Web-Based public health center management information system using Codeigneter and Ajax techniques at Public Health Canter

by Reno Renaldi

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Sistema de información de gestión del centro de salud pública basado en la web utilizando Codeigneter y técnicas Ajax en el Centro de Salud Pública

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SUMMARY

Introduction: *The development of science and technology at this time, especially in computerization, has developed rapidly. Computers are beneficial in completing various fields of work because they can save time and money to provide satisfactory results. However, the public health center's data management process is still manual, and it is ineffective in managing data and time inefficient, resulting in less effective performance. This research aimed to find data and make it easier to create reports or record data, which will be effective in terms of time and management data.*
Methods: *This study used the waterfall method with five stages, namely requirements, system design,* implementation, integration, testing, operation, and maintenance. *This system performs system planning that will be made based on the previous stage so that this system is made according to the needs of the community health center. This analysis use performance, information, economy, control, efficiency, and services (PIECES).*
Results: *The results of this study were the creation of a web-based information system program at the Public Health Center. Testing using black boxes, the application of this personal data management information system can run well, free from script errors, and functionally produce the expected results.*
Conclusion: *The management data on information system application aims to make managing data at the health center easier. A backup system is recommended to be made, so existing data is stored in history data.*

Keywords: *Health Center, Information System, Waterfall Method, Web Based Program*

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RESUMEN

Introducción: *El desarrollo de la ciencia y la tecnología en este momento, especialmente en la informatización, se ha desarrollado rápidamente. Las computadoras son beneficiosas para completar varios campos de trabajo porque pueden ahorrar tiempo y dinero para brindar resultados satisfactorios. Sin embargo, el proceso de gestión de datos del centro de salud pública sigue siendo manual, y es ineficaz en la gestión de datos y tiempo ineficiente, lo que resulta en un desempeño menos efectivo. Esta investigación tuvo como objetivo encontrar datos y facilitar la creación*

de informes o registros de datos, que serán efectivos en términos de tiempo y gestión de datos.

Métodos: *Este estudio utilizó el método de cascada con cinco etapas, a saber, requisitos, diseño del sistema, implementación, integración, prueba, operación y mantenimiento. Este sistema realiza la planificación del sistema que se realizará en base a la etapa anterior para que este sistema se realice de acuerdo a las necesidades del centro de salud comunitario. Este análisis utiliza rendimiento, información, economía, control, eficiencia y servicios (PIECES).*

Resultados: *Los resultados de este estudio fueron la creación de un programa de sistema de información basado en la web en el Centro de Salud Pública. Probando con cajas negras, la aplicación de este sistema de información de gestión de datos de personal puede funcionar bien, sin errores de script y producir funcionalmente los resultados esperados.*

Conclusión: *La aplicación de gestión de datos en el sistema de información tiene como objetivo facilitar la gestión de datos en el centro de salud. Se recomienda realizar un sistema de respaldo, de modo que los datos existentes se almacenen en los datos históricos.*

Palabras clave: *Centro de salud, sistema de información, método Cascada, Programa Web.*

INTRODUCTION

Health is a problem in most countries in the world, including Indonesia, the cause of which is dominated by the inability of the community to handle personal and environmental health. With the rapid population growth and the complexity of public health problems, it is necessary to strengthen the role of public health center services as the primary health service in the community. The role of the government is the main factor in health management, both the central government and especially the role of local governments as a form of the decentralized development progress of a region (1). The public health center is one of Indonesia's most important public health service facilities. The public health center is a technical implementing unit for the district/city service responsible for organizing health development in a work area. Public Health Center is a functional organizational unit that carries out comprehensive, integrated, equitable health efforts that are acceptable and affordable by the community with active community participation and using the results of the development of appropriate science and

technology, at a cost that the government and the wider community can bear to achieve optimal health status, without neglecting the quality of service to individuals (2,3).

Technology development is growing rapidly, affecting all aspects of life, including the health sector. A computer-based health information system produces easier, quality, and more relevant information (3-5). It can support management functions and overcome the increasing complexity of health data (6,7). The health center management information system (SIMPUS) aims to produce a system that can provide service workers with the information needed for patient management (8). Public health center management and health services based on information technology. As for the future, public health centers are also guided to use information technology related to efforts to improve health services in a comprehensive and integrated manner (9-11).

Data in the management process of public health centers are still less effective in terms of time. Then, bookkeeping the data of the community health center requires additional costs, such as the cost of purchasing several cabinets for filing files, paper costs, and others. Then, requesting the information is quite difficult for officers because they have to look at the data in their archives and have difficulty searching for the necessary data, such as data on employees, doctors, and patients. Making health center management information system (SIMPUS) using Codeigneter and ajax. The right of access to the system is granted to employees of the community health center data entry. A database system is a computerized system whose main purpose is to maintain processed data or information and to make information available when needed (12-14).

This health center provides care, treatment, hospitalization, emergency department, and others. However, in the management process, such as patient data, they still use paper containing patient data, which is recorded in archive form, and data on doctors, employees, and others. In recording data on a time basis, it is still less effective; for example, in finding patient data, doctor data, and other data, as well as in making reports or recording data on a timely basis, is still less effective and also requires additional

costs such as the cost of several cabinets for file storage, paper, and others. A health care provider is an individual health professional or a health facility organization licensed to provide health care diagnosis and treatment services, including medication, surgery, and medical devices (15).

The solution makes managing management data at the public health center easier, minimize errors in file archiving and data loss. The purpose of this research is to implement a health center management information system (SIMPUS) which includes recording data on lecturers, patients, and officers and making reports that are effective and efficient in terms of energy, time, and cost to implement in a community health center in terms of information on Tapung Health Centre that can be accessed by fast and efficient.

METHODS

The waterfall method is often called the classical life cycle, which describes a systematic and sequential approach to software development, starting with the specification of user requirements and then proceeding through the stages of planning, modeling, construction, and delivery of the system to customers/users (deployment), which ends with support for the complete software produced (16).

This analysis use performance, information, economy, control, efficiency, and services (PIECES). To obtain complete and accurate data, cooperation with related parties is needed, while the steps taken for data collection are observation of data collection through observation and recording of the symptoms or events investigated on the object of research directly. One example of the observations made is the health observation which is still done manually. Interview Data collection through face-to-face and direct question and answer with community health center officers and their patients. For example, regarding the data needed in the data collection process for the data needs the researcher desires. Literature study read and understand books or journals in completing this research, in this case, research on public health center management information system (SIMPUS).
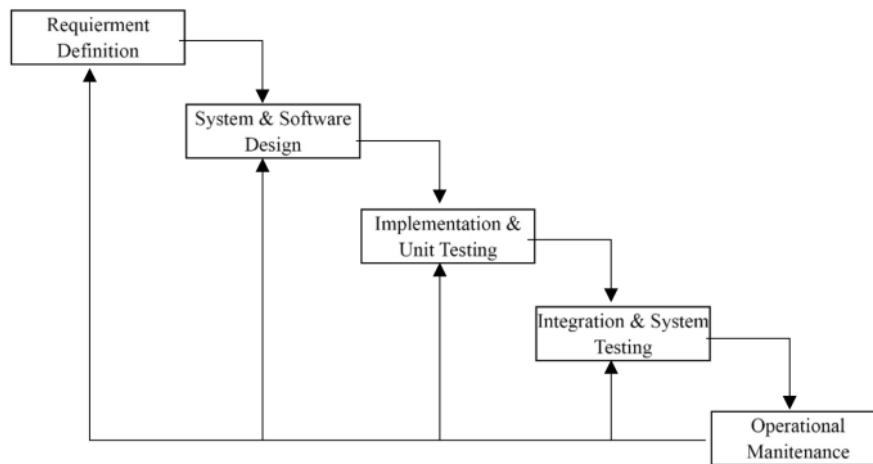

Figure 1. Waterfall.

The following is an explanation of the stages carried out in the waterfall model: step one Requirement, at this stage, the authors analyze what needs are needed in building this system and

hold a data collection stage by meeting directly with the community health center, a question and answer process is also carried out regarding requests and wishes from the community health

center. System design includes planning a system that will be made based on the previous stage so that this system is made according to the needs of the community health center. Implementation of this process, the researcher, will start to make the information system. This stage starts with coding, which is the translation of designs that have been made into the computer language, creating databases, tables, and other functions using the software until the creation of a management information system for the community health center is completed and ready to be used. Integrating and testing. This stage is the testing stage or the testing stage of the system that has been created. Where all units developed in the implementation phase are integrated into the system after the tests carried out by each unit. After integration, the whole system is tested to check for any system failures.

RESULTS

The findings in the field are that the problem at the public health center occurs in data processing, where the complete process takes a long time and then causes delays in processing the management data of the Tapung Health Center. Therefore, the data processing results at the public health center are less relevant. Management data processing will cause problems because data processing is still done manually. The system used at the Tapung Health Center is still simple, using files on paper and folders to process management data at the Tapung Health Center, so a budget is needed. Themselves for the purchase of stationery and the cost of spending is getting bigger. So

it is necessary to change the system to control expenses.

This stage is the activity of making a system or application using the help of software and hardware, following the analysis and design to produce a system that works.

Furthermore, an evaluation of the test results is carried out. If the test results have errors, then improvements are made. This evaluation is carried out to determine whether the system is as desired. After repairs and modifications to the system are made, the system can already be operated.

Figure 2. Login Menu Display.

This menu has two inputs: the username and password to enter the application. The entered username and password will be matched to the data contained in the database. If the data match, the user can enter the system, but if the data is not found, an error message will appear that the username and password are incorrect.
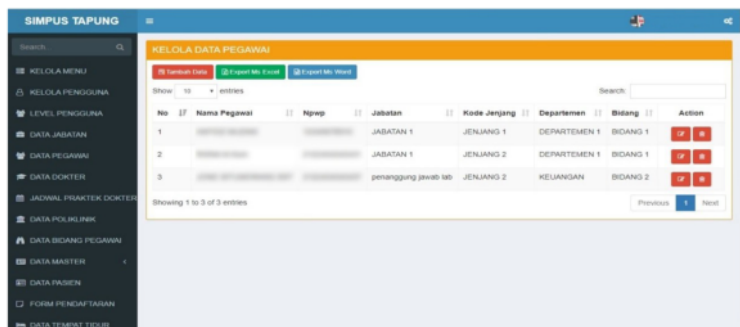

Figure 3. Employee Data Menu.

This menu will display employee data stored in the database. The data to be displayed is the employee's name, the number of the taxpayer participant, the position, code level, department, and field. There are also two buttons, namely, edit and delete. Edit is used to change employee data, and delete is used to delete employee data.

Figure 4. Display Menu Doctor Practice Schedule Data.

This menu will display the doctor's practice schedule data. The data displayed is the doctor's name, day, start time, end time, and polyclinic. There are also two buttons in this menu: edit and delete. Edit is used to change the doctor's practice schedule data, while delete is used to delete the doctor's practice schedule data

Figure 5. Action Menu.

In this menu, some information is displayed: patient biodata, action history, and drug administration history. The patient's biodata section has five buttons: action input, drug input, laboratory examination, print laboratory examination report, and print medical record file. Action input is used to input any actions carried out on the patient. Drug input is used to input any drug data given to the patient. Laboratory tests are used to input data on the results of laboratory tests that the patient has carried out, print out laboratory examination reports used to print the results of the laboratory examination input, and print the medical record

file used to print the patient's medical record file document. The action history section contains action data, examination results, progress, date of examination, and tariffs charged. In the history of drug administration, there are data on names of drugs and medical devices, date of administration of drugs, quantities, prices, and subtotals.

Figure 6. Laboratory Examination Output Display.

This Output Report is a Patient Examination Report Display that explains all examinations' details. This report will show what examinations were carried out, the examination results, units, reference values, and a description of the patient's examination results.

Testing is carried out using the Blackbox Testing method, which is carried out only by observing the execution results through test data and software functional checkers using specific email and password. By using the Blackbox method.

Table 1
Table Test

Scenario Test	Expected Results	Test Results	Conclusion
Username and Password that are not registered	The system will refuse and show the message "email or password you entered is incorrect."	In accordance Hope	Valid
Correct username and incorrect password registered	The system will refuse and show the message, "The password you entered is incorrect."	In accordance Hope	Valid
Username that is not correct and registered password	The system will reject and display the message, "The username you entered is incorrect."	In accordance Hope	Valid
Registered Username and Password	The system will accept and enter to system	In accordance Hope	Valid

DISCUSSION

Existing data still uses archives or files. Management data has not been well structured as in employee and patient data, so the complete process requires excessive resources. And the Tapung Health Center has not been able to provide good service. It takes a long time to process the Tapung Health Center management data, which has a lot of archives piled up in books.

Health Information System (SIK) Public health center or called health center management information system (SIMPUS) aims to produce a system that can provide the information needed for patient management for service workers, community health centers, and health services based on information technology. Furthermore, accurate data and information from the results of the activities of the Community Health Center become a source of decision-making for regional and central policies. As for the future community health centers are also guided to use information technology related to efforts to improve health services in a comprehensive and integrated manner (2).

Some of the advantages that can be obtained by implementing the Public Health Center Management information system are the ease for officers to obtain information without having to search data one by one. In addition, convenience for patients will be responded to quickly and efficiently. Furthermore, this system can minimize patient queuing in inputting data and Structured data storage because the public health center management information system uses a database stored on a computer (17).

The test results using the black box method show that the system runs well without errors, where all features run according to their respective functions without an error message appearing. The researcher's opinion is that the data management information system application design will minimize errors in file archiving and data loss. Then, this personnel data management information system application can run well with black box testing.

CONCLUSION

The design of this management data management information system application aims to make it easier to manage management data at the Health Center. It can minimize errors in archiving files and data loss. From the test results using the black box, this personnel data management information system application can run well, free from script errors, and functionally produce the expected results as for suggestions. For the next system development, it is better to create an Employee Work Structure (SKP) that all employees can access. The next system development should include transaction, financial, and banking processes so that it becomes a complex system.

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