CHAPTER I

INTRODUCTION

1.1 Background

The world is becoming more connected than ever before. Thanks to the internet and smartphones, we can communicate with people on the other side of the world without leaving our homes. We can access almost infinite amounts of information from the comfort of our couches. And we can experience things—sometimes in ways that seem impossible—through the lenses of our smartphones and headsets. This is where the metaverse comes in. The metaverse is a platform that can be used to create and share virtual worlds, including 3D spaces and avatars. It is a platform that has become increasingly popular in recent years. The metaverse has been a subject of much discussion and speculation due to its potential to transform the internet as we know it and provide a new platform for social interaction. It is the next wave of internet invention that is constantly being developed that improves the ways to use the internet.

There has been a lot of hype surrounding the metaverse, or what people would say "the next evolution of the internet". CEOs like Mark Zuckerberg or Satya Nadella talk about it, the metaverse is the future of the internet. Or it's a video game. Or maybe it's a deeply uncomfortable, worse version of Zoom? It's hard to say. A study done by YouGov7 showed that 36% of Americans are interested in participating in the metaverse, with the most interest coming from ages 18-29 (51%) and 30-44 (43%). Not surprisingly, there was significantly less interest from ages

45-64 (32%) and 65+ (19%). On the other hand, not only commercial brands are betting on the metaverse. Other types of organizations, such as public organizations, are exploring their possibilities in the virtual world. The city of Seoul announced in November 2021 that it will spend $3.3 billion to become the first city in the world to be in the metaverse. The metaverse market is expanding in tandem with the advancement of new-age technology. According to Fortune Business Insights, the global metaverse market will grow at a CAGR of 47.6 percent, from $100.27 billion in 2022 to $1,527.55 billion in 2029. The research further highlighted that the COVID-19 pandemic led the demand for metaverse experience higher-than-anticipated across all regions, including Europe, US, and Asia Pacific. And since, the first inception of the metaverse, there have been many iterations, each one promising to be better than the last. The current state of the metaverse is a far cry from the original vision of the Metaverse, which has caused a lot of disappointment in users. Instead of providing a platform for users to create and share content freely, the current metaverse is primarily used for gambling and other illicit activities. This begs people the question: can the metaverse be used for good? Can it be used to have genuine conversations and share content that is not related to gambling or other illicit activities? Can it be used to create a more immersive and realistic experience? The answer to all of this can be decided through sentiment analysis of what people think about the metaverse.

Sentiment analysis is the process of determining the attitude of a person or a text toward a certain topic or thing. It's used in a wide variety of applications, including market research, financial analysis, and customer feedback. The most

basic form of sentiment analysis, which is also the most straightforward, relies on human beings to identify the attitude expressed in a given text, determining whether the text is positive, negative, or neutral. This is often called subjective or traditional sentiment analysis.

However, today that field is being revolutionized by the same force that has disrupted so many others: artificial intelligence. Sentiment analysis can now be carried out by neural networks—complex algorithms that learn how to perform tasks by analyzing large amounts of data—which can often detect sentiment better than humans, and far more cheaply. This has led to a further level of automation: machines that automatically detect sentiment in text, often without human oversight.

For this exact reason is why the author proposes to conduct a sentiment analysis regarding the metaverse from YouTube comments to decide whether or not it can be the next big thing by using one of the neural network methods called Recurrent Neural Network (RNN).

1.2 Problems

According to the background, the problems can then be formulated as such:

1. How to perform a *Sentiment Analysis* on a *YouTube* commentary in a *Metaverse*-related opinion using *Recurrent Neural Network*?
2. What is the accuracy, *recall*, *precision*, and *f1-score* that *Recurrent Neural Network* produced on a *Sentiment Analysis*?

1.3 Problems Limitation

The authors created problem limitations to prevent the widespread scope of problems in this study, the problem limitations of this study are as follows:

1. This research only uses *Recurrent Neural Network* (RNN) with *Long Short-Term Memory* (LSTM) architecture to conduct sentiment analysis.
2. The dataset is only taken from a YouTube commentary in English.
3. Only Metaverse-related opinions will be taken as datasets.
4. The sentiment will only be classified into three types: positive, neutral, and negative.

1.4 Research Purpose

The purpose of this study is to implement Recurrent Neural Network (RNN) to automatically classify a YouTube user's sentiment regarding the Metaverse and gain knowledge of its accuracy.

1.5 Research Benefits

The benefit gained in this study for researchers are as follows:

1. To gain knowledge of the Recurrent Neural Network's capability of sentiment analysis and further its reliability.
2. This research can be fully developed into a reliable real-time analysis, market research, and customer feedback about the *Metaverse*
3. Can be used to determine investors' opinions of the *Metaverse's* stock or asset. Sentiment may at times hint at future price action, assisting as a forecasting tool to determine possible future price changes.

1.6 Research Methodology

These are the stages performed in this study.

1.6.1 Data Collection Method

The methods used in collecting datasets to analyze are as follows:

1.6.2 Literature Review

To collect various data collection methods through several journals, proceedings, books, articles, and several other references related to this study.

1.6.3 Data Scraping

Data scraping or data crawling is a process of extracting data from web pages and websites. Data collection from this research is data downloaded from the YouTube server in the form of user comments and replies along with its attributes. To access information from YouTube with the use of YouTube API.

1.6.4 Analysis Method

The analysis method that will be used is the Recurrent Neural Network to classify a sentiment regarding Metaverse on YouTube into three classes, that is positive, neutral, and negative.

1.6.5 System Design

At this stage, the system is designed using python to solve the problems contained in the analysis stage.

1.6.6 Implementation

At this stage, implementation is carried out based on the analysis that has been done in the form of programs (notebooks) following the design.

1.6.7 Testing

The next stage of testing the system has been made to test the quality of the Recurrent Neural Network (RNN) with confusion matrix, K-fold cross-validation, and f1 score.

1.7 Systematics Writing

Overall, this thesis report consists of five (5) chapters in accordance with the thesis report guidelines applicable at Universitas AMIKOM Yogyakarta, the systematics of writing this report are as follows:

BAB I Introduction

This chapter contains the background, problem formulation, problem boundaries, research aims and objectives, research benefits, research methods, and writing systematics.

BAB II Related Work

This chapter contains the basic theories or concepts that are used in this research. The theoretical review is obtained from literature books, journals, and previous research related to the research problem.

BAB III Research Methodology

This chapter contains the analysis of the methods used by the author, explaining the analysis and system design of this research.

BAB IV Implementation and Discussion

This chapter contains a discussion of the implementation of the methods used as well as the analysis and design that has been done previously and testing the results obtained.

BAB V Conclusion

This closing chapter contains the conclusions obtained by the author through the previous chapters, as well as suggestions for further research.

REFERENCES

This section contains a list of references that have been used in writing