

RESEARCH ARTICLE

Reimbursement Application Using REST API Methods and Android-Based Flutter Framework (Case Study: PT. Protonema)

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Abstract

PT. Protonema is a company engaged in the field of information technology, namely as a consulting partner in Jakarta. This company has provided various kinds of facilities to employees to support their work and simultaneously to improve their quality of life who are concerned about the importance of self-development and provide health insurance. Employees can submit claims to obtain these facilities by attaching receipts as further evidence that the company reimburses the costs that have been incurred, this is often referred to as reimbursement. Submission of reimbursement by employees based on the current process has problems, such as the absence of notification of claims submitted by employees whether the claim is accepted or rejected and still using Microsoft Word which is eventually printed into this archive, it is feared that it will be lost or forgot to save it because scattered archives. The purpose of writing this research is to produce an Android-based reimbursement submission application at PT. Protonema with the REST (Representational state transfer) API (Application Programming Interface) method as a data exchange medium and supported by MySQL so that data processing is precise and safe because it is stored in a database and other supports, namely the Flutter framework, are used to design Android applications. In making this software using the waterfall model and data collection techniques, namely observation, interviews and literature study. From this research, it can be concluded that an Android-based reimbursement application using the REST API method and supported by MySQL can help PT. Protonema in managing employee reimbursement applications more efficiently and effectively. By using this application, employees can submit reimbursement requests easily and quickly via their cellphones, and the data obtained will be recorded correctly and safely in the database. The use of the Flutter framework also helps in designing the appearance and functionality of applications that are easier to use and accessible to employees. Therefore, this application can be an effective solution to increase the efficiency and effectiveness of employee reimbursement management at PT. Protonema.

Keywords

Reimbursement Submission Application; Android; REST API; MySQL; Flutter Framework; PT. Protonema.

1 | INTRODUCTION

Technological advances are currently experiencing very rapid development along with human needs in solving problems. One technology that is currently growing rapidly in the world is mobile-based technology such as Android. As for companies that have not utilized this Android technology for their administrative activities. One of them at PT. Protonema in the process of submitting claims still uses Microsoft Word, of course this requires a printer and paper to be printed, then the results of printed documents are submitted to the admin which is considered impractical when the office is working from home, and also data storage is not integrated and has not been stored in databases. So there must be a system that can solve the problem of submitting reimbursement so that it can display reimbursement data effectively and efficiently.

Research conducted by Anugerah, V.P., Fitriansyah, A. and Satryawati, E. in 2020 aims to develop an electronic reimbursement system (e-reimbursement) at PT Fan Technology Integration using the prototyping method. This study discusses the process of developing an e-reimbursement system from start to implementation and the results obtained, including the advantages and challenges of using this system [1]. Setiyawati & Hariyanto, in 2020 conducted research on the design and construction of web-based assignment letter permits and reimbursement applications. This study aims to develop a web application that can facilitate employees in applying for permits, assignment letters, and reimbursement. The method used in this study is the waterfall method, and the results obtained are web applications that are easy to use and can increase the efficiency of licensing and reimbursement applications [2]. Research conducted by Linthia, in 2021 aims to develop a mobile-based employee reimbursement application. The method used in this study is the waterfall method, and this application was developed using the Flutter framework and MySQL database. The results obtained are applications that are easy for employees to use and can increase efficiency in the process of submitting reimbursement [3]. Fadli, Supriyatna, & Subyantoro, in 2019 conducted research on developing a mobile-based reimbursement submission application at PT Sysware Indonesia. This research uses the waterfall method, and this application was developed using the Java programming language and SQLite database. The results obtained are applications that are easy to use and can increase efficiency in the process of submitting reimbursement [4]. Research conducted by Azizah, in 2022 discusses the analysis of reimbursement procedures through the Satria Finance application system at the Health Service. This study aims to analyze the procedures for submitting reimbursement at the Health Office using the Satria Finance application system. The results obtained are recommendations for increasing efficiency in the reimbursement submission process, such as increasing user understanding and skills in using the Satria Finance application system [5].

Of the five studies mentioned, there are three studies related to the research topic Reimbursement Submission Application at PT. Android-Based PROTONEMA With a Rest Fire Method Using the Flutter Framework. The three studies conducted by Anugerah et al. (2020) also conducted research on electronic reimbursement systems (e-Reimbursement) in companies, even though the companies studied were different. However, what this research has in common is the use of technology to facilitate the process of submitting reimbursement [1]. Fadli et al. (2019) also conducted research on mobile-based reimbursement applications for companies. Even though the companies studied were different, the relationship with the research topic remained, namely the use of technology to facilitate the process of submitting reimbursement [4]. Linthia (2021) conducted research on developing a mobile-based employee reimbursement submission application. This research is closely related to the topic of this research, because both of them develop mobile applications to facilitate the process of submitting reimbursement [3]. From these three studies, it can be concluded that the use of technology in the process of submitting reimbursement is increasingly becoming the concern of many companies. This is also seen in the research conducted by the author. The use of this technology is expected to facilitate the reimbursement application process, reduce data input errors, and increase the efficiency and effectiveness of the reimbursement application process.

The formulation of the problem in this research is; How to make an application system for submitting reimbursement for employees so that it doesn't require a long process?, How can employee reimbursement be submitted anywhere without having to go to the office to submit documents to the admin?, and How to display reimbursement information that can be seen by employees and admin with a database that is well integrated and also paperless? While the research objectives are; Create an Android application for submitting reimbursement that can be used by employees easily, Increase effectiveness and efficiency in administrative activities at PT. Protonema for employees so that they can submit reimbursement anywhere, and provide solutions to the reimbursement submission process so that information can be seen by employees and admins in the application so that no paper is needed which can reduce company costs in administrative activities.

2 | BACKGROUND THEORY

The Reimbursement Application is an application designed to facilitate the process of submitting reimbursement for employees or customers of a company. These applications are usually mobile or web-based, which allows users to submit reimbursement requests quickly and easily. Android-Based reimbursement applications refer to mobile applications designed to operate on the Android operating system. The Android operating system is one of the most popular mobile platforms and is used by millions of users worldwide. The Rest Api method is one of the methods used to exchange data between client and server applications. REST API allows client applications to access and manipulate data stored on servers easily and efficiently. This method also allows users to access applications from various devices and platforms. The Flutter framework is one of the frameworks used to build mobile applications. Flutter uses the Dart programming language and provides a variety of features and widgets to build mobile applications that are fast and easy to operate. The combination of these theories allows users to submit reimbursement requests quickly and easily via mobile devices. This application can also ensure proper and safe data processing because it is stored in the MySQL database and protected by other security features.

Maeda et al. (2021) found that the time limit for submitting medical fee refund claims in Japan can affect the overall costs returned by companies. They recommended that the company review its claim time policy to ensure that employees have sufficient time to submit claims accurately and in a timely manner. This research underscores the importance of managing claim submissions effectively to minimize costs for companies and ensure employee satisfaction [8]. In the world of health, reimbursement or reimbursement is the process of claiming medical expenses paid by insurance or other parties who are responsible for these costs. Evaluation of reimbursement applications for new medicines is an important thing to do to determine whether the cost of the drug is worth the benefits. This evaluation can be carried out by taking into account the quality of the research methodology that supports the proposal, as well as conducting an economic analysis to assess whether the cost of treatment is worth the benefits obtained. In several countries such as Belgium, the quality of research methodology is an important criterion in assessing reimbursement applications [9][10].

Reimbursement application literacy related to research, according to research conducted by Hariyanto (2019) entitled "Design of Web-Based Letter of Assignment and Reimbursement Licensing Applications Using the CodeIgniter and Materialize Frameworks: A Case Study of PT. XYZ". This research focuses on developing web applications to manage assignment letters and employee reimbursement at PT. XYZ by using the CodeIgniter and Materialize frameworks [11]. Nurzaman (2021) conducted research entitled "Automatic Notification System for Tracking Reimbursement Claims Via Whatsapp in Supporting Improved Customer Service at the Health Insurance Company PT. XYZ". This research develops an automatic notification system via Whatsapp to track reimbursement claims and support customer service improvement at the health insurance company PT. X Y Z [12]. Research by Sesyana (2022) entitled "Analysis of Reimbursement Procedures or Change Money Through the Financial Satria Application System at the Banyumas District Health Office". This study discusses the analysis of reimbursement procedures or changing money through the Satria Finance application system at the Banyumas District Health Office [13]. Ceka (2022) conducted research with the title "Web-Based Employee Service Fee Request and Approval Reimbursement Application System (Case Study: PT. Mitra Integrasi Informatika)". This study aims to develop a web application to manage requests and approval of reimbursement of employee service fees at PT. Informatics Integration Partners [14]. The conclusion from the reimbursement application literacy above is that the reimbursement application was developed to manage and simplify the process of submitting, requesting, and approving work cost reimbursement. These applications can be web or mobile based, use various frameworks and technologies, and can be developed to support customer service improvements.

Based on the literacy that has been presented, reimbursement applications can be designed using various platforms and technologies, both web and mobile based. This application can help increase the efficiency and transparency of the process of submitting and disbursing reimbursement. Research also shows the importance of evaluating and analyzing reimbursement procedures to ensure the quality and successful implementation of reimbursement applications. In addition, the use of automatic notifications and tracking systems can improve customer service and simplify the process of reimbursement claims.

3 | METHOD

Time This research was carried out in January-July 2021. The location of the research with data collection took place at PT. Protonema which is located at L'Avenue Office Lt.12 Unit-C Jalan Raya Pasar Minggu kav.16 Pancoran South Jakarta 12780. This data collection is the most important step in the purpose of exploration. At the data collection stage consists of:

- 1) Observation
Collecting supporting documents as samples and direct observation of activities carried out or all work sequences of the flow of claims submitted by employees of PT. protonema.
- 2) Interview
In this method the author collects research data by asking directly the parties concerned and influential at PT. Protonema, namely Mr. Resaldi Ramadhan Putra as the manager can provide the information needed, by conducting interviews researchers obtain data, namely the process of submitting claims that takes place at PT. protonema.
- 3) Library Studies
Collect data by searching and studying data from books, research journals, papers, magazines or from other references related to research such as citations in sentences.

Literature study on developing Android applications, using REST APIs, processing data using MySQL, and using the Flutter framework. Analysis of user needs, including the required features and the appearance desired in the reimbursement application. Designing a reimbursement application using the Flutter framework. Making a REST API that will be used to exchange data between Android applications and MySQL databases. Android application development for reimbursement applications using REST API and MySQL as database. Testing the reimbursement application to ensure its functionality and security. Evaluate the results of the development of the reimbursement application to see how far this application can help PT. Protonema in managing employee reimbursement applications more efficiently and effectively.

4 | RESULT

In figure 1 Use Case Diagram of the Employee Page, Employees access the application and fill out the login form, after successfully logging in employees can view personal data, change passwords, submit claims, view claim submission data that has successfully sent Claim Submissions to Admin.

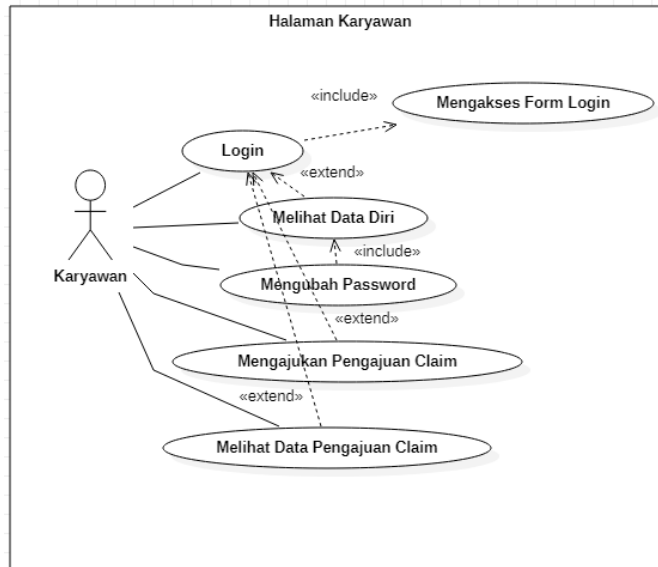


Figure 1. Use Case Diagram Employee Page

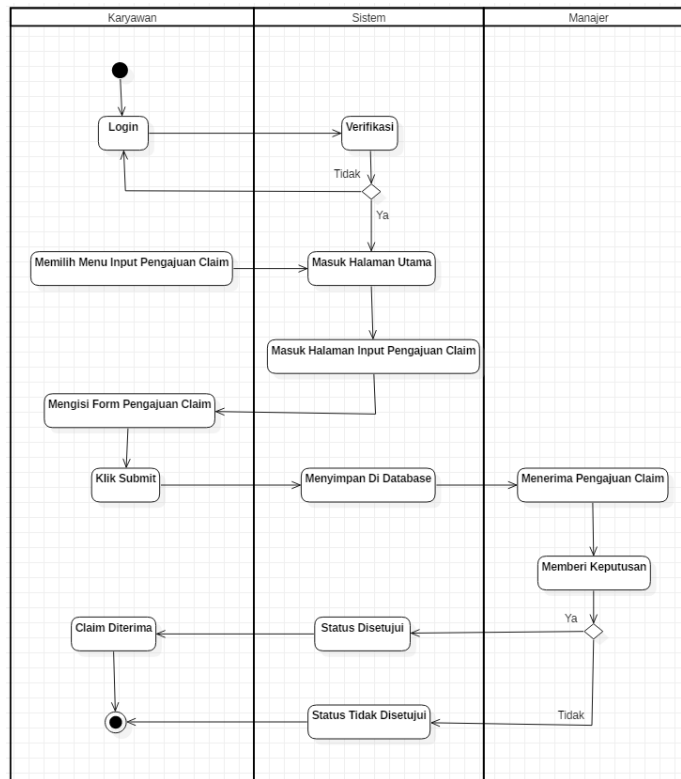


Figure 2. Employee Page Activity Diagram

In Figure 2, the Employee Page Activity diagram, the employee logs in, the system will process it, if not, it will display an error message and if so, it will display the dashboard page, then select the claim submission input menu, the system will display the claim submission input form page, then after clicking submit data will be stored in the database, the admin accepts the claim submission, then the admin makes a decision, if it is approved then the claim is accepted if not the system will mark the claim as not approved. In figure 3 Entity relationship diagram, database design produces a mapping of tables which are described by entity relationship diagrams (ERD).

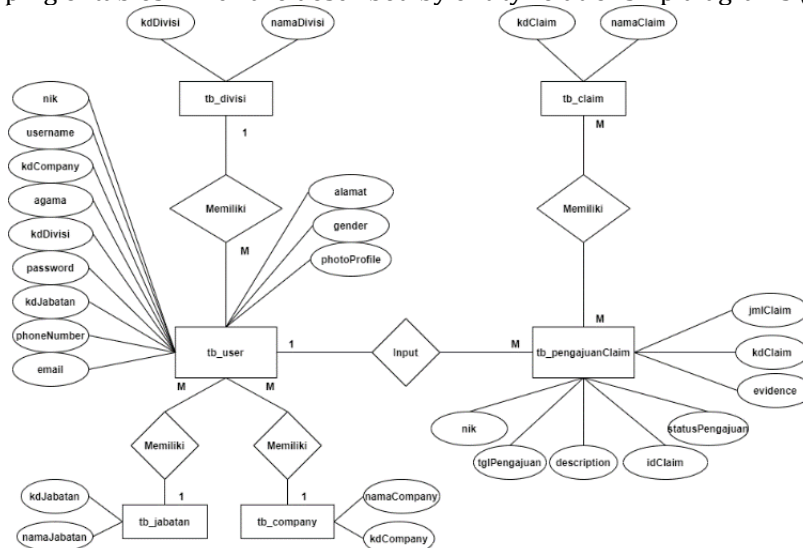


Figure 3. Entity Relationship Diagram (ERD)

In Figure 4 the Logical Record Structure is a database description in tabular form such as tb_juangan, tb_divisi, tb_company, tb_claim, tb_user, tb_pengajuanClaim, in the design of the reimbursement submission system at PT. protonema.

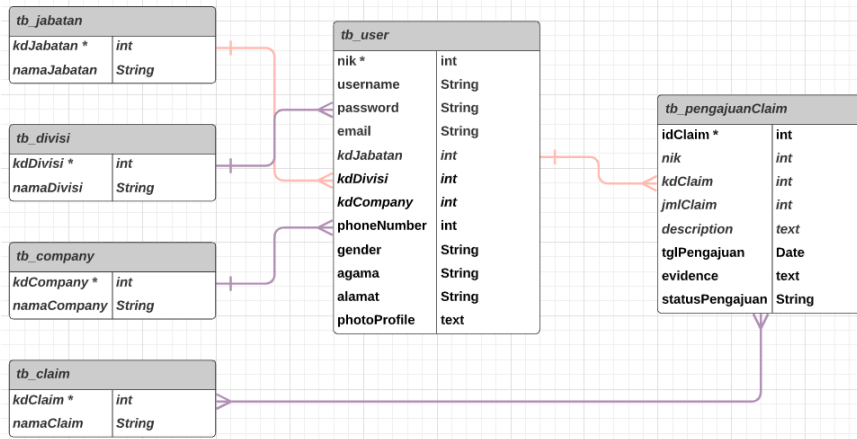
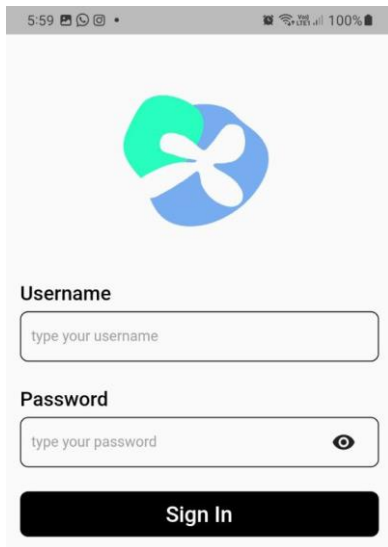
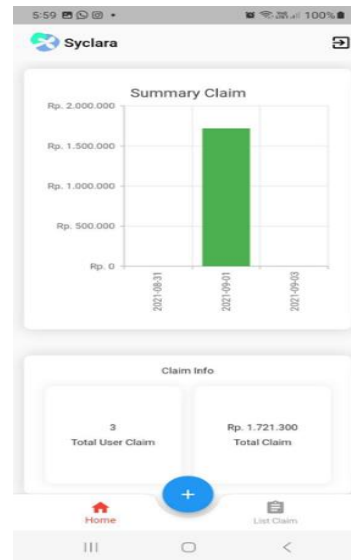


Figure 4. Entity Relationship Diagram (ERD)

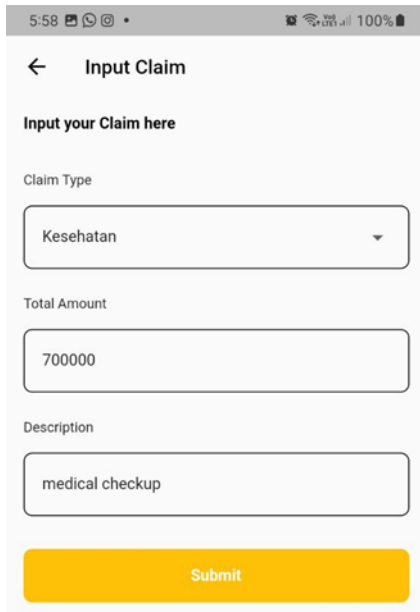
In Figure 5.a the Login Page Display is the Display of the Android-Based Application which will display the login form when you first open the reimbursement submission system application, to log in the user fills out the login form with the registered username and password then clicks the sign in user button directly on navigate to the dashboard page. In Figure 5.b the Dashboard Page View is the Display of an Android-based application that is used to view information about submitted claims, and also users can add claim submissions by clicking the plus button. In Figure 5.c is the Claim Input Page Display, this page will appear if the user clicks the add button, used for the user to submit a claim by filling out the claim type combo box, claim amount, and claim description. In Figure 5.d is the Claim List Page Display, on this page there is information on the list of claims that have been submitted by clicking submit previously.



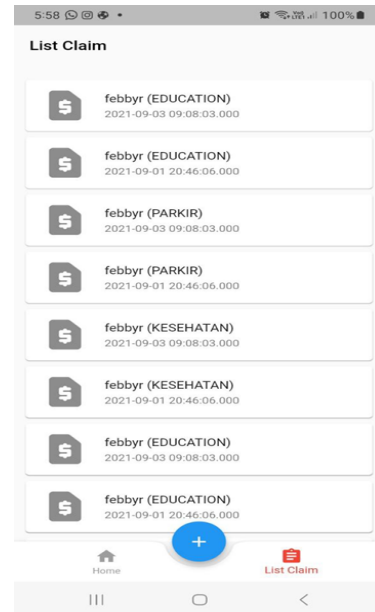
(a) Login Page Display



(b) Dashboard Page Display



(c) Display the Input Claim Page



(d) Display Claim List Page

Figure 5. Application View

In Figure 6 is the Claim Detail Page Display on this page there is more detailed detailed information from the list of claims that have been submitted, it contains username information which means who submitted the claim, claim date when the claim was submitted or submitted, amount means how much the amount of the claim submitted for reimbursement, the claim type is the type of claim such as Health, Education, and parking, and a description of the claim that can be filled in to explain the claim that has been submitted.

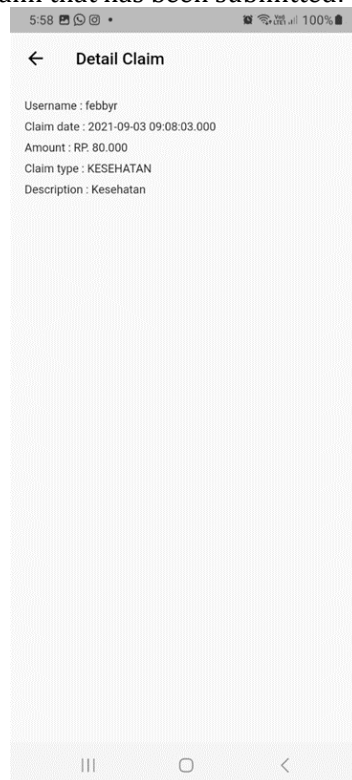


Figure 6. Advanced Application View

5 | CONCLUSIONS AND FUTURE WORK

From the results of the above research at PT. Protonema in submitting reimbursement has become easier and more practical and administrative activities have become more modern and efficient by utilizing this Android-based application, it has also become paperless, which means it reduces paper use. From the discussion and process of making the design of an Android-based reimbursement application using the Flutter Framework with Dart as the programming language, it can be an option to build Android applications with one code base or single code base, now employees can submit claims anywhere because the process is more practical and efficient. the information displayed on the application can be seen by employees and admins.

Some future work that can be done to further develop the topic of Android-based reimbursement applications at PT. Protonema with the REST API method, MySQL, and the Flutter framework with the hope that by doing this future work, the reimbursement application can become more sophisticated and help PT. Protonema in managing finances and employees more efficiently and effectively, ie:

- 1) Integration with the financial system of PT. Protonema: The reimbursement application can be further developed by integrating into PT. protonema. This can help in facilitating the process of verification and management of company finances.
- 2) Integration with other platforms: Apart from the company's financial system, the reimbursement application can be integrated with other platforms, such as HR and payroll platforms, so that the process of managing finances and employees becomes more integrated.
- 3) Improved data security: Reimbursement application applications can be developed with increased data security, such as the use of data encryption and the use of better access authorization technology.
- 4) Refund feature: The reimbursement request application can be developed with a refund feature, so that employees can monitor the status of their refund through the application.
- 5) Development of versions for other platforms: Apart from Android, the reimbursement application can be developed for other platforms, such as iOS and the web, so that employees can submit reimbursement requests from a variety of different platforms.
- 6) Data analysis: The data collected in the reimbursement application can be analyzed to provide useful insights and information for companies in managing finances and employees.

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