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# Design and Implementation of Treasury Application Based on Mobile in Student Organization Mercu Buana University

Riad Sahara<sup>1</sup>, Indra Ranggadara<sup>2</sup>

<sup>1</sup>Information System-Faculty of Computer Science, Mercu Buana University, Indonesia

<sup>2</sup>Information System-Faculty of Computer Science, Mercu Buana University, Indonesia

<sup>1</sup>[riad.sahara@mercubuana.ac.id](mailto:riad.sahara@mercubuana.ac.id); <sup>2</sup>[indra.ranggadara@mercubuana.ac.id](mailto:indra.ranggadara@mercubuana.ac.id)

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**Abstract**— *Treasury Application is a mobile based application to financial records of organization and / or personal necessary. This application is developed to give the solution of all matters of which adjusted with needs activity organization on students. During the research, system developed with the approach the prototyping concept. Analysis problem with of problems that emerged done through an assessment of elements PIECES analysis. Then design the analysis supplementary system used to develop application through UML design (Unified Modelling Language). A method of testing done through black box testing method by user of the process feedback on every cycle the prototype. The development of application treasury is designed with used mobile hybrid technology and applied to platform android.*

**Keywords**— *Treasury apps, prototype, UML, PIECES, black box, hybrid Mobile, android.*

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## I. INTRODUCTION

Organization is a unity (composition and so on) consisting of parts (people and so on) in associations and so forth for a particular purpose [1]. Organizational activities are of course related to the purpose and participation of the members involved. In realizing some of its activities, required good financial processing. On the other hand, the current use of smartphones has penetrated not only for business and parents, but also began to enter the world of students. It is noted as it has been noted that smartphone users in Indonesia reach 63.1 million per 2016 and users who are students reach up to 8.3 million [2]. Smartphones can also be used for implementation with a variety of applications that can help various needs ranging from simple to complex systems. Nevertheless, the current state of financial recording within an organization among learners still uses a manual system using books or records using paper, the calculations are based on human counts, resulting in problems arising. The problems that often occur are starting from tucked income data, the lack of calculation on the total funds, resulting in an unsuitable result between income and expenditure. This may be due to human error to technical errors, missing papers, recording books not carried, etc. By looking at the opportunities of Mercu Buana University students who have a lot to use a smartphone, it is possible if the use of mobile applications that can help all kinds of needs of students, both individually to the organization. The absence of good management in financial management within an organization can certainly be detrimental not only to the organization itself, but to the permissiveness of each member involved. It is unfortunate if the use of smartphones among students who are only used as a means of communication only. So it's good we change also in the direction to form a generation smart people. Based on the background that has been described above it is expected that the design and implementation of this treasury application will be able to help the treasurer of the community among the

students. So that can take advantage of smartphones in an optimal and well-computerized financial management system.

#### A. *Research Problems*

Based on the background described above, the outlines of the problem are:

- 1) Why is a computerized application required for financial records?
- 2) How will the Treasury application be made to solve the common treasury problem?
- 3) How to implement the concept and recording model offered by Treasury application in order to meet the requirement of financial records among students?

#### B. *Limitation of Research*

In this issue so that the discussion is not too extensive, then the focus problem definition are as follows:

- 1) This design is based on the treasurer of a small community and the targets to be achieved are smartphone users among students Mercur Buana University
- 2) Applications created using hybrid systems and for platforms developed using Android.
- 3) This application only provides recording of incoming and outgoing money, can be in the form of regular payments (cash), dues, and bills. But in it will not be a report form such as accounting (balance sheet, asset report, etc.), only a summary that can be understood by most people who do not understand accounting variables.

#### C. *Purpose and Objectives*

The purpose of this research are:

- 1) Treasury applications can provide can process information much better and provide recap and record data so it is more useful for ease of organizational activity.
- 2) Treasury applications can provide better quality of information and are easier to use.
- 3) Concepts and models designed to produce a product that can cover the overall needs of the treasurer among the learners.

And the benefit of this implementation are:

- 1) The existence of a treasury application will provide a solution of the organization's financial records (currently the majority of students still use manual recording systems). So as to reduce the possibility of human error or loss of data.
- 2) Treasury applications will provide more efficient financial management and recording solutions using smartphones and user friendly.
- 3) The concept used in the development of this treasury application brings the same global concept of recording in every organization among learners. So it can meet the needs of recording in general.

#### D. *Previous Research*

According to Gema, Liawan, and Polla has undertaken a knowledge management application development as a means to support a knowledge sharing culture in Oracle Financial subdivision in the Orang Tua Group. In his research mentioned that researchers develop by using prototype approach. By providing information that provides the needs of users in sharing knowledge. However, the development of the application cannot be applied maximally, because the application cannot be adequate for the needs for users with high mobility [3].

In another study, according to Fransiska at PT Astra International Tbk. - Isuzu Bandar Lampung cash receipts in the input account code is still done manually so this often leads to errors input account code. So in his research, expected cash receipts in the financial / cash department and the efficiency of employees and the level of error can be minimized. But in his research there is still no system that can oversee the movement of transactions either in the listing, management, or the legitimacy of the account owner [4].

Based on the research that has been done, in writing this research will do the development by giving solution of recording management of money entry and money out for organization activity on student, with development that use prototype in its development.

## II. THEORY FUNDAMENTAL

#### A. *Treasury System*

In general, treasury is the storage of property (finance and so on) [1]. Where the system therein is recorded property ownership of valuable, good cash, assets, debts and others. Almost in every organization has a treasury system, because every organization is formed for an activity and the achievement of certain goals. The treasury system certainly has someone with a financial recorder role called the treasurer, as the person in charge and the

controller of the incoming and outgoing wealth / money. In simple terms the treasury for small organizations includes financial records, lists of members involved, the amount of money entry conditions in a given period, to the fine if there is a violation. And the complex system can achieve a balance sheet of profit and loss, reporting of assets, etc.

**B. PIECE Analysis**

PIECES analysis is very important to do before developing an information system because in this analysis will usually found some major problems and problems that are symptomatic of the main problem [5]. Below will be explained on the understanding of each of the PIECES components as follows:

- 1) System Performance Analysis  
Performance is a system capability in completing tasks quickly so that targets can be achieved immediately.
- 2) Information Analysis  
Information is important because with the information the management (marketing) and users can take the next step.
- 3) Economic Analysis (Economy)  
Utilization of costs used from the utilization of information. An increase in economic needs affects cost control and increased benefits.
- 4) Control Analysis  
This analysis is used to compare systems analysed based on timeliness, ease of access, and accuracy of processed data.
- 5) Efficiency Analysis  
Efficiency relates to how the source can be used optimally. Operations in a company are said to be efficient or not usually based on the task and responsibility in carrying out the activities.
- 6) Service Analysis  
Improved services show diverse categories. The selected project is a better service improvement for management (marketing), user and other parts which is a symbol of the quality of an information system.

**III.METHODOLOGY**

**A. Research Flow**

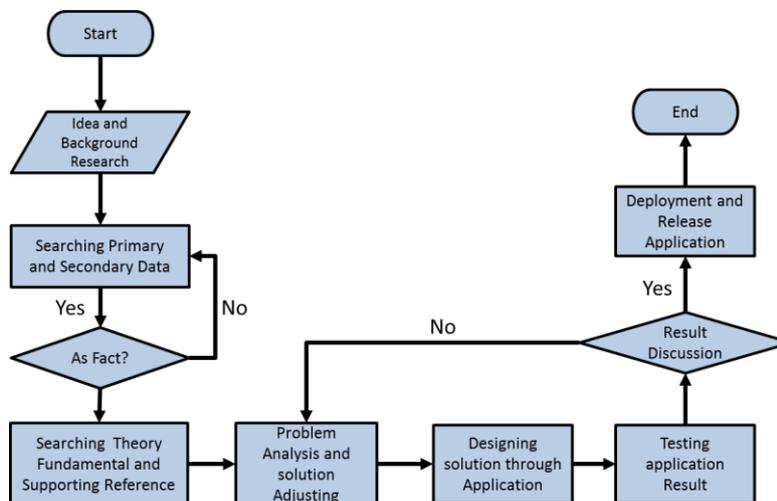


Figure 1. Research Flow

Figure 1. Shown the research begins with the collection of primary data and secondary data as a source of supporting data. Further data collection starts from source search by conducting interviews and observation. After getting the supporting facts, then the search for the foundation of the theory and supporting reference (material from polling on the internet). After that perform the problem analysis process in accordance with supporting facts and find suitable solutions. Then made an application design and designed according to a predetermined solution. The next stage is the process of development, deployment, and testing. The Final Stages make a result discussion with potential users. If the results are in accordance with the expected, then the next release of the application, if not then re-analysed until the results in accordance with the expected.

**B. Collecting Data Method**

The collecting data used in this research are:

- 1) Interview
  - a. Drafting of interview materials, studying cases to be asked (resource persons to organization conditions).
  - b. Conducting interviews with treasurers from several organizations.
- 2) Observation
  - a. Collection of financial recording data across multiple organizations.
  - b. Recording of things that often happen especially about obstacles.
- 3) Study Literature
 

Search the material to obtain information that is supportive for the design by reading and summarizing from the relevant material or source of reading.
- 4) Internet Reference
 

Surfing, looking for additional information both articles, journals, until the latest technological developments that can be used as a reference in the writing and system design.

**C. Problem Analysis Method**

The methodology used to analyse problems using the PIECES method, where aspects of coverage include:

Table 1. PIECE Analysis

Analysis	Parameter	Result Analysis
<b>Performance</b>	Recording Procedure	The organizational treasury system, takes time recording and recording long enough
	Accuracy of financial summary	Data is still manually stored using paper and often the occurrence of messy data, other than that the total income and expenditure may not necessarily produce a round number so accuracy often slip or often also lead to rounding of origin
<b>Information</b>	Accessing data and history data	search and access are often the most important obstacle, especially when organizational events, whether for recording, moving books, or recording (e.g. for reports)
<b>Economic</b>	Common disadvantages	Manual recordings of course often lead to negligence count and recap, so that often also occur losses and rebukes
<b>Control</b>	Control of the influx of incoming and outgoing cash, bills, and employment reports of treasurers	Financial records are often less tidy, controlling and calculating the total cost or total cash that has / has not been paid into uncontrollable. So almost done the manipulation in reporting
<b>Efficiency</b>	Efficiency of the treasury system	One treasurer can handle two different organizations, causing frequent errors of memory and mixed data
<b>Service</b>	Submission of summary and financial statements	Because of the often messy paper and recording origin only, so the delivery of summary cannot be done by impromptu, and still very dependent on the ability of the treasurer who must be good at estimating the financial condition

**D. Development Method**

The system development methodology used using the prototype approach. With the cycle stages as follows:

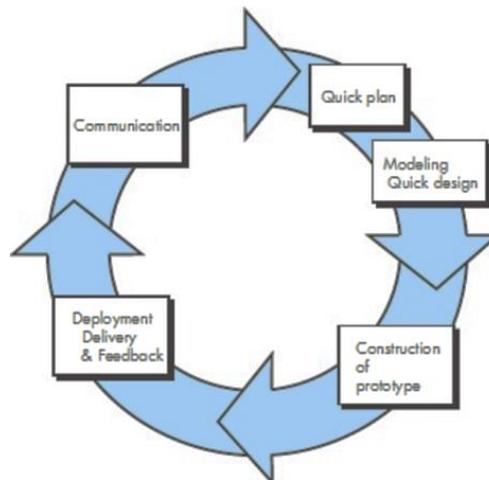


Figure 2. Development of Prototype Approach System

- 1) **Communication Stage**  
Communicate with prospective users of Treasury applications, by collecting information and development needs. What is the flow of the recording process; the parties involved, the description of the needs of the recording application, and identify the key points of the record.
- 2) **Rapid Planning Stage**  
With the results of communication and identification, then generate a way to plan the fastest way to meet the needs and modeling application design solutions. It is modeled here that the system flow uses UML, an application design model from either the mockup user interface, the application architecture, etc.
- 3) **Phase Development prototype**  
Conducted application development starting with coding until testing features and applications.
- 4) **Deployment, Deliver, and Feedback Stages**  
Apps that have been developed installed and assessed by potential users of the app for feedback and provide a better understanding of the applications to be passed.

*F. Testing*

Testing methods used with application test using Black Boxes. Where each feature will be given a test script about the input, the process that occurs, until the expected output form, starting with positive case to negative case

**IV. RESULT AND CALCULATION**

*A. Use Case Design*

Use Case Diagram is a UML (Unified Modeling Language) diagram model used to describe the expected functional agreement of a system. Use Case is always made first, but another sequence of diagrams is created depending on the project and personal preferences of analysts [6].

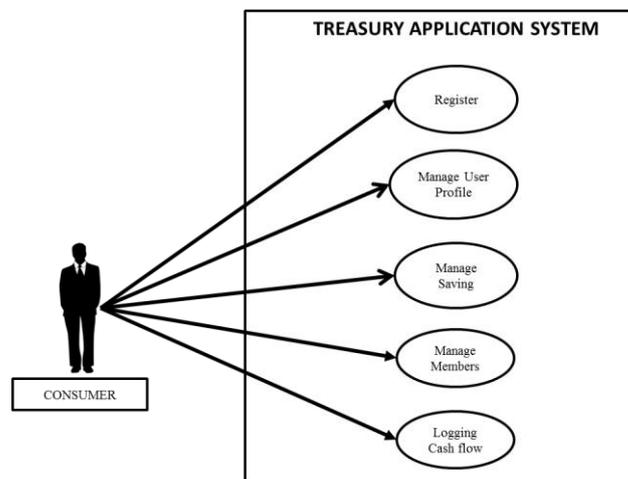


Figure 3. Use case diagram of the system to be created

Figure 3 shown an describe below:

- 1) Register; The Treasurer enrolls to create a new account through the registration form (from the application)
- 2) Manage User Profile; Actors perform savings management either add, change, deactivate savings according to the type of savings (cash, bills, dues)
- 3) Manage Saving; Actors perform savings management either add, change, deactivate savings according to the type of savings (cash, bills, dues)
- 4) Manage Members; Each type of savings has a list of members (within the organization) and greatly enables the addition or alteration of its members
- 5) Logging cash flow; The actor keeps track of the entry and exit of money in accordance with the type of savings

**B. Application Development Discussion**

Object-based development (MVC), using ionic angular (for mobile application development) and slim framework (as a service for the backend).

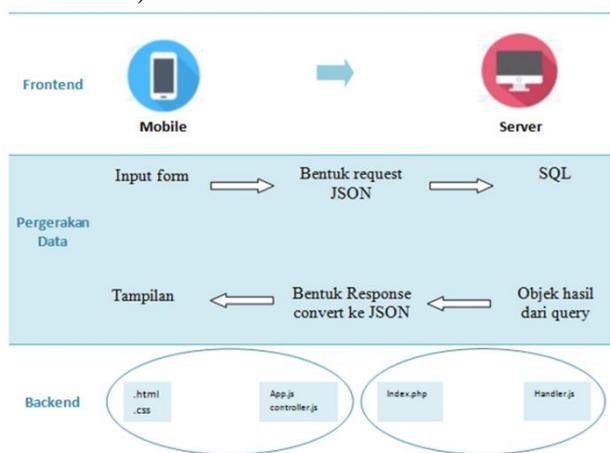


Figure 4. Application Development Discussion

**C. Final Stages Development**

The final result of the developed application:

- 1) Registration (to create an account).
- 2) Login user.
- 3) Manage user accounts.
- 4) Selection of recording categories (routine cash, dues, bills).
- 5) Management of the members of each record.
- 6) Recording incoming and outgoing money adjusted to the function of each category of record (regular cash, contributions, bills).
- 7) A summary view in each listing category.
- 8) Report in summary and detail report for each type of record

**D. Development Specifications**

Table 2. Development Specifications

Hardware	Description
Processor	Min. INTEL CORE I5 2320 - 3.0GHZ
Mother Board	MB ASUS H61M-C
RAM (Random Access Memory)	Min. RAM 8GB PC 10600/12800 VGEN
Hardisk	Min. HARDISK 256GB SATA SEAGATE /WD
Monitor	LG LED Monitor 15.6 Inch [16M38A]
Connection	Wi-Fi / LAN
Operating System	Microsoft Windows; Min. Win 7 Pro, 64 Bit, Enterprise
Database	MySQL version 1.7.7

E. Documentation Development

Table 3. Development Specifications

Type	Description
Web	<b>PHP</b>
	Version 5.3.8
Mobile	<b>Ionic</b>
	Version 1.7.6
Adapter	<b>SlimFramework</b>
	Version 2.3.5
Server	<b>XAMPP</b>
	Version 1.7.7
	Port 8012
IDE / editor	<b>Notepad++</b>
	Version 6.9.1

F. Testing Prototype

from the test results there are 3 prototype results are:

1. treasury\_v01 (Alfa Test)
2. treasury\_v02 (Beta Test)
3. treasury\_v03 (Final Test)

The result of the treasury\_v03 (Final Test) are shown on below:

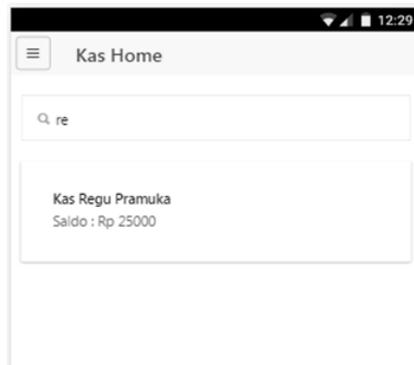


Figure 5. Display the Treasury register with function search

Figure 5 show the treasury register with search function as development from previous version, and meanwhile the treasury home show collecting the group member in this community, and the remainder module show on below:

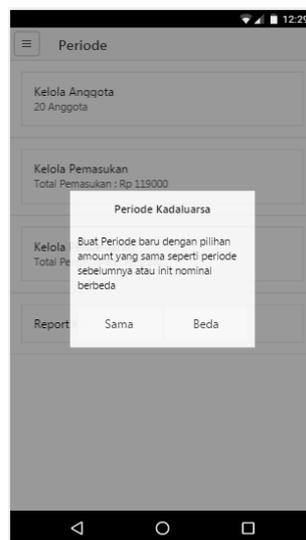


Figure 6. Remainder New Period

Figure 6 show notification for remainder the period will be taken from administrator to change or keep same the treasury recapitulation and many function module from this application to support the application.

## V. CONCLUSION

Based on the results of the implementation of the design that has been done, then the conclusion of the use of mobile-based application of Treasury applications on the students, as follows:

- 1) Treasury applications can be used / used by potential users, i.e. the treasurer of the organization among students. Through the feature of recording cash (which is a routine), bills, and dues (voluntary) that have been based mobile can help solve the problems often encountered treasury, human error, errors in recording, books lost, and search data.
- 2) Treasury applications help with more flexible logging ensures high mobility and ensures better recap and data recording by transforming treasurer systems that still use paper into a better computerized and managed system. So as to produce better information quality.
- 3) Treasury application concepts and designs are tailored to the treasury's approach to the learner, so organizational treasurers can optimize organizing activities with complete applications and features that provide better information quality.

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