

Design of Mobile-Based HR Management Application in Pekanbaru Army Hospital

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ABSTRACT: Pekanbaru Army Hospital as a health institution that has a strategic role in health services for military personnel and the people of Pekanbaru city still faces challenges in carrying out human resource management (HRM). This research aims to build a mobile-based medical HR management application using Flutter technology. This software development applies the Rapid Application Development (RAD) methodology which allows application development to be carried out in stages and iteratively, focusing on speed and flexibility, and for application testing using the black box testing method. This research produces a mobile-based HR management application with location-based online attendance features, medical performance monitoring for medical clusters, online leave applications, and e-file management. This application has been tested with Blackbox Test to ensure all functionality runs well and as expected. User Acceptable Test also shows that this application gets a satisfaction percentage of 84%, so it can be concluded that this application can be well received by users and is suitable for use.

KEYWORDS: HRM Mobile, Attendance Mobile, *Flutter*

I. INTRODUCTION

Information technology has become an unavoidable necessity, especially in the management of Human Resources (HR) in the hospital environment. Army Hospital Pekanbaru, as a health institution that has a strategic role in health services for Pekanbaru residents, still faces challenges in improving the effectiveness of HR management. According to (Cundo Harimurti, 2021) Human resources function to achieve goals and objectives through the efforts of a group of people in it, so it can be said that human resources are a factor that determines the success or failure of a company in achieving its goals. HR departments are often so busy with routine administrative tasks that they neglect to consider important matters going forward. According to (Nia Kurnia Mawaddah, 2023) The higher mobility of individuals will require more dynamic tools in performing activities. Attendance management in organisations is an important activity in their daily lives, necessitating the need for a revolutionary automated attendance recording and tracking system. (Sakshi Chetan, 2021).

Currently the Pekanbaru Army Hospital already has a web-based HR management information system. The process of recording attendance or attendance at the Pekanbaru Army Hospital is still carried out conventionally with paper-based recording which is carried out during an apple or routine ceremony every working day, before working hours begin. There are many obstacles to attendance using this paper-based method, including it is difficult to know how many attendance violations are committed by employees each month, errors and manipulations in attendance calculations

that impact on employee lunch allowances, employees also have to queue to take attendance because attendance is done paper-based requires employees to attend by name to verify their attendance. In addition, attendance data is one of the indicators of employee performance assessment, where employees who arrive late and leave early will have their allowances deducted.

The next HR management problem is the difficulty in viewing medical performance for employees from medical clusters consisting of doctors, nurses, midwives, and other medical clusters. This medical performance feature does not yet exist in the HR management system of the Pekanbaru Army Hospital, so this medical performance feature helps in the remuneration process because it provides information to evaluate the actions and contributions that have been made by medical family employees within a certain time span.

The next problem in HR management is the application for employee leave. Employees are required to submit an application that must be fully completed before the leave is approved (Jasmin Jeanette C. Mama, 2022). The existing leave application at the Pekanbaru Army Hospital is still paper-based, namely by submitting a leave letter directly with the paper form provided to the HR department employee, then the HR department will ask for approval from the superior for approval. According to Government Regulation of the Republic of Indonesia Number 24 of 1976 Regarding Annual Leave Article 4 Number 2, the length of annual leave is 12 (twelve) working days.

Another problem is the management of personnel electronic files, which is only centralised in the module on the

HR management information system of the Pekanbaru Army Hospital. Electronic files are the main tool and indispensable real record of e-government and business activities (Jin Han, 2021). The existing HR management system at the Pekanbaru Army Hospital can only upload files that have been made into electronic files. A file management system is a type of software that manages data files in a computer system (Gerald C. Albacite, 2021).

Seeing these obstacles, there is a need for innovative solutions that can overcome the limitations of the existing HR management system, attendance with paper-based recording, leave applications that are still done paper-based, difficulties in file management, and the absence of medical performance history. Thus, designing a mobile application is the right choice to support the HR management system at the Pekanbaru Army Hospital. This application is expected to provide easy access, affordability, and responsiveness in daily activities, such as recording attendance, viewing medical performance, applying for leave, and HR electronic file management.

According to (Carlos Tam, 2020) the use of mobile applications (apps) is growing in the world of technology, a phenomenon related to the increasing number of smartphone users. In this case, the Pekanbaru Army Hospital can take advantage of the development of information and communication technology in almost all operational lines of the institution. In most developed countries, mobile device penetration rates have reached over 100% per capita, with individuals often owning more than one mobile phone. Mobile applications are software that runs on a mobile device (Ruqiya, 2020). According to research conducted by (Weichbroth, 2020) Mobile applications are defined as "software applications developed specifically for use on small wireless computing devices, such as smartphones and tablets, rather than desktop or laptop computers".

In the development of this application will be made using the Dart programming language with the Flutter framework. This means you can use one programming language and one code base to create two different applications (for IOS and Android) (Bhagat, 2022). *Flutter is based on the Dart programming language, which is an object-oriented processing (OOP) language* (Hassan, 2022). Researchers have explored the potential of Flutter in improving user experience and performance in mobile applications (Riad Haidar, 2023). So that from the background that has been described previously, a research will be conducted with the title "**Designing Mobile-Based HR Management Application in Pekanbaru Army Hospital**".

II. RESEARCH METHODOLOGY

A. Research Stages

This research stage uses the RAD (Rapid Application Development) method to develop mobile-based HR management applications. RAD is a system development

method that prioritises rapid development starting from prototypes and continuous iteration and involving end users during the development process (Somantri S, 2023). Based on research (Desy Agustin, 2023) confirmed that this aims to reduce development time and costs while ensuring high quality software. The following is an image of the flow of the research methodology used.

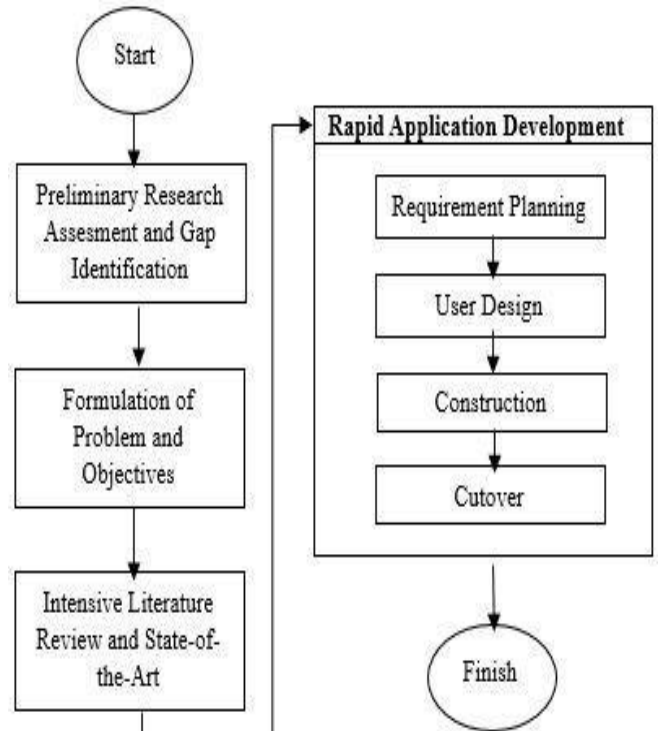


Figure 1 Research Stages

B. Preliminary Research Assesment and Gap Identification

To begin the research, researchers conducted direct assessment and observation at the Pekanbaru Army Hospital, as for the problems that researchers found, namely attendance which was still carried out conventionally using paper-based, there was no way to help medical employees to see their medical performance history, leave applications that were still carried out conventionally using paper-based, the existing HR file management system at the Pekanbaru Army Hospital could only upload files that had been made into electronic files. The results of the research conducted are, researchers will develop a mobile-based HR management application.

C. Formulation of Problem and Objectives

From the assessment that has been carried out in the preliminary research assessment and gap identification, the researcher also conducted an interview with the HR department at the Pekanbaru Army Hospital. The problems that occur are due to several things, namely:

1. attendance that is still conventionally using paper-based, where employees take attendance every day through morning ceremony and shift change ceremony.
2. there is no information for medical clump employees to see their medical performance, this affects when medical clump employees want to see how much MS (Medical Services) they receive while providing services at the Pekanbaru Army Hospital.
3. the request for leave at the Pekanbaru Army Hospital is still paper based, namely by submitting a leave letter directly with the paper form that has been provided to the HR department employee, then the HR department will ask for approval from the superior for approval.
4. The feature only upload files that have been made into electronic files in the existing HR module. So that doctors or other employees have difficulty uploading their files directly. For example, there are doctors who conduct training and want to upload their certificates by taking photos of the certificates so that they can be uploaded directly to the existing HR module, because the current HR module can only upload files that are already in the form of electronic files.

As a solution to overcome the problems that have been analysed and interviewed, the researcher will design a mobile-based HR management application. In developing this application, researchers need the Electronic Health Record module that already exists at the Pekanbaru Army Hospital to be implemented into the application to be built. The problem limitation is to avoid the discussion deviating from the subject matter. The limitations of this research problem are as follows:

1. The mobile application to be built can only be used on the Android and iOS platforms.
2. The medical performance feature can only be accessed by employees in the medical clump, so employees in other clumps cannot access the feature.

D. Intensive Literature Review and State-of-the-Art

Based on the problem formulation and research objectives, the researcher analysed and compiled information relevant to the development of a mobile-based HR management application. In this process, the results of the literature review and state-of-the-art analysis will be one of the main foundations in the development of the application. To help develop the application, researchers took some references from several existing studies.

Achmad Fatkharrofiqi, Herman kuswanto, Taufik Rahman, Sumarna, Felix Wuryo Handono, and Hafis Nurdin conducted research in 2020 on "Employee Attendance Application Using Location Based Service (LBS) Method Based On Android". The result of this research is an Attendance Mobile Application with Location Based Service for employees at PT Brainmatics Cipta Informatika to be presented. The area is set for tracking using GPS so that it

works with the coordinates in the border image of the area in the company.

Jay-Arr C. Buhain and Christian E. Pulmano conducted research in 2021 on "Development of a Leave Management and Monitoring System for the Cavite State University Campus Network". The result of this research is an online leave management and monitoring system to manage and monitor university employee leave records. The developed system is able to manage employee leave records, generate up-to-date reports for HR staff, and provide direct access to employees in leave credit balances, leave history, and leave cards, thus overcoming the problem of transparency of records.

Muhammad Iqbal Fachry Krisbudiana and Edi Susilo conducted research in 2021 on "Employee Attendance Application Using QR Code Android - Based at Eria Hospital Pekanbaru". The results of the study An application that uses QR codes and GPS to make it easier for employees to record their attendance while in the work area and has contributed to the optimisation of the collection and processing of attendance data at Eria Hospital.

Dita Madonna Simanjuntak and Gede Putra Kusuma conducted research in 2020 on "Mobile Application Using Location-Based Service for Supporting Tourism Industry". The results of the study The tourism application implemented in this study is based on location-based services on mobile phones, especially on the Android platform. The results of testing the tourism application show that the function runs well.

Sunil Mulay Rohan Shrinath Fatangare, Bhushan Vilas Deore and Gaurav Madhavrao Mistari Conducted Research in 2022 on “Student Attendance Application” and from this research has resulted in the development of a cross-platform Mobile application that helps teachers and students to quickly record attendance. It also helps save faculty time by exporting attendance to a known format (csv) digitally. This application mainly focuses on the educational institution use case and can be further enhanced to support any type of institution when attendance is still manual.

Gerald C. Albacite, Diana Rose Macua, April Jay C. Diolata and Noel P. Sobejana, IT.D. conducted research in 2021 on “Android-based File Management System”. This research uses the Agile System Development Life Cycle model method. With the research results registered users can add users and record files. The system automatically sends notifications to users to inform and remind and all information is stored into the database. The system can also add holders. Administrators can delete and recover deleted files, can add files and update information in the system but users cannot delete users and files, but they can add files and users.

III. RESULT AND DISCUSSION

A. Requirements Planning

Requirements Planning process based on the background described in the introduction. So, at this stage the researcher will analyse the HR management application by conducting observations and interviews with the head of HR and employees directly to understand what needs are needed by HR at the Pekanbaru Army Hospital, find solutions to problems experienced by HR, and compile what features will be applied to the HR management application at the Pekanbaru Army Hospital.

B. User Design

This stage is done to design functional, system interface, and database. In this stage, the author uses the Unified Modelling Language. The following are the results of the design using a use case diagram that describes a set of actors involved with the system to be created. The use case diagram describes one actor involved in the mobile application, namely the employee in Figure 2.

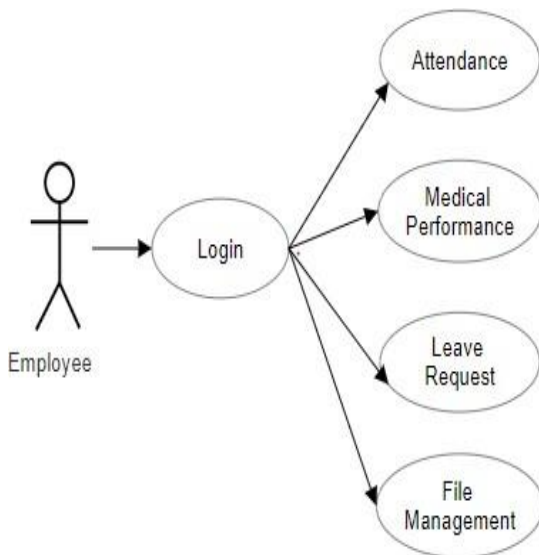


Figure 2 Use Case Diagram

C. Construction

The HR management application is made with 4 main features starting from online attendance which will use Location Based Service (LBS) technology. LBS can be defined as computer applications (especially mobile computing applications) that provide information tailored to the location and context of the device and user (Haosheng Huang, 2018). Examples of using LBS (Location Based Services) are interactive maps, directions to a destination, or recommendations for tourism activities (Dita Madonna Simanjuntak, 2020). So that employees who will fill in attendance no longer need to take attendance conventionally by verifying attendance paper-based when conducting apples or ceremonies, simply by filling in attendance in and out of areas within the scope of the Pekanbaru Army Hospital using a smartphone device owned by the employee.

Next is a feature that allows the medical team to view the medical performance performed after serving the patient, including the name of the action, cost, and date of action. This medical performance feature is specifically for medical clump employees such as doctors, nurses, midwives, physiotherapists, and other medical clump employees can see the performance they have done after serving patients. Medical clump employees can see the amount of action costs or estimate the rewards that will later be received in the form of JM (Medical Services) or Remuneration. Medical clump employees can see the amount of action costs or estimate the rewards that will later be received in the form of JM (Jasa Medika) or Remuneration. Remuneration in the hospital context refers to the monetary compensation received by healthcare providers, such as doctors, nurses, and other medical staff, in exchange for their services (Spriggle, 2020).

For the Leave Application feature, employees can apply for leave online via their smartphone device without having to apply for leave paper-based at the HR department of Pekanbaru Army Hospital. When an employee applies for leave via their smartphone, the employee or supervisor in charge of the HR department can verify the leave application through the mobile application using the supervisor's existing special account. When the leave request has been verified by the supervisor, the employee can see on his smartphone whether the proposed leave is accepted or not.

The last feature, namely, the e-file (electronic file) management feature in this HR management application functions to manage HR electronic files at the Pekanbaru Army Hospital. Employees can take photos or upload files to upload to the HR management management application. The HR file can be in the form of KTP, KK, and other files. So that employees at the Pekanbaru Army Hospital can access their administrative files anytime and anywhere when they need them.

In this finished mobile application there is also a structure that becomes a route or description of the data that will be displayed on the mobile application as in Figure 3. The following is an overview of the Application structure used in the Pekanbaru Army Hospital HR management application, where the data displayed are all drawn from the module data that already exists in the Pekanbaru Army Hospital EHRS system.

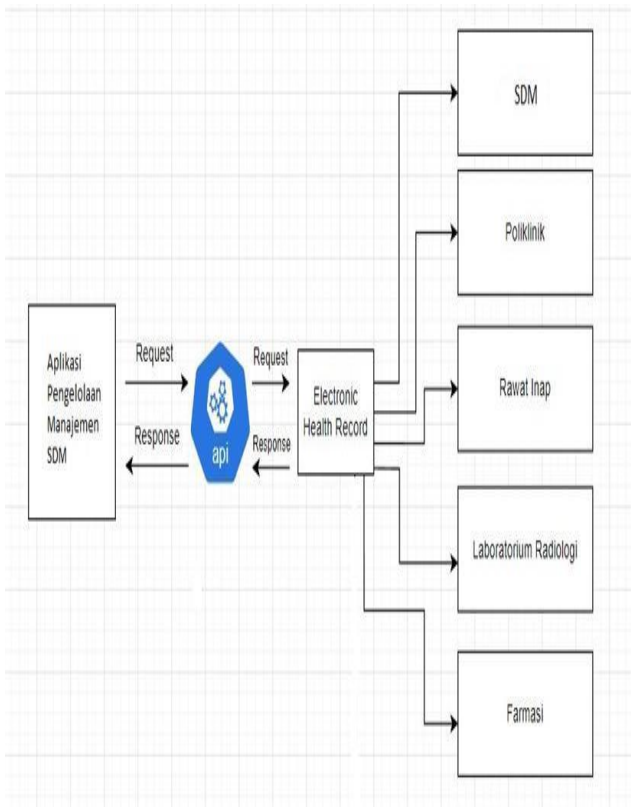


Figure 3 Mobile-based HR Management Application Architecture

D. Implementation of Application

In this research, the expected result is a Mobile-Based HR Management Application. Here is a look at the application interface :

1. Dashboard

The following is a dashboard display when the employee successfully logs in using his account:

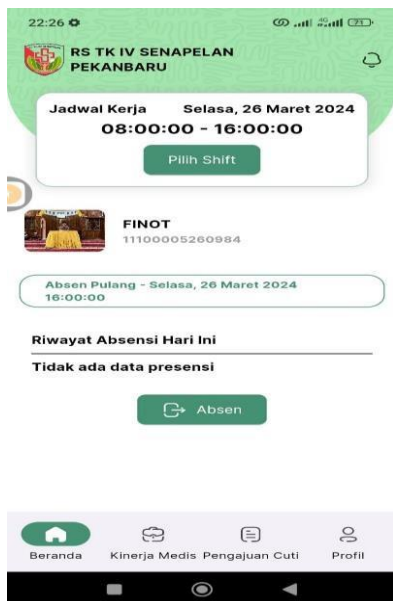


Figure 4 Dashboard

2. Attendance Menu :

The following is a view of the attendance menu after employees press the attendance button on the dashboard, employees can clock in, clock out and then confirm the attendance :

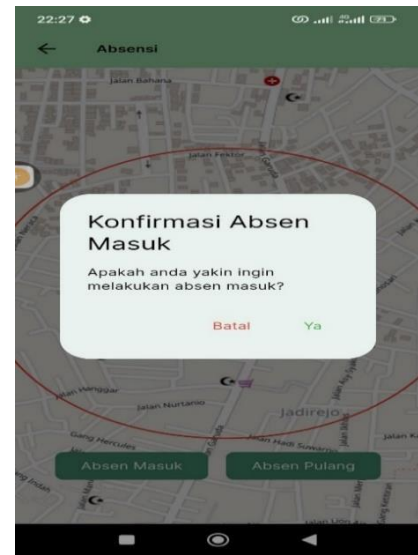


Figure 5 Attendance Menu

3. Medical Performance Menu :

The following is the display of the medical performance menu after the employee clicks on the medical performance menu in the footer section of the application :



Figure 6 Medical Performance Menu

4. Leave Submission Menu :

The following is a view of the leave submission menu after clicking the leave submission logo on the footer, the display on the supervisor account will be able to verify whether the leave is accepted or not

“Design of Mobile-Based HR Management Application in Pekanbaru Army Hospital”

while the ordinary employee account can only apply for leave :

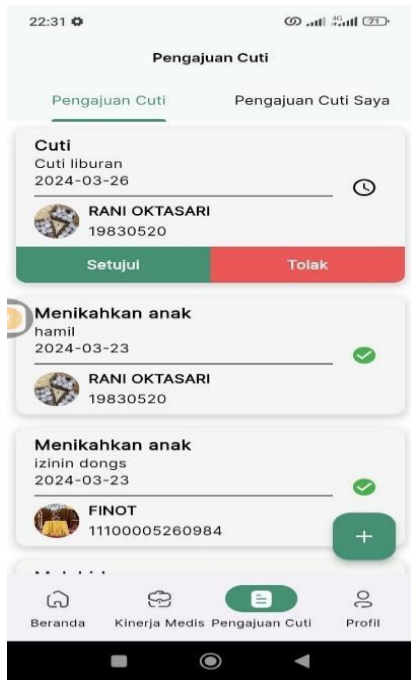


Figure 7 Leave Submission

5. File Management :

The following is a view of the file management menu to manage personal data and manage existing files :

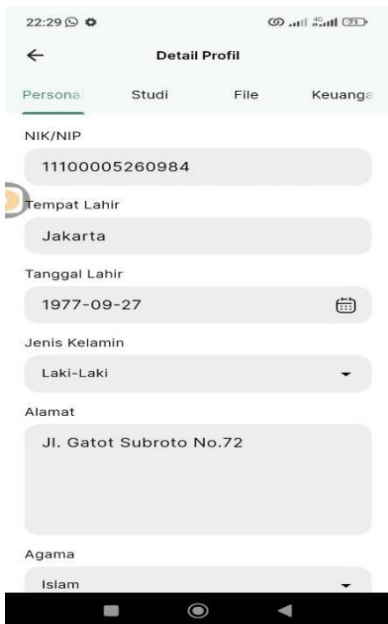


Figure 8 File Management


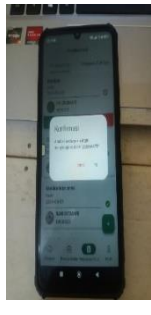


E. Black Box Testing

Testing this application uses the black box testing method. The black box testing process is carried out by testing the program that has been developed through filling in the data on each available form (Dwi Yulistiyanti, 2022). To ensure

that the system cannot accept inappropriate input, black box testing can be done in a way that is contrary to standards (Muhammad Arvy Syahputra, 2022) The following is the process and results of the black box testing that has been done.

No	Testing Scenario	Expected Results	Screenshot of test result	Testing Result
1	Login	Login Success		Success
2	Enter the dashboard view	successfully display the dashboard along with attendance history		Success
3	Taking attendance	Successfully perform attendance so that the attendance history appears on the dashboard like test number 2		Success
4	Check the medical performance history by setting the date of the history to be viewed	Successfully view medical performance based on the specified date		Success

“Design of Mobile-Based HR Management Application in Pekanbaru Army Hospital”

5	Submit a leave request in the leave request menu	Successfully apply for leave and wait for verification of leave application from supervisor		Success
6	Verify whether the leave is accepted or not using the supervisor's account	Successfully verify leave		Success
7	Enter the profile menu view	Successfully enter the profile menu and view attendance data and existing leave quota		Success
8	Upload a file in the file management menu	Successfully upload training files on the file management menu		Success

3.	This application helps me as a medical clump employee to see my medical performance				2	2
4.	This application makes it easy for me to submit leave applications				3	1
5.	This application helps me to manage my personal files and other supporting certificates.				3	1

After the test results have been obtained, the next step researchers will weight and calculate the test results. The following is a table of answer weights and calculation of test results on user acceptable tests.

Description	Score
SA : Strongly Agree	5
A : Agree	4
N : Neutral	3
D : Disagree	2
SD : Strongly Disagree	1

Maximum score for each question: 5 × 4 Respondents = 20

The results of the test calculation using the Likert Scale, namely:

- First Question Score = 16 : 20 × 100% = 80 %
- Second Question Score = 16 : 20 × 100% = 80 %
- Third Question Score = 18 : 20 × 100% = 90 %
- Fourth Question Score = 17 : 20 × 100 % = 85 %
- Fifth question score = 17 : 20 × 100 % = 85 %

So that the results of the User Acceptance Test percentage calculation are obtained, namely:

$$Percentage = \frac{(16 + 16 + 18 + 17 + 17)}{(5 \times 5 \times 4)} \times 100 \%$$

$$Percentage = \frac{84}{100} \times 100 \%$$

$$Percentage = 84 \%$$

F. User Acceptance Test

User Acceptance Testing (UAT) is a testing process carried out by users which is intended to produce documents and serves as evidence that the system used is acceptable or not by the user, if the test results can be considered to meet user needs then the application can be operated (Putri Febriana Aulia, 2023). At this stage, the researcher conducts a survey to users to get a response to the application that has been made..

No	Question	Answer				
		SD	D	N	A	SA
1.	The appearance of the App is easy to understand				4	
2.	This application makes it easier for me to do attendance				4	

IV. CONCLUSION

Based on the research results, it can be concluded:

- This Mobile-Based HR Management Application is very helpful in supporting HR activities, making it easier for all matters relating to HR in RST PKU.
- Users can easily perform online attendance within a predetermined scope of RST PKU, view medical performance history for medical group employees, submit and verify leave, and assist employees in managing existing files using mobile-based applications.
- Based on the results of Black Box Testing, the application functionality successfully runs well and

there are no defects in the design of the HR management application.

V. SUGGESTION

Future research can expand the scope of functionality of this HR Management Application by adding features needed by HR and improving the capabilities of the application so that it can be used better in the future. In addition, evaluate employee suggestions and complaints about the application that has been built to optimise future application developments.

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