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PROCEEDINGS OF JOHOR INTERNATIONAL INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2024 (JIICaS 2024)



*“Flourish and Nurturing Sustainable
Innovation for a Prosperous Nation”*

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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 International Innovation Invention Competition and Symposium 2024 (JIIICaS2024), where JIIICaS2024 is a virtual platform for all creative minds to share and present their invention and innovation. 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 and get some ideas to develop future innovation products.



Foreword Rector



Assalamualaikum warahmatullahi Wabarakatuh,
Salam Sejahtera, Salam Malaysia MADANI and
Salam UiTM Dihatiku.

In the name of Allah, the Most Gracious, the Most
Merciful.

It is a great honor to welcome you to the Johor
International Innovation, Invention, Competition, and
Symposium 2024 (JIIICaS 2024). This event

connects various disciplines, focusing on education and engaging educators,
students, researchers, and innovators from all walks of life.

Innovation is not just about ideas; it demands perseverance, creativity, and
determination to turn those ideas into reality. The remarkable projects
showcased today highlight the dedication and spirit of all participants.
Initiatives like this not only explore new technologies but also cultivate skills
and leadership among our youth. At Universiti Teknologi MARA (UiTM) Johor
Branch, we are fully committed to fostering a dynamic culture of innovation,
promoting the commercialization of new products, and encouraging
meaningful collaborations with industry and society.

As we celebrate this event, I would like to extend my heartfelt gratitude to all
sponsors, judges, the College of Computing, Informatics and Mathematics,
UiTM Pasir Gudang Campus as the event organizer, as well as to the
researchers and participants for their hard work in making this event a
success. Let us continue striving for innovation and excellence. May the
ideas presented today inspire us and lay the groundwork for future
achievements.

Thank you.

Associate Professor Dr. Saunah Zainon
Rector
Universiti Teknologi MARA (UiTM)
Johor Branch

(A-ST042) SMARTRESIDENT: RESIDENT MANAGEMENT CENTRE SYSTEM

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ABSTRACT

The complexities of managing residential communities in today's busy lifestyle have given rise to solutions. The proposed system is a smart platform that simplifies residential management. It is a solution to revolutionise residential community management by centralising and automating various tasks, catering to the needs of administrators, residents, and security guards. The requirement of notifying residents promptly when the packages arrive is crucial for an automated system to handle the problem of inconvenience and inefficient informing residents about delivered packages. Implementing such a system can minimise the need for frequent mailbox checks to enhance overall operational efficiency. The system addresses problems of paper-based announcements that benefit residents by offering a platform to disseminate messages to the residents and reducing paper usage, making sending and receiving messages without effort. The system allows residents to report issues and provide feedback for community improvement. The proposed system will be developed using the Waterfall model. A comprehensive series of functional and user acceptance testing will be conducted among potential users before proceeding with the deployment phase based on a 5-point Likert scale with three quality dimensions such as heuristics, content, and navigation. As a result, the system seeks to optimise residential management by automating tasks to increase efficiency and improve user experience.

Keywords: Resident Management System, Waterfall Model, Automation System, Smart Platform, Parcel Notification, Mobile Apps.

1.0 INTRODUCTION

The Resident Management Centre System is a mobile application system that simplifies and automates tasks related to residential management. This app is aimed to enhance communication and convenience in managing parcels, pre-registered for visitors, paying utility bills, sending feedback, dissemination announcements, reporting issues, and notifying disruptions related to water and electricity. The idea for this proposed system comes from reviewing similar existing systems. The existing notification process for delivered packages in our residential community lacks efficiency and convenience, making residents need to physically check their mailboxes frequently. Distributing paper notifications for water and power outages to residents is time-consuming and resource-intensive, leading to delays and significant paper waste. Besides, registering visitors with manual paperwork and lengthy procedures leads to delays and inefficiency. Therefore, there is a need to develop a system to optimise

residential management by automating tasks to increase efficiency and improve user experience.

2.0 OBJECTIVE

The objectives of the proposed system is to refine features for an improved Resident Management Centre System that eliminates the need for physical visits, providing easy access to services and enhancing resident satisfaction. It also involves testing and validation to ensure the new system design automates and simplifies resident management processes, reducing manual tasks and improving operational efficiency.

3.0 METHODOLOGY

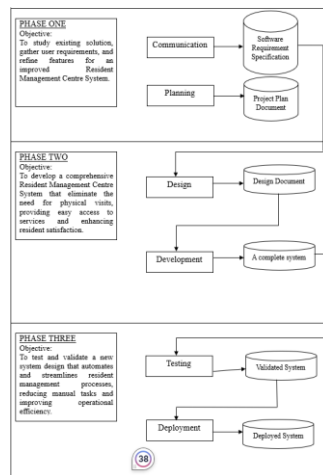


Figure 3.1: Project Framework

This proposed system will be developed according to the waterfall model. Figure 3.1 illustrates the flow of three phases. Phase one aims to study existing solutions, gather user requirements, and refine features for an improved Resident Management Centre System. Phase two focuses on developing a comprehensive Resident Management Centre System that eliminates the need for physical visits, providing easy access to services and enhancing resident satisfaction. Phase three is testing and validating a new system design that automates and streamlines resident management processes, reducing manual tasks and improving operational efficiency.

3.1 Phase One: Communication and Planning

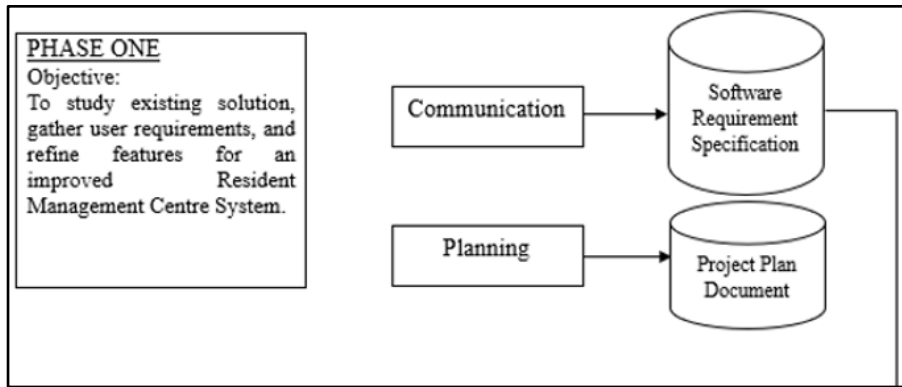


Figure 3.2: Phase One

During phase one of the project, the primary objective was establishing the foundation for a user-friendly Resident Management Centre System. This phase comprised two sub-phases: communication and planning. The communication phase involved thoroughly studying existing Resident Management Centre Systems and similar market solutions, such as the MyTaman App, MyGate App, and i-Neighbour App.

This analysis covered the features, benefits, and drawbacks of these systems, providing insights into industry best practices and identifying areas for improvement in the new system. In the planning phase, a supervisor reviewed and refined the requirement lists based on insights from the communication phase, ensuring accuracy, completeness, and consistency. Necessary resources and technical specifications were determined, including the choice of development frameworks like Flutter and database solutions such as Firestore. Hardware and software requirements, including a laptop, Android Studio, Dart programming language, and online drawing tools were identified.

3.2 Phase Two: Design and Development

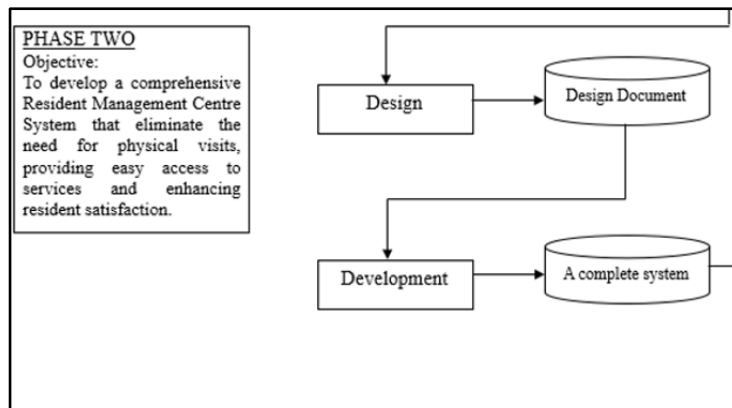


Figure 3.3: Phase Two

During the project's design, development, and testing phases, careful attention was given to creating a secure and intuitive system that enhanced resident satisfaction and convenience. The objective was to eliminate the need for physical visits to the management or post office by providing residents with easy access and utilization of the services offered. The detailed requirements gathered from previous phases were converted into a completed detailed systems design in the design phase. This design provided a clear picture of how the system would work and what it would look like.

Various diagrams, such as use case, activity, sequence, and class, were created using online tools like draw.io.

These diagrams helped visualize the system’s functionality and interactions. A detailed description of the use case functionality and system design was documented. This description served as a reference during the development phase. A Resident Management Centre System prototype was built first during the development phase. This prototype guided the improvement of the system’s aesthetics and the implementation of essential functions such as navigation, buttons, and text fields to enhance usability. After prototyping, a fully completed system is developed based on the prototype. The completed system’s database was connected to Firestore to ensure seamless data management. All the requirements identified during the design phase were implemented in this phase and met the desired objective.

3.3 Phase Three: Testing and Deployment

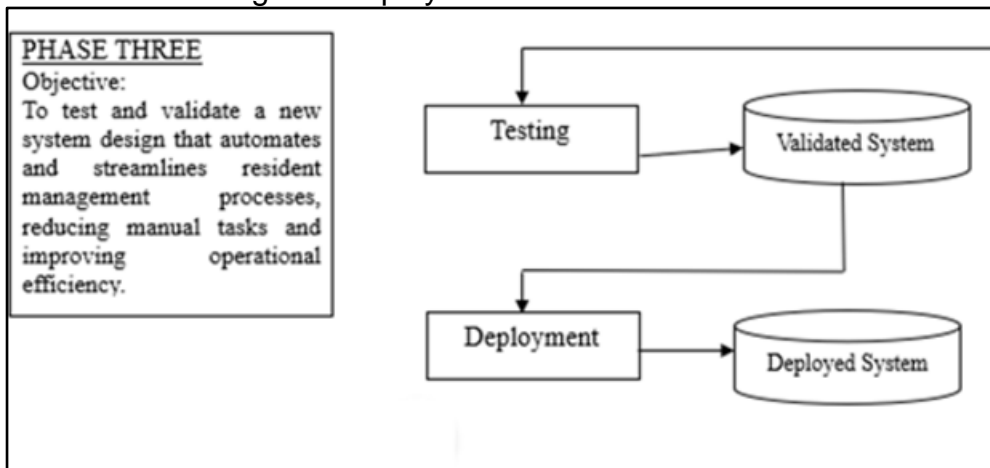


Figure 3.4: Phase Three

After completing the development phase, the modules were thoroughly reviewed to ensure they functioned as expected. These modules were then integrated to form a complete system. A comprehensive test plan was designed to validate the system’s functionality and adherence to the requirements. This plan included the design of test data and the execution of testing activities, following object-oriented testing principles. The Resident Management Centre System was tested using an Android mobile phone to ensure it met the expected standards. Proper documentation is maintained throughout the process to address any issues or bugs identified during testing for further improvement. This documentation has served as a reference for future enhancements and maintenance.

During the User Acceptance Testing and Deployment phase, several activities were conducted to ensure the new system design enhanced operational efficiency and satisfied user requirements. The first activity was User Acceptance Testing (UAT), where beta testing occurred on the user side. A selected group of users, focusing on gated-community users, actively utilized the system and evaluated its performance against their specific needs. However, due to time constraints, the system is eventually tested by 30 adults without focusing only on the gated community users. This testing phase determined user satisfaction and bugs in the system. Besides, non-functional requirements such as performance, load, and stress were thoroughly tested during acceptance testing, and valuable user feedback was obtained. This feedback addressed errors, and the system was refined and optimized to meet desired

performance standards. The system was successfully deployed after all necessary amendments had been made.

4.0 RESULT

The system will be tested with 30 suitable respondents, the respondents will be required to access the application and answer the questionnaire with three quality dimensions: heuristics, content, and navigation. The system will be tested based on these three qualities. User Acceptance Testing helps to identify bugs that have not been addressed, know the real experiences of the respondent when using the system, and make enhancements or refinements to the system.

5.0 CONCLUSION

In conclusion, the Resident Management Centre System presents an innovative solution to simplify residential management processes. The system will be developed using the waterfall model. This proposed system helps to address key challenges such as inefficient parcel notifications, visitor registration, and utility bill payments. Besides, implementing User Acceptance Testing validates the system's effectiveness in meeting user expectations and refining the system for optimal performance before being deployed to the real environment. As a result, developing such a system has the potential to optimise residential management and enhance the convenience and satisfaction of all users.