

An Android Based Inventory Reporting System: A Case Study in The Engineering Faculty of Muria Kudus University

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Abstract. Inventory, in this case, is the goods and equipment in an institute or company which used to fulfil work necessities. The inventory availability at The Engineering Faculty in the University of Muria Kudus contains air conditioner (AC), teaching and learning tools, and any other types of equipment at the dean and lecturer's room. However, the inventory not always in good condition. This is certainly will able to inhibit activity in the Faculty of Engineering. Based on these problems, and along with the technology development in this modern era, the researcher proposed a research about inventory damage reporting system based on mobile. This research is purposed to give facility to students and officers to deliver their lamentation or reporting about inventory problems. In addition, the research will take benefits of the smartphone as media to improve students or staff's discipline in using and maintaining inventories in The Engineering Faculty.

Keywords: android, the engineering faculty, inventory.

1 Introduction

Inventory holds the important role for a company, the management and control of an effective inventory is an important effort to do in avoiding company's financial losses so that operational activities will going well [1]. Thus, it's necessary to manage inventory in the effective and efficient way. An effective inventory management affects the performance of a company [2]. Inventory management role not only affects a company but also college as part of the organization. The role of inventory in the academic world such universities is important as media for supporting the activities of the lecturer or other academic activities. Currently, the availability of facilities and inventory on the building of the Faculty of the Engineering in the University of Muria Kudus already fulfilled as well as an air conditioner (AC), teaching and learning tools, and any other types of equipment at the dean and lecturer's room. Those facilities have been used by students, lecturers or faculty staffs.

Due to the frequent use of those facilities will cause problems or damage. To ensure the maintenance of inventories are up to date, and to repair all the damage of inventories as soon as possible, the Secretariat of the Engineering Faculty needs reports of those inventory damage. In the Engineering Faculty building, there are several inventories which have problems as well as a projector, chairs, AC, projector cable, etc. Damage to those facilities will inhibit the learning process of students and any other activities in the Engineering Faculty. However, nowadays

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reporting of out of order inventories only be done in a conventional way such as an oral and paper-based complaint, either to the office boy or the secretariat. The oral and paper-based complaint is less effective because it is not a real-time and systematic reporting process.

So, in order for the secretariat of the Engineering Faculty to effectively achieves its roles, in this case, is to cope inventory damage reports, it is necessary to adopt technologies in helping them to automate their conventional inventory reporting system by taking advantage of technology. Most companies and organizations in developing countries are adopting technologies presence that has rapidly spread around the world [3].

A lot of technologies built to ease human jobs. The existence of technology cannot be released from human life. An example of a technology which is most commonly used in everyday life is a smartphone. According to data from www.emarketer.com said that the smartphone users in Indonesia in 2017 reached 86.6 million, while in the year 2018 is estimated at 103 million users [4]. Currently, most smartphones using Android as its mobile operating system. Android is a Linux-based operating system and created specifically for mobile phones [5] [6].

Considering the problems above and along with the development of the technology. This study focuses on changing the manual to inventory reporting based on the system in the Engineering Faculty. This research chooses Android to build the system as it a mature technology, simple and easy to use. This study expects that this system will help the Secretariat to manage inventory damage reports, and also ease students and staffs in giving their reports about inventory damage in the building of the Engineering Faculty to the secretariat.

2 Literature review

Inventory, Android, related works, research methods are discussed in the subsequent section below:

3.1 Inventory

Inventories are dormant stocks of items that are stored in the warehouse waiting to be utilized [7]. In a company inventory also called stocks such as goods and any other resources [8]. Inventory holds the important role for a company or organization, without inventories all activities will not run well.

3.2 Android

Android is a software for mobile phone based on Linux. Android Standard Development Kit (SDK) is an Application Programming Interface (API) which used to develop an application on the Android platform, this programming use Java as programming language [9].

3.3 Related Works

Kusuma and Welda [10] developed an integrated monitoring system in STMIK STIKOM Indonesia to monitor the handling of electronic equipment damage there. This study held to manage and ensure that all damage electronic equipment are handled well.

Hestingsih, et al [11] developed a management information system, this study used SMS gateway and web technology to manage machine shop tools in Politeknik Negeri Semarang.

3 Methodology

3.1 Baseline study

Methods research used in this study as follow:

- 1) Study Object: The target of this study included the secretariat employee of Engineering Faculty who works to manage inventory reports, students, lecturers, and all staffs.
- 2) Research Instrument: The research instruments were proposed to meet the purpose of this study. The instruments included the following:
 - a) Interview with the secretariat employee who works to handle inventories management.
 - b) Interview with the 2nd Vice Dean to get a limitation on how to build the system.
 - c) Observation in the Engineering Faculty to clearly analyze the needs of the reporting system.
- 3) Data Collection: The researchers asked for data from the Faculty of Engineering, here is the data:
 - a) Buildings: There are 4 buildings, they are J, I, K, and S building.
 - b) Rooms: The researchers collect all the rooms data for each building, there are 24 rooms in J building, 9 rooms in I building, 14 rooms in S building, and 5 rooms in K building. Those rooms include some laboratories.

3.2 System development

In this study, the researchers using the Waterfall as system development method. The waterfall is a method of software development that proposed an approach to systematic and sequential software started at the level of progress of whole system analysis, design, coding, testing and maintenance.

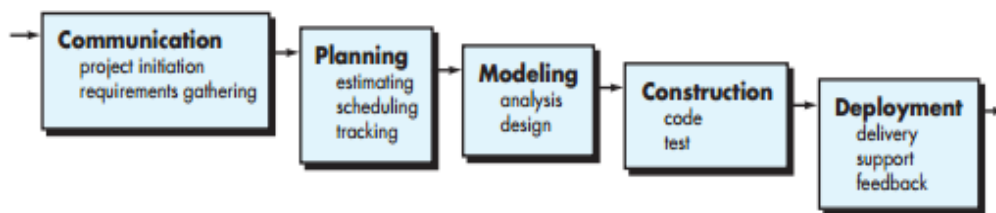


Fig. 1. Waterfall model.

The main stages of the above Figure 1. which shows the basic development activities are as follows:

- The analysis and definition of requirements. Services, limitations and objectives of the system are determined through consultation with a user of the system. These requirements are defined in detail and then serves as the specification of the system.
- The design of systems and software. The process of designing a system divides the requirements in system hardware and software. These activities determine the overall system architecture. Software design involves the identification and description of the abstraction underlying software systems and its relationship.
- Implementation and testing of the unit. At this stage, the design of the software is realized as a set of programs or program unit. Unit testing verifying that each unit has met its specifications.
- The integration and testing of the system. The unit program or individual programs are integrated and tested as a complete system to guarantee that the system requirements have been met [12]. After testing the system, the software is sent to the customer.
- Operation and maintenance. Typically, (although not supposed to), this is the longest phase of the life cycle. The system is installed and used. Maintenance includes the correction of various errors which are not found in the earlier stages, an improvement over the implementation added [13].

3.3 Use case diagram

The use case diagram shows the interaction between the actors and the system in the system implementation [14]. Unified Modelling Language (UML) is the approach system design in this study, and use case diagram, sequence diagram, and class diagram are one of its models to analyze the system. Figure 2. shows the use case diagram on user perspective, the main actors here are students, lecturers, and staff. The actor has access to send inventory damage reports, view their reports history, view their reports detail, deleted sending reports but unapproved by the secretariat, view their profile, send a suggestion to the Engineering Faculty, and log out. Before the user access the system, they need to log in to the very first.

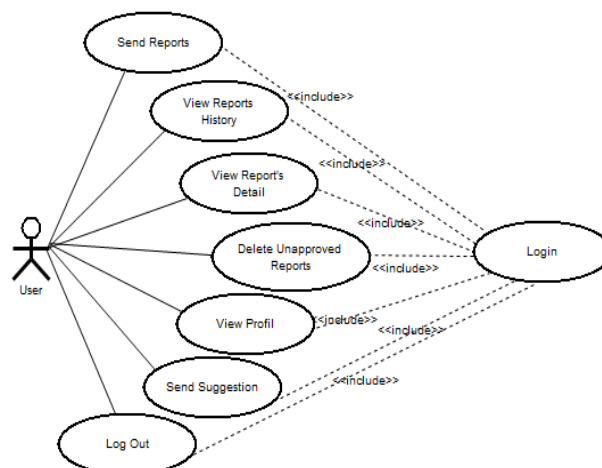


Fig. 2. Use case diagram.

3.4 Sequence diagram

Figure 3. shows a sequence diagram for “Send Report” from the use case above. The User firstly login to the system. The user interface (UI) starts and then controller run and check the user data from the database (tb_user) if the data exist UI shows the home display to the user. The user then sends reports, the controller run and sending data to the database (tb_pelaporan), if the reports already saved to the database then UI will display confirmation to the user.

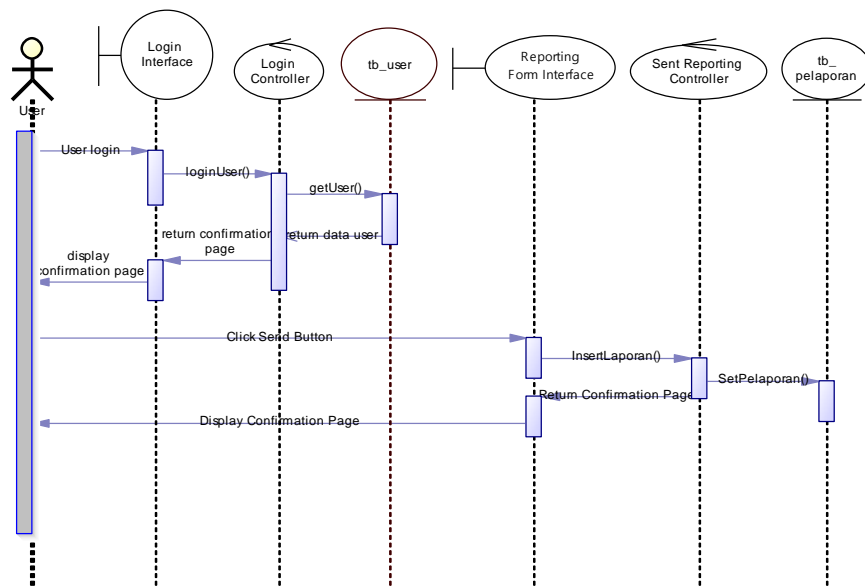


Fig. 3. sequence diagram.

3.5 Class diagram

The class diagram describes the structure of a system by indicating the system's classes, attributes, operations, and their relationship among classes. The class diagram in this study described in Figure 4.

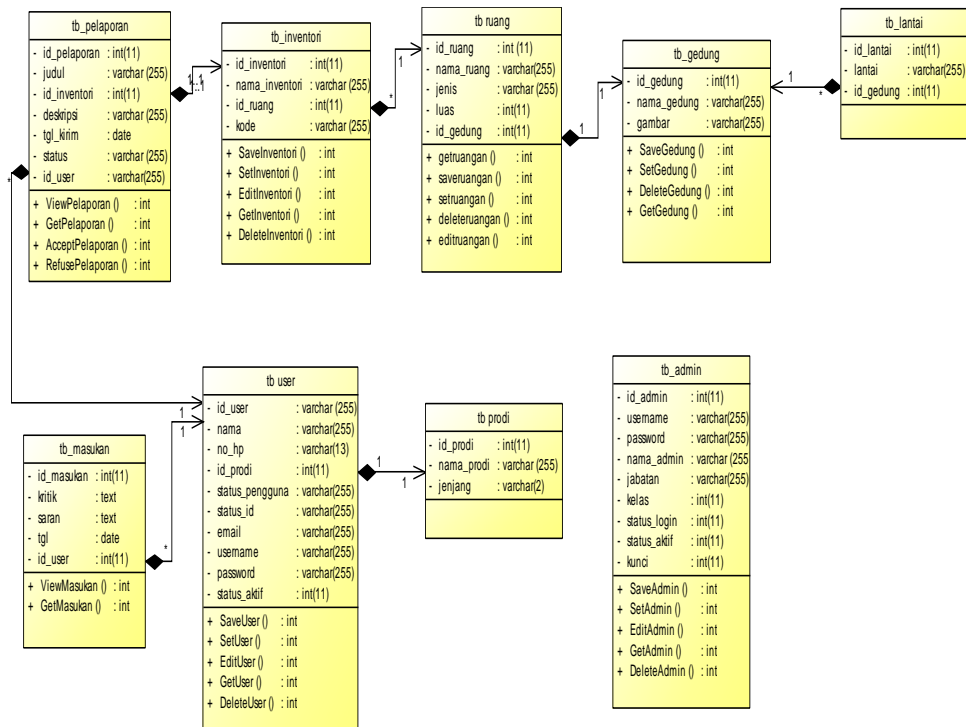


Fig. 4. Class diagram.

4 Result

The result obtained from the baseline study, designing or development, and testing are presented in this section.

4.1 System development

Figure 5. shows the screenshot for the sending reports menu. This system is based on Android named Inventory Reporting System (IRSY). Before using this system it is necessary to create a new account in the secretariat and always log in first before managing reports.



Fig. 5. Send report menu.

The user can create a report of inventory damage then send those reports to the Faculty. Before sending the report user to have to fulfil all the column, such as report title, damage detail, building, and room.

Figure 6. shows the display of reports list menu, in this menu users can see all their history reports, and reports status whether the report is rejected, approve or repaired.

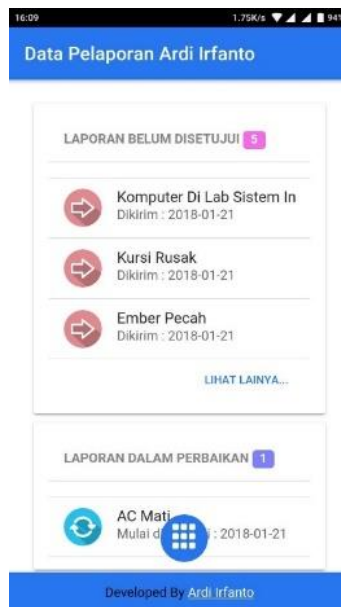


Fig. 6. Report list menu.

Figure 7. shows the report detail menu. In this menu, the user can see all the detail refers to their report as well as when the report sent, approved, and repaired.

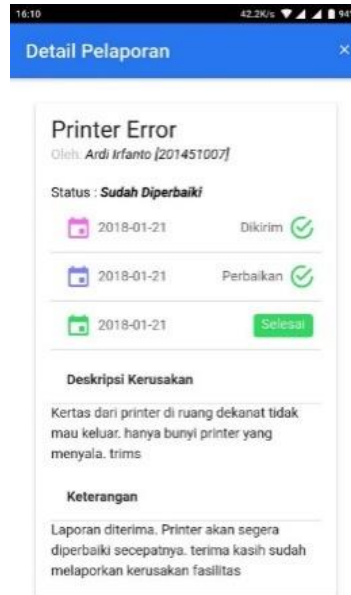


Fig. 7. Report detail menu.

5 Conclusion

The study was conducted and identifies a number of problems such as late response to the reporting, inefficient and ineffective inventory damage reporting process. A system based on Android was developed in order to solve the problems that were discovered. The Waterfall model was chosen as the system development method to build IRSY. By using IRSY the reporting of damage inventory will be faster, efficient, and effective, this will affects the repairing process of those inventories.

For the development of further research, the authors suggest:

- a. In the development of the next system is expected to add any other necessary features which do not exist on the current IRSY system.
- b. It is expected to improve the user interface of IRSY.

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