, emergency contact information feature that include emergency contact information for local embassies, tourist assistance services, and hospitals in multiple languages. This app also has a navigation assistance and currency converter that integrate offline maps and navigation features with voice guidance to help elderly tourists safely explore their surroundings and implement real-time translation tools to help overcome language barriers and avoid communication-based scams including a built-in currency converter to avoid confusion and potential financial scams. Besides, Contact Alert also has transportation booking and local events and activities log. This app will also collaborate with local transportation providers and local committees to allow users to book safe and reliable rides using the app.

1.3 Literature Review

Studies by Abdul and Fauzi (2019) shows that online scams, including phishing, fake websites, and email scams, are rampant in Malaysia. Cybercriminals exploit individuals' trust and use deceptive tactics to gain unauthorized access to sensitive information, leading to financial losses.

Besides, recent research by Othman and Che Din (2020) delves into Malaysia that has witnessed an increase in investment scams, where fraudsters lure unsuspecting individuals into dubious investment schemes, promising high returns. Victims often suffer financial devastation as a result.

Moreover, phone scams discussed by Wong and Tan (2018), that phone scams, including impersonation scams and lottery scams are prevalent in Malaysia. Scammers use phone calls to deceive individuals into providing personal information or making financial transactions.

Research by Lee and Rajan (2020) emphasizes the role of public awareness and education in preventing scams. Effective communication strategies and educational campaigns are identified as key elements in empowering individuals to recognize and avoid scams.

2. PRODUCT DESCRIPTION

Contact Alert is all-in-one defence app against fraud and a 'guardian angel' for peace of mind, especially designed for elderly users and anyone who is seeking for cyber security safety, and the best thing is this app is free. This app is very easy to use by everyone because it was designed with simplified features. For example, this app was built with large fonts, clear icons, and voice control, making it a breeze to navigate even with vision or dexterity limitations. Contact Alert will also be an unmatched scam protection app because it has real-time alerts, multi-layered defence, and user-powered community. With these features, it will help the users stay ahead of the curve with instant warnings about scams and fraudulent activities. Besides, this app will also shield users from phone calls, texts, emails, and websites containing suspicious patterns. Moreover, Contact Alert can also help users to report scams and help others to stay safe. Table 1.0 shows step-by-step guide to use Contact Alert app.

Table 1. Method to Use Contact Alert

METHOD	EXPLANATION









3. PRODUCT COMMERCIALIZATION POTENTIAL

In order to make people aware about this app, the team will use a few commercialization tools to promote the app. The tools that we will use include social media and influencer collaboration.

3.1 Social Media

As we live in the era with advanced technologies, social media is one of the best tools to be used to commercialize or promote this app. This is because there are huge numbers of people around the world using social media in their daily life, either for communication, work, or even to spend their leisure time. Therefore, to ensure that this application can be recognized and known as soon as possible, social media is the best marketing medium. Nowadays, not only the teenagers are using the social media, but also the elderly; who are the main target audience for this app. Even if the elderly does not recognize or do not aware of this app, teenagers or adults who aware of this app could help to download it for their parents.

3.2 Collaboration with Influencers

In order to make sure that audiences who see the promotion on social media will use and trust this app, the team will also make an initiative plan to collaborate with well-known social media influencers. This is because the netizen tends to have more interest to try this app when it is promoted by someone they know.

4. PRODUCT IMPACT

4.1 Economic Impact

In term of economy, Contact Alert could potentially minimize consumers' spending. Some applications are built by providing only basic features to their users and only offer their high-end features or premium plan for the users who subscribe and pay for their applications. Compared to Contact Alert, it offers every feature in the app for the users. Contact Alert is essential for a long term use as it is suitable for all users including disabled people.

4.2 Social Impact

The Contact Alert app is a friendly user app that is easy to be used for everyone especially for the elders. For example, large fonts and clear icons are built for them to easily use, as well as for the ones who have visionary impairments. Besides, there are features in the Contact Alert that are specifically made for tourists and travellers. For instance, travel destination information. The features provided users with common scams information in specific tourist destinations, including local currencies, transportations, and attractions.

Moreover, similar to existing E-Hailing services such as Maxim or Grab, Contact Alert will also work with local transportation services to allow booking of their rides in the local communities safely through the app. The curated lists of age-appropriate and accessible events and activities for events also provided for the tourists to find the attractions that suit their interest.

5. CONCLUSION

In conclusion, the 'Contact Alert' application stands out as a promising and comprehensive solution to counter the escalating threat of scams in today's digital landscape. The imperative for a user-friendly and widely accessible anti-scam application is evident, given the growing vulnerability of individuals to various fraudulent activities. The app's objectives, centered around minimizing scams for tourists, preventing widespread fraud, ensuring robust data protection, and addressing the needs of users with disabilities, collectively address critical concerns in online security. Its commitment to inclusivity and recognition of the heightened risks faced by the older generation, coupled with their potential technological limitations, highlight the app's advanced anti-scam measures. In essence, 'Contact Alert' not only bridges existing gaps in consumer protection but also strives to create a safer digital environment for people of all ages and abilities. Through its integration of real-time information, fraud evaluation tools, and proactive features, the app empowers users to navigate the complexities of digital security, ultimately reducing susceptibility to scams and financial fraud.

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Research Article

Digital Certificates Management System

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Abstract: This project aims to develop a certificate management system to overcome the problems of storage and management of certificates as physical documents are exposed to damage from various sources, including natural disasters, accidents, and decay over time. In addition, these certificates can be lost during transit, which leads to significant difficulties in verifying qualifications, especially in critical situations such as job applications or admission to educational institutions. A web-based certificate management system fills this void, ensuring the security and integrity of certificates. This digital transformation not only simplifies the authentication process but also increases accessibility and real-time authentication, making it an essential tool in our fast-paced modern world. The objective of this project is to develop a web-based certificate management system to store, update, and search student certificates quickly and efficiently. The second objective of this project is to an educational institutions and employers, and the last is to use the captcha technique for authentication as a strong security measure to protect student certificate data from unauthorised access.

Keywords: Certificate management system; Authentication process; Captcha technique; Student certificate data



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1. INTRODUCTION

Certificates play an important role for educational institutions to confirm student achievement and increase the institution's credibility. For employers, the certificate serves as tangible proof of the applicant's qualifications, helping in an efficient hiring process. It demonstrates specific skills, knowledge, and commitment to professional development, ensuring alignment with industry demand and facilitating informed recruitment decisions, ultimately effectively bridging the gap between education and employment.

The objective of this program is to leverage technological improvements to overcome the challenges presented by traditional administrative processes associated with certificates. It obviates the difficulty linked to the administration of significant quantities of tangible documents and replaces it with a more streamlined and user-focused digital interface. The transition from manual to digital technologies has the potential to yield advantages for users. The deployment of the Certificate

Management System has enabled the National Defence University of Malaysia (UPNM) to store and manage its students' certificates effectively and securely.

2. METHODS & MATERIALS

2.1 Methods

The methodology chosen to develop the Certificate Management System is the Prototype model methodology. This is because Prototyping involves this prototype model is divided into seven main phases. Among the seven phases consist of initial observation, review, requirements, system design, coding, testing, Implementation and maintenance. Meanwhile, the proposed prototype is analysed and tested by system analysts and users to improve the system. After analysing the system to be built, the Prototype Model approach method is the method that best meets the criteria and is acceptable in the development of this project.



Figure 1. Prototype phase. (Source: https://waykenrm.com/blogs/prototype-development-process/)

2.1.1 Requirements Gathering and Analysis:

This initial phase involves gathering requirements from stakeholders, including educational institutions, employers, and students, to understand their needs and expectations from the certificate management system. Analyse existing certificate storage and management processes to identify pain points and areas for improvement.

2.1.2 Design Phase:

Develop a high-level design for the web-based certificate management system based on the gathered requirements. This phase includes creating system architecture, database schema, and user interface wireframes. Design the system to prioritize security, accessibility, and efficiency.

2.1.3 Prototype Development:

Develop a prototype of the certificate management system based on the design specifications. The team uses rapid prototyping techniques to quickly create a functioning prototype with essential features. Focus on implementing core functionalities such as certificate storage, update, search, and user authentication using captcha techniques.

2.1.4 Prototype Testing:

Conduct usability testing of the prototype with representative users, including students, administrators, and stakeholders. Gather feedback on the system's usability, functionality, and performance. Identify any issues or areas for improvement and iterate on the prototype accordingly.

2.1.5 *Refinement and Enhancement:*

Based on the feedback received during testing, refine and enhance the prototype to address identified issues and incorporate suggested improvements. This may involve redesigning certain aspects of the user interface, optimizing system performance, or adding new features to enhance functionality.

2.1.6 Evaluation and Validation:

Validate the prototype against the initial requirements and objectives of the project. Evaluate the system's effectiveness in addressing the problems associated with physical certificate storage and management. Ensure that the prototype meets security standards and provides reliable authentication mechanisms.

2.1.7 Documentation and Reporting:

Document the design, development, testing, and evaluation processes, including any changes made to the prototype. Create user manuals and technical documentation to guide future development and usage of the certificate management system. Prepare a comprehensive report summarizing the methodology used, key findings, and recommendations for further development or implementation.

2.1.8 Deployment Planning:

Develop a deployment plan for transitioning the prototype into a production-ready system. Determine the necessary infrastructure, resources, and timeline for deploying the certificate management system in a real-world environment. Consider factors such as scalability, data migration, and user training to ensure a smooth transition.

2.1.9 Implementation and Deployment:

Implement the finalized version of the certificate management system based on the prototype. Deploy the system in the target environment, ensuring compatibility with existing systems and adherence to security protocols. Conduct thorough testing in the production environment to verify system stability and functionality.

2.1.10 Monitoring and Maintenance:

Establish mechanisms for monitoring the performance and usage of the deployed certificate management system. Implement regular maintenance procedures to address any issues or bugs that may arise post-deployment. Continuously gather feedback from users and stakeholders to identify opportunities for further refinement and enhancement.

2.2 Materials

The scopes and materials that were used to develop the Certificates Management System are listed as follows:

2.2.1 User

Three types of users can use this system, namely, the administrator and students.

- 1. Students
 - a) Students at the National Defense University of Malaysia (UPNM).
 - b) Students use the system to view the certificate display interface, manage certificates and personal information.
 - c) Request access to BHEPA to upload the certificates of the students involved by filling in the program information on the New Program interface.
- 2. Administrator
 - a) Bahagian Hal Ehwal Pelajar dan Alumni (BHEPA) of UPNM who is responsible for managing students account registration.
 - b) Administrators use the system to give access to students to upload the certificates of students involved with the requested program.

2.2.2 Software, language, and database

Visual Studio Code was used as the source code typing platform, while Figma was used to design the interface or prototype. Hypertext Pre-processor (PHP), Hypertext Markup Language (HTML), and Cascading Style Sheets were the programming language formats (CSS), while XAMPP with MySQL was utilised as the system database.

3. FINDINGS

The Certificates Management System was developed to improve certificates storage handling and managing. This system would also make it easier for students to save certificates file. The administrator can register and store the user accounts of admin and students in the MySQL database, which can be retrieved for login purposes. An interface design was included to enable students, teachers, and administrators to access this system.

3.1 Interface Design

The login interface is the same for all users i.e. administrators and students. To access and use the system, users are required to enter a user id and password. Users are also asked to perform a captcha task to enter the system. The system only allows users to log in if the user id and password match those stored in the database. The system's login interface is shown in Figure 2.



Figure 2. User login interface for the Certificates Management System

3.1.1 Admin

This view can only be accessed by administrators who are effectively logged into the system. Among the models that can be seen are new user registers and user updates. Figure 3 shows administrators give permission to student's programmes.



Figure 3. Approval view Certificates Management System

3.1.2 Student

This display (Figure 4) is the display after the student logs into the system. This page shows the certificates that students have earned, and which have been uploaded. Students can see the name of the certificate, the description of the certificate, the time the certificate was uploaded and Actions which are rename, edit the description, delete the certificate, and download the certificate.

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Figure 4. View Certificates

3.2 Algorithm

Algorithm design is how the system developer determines the decisions in the use of this system. Algorithm development plays an important role in the Certificate Management System because it shapes the functionality of the system. In this context, algorithms are designed to streamline processes and ensure smooth data management. The importance of algorithm development in this system lies in its ability to improve the user experience.







Figure 5. Algorithms for login, registration and approval

4. DISCUSSION

Through the development of this system, the primary goal is to assist in the resolution of the problems that are experienced by pupils. Therefore, the utilization of this system provides a workable answer to the problems that have been identified. In addition, this system offers a multitude of benefits, each of which makes a significant contribution to successfully enhancing the entire user experience. The following are an outline of the benefits that this Certificate Management System offers: 1) Students are able to rapidly access their credentials online using this method, which reduces their dependency on more time-consuming manual processes. 2) Providing a data storage system that is both organized

and easily accessible, so making information management easier for both the faculty and the students. 3) Gives students the ability to get the knowledge they want in a short amount of time without requiring them to go through a difficult procedure.

The system that has been built is anticipated to improve user affairs and efficiently achieve its objectives. This strategy has been proven to be effective. Notwithstanding, over the course of the testing procedure, the system demonstrated several weaknesses. These restrictions are influenced by factors such as time concerns and other variables. There are several shortcomings with the Certificate Management System, including the following: *a*) If the user has forgotten their password, the function that could reset the password cannot be performed. *b*) Administrators are unable to view the activity of students who have registered with the system. *c*) Bahasa Melayu is the sole language that is used according to this system. *d*) It was discovered that the user interface of this system was not particularly user-friendly since the reporting of error messages was inconsistent.

5. CONCLUSION

The Certificate Management System has successfully achieved its main objective in providing assistance in dealing with the challenges faced by students. Although this system offers many useful advantages, such as ease of access to certificates online and systematic data storage, there are some weaknesses that need to be improved, such as problems with the password update function and an unfriendly user interface. Future recommendations given aim to improve this system by improving identified weaknesses, such as providing a password reset function and providing a more user-friendly interface. With the implementation of these recommendations, the Certificate Management System can be optimized to provide a better user experience and achieve the objectives of system development more effectively.

Acknowledgments: Special thanks to the Faculty of Defence Science and Technology, National Defence University of Malaysia for supporting this project and also the Student Affairs Department for the sponsorship to participate in i3DC 2024.

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Research Article

Ecopaper (Recycled Paper Production from Milk Carton: A Sustainable Approach)

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Abstract: The implementation of the School Milk Program (PSS), which is the provision of milk to primary school students, especially among low-income families (B40), has become a platform to increase nutritional intake among them in addition to producing intelligent individuals. This programme was given to 73 chosen students at SJK (T) Tapah. The amount of milk cartons that students discard each week comes to 365. According to the school week, at least 15,000 milk cartons are thrown away annually at SJK (T) Tapah only. In response to the growing environmental concerns associated with waste generated from milk cartons, this study proposes an innovative method for recycling milk cartons into high-quality paper products. Traditional milk cartons, composed of paperboard lined with layers of polyethylene and aluminium, pose significant challenges for recycling due to the complex materials involved. However, this innovation aims to overcome these hurdles by introducing a homemade process that efficiently separates and transforms these materials into usable paper called Ecoapaper. In conclusion, the innovation presented in this study represents a significant step forward in the quest for sustainable solutions to waste management and resource conservation. Through the transformation of milk cartons into recycled paper, this approach offers a viable pathway towards a more environmentally friendly and economically viable future for the paper industry.

Keywords: Milk carton; recycled paper; Ecoapaper.



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1. INTRODUCTION

The implementation of the School Milk Program (PSS), which is the provision of milk to primary school students, especially among low-income families (B40), has become a platform to increase nutritional intake among them in addition to producing intelligent individuals. This programme was given to 73 chosen students at SJK (T) Tapah. The amount of milk cartons that students discard each week comes to 365. According to the school week, at least 15,000 milk cartons are thrown away annually at SJK (T) Tapah only. In response to the growing environmental concerns associated with waste generated from milk cartons, this study proposes an innovative method for recycling milk cartons into high-quality paper products. Traditional milk cartons, composed of paperboard lined with layers of polyethylene and aluminium, pose significant challenges for recycling due to the complex materials involved. However, this innovation aims to overcome these hurdles by introducing a homemade process that efficiently separates and transforms these materials into usable paper.

The proposed method utilizes mechanical techniques to break down milk cartons into their constituent components. Through a series of shredding, pulping, and deinking processes, the paper fibers are extracted and purified, ready for reuse in paper production. Meanwhile, the polyethylene

and aluminium layers are separated and repurposed for other applications, minimizing waste and maximizing resource efficiency. Key advantages of this innovative approach include reduced environmental impact, as it diverts milk cartons from landfills and reduces the need for virgin pulp in paper manufacturing. Additionally, the recycled paper produced retains quality and performance comparable to conventional paper products, ensuring market acceptability and usability across various applications (Smith and Jones, 2023). Moreover, the proposed method offers economic benefits by creating new opportunities for revenue generation through the sale of recycled paper products and recovered materials. According to Johnson (2018), by promoting circularity and sustainability in the paper industry, this innovation aligns with global efforts to combat climate change and advance the circular economy agenda.

In conclusion, the innovation presented in this study represents a significant step forward in the quest for sustainable solutions to waste management and resource conservation. Through the transformation of milk cartons into recycled paper, this approach offers a viable pathway towards a more environmentally friendly and economically viable future for the paper industry.

2. METHOD & MATERIAL

Despite growing awareness of environmental issues, a significant challenge persists in the form of waste generated from milk cartons discarded by students daily. Milk cartons, often composed of paperboard lined with layers of polyethylene and aluminium, pose a considerable environmental burden due to their non-biodegradable nature and complex material composition. As students continue to dispose of these cartons without proper recycling, valuable resources are lost, and environmental degradation intensifies. The problem lies in the lack of effective waste management systems and awareness campaigns targeting students, resulting in the improper disposal of milk cartons and a missed opportunity for recycling. This issue not only contributes to the accumulation of non-recyclable waste in landfills but also exacerbates resource depletion and pollution associated with paper production.

Moreover, the disposal of milk cartons by students represents a missed educational opportunity to install environmentally responsible behaviours and foster a culture of sustainability within educational institutions. Without intervention, this cycle of waste generation will persist, perpetuating negative environmental and social impacts. Addressing this problem requires innovative solutions that not only streamline the recycling process for milk cartons but also engage students in sustainable practices. According to Doe (2024), by effectively managing milk carton waste and promoting recycling initiatives, educational institutions can play a pivotal role in mitigating environmental degradation and instilling values of environmental stewardship among students. Therefore, the key challenge is to develop a comprehensive solution that incentivizes and facilitates the proper recycling of milk cartons among students, thereby reducing waste generation, conserving resources, and fostering a culture of sustainability within educational settings.

In the process of Ecoapaper production from milk cartons, the process begins with the collection of discarded milk cartons. Once collected, the milk cartons are submerged in water to initiate the separation of their constituent materials. Through soaking, the paperboard fibers, polyethylene, and aluminium layers start to disengage from each other. Following this, the cartons undergo a grinding process, typically facilitated by a blender, to further break down the paperboard fibers into smaller particles. These ground fibers are then dissolved in a basin of water, forming a pulp mixture. Throughout this step, any remaining polyethylene and aluminium materials are separated from the pulp, allowing for a more homogeneous solution. After achieving the desired consistency, the pulp mixture undergoes rinsing to remove any impurities or unwanted materials. This rinsing process helps purify the pulp, ensuring a cleaner end product. Subsequently, the purified pulp is transferred onto a

screen or mesh frame, where excess water is drained away, leaving behind a thin layer of wet pulp. This wet pulp layer is then pressed and dried, either by air-drying or through the application of heat, to form a solid sheet of paper.

Throughout the entire homemade paper production process, careful attention is paid to maintaining the quality and integrity of the recycled paper. By utilizing simple household tools and basic techniques, such as grinding, dissolving, rinsing, and drying, milk cartons can be transformed into usable paper products. This homemade method not only provides a sustainable solution for recycling milk cartons but also empowers individuals to actively participate in the paper production process, contributing to environmental conservation efforts at the grassroots level.

3. FINDINGS

The impact of a Ecoapaper innovation towards the Sustainable Development Goals (SDGs) can be significant across multiple dimensions. Here's an analysis of how such an innovation aligns with various SDGs.

3.1 SDG 12: Responsible Consumption and Production:

Ecoapaper innovation embodies the principles of responsible consumption and production by reducing reliance on virgin paper materials. By repurposing waste materials, such as milk cartons, into valuable products, this innovation promotes sustainable production practices and contributes to waste reduction efforts. Moreover, it minimizes the environmental footprint associated with traditional paper production processes, aligning with SDG 12 objectives.

3.2 SDG 13: Climate Action

The adoption of Ecoapaper innovation offers tangible benefits for climate action initiatives. By diverting milk cartons from landfills and decreasing the demand for virgin pulp, this innovation helps mitigate greenhouse gas emissions associated with waste decomposition and resource extraction. Furthermore, it supports forest conservation efforts by reducing reliance on timber for paper production, thereby preserving carbon sinks and biodiversity.

3.3 SDG 8: Decent Work and Economic Growth

Ecoapaper can stimulate economic growth by creating opportunities for small-scale entrepreneurs and local communities to engage in paper recycling and production. It supports decent work by potentially generating employment in recycling, manufacturing, and distribution sectors, especially in areas with limited economic opportunities

3.4 SDG 9: Industry, Innovation, and Infrastructure

Ecoapaper promotes technological innovation in waste management and recycling, contributing to more sustainable industrial practices. It encourages the development of infrastructure for recycling and processing of waste materials, fostering circular economy principles within the manufacturing sector.

3.5 SDG 7: Affordable and Clean Energy

While indirectly related, Ecoapaper may lead to energy savings in paper production compared to conventional methods. Recycling generally requires less energy than producing paper from virgin pulp, contributing to the promotion of affordable and clean energy access.

3.6 SDG 14: Life Below Water and SDG 15: Life on Land

By reducing the demand for virgin pulp, homemade Ecoapaper innovation helps conserve forests and terrestrial ecosystems, thereby supporting biodiversity and ecosystem integrity. It indirectly contributes to the protection of marine and freshwater ecosystems by reducing the pollution and resource depletion associated with paper production and waste disposal.

4. DISCUSSION

Ecoapaper helps environmental Conservation by reduces the need for virgin pulp, which in turn conserves forests and natural habitats. By using Ecoapaper, individuals contribute to mitigating deforestation, preserving biodiversity, and protecting ecosystems. Ecoapaper also diverts waste from landfills, reducing the volume of solid waste and minimizing environmental pollution because of milk carton especially at schools. This helps alleviate pressure on landfill capacities and reduces methane emissions, a potent greenhouse gas generated by decomposing organic waste. Moreover, producing recycled paper typically requires less energy compared to manufacturing paper from virgin pulp (Jones, 2023). By utilizing Ecoapaper, individuals indirectly contribute to energy conservation and reduce greenhouse gas emissions associated with energy-intensive paper production processes.

Furthermore, Ecoapaper converses valuable resources such as water, energy, and raw materials. It reduces the demand for wood fibers and water needed for pulp production, contributing to more sustainable resource management practices. Using Ecoapaper results in lower carbon emissions compared to paper made from virgin pulp. By choosing recycled paper products, individuals help mitigate climate change by reducing carbon dioxide emissions associated with forest degradation and paper production. It also stimulates economic activity in the recycling industry and creates job opportunities in waste management, processing, and manufacturing sectors. It also reduces the costs associated with waste disposal and raw material acquisition for paper production, potentially leading to cost savings for businesses and consumers.

Ecoapaper promotes environmental education and awareness among the students. Participating in recycling initiatives fosters environmental awareness and encourages sustainable behaviours among individuals and communities. By promoting recycling, individuals contribute to a culture of environmental stewardship and inspire others to adopt eco-friendly practices. Choosing Ecoapaper demonstrates a commitment to responsible consumption and environmental sustainability. It reflects individual values and contributes to a collective effort towards building a more sustainable and equitable society.

5. CONCLUSION

Ecoapaper is often to reduce the environmental impact of paper production by promoting the use of recycled materials. This includes conserving natural resources such as trees, reducing energy consumption, and minimizing water usage and air pollution associated with paper manufacturing processes. By transforming milk carton into new products, Ecoapaper helps to mitigate the environmental and economic impacts of landfilling and incineration. It can help reduce greenhouse gas emissions associated with deforestation, transportation, and paper production. This contributes to climate change mitigation efforts and supports the transition to a low-carbon economy. In conclusion, Ecoapaper innovation is often to raise awareness about the importance of recycling and sustainable consumption among the school students. By educating students about the environmental benefits of using recycled paper products, this innovation can encourage behaviour change and promote a culture of sustainability.

Acknowledgments: I would like to extend my heartfelt gratitude to all those who have contributed to the development and dissemination of this Ecopaper innovation. Special thanks to Headmistress of SJKT Tapah, Madam Kumutha for her invaluable insights, support, and encouragement throughout the research process. I also express our appreciation to the reviewers for their constructive feedback, which has significantly enriched the immensely grateful. Lastly, I acknowledge the dedication and commitment of my team members, whose collaborative efforts have culminated in the production of this innovation. Their contributions have been instrumental in advancing the discourse on sustainable paper production and environmental conservation.

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Research Article

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Abstract: T.H.E CONCERT disrupts online ticket booking with its captivating UI interface, offering an unparalleled user experience. Seamlessly blending aesthetics with functionality, the platform streamlines event discovery to secure transactions, simplifying the process for music enthusiasts. Beyond transactions, T.H.E CONCERT fosters community engagement, serving as a hub for discovering artists and connecting with fans. Its commercialization potential is vast, with opportunities for partnerships and expansion within the music industry. Positioned as a game-changer, T.H.E CONCERT promises sustained growth, redefining fan engagement with live music events. With scalable infrastructure, it capitalizes on the demand for immersive ticketing experiences, paving the way for expansion in the digital market. As it gains traction, strategic partnerships with artists and venues enhance its appeal, while its intuitive features promise a seamless ticket-buying journey.

Keywords: Online Ticket Booking; User Experience; Community engagement.



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1. INTRODUCTION

In the ever-evolving intersection of music and technology, a project has emerged that seamlessly blends the worlds of melody and code. The project, called T.H.E Concert, short for "Ticket Hub for Events" is an innovative system built with Laravel/PHP, revolutionizing the landscape of concert ticket procurement.

In today's digital age, where the love for music intersects with online connectivity, T.H.E Concert is a beacon of simplicity, offering music enthusiasts an effortless way to secure tickets for their favourite concerts. This project represents a harmonious fusion of creativity and technical expertise, employing Laravel and PHP to construct a strong and user-friendly platform for ticket reservations.

As music lovers, the team understands the excitement that comes with the prospect of attending a live concert. T.H.E Concert aims to enhance this experience by providing fans with a streamlined and secure way to discover, browse, and purchase tickets for their preferred events. With a variety of features designed for speed and efficiency, T.H.E Concert promises to improve the ticketing experience, offering unparalleled convenience to its users.

As the team embark on this journey, the team delve into the intricacies of web development, harnessing the power of Laravel and PHP to create a system that caters to the needs of concert-goers and facilitates seamless event management for organizers. T.H.E Concert spans a wide range of

functionalities, including user authentication, robust payment handling, and stringent security protocols, providing a comprehensive solution that showcases the transformative potential of modern web development.

The team would like to invite music enthusiasts to join on this musical journey, where the passion for music meets the finesse of Laravel/PHP development. T.H.E Concert goes beyond being just a project; it exemplifies the symbiotic relationship between technology and artistry, creating an unparalleled experience for music enthusiasts worldwide. In the bustling intersection of music and technology, emerges T.H.E Concert – an innovative school project that seamlessly integrates the realms of melody and code. Aptly named, T.H.E Concert, an acronym for "Ticket Hub for Events," embodies a sophisticated system crafted with Laravel/PHP, redefining the landscape of concert ticket procurement.

2. METHOD & MATERIAL

In the dynamic landscape of software development, the Incremental Model stands as a testament to its iterative and evolutionary nature, offering a structured approach to project management and execution. Within the framework of this model lies the essence of adaptability and flexibility, allowing for continual refinement and enhancement of the product. As a practitioner of this methodology, my journey in developing the T.H.E Concert project has been characterized by deliberate increments, each contributing to the realization of a robust and feature-rich ticketing platform.

The Incremental Model, with its phased and iterative approach, provided the ideal framework for the development of the T.H.E Concert. The project unfolded in distinct increments, each encompassing specific functionalities and features, thus enabling a gradual and systematic progression towards the final product. This incremental approach not only facilitated early feedback and validation but also mitigated risks associated with large-scale development endeavours.

The inception phase marked the genesis of the T.H.E Concert, laying the foundation for subsequent increments. During this phase, meticulous planning and requirement analysis were conducted, delineating the project scope and objectives. Collaborative brainstorming sessions with stakeholders helped crystallize the vision for the platform, ensuring alignment with user expectations and industry standards.

Subsequent increments focused on the implementation of core functionalities, prioritizing features essential for the basic operation of the ticketing system. The iterative nature of the Incremental Model allowed for rapid prototyping and experimentation, enabling quick iterations and refinements based on user feedback. With each increment, the platform evolved incrementally, incorporating enhancements and optimizations to improve user experience and system performance.

The incremental development approach also facilitated concurrent development and testing activities, fostering collaboration among team members and stakeholders. Continuous integration and testing ensured the stability and reliability of the evolving system, enabling early detection and resolution of issues. As the project progressed through successive increments, the platform matured iteratively, culminating in a robust and feature-complete ticketing solution.

One of the key advantages of the Incremental Model is its inherent adaptability to changing requirements and priorities. As the project progressed, new insights and user feedback prompted adjustments to the development roadmap, allowing for the incorporation of additional features and refinements. This iterative and adaptive approach ensured that T.H.E Concert remained aligned with

evolving market trends and user preferences, thereby enhancing its relevance and competitiveness in the concert ticketing landscape.

In conclusion, the Incremental Model proved to be instrumental in the development of the T.H.E Concert, facilitating a structured and iterative approach to project management and execution. Through deliberate increments and continual refinement, the platform evolved into a robust and user-friendly ticketing solution, exemplifying the transformative potential of incremental development methodologies in software engineering. As technology continues to evolve, the Incremental Model remains a valuable paradigm for delivering innovative and high-quality software solutions that meet the evolving needs of users and stakeholders alike.

3. FINDINGS

The layout of the T.H.E Concert website captivates users with its bold and immersive dark theme, accentuated by luminous white glowing accents that infuse a captivating allure into the UI design. Against a backdrop of sleek, charcoal hues, the website exudes a modern and sophisticated aesthetic, evoking an ambiance reminiscent of a concert venue bathed in the glow of stage lights. The strategic placement of glowing white elements, such as buttons and navigation icons, not only enhances visual contrast but also adds a touch of dynamism and interactivity to the user interface. This juxtaposition of darkness and illumination creates a visually captivating experience, drawing users into the heart of the concert-going journey. Inspired by the dramatic spotlight that shines upon singers on stage, the dark theme symbolizes the enigmatic allure of live performances, while the glowing white accents emulate the radiant glow of stage lights, illuminating key elements much like a singer at the centre of attention. As users navigate through event listings and artist profiles, the subtle interplay of light and shadow guides their exploration, enhancing engagement and immersion. With its captivating dark theme punctuated by luminous accents, the T.H.E Concert website sets the stage for an unforgettable ticketing experience, where every click resonates with the pulse of the music.



3.1 Start Page

Figure 1. Start Page.

Figure 1 shows the start page of the website, and it contains some background video for users to admire, it has a video running in the background to let user to feel the hype of bring in a concert. This interface has a "JOIN" button option for user to enter the page of the website.

3.2 Home Page

When users click the "Join" button on the T.H.E Concert website, they are seamlessly transported to the vibrant heart of the platform: the homepage. This intuitive action serves as a gateway to a world of musical discovery and ticketing opportunities, guiding users to the epicentre of the concert experience. As they transition from the join page to the homepage, users are greeted by a visually captivating display of upcoming events, artist highlights, and featured content, inviting them to immerse themselves in the rich tapestry of musical offerings. Whether seeking the thrill of live performances or exploring new artists and genres, the homepage serves as a dynamic hub where users can embark on their musical journey with ease and excitement. With just a click of the "Join" button, users are ushered into a realm of endless possibilities, where the magic of music awaits at every turn.



Figure 2. Home Page(1).



Figure 3. Home Page(2).



Figure 4. Home Page(3).



Figure 5. Home Page(4).

3.3 Add Concert Page

The "Add Concert" page facilitates the seamless integration of new concerts into the T.H.E Concert website, with the data securely stored in the MySQL database managed through phpMyAdmin. As administrators input essential details such as event name, date, venue, and artist lineup, this information is meticulously recorded and organized within the database, ensuring reliability and accessibility. By leveraging phpMyAdmin's intuitive interface, administrators can efficiently manage concert data, including updates, edits, and deletions, with ease and precision. This robust backend infrastructure not only ensures the integrity and consistency of concert information but also facilitates seamless synchronization between the database and the website's frontend. As a result, users browsing the website can access up-to-date concert listings and make informed ticket purchases, thereby enhancing their overall experience. By leveraging the power of phpMyAdmin to manage concert data, administrators uphold the website's commitment to providing a dynamic and user-friendly platform for concert discovery and ticketing.

HOME CONCERT TICKET CONTACT US
ADD CONCERT
CONCERT NAME
CONCERT DESCRIPTION
SEAT PRICE 1
SEAT PRICE 2
SEAT PRICE 1
CONCERT IMAGE
CONCERT BACKGROUND IMAGE
Choose Rile No ble chosen
CONCERT PHOTO 1
Channe Tile No ble clasen
CONCERT PHOTO 2
CONCERT PHOTO 5
Chorse File No file chosen
CONCERT DESCRIPTION T
CONCERT DESCRIPTION 2
CONCERT DESCRIPTION 3
SUBMIT
(rent

Figure 6. Add Concert Page.

3.4 Display Concert Page



Figure 7. Display Concert Page.

The "Display Concert" page of the T.H.E Concert website presents users with a captivating array of upcoming events, pulling data seamlessly from MySQL to populate elegantly designed cards

featuring event details. As users hover over these cards, a subtle call-to-action button appears, inviting further exploration. Clicking this button effortlessly directs users to the dedicated "Concert Section" page, where they can access comprehensive event information, including ticket availability and pricing. This seamless integration of MySQL data ensures users have access to the latest event details, while interactive elements enhance engagement and streamline navigation. Overall, the "Display Concert" page offers users an immersive and intuitive platform for discovering and exploring upcoming concerts.

3.5 Concert Section Page



Figure 8. Concert Section Page(1).



Figure 9. Concert Section Page(2).



Figure 10. Concert Section Page(3).

SELECT SEAT	
(NM209 ·)	
TICKET QUANTITY	
TOTAL AMOUNT: RM 0	
PAY	

Figure 11. Concert Section Page(4).

The "Concert Section" page on the T.H.E Concert website offers users a comprehensive and engaging platform for exploring concert details and purchasing tickets. Upon selecting a specific concert, users are presented with essential event information and captivating photos of the performing artists during their concerts, enhancing the immersive experience. Leveraging intuitive CSS hovering effects, users can visualize the atmosphere of the event before making their ticket selections. As users scroll down, they encounter a user-friendly interface for selecting seating sections and ticket quantities, with real-time price calculation for transparency. Once users have finalized their choices, they simply click the "Pay" button to proceed to the secure payment page, ensuring a seamless transition to completing their transaction. Overall, the "Concert Section" page streamlines the ticket purchasing process while providing an immersive and user-friendly experience for concert-goers.

3.6 Payment Page

The payment page on the T.H.E Concert website provides users with a secure and streamlined platform to finalize their ticket purchases using debit or credit cards. Utilizing JavaScript validation, the page ensures accurate completion of payment details before users proceed, minimizing errors and enhancing data accuracy. Upon clicking the "Pay" button, users' payment information is encrypted and processed securely, leading to swift authorization and redirection to a confirmation page. Simultaneously, users receive a digital ticket in PDF format via email, serving as their proof of purchase
for the selected concert. This seamless process offers users convenience and peace of mind, enabling them to access their tickets instantly and effortlessly for an unforgettable concert experience.



Figure 12. Payment Page(1).



Figure 13. Payment Page(2).

3.7 Contact Us Page

The "Contact Us" page on the T.H.E Concert website serves as a vital conduit for users to connect with the platform's administrators and provide feedback or seek assistance. Designed with user convenience and accessibility in mind, this page features a simple yet intuitive interface that encourages users to reach out with any inquiries or concerns they may have. Users are presented with a form where they can input their name, email address, subject, and message, allowing them to communicate their queries or feedback effectively. Additionally, the page may include alternative contact options such as email addresses or phone numbers for users who prefer direct communication channels. By providing a dedicated space for user interaction, the "Contact Us" page fosters transparency, trust, and engagement, reinforcing the platform's commitment to customer satisfaction and support.

NAME	
EMAJE	
PHONE NO	
DESCRIPTION	
SUBMIT	
(manyor)	

Figure 14. Contact Us Page.

4. DISCUSSION

As the visionary behind the T.H.E Concert project, it is imperative to outline the future and envisioned enhancements to propel this innovative platform to new heights of success. Looking ahead, the project's roadmap is brimming with exciting opportunities for expansion, refinement, and user enrichment. First and foremost, the future for T.H.E Concert revolves around scaling the platform to accommodate a broader range of events and genres, catering to the diverse tastes and preferences of music enthusiasts worldwide. This expansion will entail forging strategic partnerships with renowned artists, concert promoters, and event organizers to curate an extensive catalogue of live performances, ensuring that users have access to a comprehensive array of concerts spanning various genres, venues, and locations.

Furthermore, the project will focus on leveraging emerging technologies to enhance the user experience and streamline key processes. Implementation of advanced algorithms and machine learning techniques will enable personalized recommendations and tailored event suggestions based on users' musical preferences, browsing history, and geographical location. Additionally, integration of immersive virtual reality (VR) experiences will transport users to virtual concert venues, allowing them to enjoy live performances from the comfort of their own homes.

In addition to content expansion and technological innovation, the future for T.H.E Concert includes bolstering the platform's social and community features to foster a vibrant and engaged user community. This entails the development of interactive forums, discussion boards, and social media integrations where users can connect, share experiences, and discover new music together. Furthermore, the implementation of user-generated content features such as concert reviews, ratings, and photo galleries will empower users to contribute to the platform's content ecosystem, fostering a sense of ownership and belonging.

Moreover, the project will prioritize enhancing the platform's mobile responsiveness and crossplatform compatibility to ensure a seamless and consistent user experience across devices and operating systems. This includes optimizing the website for mobile devices, developing dedicated mobile applications for iOS and Android platforms, and implementing progressive web app (PWA) technologies to enable offline access and native app-like experiences. In summary, the future for T.H.E Concert is characterized by a commitment to continuous innovation, expansion, and user-centricity. By embracing emerging technologies, fostering community engagement, and prioritizing mobile responsiveness, the project aims to elevate the concert ticketing experience to unprecedented levels of convenience, accessibility, and enjoyment. With a clear vision and unwavering dedication to excellence, T.H.E Concert is poised to revolutionize the way music fans discover, connect, and experience live music for years to come.

5. CONCLUSION

In conclusion, T.H.E Concert stands as a testament to the transformative power of technology in revolutionizing the live music experience. Through meticulous planning, innovation, and a steadfast commitment to user-centricity, this project has evolved into a dynamic platform that seamlessly connects music enthusiasts with their favourite artists and live events. As we look to the future, the vision for T.H.E Concert remains clear: to continue pushing the boundaries of what is possible in concert ticketing, leveraging emerging technologies, expanding content offerings, and fostering a vibrant community of music lovers. With unwavering dedication and a passion for innovation, T.H.E Concert is poised to redefine the concert experience for generations to come, ensuring that the magic of live music remains accessible and exhilarating for all.

Acknowledgments: I extend my heartfelt gratitude to all who contributed to the success of T.H.E CONCERT. Special thanks to Mr. Yang Chee Beng for invaluable guidance. My teammates' dedication and creativity were pivotal. Thanks to Southern University College for resources and support.

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Research Article

Simulasi Penyiasatan Jenayah (SiPenJenayah)

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Abstrak: Simulasi Penyiasatan Jenayah (SiPenJenayah) ini merupakan simulasi pengajaran dan pembelajaran penyiasatan jenayah. SiPenjenayah ini dibangunkan khusus bagi pelajar yang mengambil kursus penyiasatan jenayah seperti Digital Forensik. Simulasi ini terdiri daripada beberapa komponen iaitu penyiasatan, penyelesaian dan kesimpulan. Pada masa ini, pelajar yang mengambil kursus tersebut mempelajarinya secara teori dan sebahagian sahaja secara praktikal di dalam kelas. Akibat kurangnya pendedahan pelajar terhadap situasi sebenar, pelajar tidak bersedia sepenuhnya terhadap cabaran yang bakal dihadapi di industri. Ketidakupayaan pelajar mendapatkan pengalaman senario di tempat kejadian jenayah telah mengurangkan kemahiran penting seperti kemahiran pengumpulan, pemeliharaan, analisis bukti, dan keupayaan untuk menganalisis tempat kejadian jenayah dengan tepat. Pengalaman pelajar dalam simulasi penyiasatan jenayah dapat membantu pelajar mengalami sendiri situasi yang mungkin berlaku sekiranya berada di lokasi jenayah. Satu soal selidik keperluan telah dijalankan bersama 31 orang pelajar dan majoriti bersetuju dengan adanya simulasi ini dapat meningkatkan keberkesanan pembelajaran kursus Forensik Digital. Simulasi ini dibangunkan menggunakan pengaturcaraan HTML, CSS, JavaScript dan MySQL sebagai pangkalan data. Beberapa misi dan idea penyelesaian disediakan untuk pelajar bagi mendapatkan markah yang menentukan tahap kefahaman pelajar. Pelajar perlu menganalisis kawasan jenayah dan mengumpulkan bahan bukti. Metodologi Rapid Application Development (RAD) yang memberikan penekanan terhadap keperluan pengguna digunakan untuk membangunkan sistem ini berdasarkan empat fasa utama iaitu perancangan keperluan, reka bentuk, pembangunan dan perlaksanaan. Simulasi ini diharapkan dapat melahirkan pelajar yang mempunyai kemahiran menyiasat dan menganalisis tempat kejadian jenayah, mengumpulkan bukti, dan membantu proses penyiasatan.

Kata kunci: Simulasi; Pengajaran dan Pembelajaran; Forensik Digital.



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1. PENGENALAN

Simulasi Penyiasatan Jenayah (SiPenJenayah) merupakan simulasi yang dibangunkan khusus bagi pelajar yang mengambil kursus Forensik Digital. Simulasi ini dapat memberikan pelajar suatu pengalaman yang menarik dan membantu merasai pengalaman di lokasi jenayah yang sebenar. Terdapat beberapa misi dan idea penyelesaian disediakan kepada pelajar. Antaranya simulasi ini membantu pelajar mempraktikkan teori yang dipelajari di dalam kelas. Kesannya tahap kefahaman pelajar terhadap kursus tersebut akan meningkat. Pengaturcaraan HTML, CSS, JavaScript dan juga pangkalan data MySQL digunakan untuk membangunkan simulasi ini manakala metodologi Rapid Application Development (RAD) merupakan metodologi yang dipilih. Metodologi tersebut bersesuaian dengan pembangunan sistem simulasi ini. Akhir projek ini, diharapkan simulasi ini dapat

membantu proses pembelajaran pelajar bagi melahirkan penyiasat jenayah yang mahir dan terlatih untuk kerjaya yang ingin diceburi selepas ini.

2. METODOLOGI KAJIAN

Simulasi Penyiasatan Jenayah (SiPenJenayah) dibangunkan dengan menggunakan metodologi Rapid Application Development (RAD). Rajah 1 menunjukkan metodologi RAD terdiri daripada beberapa fasa iaitu perancangan keperluan, reka bentuk, pembangunan dan perlaksanaan. Metodologi ini memberi penekanan kepada penghasilan sistem yang berkualiti tinggi secara cepat dan menumpukan keperluan pelajar. (Anissa Medina Sari, 2023)

Secara amnya, metolodogi RAD dipilih kerana ia mempunyai ciri – ciri yang sesuai dan membantu dalam pembangunan simulasi ini. Metodologi ini dipilih kerana dapat mengurangan risiko kesalahan yang dilakukan di dalam pembangunan SiPenJenayah dapat dikurangkan. Dengan membangunkan prototaip SiPenJenayah pada peringat awal berdasarkan storyboard dapat memastikan simulasi ini berjalan dengan baik dan menepati objektif kajian. Akhir sekali, metodologi RAD dapat mengurangkan masa dan mempercepatkan proses pembangunan projek kerana komponen-komponen yang sudah ada dapat digunakan semula untuk mengembangkan sistem yang baru. (MySQA, 2023).



Rajah 1. Fasa Metodologi Rapid Application Development (RAD) SiPenJenayah

3. HASIL KAJI SELIDIK KEPERLUAN

Soal selidik simulasi melalui google form disediakan kepada pelajar yang mengambil kursus Forensik Digital. Soal selidik atas talian ini telah mendapat respons daripada 31 pelajar yang terdiri daripada pelajar tahun dua dan tiga dari kursus Sains Komputer (Kepujian) – ZC00 dan Sains Komputer (Keselamatan Sistem) – ZC27. Hasil dapatan dari soal selidik keperluan ini membolehkan simulasi ini dibangunkan selari dengan objektif dan tujuan pembangunan.

3.1 Kaji Selidik Keperluan

Berdasarkan Rajah 2, statistik menunjukkan sebanyak 71% (dua puluh dua orang) masih menggunakan kaedah pembelajaran secara tradisional-lisan, 19.4% (6 orang) pelajar masih terlibat dalam kaedah pembelajaran dalam talian dan selebihnya. 9.7% (3 orang) menggunakan kaedah praktikal untuk mempelajari kursus Forensik Digital. Kaedah pembelajaran dan pengajaran masa kini yang dipraktikkan di dalam kuliah lebih menekankan konsep teori berbanding praktikal.



Rajah 2. Soalan Pertama Kaji Selidik

Rajah 3 menunjukkan peratusan pemilihan bagi soalan yang kedua. Peratusan tertinggi iaitu sebanyak 87.1% (27 orang) memilih pembelajaran secara praktikal kerana ia lebih efektif terutamanya untuk subjek-subjek seperti Forensik Digital. Pembelajaran sedia ada menyediakan pembelajaran secara teori di dalam kelas dan kurang pendedahan terhadap pembelajaran secara praktikal. Baki 12.9% masing-masing dibahagi sama rata di antara pembelajaran secara dalam talian dan secara di dalam kelas (dua orang). Hal ini menunjukkan pelajar lebih minat untuk mempraktikkan pelajaran teori berbanding pemahaman sahaja.



Rajah 3. Soalan Kedua Kaji Selidik Keperluan

Berdasarkan Rajah 4, keputusan kaji selidik soalan keempat iaitu adakah simulasi permainan menyeronokkan dan amat menarik mendapati seramai 28 orang (90.3%) bersetuju bahawa simulasi permainan menyeronokkan dan amat menarik kerana ia melibatkan permainan yang interaktif dan pengguna dapat merasai pengalaman secara realiti.



Rajah 4. Soalan Keempat Kaji Selidik

Rajah 5 menunjukkan seramai 13 orang (41.9%) bersetuju bahawa pembelajaran secara teoritikal kurang berkesan berbanding pembelajaran secara praktikal manakala seramai 18 orang (58.1%) sangat bersetuju berkaitan hal tersebut. Pembelajaran secara praktikal dijangka membantu kaedah pembelajaran masa kini kerana ia melibatkan interaksi antara pelajar dengan sesuatu bidang ataupun pelajaran.



Rajah 5. Soalan Ketujuh Kaji Selidik

Rajah 6 menunjukkan seramai 15 orang (48.4%) bersetuju bahawa penyiasatan jenayah amat berbahaya dan mendatangkan pelbagai risiko manakala seramai 16 orang (51.6%) sangat bersetuju berkaitan soalan tersebut. Penyiasatan jenayah mendatangkan risiko yang tinggi kerana ia melibatkan lawatan lokasi jenayah yang berlaku dan kemungkinan penjenayah tersebut masih di lokasi kejadian bagi menghilangkan bahan bukti.



Rajah 6. Soalan Kesembilan Kaji Selidik

Soalan kesepuluh pada Rajah 7 mendapati seramai seorang (3.2%) bersetuju dan seramai 30 orang (96.8%) sangat bersetuju dengan wujudnya SiPenJenayah dapat membantu pelajar merasai pengalaman dalam kondisi yang selamat. Penggunaan platform simulasi hanya melibatkan pengalaman secara praktikal di dalam komputer dan tidak melibatkan penggunaan peralatan yang sebenar.



Rajah 7. Soalan Kesepuluh Kaji Selidik

Rajah 8 menunjukkan keputusan bagi soalan terakhir. Seramai 2 orang (6.5%) bersetuju manakala selebihnya 29 orang (93.5%) sangat bersetuju bahawa SiPenJenayah dapat meningkatkan keberkesanan pembelajaran khususnya dalam kursus Forensik Digital



Rajah 8. Soalan Kedua belas Kaji Selidik

3.2 Reka Bentuk

3.2.1 Reka Bentuk Paparan Muka Utama

Rajah 9 menunjukkan paparan antara muka proses log masuk pentadbir dan pengguna (pelajar). Paparan muka ini merupakan paparan utama bagi SiPenJenayah untuk melog masuk ke dalam simulasi.

	0	SIMULASI PENYIASAT JENAYAH (SIPENJENAY	AN AH)
		WELCOME DETECTIVE	
ar .	and the	Timer your palaneout	a gane art and
INTERNA		Show Parsword	
		Forgot your patsword? Reset it here	
	28	X etc	

Rajah 9. Antara Muka Proses Log Masuk Pengguna dan Pentadbir

Rajah 10 menunjukkan paparan muka utama pengguna untuk memulakan simulasi. Pelajar boleh memilih untuk memulakan misi, melihat kredit atau melog keluar.



Rajah 10. Antara Muka Pengguna (Menu Utama SiPenJenayah)

3.2.2 Reka Bentuk Paparan Pengguna (Pengenalan Misi)

Rajah 11 menunjukkan pengenalan misi pertama yang memerlukan pelajar mencari peta perpustakaan PJTI. Paparan ini merupakan satu mesej pemakluman sahaja dan tiada input daripada pengguna.



Rajah 11. Antara Muka Makluman Tugasan Misi Pertama

Rajah 12 menunjukkan paparan Antara Muka Misi Pengenalan. Antara muka ini menunjukkan pintu utama PJTI. Selain itu, paparan ini memberi tips dan petunjuk bagi perlaksanaan misi.



Rajah 12. Antara Muka Misi Pengenalan

Rajah 13 menunjukkan lokasi bagi misi-misi yang terdapat di dalam SiPenJenayah. Antara misi-misi tersebut ialah *The Meeting, The Study* dan *The Key*. Nama-nama misi ini berdasarkan gambaran dan tema situasi tersebut.



Rajah 13. Antara Muka Pengguna Peta Perpustakaan

3.2.3 Reka Bentuk Paparan Pengguna (Misi Pertama)

Rajah 14 menunjukkan penceritaan dan tugas bagi misi pertama. Paparan ini merupakan tiga mesej pemakluman. Rajah ini sama seperti Rajah 11 yang tidak memerlukan input daripada pengguna.



Rajah 14. Antara Muka Makluman Tugasan Misi Pertama

Rajah 15 menunjukkan paparan muka bagi misi pertama. Pelajar perlu meneliti paparan ini untuk mencari petunjuk dan gambar yang perlu dicari.



Rajah 15. Antara Muka Misi Pertama

Rajah 16 menunjukkan petunjuk penyelesaian misi yang menunjukkan cara penyelesaian misi dengan terperinci.



Rajah 16. Antara Muka Pengguna Paparan Tips Misi Pertama

Rajah 17 menunjukkan pad kekunci yang perlu diisi oleh pelajar untuk ke misi yang kedua. Pelajar perlu mendapatkan kata laluan pad kekunci pada misi pertama dan mengisi di dalam pad kekunci ini.



Rajah 17. Antara Muka Kekunci Pintu Misi Pertama

3.2.4 Reka Bentuk Paparan Pengguna (Misi Kedua)

Rajah 18 menunjukkan penceritaan dan tugas bagi misi kedua. Paparan ini merupakan satu mesej pemakluman. Rajah ini sama seperti Rajah 11 yang tidak memerlukan input daripada pengguna.



Rajah 18. Antara Muka Makluman Tugasan Misi Kedua

Rajah 19 menunjukkan paparan muka bagi misi kedua. Misi ini mempunyai *cipher text* yang perlu ditafsirkan kepada *plain text* bagi meneruskan misi ke misi ketiga.



Rajah 19. Antara Muka Misi Kedua

Rajah 20 menunjukkan petunjuk penyelesaian misi yang menunjukkan cara penyelesaian misi dengan terperinci.



Rajah 20. Antara Muka Pengguna Paparan Tips Misi Kedua

Rajah 21 menunjukkan sub-misi kedua iaitu misi yang terdapat di dalam misi kedua yang perlu pelajar selesaikan untuk mendapatkan *vignere table.*



Rajah 21. Antara Muka Mesej Makluman Sub-Misi Kedua

Rajah 22 menunjukkan soalan-soalan yang terdapat di dalam sub-misi kedua. Terdapat lima soalan yang perlu diselesaikan dan ia dipilih secara rawak dari jumlah 30 soalan.

What does 'MDS' stand for in the context of digital forensics?	No. 19 Long Solid Longer (in Solid in provide the second set of th
Menage Digest Algorithm 5	
Memory Dump 5	What does 'MDS' stand for in the central of digital forensics?
Mobile Data 5	Manage Digat Appoints 5
Metadata 3	Manury Dung B Malas Day 1
You scarred 5 out of 5 correct answers!	Minutes 1

Rajah 22. Antara Muka Soalan Sub-Misi Kedua

Rajah 23 menunjukkan pad kekunci yang perlu diisi oleh pelajar untuk ke misi yang ketiga. Kata laluan ini merupakan hasil dapatan daripada misi kedua.

57000 1 2 3 4 5 6 7 8 9 с 0 Ок васк
1 2 3 4 5 б 7 8 9 С 0 ОК ВАСК
4 5 6 7 8 9 С 0 ОК ВАСК
7 8 9 С 0 ОК ВАСК
C 0 OK BACK
BACK

Rajah 23. Antara Muka Kekunci Pintu Misi Kedua

3.2.5 Reka Bentuk Paparan Pengguna (Misi Ketiga)

Rajah 24 menunjukkan paparan antara muka bagi misi ketiga. Misi ini merupakan misi yang terakhir SiPenJenayah. Terdapat beberapa bahan bukti yang berada di dalam ruangan ini dan pelajar perlu mendapatkan bukti yang sebenar kerana ia adalah maklumat yang diperlukan untuk ke misi seterusnya.



Rajah 24. Antara Muka Misi Ketiga

Rajah 25 menunjukkan klu bagi pad kekunci di misi yang ketiga. Huruf ini merupakan huruf pertama bagi nama-nama bahan bukti.

Rajah 25. Antara Muka Klu Misi Ketiga

3.2.6 Reka Bentuk Antara Muka Markah

Rajah 26 menunjukkan pemarkahan pelajar bagi setiap misi pada akhir simulasi. Pemarkahan ini boleh digunakan sebagai rujukan oleh pensyarah untuk dijadikan sebagai penilaian kursus.

JENAYAH (SIPENJENAYAH) High Score Table <u>Name Maxim 1 Time Maxim 2 Time Maxim 3 Time Tatal Time Ranking</u> <u>Name 000110 000005 000010 000125 1</u> <u>NEMAL 000021 00.0039 000010 000113 2</u> <u>DISB 02039 001233 000118 003422 3</u>		SIM	ULASI	PENYI	ASAT	AN
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	Dr.Sr	00.20.34	00.12.33	podr.15	00:34:22	3
	-					

Rajah 26. Antara Muka Markah

4. PERBINCANGAN

Projek Simulasi Penyiasatan Jenayah (SiPenJenayah) bertujuan membantu khususnya pelajar yang mengambil kursus Forensik Digital. Kursus ini akan dilaksanakan secara praktikal seterusnya membantu pelajar memahami dengan mudah. Kaedah pembelajaran semasa untuk Forensik Digital kurang menekankan pembelajaran secara praktikal. Hal ini mengurangkan keberkesanan kemahiran penting seperti pengumpulan, pemeliharaan dan analisis bukti. Maka, satu simulasi pembelajarn dibangunkan iaitu Simulasi Penyiasatan Jenayah (SiPenJenayah) untuk mengatasi permasalahan tersebut.

Simulasi Penyiasatan Jenayah (SiPenJenayah) ini telah berjaya mencapai objektif seperti yang diterangkan. Objektif projek ini telah dicapai dengan jayanya seperti:

a. Mengkaji senario atau praktikal situasi jenayah siber yang sebenar dan keberangkalian cabaran di tempat kejadian.

Simulasi ini dibangunkan dan direka bentuk menggunakan gambaran situasi yang sebenar. Penggunaan lokasi Perpustakaan Jeneral Tun Ibrahim sebagai rujukan utama lokasi peyiasatan dapat memberi gambaran sebenar kepada pelajar.

b. Mereka bentuk paparan Simulasi Penyiasatan Jenayah (SiPenJenayah) yang mesra pengguna dan aksesibiliti yang mudah diakses pada bila – bila masa.

SiPenJenayah merupakan simulasi yang mesra pengguna kerana ia mempunyai panduan yang mudah dan kaedah penyelesaian yang membantu pelajar untuk menyelesaikan misi.

c. Membangun SiPenJenayah yang interaktif dan menawarkan pelbagai senario untuk menguji kemampuan pelajar mengaplikasikan teori yang telah dipelajari di dalam kelas.

Simulasi ini mempunyai paparan muka yang menarik dan penyelesaian misi yang interaktif. Penggunaan pelbagai teknik digunakan untuk meningkatkan keberkesanan dan penerapan soalan-soalan yang menarik.

Tujuan simulasi ini dibangunkan adalah untuk mengatasi masalah yang dihadapi dalam sistem semasa. Antara kelebihannya ialah:

- a. Paparan muka yang mesra pengguna dapat membantu pengguna dalam menggunakan simulasi ini.
- b. Simulasi ini dapat membantu pensyarah Forensik Digital bagi pembelajaran dan pengajaran di dalam kelas.
- c. Simulasi ini boleh digunakan oleh pensyarah untuk dijadikan markah bagi kerja khusus pelajar.

Simulasi ini menyediakan multimedia yang menarik dan interaktif bagi melatih pelajar dalam persekitaran selamat dan terkawal. Pelajar dapat memperoleh pengalaman praktikal, meningkatkan keupayaan membuat keputusan, dan mengembangkan kemahiran pemikiran kritis untuk menyelesaikan jenayah yang kompleks. SiPenJenayah membolehkan pelajar dapat mempelajari pengetahuan teori dan aplikasi praktikal. Pada akhirnya, simulasi ini diharapkan dapat melahirkan penyiasat tempat kejadian jenayah yang mahir dan terlatih dengan baik serta mampu menganalisis tempat kejadian jenayah, mengumpulkan bukti dan mempercepatkan proses menuntut keadilan.

5. KESIMPULAN

Projek Simulasi Penyiasatan Jenayah (SiPenJenayah) bertujuan untuk membantu pelajar, khususnya yang mengambil subjek Forensik Digital, mempelajari subjek tersebut secara praktikal, memahami dengan lebih mudah, dan mengembangkan kemahiran yang diperlukan dalam penyiasatan tempat kejadian jenayah. Ini merupakan keperluan bagi membantu kaedah pengajaran tradisional yang bergantung kepada teori dan latihan praktikal yang terhad. Kaedah pengajaran tradisional tidak mencukupi dalam menyediakan pelajar dengan persediaan baik di tempat kejadian jenayah sebenar. Simulasi yang interaktif dan penuh dengan pembelajaran ini melatih pelajar untuk membuat keputusan dengan tepat dan berfikiran kritis. Harapan bagi projek ini dapat menghasilkan penyiasat tempat kejadian jenayah yang mampu menganalisis tempat kejadian jenayah, mengumpulkan bukti, dan menyumbang kepada proses keadilan jenayah siber.

Penghargaan: Sekalung perhargaan dan ucapan jutaan terima kasih didedikasikan khas buat Fakulti Sains dan Teknologi Pertahanan dan Jabatan Hal Ehwal Pelajar dan Alumni, Universiti Pertahanan Nasional Malaysia kerana memberi sokongan kewangan dalam penerbitan jurnal ini.

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Research Article

FixIt and Foliage Frenzy Mobile Apps

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Abstract: The times are constantly changing, and with the pace of technological advancement, people's stress levels have increased. This has led to a growing population of individuals living alone. In this scenario, they are more prone to feeling lonely. When they find themselves in need of assistance while alone at home, there is often no one to turn to, and they may be hesitant to seek help from strangers because of security issues. Therefore, it is necessary to create a service provider system to address common issues that they might encounter at home, such as plumbing and electrical repairs, gardening management, and errand services. The implementation of such a service provider system utilizing modern programming frameworks like Flutter, Laravel, MySQL, and Bootstrap to develop this system. The goal of this system is to assist marginalized groups in society, such as individuals living alone, people with disabilities, and the elderly, in obtaining more reliable assistance. Administrators will verify all the services registered in the system. So, the safety of users will be guaranteed, they will not feel threatened and the risk of robbery will decrease. The project uses a waterfall model, starting with communication and planning, moving through design, development, and testing, and finally to user acceptance and deployment. In summary, this system takes a systematic approach to help these vulnerable groups to access secure and trusted services.

Keywords: service provider system; marginalized group; waterfall model; reliable assistance; secure and trusted.



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1. INTRODUCTION

The proposed system, FixIt and Foliage Frenzy is a service provider system aimed at providing an efficient and trusted process to help marginalized groups to solve their problems that might encounter at home. This is an ongoing project and is still in the process of developing. This system provides a more systematic approach to requesting services from the system. Numerous services can help those people in need. However, based on the observation and interview session, people voted for four main mandatory services. Therefore, after thinking twice, this system will provide four main services which are piping, wiring, gardening, and running. This is also where the system name comes from.

By considering security and trustworthiness in this system, an emergency button is provided for users to click on when they are feeling insecure. When using the services, there will be the possibility of occurring accidents. So, users can ask for help using that button. Once the emergency button is clicked, the system administrators will receive the notification and contact the police. The application system will also start to record a 1-minute audio recording and submit it through the system. The recording will then be forwarded to the police station. Thus, users' security will be assured.

First, if people who live alone request help to solve their house problems such as plumbing, they can use the application. For example, if the person is a novice and does not know anything about the pipe connection, he or she may face difficulties even if they want to start buying the equipment. So, a plumbing company is needed to provide professional assistance. However, the security issue is still a concern because the plumbing company may be a scam that will jeopardize their life. Through this system, only verified services can be registered in this system. It has increased the trust of people to use the services. Besides, normal people without a technical background may encounter various types of electrical issues such as power outages, short circuits, and so on. They might be curious and do not know what is happening. When these issues happen, they are not encouraged to hand on to find the problem on their own. It is because they have no professional knowledge, and if they are not careful, they may cause irreversible accidents. Hence, this system provides them with a platform to ask for help from experts.

Moreover, if a person owns a house with a yard, they might not have enough time to manage. This happens the same to people with disabilities or the elderly who cannot maintain the garden. Gardeners can design the garden based on the requirements of the users. They will discuss with users first and users will pay the fee following the size of the garden. For the errand services, it does help when the user is busy. For instance, if the user is a teacher, who is having class during a certain period. However, his mouse has broken, and he does not have extra time to go out and buy a new one. In this condition, a runner is essential to help. This is referring the concept of cloning. A clone helper is generated to help a person when they do not have extra time to do other stuff.

2. METHOD & MATERIAL

In this project, the method and material that will be used are Flutter, Laravel, and Bootstrap. The database involved in this system is MySQL. The programming languages are HTML, CSS, Javascript, Dart, Structured Query Language, and so on.

2.1 Framework

2.1.1 Flutter

Flutter is an open-source programming framework developed by Google. Flutter is a multiplatform framework which means that Flutter could support the development of the system in platforms such as mobile, web, desktop, and embedded systems. The Flutter application was written in Dart programming language.

2.1.2 Laravel

Laravel is one of the free and open-source PHP web frameworks under MIT license. It was developed and released by the developer Taylor Otwell in June 2011. It makes use of the modal-view-controller concept to provide an easy and faster development process.

2.1.3 Bootstrap

Bootstrap is a free open-source frontend framework. It aims to provide faster development for the web developer to build a responsive website. It provides a pre-defined CSS library for the developer to insert into their website.

2.2 Database

2.2.1 MySQL

MySQL is an open-source relation database management system which originally developed by Widenius and Axmark but is currently maintained by Oracle Corporation. SQL stands for structured query language which is the programming language that is used to control the MySQL database. MySQL provides a series of keywords for the developer to have better control over the databases, for instance, CREATE, INSERT, DELETE, UPDATE, WHERE, etc.

2.3 Hardware Requirement

Table 1. Hardware Requirement

Hardware Components	Specification
Processor	Intel Core i5-8400H
Graphic Processor	Nvidia GTX1050
Memory	12GB DDR4
Storage	480GB SSD & 1TB HDD
Peripherals	Wi-Fi adapter, keyboard, mouse, headphone

2.4 Software Requirement

Table 2. Software Requirement

Software Name	Description
Visual Studio Code	Visual Studio Code is a text editor software that supports various types of programming languages such as Java, C/C++, HTML, CSS, JavaScript, Python, etc. With a variety of extensions developed by the community, it also provides an easier debugging and coding environment.
Android Studio	Android Studio is a text editor software that primarily focuses on providing an Android software application. It provides an Android emulator for the developer to emulate the software. This provides an easier debugging process for the developer because the developer can view the software in real-time.
XAMPP	XAMPP is a software that provides the local hosting of the website and server. By enabling the Apache and MySQL modules in XAMPP, the developer can host the website and serve in a Local Area network. So, it could help the developer to emulate the system in real-time.

3. FINDINGS

In this section, it presents the use case diagram and storyboard of this system. The main features and process flow will be described in the diagram below. Users and vendors will be using mobile applications to perform their tasks. They can perform their task through the same platform by providing different roles. The administrators will use the website to manage the system.

3.1 Use Case Diagram



Figure 1. Use Case Diagram for Users

Figure 1 illustrates the main features of users. This use case has two different actors, which are old users and new users. The purpose of this use case is to show what users can do. Figure 2 describes the main features of vendors. This use case has two different actors, which are the old vendor and the new vendor. The purpose of this use case is to show what vendors can do.



Figure 2. Use Case Diagram for Vendors

Figure 3 shows the main features of Administrators. This use case has two different actors, which are the branch admin and head admin. The purpose of this use case is to show what admins can do.



Figure 3. Use Case Diagram for Administrators

3.2 Storyboard

3.2.1 Storyboard for Users



Figure 4. Storyboard for Users

Figure 4 depicts the main flow of users to use this system. First, users can log in or register if they do not have an account. They can also update location details, view and book the services, make payments, view services history, and receive notifications regarding promotions. After the service is completed, they will receive a receipt through E-mail. If they are satisfied with the service, they can provide feedback.



Figure 5. Workflow Login System

Figure 5 describes the workflow of logging into the system. First, users can enter the correct ID and password. If they have forgotten their password, they will receive a verification email. Then, they can log in using the email and reset the password.



Figure 6. Workflow for Member Registration

Figure 6 depicts the workflow for member registration. Non-registered users can choose to register as members. If they want to register, they need to enter their profile information and verify their identity through email.



Figure 7. Workflow for Location Details

Figure 7 indicates the workflow for location details. User needs to update their location details before booking services. They need to allow the location access to get a more accurate location. If the location is not specific, they need to fill in manually.



Figure 8. Workflow for Book Service

Figure 8 demonstrates the workflow for booking services. Users can choose the types of services such as piping, wiring, gardening, and runner. They can chat with the vendor and book the date and time.



Figure 9. Workflow for Book Service

Figure 9 explains the workflow for making payments. The system will show the total included fee and tax. Users can choose to pay by cash, online payment, or card payment. If users choose to make online payments, they will receive the OTP number. Once payment is done, users will receive the notification and receipt.

3.2.2 Storyboard for Vendors



Figure 10. Workflow for Vendor

Figure 10 illustrates the main flow of vendors to use this system. First, vendors can log in or register if they do not have an account. They can also make identity authentication by uploading all the required documentation. They can register their new services in the system, negotiate with users about the service details, accept or reject bookings, receive payment, view service history, and receive notifications.

3.2.3 Storyboard for Administrators



Figure 11. Workflow for Admin

Figure 11 shows the main flow of vendors to use this system. First, admins can log in to the system using their username and password. They can verify vendors, and manage vendors, users, rewards, and services. They can also send promotion notifications to all users. If users click the emergency button, admins will receive and report to the police.

4. DISCUSSION

The purpose of developing this FixIt and Foliage Frenzy system is to reach convenience. By providing a centralized platform for accessing services such as piping, wiring, runner, and gardening, the system aims to ensure that users can easily connect with qualified professionals to meet their needs. This has eliminated the need for users to search the services manually online. They need to contact the vendor by themselves and adjust their available time. This has also limited their choices to choose the nearest vendor. Therefore, this system will provide a list of vendors that are closer to users' locations to provide services as soon as possible.

Furthermore, it can increase work efficiency and productivity. Having a runner who can help to deliver products when doing other stuff, can enhance time efficiency. This can also be helpful for disabled people to buy them the things they need.

On top of that, it can help people in need. By having this system, it provides a user-friendly experience for both users and service providers. By offering intuitive interfaces, transparent pricing, and responsive customer support, the system aims to enhance user satisfaction and engagement.

Additionally, the system aims to create economic opportunities for service providers by connecting them with potential clients and facilitating income generation. By offering a platform for showcasing their skills and expertise, the system aims to empower service providers to grow their businesses and expand their clientele.

To measure the effectiveness of the system, different sets of questionnaires will be given to potential users. The feedback will be gathered after they have used the system for three months. The result will be analyzed and categorized for future improvement.

Apart from that, acceptance testing will be carried out to enable the customers and users to determine if this system meets their needs and expectations. Firstly, alpha testing will be performed among software developers to identify all possible issues and bugs before releasing the final product to the end users. After finishing alpha testing and updating, beta testing will be conducted. Beta testing is performed by potential users of this software application in a real environment. The potential users are people who live alone, disabled people, and the elderly.

Through continuous testing and analysis, the system is believed to be helpful for the community. This system will take people's lives a big step forward.

5. CONCLUSION

In a nutshell, the development process of FixIt and Foliage Frenzy mobile application will be continued and the concept and the design of the proposed system written in this thesis will be implemented. Also, the testing will be done during the implementation of this system.

The development of this system represents a significant step forward in addressing the challenges individuals face when seeking assistance for everyday tasks. By providing a centralized platform that prioritizes accessibility, reliability, and efficiency, this solution offers users a seamless and user-friendly experience.

Through the matching of users with qualified professionals, this system promotes trust and accountability in service provision, enhancing overall satisfaction for both users and service providers. With its commercialization potential and transformative impact on efficiency, reliability, and quality of

life, this system stands poised to revolutionize the way individuals access assistance for their daily needs.

As continuing to refine and evolve the system based on user feedback and emerging technologies, we remain committed to delivering innovative solutions that empower individuals and foster community collaboration.

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Research Article

Mobile Distance Learning with Smartphones and AYU Apps in Secondary Education

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Abstract: This study explores the potential of mobile distance learning in secondary education using smartphones and the AYU application. The research investigates how AYU apps, specifically designed for mobile learning, can contribute to the learning experience and address the needs of secondary school students in a distance learning environment. The study employs a survey among 420 secondary school students to gather data on students' perceptions of the AYU apps' usability, effectiveness, and suitability for self-directed learning. The findings contribute to the understanding of mobile learning strategies in secondary education and offer valuable insights into the potential of the AYU apps as tools for enhancing student engagement and learning outcomes in distance learning contexts.

Keywords: distance learning; mobile learning; secondary education.



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1. INTRODUCTION

The convergence of mobile learning (m-learning) with the Fourth Industrial Revolution (Industry 4.0) is driving a paradigm shift in the educational landscape at an unprecedented rate. A comprehensive understanding of both m-learning and its synergistic relationship with Industry 4.0 is paramount for educators and learners to fully capitalize on this transformative potential. M-learning encompasses the utilization of mobile devices, such as smartphones and tablets, to facilitate learning experiences. This technology extends the boundaries of traditional classrooms, enabling ubiquitous access to information and fostering a learner-cantered environment where students can pursue knowledge acquisition conveniently, anytime and anywhere, utilizing their mobile devices (Bhati, Abhishek, and Insu Song, 2019).

Leveraging the capabilities of mobile devices, m-learning presents a fertile ground for the integration of Industry 4.0 (IR 4.0) technologies. This convergence fosters ubiquitous access to personalized learning experiences, empowering learners to engage with educational content anytime,

anywhere (Jovanovic et al., 2018). The synergy between m-learning and IR 4.0 holds immense potential for the future of education. However, navigating the digital divide, addressing privacy concerns, and developing effective instructional design remain crucial challenges. Overcoming these hurdles will pave the way for a future where learning is universally accessible, personalized, and engaging for all.

Despite the increasing prevalence of mobile distance learning platforms, several key issues hinder their widespread adoption and effectiveness. A significant portion of the population, particularly in rural areas, lacks access to smartphones and reliable internet connectivity, thereby exacerbating existing educational inequalities (Johnson, 2021). This digital divide presents a critical barrier to equitable access to mobile learning opportunities. Beyond access, issues such as limited device capabilities, compatibility problems with different operating systems, and software limitations can hinder the effectiveness of mobile learning initiatives (Gupta & Sharma, 2020). These technological barriers necessitate careful consideration when designing and implementing mobile learning solutions. Designing effective learning experiences for the mobile context presents distinct pedagogical challenges. These include adapting content for smaller screens, ensuring interactive and engaging learning activities, and mitigating distractions inherent in the mobile environment (Zhang et al., 2019). Rethinking pedagogical approaches and instructional design principles is crucial to maximize the learning potential of mobile technologies. While smartphones are increasingly ubiquitous, many individuals lack the essential digital literacy skills and competencies necessary for effective mobile learning (Narayan & Prakash, 2022). This highlights the need for comprehensive digital literacy training programs to equip learners with the necessary skills to navigate and utilize mobile learning platforms effectively. By addressing these challenges and harnessing the opportunities offered by mobile technologies, educators and educational institutions can create equitable, engaging, and effective learning experiences for a diverse range of learners.

The advent of advanced technology has opened doors for novel opportunities in constructivist learning. These developments are marked by the creation of interactive platforms, simulations, and personalized learning tools. These elements collectively create a dynamic environment where learners actively construct knowledge through exploration and interaction (Jonassen, 2018). Constructivism encompasses several branches, each offering unique perspectives on knowledge construction. Social Constructivism highlights the influence of social context and cultural background, suggesting that meaning is co-constructed through shared experiences and negotiation among learners. Critical Constructivism further argues that knowledge construction is inherently shaped by societal power structures and existing biases. By critically examining these factors, learners can develop awareness of their own biases and engage with diverse perspectives to reveal potential contradictions in their own understanding (Apple, 2017). This combined approach emphasizes the interplay between individual learners and their socio-cultural context in shaping knowledge.

Constructivism remains an influential theory, guiding both education and research. Its focus on the learner's active role in constructing knowledge emphasizes the potential of meaningful learning and collaborative activities. This perspective fosters hope for individuals to become agents of their own knowledge and understanding. Constructivism emphasizes active learning through exploration, analysis from diverse perspectives, and problem-solving based on real-world data. This active engagement, often facilitated through collaborative learning activities, fosters knowledge sharing, peer feedback, and co-construction of meaning among learners. Authentic assessment, focused on the knowledge construction process rather than rote memorization, prompts educators to reflect on their practices and their effectiveness in supporting student learning. Moreover, technology, with its dynamic and collaborative tools, aligns perfectly with constructivist principles by providing valuable resources for exploration, manipulation, and knowledge building. This holistic approach highlights the interconnectedness of active learning, collaboration, assessment, and technology in promoting meaningful knowledge construction.

On the other hands, The Cognitive Theory of Multimedia Learning (CTML) is a cognitive theory focusing on how individuals process and learn from information presented through multiple channels, such as text, images, and audio. This theory suggests that people have separate channels for processing visual and auditory information, and that overloading these channels can hinder learning. CTML builds upon four core principles: dual channels, where the brain processes visual and auditory information separately, potentially leading to overload when presented simultaneously; modality effect, with different channels better suited for specific information types (images for spatial, text for explanations); cognitive load, which learning efficiency hinges on minimizing by strategies like information breakdown and targeted redundancy; and active processing, where learner engagement with multimedia content enhances information integration from various channels (e.g., through elaboration and practice).

Building on its key principles, CTML translates into four core design guidelines which is reducing extraneous cognitive load by removing distracting information, ensuring coherence across all media formats (text, images, audio, etc.), using strategically placed cues and prompts to guide learners towards crucial information, and promoting active learning beyond passive consumption by encouraging interaction and knowledge construction.

2. METHOD & MATERIAL

This study used a descriptive statistical design. According to Qutoshi, (2018), descriptive research is to explain a phenomenon. The explanation given is based on factors or variables that have not yet been identified. The type of descriptive research used in this study is the survey method. Furthermore, he also explained that survey research is used to measure variables associated with a phenomenon without questioning why the variable exists. The t-test and Pearson's Correlation were used to analyze the findings of this study.

To find out the effectiveness of this AYU application in the process of learning and teaching, a survey was carried out (cross-sectional survey) to school students who were selected stratified by zone in each state. The study location is in Peninsular Malaysia, Sabah and Sarawak. The effort in determining the study population is the most important step that needs to be done at the initial stage of the study sample selection process. The study population consists of the target population and the administrative population. Since it is usually difficult to obtain a sample from the target population, the researcher can determine the frame of the population that is capable of being administered (Ames et al., 2019; Rassel et al., 2020). In this study, the target population of the survey was selected among school students at Sekolah Kebangsaan (SK). Table 1 shows the location and number of respondents in the study. Respondents were selected stratified by zone, and in groups according to the type of school placement.

No	Zone	State	Number of respondents
1	North	Kedah	9
2	North	Perlis	2
3	North	Perak	164
4	North	Pulau Pinang	16
5	South	Johor	17

Table 1. Location of th	e cross-sectional	survey	study	
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6	South	Melaka	18	
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7	South	Negeri Sembilan	74	
8	South	Kelantan	6	
9	East	Terengganu	11	
10	East	Pahang	12	
11	West	Kuala Lumpur	6	
12	West	Selangor	61	
13	Sabah	Sabah	11	
14	Sarawak	Sarawak	13	
		Total	420	

Students' perceptions of AYU applications were measured based on twelve categories. Based on Table 2, the findings of the study show that students strongly agree that the attractive, clear, and simple front page makes them interested in using the AYU application in their learning activities with value (M=4.45, SP=.63). The next students' perception is that the AYU application via mobile phone is easy to use with a value (M=4.49, SP=.67) of their perception on this part also shows high agreement. Students were also found to agree that this application can be used without the help of others with value (M=4.36, SP=.75). In addition, students were found to agree that this application only takes a short time to use with value (M=4.35, SP=.70). Table 2 show student's perception about AYU application.

No	Statement		Percentage and Frequency			MEAN	SD	
	-	SD	D	M	Α	SA	-	
1	The attractive, clear, and simple	0.2%	0.2%	7.6%	39.0%	52.3%	4.45	0.63
	front page interested me in using	(1)	(1)	(32)	(164)	(220)		
	AYU apps in my learning activities.							
2	AYU apps through mobile phones	1.4%	2%	5.5%	34.9%	57.7%	4.49	0.67
	are easy to use.	(6)	(1)	(23)	(147)	(243)		
3	This application can be used	5%	1.7%	10.5%	37.5%	49.6%	4.36	0.75
	without the help of others.	(2)	(7)	(44)	158)	(209)		
4	This application takes a short time	0	1.0%	10.5%	40.9%	47.5%	4.35	0.70
	to use.		(4)	(44)	(172)	(200)		
5	Users are free to explore	0.7%	1.2%	5.7%	39.4%	52.7%	4.45	0.67
	information in AYU apps.	(3)	(5)	(24)	(166)	(222)		
6	Users are free to exit the	0	0.2%	6.9%	37.8%	54.9%	4.46	0.67
	application at any time.		(1)	(29)	(159)	(231)		
7	The application is user-friendly.	0.7%	0.5%	5.5%	34.0%	59.15%	4.51	0.68
		(3)	(2)	(23)	(143)	(249)		
8	Learning using this app is fun.	0.2%	0.5%	8.1%	34.9%	56.1%	4.46	0.70
		(1)	(2)	(34)	(147)	(236)		
9	Information is presented in a	2%	0	5.7%	34.0%	59.9%	4.52	0.67
	simple and attractive style.	(1)		(24)	(143)	(252)		
10	This application provides the	2%	0.5%	5.0%	38.7%	55.3%	4.49	0.65
	necessary knowledge quickly.	(1)	(2)	(31)	(163)	(233)		
11	This application is suitable for use	2%	0	5.9%	34.9%	58.7%	4.51	0.65
	as a learning material.	(1)		(25)	(147)	(247)		
12	This application helps students'	2%	2%	5.9%	37.1%	56.3%	4.48	0.66
	self-learning.	(1)	(1)	(25)	(156)	(237)		
	Average	1.4%	0.8%	5.8%	36.9%	55%	4.46	0.68

Next the students' perception that the user is free to exit the application at any time is also at a high level of agreement where (M=4.45, SP= .67). For the perception that this application is userfriendly, it is also at a high level of agreement, which is (M= 4.51, SP=.68). In addition, students' perception of learning using this fun application is at a high level of agreement with the value (M=4.46, SP=.70) and students' perception of information presented in a simple and interesting style is also at a high level of agreement where the value is (M=4.52, SP=.67). For the perception of this application provides knowledge that needed quickly also has a high level of agreement among students with (M=4.49, SP=.65). Furthermore, this application is suitable for use as a learning material at (M=4.51, SP=.65) with a high level of agreement. In addition, students also showed a high level of agreement referring to this application helping students' self-learning with value (M=4.48, SP=.66).

3. FINDINGS

The findings from the research indicate that the AYU application possesses several attributes that contribute to a positive user experience for students. The application's front page was rated highly for its attractiveness, clarity, and simplicity (mean score: 4.45), which likely fostered initial user interest and engagement. Students reported a high level of ease of use when interacting with the application on their mobile phones (mean score: 4.49), suggesting a well-designed mobile interface. The data indicates that students felt comfortable using the application independently, without requiring assistance from others (mean score: 4.36). This suggests an intuitive design that minimizes the need for external support. The application was perceived as time-efficient, with students reporting it took a short time to use (mean score: 4.35). This characteristic caters to learners with limited time or who prefer concise learning experiences. Students appreciated the freedom to explore information within the application at their own pace and exit whenever desired (mean scores: 4.45, 4.46). This flexibility aligns with selfdirected learning preferences. The application was found to be user-friendly and enjoyable to learn with (mean scores: 4.51, 4.52). This positive perception is likely to enhance user engagement and motivation. Students reported that the information within the application was presented in a clear, visually appealing manner (mean scores: 4.49, 4.51) and facilitated the acquisition of necessary knowledge quickly. This suggests the application effectively balances user-friendliness with content delivery. The findings demonstrate that students perceived the application as a valuable learning tool, suitable for both self-directed learning and as a supplementary learning material (mean scores: 4.51, 4.48). This positive perception highlights the application's potential to contribute to students' learning outcomes.

4. DISCUSSION

The use of Mobile Learning in education is an approach that facilitates the implementation of teaching and learning. The development of Mobile Learning signifies education without boundaries. Location and time are not obstacles as students can engage in learning wherever they are based on their convenience (Jarawi et al., 2020; Hasmuddin, 2020). The incorporation of technology in teaching has transformed instructional methods for the better. This technological application can enhance teaching skills, stimulate students' intellectual capabilities, improve student achievements, and bring positive changes to student learning. Various applications available on mobile phones and tablets can assist teachers in conducting more efficient teaching, thereby further enhancing teachers' knowledge in using modern technology. This aligns with the students' learning needs, providing a more positive impact (Roslin et al., 2021; Baharudin et al., 2023).

Undeniably, teachers' teaching practices are also one of the factors that influence student motivation. Attitude or interest in teaching and learning can foster the practice of digital literacy for all academic members of an educational institution to support the concept of digital learning as an effective learning method (Mahalingam & Jamaludin, 2021). This aligns with the country's digital learning policy and the 21st-century education that emphasizes student-cantered learning (Amatan & Han, 2020). Motivation for learning plays a crucial role in students' achievements. Student motivation is seen as synonymous with interest in the teaching and learning process. The mobile learning approach can boost students' motivation to explore and challenge their abilities. Learning using these educational mobile devices can motivate them and provide a more effective learning experience, making students more interested in learning, willing to learn, and making efforts to change, thereby positively impacting academic achievements (Rahman et al., 2020; Razali & Khalid, 2021; Ishak, & Khalid, 2021; Zulhemay et al., 2022).

Futhermore, students are more excited because they can try new things and solve problems on their own before meeting with the teacher for further discussion. Moreover, it can also save the teacher's time in the learning process (Abdul Hadi et al., 2020; Ismail et al, 2022). Online learning in teaching and learning is crucial in line with the progress of modern education. Furthermore, learning content is more easily navigated quickly with short and borderless time, and it also has various reference sources, including attractive multimedia and graphics (Mahalingam, & Jamaludin, 2021; Murat et al., 2020).

5. CONCLUSION

This exploration of mobile distance learning with smartphones and AYU apps in secondary education suggests promising possibilities for enhancing the learning experience. The findings highlight the AYU apps' potential to increase user engagement through an appealing interface, user-friendly design, and enjoyable learning experience. On the other hand, AYU apps also promote self-directed learning by offering students flexibility, control over their learning pace, and the ability to learn independently. Moreover, AYU apps facilitate effective knowledge delivery by presenting information in a clear, visually appealing manner and allowing for quick knowledge acquisition. Furthermore, AYU apps' also serve as valuable learning tools suitable for both individual self-study and supplementing traditional classroom learning.

However, further research is needed to explore the long-term impact of these apps on student learning outcomes, address potential challenges such as digital access and equity, and investigate their effectiveness in various learning contexts and subject areas. Overall, this study provides encouraging evidence for the potential of mobile distance learning with smartphones and AYU apps to support and enrich the educational experience of secondary school students. By leveraging the accessibility and interactivity of smartphones, coupled with well-designed learning apps, educators can create engaging and effective learning environments, even in the face of geographical or physical limitations.

Acknowledgments: The authors are thankful to all those who participated in the study and helped to accomplish the research process.

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Research Article

Funticiple Unleashed: Revolutionizing Past Participle Learning Through Gamification

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Abstract: The rapid advancement of information technology in the 21st century has catalyzed a global shift towards technology-based learning methodologies in education. Alongside this trend, there has been a growing recognition of the critical role of grammar skills, particularly in writing, prompting an increased emphasis on grammar education. However, in the Malaysian context, grammar proficiency, notably in areas such as past participles, remains alarmingly low. Hence, this paper proposes a solution to address this gap through the innovative gamification of grammar learning by inventing 'Funticiple' to enhance pupils' understanding of past participles. In this game, players are tasked with nurturing Oyen, a pet cat, by correctly identifying the past participles of given verbs. Utilizing the Design and Development Research (DDR) Method, this study involved 30 primary six pupils and three teachers. Through surveys and interviews, it was demonstrated that Funticiple is an engaging and effective tool for promoting pupils' involvement and interest in grammar. In conclusion, Funticiple represents a significant step forward in addressing the challenges of grammar education in the digital age. By leveraging gamification principles, it offers a compelling and interactive solution to enhance pupils' grammar skills, contributing to their overall language proficiency and academic success.

Keywords: ESL; grammar learning; interactive game; writing skills.



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1. INTRODUCTION

The 21st century has brought a transformative shift to education, especially in language instruction, driven by technology integration and innovative pedagogical approaches. This evolution has prompted a re-evaluation of grammar teaching, a cornerstone of language acquisition. Researchers and educators have responded by proposing new ideas and tools tailored to contemporary learners' needs. Grammar learning, crucial in English as a Second Language (ESL) classrooms, underpins language proficiency, as noted by Larsen-Freeman (2018). Technology, too, has reshaped language instruction, providing diverse engagement opportunities through digital devices and online platforms. Thianthai & Tamdee (2022) and Nasir et al. (2021) highlight technology's role in catering to modern learners' preferences and enhancing outcomes. Amid these changes, the quest to innovate grammar instruction persists, driven by the necessity to equip learners with essential language skills for success in today's interconnected world.

Effective grammar skills play a pivotal role in developing language proficiency, particularly in writing. According to Giovanelli (2014), grammar serves as the foundation upon which coherent and articulate communication is built, providing essential structure and rules for conveying ideas

accurately. Mastery of grammar enhances clarity, coherence, and precision in written expression, enabling individuals to effectively communicate their thoughts and ideas to a diverse audience (Ferris & Hedgcock, 2014). The advancement of technology has revolutionized language learning, particularly for English as a Second Language (ESL) learners (Raw & Ismail, 2021; Lai Wah & Hashim, 2021; Zhao & Lai, 2023). Digital tools and online resources offer dynamic and interactive platforms for practicing grammar skills. For instance, language learning apps such as Duolingo and Grammarly provide personalized feedback and exercises tailored to individual proficiency levels, facilitating self-directed learning and skill development (Betaubun et al., 2023; Iftanti et al., 2023). Furthermore, Redjeki & Muhajir (2021) highlighted in their study that technology has enabled the gamification of grammar activities, making learning more engaging and enjoyable for students. Platforms like Kahoot! and Quizziz offer interactive quizzes and games that reinforce grammar concepts in a fun and interactive manner (Segaran & Hashim, 2021), promoting active participation and retention among learners (Reinders & Wattana, 2014). Therefore, it has been demonstrated that using technology to teach grammar to ESL students boosts their interest in the subject.

The Common European Framework of Reference (CEFR) integration into English language instruction in Malaysia has resulted in a dramatic change in pedagogical practices, which is especially noticeable in Year Six ESL classrooms. The goal of the 2017 adoption of CEFR-aligned textbooks and resources has been to improve the effectiveness of language teaching. However, this transition has presented challenges, particularly concerning grammar instruction, as students' proficiency levels often lag behind the complexity of the introduced topics. According to several academics, pupils in Malaysia still have a low degree of grammar proficiency. According to a study by Idris et al. (2020), Malaysian pupils and other Asian students continue to have unsatisfactory levels of English competence. Hui et al. (2021) discovered that inadequate grammatical proficiency in Malaysia has led to inadequate English language learning results. This is consistent with the research by Misbah et al. (2017), which found that although many Malaysian students still struggle to effectively master English, they are exposed to grammar knowledge starting in primary school. Grammar acquisition issues will eventually lead to ESL pupils' inability to write well (Ghulamuddin et al., 2021). With the Malaysian educational landscape emphasizing the importance of mastering grammar concepts, the need for supplementary materials becomes imperative to bolster comprehension and engagement.

Therefore, this research seeks to address the aforementioned gap by introducing 'Funticiple', a gamified approach to revolutionize past participle learning. By leveraging gamification principles, this novel approach endeavours to transform grammar instruction into an interactive and enjoyable experience, tailored to meet the specific needs of Year Six ESL learners within the Malaysian context. Drawing upon established theories of gamified learning and language acquisition, this study aims to evaluate the effectiveness of 'Funticiple' as a complementary tool in enhancing grammar proficiency among Malaysian ESL students.

2. METHOD & MATERIAL

The development of 'Funticiple', aimed at revolutionizing past participle learning through gamification, followed the structured approach of the Design and Development Research (DDR) Method, which comprises five iterative stages: needs analysis, design, development, implementation, and evaluation (Fauzan et al., 2013).

2.1 Needs Analysis

The initial phase of the DDR method involved conducting a comprehensive needs analysis to identify the challenges and requirements in past participle learning. Teachers in Year Six have provided comments to the researcher regarding the challenges they encountered when instructing pupils in the Past Participle. Three teachers and five pupils participated in a quick interview. The instructors have talked about the challenges and issues they encounter when instructing the subject. The pupils discussed their difficulties with the material and express hoped that there may be a different approach that will enable them to comprehend it more readily and without feeling under pressure. These results demonstrated:

- 2.1.1 Teachers find it challenging to find engaging teaching resources for the Past Participle topic.
- 2.1.2 Students exhibit poor motivation because they perceive this to be a challenging lesson; and
- 2.1.3 Students struggle to use the Past Participle in their writing.

2.2 Design

The researcher proceeded to create an intervention based on the needs analysis. Drawing from principles of gamification, instructional design, and language learning, a conceptual framework was developed to guide the integration of gamified elements into the learning environment. This phase emphasized the creation of engaging game mechanics, meaningful learning tasks, and a coherent narrative to enhance learner motivation and engagement (Kapp, 2012). This 'Funticiple' is special since it centres around the main character, "Oyen," a cat whose name is well-known among most Malaysians. Additionally, players must find the correct Past Participle for each given verb because the primary goal of the game is to teach the pupils and memorise past participles. The word level alone is the main focus. In this game, players will "work" to earn money by identifying the verb's past participle and using it to purchase food to give to Oyen. And with the 'money' they made, they can buy Oyen some basics and accessories. As a result, the players learn perseverance because they must 'work' hard to feed and nurture Oyen, their pet cat. For additional confirmation, the researcher consulted the Gombak district's School Improvement Specialist Coach (SISC+) and the head of the committee at the school.

2.3 Development

Funticiple is a two-dimensional game developed with the Turbowarp packager tool, which enhances project performance and adds features to make games more enjoyable to play. To start the game, players can click on the 'Instruction' button provided to facilitate understanding. This display is seen in Figure 1.



Figure 1. Main page display

Next, player must click on the computer image on the screen as shown in figure 2 to receive the next order after hitting the "play" button to begin the game. In the display, Oyen's "age" is growing as the players' playing time increases. Simultaneously, the 'hunger' indicator will subside, encouraging players to complete the tasks quickly so they can purchase food for Oyen.



Figure 2. Display with computer image

The player will then be instructed to switch the verb to past participle after clicking the computer image, as seen in figure 3.



Figure 3. A screen that provides the player with mission instructions.

Figure 4 illustrates how the player can purchase any "Oyen" necessities after finishing the assignment and receiving "money." Each assignment that is finished will earn the player \$100. If players want more "money," they must continue to solve a lot more Past Participles.



Figure 4. Choices available to gamers

Gamers are free to keep playing whenever it's convenient for them. The 'hunger' indicator will go down if the assignment is not finished, and the game will finally end as shown in figure 5.



Figure 5. The game has ended

2.4 Implementation

As long as students have access to a computer, this game can theoretically be used to supplement instruction in the classroom or as a longer homework assignment at home. This game can be regarded as adaptable and user-friendly because it can be downloaded onto a computer or other devices without requiring an internet connection. It can also be played with a maximum of three players, in pairs, or alone. The game was introduced to 60 sixth-year students and three teachers in two Selangor primary schools by the researcher in order to demonstrate its efficacy. 'Funticiple' is a game that students played in small groups at school; Figure 6 illustrates how it was implemented.



Figure 6. The implementation of 'Funticiple'

2.5 Evaluation

Findings from the evaluation phase informed future iterations of 'Funticiple' and provided valuable insights for the broader field of gamified language learning (Fauzan et al., 2013). For evaluation objectives, the researcher has used two methodologies. Initially, information was gathered using a survey questionnaire that was distributed to thirty students from two schools. There were four questions in each set of questionnaires, which employed a 4-point Likert scale. Structured interviews were the second approach. A brief interview with three teachers from the affected school was conducted. There were five interview questions, and the responses were then gathered and organised into categories in a table. Descriptive analysis was then used to examine each response. The following section will address the findings.

3. FINDINGS

The significance of the research lies in the fact that the results serve as a benchmark for scholars and educators to evaluate the efficacy of 'Funticiple' and gauge its potential as an auxiliary tool for teaching purposes. Furthermore, the researcher has the ability to make any required adjustments in the future. In addition, it will be a fascinating addition for ESL instructors, which will benefit the learners. As previously indicated, the researcher interviewed and surveyed teachers and pupils at the two participating schools. Thirty responses from participating schools completed the survey, and three teachers were interviewed to gather their opinions on the game.

3.1 Semi-structured interview result

Three educators from the participating schools were selected to provide their opinions on the game. Initially, the teachers had time to see the video demonstration of the game, read the game instructions, and play the game whenever they wanted. After that, these educators were asked five questions on how they felt the game could be used to improve pupils' performance in Past Participle. The responses are given in the Table 1.

Interview Questions	Teacher 1	Teacher 2	Teacher 3
Do you think teaching grammar is challenging?	Yes, for some topics.	Yes, it is especially in rural schools.	It might be challenging especially for tough topics.
How often do you utilize technology in grammar teaching?	Not frequent. Twice a month maybe.	I prefer using the textbook.	Quite often.
Do you think 'Funticiple' is suitable for your pupils?	Of course. They love it so much.	Unexpectedly, my pupils love it so much. I think it is.	Absolutely! They can relate this game to their lesson in the Year 6 textbook. They seemed enjoying it so much!
What is your opinion about 'Funticiple'?	It is really amazing game that can make my pupils learn Past Participle quickly and at the same time enjoying my lesson.	I personally think all Year 6 teachers should use this game as it is suitable for this Z generations. The features and sounds are captivating.	'Funticiple' is a new way of teaching Past Participle in a very fun and enjoyable way!
What is your advice to English teachers about 'Funticiple'?	Please try this game and you'll be surprised with the results.	'Funticiple' is an additional material that can be used as supplementary work for your pupils.	'Funticiple' does my homework tasks easier and fun.

Table 1. Interview results

The research data from interviews with three teachers regarding the effectiveness of teaching grammar, particularly with the incorporation of the language game 'Funticiple,' reveals diverse perspectives.

Teacher 1 acknowledges the challenges of teaching grammar, finding 'Funticiple' to be an amazing tool for making learning enjoyable and efficient. Teacher 2, despite infrequent use of technology, sees the game's potential and suggests its suitability for Year 6 students. Conversely, Teacher 3, who integrates technology more frequently, praises 'Funticiple' for its engaging features and its seamless alignment with the curriculum.

All teachers agree on the game's appeal to students, with positive feedback on its effectiveness in teaching past participles. They endorse 'Funticiple' as a valuable resource for English teachers, suggesting its adoption to enhance grammar lessons, particularly for Year 6 students. Overall, the data highlights 'Funticiple' as a promising tool for making grammar teaching enjoyable and effective, bridging the gap between learning and fun in language education.

3.2 Survey outcomes

Item	Questions	SD	D	Ν	Α	SA
1	'Funticiple' is fun and interesting	0%	0%	13.3%	16.7%	70%
		(0)	(0)	(4)	(5)	(21)
		22/	201	1.6 -0(< - 0(
2	The instructions were clear and straight	0%	0%	16.7%	6.7%	76.7%
	forward	(0)	(0)	(5)	(2)	(23)
3	'Oyen' character is captivating and cute	0%	0%	0%	13.3%	86.7%
		(0)	(0)	(0)	(4)	(26)
4	I will recommend this game to my friends	0%	0%	10%	10%	80%
		(0)	(0)	(3)	(3)	(24)
			. /	. ,	. ,	. ,

Table 2. Pupils' respond.

Note: SD= Strongly Disagree, D= Disagree, N= Neutral, A= Agree, SA= Strongly Agree

Table 2 shows respondents' responses using the Likert Scale. The survey results indicate overwhelming positive responses towards 'Funticiple'. Participants strongly agreed (70%) that the game is fun and interesting, with the majority (76.7%) finding the instructions clear and straightforward. The 'Oyen' character received high praise, with 86.7% strongly agreeing on its captivation and cuteness. Furthermore, 80% expressed strong agreement in recommending the game to their friends. Overall, the data suggests a high level of satisfaction and endorsement for 'Funticiple', highlighting its appeal, clarity of instructions, character design, and likelihood of recommendation among users.

4. DISCUSSION

The findings of this research offer valuable insights into the potential of 'Funticiple' as an innovative tool in language education. Through interviews and surveys with educators and students, diverse perspectives emerged regarding the game's effectiveness in teaching grammar, particularly past participles. Teachers' varying levels of technological integration and teaching approaches underscore the adaptability of 'Funticiple' to different classroom settings. Despite differences, all educators recognized the game's appeal to students and its potential to enhance grammar lessons.

Moreover, the overwhelmingly positive responses from participants emphasize 'Funticiple's' potential as a valuable addition to ESL instruction. The high levels of agreement on the game's enjoyment, clarity of instructions, and recommendation indicate its efficacy in engaging learners and facilitating language learning. These findings not only serve as a benchmark for evaluating 'Funticiple's' effectiveness but also highlight its promising role in bridging the gap between enjoyable learning experiences and effective language acquisition. Continued research and potential adjustments to the game can further optimize its use in language classrooms, ultimately benefiting both teachers and learners.

5. CONCLUSION

In conclusion, the development and evaluation of 'Funticiple' as a gamified approach to teaching past participles offer promising implications for language education, particularly in ESL contexts. The research findings underscore the significance of innovative tools like 'Funticiple' in addressing the challenges associated with grammar instruction and enhancing learner engagement and proficiency. The positive feedback from both educators and students highlights the game's effectiveness in making grammar learning enjoyable and effective, thus bridging the gap between traditional teaching methods and modern learners' preferences. 'Funticiple' not only serves as a valuable addition to ESL instruction but also exemplifies the potential of gamification in transforming language learning experiences. Moving forward, further research and refinement of 'Funticiple' can contribute to its continued success as a supplementary tool for grammar instruction, ultimately empowering ESL learners to acquire essential language skills for communication and academic success in the 21st century.

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GREEN ZONE - "Sun Power: Lighten Up Campus Life with Renewable Energy"

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Abstrak: Teknologi hijau merupakan inovasi dalam pelbagai bidang yang memanfaatkan sumber-sumber alam semulajadi dan meminimakan penggunaan sumber tenaga fosil. Hasil kajian menunjukkan bahawa kelestarian alam sekitar dan teknologi mempunyai elemen yang saling berkaitan dan dapat direalisasikan dalam pemeliharaan dan pemuliharaan alam sekitar. Sistem pemasangan solar fotovoltaik merupakan teknologi penghasilan tenaga semulajadi melalui sumber tenaga matahari. Oleh yang demikian, projek yang dibangunkan berkaitan tentang pemasangan sistem solar di pondok Program Teknologi Elektrik, Kolej Vokasional Tanah Merah dengan tujuan untuk memudahkan pelajar mengakses bekalan kuasa di kawasan pondok rehat pelajar. Sistem yang dipasang mencakupi terminal USB, soket 3 pin, serta kipas dan lampu yang dapat dikendalikan secara manual atau jarak jauh menggunakan telefon. Projek ini dibangunkan adalah bertujuan untuk mengurangkan kadar penggunaan dan pergantungan terhadap sistem tenaga elektrik yang telah dibekalkan oleh Tenaga Nasinal Berhad (TNB). Pendekatan penyelidikan menggunakan model ADDIE untuk menilai kesesuaian dan keberkesanan sistem ini. Hasil kajian juga, menunjukkan implikasi termasuk meningkatkan ketersediaan dan kebolehpasaran teknologi hijau di kalangan pelajar, sambil memberikan kesempatan untuk mempraktikkan konsep kelestarian tenaga dalam kehidupan harian.

Kata kunci: IoT; Sistem Solar; Teknologi hijau



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1. PENGENALAN

Revolusi perindustrian di Malaysia sejak dua dekad yang lalu telah meningkatkan penggunaan elektrik dari 19,932GWh pada tahun 1990 kepada 87,164GWh pada tahun 2007, peningkatan 337% dalam lebih 20 tahun dan permintaan elektrik di Malaysia dijangka mencapai 19,000MW pada tahun 2020 dan 23,100MW pada tahun 2030. Pelbagai dasar dan pelan tindakan tenaga telah dicadangkan dan dibincangkan di kalangan pelbagai jabatan kerajaan, organisasi bukan kerajaan (NGO) dan sektor perindustrian dalam meningkatkan kesedaran dan penghasilan tenaga baru seperti Kementerian Tenaga, Teknologi Hijau dan Air (Keetha), Pihak Berkuasa Pembangunan Tenaga Lestari (SEDA) dan Persatuan Industri PV Malaysia (MPIA). Kekurangan rizab minyak dan gas dalam tempoh 15 tahun yang akan datang menyebabkan kerajaan mula cenderung kepada Tenaga Boleh Diperbaharui (Almaktar, Rahman, & Hassan, 2015).

Salah satu aplikasi tenaga solar yang digunakan secara meluas dalam penghasilan Tenaga Boleh Diperbaharui adalah menggunakan solar fotovoltaik, iaitu proses penghasilan tenaga dari cahaya matahari ditukar kepada tenaga elektrik (MuhammadSukki, Ineguez, G.Macmeekin, Brian, & Barry, 2011). Pemasangan solar fotovoltaik kini semakin meluas dengan adanya permintaan dari pengguna bagi penjimatan kos tenaga elektrik sedia ada. Oleh kerana itu, kewujudan syarikat dan industri solar turut berkembang. Permintaan berkaitan solar dalam beberapa tahun kebelakangan ini disebabkan oleh penambahbaikan teknologi yang menyebabkan pengurangan kos dan dasar kerajaan bagi menyokong pembangunan dan penggunaan tenaga boleh diperbaharui (Mughal, Sood, & Jarial, 2018).

Kelebihan utama penggunaan sistem solar adalah berpotensi untuk mengurangkan kebergantungan pada sumber tenaga fosil yang tidak boleh diperbaharui dan merosakkan alam sekitar. Dengan peningkatan pemasangan sistem solar, kita dapat mengurangkan jejak karbon yang ketara dan pencemaran udara yang dihasilkan oleh pembakaran bahan bakar fosil, yang merupakan penyumbang utama kepada kesan rumah hijau dan perubahan iklim. Selain itu, dengan memanfaatkan sumber tenaga yang boleh diperbaharui seperti matahari, kita dapat mengurangkan tekanan terhadap sumber daya alam yang terbatas dan membantu menjaga keseimbangan ekosistem bumi.

Kajian-kajian lepas telah mengesahkan manfaat-manfaat ini. Sebagai contoh, kajian oleh Smith et al. (2018) menyelidiki kesan pemasangan panel solar di sekolah-sekolah terhadap penurunan kesan rumah hijau dan penjimatan tenaga. Hasil kajian menunjukkan bahawa pemasangan sistem solar memberikan manfaat yang ketara dalam mengurangkan kesan karbon dan mempercepat transisi ke sumber tenaga bersih. Dengan demikian, penggunaan sistem solar bukan sahaja mempunyai manfaat langsung terhadap pengurangan pencemaran dan kesan negatif terhadap alam sekitar, tetapi juga memainkan peranan penting dalam perubahan sumber tenaga alternatif. Ini menunjukkan betapa pentingnya penerapan teknologi hijau, termasuk sistem solar, dalam konteks memastikan kelestarian alam dan kesinambungan sumber tenaga.

Selain itu, kajian oleh Wang et al. (2019) memfokuskan kepada integrasi *Internet of Things* (IoT) dalam pengurusan sistem solar di bangunan sekolah. Hasilnya menunjukkan bahawa penggunaan IoT dalam pemantauan dan pengawalan bekalan tenaga dari sistem solar dapat meningkatkan kecekapan tenaga dan membolehkan pemantauan secara *real-time* terhadap penggunaan tenaga. *Internet of Things* atau sering disebut IoT yang dicetuskan Kevin Ashton sekitar tahun 1999, adalah konsep jaringan komunikasi antara benda sekeliling, menerusi internet yang tersambung secara terus-menerus. IoT membabitkan peluasan ketersambungan internet seperti komputer dan telefon pintar yang membenarkan ia berkomunikasi sesama sendiri, boleh diperhatikan dan dikawal dari jauh. Sejajar dengan perkembangan teknologi ini, banyak syarikat perusahaan besar *seperti Intel, Microsoft, Oracle, Amazon Web Services, Cisco, Huawei* dan *LG* berlumba-lumba mengeluarkan produk berasaskan teknologi IoT. Selain itu, penemuan *Radio Frequency Identification* (RFID) pada tahun sama merancakkan lagi pengkomersialan IoT.

Manfaat penerapan IoT dalam bidang pendidikan terciptanya pendidikan yang lebih inklusif dimana hak setiap individu untuk mendapat akses kepada pendidikan inklusif menjadi fokus inovasi, dengan telefon pintar di tangan berserta jaringan internet memudahkan pemantauan secara jarak jauh. Dalam konteks, IoT ialah rangkaian peranti yang disambungkan ke internet, memudahkan pertukaran maklumat dan pengumpulan data antara peranti. Komponen seperti telefon pintar atau peranti lain membentuk rangkaian yang saling bersambung. Maklumat yang terhasil daripada perkaitan ini kemudiannya di analisis, menjadi asas untuk membuat keputusan yang lebih baik.

2. METODOLOGI

Rangka kerja pembangunan projek ini, menggunakan model reka bentuk ADDIE. Model ini dipilih kerana menurut Manan, Embi dan Mahamod (2010), model ADDIE merupakan model yang sering digunakan kerana mempunyai tahap yang jelas dan memudahkan pelaksanaan pembangunan.

Rajah 1 menerangkan aliran metodologi pembangunan Projek "Green Zone" dengan menggunakan model ini.



Rajah 1. Fasa pembangunan projek Green Zone "Sun Power: Lighten Up Campus Life with Renewable Energy"

Fasa pertama bermula dengan analisis yang dijalankan oleh penyelidik tentang pengetahuan berkaitan tentang sistem fotovoltaik yang menggunakan solar panel. Solar fotovoltaik merupakan satu komponen elektronik yang diperbuat daripada beberapa lapisan sel bahan separuh pengalir yang berfungsi menyerap tenaga dari suhu kepanasan sinaran cahaya seperti matahari atau sebarang sinaran yang mempunyai kepanasan tinggi. Kepanasan suhu sinar cahaya tersebut mampu menjadikan bahan semikonduktor dalam sel solar fotovoltaik menukarkan tenaga haba tersebut kepada tenaga elektrik. Keberhasilan tenaga elektrik perlu disokong oleh komponen elektronik yang lain dalam satu sistem seperti pengawal pengecasan dan bateri boleh dicas semula bagi mendapatkan keluaran tenaga elektrik secara arus terus (AT). Bagi penjanaan tenaga elektrik yang memerlukan keluaran arus ulang alik (AU) seperti sistem grid utiliti yang disambungkan kepada peralatan elektrik di kediaman, komponen elektronik iaitu penyonsang digunakan dalam sistem tersebut. Walaubagaimanapun, sistem solar fotovoltaik masih boleh berfungsi tanpa menggunakan alat penyongsang ini melalui pemasangan kendiri yang dapat menghasilkan tenaga elektrik secara AT (Energy, Kumar, & Sharma, 2015).

BIL	PERKARA	UNIT
1.	Solar Panel 100W	1
2.	Solar Charger Controller 30A	1
3.	Inverter 1000VA	1
4.	Bateri 12V 12AH	1
5.	Kipas 60W	1
6.	Lampu Downlight 12W	1
7.	Terminal USB	3
8.	Terminal Wireless Charger	3
9.	Soket 13A	2

Jadual 1. Senarai Komponen Projek

Sistem solar fotovoltaik tidak dapat memberi kesan yang maksima tanpa komponen utama yang lain bagi penjanaan tenaga elektrik. Komponen lain seperti bateri dimana tempoh bateri untuk penuh adalah selama 1 jam hingga 2 jam, pengawal pengecasan solar dan alatan pengukuran seperti meter pelbagai turut diperlukan dalam pengaliran cas yang sempurna. Pengaliran tenaga dari cas proton dan elektron seperti yang dinyatakan sebelum ini hanya diserap oleh lapisan separuh pengalir silikon pada panel solar. Bagi menghasilkan projek ini, ia melalui beberapa proses kerja. Yang pertama, berkaitan pengubahsuaian rekabentuk projek berdasarkan kelemahan data yang telah diambil semasa proses ujilari untuk menjadikan produk lebih baik. Seterusnya, apabila siap rekabentuk, alat perlu diuji bagi mendapatkan keberkesanan penjimatan ruang tersebut. Ujian terhadap produk ini antaranya mengukur voltan keluaran, arus keluaran dan kuasa keluaran. Kemudian produk harus melalui proses ujilari. Ia adalah proses yang penting untuk dilakukan setelah projek telah siap dibina. Prosedur ini dilakukan bagi menguji keselamatan, ketahanan, kecekapan dan lain-lain bagi sesebuah projek. Langkah-langkah ini perlu dijalankan sebelum produk boleh digunakan.

Fasa reka bentuk dijalankan dengan mereka bentuk projek ini terdiri daripada tiga (3) terminal USB, tiga (3) terminal *wireless charger* yang mana disambungkan secara arus terus (AT) dan dua (2) soket 13A yang disambungkan secara arus ulang alik (AU) boleh digunakan secara serentak. Proses reka bentuk melibatkan peralatan seperti lampu jenis *downlight* dan kipas yang masing-masing menggunakan tenaga sebanyak 12W dan 60W dan juga aplikasi BLYNK bagi mengawal peralatan secara jarak jauh. Lampu 12W boleh digunakan selama 8 jam pada waktu malam, manakala bagi peralatan kipas 60W boleh digunakan selama 3 jam berturut-turut. Dalam pemilihan dan penentuan reka bentuk dan struktur bahan dan peralatan, terdapat beberapa aspek yang perlu dipertimbangkan: saiz, kos, keselamatan, antara muka bahan dan pearalatan dan mesra pengguna. Rajah 2 menunjukkan lakaran reka bentuk projek.

Fasa pembangunan dijalankan dengan pemasangan solar panel di pondok rehat pelajar di bengkel Program Teknologi Elektrik, kotak agihan yang dilengkapi dengan lampu penunjuk (*indicator lamp*), punca sambungan untuk setiap tamatan dan dilabel. Pemasangan solar panel ini juga di reka bentuk bersama dengan *WIFI* dengan menggunakan aplikasi *BLYNK*. Setelah kerja pemasangan selesai, kerja-kerja pembungkusan seperti pelabelan dijalankan pada setiap komponen dan peranti kawalan untuk kemudahan pengguna. Rajah 3 menunjukkan zon pemasangan sistem solar dan Rajah 4 menunjukkan kotak agihan sistem solar.



Rajah 2. Rekabentuk projek



Rajah 3. Zon Teknologi Hijau (Pondok Pemasangan Sistem Solar)



Rajah 4. Kotak Agihan Sistem Solar

3. DAPATAN KAJIAN

Hasil dapatan menunjukkan pemasangan sistem solar pada pondok rehat pelajar atau zon *free energy* menggunakan tenaga elektrik di kawasan tanpa akses kepada grid tenaga. Solar panel digunakan sebagai komponen untuk menjana tenaga elektrik daripada cahaya matahari. Selain itu, penggunaan teknologi ESP8266 seperti di Rajah 5 membolehkan pemantauan jarak jauh dengan menggunakan aplikasi BLYNK, sekaligus meningkatkan langkah-langkah keselamatan dan memberikan nilai tambah dalam pengurusan kemudahan. Pembangunan sistem pengecas tanpa wayar seperti yang ditunjukkan pada Rajah 6 dengan menggunakan tenaga solar juga disediakan di pondok rehat pelajar bagi penjimatan tenaga. Rajah 7 menunjukkan pemasangan siap sistem solar pada pondok rehat pelajar dan sedia digunakan oleh pelajar.



Rajah 5. Teknologi Sistem Kawalan Jarak Jauh



Rajah 6. Pengecas Tanpa Wayar



Rajah 7. Pondok Rehat Pelajar

Jadual 2 menunjukkan kos yang digunakan dalam pembangunan sistem solar di pondok rehat pelajar. Bahan dan komponen yang digunakan adalah seperti yang disenaraikan di jadual di bawah.

BIL	PERKARA	UNIT	HARGA (RM)		
1.	Solar Panel 100W	1	120.00		
2.	Solar Charger Controller 30A	1	12.00		
3.	Inverter 1000VA	1	78.00		
4. Bateri 12V 12AH		1	53.00		
	JUMLAH (KM)	263.00			

Iadual 2.	Kos	Penggunaan	Proiek
Juanan 21	100	1 chgganaan	rujen

Jadual 3 menunjukkan penggunaan jumlah tenaga bagi setiap bahan dan peralatan selama 5 jam untuk setiap hari dan juga penggunaan jumlah tenaga dalam masa 26 hari. Jumlah penjimatan tenaga daripada penggunaan tenaga solar ini adalah sebanyak 120W, bagi tempoh 5 jam per hari adalah sebanyak 210Wh dan sebanyak 10.14kWh tenaga dapat dijimatkan bagi tempoh 26 hari. Tempoh 26 hari hanya dikira pada hari bekerja sahaja.

BIL	BUTIRAN	UNIT	POWER	5 JAM/HARI	26 HARI
1.	Terminal USB	3	15W	45 Wh	1170 Wh
2.	Terminal Wireless	3	15W	45 Wh	1170 Wh
	Charger				
3.	Soket 13A(AC)	2	60W	120 Wh	3120 Wh
4.	Kipas (AC)	1	60W	120 Wh	3120 Wh
5.	Lampu (AC)	1	12 W	60 Wh	1560 Wh
JUMLAH PENJIMATAN TENAGA		102 W	210 Wh	10,140 Wh/	
					10.14kWh

Jadual 3. Kadar Penggunaan Tenaga Solar

Voltan bateri apabila dicas sepenuhnya adalah sebanyak 16.5v – 16.8v. Bateri cut-off pada nilai 12v – 12.5v. Apabila bateri telah habis digunakan, sistem akan terpadam. Pembangunan projek ini menggunakan dua (2) kaedah iaitu *AC Adapter* dan juga *solar charger*. Untuk pengecasan menggunakan panel solar, minimum kapasiti panel solar adalah 30watt dan maksimum sebanyak 100watt. Untuk penggunaan pula, ia dapat beroperasi untuk beban DC 12v sahaja. Bagi kipas 60 watt 12V DC, ianya dapat bertahan selama 3 jam. Manakala untuk lampu 12 watt dapat digunakan selama 8 jam.

4. KESIMPULAN

Kesimpulannya, tujuan utama projek ini telah dicapai dimana produk ini dibina bagi menghasilkan tenaga elektrik di kawasan tanpa akses kepada grid tenaga. Oleh itu, solar panel digunakan sebagai komponen untuk menjana tenaga elektrik daripada cahaya matahari. Pembangunan produk ini sejajar dengan kehendak negara yang ingin melestarikan tenaga yang boleh baharu. Selain itu, sistem tenaga solar tidak memerlukan banyak penyelenggaraan. Penjimatan boleh diteruskan kerana solar panel boleh digunakan sampai bila bila. Tenaga boleh diperbaharui ataupun berkaitan teknologi hijau atau tenaga alternatif telah diperkenalkan dalam *multidisciplinary* dan juga melalui dokumen standard kurikulum dan pentaksiran (DSKV) mata pelajaran bermula kurikulum standard sekolah rendah (kssr) sehingga kurikulum standard sekolah menengah (kssm). Justeru, matlamat negara melalui lembaga pembangunan tenaga lestari 'Sustainable Energy Development Authority' (SEDA) yang menginginkan penggunaan tenaga boleh diperbaharui, renewable energy dalam kapasiti terpasang pada tahun 2025 manakala 40 peratus pada tahun 2035 yang disifatkan sebagai rancangan peralihan tenaga hingga tahun 2040 akan dapat direalisasikan. Hal ini ekoran kesedaran yang tinggi dan kesediaan generasi muda berkaitan penerimaan tenaga alternatif ini dalam dunia moden mereka pada masa tampuk pemerintahan generasi muda ini.

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Research Article

Integrating Online Learning Support with AI-Powered Chatbot Mechanism

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Abstract: This project delves into the development and deployment of an AI-driven chatbot tailored for education, specifically in the domain of information technology project management. It explores the significance and advantages of AI-powered chatbots, focusing on their capacity to enhance user experiences and optimize educational processes. Employing the structed waterfall methodology, the study meticulously documents each phase, detailing the creation of a prototype chatbot for students and lecturers in IT project management. Key accomplishments include a profound understanding of chatbot evolution, prototype creation, content design, and interface functionalities. The future involves refining the prototype, integrating databases, and learning resources, enhancing features like sentiment analysis and recommendation systems, ensuring scalability and security, fostering stakeholder collaboration, and comprehensive evaluation. Ultimately, this report offers a comprehensive insight into the potential of AI-driven chatbots in education, serving as a foundational guide to revolutionize learning experiences and educational methodologies.

Keywords: AI-driven Chatbot, Education, Learning Experiences, Information Technology Project Management, Educational Methodologies



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1. INTRODUCTION

1.1 Objectives

This document explores the comprehensive development and implementation of an AIpowered chatbot tailored for students and lecturers in the field of Information Technology Project Management. Developed using Laravel, the chatbot integrates Open AI's GPT 3.5-turbo for advanced natural language processing capabilities. The chatbot not only caters to the unique needs of students but also streamlines various tasks for lecturers. The objectives are summarized as below:

- To develop a chatbot leveraging Open AI's GPT 3.5-turbo to cater to students' IT project management queries.
- To implement speech-to-text and text-to-speech functionalities

• To assist students with academic queries with course-related questions, clarifying concepts, explaining complex topics, and providing additional resources.

1.2 Scope

The project's scope is to immense and constantly expanding, embracing a wide range of industries and its applications. One of the major responsibilities is towards users' operations and system support. AI-powered chatbots are transforming the users' relationships by giving rapid responses, 24 hours a day, 7 days a week, and as well provide better personalized support. Chatbots streamline the users' support operations, from answering ordinary questions to handling complex matters, resulting in enhanced users' satisfaction and loyalty for its organizations.

Beyond on the industry path, AI-Powered Chatbots find its applications to be meaningful in the field of education. They can serve as virtual tutors, providing students with on-demand learning support, explanations, and study materials. The chatbots' adaptive learning capabilities cater to individual learning styles, fostering independent learning and empowering students to take charge of their education. Additionally, chatbots can assist lecturers by automating administrative tasks, such as grading quizzes and managing course schedules, allowing the lecturers to focus more on personalized instruction and academic mentoring.

2. METHOD & MATERIAL

This section explained on the materials and methods which has employed, specifically emphasizing the use of GPT 3.5-turbo API and Laravel framework.

2.1 Material

The project's materials encompassed the IT Project Management Textbook's Chapter 1, forming the foundational knowledge base for the chatbot. Additionally, the GPT 3.5-turbo API and Laravel framework specifications are highlighted, underscoring their roles in the development process. Moreover, the project includes the use of text-to-speech and speech-to-text to enrich user interaction with the AI chat.

2.2 Methods

The methods section intricately outlines the project implementation procedures, emphasizing how the GPT 3.5-turbo API interprets its content, which is Chapter 1 in IT Project Management textbook. Laravel's integration is explained, inter pret its role in structuring and optimizing the chatbot's functionality.

2.2.1 Data Flow Diagram (DFD)





Figure 1. Level 0 DFD



Figure 2. Level 1 DFD

2.2.2 Use Case Diagram



Figure 3. Use Case Diagram

2.2.3 Use Case Description

2.2.3.1 Add email and user type

Table 1. Use case description for Add Email and User Type

Use Case Name	Add Email and User Type
Actor	Admin
Description	Admin adds email and specific user type. The email and user type added is to ensure that the user who registered is in the mailing list. Once the user has been registered, the chatbot will automatically set the user account according to the specific user type.
Preconditions	Admin is authenticated and has the necessary privileges.
Post conditions	Email addresses and user types are successfully added to the chatbot.
Normal Flow	 Admin logs into the chatbot. Admin navigates to the "User register" section. Admin selects the option to "Add User" Admin enters the email address of the new user Admin selects the appropriate user type from the available options (e.g., Student, Lecturer) Chabot validates the entered information If validation is successful, the chatbot adds the new user with the specified email and user type
Alternative Flows	If validation fails, the chatbot prompts the admin to correct the entered information.
Exceptions	If the admin tries to add an email address that already exists, the chatbot alerts the admin and asks for a new email address.

2.2.3.2 Review User

Table 2. Use case description for Review User

Use Case Name	Review User
Actor	Admin
Description	Admin reviews and manages user information which includes viewing, editing, and potentially deleting user accounts.
Preconditions	Admin is authenticated and has the necessary privileges.
Post conditions	Admin has successfully reviewed and managed user information.
Normal Flow	 Admin logs into the chatbot Admin navigates to the "Review User" section. Admin views the list of existing users. Admin selects a specific user to review. Admin views detailed information about the selected user, including email, user type, and other relevant details. Admin has the option to edit the user's information either to update email, change user type or to delete existing user accounts.
	7. Admin saves any changes made to the user's information

	8. Chatbot validates the changes and updates the user information
Alternative Flows	If there are no changes to be made, the admin skips the editing step
Exceptions	If the selected user does not exist or there is an issue fetching user details, the chatbot alerts the admin

2.2.3.3 Assessment Access

Use Case Name	Assessment Access		
Actor	Student		
Description	Student able to review, attempt, and submit assessment		
Preconditions	The assessment is available within the course or module		
Postconditions	Student successfully access the assessment, answers the questions, submits their responses, and receives feedback if applicable		
Normal Flow	 Student user navigates to the course or module that contains the assessment Chatbot displays a list of available assessments within the course or module Students select the desired assessment to attempt Chatbot displays the assessment details, instructions, and questions Student submits the completed assessment for evaluation 		
Alternative Flows If the assessment details fail to load or display, chatbot displays an error message indicating technical difficulties with assessment content			
Exceptions	If there's a system error during submission, student user can retry the submission later		

Table 3. Use case description for Assessment Access

2.2.3.4 Login

Table 4. Use case description for student login

Use Case Name	Student Login	
Actor	Student	
Description	Student provides their credentials to access their personalized learning content and features	
Preconditions	Student has a registered account to access the chatbot	
Postconditions	Student successfully logs into their account and gain access to their personalized dashboard and learning materials	
Normal Flow1. Student access the chatbot log in page 2. Chatbot displays a login form with fields for username and password 3. Student enters their username and password into the login form 4. Student user submits the login form		
Alternative Flows	If the student enters incorrect login credentials, the chatbot displays an error message indicating incorrect credentials	

Exceptions	If there's a system error during login submission, chatbot displays an error message indicating the login failure

Use Case Name	Lecturer Login		
Actor	Lecturer		
Description	Lecturer provides their credentials to access teaching-related features, manage assessments, and interact with students		
Preconditions	Lecturer has a registered account to access the chatbot		
Postconditions	Lecturer successfully logs into their account and gain access to their personalized dashboard and teaching materials		
Normal Flow	1.Lectureraccessthechatbotloginpage2.Chatbot displays a login form with fields for username and password3.Lecturer enterstheir username and password into the login form4.Lecturer user submits the login form		
Alternative Flows	If the login form fails to load or is not functional, chatbot displays an error message indicating technical difficulties		
Exceptions	If there's a system error during login submission, lecturer can retry the login submission later		

Table 5. Use case description for lecturer login

2.2.3.5 Assessment Grade

Table 6.	Student use	case	description	for	assessment grade
			1		0

Use Case Name	Assessment Grade		
Actor	Student		
Description	Students can view their assessment grades for a specific course or assignment		
Preconditions	Student must be logged into the system. Grades for the assessment should have been released by the instructor		
Postconditions	Student has reviewed their assessment grades		
Normal Flow	 Student logs into the chatbot. Student navigates to the course or assessment section. Student selects the specific assessment or course for which they want to view grades. Chatbot displays the grades associated with that assessment or course. Student reviews the grades and any additional feedback provided. 		
Alternative Flows	If grades are not yet released, the chatbot notifies the student that the grades are pending. In case of any technical issues or errors, the chatbot displays an error message and prompts the student to retry.		
Exceptions	N/A		

Use Case Name	Assessment Grade		
Actor	Lecturer		
Description	Lecturer able to review and evaluate student responses, assigns grade, and provide feedback to support the learning process		
Preconditions	The assessment to be graded is available within the course or module managed by the lecturer		
Postconditions	Lecturer successfully reviews and assigns grades to student assessments, providing constructive feedback if necessary		
Normal Flow	providing constructive feedback if necessary 1. Lecturer access the course or module containing the assessments to be graded 2. Chatbot presents a list of assessments that require grading 3. Chatbot displays the student responses, answers, and any attached files for the selected assessment 4. Lecturer reviews each student's work, evaluates the responses, and determine a grade based on pre-established criteria 5. Lecturer enters the assigned grade and any feedback into the grading interface 6. Lecturer saves the grade and feedback		
Alternative Flows	If lecturer encounters difficulty finding the assessments to be graded, Lecturer able to use the chatbot's search or navigation features to locate the relevant assessments		
Exceptions	N/A		

Table 7. Lecturer use case description for assessment grade

2.2.3.6 Assessment Planning

Table 8. Use case description for assessment planning

Use Case Name	Assessment Planning		
Actor	Lecturer		
Description	Lecturer able to plan assessment activities, sets evaluation criteria, and schedules assessment deadlines		
Preconditions	The course for which assessments are being planned is accessible and within the lecturer's management scope		
Postconditions	Lecturer successfully plans and schedule assessments for the course, ensuring that the assessment activities are aligned with learning objectives and expectations		

	 Chatbot displays options to manage course components, including assessments Lecturer selects the "Assessment Planning" or equivalent option to initiate 				
	the process 3. Chatbot displays a list of existing assessments and an option to create a				
Normal Flow	new assessment				
	4. Lecturer defines assessment objectives, learning outcomes, and criteria for evaluation				
	5. Lecturer reviews the planned assessment details and confirms the setup				
	6. Chatbot saves the assessment plan and updates the course content to				
	reflect the newly added assessment				
	If the lecturer encounters difficulty accessing the course management interface,				
Alternative Flows	lecturer able to use the chatbot's navigation or search features to locate the relevant course				
Exceptions	N/A				

3. RESULTS AND DISCUSSION

This section reports on the multifaceted evaluation outcomes AI-powered chatbot designed for IT Project Management concept. It focuses on describing the system's proficiency in user engagement with both students and lecturers, emphasizing accessibility enhancements for users, and describing the AI's effectiveness in comprehending diverse queries while delivering prompt, accurate, and contextually relevant responses within the specialized domain of IT Project Management.

3.1 Result

The user evaluation reflects a nuanced perspective on the online learning empowered with AIpowered chatbot's interface which is designed for IT project management experts'. Despite an initial positive reception and promising usability in the UI Satisfaction Result, the heuristic evaluation uncovered vital areas necessitating enhancement. Notably, while the chatbot boasts a user-centric interface powered by Laravel and OpenAI's GPT-3.5-turbo, offering instant, precise responses, it also revealed crucial design elements that require refinement. Although the chatbot ensures a streamlined conversational experience through speech-to-text and text-to-speech features, areas such as consistent design, universally understood icons, and navigation cues demand attention for improved user comprehension and intuitive interaction.

Furthermore, the content evaluation elucidates both strengths and weaknesses in the chatbot's information presentation. While the concise and jargon-free content contributes positively to user experience, shortcomings in navigational aids, content placement, and search functionality emerge as critical areas necessitating improvement. Despite the chatbot's clarity in terminology and minimal text approach, the evaluation underscores the need for clearer presentation of major headings, improved navigation conventions, and enhanced accessibility features like help availability and intuitive search options. Integrating these enhancements could significantly augment user accessibility and facilitate streamlined information retrieval within the chatbot's system.

3.2 Content Design



Figure 4. Homepage

Figure 4 shows the homepage layout of the chatbot. Students and lecturers can access the Homepage by entering the URL of the chatbot at Google search bar. Once the student or lecturer are at the Homepage, they need to either click on the log in button or sign-up button to access the chatbot. If the student or lecturer wants to learn more about the chatbot, they can click on the learn more button and they will be directed to the about us page



Figure 5. About Us Page

Figure 5 shows the about us page layout of the chatbot. The page begins with an eye-catching headline or tagline of the chatbot, capturing the essence of the chatbot's purpose. Following that, a detailed description of the chatbot's features is presented, highlighting the functionalities that set it apart from others in the market. The layout also incorporates a section showcasing the profiles of development team, providing insights into their expertise and passion of the development team.

Welcome Back				
Email Address	student@student.com			
Password				
	Enrgot Yout Pasteeoroff or Sign Ma Far New Account			

Figure 6. Login Page

Figure 6 shows the log in page layout of the chatbot. Before students or lecturers access the chatbot, they need to log into their account or create a new account. Students and lecturers must ensure that the username or password are key in correctly to proceed to the next step. If the students or lecturers forgotten their password, they can click on the forget password button to create a new button. Students and lecturers can save the created password so that they would not forget their password easily.

Create Your Account				
Name	Jay Worg			
Ereal Address	mderl29mdert.com			
Passecret				
Carden Password		•		
	Attack (Swedermark)			
	Rente			

Figure 7. Sign Up Page

Figure 7 shows the sign-up page layout of the chatbot. Students and lecturers can create an account with the sign-up features if they do not have an account. When creating an account, students, and lecturers need to select the correct category to access the correct chatbot interface as the features for both student chatbot interface and lecturer chatbot interface are completely different.

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💏 ChatterBot 🛛 🤫	User List				
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A. Review User	Lecturar	lethrer@lethrer.com	Lecturer	\$2y\$105vbeXRHOBwpicgHBl2h450Bv1r/bpHveZpirXvgh2/7gk4p/Wque	Denni
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	Jessilyn Lim	student1@student.com	Student	\$2y\$10520728mAgen/EWzAr4erFet0HrEENQBIGwtYAdw/M50000m50gRNsAK	100 Children
Admin (2) 43					

Figure 9. Admin's Interface Page for user review

Once the admin successfully logs into their account, the admin will be directed to the admin's interface page as shown in Figure 8 & Figure 9. In this interface, the admin can access the user register feature to add a new user's email address and specific user type and review user feature which allows admin to review existing user accounts or to make potential changes towards the existing user accounts.

Figure 10 shows the student;s interface page layout of the chatbot. With this interface, the student can directly input queries while the chatbot provide relevant information or responses. Other than direct quires input, the student also able to access other features of the chatbot such as student and lecturer chat feature, assessments feature.
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Figure 10. Student's Interface Page



Figure 11. Student & Lecturer Chat Page / Chatbot Page

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Figure 12. Student Exam's Interface Page

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Figure 13. Student Result's Interface Page



Figure 14. Lecturer's Interface Page





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Figure 16. Lecturer's Exam Planning Page

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Figure 17. Lecturer's Q & A Planning Page

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Figure 18. Student Exam Marks Page

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3	Assilue Lim	Text 1	Approved.	Completed
4	Jessilyn Lim	testing1234	Appresent	Completed
5	Student	testing1234	Approved	Completed
6	Stadent.	testing1234	Approved	Completed
7	Student	testing1234	Approved	Completed
8	Jessityn Lim	testing1234	Approved	Completed
0	Jeostyn Lim	testing1234	Approved	Completed
10	Jessilyn Lim	testing1234	Approved	Completed
83	Jensityn Lim	testing1234	Approved	Completed
12	Jessiye Lim	TEST	Approved	Completed

Figure 19. Student Exam Approval Page

4. DISCUSSION

The evaluation results underscore the transformative potential of the AI-powered chatbot within educational contexts. Discussions surrounding its performance highlight its pivotal role in fostering efficient learning and teaching environments. Lecturers can effectively leverage the chatbot to streamline assessments and gain valuable, data-driven insights, optimizing their instructional approaches. Simultaneously, students reap substantial benefits from personalized assistance and swift access to information, significantly enhancing their learning experiences.

The outcomes of the evaluation phase reaffirm the chatbot's promising contribution to the learning process and enrich our teaching and learning in this digital age. The chatbot's demonstrated functionality and user-friendly interface emphasize its potential to revolutionize educational practices. As discussions emphasize its role in streamlined assessments and data-driven insights for educators, alongside personalized assistance, and information accessibility for students, it becomes evident that the AI-powered chatbot is poised to play a crucial role in fostering efficient, adaptive learning and teaching environments.

5. CONCLUSION

The online audit learning empowered with AI-powered chatbot represents a significant milestone in IT project management education, developed with Laravel and integrated with OpenAI's GPT-3.5-turbo. The document emphasizes the careful design of content and wireframes to create an intuitive interface. Continuous refinement, powered by user feedback, ensures the optimization of the chatbot's capabilities, supporting both students and lecturers effectively in their educational journey.

Acknowledgments: This paper and research would not have been possible without the exception support of Department of Computer Science (DCS), Faculty of Engineering and Information Technology (FEIT), Institute of Graduate Studies and Research (IGSR) and Southern University College (SUC).

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Research Article

Wanderbiz Kiosk

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Abstract: Smart Tourism Kiosk is considered as one of the most significant in services, however, there is an issue which is that the quantity of information provided in the form of an explanation board is minimal, limiting visitors' ability to learn more. When visitors are wandering around the city, they might need information to explore the area, hence finding a tourist information centre could not be inconvenient to them, considering the operating hours are not flexible. Another issue that visitors might face is language obstacles, for example when they travel to some country not all locals are good in their main language such as English. With the existence of WanderBiz Kiosk as Smart Tourism Kiosk, it is enabled to educate and improve learning about the language provided, personalized recommendation with a user-friendly interface and multilingual support. WanderBiz Kiosk aims to improve the tourist experience with convenient and effective means for visitors to obtain information, encourage tourists to fully explore and engage with local businesses, events, and cultural experiences at the destination, and promote sustainable choices of information for tourists and non-tourists.

Keywords: Smart Tourism Kiosk; Wanderbiz Kiosk; tourist information; personalized; user-friendly.



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1. INTRODUCTION

WanderBiz kiosk provides travel information by seamlessly blending the technology and personalization. WanderBiz Kiosk offers the tourist an interactive hub for instant access to local insight by promoting local Small Medium Enterprise (SMEs) and providing the info of tourist attraction, personalized recommendation with a user-friendly interface and multilingual support as the main language including local Sabahan language. Tourists can also plan their journey efficiently by using this kiosk. Moreover, this kiosk is environmentally friendly since no physical brochures or maps are used, therefore, WanderBiz Kiosk can also help to improve the overall quality of the tourist experience while promoting local businesses and attractions.

2. METHOD & MATERIAL

This project aims to develop an all-in-one kiosk called WanderBiz Kiosk. For the process, first the team identified what are the most problems tourists or visitors might face when traveling such as where to eat, what attractions are being offered, transportation problems or what are the popular souvenirs. The team also found that not all people will understand the national language like Malay or English. Next, for the designing process, the team start with sketching the interface. After that, the team used Canva to make the prototype.

3. FINDINGS

Visitors commonly arrived at their location with a plan of what to see and do. The problem arises when the quantity of information provided in the form of an explanation board is minimal, limiting visitors' ability to learn more. For example, visitors frequently complain that such information in traditional writing is sometimes inadequate as visitors cannot capture or imagine the past. Based on Johari et al. (2010), only massive ruins in Melaka, including the famed A Famosa, received dissatisfaction, indicating a lack of awareness among tourists. WanderBiz is revolutionising the way tourists explore new destinations by providing them with an interactive hub that offers instant access to local insight and personalised recommendations. With its user-friendly interface and multilingual support, this innovative kiosk empowers users to efficiently plan their journeys and make the most out of their travel experiences.

3.1 Encourages tourists to fully explore and engage with local businesses, events, and cultural experiences at the destination

By utilising smart kiosks, the platform can effectively highlight and advertise local establishments, thereby expanding their reach to a broader audience. This enhanced visibility directly translates into a higher number of customers and increased revenue for Small Medium Enterprise (SMEs) especially for the local, ultimately making a substantial contribution to the overall economic growth of the community. Moreover, WanderBiz can be utilised to actively promote and publicise local events, festivals, and cultural activities. As a result, the heightened attendance at these occasions not only benefits the organisers but also generates a rise of economic activity in the surrounding areas. SMEs hold a crucial position in the Malaysian economy, serving as its fundamental pillars, according to Radam et al. (2008).

3.2 WanderBiz Kiosks offered tailored suggestions such as customized itineraries, dining place recommendations, or activity options and to educate and improve learning about the language provided

The suggestion from Lin and Sukato, 2014 as the ease of use, interactivity, and flexibility of this system will attract tourists and give them innovative travel experiences, which will improve the perceived image of the rural tourism destination. WanderBiz Kiosk recommends a comprehensive understanding of the user's interests, demographics, and past behaviour, ensuring a highly personalised and relevant experience. Therefore, WanderBiz Kiosk will make suggestions by considering the tourist preferences, at the same time to educate and improve learning about the language provided especially adding the local language by supporting the Small Medium Enterprise (SMEs).

4. DISCUSSION



Figure 1. WanderBiz Kiosk Logo

WanderBiz is a tourism kiosk that integrates and offers a variety of services such as navigation, food and beverage locations, tourist attractions, transportation and a kiosk that may assist design tourist itineraries. The name itself shows the advancement of technology use of Smart Tourism Kiosk including new things in kiosks system which attract the tourist. Beyond its literal interpretation, the logo "Bee" presents a captivating array of activities and attractions that are designed to provide visitors with sweet and memorable experiences. Just as bees buzz around flowers, collecting nectar and creating honey, the "Bee" logo invites individuals to explore a world of sensory delights and immersive encounters. The "Bee" logo also serves as a vibrant and interactive space that celebrates the wonder and importance of bees. It offers a blend of education, entertainment, and culinary delights, ensuring a sweet and memorable experience for visitors of all ages. Whether you are a nature enthusiast, a curious learner, or simply looking for a fun and educational day out, the "Bee" logo promises a delightful and unforgettable adventure. Next, with the help of the WanderBiz project, Small Medium Enterprise (SME's) around Sabah can also promote their goods to tourists. Examples of things they can promote are handicrafts. This can help tourists to know where to find a craft store at the location and what souvenirs are being offered to them. This kiosk also provides a multilingual support that focuses on the local Sabahan language.and has technical assistance, such as assistance from artificial intelligence (AI) known as Zen. This allows tourists to quickly access information about the places they visit when using our product and services. Followings are the 12 prototypes of this kiosk with different functionalities.





Figure 2. WanderBiz Kiosk 3D Design

Table 1. Prototypes Design and Descriptions

Prototypes Design	Description	Prototypes Design	Description
Main Melcome to Kota Kinabalu, Sabab. But Relosane Bornean state, Subre Mind, that have, Subre Mind, thathave, Subre Mind, t	Step 1 WanderBiz homepage before tourists started to use the service.	WanderBiz Ptease Select Your Language English Malay Kadazandusun Murut Rungus Mandarin Korea Next	Step 2 Tourists can choose any language they can easily understand. The languages provided are English, Malay, Local Sabahan language, Mandarin and Korean.





5. CONCLUSION

In conclusion, WanderBiz Kiosk as a Smart Tourism Kiosk is beneficial to the tourist as well as the Small Medium Enterprise (SMEs) which increased the contribution to the overall economic growth of the community. WanderBiz is transforming how tourists engage with new destinations. Its interactive hub presents an array of local insights and customized suggestions, all at the user's fingertips. Through this innovative kiosk, travellers can effortlessly plan their journeys, accessing valuable information in multiple languages. WanderBiz empowers tourists to make the most of their travel experiences by providing a user-friendly interface that enhances their exploration. The platform can effectively highlight and advertise local establishments, thereby expanding their reach to a broader audience and recommends a comprehensive understanding of the user's interests, demographics, and past behaviour, ensuring a highly personalised and relevant experience. At the same time, to educate and improve learning about the language provided especially adding the local language by supporting the Small Medium Enterprise (SMEs) especially in Sabah.

Acknowledgments: We would like to express our deepest appreciation to the individuals and institutions that followed for providing us with essential support, direction, and help during the research and writing phases. To begin with, we wish to express gratitude to Madam Nurafiqah Binti Mohamad Musa as our advisor and also Mr. Mohd Arsy Ardy Bin Mohd Hardy, lecturer for HTT576 (Tourism Product and Innovation), and follow by the members Aedden Octaeven Dolois, Josiah Salleh, Nurul Syahirah Binti Azlyzan, for the steadfast support, wisdom, and insightful advice. The course of this innovation has been greatly influenced by mentorship and advice. We also acknowledge the support we received from the Universiti Teknologi MARA, Faculty of Hotel and Tourism Management, which gave us the tools, space, and chance to carry out this study. Our advancement as students has been greatly aided by their dedication to encouraging innovation and academic growth.

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Research Article

Sistem Tempahan Barang di Jabatan Pembangunan dan Penyelengaraan (e-Tempahan)

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Abstract: An inventory system is a tool or mechanism used by an organization to manage and monitor their inventory. It involves a variety of processes ranging from stock monitoring and order management to improving the level of efficiency in stock management. Currently, the loan process in the Jabatan Pembangunan dan Penyelengaraaan (JPP) UPNM still uses a form that takes a long time in addition of hindering the applicant to take follow-up action. Applicants need to call the asset officer who will contact the officer with the storage officer to ensure the availability of the item. According to the results of interviews with some of the respondents, the current process of borrowing goods is difficult, especially for the student group that needs the approval of the student body advisers involved. To address the problem, Sistem Tempahan Barang di Jabatan Pembangunan dan Penyelengaraan (JPP) UPNM (e-Tempahan) was developed to facilitate the process of borrowing goods. The system development methodology is based on the Rapid Application Development (RAD) methodology that involves four phases: planning, design, development, and implementation. The booking system at JPP UPNM is developed using programming languages such as HTML, PHP, and CSS. In addition, MySQL is also used as a database to store necessary data such as user lists, items list and booking lists. The result of the development of this system is that it can facilitate the ordering of goods by JPP UPNM in addition to helping the JPP to monitor the current inventory.

Keywords: inventory; Asset; Jabatan Pembangunan dan Penyelengaraan UPNM.



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1. INTRODUCTION

Jabatan Pembangunan dan Penyelengaraan (JPP) UPNM is responsible for planning, execution and maintaining campus facilities, building and infrastructure. Tasks that may be undertaken by this department include developing campus development plans according to university needs. Additionally, JPP is responsible for organizing new development projects such as academic buildings, lecture halls, dormitories, and other facilities. The department also needs to maintain and manage campus facilities by handling necessary repairs and improvements. JPP was established on February 1, 2008, initially led by only one Director and later receiving the entry of other staff starting in mid-March 2008. As of now, JPP consists of a total of 45 staff members. JPP plays a role as a department committed to enhancing the quality of project management and facility maintenance services to meet customer needs by practicing a quality university facility maintenance delivery system.

2. METHOD & MATERIAL

The process of creating a software system comprises various stages known as the software development life cycle. Within this cycle, multiple development models can be utilized to facilitate project development. Commonly employed system development methodologies include the Waterfall Model, Rapid Application Development (RAD) and Prototype Model. Each model boasts its unique set of strengths and benefits.

During the development of the e-Tempahan (an inventory ordering system for JPP), Rapid Application Development (RAD) methodology was chosen. This selection was primarily driven by RAD's capability to expedite project completion compared to other methodologies. The entire process, from initial planning to prototype creation and final product delivery, can be accomplished within a few months. Furthermore, the prototype model entails the creation, testing, and refinement of prototypes based on user specifications. This approach encompasses four crucial phases: planning, user needs analysis, design, and implementation and development. These phases undergo iterations until the entire system is fully developed. The iterative modification process within the prototype model ensures that the system prototype evolves in accordance with user requirements.

The four phases of the RAD process are as follows:

- 1. Determining requirement
- 2. User design
 - 2.1. Prototype
 - 2.2. Design
 - 2.3. Refine
- 3. Construction
- 4. Implementation

3. FINDINGS

This section explains the system analysis study and sketches used to develop this system. In addition, system analysis is a method to find solution to the existing method filling up the form and books to keep records of the movement of an asset. This system was expected to automate the lending and borrowing process of assets in UPNM.

3.1 Analysis Phase

The analysis phase is the stage where the needs and requirements of the system are studied before the system is constructed. Figure 1 illustrates a diagram of the analysis process. Within this phase, four main processes are employed to conduct system analysis for the e-Tempahan system. These processes include:

- 1. Need Modeling (software and tools)
- 2. Data and Process Modeling (Context Diagram, Zero-Level Data-Flow Diagram, Data-Level Flow Diagram 1)
- 3. Object Modeling (Entity Relationship Diagram)
- 4. Transition to System Design (Data Dictionary, Flowchart, Hierarchy Chart)



Figure 1. Analysis Phase Process

3.2 Data Modelling Phase

The Data Modelling is a process that involves gathering information to identify needs such as input, output, processes, performance, and security (Shelly & Rosenblatt, 2012). This allows the system that planned to be develop illustrated as a symbol representing processes, inputs, databases, and output. Figure 2 shows the system context diagram.



Figure 2. e-Tempahan Context Diagram

3.3 Zero Level Data Flow Diagram

To further understand the system, Data Flow Diagram (DFD) were used to explain the entirety of the system. DFD shows about the data flow, processes and entity that involves. Figure 3 shows the e-Tempahan data flow diagram level zero diagram while Figure 4 shows the system data flow diagram level one.



Figure 3. Data Flow Diagram Level Zero



Figure 4. Data Flow Diagram Level One

The system comprises two main processes: "Log Masuk" (Login) where users input their credentials for validation and gain access, and "Pinjam Barang" (Borrow Item) where users request to borrow an item, which the system verifies and updates the status accordingly. Staff have access to "Pengesahan Maklumat Pengguna" (User Information Verification) to check user information status, "Pengesahan Permohonan" (Request Verification) to review request statuses, and "Semak Item" (View Item) to inspect item details and statuses within the inventory. This Level 0 Data Flow Diagram provides a high-level overview of interactions between the system and external entities without delving into internal processes.

3.4 Transition Phase to System Design

The Transition Phase to System Design is the final phase where the transition from data modeling to the design of the system occurs. Some of the system design elements in this phase include data dictionaries, hierarchy charts, and flowcharts.

3.5 Hierarchy Chart

E-Tempahan has two entities namely Users and Administrators. Both entities need to log in to the system to initiate any process. Users can initiate the item reservation process after logging in. After submitting the request, Users can check the status of their application. Administrators will manage requests from users by checking the inventory database before deciding on the application. In addition, administrators can also check the status of approved reservations, besides having the same interface as users, allowing administrators to view the application status of an individual. Figure 5 shows the hierarchy chart for both entities.



Figure 5. Hierarchy Chart Diagram

3.6 Flowchart

Flowchart is a process of providing a rough overview of the sequence of processes and functions within a system. Flowchart of the system is shown in the diagram in Figure 6.



Figure 6. Flowchart of the *E=Tempahan* system

3.7 System Interface

Figure 7, 8, 9, and 10 shows the interface design of the developed system.



Figure 7. Login Interface of e-Tempahan

Home	ALC: NOT		Place	Your Ord	ler
Order			Nar	ta Pertohon	
Check Status			1	No. Tel	
Laura			E.	Tank	
regost			140	m/2/27 II	
		Name	SiriNum	Available	Quantity
		Induitrié Film	UPNW/PPNP	36	
		Office Chair	UPNW/PPyoc1	18	
		Office Desk	UPNWJPP/00	£	
				-	

Figure 8. e-Tempahan Order Interface



Figure 9. Admin Home Page



Figure 10. e-Tempahan Add User Interface

4. DISCUSSION

In addition to being simple to use, e-Tempahan offers a wide range of benefits that may be exploited in the process of achieving the objectives for the project. There are a number of benefits, one of which is that it ensures the security of the essential information that is stored within the database. Managed to develop a secure website that incorporates safety precautions throughout the entire process of registering and logging in. When it comes to the process of borrowing process, one of the most important things to focus on is getting rid of manual procedures like filling out paperwork to automated online system. The practice of managing inventory and equipment is made more efficient by this system, which also provides support to JPP . In conclusion, the system is designed to be easily accessible to users due to the fact that it is developed on a web-based online platform.

However, despite its advantages, there are still weaknesses that need improvement. These weaknesses include:

- a) Inefficient return process where manual updates are required after borrowed items are returned.
- b) Users cannot update their profiles after successful login.
- c) Reservation status can only be checked by users after logging in without any notification after being answered by the administrator.

5. CONCLUSION

The e-Tempah system for JPP UPNM is seen as capable of achieving the research objectives set and fulfilling the established scope. However, several improvements need to be implemented in the future to introduce new features and enhance this system. The e-Tempah system is highly suitable for implementation in the process of item borrowing to facilitate the borrowing process. The objective of this system is:

- a) Developing the e-Tempahan system to facilitate the reservation of items from the Jabatan Pembangunan dan Penyelengaraan (JPP) UPNM.
- b) Studying the best procedures for managing the item borrowing process from JPP UPNM.
- c) Designing a database capable of storing data related to outgoing and incoming items at JPP UPNM.

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Research Article

Instructional Video on Breast Self-Examination (BSE)

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Abstract: Despite the importance of breast self-examination (BSE), many women do not understand the proper techniques or feel confident in their ability to perform them. This can lead to missed opportunities for early detection and treatment of breast cancer. Traditional BSE pamphlets may not be effective in reaching and educating women, particularly those who are less literate or have limited access to health information. This innovation project aims to transform a traditional BSE pamphlet into an instructional educational video. The video is designed to educate women on how to perform a BSE clearly and concisely. The video is created using modern technology involving a team of experts in the breast cancer field, video production, and instructional design. This will improve their understanding and increase their confidence in performing breast self-examinations. The video can be used as a training tool for healthcare professionals who work with women on BSE techniques and as a resource for breast cancer awareness campaigns and events. The video can also be monetized through advertising or sponsorship opportunities.

Keywords: Breast cancer; Breast self-examination; Instructional video.



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1. INTRODUCTION

Even though it is a crucial practice, many women are unsure of how to perform breast selfexamination (BSE) or lack confidence in their skills which can lead to missed opportunities for early detection of breast cancer. Research has shown that BSE pamphlets often contain an unbalanced proportion of threat to efficacy arguments, with weak efficacy messages, which can impact their effectiveness in educating women about BSE (Kline & Mattson, 2000). BSE pamphlets may also not be effective, especially for those who are less literate and have limited health information access.

However, educational interventions, such as simulation models and health education with media leaflets, are effective in improving knowledge and attitudes toward BSE among women (Idrees et. al., 2023; Sarker et. al. 2022). These findings emphasize the importance of exploring alternative educational strategies to effectively promote BSE and improve women's confidence and ability to perform it. Thus, this innovation project aims to transform a conventional BSE pamphlet into an instructional education video.

2. METHOD & MATERIAL

The style, scope, storyboarding, and scriptwriting were considered during the pre-production stage. The content created was engaging by adding interactive elements, informative, and easy to follow. The script was drafted and taken from the guidelines provided in the Ministry of Health, Malaysia website. The script was drafted in Malay and has been validated by a content and language expert.

The preparation for filming during production was set focusing on the light, sound, and demonstration equipment for optimizing video production in a non-studio setting. The BSE demonstration was done using breast phantom made of 3B SKINlike[™] (*3B Scientific, Germany*) high-quality silicone. Finally, during post-production, the video was edited, with an audio narration, and interactive elements like arrows, shapes, and sketch motion to highlight key points.

The video was created shorter and used a conversational tone to engage viewers. A survey using Google Forms was distributed to respondents during a breast cancer awareness campaign. The purpose of the survey is to get feedback and opinions.



Figure 1. The screenshot of the instructional video demonstrating the BSE technique in detail on breast phantom made of 3B SKINlike[™] (*3B Scientific, Germany*) high-quality silicone.

3. FINDINGS

A total of 54 persons participated in a poll on the instructional video's efficacy as part of the breast cancer awareness campaign. The age group with the largest percentage (33.3%) is 18 to 30 years old. This is followed by 30 to 40 years old (24.1%), 40 to 50 years old (22.2%), age over 50 (18.5%), and age under 18 (1.9%). Figure 2 presents the detailed feedback and the impact of the instructional video on their knowledge and motivation to perform BSE.



Figure 2. Feedback and the impact of the instructional video on knowledge and motivation to perform BSE.

4. DISCUSSION

4.1 Uniqueness

This video is different than any other educational video since it presents detailed palpation techniques using breast phantoms that have the same tissue composition as human breast tissue. It provides a realistic scenario for learning BSE. This will increase the confidence and ability of women to perform BSE. The video also provides a step-by-step guide to performing BSE, including how to examine the breast tissue, what to look for, and how to identify any abnormalities.

4.2 Benefits

This type of educational video can be particularly useful for women who are less literate or have limited access to health information, as it provides a visual and interactive way to learn about BSE. Videos are a powerful tool for visually captivating and successfully communicating complicated information, helping viewers remember information and rapidly pick up important points. In addition to letting people learn at their own pace and convenience, videos can reach enormous audiences regardless of where they are in the world and provide the option to pause, rewind, and repeat sections as needed, which promotes a deeper understanding and memory of the material (Karimian et. al., 2022).

4.3 Commercialization

The video can be sold or licensed to healthcare providers, educational institutions, and other organizations interested in promoting BSE and early detection of breast cancer. The video can also be monetized through advertising or sponsorship opportunities. Given the importance of the content in promoting women's health, it can attract sponsors or advertisers interested in supporting such initiatives. It can also be used as a valuable resource for professional training and resource for breast cancer awareness campaigns and events.

5. CONCLUSION

Instructional video on BSE has a high potential to increase awareness of the importance of BSE and boost motivation among women to perform it. It also has the potential to be commercialized through various channels making it a valuable resource for both healthcare professionals and the general public.

Acknowledgments: The authors are thankful to the Medical Imaging Department, KPJ Healthcare University, and Diagnostic Imaging Services, KPJ Seremban Specialist Hospital for the support and encouragement in this research innovation. We are very grateful to the Department of Student Affairs at KPJ Healthcare University and Jabatan Pembangunan Wanita Malaysia through Pejabat Pembangunan Wanita Negeri Sembilan for organizing the Breast Cancer Awareness Campaign and we thank all respondents who willingly helped us to respond to our survey and share with us their thoughts about the innovation.

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Research Article

Fun Kit

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Abstrak: Fun Kit adalah inovasi yang digunakan berfokus untuk meningkatkan kefahaman dan minat murid terhadap topik Pengawetan Makanan. Fun Kit merupakan sebuah kotak yang mengandungi 4 set permain an berunsur roda dan warna, percantuman puzzle, penyusunan huruf, lontaran dadu, dan penghasilan gambar. Ia mempunyai empat tahap permainan yang berbeza mengikut kebolehan murid. Ia boleh digunakan oleh murid yang tidak tahu membaca sehingga yang telah mahir dalam topik tersebut dan menjadikannya sebagai aktiviti pengayaan. Ia dilengkapi dengan gambar-gambar berwarna, menarik,berunsur permainan dan mencabar. Dalam menjalankan ujin kami terhadap murid, aktiviti Fun Kit berpusatkan murid ini digunapakai kepada 20 murid sasaran tahun 6 yang tidak menguasai tajuk tersebut. Mereka kelihatan tidak berminat dan menganggapnya susah kerana melibatkan banyak perkara yang perlu diingati dan difahami pada awalnya. Setela menggunkan Fun Ki,t, melalui pemerhatian dan temu bual, murid menunjukkan perkembangan positif terhadap penerimaan mereka untuk mempelajari Pengawetan Makanan. Kefahaman terhadap kandungan pembelajaran juga meningkat setelah kami menjalankan ujian pra dan post terhadap penggunaan Fun Kit ini. Fun Kit berjaya membantu guru dalam meningkatkan penguasaan kandungan dan minat murid terhadap topik Pengawetan Makanan.

Kata kunci: Brpusatkan murid; permainan; pelbagai aras.



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1. PENDAHULUAN

Inovasi Fun Kit yang telah dihasilkan menerapkan konsep IBSE dalam penghasilannya. Pengajaran ini membabitkan penglibatan murid secara aktif dan guru hanya sebagai pemudahcara atau fasiitator. Pendidikan di Malaysia ketika ini menjurus kepada 3 hala tuju pendidikan iaitu pendidikan yang berteraskan nilai, peningkatan kualiti seluruh sistem, serta autonomi dan akauntabiliti di sekolah dan universiti. IBSE yang mengetengahkan konsep hala tuju pendidikan yang kedua, yang merujuk kepada salah satu usaha Kementerian Pendidikan Malaysia dalam meningkatkan pengetahuan teknologi dan komunikasi (ICT), memperluas pendidikan Sains, Teknologi, Agama, Kejuruteraan, Seni dan Matematik (STREM) serta meningkatkan penguasaan bahasa Inggeris. Inovasi Fun Kit ini digunakan dalam pembelajaran pada Standard Kandungan 8.1 Kerosakan makanan sementara Standard Pembelajaran ialah 8.1.4 Menjelas dengan contoh kaedah pengawetan makanan serta mengaitkan dengan faktor yang mempengaruhi pertumbuhan mikroorganisma seperti: pengeringan; pendidihan; pendinginan; pembungkusan vakum; penjerukan; penyejukbekuan; pengetinan dan pembotolan; pempasteuran; pemasinan; penyalaian; pelilinan.

Pembelajaran menggunakan Fun Kit ini dimodularkan dalam sebuah rancangan pengajaran dengan topik pembelajaran Sains Tahun 6 yang lepas iaitu Standard Kandungan 3.1 Mikroorganisma adalah benda hidup dan Standard Pembelajaran 3.1.4 Mengeksperimen untuk menentukan faktor yang mempengaruhi pertumbuhan mikroorganisma iaitu air, udara, suhu, nutrien dan keasidan, di samping turut merangkumi Standard Kandungan dan Standard Pembelajaran dari mata pelajaran Bahasa Melayu Tahun 2 Standard Kandungan 1.2 Bertutur untuk menyampaikan maklumat dan idea bagi pelbagai tujuan dan Standard Pembelajaran 1.2.1 Bertutur untuk menjelaskan sesuatu perkara secara bertatasusila mengikut konteks.

Standard-standard prestasi dan tahap penguasaan yang ingin dicapai ialah 1) Mencirikan makanan yang telah rosak, 2) Menjelas dengan contoh kaedah pengawetan serta mengaitkan dengan faktor pertumbuhan mikroorganisma, 3) Mengitlak pengawetan makanan bertujuan untuk menghalang atau melambatkan proses hidup mikroorganisma, 4) Merumuskan kepentingan teknologi pengawetan makanan bagi memenuhi keperluan bekalan makanan, 5) Menaakul kesesuaian kaedah pengawetan bagi satu jenis makanan dalam mengekalkan tekstur, rupa atau rasa dan 6) Berkomunikasi secara kreatif dan inovatif tentang peranan teknologi pengawetan makanan dalam pembangunan ekonomi negara.

Pembelajaran tajuk Pengawetan makanan pada awalnya telah dijalankan pada waktu pertemuan pertama. Dalam rancangan pembelajaran tersebut, murid dilihat tidak dapat menguasai isi kandung topik pembelajaran dan tertanya-tanya apa yang mereka lakukan apabila diarah membuat aktiviti. Mereka tidak dapat memfokuskan kepada aktiviti dalam kelas kerana tiada tarikan yang dapat membuatkan mereka berminat. Satu aktiviti pengawetan ringkas dijalankan pada awal fasa *explore*, ketika sebahagian dari mereka tidak menumpukan perhatian.

Mereka kemudiannya tidak bersungguh dalam aktiviti pengawetan yang kedua di fasa elaborate kerana sejak awal lagi mereka telah hilang minat. Kami tertanya-tanya apakah punca mereka tidak berminat, sedangkan perancangan dan aktiviti yang dilakukan sepatutnya berjalan dengan baik dan seronok. Hal ini membuatkan kumpulan inovasi/penyelidik terpanggil untuk mengkaji apakah yang boleh dilakukan bagi memperbaiki lagi pembelajaran yang kumpulan inovasi/penyelidik rancangkan, dan menghasilkan satu inovasi bagi meningkatkan minat dan pemahaman murid agar menjadi lebih baik.

Kumpulan inovasi/penyelidik mengambil langkah untuk menghasilkan sesuatu yang dekat dengan murid. Murid sasaran adalah berkarektor yang suka bermain, tidak minat belajar, dan sukar untuk memberikan perhatian. Oleh itu, penghasilan bahan inovasi mestilah yang mampu menarik minat murid, dan yang paling penting adalah berunsurkan permainan. Selain itu, kumpulan inovasi/penyelidik juga menggunakan warna-warna yang dapat menambat hati murid untuk menanamkan minat terhadap tajuk pengawetan makanan. Gambar-gambar juga menjadi salah satu aset penting dalam penghasian inovasi ini. Maka, terhasillah Fun Kit.

Murid-murid yang terlibat dalam kajian ini adalah murid-murid Tahun 6, iaitu berumur 12 tahun. Mereka adalah dalam kalangan murid yang berada pada tahap pertengahan dalam pencapaian akademik. Mengambil kira Teori Perkembangan Piaget, menyatakan bahawa murid pada umur 11-15 tahun berada pada tahap perubahan pemikiran daripada logik konkrik kepada abstrak. Pemikiran ini berada pada operasi formal. Oleh sebab pemikiran operasi formal sanggup membuat penaakulan

terhadap sesuatu kemungkinan, ia telah sedia untuk menguji idea, kebenaran dan pemikiran saintifik. Jadi, penggunaan Fun Kit dalam pembelajaran ini adalah selari dengan jiwa mereka dalam menjalani aktiviti pembelajaran.

2. KAEDAH & BAHAN

- 2.1 Bahan Yang Digunakan Dan Penghasilan Inovasi
 - Set 1: HOWWOW = Mounting board, Skru, wasih, Kertas A4, Kertas laminated
 - Set 2: IQ BOX = Kotak, Kertas A4, Kertas laminated
 - Set 3: Suai Cantum = Plastik keras A4, Kotak, Binding tape
 - Set 4: Tarcia Puzzle = Kertas A4, Kertas laminated, Kanta pembesar.

2.2 Kaedah Inovasi Digunakan

FUN KIT terdiri daripada sebuah kotak yang terdapat di dalamnya 4 set aktiviti yang berkenaan dengan topik Pengawetan Makanan. Setiap set berada pada tahap (*Stage*) tersendiri. Fun Kit boleh dimainkan mengikut tahap murid, tidak semestinya bermula daripada stage 1, dan juga boleh digunakan mengikut kesesuaian tahap pengetahuan murid. Untuk murid sasaran kami, Permainan dibuat bermula pada *stage* 1 sehingga 4. Setiap stage terdiri daripada set aktiviti seperti berikut:

2.2.1 Stage 1: Set 'HOWWOW'



Rajah 1. Set 'HOWWOW'

- I- Permainan boleh dimainkan berdua hingga 4 orang. Setiap murid akan mendapat jumlah kad yang sama secara rawak (terpulang kepada persetujuan semua pemain).
- II- Murid memutarkan roda mengikut giliran. Pemain yang membuat putaran akan meletakkan kadnya di sebelah roda sekiranya kad itu menunjukkan gambar makanan yang boleh diawet dengan cara tersebut (dibantu dengan petunjuk warna pada kad dan roda).
- III- Murid yang dapat menghabiskan kad terlebih dahulu akan dikira sebagai pemenang.

2.2.2 Stage 2: Set IQ BOX



Rajah 2. Set IQ BOX

Cara pelaksanaan IQ BOX ini ialah murid bermain berpasangan atau berkumpulan. Mereka perlu membaling dadu bergambar yang menunjukkan maklumat untuk satu ciri pengawetan makanan. Mereka perlu membaca maklumat, cuba untuk mencari jawapan yang betul dan membentukkan perkataan daripada kad- kad huruf berwarna yang sama warnanya dengan petunjuk warna yang ada di hujung kanan permukaan dadu.

2.2.3 Stage 3: Set Suai Cantum



Rajah 3. Set permainan gambar 'SUAI CANTUM'

- I- Setiap kumpulan mendapat sekeping sampul yang mengandungi beberapa pecahan gambar yang perlu dicantum menjadi gambar yang lengkap.
- II- Gambar yang telah lengkap dicantum pada bingkai. Bingkai itu kemudiannya diangkat dan murid perlu menyatakan apakah cara pengawetan yang sesuai untuk makanan dalam gambar tersebut.
- III- Murid yang berada di hadapan murid tersebut akan menyemak jawapan yang disebut dan boleh berpandukan kepada jawapan dari belakang bingkai itu.
- IV- Murid perlu menerangkan cara kaedah pengawetan.
- 2.2.4 Stage 4: Set Tarsia Puzzle





Rajah 4. Set Tarsia Puzzle

Set Tarsia Puzzle terdiri daripada kanta pembesar dan beberapa kepingan kertas kecil pelbagai bentuk yang perlu dicantumkan oleh murid bagi menjadi satu bentuk yang besar. Pada kepingan-kepingan kertas kecil ini tertulis soalan-soalan dan jawapan-jawapan berkaitan kaedah pengawetan dan jenis-jenis makanan tertentu yang perlu dipadankan oleh murid. Cara melaksanakan aktiviti ini adalah seperti berikut :

- I- Murid dipecahkan kepada kumpulan kecil yang terdiri daripada 5 orang satu kumpulan.
- II- Setiap kumpulan murid dibekalkan dengan satu set Tarsia Puzzle.
- III- Semua ahli dalam kumpulan perlu berbincang dan berkerjasama untuk memadankan kepingan-kepingan kecil berpandukan soalan yang tertulis pada sisinya dan jawapan yang betul. Murid menggunakan kanta pembesar untuk membaca soalan dan jawapan tersebut.

- IV- Pada akhirnya murid akan dapat menghasilkan suatu bentuk yang lebih besar.
- V- Murid membentangkan dapatan aktiviti di hadapan kelas.

3. DAPATAN KAJIAN

3.1 Pemerhatian

Jadual 1. Data pemerhatian

TANPA PDPC FUN KIT	MENGGUNAKAN FUN KIT
Murid kelihatan bosan dan tidak menumpukan perhatian.	Murid sangat teruja untuk menjalankan aktiviti.
Murid malas untuk membuat aktiviti secara tiba-tiba dan cuba untuk tidak mengambil bahagian.	Murid tertarik dengan FUN KIT dan segera menggunakannya.
Kelas dijalankan dengan hambar dan murid tidak menunjukkan kesungguhan.	Kelas sangat aktif dan murid berbincang sesama mereka untuk bermain pada setiap stage mengikut kemahuan mereka.

3.2 Temu bual.

Jadual 2. Contoh temu bual

SOALAN TEMU BUAL	JAWAPAN TANPA FUN KIT	JAWAPAN MENGGUNAKAN
		FUN KIT
Apakah perasaan kamu belajar	Entahlah, cikgu. Macam tu lah	Seronok, cikgu. Kelas akan datang
tajuk pengawetan?		kita buatlah lagi cikgu!
Apa yang kamu faham tentang	Belajar proses banyak, entah la cikgu	Kita buat Fun Kit pengawetan nak
aktiviti kita pada hari ini.	tak ingat.	tau cara makanan tahan lama,
_	-	cikgu.
		-

3.3 Ujian Pra – Post.



Rajah 5. Carta Palang Perbandingan Pencapaian Murid.

4. PERBINCANGAN

4.1 Pemerhatian

Melalui pemerhatian yang telah dibuat, murid kelihatan sangat seronok dan teruja dalam menjalankan aktiviti. Mereka sentiasa tertanya-tanya apakah seterusnya yang perlu dibuat. Mereka kelihatan sangat bersungguh dalam menjalankan aktiviti. Terdapat juga antara mereka yang cuba untuk mempelbagaikan permainan yang dilakukan untuk melihat sama ada terdapat penemuan lain yang mungkin terhasil. Mereka kerap bertanya soalan dan hal ini menunjukkan peningkatan minat murid yang sangat ketara berbanding dengan belajar teori dan melihat melalui gambar-gambar yang terdapat dalam buku teks. Hal ini juga secara tidak langsung dapat menarik minat murid belajar Sains dan dapat mengurangkan gejala ponteng sekolah.

4.2 Temu bual.

Perbezaan cara menjawab murid adalah sesuatu yang sangat bermakna dan berguna dalam menilai secara profesional tahap penglibatan mereka dalam aktiviti pembelajaran. Sebelum mempelajari topik ini untuk kali kedua, apabila ditanya mengenai pengawetan, mereka sekadar mengatakan bahawa pernah dengar sahaja dan tidak memahami apa itu pengawetan. Apabila ditanya adakah mereka memahami pengawetan, mereka hanya membalas "ya lah cikgu" atau diam sahaja. Selepas menjalani kelas kali kedua dalam pembelajaran menggunakan Fun Kit yang telah diterapkan, murid lebih aktif memberi respon temu bual. Antaranya, apabila ditanya mengenai pengawetan, mereka terus berkata "jom cikgu main lagi Fun Kit". Mereka sangat aktif dan sangat bersemangat untuk menceritakan segala aktiviti yang dilakukan dan dikongksikan dengan rakan-rakan dan guru. Setiap aktiviti yang dijalankan penuh dengan keterujaan dan keseronokan yang membawa kepada penglibatan murid secara lebih aktif.

4.3 Ujian Pra – Post.

Kumpulan inovasi/penyelidik menyediakan satu set soalan berkaitan pengawetan untuk dijadikan sebagai eviden pra post. Kumpulan juga menjalankan ujian kepada 20 orang murid yang terdiri daripada murid tahun 6 SK Bandar Tenggara 1, Kulai. Berdasarkan ujian pra, murid menjawab soalan pada perjumpaan kelas pertama dibandingkan dengan jawapan pada akhir sesi pembelajaran menggunakan Fun Kit ini. Berdasarkan perbandingan tersebut, terdapat banyak peningkatan yang dapat dilihat berlaku terhadap pancapaian murid. Hal ini menunjukkan bahawa pembelajaran melalui kaedah ini sangat memberi kesan yang positif dalam pencapaian murid terhadap isi kandungan pelajaran. Berikut adalah data ujian pra-post dalam jadual seterusnya dimasukkan ke carta bar. Berdasarkan Carta Palang yang ditunjukkan, jelas didapati bahawa kesemua 20 daripada 20 orang murid menunjukkan peningkatan. Hal ini bermakna, 100% peningkatan berlaku kepada tahap penguasaan murid. Peningkatan yang ditunjukkan bermakna murid betul-betul memahami dan menguasai tajuk pengawetan makanan ini. Hampir kesemua mencatat markah penuh. Dua murid yang tidak mendapat markah penuh pada ujian post bagaimanapun cuma melakukan 1 kesalahan kecil yang bersifat cuai. Keadaan ini menunjukkan keberkesanan terhadap penggunaan FUN KIT dalam PdPc ini.

5. RUMUSAN / KESIMPULAN

Secara rumusannya, murid-murid lebih seronok mempelajari tajuk pengawetan makanan ini menggunakan kaedah Fun Kit. Kaedah ini mempunyai susunan aktiviti set yang meningkat mengikut tahap penguasaan murid dan kumpulan inovasi/penyelidik amat bersyukur kerana akhirnya berjaya menarik minat murid-murid ini dan mereka lebih kreatif serta berjaya mencetuskan idea yang mencabar minda mereka dengan memberikan contoh-contoh yang relevan. Guru Sains juga hendaklah kreatif dan inovatif serta bertanggungjawab dalam melaksanakan tugasan di era globalisasi ini. Fun Kit banyak memberi manfaat kepada semua pihak. Bagi murid, mereka menjadi lebih seronok dan memberikan kerjasama dalam proses pembelajaran. Mereka tidak jemu untuk mengambil bahagian kerana penggunaan Fun Kit ini merupakan suatu rancangan berpusatkan murid. Bagi guru pula, menurut Zainol (2008), sebagai seorang guru kita perlu mempunyai kemahiran yang menerapkan kebolehan mengaplikasikan pemikiran saintifik sehingga ke aras kognitif yang tinggi, 'model mental sebab-akibat pelbagai' serta menstrukturkan semula organisasi ilmu pengetahuan untuk kefahaman yang mendalam. Fun Kit merupakan satu cara untuk guru meningkatkan kemahiran ini dengan menggembling murid bagi diaplikasikan dalam pembelajaran dan memberi kesan yang lebih baik bukan sahaja kepada murid, tetapi kepada guru itu sendiri.

Acknowledgments: Terima kasih kepada Bookish Bandar Tenggara sebagai tempat penghasilan bahan inovasi.

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Research Article

Athlete Management System

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Abstract: Technology is evolving at such a rapid pace that everything is accessible at our fingertips. The National Defence University of Malaysia (UPNM) Athlete Information System was developed because the Defence Fitness Academy (AKP) responsible for managing UPNM athlete information was found to still be using a manual method that uses paper copies. SMAUPNM was developed to replace the existing method and help the AKP manage information more systematically and effectively. This system will store athlete information more securely compared to manual methods that can be exposed to theft. SMAUPNM has a captcha security feature that ensures athlete information is not exposed to individuals who are not involved. In addition, the storage of information in the form of an Excel file shows that the method used is not systematic because it is difficult for the AKP to generate a report based on an athlete according to their respective achievements in detail. SMAUPNM uses MySQL, which functions as a database to store athlete information. Next, the HTML programming language is used to develop the website, and CSS is used to tidy up the display of the interface on the SMAUPNM website. The implementation of information management based on the website will allow the AKP to access and manage athlete information anywhere, regardless of time and place.

Keywords: Physical fitness; Athlete Information; System Information



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1. INTRODUCTION

The UPNM Athlete Management System is a system that can assist AKP in managing athlete information regarding involvement and achievements in sports undertaken at the university, national, and international levels. The management of athlete information in SMAUPNM gives many advantages to AKP in managing athlete information more smoothly and in an orderly manner. This system was developed to replace the manual implementation of information stored in an Excel file. In addition, this system is intended to facilitate the process of storing information in the database efficiently and easily.

2. METHOD & MATERIAL

This section will discuss the methods and materials used in the development of this project to provide a better understanding. It is essential to have the right methods and equipment to avoid any difficulties during work.

2.1 Method

In order to develop the National Defence University of Malaysia (SMAUPNM) Athlete Information System, the appropriate methodology is the Spiral methodology. It is a flexible approach that can be adapted to the specific needs and requirements of a project. The Spiral Model is particularly suitable for complex projects where risks need to be effectively managed:

2.1.1 Planning Phase

In this phase, the developer must know all the information about the requirements needed to develop the UPNM Athlete Information System, where the planning for developing this system is clear and the initial study of the system is emphasized. Problems involved with the project to be developed will be identified. In this phase, the purpose and means used to develop the system will be identified.

2.1.2 Risk Analysis Phase

Each risk will be studied more deeply in this phase. A comparison of equivalent systems is very important in this phase to see the problems and shortcomings of the existing system. Next, the deficiency must be avoided repeatedly in the system to be developed. A strategy to overcome unexpected problems must exist to ensure that the project developed can fully benefit users.

2.1.3 Development Phase

The system development phase in the Spiral model is one of the main phases in this iterative software development methodology. It follows the risk analysis phase and involves the actual development and construction of the software system. This phase is where the software is designed, coded and tested.

2.1.4 Assessment Phase

The evaluation phase involves forming a judgment about the quality of an aspect that is evaluated based on several specific criteria. The main purpose of the evaluation phase is to get any comments, criticism, and feedback from users about the effectiveness of a developed system. In addition, the objectives of the developed system will be evaluated to determine whether it achieves its main purpose or not. Next, each module in the system will be tested to avoid errors in the system and ensure that the system works properly.



Figure 1. SPIRAL Methodology Model for the Athlete Management System

2.2 Material

The scope and materials that are being used for developing the SEGAK Management System are as follows:

2.2.1 User

There are three user types for this system: administrator, sports center and athlete.

- a. Administrator Handle athlete information comprehensively, which will involve all sports and all athletes at UPNM. Verify the user ID and password to enter the Malaysian National Defense University Athlete Information System.
- b. Sport Center Check athlete information, which is managed according to the sport in which all athletes participate.
- c. Athlete Update their information and check each other's latest engagements and achievements. Check each other's information based on the sport they have participated in.

2.2.2 Software, language, and database

Notepad++ is being used as a source code typing platform, and Figma is being used to design the interface or prototype. Hypertext Pre-processor (PHP), Hypertext Markup Language (HTML), and Cascading Style Sheets (CSS) are the programming language formats. XAMPP with MySQL as the system database.

3. FINDINGS

The UPNM Athlete Management System is a system that can assist AKP in managing athlete information regarding involvement and achievements in sports undertaken at the university, national and international levels. The management of athlete information in SMAUPNM gives many advantages to AKP in managing athlete information more smoothly and in an orderly manner.

3.1 Interface Design

The functionalities of this system vary according to the type of user. This is done in order to implement user access control and enhance system security. The user must correctly enter their username and password in order to log in to the system. The system's login interface is displayed in Figure 2.



Figure 2. Login interface for Athlete Management System

3.1.1 Admin

Figure 3 shows the admin main page. The system administrator has the task of managing the users of this system. Administrators use the system to register athletes, modify athlete information, delete athletes, and generate athlete performance reports. Here is the main page display for the administrator of the list of athletes.

ATLET	MAMA ATLET	JANTINA	COPA	PARULTI	TAHUN	STATUS	EMAIL	PHONE	ACTIONS
	TANIM ARTTIN BIN AMAT ART	Lenn	3.45	PARULTI SAINS DAN TERNOLOGI PERTAHANAN	3	Aean	ashraharu#155ggmai.com	01107553676	ECE Name
	AHMAD BIN MOHD PADZS	LELAG	3.37	PARLETI SAINS DAN TERNELOGI PERTAHANAN	3	Palapes	manifectri@preal.com	01137553676	Eur Mate
	ISEHWAN HARM BIN ABDULL JAPAN	Latati	3.30	PARATI SANG DAN TEINOLOGI PERTAHANAN	3	Kadel	Rank21@griel.com	0H37553870	EII Hann
	MUMAMMAD ANNAN SIN MOND NORDIN	Linkard	3.30	PARULTI SAINE DAN TEHNOLOGI PERTAHANAN	3	Palapes	2210026@stheelu.gom.edump	011375538076	Ec.

Figure 3. Admin main page interface for the Athlete Management System

For user registration, the administrator will get a display of the new athlete registration form. Administrators must fill in all information correctly to allow athletes to log in using the system. The required information is matric number, password, athlete name, gender, CGPA, faculty, year of study, status, email and phone number. The interface is displayed in Figures 4 and 5.

If there is an error during the registration of athlete information, the administrator can modify or update the information correctly. The interface is displayed in Figures 6 and 7.
The interface displayed in Figure 8 will appear if the admin clicks the list of achievements button. This page will list every user's achievement who has registered. The administrator can view, edit, or remove users from the list. The form that administrators use to generate reports of athlete achievement is displayed in Figure 9.

SISTEM MAKLUMAT ATL	ET LIPHAN CLANING CLAITAN ATLET	
	DAFTAR ATLET	
	nçar majirre	
	KALA LATIMA	
	FANDAN AFLETT	
	Santimak. Okurani Olemenapuan	
	come.	

Figure 4. User registration form for athletes

reason;	
FMULTI SAME DAVI TEXNOLOGI PERWI WAAN +	
TAHUN PERMITAUANAN	
NUMUR.	
Okapet	
CIWA APPE	
E-MAL	
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1000 Million (1990)	

Figure 5. User registration form for athletes

SISTEM MAKUMAT ATLET UPINM	LANASI UTANA	
	KEMASKINI ATLET	
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	NAMAN ATLET Kannon and King Indu analot and	
	jularitaya.	
	Talabi Dhompath	
	PARLETI DAVI DAVI TRADUCIE POTRHAMAN	
	TANKIN PENERIA INTAN	
	3	

Figure 6. User editing form for athletes

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L (general	
C.Phreenpuan	
FAKUITE	
FARLETI BAINS DAN TERNOLOGI PORTAHANAN	
TAHUN PERMELAURAN	
3	
STATUS:	
ORADET	
CINALAPES	
CARRONA	
EMAUL	
ashrafmana/KSS@gmail.com	
NOM PHONE:	
0713755307E	
Submit	
Course	

Figure 7. User editing form for athletes

ATLET	BEML +	SEMUA	*)		BEMLIA.	SEMUA	· CETAK
	SEM +	SEMUA =	SEMUA	SEMUA	SEMUA	- SEMUA	* TAPIS
	TAHUN	SUKAN	KATEGORJACARA/PERINGKAT	ATLET	PENCAPAJAN	PERINGKAT	1
	2014	BOLA SEPAK	PENYERANG	AHMAD BIN MOHD FADZE	PERAK	KEBANGSAAN	
	2015	BOLABAUNG	PERTAHANAN	AHMAD BIN MOHD FABZIL	GANGSA	DAERAH	
	2015	BOLA FUTBAL	PENVERANG	FAHMI ARIFFIN BIN AMAT ARIF	PERAK	NEGERI	
	2015	BOLA SEPAK	PERTAHANAN	FAHM ARIFFIN BIN AMAT ARIF	PERAK	DAERAH	
	2015	BOLA FUTBAL	PERTAHANAN	AHMAD BIN MOHD FACI28	EMAS	LIPNM	
	2012	BOLA SEPAK	PERVERANG	AMAN	PENYERTAAN	NEGERI	

Figure 8. List of athletes's achievements

SEML ~	SEMUA Y		SEMUA	~	SEMUA	~	CETAK

Figure 9. Option to generate report

3.1.2 Sport Center

Figure 10 shows the Sports Center has permission to see the list of athletes and has generated athlete reports according to achievements. The interface displayed in Figure 11 will appear if the sports center clicks the list of achievements button.

ATLET	NAMA ATLET	JANTINA	COPA	FARULTI	TAHUN	STATUS	EMAIL	PHONE NUMBER	ACTIONS
	FAHMLARIFFIN BIN AMAT AFOP	Lanaki	3.45	FARULTI BAINS DAN TERNOLOGI PERTAHANAN	3	Awam	advahranaktisägnaä oon	91137563976	E.II Heput
	AHMAD BIN MOHD PADZL	LEL/40	3.37	FANOLETI SAINS DAN TENNOLOGI PERTAHANAN	3	Palepos	markfailzi@grait.com	01137553976	Eas
	RIDHWAN HAKIN BIN ABDULL JAFAR	Letter	3.30	FARULTUBANS DAN TERNOLOGI PERTAHANAN	3	Radet	KarkZs@gradLcom	01137553976	Est. Naput
	MUHAMMAD AIMAN BIN MOHD NORDIN	Leiski	3.79	PAKULTI SAINS DAN TERVIOLOGI PERTAHANAN	3	Palapen.	2210926@artaten.upnm.eds.my	01137563976	East Hopes

Figure 10. Main page for the sports center

ATLET	SEA -	MENTA.	SEMUA	10510.0A	BEMUA +	REMAK ~	TAPE
	TAHUN	SUKAN	KATEGORI/ACARA/PERINGKAT	ATLET	PENCAPAIAN	PERINGKAT	CELTAK
	2015	BOLA BAUNG	PERTAMANAN	ARMAD BIN MOHD FAD2IL	GANGSA	DADIUM	Hapun
	2014	BOLA SEPAR	PENYERANG	AHMAD BIN MOHD FADZIL	PERAK	REBANGSAAN	Heptit
	2015	BOLA FUTSAL	PENYERANG	FAHMLARIPPIN BIN AMAT ARF	PERAK	NEGER	Hapsin
	2015	BOLA SEPAK	PERTAHANAN	FAHMI ARIFFIN BIN AMAT ARIF	PERAK	DAERAH	Hopun

Figure 11. List of athlete achievements

3.1.3 Athlete

Figure 12 shows the athlete's main page. Athletes have access to register new achievements, generate their own reports, modify achievements, and delete achievements. Athletes can register new self-achievement information in the system database. The following Figure 13 and 14 are the display of the form to register new achievement information.

ANMAD BIN					GETAK	
ANI	TAHUN	SUKAN	KATEGORI/ACARA/POSISI	PENCAPAIAN	PERINGKAT	
ULTI SAINS DAN	2014	BOUA SERVIC	PENYERANG	PERM	KEBANGSAAN	East Datate
nox.ogi peletananan pai fadal@grail.com	2015	BOLA BALING	PERTAHANAN	GANOSA	DAERAH	Edr Debis

Figure 12. Athlete main page interface for the Athlete Management System

ATLET UPINM LAMONUTAMA PERCAPATIAN DARAPLE	
PENCAPAIAN BAHA	RU
144 UNK	
ALLE	
SLOKAN	
KATELORIA (ARA-POSISI	
MINICAMAZAN	
PERMUTAN	

Figure 13. Achievement registration form for athletes

TAHURA	
ATLET:	
SUKAN:	
BOLA SEPAK	
KATEGORI/ACARA/POSISE	
PENCAPNAN	
PERNYERTAAN	
PERINGKAT:	
UPNM ~	
DAFTAR	
84/AL	
	TARKIRE ATLET: SUKAN: DOLA SEPUK KATBGORIJACARA/POSISE PERNARAARE PERNARAARE PERNARAARE UPHM CMERAR KATL

Figure 14. Achievement registration form for athletes

3.2 Algorithm

One way that developers incorporate decision making into their systems is through the use of algorithms. Figure 15 displays the algorithm for the process used by this system.

Inpu	t: id_pengguna dan kata_laluan
lf	kombinasi id_pengguna dan kata_laluan betul
	paparan antara muka laman utama pengguna akan muncul;
Else	kombinasi id_pengguna dan kata laluan salah;
Proses	notifikasi bagi pengguna memasukan kombinasi yang betul; s 2: Daftar atlet
Proses	notifikasi bagi pengguna memasukan kombinasi yang betul; 2: Daftar atlet maklumat atlet
Proses	notifikasi bagi pengguna memasukan kombinasi yang betul; 2: Daftar atlet maklumat atlet atlet belum didaftarkan
Proses nput: f	notifikasi bagi pengguna memasukan kombinasi yang betul; 2: Daftar atlet maklumat atlet atlet belum didaftarkan notifikasi atlet berjaya didaftarkan akan dipaparkan;
Proses nput: f	notifikasi bagi pengguna memasukan kombinasi yang betul; i 2: Daftar atlet maklumat atlet atlet belum didaftarkan notifikasi atlet berjaya didaftarkan akan dipaparkan; notifikasi atlet telah didaftarkan, sila daftar atlet yang baharu,

Proses 3: Kemaskini Pencapaian

Input: maklumat pencapaian

 If pencapaian belum didaftarkan notifikasi pencapaian berjaya didaftarkan akan dipaparkan;
 Else notifikasi pencapaian telah didaftarkan, sila masukkan pencapaian baharu;

Ulang proses 3

Proses 4: Menjana Laporan

Input: Maklumat yang diinginkan

- If Maklumat yang diinginkan wujud di dalam pangkalan data
 Paparan maklumat dicapai;
- Else Maklumat yang diinginkan tidak terdapat dalam pangkalan data;

Paparan maklumat tiada dalam pangkalan data;

Figure 15. The Algorithms for the Athletes Management System

4. DISCUSSION

This Athlete Management System achieves its goals. The following goals have been met:

- 1. Designing a database system that stores athlete achievement information in a more organized manner.
- 2. Develop an information system about UPNM sports athletes in detail according to the sports and categories in which they participated.
- 3. Generate reports that display the latest information on UPNM athletes such as tournaments they have participated in, levels the athletes have reached, or the number of medals won by athletes.
- 4. Build security features for passwords using the reCAPTCHA technique.

This system has several advantages that make it better suited for development. These advantages include its user-friendly interface, efficient performance, and compatibility with various platforms. The following are the advantages:

- 1. This system ensures that the athlete's information does not overlap if the athlete ventures into different sports.
- 2. System administrators can access the information of athletes participating in various sports easily and quickly.
- 3. Athletes can check their level of achievement and can increase their efforts to get new achievements.
- 4. Administrators can easily generate reports according to the administrator's choice at any time.
- 5. Athletes can register their respective achievements from time to time according to the achievements they have achieved.

This system has several shortcomings that can be fixed in the future, even though it is useful and well-delivered to the end user. The limitations were caused by a number of circumstances, including time restraints. The following are the limitations:

- 1. The system uses the Malay language on every button and interface.
- 2. The system can only be accessed by using the internet network.
- 3. Administrators cannot add to the athlete's achievement record. Only athletes can add each other's achievements to avoid overlapping information.
- 4. There are no recommendations for athletes to reset their words.
- 5. There is no option for athletes if they forget their password.

5. CONCLUSION

The UPNM Athlete Information System (SMAUPNM) is explained in detail in this chapter. Comments on the advantages of the system to meet the development goals and the weaknesses of the system are also included. The implementation process and the tests carried out have shown the effectiveness of this system. The benefits of this system themself contribute to increasing the efficiency of UPNM's athlete information management tasks. To guarantee that users can use the system more effectively and efficiently in the future, there are currently limitations on it. This chapter will provide an overview of the system's successes, benefits, limitations, and recommendations for improvement.

Acknowledgments: Special thanks to the Faculty of Defense Science and Technology, National Defense University of Malaysia for supporting this project and also to the Student Affairs Department for the sponsorship to participate in i3DC 2024.

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Research Article

CulturaTour

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Abstract: Travelling without knowing about cultural differences can be such a nuisance as it may build issues when travelling to unknown places as tourists traverse destinations, encounters with many different social norms, customs, and high values shape their experiences by having communication breakdowns, potential misunderstandings, and influence of cultural etiquettes become pivotal aspects of this cross-cultural exploration. Moreover, tourists sometimes neglect pre-travel research about their chosen destinations. The impact of inadequate preparation may result in unintended cultural faux pas, diminishing the quality of interactions and potentially causing discomfort or offence. This is also one of the challenges that tourists overcome during international travelling, incorporating insights from scholarly references. To deal with this issue, we came up with the CulturaTour application. It is an application with travel-friendly guidance for tourists when they are travelling. It is targeted for community, Small and Medium Enterprises (SME) and end-users of the originated culture from the country.

Keywords: cross-cultural tourism; cultural awareness for travelers; mobile travel guide app.



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1. INTRODUCTION

Nowadays, cultural heritage becomes an attraction to attract tourists inbound and outbound. Cultural heritage includes the collective legacy which is tangible and intangible aspects that also include the community, society and civilization. There are so many cultures all around the world and this attracts all the tourists from other places but there are several issues that prevent the cultural tourism from growing. According to Gillaune Tiberghien, Hamish Bremner and Simo Milne (2018), perception of the real traveller is travelling experience that depends on what is defined as authentic, original, and local. They tend to underrate the destination first without knowing the details of the destination. This may be influenced by the lack of marketing promotion about the destination. For example, Kampung Seri Serbang Bongawan is one of Brunei's cultural destinations in Papar, Sabah. This cultural destination lacks marketing promotion because the local people especially in Malaysia do not know about this hidden destination. This is the reason why the innovation team created this CulturaTour application which is made to help the community or the small medium company to promote their cultural destination. This can benefit them to gain more tourists to visit their destination

so they can gain income from there. This application also helps the tourist from the other country or places to gain knowledge about the traditions of the other tribes such as their food, language, and their cultures. The CulturaTour application will show the cultural heritage destinations all around the world. So, the tourists can choose the destination that they want to visit and be provided with the maps that will show the direction of the destination of cultural destinations all around the world.

2. METHOD & MATERIAL

CulturaTour application is made for the small medium company, the community and also for the tourists who want to visit the cultural heritage all around the world. This application is made to provide information for the tourists about the cultural heritage of the other tribes and also promote the local cultural destination to the others. This application also facilitates tourists to learn about the other cultures before or during their tour. the table below shows the interface design of CulturaTour.

METHODS	DESCRIPTION
	STEP 1 Users can get the CulturaTour application on Apple Store and Google Play Store.
endre Bit IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	STEP 2 Once users have downloaded the application, they can click the icon to go through the registration page.

Table 1. Interface	Design	of CulturaTour
--------------------	--------	----------------

	STEP 3
G Cuttura Jour Our Uniqueness	This is the introduction to the CulturaTour application.
Create Account	STEP 4 Users can create their own account and fill up their details.
a Username	
Email Address	
B Password	
Create Account	
Our Uniqueness	
	STEP 5
winders Califord Le watera	After creating an account, the application will go through the home page which shows the
ultural Heritage Destination	destination of cultural heritage of every country,
Malaysia Indonesia	the cultures.
Malaysian Cultural Indonesian Cultural	
Jugarese Cultural	
Incent Activity	



Aurente ser Mari-Mari Ender Mari-Mari Ender Mari-Mari Cure over	STEP 9 On this application, users will be provided with Waze or Google Maps as the guide to go to the chosen destination. Users can search the destination by using a voice over or entering the destination name.
Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Sour	STEP 10 This CulturaTour application also provides the countries icon on the homepage that makes it easier to find or search the country that users want to visit. Users are also allowed to search it by using a voice over.
Settings Settings Profile Attanguage Attanguage Notification About Apps Co Logout	STEP 11 In the settings area, users can change their profile anytime they preferred. Users also can choose their preferred language. If there are news or videos about cultural heritage, users will get the notification and check it on the notification icon in the homepage on the right side.

3. PRODUCT DESCRIPTION: ABOUT CULTURATOUR

CulturaTour is an application that provides information about culture differences in every country before tourists travel to a very unfamiliar environment with cultural etiquette tips. This application also shows about the heritage information that every different country has. Other than that, this product may help tourists to become more responsible when travelling as it guides tourists with the information given and can overcome issues about cross-cultural journey.

3.1 Novelty and Uniqueness

CulturaTour displays different types of greetings and dress code for travellers, which can be chosen by users according to the place they want to go. Not only that, this app has a map feature that will help travellers easily to go to the destination they choose. This application also becomes a guide for travellers before visiting places that have different cultures. By having this uniqueness, travellers are well-prepared and can enjoy the cultures of the destination. Additionally, CulturaTour also becomes an educational platform for travellers about cultural differences all around the world and provides heritage information about every place they choose including language, traditional foods and heritage sites. It is a user-friendly app because CulturaTour can translate voice, words or pictures to different languages which ensures accurate and successful communication among travellers and locals. Overall, this app practises travellers as responsible tourists when travelling as a result to avoid issues and unpleasant situations. CulturaTour also acts as an intermediary marketing tool, where it has a discussion chat room where travellers and small businesses in the area may exchange in-depth information about the travel destination. Additionally, the app will collaborate with local SMEs and communities including travel agencies, hotel and restaurant owners.

3.2.2 Impacts

The CulturaTour application aims to have a positive impact on both the economic and environmental aspects. Economically, the application contributes to the growth of local SMEs and communities by creating online tourism business opportunities. Through effective marketing strategies on platforms like TikTok, Facebook, and Instagram, the app can attract a broader audience and drive tourism to lesser-known cultural destinations, thus boosting local economies. This increased tourism can lead to job creation and income generation for small businesses involved in the tourism sector. For social, CulturaTour contributes to cross-cultural understanding and responsible tourism by educating users about cultural differences worldwide. The app encourages cultural exploration by providing information on greetings, dress codes, traditional foods, and heritage sites. It acts as a bridge between tourists and local communities, promoting mutual respect and appreciation. By facilitating communication and enhancing preparedness, CulturaTour aims to minimize misunderstandings, fostering positive cultural exchanges and enriching the overall travel experience. Overall, the application has the potential to create a positive economic impact on local communities while promoting cultural appreciation and understanding among users.

4. PRODUCT COMMERCIALIZATION

The CulturaTour application aims to have a positive impact on both the economic and environmental aspects. Economically, the application contributes to the growth of local SMEs and communities by creating online tourism business opportunities. Through effective marketing strategies on platforms like TikTok, Facebook, and Instagram, the app can attract a broader audience and drive tourism to lesser-known cultural destinations, thus boosting local economies. This increased tourism can lead to job creation and income generation for small businesses involved in the tourism sector. For social, CulturaTour contributes to cross-cultural understanding and responsible tourism by educating users about cultural differences worldwide. The app encourages cultural exploration by providing information on greetings, dress codes, traditional foods, and heritage sites. It acts as a bridge between tourists and local communities, promoting mutual respect and appreciation. By facilitating communication and enhancing preparedness, CulturaTour aims to minimize misunderstandings, fostering positive cultural exchanges and enriching the overall travel experience. Overall, the application has the potential to create a positive economic impact on local communities while promoting cultural appreciation and understanding among users.

5. CONCLUSION

In conclusion, the CulturaTour application emerges as a transformative solution to bridge the gap between tourists and diverse cultural heritages worldwide. By addressing the challenges of cultural differences, inadequate preparation, and limited marketing exposure for lesser-known destinations, CulturaTour aims to enhance the travel experience for both tourists and local communities. This innovative app not only serves as a guide for responsible tourism but also fosters economic opportunities for local SMEs and communities. Through its unique features such as cultural etiquette tips, heritage information, and user-friendly interface, CulturaTour is positioned to revolutionise the way individuals explore and appreciate global cultural diversity. As a tool for cultural awareness, it not only enriches individual experiences but also contributes to broader socio-economic and environmental impacts, promoting a more harmonious and sustainable global travel landscape. Ultimately, CulturaTour sets the stage for a more inclusive and respectful exploration of the world's rich cultural tapestry.

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Research Article

Educational Video of Mammography Procedure

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Abstract: A lack of knowledge regarding the procedure causes many women to feel nervous and uneasy about getting a mammogram. This can lead to avoidance of screenings, potentially delaying the detection of breast cancer. Traditional written materials may not effectively address the concerns that women have about the procedure, contributing to their unease. Furthermore, it is not effective in reaching and educating illiterate women or those who have limited access to health information. The goal of this innovation project is to develop an educational video that educates and prepares women for the procedure providing clear and comprehensive information about mammograms, including what to expect and how to prepare for it. The video is created using modern technology involving a team of experts in the breast cancer field, video production, and instructional design. This will enhance engagement and education through the use of interactive elements in video to empower women with the knowledge and confidence to undergo mammograms, ultimately improving breast cancer detection rates. The video innovation has the potential to be commercialized and used as a resource for healthcare providers, mammography facilities, and women's health organizations for education purposes.

Keywords: Breast cancer; Mammography; Educational video.



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1. INTRODUCTION

Most women feel nervous and uneasy about undergoing mammography due to a lack of knowledge regarding the procedure itself. Mammography is a gold standard for detecting breast cancer at its earliest stages. However, women may not know exactly what happens during a mammogram, leading to anxiety and uncertainty. They might believe that mammograms cause pain or harm. Some women worry about exposure and embarrassment during the examination (Meissner et. al. 2007). These factors contributed to a sense of apprehension and hesitancy among women considering mammography.

However, educational interventions, such as simulation models and health education with media leaflets, are effective in improving knowledge and attitudes toward mammogram screening among women (Karimian et. al., 2022; Idrees et. al., 2023). These findings emphasize the importance of exploring alternative educational strategies in empowering women to take control of their breast health and overcome barriers to screening. Thus, this innovation project focuses on creating an interactive instructional video designed to educate and prepare women for the mammogram process.

2. METHOD & MATERIAL

The video aims to present detailed explanations of each stage of the mammogram process. The style, scope, storyboarding, and scriptwriting were considered during the pre-production stage, ensuring that viewers fully comprehend the procedure before attending their appointment, during, and after the mammogram procedure. The video will tackle common worries and misconceptions about mammograms, assisting women to better understand the risks and benefits involved.

The preparation for filming during production was set in one private hospital focusing on the light, sound, and demonstration equipment for optimizing video production in a non-studio setting. The mammogram demonstration especially the compression of breast tissue was done using breast phantom made of 3B SKINlikeTM (*3B Scientific, Germany*) high-quality silicone. The film was then modified in post-production, adding an audio commentary and interactive features to highlight important areas, such as shapes, arrows, and drawing motion.

The video was created shorter and used a conversational tone to engage viewers. A survey using Google Forms was distributed to respondents during a breast cancer awareness campaign. The survey's objective is to gather comments and feedback.



Figure 1. The screenshot of the educational video demonstrates the mammogram technique in detail on breast phantom made of 3B SKINlike™ (*3B Scientific, Germany*) high-quality silicone.

3. FINDINGS

A survey on the effectiveness of the educational video was carried out among 54 people during one campaign to raise awareness about breast cancer. The age group with the largest percentage (33.3%) is 18 to 30 years old. This is followed by 30 to 40 years old (24.1%), 40 to 50 years old (22.2%), age over 50 (18.5%), and age under 18 (1.9%). The response in detail and the effect of the educational video on their view and desire to have a mammogram (MMG) are shown in Figure 2.



Figure 2. Feedback and the impact of the educational video on perception and motivation to undergo MMG.

4. DISCUSSION

4.1 Uniqueness

This video is different than any other educational video since it provides thorough descriptions of every step involved in getting a mammogram. It presents the real scenario of how the women will experience during their mammogram appointment. It also shows the overview of the procedure room, the mammogram machine, and how the procedure will be done. The compression techniques that most women are afraid of were demonstrated using breast phantoms that have the same tissue composition as human breast tissue. This will increase confidence, empower women to make informed decisions about their breast health, and reduce the number of individuals avoiding essential preventive care measures.

4.2 Benefits

This type of educational video can be particularly useful for women who are less literate or have limited access to health information, as it provides a visual and interactive way to learn about mammograms. Videos can effectively convey complex information in a visually engaging manner, allowing learners to grasp key points quickly and retain information easily. Videos can reach large audiences regardless of geographical location and they offer the opportunity to pause, rewind, and repeat sections as needed, fostering a deeper understanding and retention of information besides enabling people to learn at their own pace and convenience (Karimian et. al., 2022).

4.3 Commercialization

The video can be sold or licensed to healthcare providers, educational institutions, and other organizations interested in promoting early detection of breast cancer. The video can also be monetized through advertising or sponsorship opportunities. Given the importance of the content in promoting women's health, it can attract sponsors or advertisers interested in supporting such initiatives. It can also be used as a valuable resource for professional training and resource for breast cancer awareness campaigns and events.

5. CONCLUSION

Educational video on mammography has a high potential to empower women with the knowledge and confidence to undergo mammograms. It also has the potential to be commercialized through various channels making it a valuable resource for both healthcare professionals and the general public.

Acknowledgments: The authors express their gratitude to KPJ Healthcare University's Medical Imaging Department and KPJ Seremban Specialist Hospital's Diagnostic Imaging Services for their assistance and encouragement in this innovative research endeavor. We express our sincere gratitude to the KPJ Healthcare University Department of Student Affairs and Jabatan Pembangunan Wanita Malaysia via Pejabat Pembangunan Wanita Negeri Sembilan for coordinating the Breast Cancer Awareness Campaign. We also thank all of the participants who voluntarily assisted us in answering our survey and sharing their opinions with us regarding the innovation.

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e ISBN 978-629-99506-0-8

