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Web-Based Community Data Collection for the Family Hope Program in Jakabaring Sub District

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ABSTRACT

This paper addresses the need for an information system to manage data for the Family Hope Program (PKH) in Jakabaring Sub District, Palembang City, Indonesia. The PKH aims to provide assistance to Very Poor Households (RTSM), intending to alleviate immediate burdens and break the cycle of poverty across generations. The absence of a dedicated information system has led to frequent data loss, prompting the proposal and development of a structured system to enhance data collection, processing, and management. Employing the Waterfall model, the system development approach was meticulously structured, progressing through sequential stages—analysis, design, coding, testing, and implementation. The system's design components, including Use case diagrams, Activity diagrams, Sequence diagrams, and Class diagrams, were crucial in outlining functionalities and relationships within the proposed system. Notably, the proposed system's interface, exemplified by an admin dashboard, offers a user-friendly layout featuring population graphs and intuitive menus for data management and reporting. Black Box testing results exhibited satisfactory performance across various system functionalities, affirming its potential to efficiently manage data for the PKH. Overall, this proposed information system stands as a promising solution to mitigate data loss challenges and enhance efficiency in supporting Very Poor Households in Jakabaring Sub District.

1. Introduction

The existence of information systems improves the performance, effectiveness, and productivity of various agencies, both government agencies, private institutions, and individuals, as well as encouraging the realization of an advanced and prosperous population [1], [2]. Poverty is a condition of economic inability to meet the average living standard of the population in an area. This condition of inability is characterized by low income to meet basic needs in the form of food, clothing, and shelter. The Family Hope Program (PKH) is a social protection program that provides cash assistance to Very Poor Households (RTSM). Family members of Very Poor Households (RTSM) are required to carry

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out the terms and conditions that have been set. In the short term, this program aims to reduce the burden on Very Poor Households (RTSM), and in the long term, it is hoped that it can break the chain of poverty between generations so that the next generation can escape the poverty trap. Implementation of the Family Hope Program (PKH) also supports efforts to achieve millennium development goals.

Since 2007 the Indonesian government has implemented the Family Hope Program (PKH). This program was implemented because the number of Very Poor Households (RTSM) was increasing. The government formed the Family Hope Program Implementation Unit (UPPKH) to implement the Family Hope Program (PKH) in the context of accelerating poverty reduction as well as developing policies in the field of social protection. Jakabaring Sub District is an expansion district based on Palembang City Regional Regulation No. 5 of 2017. The Jakabring Sub District Office is located on Jalan Danau Opi no. 2, Fifteen Ulu Village, Jakabaring District, Palembang City. Jakabaring District has an area of 1386.45 hectares with a population of 83,498 people and has 5 sub-districts, namely Eight Ulu Village with an area of 156.40 hectares and a population of 12,079 people, Sembilan Ten Ulu Village has an area of 55.78 hectares with a population 13,256 people, Limabelas Ulu Village has an area of 650.90 hectares with a population of 26,624 people, Silaberanti Village has an area of 486.30 hectares with a population of 19,818 people, Tuan Kentang Village has an area of 37.07 hectares with a population of 83,498 people.

Currently (2022), Jakabaring Sub District is still not based on an information system for collecting data on poor people for the Family Hope Program (PKH). This condition causes frequent loss of PKH participant data. This happens because PKH participant data is often moved around. Based on these limitations, the author took the initiative to propose the development of an information system to help collect data on the Family Hope Program (PKH) in Jakabaring Sub District, Palembang City. It is hoped that this information system can further support the activities of staff and employees in processing data on Family Hope Program (PKH) participants in Jakabaring Sub District, Palembang City.

2. Method

Figure 1 illustrates the research methodology employed by the author to accomplish the predefined objectives. The chosen system development approach was the waterfall model, known for its sequential nature wherein each stage must be finished before advancing to the subsequent phase. The Waterfall Model is a software development methodology that follows a linear and structured flow [3], [4], [5]. It consists of a series of phases that must be completed sequentially, and each phase is dependent on the completion of the previous phase. Below are key phases within the Waterfall model:

1. Analysis: This phase involves gathering and comprehensively understanding system requirements. It entails engaging with users and stakeholders to define both functional and non-functional requirements.
2. Design: Following the collection of requirements, the subsequent step involves crafting the system's architecture. This encompasses outlining the system's structure, identifying algorithms, and preparing necessary technical specifications.
3. Coding: At this stage, the software is coded in accordance with the specifications outlined during the design phase. The development team generates code based on the approved design.
4. Testing: Post-implementation, the system undergoes testing to ensure fulfillment of all requirements and to detect and resolve significant bugs or errors. Testing includes functional, performance, and security evaluations.
5. Delivery/Implementation: Once the system successfully clears all tests, it is poised for implementation and deployment into a production environment or for utilization by end users.

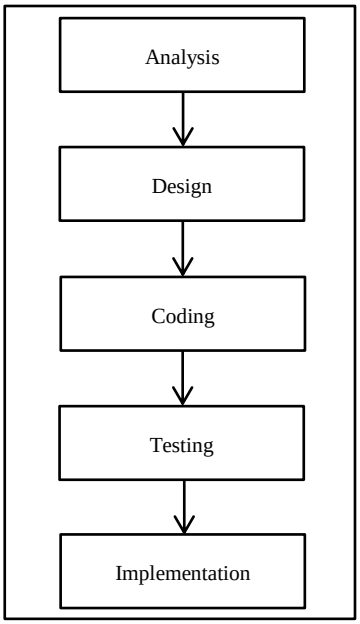

Figure 1 – Simple system development model

A primary drawback of the Waterfall model is its challenge in accommodating frequent shifts in software development requirements. The model's linear structure makes it arduous to revert to a prior phase once it's concluded.

3. Result and Discussion

The authors commenced the design of the proposed system through the generation of a UML (Unified Modeling Language) diagram [6], [7]. The proposed system design includes Use case diagrams, Activity diagrams, Sequence diagrams, and Class diagrams.

3.1. Use diagram

Various elements require elucidation, specifically actors and use cases. Actors represent system-connected users, potentially individuals denoted by their function rather than personal identity. Depicted as a stick figure with a noun denoting their role/system, an actor symbolizes this entity. Conversely, use cases are represented by an elliptical symbol housing an active verb denoting the activity from the actor's viewpoint [8], [9]. The system that the author proposes consists of two group actors, village officers and sub-district officers.

3.2. Activity diagram

An activity diagram is a description of function paths in an information system [10]. In full, the activity diagram defines where the system process starts, where it stops, what activities occur during the system process, and what sequence these activities occur in.

3.3. Sequence diagram

Derived from the established use case, a sequence diagram is generated to delineate object behavior within the use case. It illustrates the object's lifespan and details the messages exchanged between objects.

3.4. Class diagram

Class diagrams delineate the system's object types and the diverse static relationships present among them [11]. Class diagrams show the properties and operations of a class and the boundaries contained in the object relationships. Class diagram dari proposed sistem diperlihatkan Figure 2.

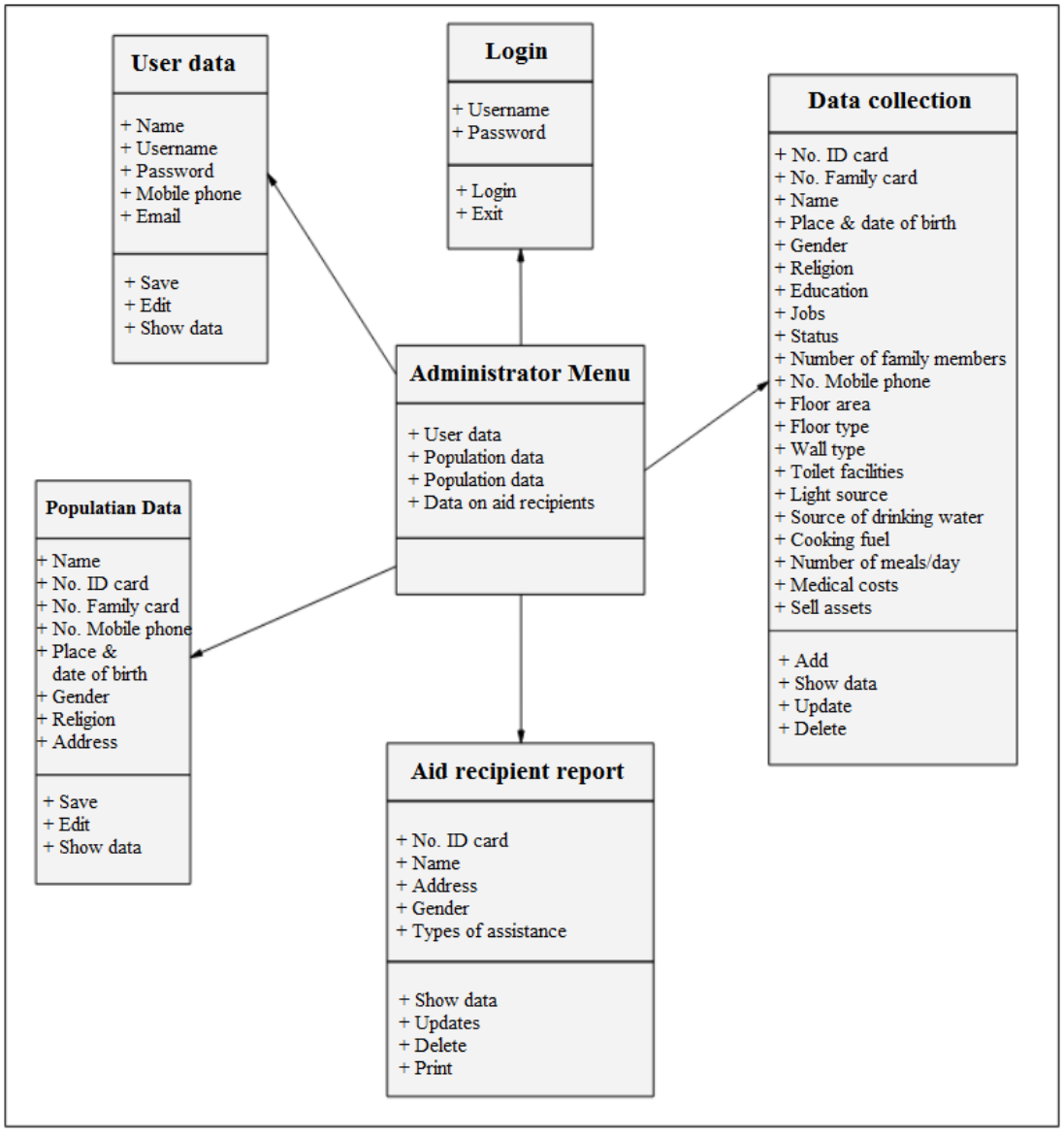

Figure 2 – Class diagram

3.5. System Interface

Figure 3 shows the admin dashboard page, where if the admin is successful in the login process, the system will display a dashboard page for the admin. On this main page, there is a population graph and several menus, including the Period Data Menu, Population Data Menu, Data Collection Menu, Aid Recipient Report Menu, and System Menu.

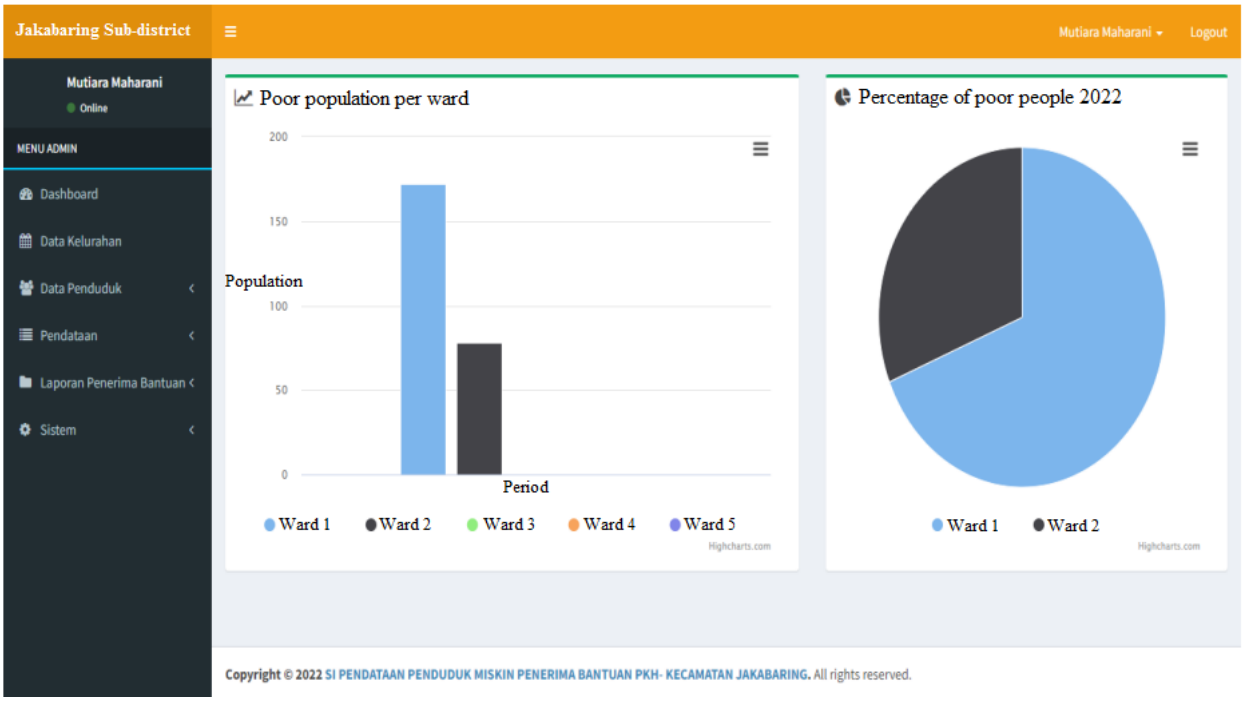

Figure 3 – Dashboard admin page

Table 1 shows the results of Black Box [12], [13] testing of the proposed system. Overall, based on testing, the results are good enough.

Table 1 – Black Box testing

No	Name	Expected outcome	Testing result									
			Function		Interface		Data structure		Performance		Termination	
			Valid	No Valid	Valid	No Valid	Valid	No Valid	Valid	No Valid	Valid	No Valid
1	Login – Successful	Username and Password match validation and login is successful	√		√		√		√		√	
2	Login – Failed	Username and Password do not match validation and login fails	√		√		√		√		√	
3	Logout - Exit the system	Data collection on poor people for the Family Hope Program (PKH)	√		√		√		√		√	
4	Access	There is population	√		√		√		√		√	

	Dashboard	graphic information per year period										
5	Access the Data Menu	Subdistrict Displays several subdistrict data that can be added and edited by the admin	√		√		√		√		√	
6	Access the Data Menu	Resident Admin can view resident data and can edit data	√		√		√		√		√	
7	Access the Criteria Menu	Displays information regarding data on the criteria for receiving aid for the poor	√		√		√		√		√	
8	Access the Data Collection Menu	Displays information regarding population residence data or parameter data	√		√		√		√		√	
9	Access the Beneficiary Report Menu	Admin can see all data on people who receive assistance and can print it	√		√		√		√		√	
10	Access the User Data Menu	Admin can add, edit and delete user data	√		√		√		√		√	

4. Conclusion

The development of an information system for the Family Hope Program (PKH) in Jakabaring Sub District, Palembang City, is a critical initiative in addressing the challenges of data management and loss. The proposed system follows a structured Waterfall model, ensuring a systematic progression through analysis, design, coding, testing, and implementation stages. The system's design encompasses various essential components, including Use case diagrams, Activity diagrams, Sequence diagrams, Class diagrams, and a user-friendly System Interface. The Use case diagrams define actors (village and sub-district officers) and their associated activities within the system. Activity diagrams delineate functional paths, while Sequence diagrams elaborate on object behavior within specific use cases. Class diagrams describe the system's object types and their relationships.

The System Interface, exemplified by the admin dashboard page, offers a clear layout presenting population graphs and menus for data management, reports, and system administration. Black Box testing results indicate a satisfactory performance across various functionalities, from successful login processes to data access, editing, and report generation. Overall, the proposed information system stands as a promising solution to streamline data collection, processing, and management for the Family Hope Program, potentially alleviating the challenges posed by data loss and enhancing efficiency in supporting Very Poor Households (RTSM) in Jakabaring Sub District.

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REFERENCES

[1] J. L. Zofio, J. Aparicio, J. Barbero, and J. M. Zabala-Iturriagagoitia, "The influence of bottlenecks on innovation systems performance: Put the slowest climber first," *Technol. Forecast. Soc. Change*, vol. 193, no. January, p. 122607, 2023, doi: 10.1016/j.techfore.2023.122607.

[2] A. A. Melaibari, N. H. Abu-Hamdeh, A. S. Alorfi, H. A. Z. AL-bonsrulah, and A. M. A. Elsiddieg, "New design for PVT system with elliptic cooling duct involving nanofluid in existence of MHD and utilizing TEG," *Case Stud. Therm. Eng.*, vol. 53, no. October 2023, p. 103815, 2024, doi: 10.1016/j.csite.2023.103815.

[3] K. D. Prasetya, Suharjito, and D. Pratama, "Effectiveness Analysis of Distributed Scrum Model Compared to Waterfall approach in Third-Party Application Development," *Procedia Comput. Sci.*, vol. 179, no. 2019, pp. 103–111, 2021, doi: 10.1016/j.procs.2020.12.014.

[4] T. Thesing, C. Feldmann, and M. Burchardt, "Agile versus Waterfall Project Management: Decision model for selecting the appropriate approach to a project," *Procedia Comput. Sci.*, vol. 181, pp. 746–756, 2021, doi: 10.1016/j.procs.2021.01.227.

[5] A. A. S. Gunawan, B. Clemons, I. F. Halim, K. Anderson, and M. P. Adianti, "Development of e-butler: Introduction of robot system in hospitality with mobile application," *Procedia Comput. Sci.*, vol. 216, no. 2019, pp. 67–76, 2022, doi: 10.1016/j.procs.2022.12.112.

[6] G. Bergström *et al.*, "Evaluating the layout quality of UML class diagrams using machine learning," *J. Syst. Softw.*, vol. 192, p.

111413, 2022, doi: 10.1016/j.jss.2022.111413.

[7] H. Wu, "QMaxUSE: A new tool for verifying UML class diagrams and OCL invariants," *Sci. Comput. Program.*, vol. 228, p. 102955, 2023, doi: 10.1016/j.scico.2023.102955.

[8] P. Danenas, T. Skersys, and R. Butleris, "Natural language processing-enhanced extraction of SBVR business vocabularies and business rules from UML use case diagrams," *Data Knowl. Eng.*, vol. 128, no. February, p. 101822, 2020, doi: 10.1016/j.datak.2020.101822.

[9] Meiliana, I. Septian, R. S. Alianto, Daniel, and F. L. Gaol, "Automated Test Case Generation from UML Activity Diagram and Sequence Diagram using Depth First Search Algorithm," *Procedia Comput. Sci.*, vol. 116, pp. 629–637, 2017, doi: 10.1016/j.procs.2017.10.029.

[10] Z. Daw and R. Cleaveland, "Comparing model checkers for timed UML activity diagrams," *Sci. Comput. Program.*, vol. 111, no. P2, pp. 277–299, 2015, doi: 10.1016/j.scico.2015.05.008.

[11] F. Chen, L. Zhang, X. Lian, and N. Niu, "Automatically recognizing the semantic elements from UML class diagram images," *J. Syst. Softw.*, vol. 193, p. 111431, 2022, doi: 10.1016/j.jss.2022.111431.

[12] E. Krupalija *et al.*, "SoftwareX ETF-RI-CEG-Advanced : A graphical desktop tool for black-box testing by using cause – effect graphs," *SoftwareX*, vol. 25, no. October 2023, p. 101625, 2024, doi: 10.1016/j.softx.2023.101625.

[13] D. Felicio, J. Simao, and N. Datia, "Rapitest: Continuous black-box testing of restful web apis," *Procedia Comput. Sci.*, vol. 219, no. 2022, pp. 537–545, 2023, doi: 10.1016/j.procs.2023.01.322.