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IMPLEMENTATION OF ANDROID-BASED COMMUNITY HEALTH CENTER EXAMINATION REPORTING APPLICATION USING THE METHOD WATERFALL

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Abstract: *Health centers have an important role in providing health services to the community, including in conducting health checks and recording patient medical data. However, the process of reporting health checks which is still done manually often results in delays, recording errors, and difficulties in accessing data. Therefore, an efficient reporting system is needed to improve the quality of health services and data management. This study aims to design and implement an Android-based health center examination reporting application using the Waterfall software development method. This method was chosen because it can provide clear and structured stages in the application development process, starting from needs analysis, design, implementation, to testing and maintenance. The result of this study is an application that allows health center officers to record and report health checks digitally and in real-time. This application is equipped with features such as patient data input, recording examination results, and reporting that is easily accessible to interested parties. With the implementation of this application, it is hoped that the health check reporting process at the health center can be carried out more quickly, accurately, and efficiently, as well as improve the quality of health services to the community.*

Keywords: *Reporting Application, Health Check, Health Center, Android, Waterfall*

Abstrak: Puskesmas mempunyai peranan penting dalam memberikan pelayanan kesehatan kepada masyarakat, termasuk dalam melakukan pemeriksaan kesehatan dan pencatatan data kesehatan pasien. Namun proses pelaporan pemeriksaan kesehatan yang masih dilakukan secara manual seringkali mengakibatkan keterlambatan, kesalahan pencatatan, dan kesulitan dalam mengakses data. Oleh karena itu, diperlukan sistem pelaporan yang efisien untuk meningkatkan kualitas layanan kesehatan dan pengelolaan data. Penelitian ini bertujuan untuk merancang dan mengimplementasikan aplikasi pelaporan pemeriksaan puskesmas berbasis android dengan metode pengembangan perangkat lunak Waterfall. Metode ini dipilih karena dapat memberikan tahapan yang jelas dan terstruktur dalam proses pengembangan aplikasi, mulai dari analisis kebutuhan, desain, implementasi, hingga pengujian dan pemeliharaan. Hasil dari penelitian ini adalah sebuah aplikasi yang memungkinkan petugas puskesmas mencatat dan melaporkan pemeriksaan kesehatan secara digital dan real-time. Aplikasi ini dilengkapi dengan fitur-fitur seperti input data pasien, pencatatan hasil pemeriksaan, dan pelaporan yang mudah diakses oleh pihak yang berkepentingan. Dengan diterapkannya aplikasi ini diharapkan proses pelaporan pemeriksaan kesehatan di Puskesmas dapat dilakukan lebih cepat, akurat, dan efisien, serta meningkatkan mutu pelayanan kesehatan kepada masyarakat.

Kata kunci: Aplikasi Pelaporan, Cek Kesehatan, Puskesmas, Android, Waterfall

INTRODUCTION

Puskesmas (Community Health Center) is one of the health institutions that has a strategic role in providing basic health services to the community. One of the main tasks of the Puskesmas is to conduct health checks and record patient

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medical data. However, so far many Puskesmas still use manual methods in the health check reporting process. This method often causes various problems, such as errors in recording, delays in reporting, and difficulties in accessing and analyzing health data. (Izhari & Dhany, 2023)(Hendrawan, Perwitasari, & Ritonga, 2023)(Syahputra Novelan & Putra, 2020)

The manual reporting process can hamper the effectiveness of Puskesmas operations and have a negative impact on the quality of health services. Limitations in data access also make it difficult for Puskesmas to make appropriate and quick decisions regarding health services. On the other hand, with the increasing use of mobile devices and the development of information technology, there is an opportunity to increase efficiency in managing health data through Android-based applications. (Rizal & Fachri, 2023)(Rizal et al., 2022) (Septian Hardinata et al., 2022)(Supiyandi et al., 2022)(Bangun Sistem et al., 2019)

The implementation of an Android-based examination reporting application can provide a solution to the problems faced by the Health Center. This application allows health workers to record and report examination results quickly and accurately, and provides ease in accessing health data in real time. In addition, this application can also help in making better decisions based on available data. (Hendrawan, Perwitasari, & Arifin, 2023)(Tasril, 2018)(Hasan Putra & Syahputra Novelan, n.d.)

The Waterfall method was chosen in developing this application because this approach allows a structured and systematic process, starting from needs analysis to the maintenance stage. With clear steps, application development can be carried out more efficiently and in a focused manner, resulting in an application that meets the needs of the Health Center and users. Based on this background, this study aims to design and implement an Android-based Health Center examination reporting application using the Waterfall method. It is hoped that the implementation of this system can improve the quality of health services, reporting efficiency, and data management at the Health Center. (Fachri, 2018)(Informatika & Hasan, n.d.)(dan Pembuatan Aplikasi Manajemen Peminjaman Kendaraan Berbasis Web Dengan et al., n.d.)

METHOD

This study uses a development method called waterfall, which is a development method from the approach used in descriptive-qualitative research. This method is a software development process that is carried out sequentially, where progress is seen as water that continues to flow down (like a waterfall) through the planning, modeling, implementation (construction) and testing phases. (Rahmat et al., 2019).

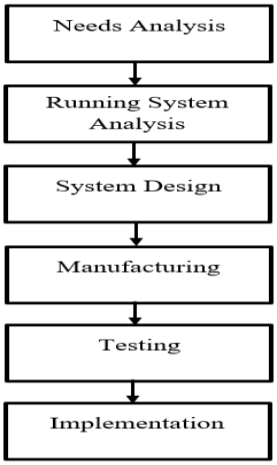

Figure 1. Method Waterfall

Based on Figure 3.1, the following is an explanation of each process of the waterfall method, including:

1. *Needs Analysis*
   At this stage the author performs services, limitations, and system objectives are determined through consultation with the system. These requirements are then defined in detail and function as system specifications. (Penjualan Online Berbasis Website et al., 2019)

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2. Analysis of the Running System
   At this stage, the author ensures that the new system being developed truly meets user needs and corrects the weaknesses of the existing system. (Fauzi Siregar & Sari, 2018)
3. System Design
   At this stage, the system design process is used to change the above needs into a representation in the form of a software blueprint before coding begins. The design stage involves designing a system where we will provide solutions to problems that arise at the analysis stage.
4. Making
   This development phase is very critical because the end result of this phase is the code that is the basis of the software. The success of the implementation phase depends greatly on the quality of the design and how well the developers can translate the design into working code.
5. Testing
   Something that is made must be tested. Likewise, software, all software functions must be tested carefully so that the software is free from errors, and the results must be truly in accordance with the needs that have been defined in the previous stage. The testing stage is also a stage that determines whether the design that has been made is in accordance with user needs or not. The purpose of this testing is to minimize website design defects so that the system that is developed can really run as well as possible. This testing will be carried out by interviewing several people as testers to assess whether the system created is in accordance with needs.
6. Implementation
   The implementation stage is the planning of the system implemented into a real situation with the selection of hardware and the preparation of the design (coding). For the implementation of the system, namely by entering the design that has been made into the device provided.

System Design

Use Case Diagram is used to interpret what the system to be designed does and to find out who interacts with the system. Use case diagrams operate by defining the relationship between one or more actors in the application being designed. The following is a use case diagram of the application to be designed as seen in the image below in Figure 2.

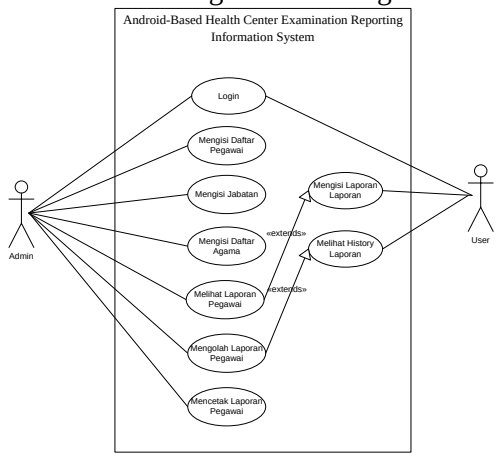

Figure 2. Use Case Diagram

1. *Activity Diagram*

Activity Diagram Admin is an activity that examines what the admin's tasks are in Android. The admin first logs in to the Android-Based Health Center Inspection Reporting Information System. After entering the application, the admin can run attendance and see the results of the examination report and can see more detailed information on the examination results.

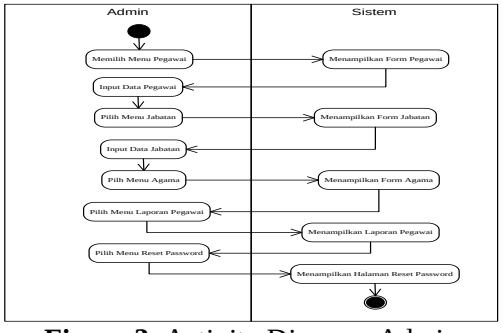

Figure 3. Activity Diagram Admin

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This activity is an activity that explains what the tasks of the user are, namely employees in Android. Employees first log in to the examination report application system. After entering the application, users can report examinations at the health center by uploading photos of the examination results. For this, the user activity diagram can be seen.

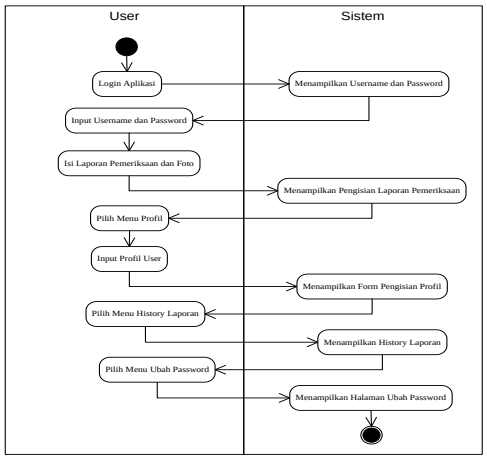

Figure 4. Activity Diagram User

2. Sequance Diagram

Sequence Diagram is a sequence of activities carried out by the user in running the employee application. Figure 5 is a sequence diagram used in this study.

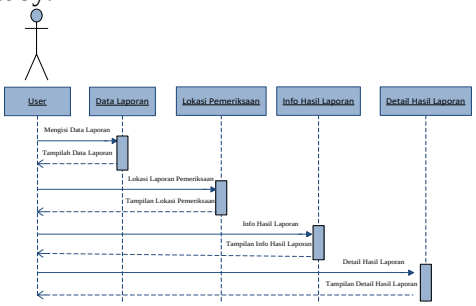

Figure 5. Sequance Diagram

RESULTS AND DISCUSSION

The results and discussion are the results of the implementation of the android-based health center examination reporting information system. The author conducted a trial using data provided by the company. However, before conducting the test, there are several device requirements for the information system.

Login Display

The login menu display consists of a username and password display. For more details, see the image below. Login Menu Display.

Figure 6. Home Menu Page View

Inspection Report Menu

On the inspection report menu display, this is where users can report inspections by providing a title, report explanation and photo evidence of the report. For more details, see Figure 7. Inspection report menu display.

Figure 7. Inspection Report Menu View

Profile Menu Display

The profile menu display consists of an employee information display containing personal data such as NIK, name, gender, address, date of birth, and the name of the company where the employee works. For more details, see Figure 8 Profile Menu Display.

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Figure 8. Master Data Menu View

Display of the Examination Report History Menu

The history menu display is a display of employee inspection report history containing the day/date, title, explanation of the report and photo of the inspection report. For more details, see Figure 9 Display of the Examination Report History Menu.

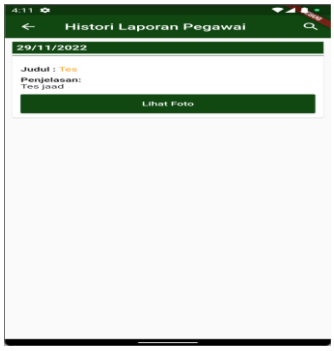

Figure 9. Examination Report History Menu View

Change Password Menu Display

The change password menu display consists of a menu display for changing the password according to the employee's wishes so that the account is more secure. For more details, see Figure 10 Change Password Menu Display.

Figure 10. Change Password Menu Display

Admin Login Display

On the admin login page is the admin account that functions to view employee inspection report data that enters the system. The admin login page can be seen in Figure 10.

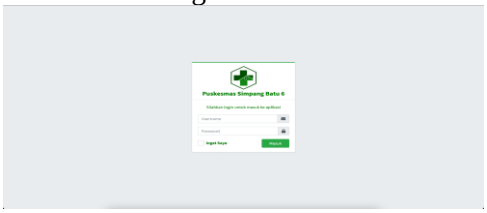

Figure 11. Value Input View

Admin Front Page View

On the admin front page is the initial display found in the web system. For the admin front page display can be seen in the image below.

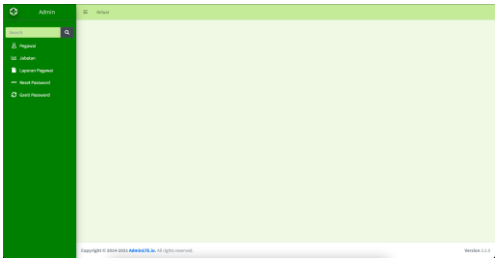

Figure 12. Admin Front Page View

CONCLUSION

The implementation of the Android-based Health Center Inspection Reporting Application using the Waterfall Method has several conclusions that can be presented, including:

1. The implementation of Android-based reporting applications has successfully increased the effectiveness and efficiency of the health examination reporting process at the Health Center. The use of this application allows medical personnel to input and access examination data in real-time, thereby minimizing errors and accelerating the decision-making process.
2. The use of the Waterfall method in application development provides benefits in terms of structured planning and implementation. The

development stages start from needs analysis to systematic final testing, which ensures that the application runs according to the specified specifications.

3. This application is designed with a user-friendly interface, making it easier for Puskesmas officers to operate it. In addition, the features provided already cover the main needs in reporting examinations, so that this application can be implemented well in the Puskesmas environment.

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