

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Many ways can be done to invest. The technological advances make it becomes easier. One of the most attractive investments is stock. The stock investment is depend on the price movement. The investor will be bought the stock while the price is low and sell it while the price is high. But there are many factors that affect stock price movements such as rumors and market sentiment, government policy, foreign exchange rate fluctuations, etc. Movement of stock prices that tend to be unstable makes a lot of people looking for a solution to analyze the movement. In fact the stock price history data that can be analyzed it is available at [finance.yahoo.com](http://finance.yahoo.com). By processing the data there, anyone can do the analysis.

There are two methods to analyze stock prediction that is fundamental and technical. Fundamental analysis includes company performance, industry analysis, business competition analysis, economic analysis and micro macro market. Fundamental analysis is a difficult way because it took a lot of information that can not be obtained by the public. Because fundamental analysis is difficult, then technical analysis becomes the best solution for investor. Technical analysis includes moving average convergence divergence, relative strength index, stochastic oscillator and others. Due to the large number of data and parameters to be tested, technical analysis becomes very difficult to do manually. One way to solve this problem is use artificial neural network.

Artificial neural network have an algorithm called backpropagation. This algorithm can provide predictions based on data in the past. It is very suitable for stock prediction because there is historical data that can be processed.

Backpropagation algorithm can learn from mistakes and improve values to provide the most optimal results.

Data historical available on finance.yahoo.com can be taken by webscraping technic. Webscraping is a way to retrieve data contained on a website. The data taken is the stock price during the last 6 months. Then it will be analyzed in 4 different ways, with different number of hidden layers cells ranging from 2, 4, 6 and 8 cell. Any hidden layer arrangement will provide predictive results and the results will be compared with reality prices. The result of this analysis can be used to predict the stock price.

## 1.2 Scope

Experiment will use historical data for 12 months from 5 companies with the largest share in Indonesia. Parameters to be used included open price, high price, low price, volume, adjective close and close price.

In Backpropagation algorithm the number of cells units in the hidden layers are 2, 4, 6 and 8. Each configuration will have a result which will be compared with the real price in 1 month. Predicted results of the three variations will be compared which is most accurate.

The problem to be studied is :

1. How to get data from a website using web scraping method ?
2. How to use backpropagation to generate a prediction ?
3. How the comparison results between the 4 variations number of hidden layer cell ranging from 2, 4, 6 and 8 ?

### 1.3 Objective

The purpose of this study to solve the problem has been described above by creating an application that can provide past stock price predictions. It is also to implement artificial neural network and to compare the accuracy of stock predictions using backpropagation algorithm with the various number of hidden layers cell.

