CHAPTER I INTRODUCTION

I.1 Background

To provide a good learning experience, each program in the Faculty of Industrial Engineering needs various equipment in its classrooms. This includes basic items like air conditioners for comfort, projectors for engaging lessons, traditional blackboards, and student desks and chairs. These are just some of the essential resources that ensure high-quality education and effective learning.

The Faculty of Industrial Engineering occupies space across several buildings on campus. These include Building B (Graha Wiyata Cacuk Sudarijanto), the Mangudu Building (Manufacturing Process Laboratory), and specific floors within the new Telkom University Landmark Tower (TULT). A detailed breakdown of the rooms allocated to the Faculty in TULT is provided in Table I.1.

Table I. 1 Rooms Owned by Faculty of Industrial Engineering at TULT

No.	Floor	Description	Number of Room
1	1st floor	administration	15
2	4th floor	Lecturer's room	150 (rubik) + 4
3	8th – 9th floor	Classes and Laboratories	40
4	18th floor	Official rooms	24

Table I.1 shows the rooms in TUlT, while Building B (Graha Wiyata Cacuk Sudarijanto), and the Mangudu Building (Manufacturing Process Laboratory) do not have data on the allocation of existing rooms because they have not been recorded by the Finance and Human Resources unit. With technology playing a central role in today's educational landscape, efficient asset management is critical for universities' success, especially those like Telkom University's Faculty of Industrial Engineering, which juggles a vast amount of equipment (Setiawan et al., 2019). The faculty acknowledges the need for a unified information system such as asset management, tracking, maintenance, acquisition, and disposal. However, the diversity of assets across the faculty presents a significant hurdle.

This underscores the need for a robust information system that integrates all these management functions. To understand the hurdles that exist in managing FRI office assets, the following is the asset data in the Academic Administrative Service (LAAK) room which will be shown in Table I.2. The following data consists of the name of the asset, the amount, and the specification of the existing asset. The process of collecting data on this asset is carried out manually using excel and there are several elements that do not yet exist so that the information about the asset is incomplete.

Table I. 2 Assets in LAAK Room

LAAK Room (TULT-01-05)			
No.	Assets	Quantity	Specifications
1	PC	2	Lenovo F0G1008HID
		2	Dell OptiPlex 7010
2	Printer	2	HP Laser Jet P1102
		1	HP Color Laser 150A
3	Scanner	1	Epson DS-410
4	Desk	4	Custom
5	Office Chair	3	Chairman
		1	Mubarix
6	Shelf	1	Custom
7	Drawer	4	Custom
8	Paper Shredder	1	Honeywell
9	Hard Drive	2	Seagate 2TB
		1	Spectra 500GB
10	Keyboard	2	Lenovo USB Calliope White
		2	Logitech K220
11	Mouse	2	Lenovo USB Calliope White
		2	Logitech M150
12	Tablet	1	Samsung S6 Lite
13	Chair	2	Mubarix
14	Glass Partition	1	Custom

The incomplete information in Table I.2 is also due to the data collection process that is not optimal, so that the data information related to the assets collected is uneven. These manual processes create significant roadblocks, especially on maintenance aspect. Based on interview with several stakeholders, People involved in the faculty, specifically staff, administrators, vice dean 2 often struggle to obtain accurate asset information. With the existing system that has been implemented, the asset data on maintenance section were not properly informed. As a result, a lot of equipment was not stored. Several assets in the office that is old or nearing its useful life tends to break down more frequently and require more frequent maintenance, making monitoring more difficult. This lack of accessibility prevents their ability to make informed decisions about allocating resources, scheduling maintenance, and acquiring new equipment. It shows that human error is a major cause of accidents, and this can be linked to both individual mistakes and weaknesses in organizational systems. Information kept in different documents, spreadsheets, physical files, and even through informal knowledge sharing. This redundancy and difficulty in accessing data create inefficiencies and gaps.

To identify the root causes of asset management issues in the Faculty of Industrial Engineering (FRI) at Telkom University, a fishbone diagram is a visual tool commonly used in problem-solving to brainstorm and discuss potential causes of problems. Figure I.1 illustrates the fishbone diagram for asset management on FRI.

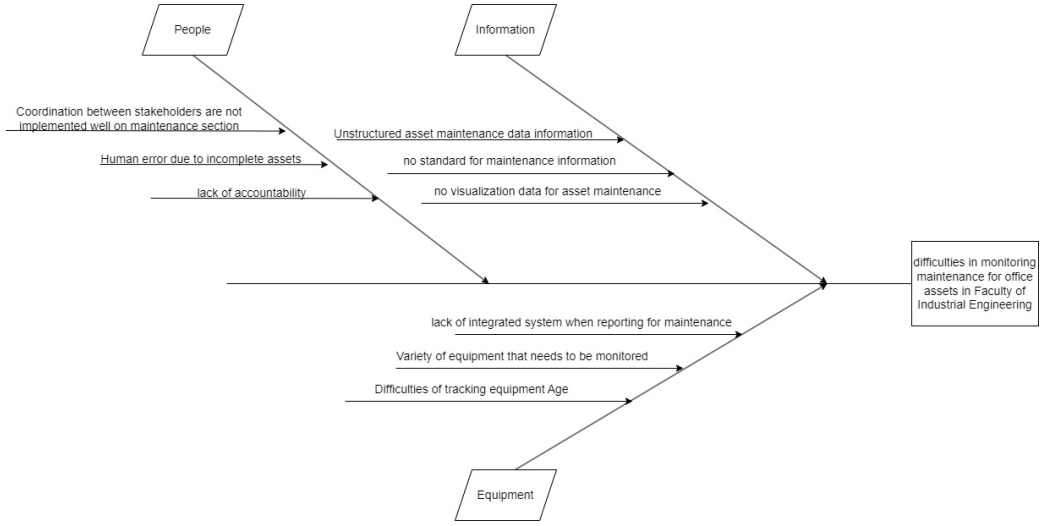

Figure I. 1 Fishbone Diagram

The fishbone diagram on Figure I.1 highlights several roots of the problem in current processes, as confirmed by stakeholder interviews. There are 3 components of the problem in the fishbone diagram, namely people, information, equipment. On the people component, Coordination between stakeholders were not implemented well especially maintenance section. There is undisciplined behaviour for collecting asset data. Human error can arise due to incomplete information about assets and the repair history can hinder good monitoring. Lack of accountability can also be a problem because without clear accountability, individuals may not feel responsible for reporting problems or completing maintenance tasks on time. For information component, Unstructured asset maintenance data information can cause wrong decisions or delays in repairment. On the existing system there is no standard for information such as collecting, reporting, and analysis of maintenance data, the existing information is unreliable and uneasy to compare. On the other hand, no visualization data for asset maintenance such as dashboards or graphic visual, it can be difficult to understand and analyse conditions and performance quickly. Several Equipment that is old or nearing the end of its life tends to suffer more frequent breakdowns and require more frequent maintenance, making monitoring more difficult for office assets in Faculty of Industrial Engineering.

To address this, the faculty needs an improvement on Management Information System (MIS) to track and monitor maintenance assets. Implementing an MIS

would increase collaboration and communication among various stakeholders involved in asset management. Faculty staff, administrators, and technicians would be empowered to collaborate seamlessly, share information related to asset management, especially the maintenance section, and coordinate tasks through the system.

The proposed to improve Management Information System (MIS) offers significant benefits for all stakeholders in the faculty, including faculty members, administrators, and other relevant personnel. This centralized system simplifies data retrieval by providing easy access to asset information such as location, status, maintenance history, availability, and reporting for maintenance. This eliminates manual searches and streamlines access to crucial data. Furthermore, the MIS automates workflows and standardizes processes, minimizing manual errors, unnecessary tasks, and inconsistencies across teams and departments. Additionally, the system facilitates asset lifecycle tracking, leading to improved maintenance plans, reduced equipment downtime, and lower maintenance costs. Therefore, developing an Asset Management Information System is beneficial for the Faculty of Industrial Engineering.

I.2 Formulation of the Problem

Based on the problem and alternative solutions outlined earlier, the problem formulation for this final project is as follows:

1. How is the improved system of an asset managament information system for managing asssets at the Faculty of Industrial Engineering at Telkom University?
2. How is the business process of the proposed management information system at the Faculty of Industrial Engineering Telkom University?

I.3 Goal of the Final Project

The objectives of this final project, based on the problem formulation, are as follows:

1. To improve the recent asset management information system for managing assets by integrating the proposed asset management information system at the Faculty of Industrial Engineering at Telkom University.
2. To identify existing business processes and describe the business processes of the proposed Management Information System.

I.4 Benefits of the Final Project

1. The management information improvement results can be utilized to monitor maintenance asset information.
2. Standardized processes within the management information system will streamline asset management activities.
3. The system will improve better tracking asset lifecycles, leading to optimized maintenance schedule, reduced downtime, and cost saving in asset update.

I.5 Outline of Chapters

To ensure a more structured approach in writing this final project, it is divided into several sections. The structure of this final project is as follows:

Chapter I: Introduction

This chapter gives a quick review of the final project's history, the issue statement that was formed from it, the project's goals, its importance, the project's limits, and its structure. This final project discusses the improvements that will be made to the management of office assets of the Faculty of Industrial Engineering. The solution that will be proposed is to improve the recent asset management information system for managing assets by integrating the proposed asset management information system at the Faculty of Industrial Engineering at Telkom University and identify existing business processes and describe the business processes of the proposed Management Information System.

Chapter II: Theoretical Foundation

This chapter explains the methods and theories used in the final project. The aim of this chapter is to build a conceptual framework based on relevant literature related to the examined problem. This consists of Management Information

System and asset management. The method that will be used is Unified Modelling Language (UML). In addition, this chapter will also review the methodology of system development using scrum and will compare it with several other methods. And don't forget that this chapter will also explain the methodology that will be used, namely Blackbox Testing and User Acceptance Test (UAT).

Chapter III: Systematic Problem Solving

This chapter describes the conceptual model and problem-solving methodology employed for improve Management Information System. The problem-solving system will outline the problem-solving process based on the stages of the system development model used.

Chapter IV: Integrated System Design

This chapter presents the specifications of the design based on factual data and the design process carried out according to the outlined methodology. The design process is conducted based on the specifications derived from the design. The design will process including stakeholder analysis, system design Unified Modelling Language (UML), as well as application development using the Scrum method.

Chapter V: Validation and Evaluation of Design Results

In this chapter, the validation and evaluation process of the design results are explained. The principles of validation and evaluation can be tailored to the specific topic addressed. This chapter discusses the validation of design results, analysis of design outcomes, and analysis of implementation/impact of the design results. Verification is carried out through black box testing to test the functionality of the system, while validation is carried out through User Acceptance Test (UAT) to evaluate the feasibility of using the system by users.

Chapter VI: Conclusion and Recommendations

This chapter includes the conclusions and recommendations based on the findings of the final project. The conclusion includes the proposed solution in improving the management of FRI's office assets and identifying existing business processes and describing the business processes of the proposed Management Information System. While the recommendations focus on the further improvement and development of the system that has been designed.