CHAPTER I
INTRODUCTION

1.1 Background

In an increasingly digital era, social media and video sharing platforms, such as YouTube, have become an inseparable part of our daily lives. In Indonesia, YouTube shows extraordinary popularity, based on (We Are Social & Meltwater, 2023) Youtube users in Indonesia are registered at more than 129 million active users. Meanwhile, the YouTube site is ranked second as the most frequently visited website in Indonesia. Through social media and video sharing platforms, Indonesian people can freely express their opinions on various relevant issues.

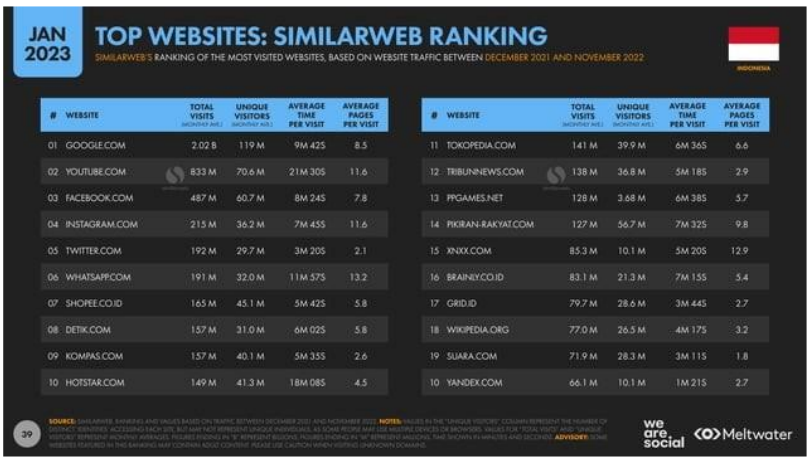

Figure 1. Top Websites : Similarweb Ranking
Source : (We Are Social & Meltwater, 2023)

The large number of active users on the YouTube social media platform has made the use of YouTube one of the main media for propaganda. According to (Akmal et al., 2020) The use of propaganda techniques in advertising on YouTube media has been a success factor for the Traveloka company in attracting audience attention and building a positive image about its services. Traveloka has succeeded in creating advertisements that not only attract attention, but also make YouTube users

feel connected to the Traveloka brand. Traveloka's success in utilizing propaganda techniques on YouTube is also reflected in the number of subscribers to Traveloka's YouTube channel which continues to increase. With many subscribers on its YouTube channel, Traveloka has built a strong fan base on the platform, which also contributes to increasing its positive image. The use of propaganda techniques in YouTube advertising has become an effective strategy for the Traveloka company in achieving marketing goals and expanding its influence among users at large.

According to research conducted by (Howard et al., 2018), Social media has become one of the tools used to manipulate audiences in the United States by spreading messages and influencing public opinion through links to the YouTube video platform. In this research, (Howard et al., 2018) noted that the activity of social media accounts associated with Russia's Internet Research Agency (IRA) had similarities during the United States presidential campaign in the 2016 US Election by sending posts on social media with links to YouTube that supported certain narratives, especially related to social media issues. sensitive social and political issues. Other research conducted by (Golovchenko et al., 2020) also explains that propaganda carried out by Russian IRA social media accounts which tend to be liberal shared conservative videos from YouTube during the 2016 American presidential election. In addition, this research also shows that the state can take advantage of the connected nature of various social media as a propaganda strategy in spreading propaganda messages and influence public opinion.

Social media can also be used as a medium in information warfare through the spread of false information that can disrupt national security stability (Prananda et al., 2021). In the cyber world, information can quickly spread and become viral, even without going through an adequate verification process. This allows irresponsible parties to spread fake news or manipulate information to achieve certain goals. Information wars on social media often involve various groups or individuals who have certain

political, economic or social agendas. They can use this platform to spread propaganda, pit people against each other, disrupt the democratic process, or even rebel that could disrupt the country's sovereignty.

In the era of globalization and the development of social media which is full of uncertainty and rapid change, the role of defense intelligence in maintaining a country's security is becoming increasingly important. Reported in the Indonesian Ministry of Defense publication media, (Biro Humas Kemhan, 2023) that the President of the Republic of Indonesia, Joko Widodo, firmly emphasized that in facing world instability, intelligence information is the main key that must be prioritized. So intelligence plays an important role in helping countries identify, understand and respond to threats that may arise, so as to ensure national security and stability. The development of global, regional and national situations, along with rapid advances in science and technology, force defense intelligence organizations to improve intelligence capabilities in collecting, analyzing and utilizing information obtained from various sources..

In facing the threat of information war, the state intelligence apparatus plays an important role in maintaining national security stability. Early detection is the key in facing information warfare in the cyber world. Intelligence must have the ability to monitor suspicious online activity, such as the spread of false information or attempts to manipulate public opinion. State intelligence must also be able to identify the source of the threat and understand the motives behind the attack. State intelligence is the country's eyes and ears to understand developments in the national situation, both for military matters and for complex economic, political and security issues. Law Number 17 of 2011 concerning State Intelligence states that State Intelligence is the organizer of Intelligence which is an integral part of the national security system which has the authority to carry out the functions and activities of State Intelligence. The aim of State Intelligence is to detect, identify, assess, analyze, interpret and present Intelligence in order to provide early warning to anticipate various possible forms and nature of

potential and real threats to the safety and existence of the nation and state as well as opportunities that exist for national interests and security. (Republik Indonesia, 2011). According to (Hendropriyono, 2013) Intelligence is the art of searching, collecting and processing strategic information needed by a country about "enemy" countries or potential threats. The country's intelligence capabilities are used to effectively collect information from various sources, including open and closed sources, which may represent potential threats that the country may face. Intelligence capabilities can also be combined with technology to obtain broad information. The use of currently developing technology to search for trends, predict content, collect and analyze data in open sources is included in Open Source Intelligence (OSINT) activities. OSINT is able to collect extensive intelligence data, therefore intelligence officers will have a lot of data that must be analyzed quickly and accurately. OSINT on social media is used for profiling, trend searching, doxing, and public opinion analysis.

Public opinion reflects society's views and feelings regarding various issues, events or policies that are currently developing. Public opinion can cover a variety of issues, ranging from political, economic, social, to international issues. State intelligence needs to actively monitor changes in public opinion regarding issues that are the focus of attention of the government or intelligence organizations. By monitoring public opinion, state intelligence can detect early changes in public attitudes or feelings that could lead to potential threats that could disrupt national security stability. According to (Lesmana et al., 2018), State intelligence must be able to conduct counter-opinions against opinions formed in online media that can affect national security stability. Understanding formed public opinion can also assist state intelligence in early detection and responding through counter-opinions that may emerge in response to certain policies or actions. Early detection of changes in public opinion can give state intelligence an edge in responding to potential threats or emerging tensions.

With accurate and up-to-date information, countries can take appropriate steps to overcome these threats, obstacles, disruptions and challenges. Apart from that, rapid technological developments are also an important factor in the role of defense intelligence. New technologies, such as Artificial Intelligence (AI) and big data analysis, enable state intelligence to process data on a larger scale and at higher speed. This helps in detecting patterns that may not be visible by conventional means. With early detection and a deep understanding of cyber threats, the nation's intelligence apparatus can play a critical role in protecting critical infrastructure, personal information, and national security. State intelligence efforts in dealing with information warfare in the cyber world can help maintain the integrity and stability of an increasingly complex cyber world. Therefore, it is important to have effective technology in identifying and analyzing all information that develops on social media and assessing public opinion formed from the dissemination of this information. By developing algorithms and technology that can quickly assess public opinion as support for intelligence data collection, state intelligence can quickly detect potential threats early and carry out defense response efforts to maintain national security stability.

The popularity of YouTube as a social media platform in Indonesia can be used as a consideration in obtaining information developing in the cyber world. Apart from that, YouTube also provides a comment feature on videos uploaded by users. This comment feature provides users to interact, express opinions and share their opinions about the video. These comments reflect the diverse views, attitudes and sentiments that exist among YouTube users (Severyn et al., 2016). Thus, the use of YouTube as a propaganda medium and influencing public opinion and views through uploaded videos allows intelligence to obtain information about public opinion which is formed based on the sentiments reflected in existing comments. According to (Stieglitz et al., 2018), The sentiment analysis method can be used to assess public opinion on various topics, products,

services, or certain issues that are of concern to the public. By analyzing the sentiment contained in these comments, state intelligence can identify the extent to which the videos are successful in influencing public opinion. Positive sentiment towards videos uploaded on YouTube can show support or approval of the message conveyed, while negative sentiment can show disagreement or rejection of the message. By understanding the sentiments contained in comments on YouTube, state intelligence can design more effective defense strategies in responding to formed public opinion or as an effort to understand developments in current situations that could disrupt national security stability. Sentiment analysis which provides the results of public opinion analysis along with the topics being discussed in the comments of a YouTube video, especially in accordance with the Pancagatra aspects (Ideology, Politics, Economics, Socio-Culture and Defense-Security) can support the Intelligence Apparatus in collecting intelligence data to provide input intelligence on strategic decision making.

The development of Artificial Intelligence (AI) technology has brought significant changes in how to process, analyze and understand information obtained from big data originating from social media. The use of AI technology in analyzing public opinion trends or sentiment analysis on YouTube comment data becomes more efficient and faster. AI is able to recognize and classify the sentiment contained in these comments, both positive and negative sentiment related to certain topics or issues in the uploaded video. The results of rapid analysis of public opinion will make it easier for state intelligence to detect potential threats early and carry out defense response efforts to maintain national security stability. Although the use of AI technology has many benefits in assessing public opinion trends, there are various challenges that need to be overcome in conducting sentiment analysis. One of them is the formation of an AI model that is capable of producing accurate predictions based on the data used, both in the training and testing stages. Apart from that, using the right dataset is the next challenge to get a more balanced model comparison in the modeling.

Modeling accuracy will be more valid if compared with other models that use the same dataset. Research conducted by (Zhafira et al., 2021) obtained the accuracy results of the sentiment analysis model on YouTube comments with an average accuracy value of 91.8%, with a precision value of 90.35%, recall of 93.6%, and f1-score of 91.95% using the Multinomial Naïve Bayes algorithm only. This research also provides a dataset that can be accessed publicly so that it can be used as a research dataset for developing new models with better accuracy in sentiment analysis on YouTube comments..

AI technology can also help in categorizing topics in a text using the Latent Dirichlet Allocation (LDA) algorithm (Anwar et al., 2022). In supporting Intelligence officers to find topics related to Pancagatra aspects (Ideology, Politics, Economics, Socio-Culture and Defense-Security) the LDA algorithm can be used as a method for categorizing topics in comment text on YouTube. This can be combined with a sentiment analysis model on YouTube comments which provides additional information in the form of topics being discussed in YouTube comments. Sentiment analysis by adding a topic categorization feature can support Intelligence officers in collecting intelligence data to detect early potential threats that occur based on public opinion formed on YouTube videos.

Therefore, with the thesis research entitled Public Opinion Trend Assessment Model using Bidirectional Long Short-Term Memory and Latent Dirichlet Allocation on YouTube Comments to Support Intelligence Data can be a new model design in supporting state intelligence that utilizes AI technology to analyze social trends and changes in public opinion and the topics being discussed in the comments of a YouTube video, especially in accordance with the Pancagatra aspects (Ideology, Politics, Economics, Socio-Culture and Defense-Security). This research can be used to design new technology to detect potential threats that could disrupt the stability of national security in the form of the results of public opinion formed and topics being discussed in YouTube comments. This research uses a publicly

accessible dataset based on research from (Zhafira et al., 2021). Public datasets are used as input data in modeling both Training and Testing. The use of public datasets was carried out to test the accuracy of the model developed in this research. Modeling accuracy becomes more valid when the results can be compared with other models that also use the same dataset. This makes it possible to measure the extent to which the developed model can compete or even surpass other existing models. When the same dataset is used as a basis for comparison, it will be easier for the resulting model to evaluate the extent to which the model developed is successful in classifying the data correctly.

1.2 Problems Identification

Problem identification is a critical step in the research process that helps researchers to understand and formulate the main problem to be researched. Problem identification involves collecting data about factors or variables that can cause or influence the emergence of the main research problem. The following is the identification of the problem in this research, namely:

1. YouTube social media can be used as a propaganda tool by various parties to achieve certain goals, both by private parties and the state.
2. The YouTube platform provides comments facilities to users which can reflect public opinion on uploaded videos.
3. Intelligence requires fast and accurate data collection on social media to assess public opinion, so that the State Intelligence Apparatus can carry out early detection and respond quickly and accurately.
4. Sentiment Analysis is a technique that can be used to assess public opinion regarding a comment on YouTube media.
5. Artificial Intelligence (AI) can help in fast and efficient sentiment analysis on social media big data.

6. The development of AI models has problems with the model and accuracy of the Sentiment Analysis process.
7. Determining the dataset is a problem in building AI models so that it affects the accuracy validation results.
8. The method of comparing accuracy in the model being built is a problem in increasing the validation of accuracy results in the model.
9. Determining topic categories in YouTube comments can help Intelligence in early detection of potential threats in accordance with the Pancagatra aspects (Ideology, Politics, Economics, Socio-Culture and Defense-Security).

1.3 Problem Formulation

In an effort to understand social trends and changes in public opinion in more depth, AI technology in the form of Bidirectional Long Short-Term Memory and Latent Dirichlet Allocation is a tool that can process data in complex layers, similar to how the human brain works. By using AI technology, countries can analyze data from social media more quickly to support intelligence data. However, one of the problems that arises in using AI technology is related to the accuracy of the AI modeling. AI modeling is also faced with the use of relevant and balanced datasets in order to increase the accuracy of the AI modeling used. The problem formulation in this research can be seen as follows:

1. How to design a Bidirectional Long Short-Term Memory and Latent Dirichlet Allocation model to assess public opinion trends from YouTube comments, and how accurate is the model?
2. How can the Latent Dirichlet Allocation (LDA) model be used to categorize topics according to Pancagatra aspects (Ideology, Politics, Economics, Socio-Culture, and Defense-Security) in YouTube comments?

3. How can the combination of Bidirectional Long Short-Term Memory and Latent Dirichlet Allocation support intelligence data in analyzing public opinion trends on social media, especially regarding sensitive issues in Indonesia such as the Papua issue?

1.4 Research Scope and Limitation

In this research, the scope of research is limited to modeling Bidirectional Long Short-Term Memory and Latent Dirichlet Allocation and measuring their accuracy. Problem limitations include the selection of data to be used, the methods to be applied, and the research time frame. This aims to maintain appropriate focus and limitations so that research can be carried out efficiently and effectively. The limitations of the problem that is the scope of this research are:

1. Using a public dataset (Zhafira et al., 2021) as training data and testing data which has information in the form of comment data with output labels, namely positive and negative sentiment in the Bidirectional Long Short-Term Memory and Latent Dirichlet Allocation modeling used in the research.
2. The increase in accuracy was obtained from a comparison between the modeling accuracy of Bidirectional Long Short-Term Memory and Latent Dirichlet Allocation in this study with the modeling accuracy proposed by (Zhafira et al., 2021).
3. This research focuses on analyzing the assessment of public opinion trends (sentiment analysis).
4. This research uses live data on YouTube comments related to the Papua issue only as a simulation of the use of a model that has been developed to detect early trends in public opinion towards sensitive issues in Indonesia.
5. The research time is June 2023 to January 2024.

1.5 Research Objectives

Based on the problem formulation above, the aim of this research is:

1. Develop a modeling design for Public Opinion Trend Assessment based on Bidirectional Long Short-Term Memory and Latent Dirichlet Allocation that can be applied to a dataset of comments on YouTube videos.
2. Measuring the accuracy value of Public Opinion Trend Assessment modeling based on Bidirectional Long Short-Term Memory and Latent Dirichlet Allocation can be applied to a dataset of comments on YouTube videos.
3. Assessing public opinion trends using live data on YouTube comments related to Papua issues in order to support intelligence data in analyzing public opinion trends on social media.

1.6 Research Benefits

With research entitled Public Opinion Trend Assessment Model using Bidirectional Long Short-Term Memory and Latent Dirichlet Allocation on YouTube Comments to Support Intelligence Data, it is hoped that it can provide various benefits. The benefits expected from this research are:

1. Increasing accuracy in analyzing public opinion trends (sentiment analysis) to support intelligence data, so that the resulting analytical data is more accurate about people's opinions and feelings based on Indonesian language YouTube comment data.
2. As intelligence support data that can be used to analyze data from social media sources in understanding social trends and changes in public opinion in order to detect potential threats that could disrupt national security stability.
3. Accurate analysis of public opinion on social media can support early detection of potential threats to national security in the form of patterns or changes in public opinion that can indicate potential threats, such as

social unrest, rebellion, radical movements, or terrorist threats.

4. This research also intends to develop tools and techniques that are more accurate and effective in accordance with current technological developments, which can be used by defense intelligence agencies in early detection of potential threats through assessing public opinion trends on social media to support efforts to maintain national security stability. .
5. This research can provide new contributions to research and scientific literature regarding Bidirectional Long Short-Term Memory and Latent Dirichlet Allocation modeling for public opinion trend analysis techniques. The output of this research can be used as a reference for future research and become the basis for further development of knowledge in this field.