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**JOHOR
INNOVATION
INVENTION
COMPETITION
AND
SYMPOSIUM
2023**



" Innovation Inspires a Society
to be Critical and Creative"

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"Innovation Inspires a Society to be
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Editors-in-Chief

**AHMAD KHUDZAIRI KHALID
NUR INTAN SYAFINAZ AHMAD**



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**Cawangan Johor
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Preface

In the name of Allah, the Almighty who gives us the enlightenment, the truth, the knowledge and with regards to Prophet Muhammad (peace be upon him) for guiding us to the straight path. We thank to Allah for giving us guidance and strength to write this e-book.

This e-book compiles the extended abstracts that submitted to Johor Innovation Invention Competition and Symposium 2023 (JIICaS2023), where JIICaS2023 is a virtual platform for all creative minds to share and present their invention and innovation. The extended abstracts are divided into two categories, which are Category A (Higher Educational Student/ Any Recognized Institutional Students in Malaysia) and Category B (Primary/ Secondary School Students / Special Education School Students in Johor). Each abstract gives a brief background on the innovation or project.

We hope that this e-book will help the readers to get to know the innovation done by the students from both categories and get some ideas to develop future innovation products.



WECARE ELDERLY HOME MANAGEMENT SYSTEM

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ABSTRACT

The influence of today's hectic lifestyle has led many young people to opt for old folk home services for their elderly parents, where their parents can receive expert healthcare from trained professionals. Therefore, it becomes imperative to establish a comprehensive management system within this old folk centre to ensure the efficiency of task management such as digitalizing the record-keeping of the old folk residents while nowadays task management still relies on paper documentation. Other than that, this system also will automatically generate the medication schedule for each of the residents, whereas prior, the caretaker has to keep track of the medication schedule conventionally by checking the resident's files manually to update the medication schedule. To improve this proposed system, it provides a communication platform between elderly relatives with the caretaker. The relatives can receive daily updates and send messages to the caretaker directly. Based on the user acceptance testing conducted, 83% of the respondents were satisfied with the system requirements, design consistency, and application navigation. Thus, this proposed mobile application has the potential to be implemented in the elderly care centre or similar care centre that provides similar services.

Keywords: Management Systems, Old Folk, Care Centre, Mobile Applications, Healthcare.

1.0 INTRODUCTION

Nowadays, with the development of digitization, industries are using digital systems to optimize their workflows. However, the elderly home currently lacks a proper management system that can help them optimize their daily workflow by generating a daily activities schedule. This is important for reducing the chaos associated with managing daily activities in the elderly home. Without a schedule provided to the caretaker, they must rely on their own memory and paperwork to remember all the activities that need to be done during the day. Without a schedule, productivity is expected to be lower because they can't plan and prepare for the activities. Furthermore, the elderly residents staying in the elderly home, usually need to take some form of medication regularly. Without a proper management system, it is difficult for the caretaker to keep track of the medication timing and inventory for elderly individuals. Without a management system installed in the elderly home, the caretaker must rely on paperwork to keep track of medication usage. Additionally, for elderly individuals who need to take their medication on time, it is very dangerous if the caretaker forgets to prepare the medication or forgets to restock it.

Moreover, there is a lack of a proper communication medium between the caretaker and the elderly's relatives. Currently, when the caretaker needs to contact the elderly's relatives, they

must find the contact number in the paperwork and contact them using a third-party application like WhatsApp or Messenger. This process is tedious, and sometimes relatives might miss important and urgent messages because they are at work.

The proposed system, the WeCare Elderly Home Management System, is aimed at providing an efficient process for managing medication inventory, generating daily activity schedules, and serving as a communication medium between the caregiver and the elderly's relatives. The system offers a more systematic approach to managing the medication for the elderly. The medication inventory is linked to the elderly's profile, providing a clear indication to the caregiver when it is running low. The system can also generate a daily activity schedule for the caregiver to prepare for the day. This feature helps the caregiver easily track medication usage and daily activities. Furthermore, for the elderly's relatives, this system can serve as a communication medium. Elderly relatives are given an account that allows them to log in to the system, enabling direct communication with the caregiver. By logging into the proposed system, elderly relatives can access the message box provided in the system to contact the caregiver directly, without the need for third-party software. This enhances privacy, as medication reports are only sent via the proposed system. Additionally, the system allows relatives to receive status updates and reports from the caregiver, keeping them informed about the elderly individual's well-being.

2.0 OBJECTIVE

The primary aim is to design a system capable of alleviating the workload associated with tracking the medication intake and managing the medication inventory of elderly individuals. This would not only reduce the administrative burden on caregivers but also ensure the timely and accurate provision of medications to elderly residents. Another crucial objective is to enhance overall work efficiency by implementing a systematic approach to managing various aspects of the elderly's home. This includes streamlining processes, optimizing resource allocation, and providing a more organized framework for caregiving tasks, ultimately leading to improved quality of care. Lastly, the proposed system will undergo rigorous testing and validation to ensure that its new design can effectively enhance the work processes within the elderly's home. Through this validation process, any potential issues or areas for improvement will be identified and addressed, with the goal of optimizing the care and well-being of the elderly residents.

3.0 METHODOLOGY

This proposed system has been developed according to the waterfall model. With the process model, the development of the proposed system is divided into three stages, each serving a distinct objective as mentioned in the previous section. The methodology starts with Stage One: Communication and Planning, followed by Stage Two: Design and Development and Testing, and the last stage is Stage Three: User Acceptance Testing and Deployment. The flow of this methodology is illustrated in Figure 1.

To achieve the objective in Stage One, the first step should involve communication with the caretakers working in the elderly home to gain a comprehensive understanding of the current workflow's challenges. Observing the existing workflow in the elderly home can also facilitate the seamless integration of the digital system without increasing the caretakers' workload. Once the problems have been identified, the second step is to create a requirement document and present it to the stakeholders. This document allows both parties to discuss and differentiate between functional and non-functional requirements for the system. Once the requirement document is finalized, the stakeholders can sign an agreement to safeguard the interests of both parties.

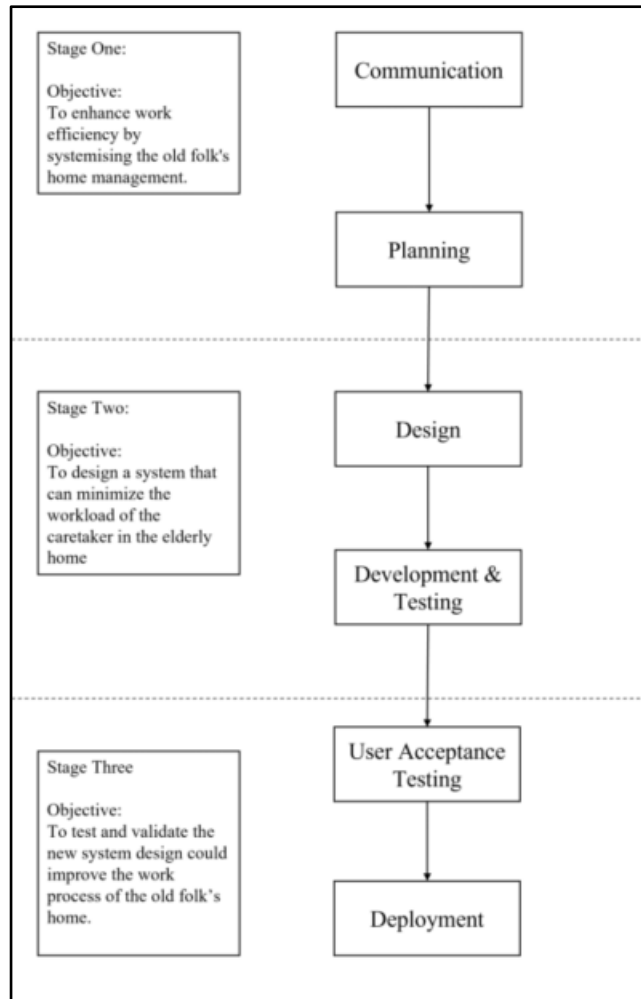


Figure 1: Project Framework.

Subsequently, the planning phase should commence. The first task is to generate a schedule or Gantt Chart, which should encompass all identified tasks. Additionally, tasks requiring resources such as hardware, manpower, and specific skills should be identified and allocated. The Gantt chart should also specify milestones and project deadlines to monitor the current development progress. The second step in the planning phase is to prepare a comprehensive risk management plan. This plan should include strategies to identify, assess, and mitigate potential risks throughout the project's lifecycle. By proactively addressing risks, the project can proceed with greater confidence and efficiency.

In Stage Two, the objective is to design a system that can enhance work efficiency. Therefore, the first step is to create a user-friendly interface. A well-designed interface can minimize the learning effort required by caretakers and increase the speed at which they can perform functions when all functions are logically placed. The second step involves preparing various diagrams, including use case diagrams, use case descriptions, activity diagrams, sequence diagrams, state transition diagrams, class diagrams, entity-relationship diagrams, and data flow diagrams. These diagrams collectively aid in understanding how to develop the system effectively. Following this, the next step is to develop the system based on the interface design and the diagrams created in the previous step. Functions and the interface should be coded one by one, and after coding is complete, an inspection or code walkthrough should be performed to ensure there are no errors. Subsequently, the integration of all functions and the interface into a cohesive system is necessary. After integration, an integration testing phase should be conducted to ensure the smooth operation and functionality of the complete system.

In the last stage of the project, the focus is on the deployment of the system. The first step in the deployment process is to test-run the system in the user environment. When it is running in the user environment, stakeholders should observe and compare the workflow and workload of the current implementation. Developers also need to gather feedback from the caretakers to validate whether the system improves the work processes of the elderly home. If the stakeholders approve the system, then it can be deployed in the real-world environment.

4.0 RESULT

User Acceptance Testing, or UAT for short, is also known as end-user testing, where the actual users of the system are involved. It is one of the final phases in the software development life cycle, during which the system is implemented in a real-world environment or the user environment to validate its functionality. The purpose of UAT is to confirm that the system meets the user's requirements and to assess its performance in the user environment. User Acceptance Testing aims to gather opinions from the actual users of the Elderly Home Management system to test whether the developed system meets their expectations. Additionally, by implementing User Acceptance Testing, future improvements can be derived from user feedback. This testing process involves presenting the developed system to the users and allowing them to experience the actual system.

In the section below, it will show the result of the user acceptance testing. In this user acceptance testing a group of 35 users was asked to answer four questions after experiencing the system the question would cover three different categories which are heuristics, content, and navigation. In addition, the result was represented using a graph, in the x-axis the rating which 1-5 is from strongly disagree to strongly agree.

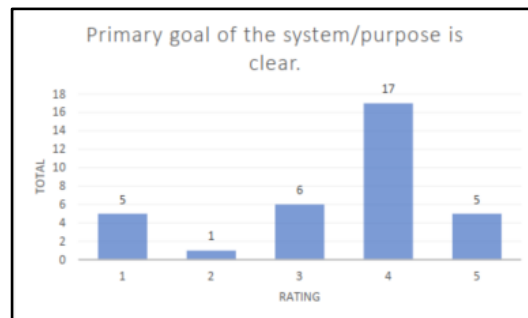


Figure 2: User Rating for Primary Goal of the System.

Figure 2 shows the results of the first question regarding whether the primary goal of the system is clear or not. Five users strongly agreed with the statement, while, on the other hand, five people strongly disagreed with it. However, overall, 62% of users agreed that the system meets its primary goal. This result indicates that the system has successfully achieved its primary goal, which is to manage medication timing for the caretaker, allowing them to accomplish this task with minimal effort as the schedule is generated automatically.

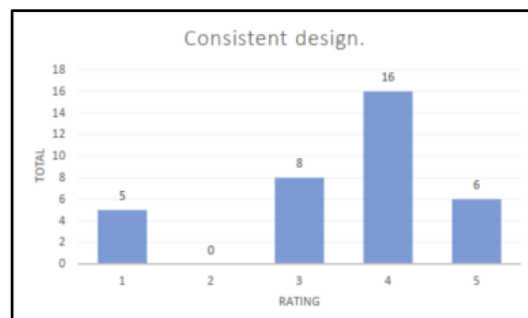


Figure 3: User Rating for Design Consistency.

Figure 3 displays the results of the second question concerning the consistency of the system's design. The results show that the majority of users agree with this question; however, there are still five users who strongly disagree. Overall, a total of 63% of users agree that this system was built with a consistent design, characterized by the use of a single primary color, green, throughout the entire system interface. This result also suggests that the system's design is optimized for mobile interfaces, as users feel comfortable using the interface design on their mobile phones.

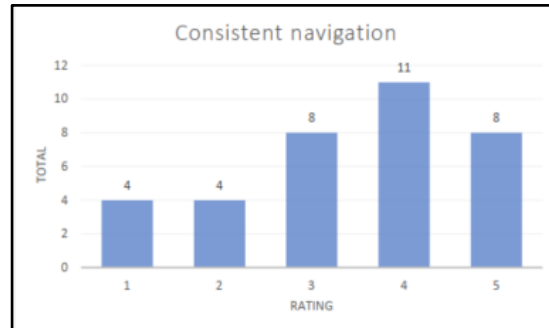


Figure 4: User Rating for Consistent Navigation

Lastly, Figure 4 displays the results of the last question concerning the navigation of the system. The results show that users are generally satisfied with the system's navigation. However, a total of eight users disagreed with the navigation. In total, 54% of users agree that the navigation is consistent. This result indicates that the system was built with a clear navigation path for users to browse through the system, and the navigation includes clear indicators to inform users of the expected outcomes when they click buttons.

5.0 CONCLUSION

In a nutshell, this proposed system's functional requirements have been successfully developed and implemented in the current system. However, there are still some aspects of the developed system that could be further improved to better serve its users. To enhance the effectiveness of the proposed system, several key areas for improvement have been identified. Firstly, host the Laravel backend online using a hosting provider like Heroku or Microsoft Azure, ensuring seamless access and reliability for our users. Secondly, recognize the importance of gaining deeper insights into the real-life scenarios of elderly homes. To achieve this, extensive field studies should be performed to gather first-hand information about the specific needs and functionalities required in such environments. Lastly, as part of the commitment to user experience, implement a WebSocket function within the message box. This feature will enable users to receive instant message notifications, enhancing communication and interaction within the system. These strategic enhancements will further elevate the performance and usability of the proposed system in catering to the unique requirements of elderly care homes.