

CHAPTER I INTRODUCTION

I.1 Background

Telkom University, as a leading private university in Indonesia located in Bandung Regency, West Java, offers academic excellence through seven Faculties and 50 Study Programs, including the Industrial Engineering Study Program. Founded on September 28 1990, the Industrial Engineering Study Program at Telkom University obtained the highest achievement with Superior accreditation based on the decision of the National Accreditation Board for Higher Education of the Republic of Indonesia No. 2555/SK/BAN-PT/AK-ISK/S/IV/2022. The Bachelor of Industrial Engineering program has a vision of becoming a world-class Industrial Engineering study program that plays an active role in developing knowledge in the field of Information Technology-based Industrial Engineering and has 3 missions as follows:

1. Organizing an international standard education system that encourages active and independent learning in the field of Information Technology-based Industrial Engineering.
2. Carrying out international standard research to develop science and technology as well as innovation in the field of information technology-based Industrial Engineering.
3. Carrying out community service and actively building synergies with domestic and foreign industries/institutions.

In line with its vision, the Telkom University program, as a leading private university in Indonesia located in Bandung Regency, West Java, offers academic excellence through seven faculties and 50 study programs, including the Industrial Engineering Study Program. Founded on September 28 1990, the Industrial Engineering Study Program at Telkom University achieved high achievements with superior accreditation based on the decision of the National Accreditation Board for Higher Education of the Republic of Indonesia No. 2555/SK/BAN-PT/AK-ISK/S/IV/2022. With a rigorous curriculum, covering 144 credits in 4 years or 8 semesters, this program emphasizes understanding core concepts, practical application, and soft skills development. Supported by experienced

lecturers and modern facilities, students of the Industrial Engineering Study Program at Telkom University are given the opportunity to develop their potential and become agents of change and innovators in the industrial world, in line with the university's vision and mission.

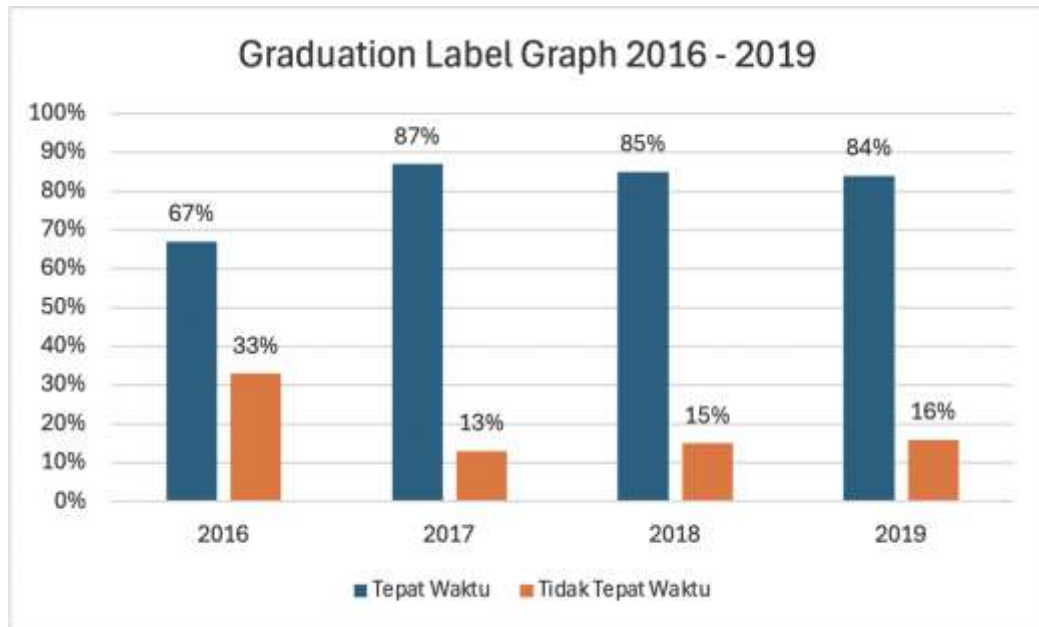


Figure I.1 Graduation Time

Based on the data that obtained from academic services Telkom University in Figure I.1 show that the graph illustrates a downward trend in on time graduation (*TW*) rates from 87% in 2017 to 84% in 2019, while late graduation (*TTW*) rates increased from 13% to 16% during the same period. This indicates that there are still many students who need support to complete their studies on time. The gradual increase in *TTW* from 2017 to 2019 is a cause for concern because it can obstruct the achievement of on time graduation and have a negative impact on students. Therefore, further research is needed to identify the factors that caused and to develop effective solutions to help students complete their studies on time.

Through the results of interviews with the Head of the Bachelor of Industrial Engineering Study Program, various factors that directly influence the success of students in completing their studies are revealed. on time. One of these factors is a delay in starting to complete the final assignment, which has the potential to hinder progress and final results. Not only that, a student's grades in each semester

can influence graduation beyond the specified time limit which is an additional factor that contributes to the difficulty of completing final assignments on time. However, head of study programs still do not know what the most factors can influence students to graduate on time or not. Apart from that, there is no system that can predict whether a student's graduation will be late or not that can be used over a long period of time. In response, this Study Program needs to design an effective strategy to overcome this challenge in order to increase the graduation rate on time in accordance with established accreditation standards. This problem can be made into various components so that the main problem can be seen using fish bones which can be seen in Figure I.2.

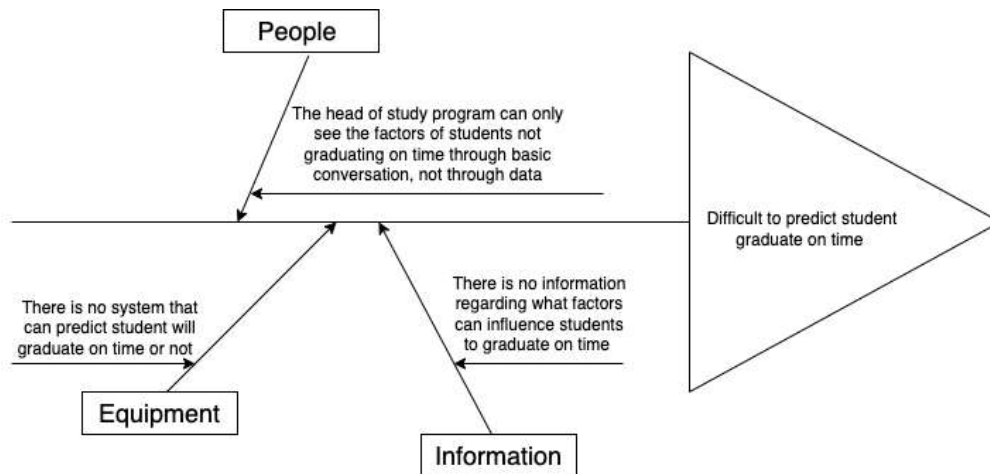


Figure I.2 Fishbone Diagram

This fishbone diagram can help to identify the root causes of the lack of transparency and visibility, which then forms the basis for designing an appropriate solution. According to the fishbone diagram, there are issues in several components:

- **People:** Currently, the Head of the Study Program only relies on basic discussions or looking at existing data fundamentally not patterns. To understand the factors causing students not to graduate on time. This makes it difficult to implement targeted interventions or earlier support measures for students at risk of delayed graduation.
- **Equipment:** There is no system in place that can predict whether a student will graduate on time or not. This lack of predictive capability means that

the study program cannot proactively identify students who might be at risk of delayed graduation. Consequently, it becomes challenging to provide timely support or interventions to help these students stay on track with their studies.

- Information: Lack of information regarding the factors that influence whether students graduate on time or not. This makes it difficult for study programs to precisely determine the specific elements that contribute to on-time graduation or late completion. Developing effective strategies to support students to graduate on time is a challenge regarding these influencing factors.

The fishbone diagram indicates that issues are causing difficulties for the study program to predict student graduation and based on the fishbone diagram, potential root causes can be identified such as the head of the study program only looking at this issue through basic data not patterns, the absence of a system that can create patterns for predicting student graduation, and the lack of information on what factors can predict whether students will graduate on time or not. Considering the solutions from the fishbone diagram, an approach using the Naïve Bayes prediction method designed into a system will be implemented.

There is previous research that implemented the Naïve Bayes method to predict student graduation. To predict student graduation, the attributes needed are academic information such as *IPS1*, *IPS 2*, *IPS3*, *IPS4*, *IPS5*, *IPS6* as well as a label stating whether you graduated on time or graduated late(Sutoyo & Almaarif, 2020). This method can be a reliable solution in identifying students who are at risk of experiencing delays in completing their studies. Through the Naive Bayes classification method, we can identify patterns based on probability in each attribute which can then be used to determine whether a student will graduate on time or not(Pambudi et al., 2019). By utilizing predictions using the Naïve Bayes method, study programs can take preventive action by identifying students who may experience difficulties so that the necessary steps can be taken early(Firdaus et al., 2021). Developing these predictions into a system will help study programs

predict student graduation using Naïve Bayes and ensure that all problems can be solved using supporting procedural standards.

I.2 Formulation of the Problem

Based on the background that already described above, problem formulation for final project is:

1. How to predict the graduation of Telkom University Industrial Engineering Study Program students on time using the factors that has been obtained?
2. How is the design of a dashboard to predict the graduation of Telkom Industry students in the industrial engineering study program?

I.3 Goal of the Final Project

Purpose of final project is based on the problem formulation above

1. Produce prediction models for data mining techniques using the Naïve Bayes method.
2. To create a design of a dashboard for predicting graduation of students in the Industrial Engineering Study Program at Telkom University.

I.4 Benefits of the Final Project

This Final Project would be give benefits as following:

1. Providing support to study programs in making predictions regarding student graduation on time or not.
2. Providing assistance to students in making predictions regarding the possibility of them completing their study program on time or not.

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: