

## CHAPTER I

### PRELIMINARY

#### 1.1. Background

The growth of the internet makes everything feel close with help of various applications such as WhatsApp or social media like Twitter, it has a direct impact on human behavior, in age where anything can be done on a smartphone with the help of an application.

Various applications have sprung up which aim to help Smartphone users, one of which is the Lunasbos application, which was built on April 21, 2018, aims to make it easier for Smartphone users to record debits and credits in their daily lives by providing a debit and credit notes feature to anyone who is in the user's Smartphone contacts. At present, the Lunasbos application has been used by more than twenty thousand Smartphone users throughout Indonesia.

Utilizing cloud computing technology services or Cloud Computing provided by Firebase in the form of Backend tasked with serving the needs of the application, the Lunasbos application can store user records on Firebase so that users can access their notes wherever and whenever they are.

However, as the growth of Lunasbos users, the number of records stored in Firebase is also increasing, so the user of the Lunasbos application starts to complain about the time of adding, changing and removing records because Firebase must always serve the needs of many users.

The problem also cannot be solved by adding the Cloud Computing package offered by Firebase because of Lunasbos small operational budget. This makes the

Lunasbos must make other solutions that are economical and can survive as users grow, namely by implementing their very own Backend.

By utilizing a runtime environment named Node.js, the difficulty of making Backend can be reduced because Node.js uses the Javascript programming language often used in website product development. The number of references, tutorials and code samples that are spread on the internet plays a big role in facilitating the process of implementing the new Backend so that maintenance costs can be reduced.

The backend consists of services such as servers that serve business needs, the service will be placed in Cloud Computing services from Amazon Web Services (AWS), this service allows the Lunasbos to monitor & develop services as users grow.

To always serve the Lunasbos application requests and feature that are continuously increasing, the service is designed separately from each other, each service fraction serves a specific application feature, then linked together with a portal called API Gateway, which regulates application requests to services that serve, this service design is called microservices architecture, with this design, services are broken down into specific services so that they are easy to maintain and develop as Lunasbos grows..

## **1.2. Problem Formulation**

Based on the background that has been explained, then the problem that can be formulated is how to implement a new Backend that is economical, fast and flexible as user growth.

### **1.3. Problem Limits**

Based on the formulation of the problem, to focus the discussion on this point, the authors limit the scope, namely:

1. The implementation is aimed at making it easier for Lunasbos to serve application users at an economical cost and ease of adding features.
2. Software that will be used to build this Backend is Visual Studio Code and Postman.
3. The programming language used to build this Backend is Javascript.
4. The runtime used to build this server is NodeJS.
5. Service company where the cloud infrastructure will be built using Amazon Web Service (AWS).
6. The database used is the MySQL Amazon Relational Database Service (Amazon RDS).
7. Users as application developers & owners can fully access this Backend.
8. The result of this implementation is a comparison of the calculation of time, flexibility proof, and service costs from before and after implementation.

### **1.4. Purpose and Objectives of The Research**

The purpose of the research is to help the Lunasbos in serving its users who aim to find out how much benefit is gained by implementing the microservices architecture in the application company.

## **1.5. Research Methods**

### **1.5.1. Data Collecting Methods**

#### **1.5.1.1. Observation Method**

This method is done by the authors to make observations or field observations of the object under study, namely the Lunasbos application.

#### **1.5.1.2. Interview Method**

This method is done by way of question and answers directly with the owner and developer of the Lunasbos application to get data and an overview of existing information systems.

#### **1.5.1.3. Case Study Method**

This method is carried out to observe how the Lunasbos application works in the field that still uses Firebase.

#### **1.5.1.4. Library Method**

The author collects data by studying library books and internet articles from expert sources relating to the object of research and then used as a reference or consideration.

#### **1.5.2. Analysis Methods**

There are three analyzes conducted by the author to ensure the research is as needed, useful and workable, which is:

1. Analysis of performance, information, economy, control, efficiency, and service or known as PIECES analysis.
2. Analysis of functional and nonfunctional requirements.
3. Technical, legal, economic and operational feasibility analysis.

#### **1.5.3. Design Methods**

After conducting the analysis process, the author will design a system by making UML with three diagrams, which is:

1. Use case diagram
2. Activity diagram
3. Class diagram

#### **1.5.4. Testing Methods**

In the testing method, the author uses the black box testing method which is a test method in which the internal structure of the program is

unknown to the examiner to test functionality, the writer will use two types of this method, which is:

1. Functional Testing

Done to find out whether the service can and is flexible in meeting its goals.

2. Non-Functional Testing

Done to find out whether the service can work under real load.

**1.6. Writing System**

Systematics of writing can be explained briefly as follows:

**CHAPTER I**

**PRELIMINARY**

This chapter has the background of the problem, the formulation of the problem, the limitation of the problem, the purpose of research the benefits of research, research method, and research systematic.

**CHAPTER II**

**THEORETICAL BASIS**

This chapter has a review of the literature and the basics of the system about Backend infrastructure, which describes the introduction of information systems, basic concepts of information, basic concepts of information systems, basic concepts of

database systems, and basic concepts of the Backend infrastructure.

### **CHAPTER III ANALYSIS AND DESIGN**

This chapter has an overview, system analysis, proposed solutions, and describes the system design that will be made.

### **CHAPTER IV IMPLEMENTATION AND DISCUSSION**

This chapter has the stages that the author did in the implementation of system design, system discussion, testing and application of infrastructure to the object of research.

### **CHAPTER V CLOSING**

This chapter has conclusions and suggestions that researchers can summarize during the research process and the system development of the thesis discussion