

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Machine condition prediction plays an important role in the process various industries in the world. The condition of machine components is a special concern for the company, because if there is damage it can result in a decrease in productivity. Therefore, it is very important to diagnose and diagnose damage to the rotating machine before the damage occurs, so that a more appropriate method and time of maintenance can be planned.

There are various methods that can be used to measure machine condition, such as vibration analysis, oil analysis, temperature measurement, pressure measurement, flow rate measurement, and others. Measurement of vibration, temperature, and machine displacement are several methods that are quite good for determining machine condition because vibration and temperature are indicators of mechanical conditions and early indicators of defects in a machine as a whole. The higher the vibration and the resulting temperature, this indicates a decrease in the condition of the machine. Productivity will not be reduced because the machine is still running during data retrieval. From the results of periodic data measurements, data will be obtained which will then be trained with the C4.5 algorithm.

This project aims to predict machine condition based on vibration, temperature, and machine displacement. From there we can improve the maintenance that needs to be applied to the machine and how long the machine will last.

### 1.2 Problem Formulation

1. How to build a C45 structure that can be used for predict the condition of the machine based on data in the form of temperature, vibration, and engine displacement ?
2. Is the C45 algorithm effective for predicting machine condition?

### 1.3 Scope

1. The sensors used can only be used on small-scale machines.
2. It is necessary to first calibrate the sensor value limit.

### 1.4 Objective

1. Creating an automatic system that is able to predict the condition of the machine by using the C45 algorithm.
2. Develop research on the application of artificial intelligence in the field of maintenance, especially for condition monitoring.

