

# CHATBOT DEVELOPMENT TO DISPLAY HOAX NEWS ON LINE PLATFORM USING RULE BASED METHOD

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## ABSTRACT

Chatbot is a computer program designed for simulating a natural conversation between a system with one or more person using an audio or text. Line Messaging is a communication platform that provides not just chatting, voice call and video call. Line also a smart portal with many solutions with content, entertainment and business. Hoax is a fake news that tried to convince the reader to believe the fake news, in fact most of the fake news creator knew that the news is fake. Based on survey on people, 22.1% of the people is LINE user, 46% of them having difficult to differ between fake and fact news, and 81.4% of the user are annoyed by the Hoaxes. The purpose of development of Hoax Checker Chatbot on LINE using Rule Based method is to make users can easily differ the Hoaxes and the real facts. The final user satisfaction result calculated by Likert Scale is 85%, this is caused because the system can only handle 2 keywords, this can be handled with the extraction of input sentence information in subsequent studies.

**Keywords:** Chatbot, Platform LINE, Hoax, Rule Based,keyword

## 1. INTRODUCTION

Data from the Ministry of Communication and Information states that there are around 800,000 sites in Indonesia that have been identified as spreading false news or hoaxes [1]. The Telematics Society has conducted a survey of hoax news that has circulated widely in Indonesian society. The results obtained from the survey, the main source of hoax circulation is known to come from social media. The survey process involved 1,116 respondents conducted online. There were 91.8% of responses from the public saying that news about Socio-Politics and the type of hoax that was most often found was Hoax related to Regional Head Election or the government, with a percentage on social media as much as 92.40%. Respondents claimed to often receive hoaxes from short message applications such as Line, WhatsApp or Telegram as much as 62.8%. And 96% of respondents also think hoaxes can hamper development [2]. Based on the results of the questionnaire that the author has

spread, as many as 46% of users have difficulty distinguishing which Hoax and non-users, and 81.4% of users were very disturbed by the news of Hoax.

Based on the above problems it can be concluded that mobile device users need an application that can help in overcoming Hoax news dissemination. Then a chatbot application will be built that can help LINE users not to be disturbed by the Hoax news by the user inputting keywords, as well as making it easier for users to be able to distinguish between Hoax news and actual facts.

## 2. RESEARCH CONTENT

In this part of the chapter contains a discussion of research ranging from system analysis to system implementation.

### 2.1 Line Platform

LINE is a communication platform that not only offers chat, voice and video call services. LINE is also a smart portal with various solutions related to content, entertainment and business. To date, out of a total of 220 million users worldwide, LINE has acquired more than 90 million users in Indonesia. An increase in the number of active users per month reached 200% from 2014 to 2016.

### 2.2 Line Messaging API

LINE @ provides facilities to create business accounts that are used to send messages to customers and also to communicate directly with customers. The intended education is in the form of live chat or using auto reply and keyword reply.



Figure 1. LINE Messaging API architecture

### 2.3 API (Application Programming Interface)

API (Application Programming Interface) is a technology to facilitate the exchange of information or data between two or more software applications. API is a virtual interface between two software functions that work together, such as between a word processor and a spreadsheet [3]

### 2.4 Rule Based System

Rule-based systems are used to store and manipulate knowledge to realize a rule made by humans. A rule based system that is built using automated rules. Rule-based REASONING uses system knowledge in the form of IF-THEN [4].

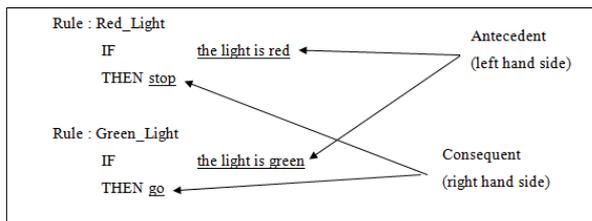


Figure 2. IF THEN Rules

### 2.5 Hoax

Fake news or commonly referred to as hoax is a news story that aims to persuade readers to believe what the hoax reporter is writing, though it is not uncommon for news creators to know that the news is false.

### 2.6 Chatbot

Chatterbot or often also called chatbot / bots is a computer program designed to simulate intellectual conversation or communicate with one or more humans both audio and text through a machine [5]. Chatbot is a computer program language that can interact with natural languages. Chatbot programs are usually tested by not disclosing their identity as a bot so that it can make the person not realize that the other person is a bot. Chatbot is said to be artificial intelligence when the opponent is talking to the chatbot unable to identify it as a program. Chatbot can be used for various purposes such as customer service providers, personal assistants, or to obtain certain information, from some of the examples above, it can be seen that chatbot is one of the agents that specifically handles conversations. The basic difference between chatbots and NLP (Natural Language Processing) is the simplicity of the algorithm and its rules. There have been many examples of chatbots that can do human language conversations naturally, but in fact these bots only respond to keywords obtained from the extraction of input sentence information, then reply with the most suitable keywords, patterns of words that are most similar from textual databases, or rules predetermined output sentence.

### 2.7 User Flow

User Flow is a flowchart that visualizes the complete path taken by users throughout the system from the initial start to the final destination. The purpose of making a user flow is to make the chatbot system easy to understand. The difference between flow charts and user flow is that flow charts are usually used to describe the system while user flow is more representative of what users encounter while using the system.

User flow is made based on data that already exists from the previous process. User flow will display bot features according to the current user state. Usually it is oriented to the user interface (user interface) according to the current situation. User flow contains greetings, on boarding, main features and fallback.

### 2.8 PHP

Hypertext Preprocessor or abbreviated PHP is a programming language used to create dynamic web [6]. Although both are used for web programming, the PHP programming language is different from HTML, PHP focuses more on the backend while HTML focuses on the frontend, the code created in PHP cannot appear on the web page just like that, but must be processed first by the web server then displayed in the form of a web page in a web browser, PHP scripts can be inserted in HTML and PHP scripts begin with the tag <? php and end with a tag?>. In PHP, the database management that is usually used is MySQL, but there are also those that use Oracle, Microsoft Access, and others. Because PHP scripts are processed on the server computer side, PHP is often called the server side programming language.

### 2.9 Research Methodology

The methodology used in this research is descriptive research methodology [7], which is a method in a research to make a picture of a situation or event based on facts with the correct interpretation. The following are the stages of the research flow used:



**Figure 3. Research Flow**

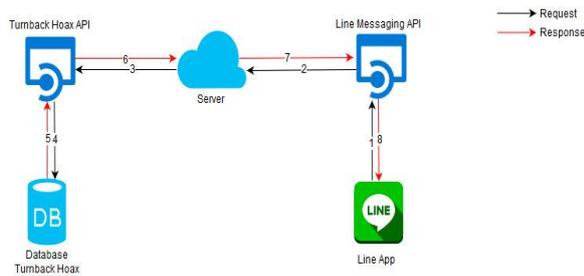
1. Identification of Problems  
The stages in the research identify problems that occur from the spread of Hoax.
2. Data Collection Methods  
There are two data collection methods used, namely literature study and questionnaires.
3. System Analysis and Design  
The analysis and design phase of the system in this study is based on data and problems that have been obtained
4. System Development  
At this stage the system is built based on the analysis and design that has been made previously.
5. System Testing  
This stage is tested on the system that is being or has been built and the end of the test is to the community as LINE users to provide input so that the system can be better.
6. Withdrawal of Conclusions

The final stage is drawing conclusions, research provides conclusions on the system that has been built, in order to find out whether the system built is in accordance with the original purpose of the study.

The method used in the construction of this software is the waterfall method, which must go through each stage which consists of the planning, modeling, construction, and ending with the testing phase [8].

**2.10 System Architecture**

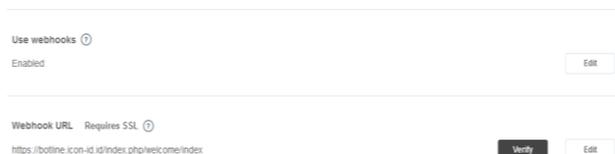
This system architecture analysis aims to identify the architecture to be built. The following is a picture of the system architecture to be built:



**Figure 4. System Architecture**

The following is a description of the system architecture image:

1. Bot Line will send a search command to the Line Messaging API by calling webhook.



**Figure 5. Webhook URL**

2. Then the Line Messaging API will make a request to the Server to process the user's request if the user searches for news, then the server will send a request to the URI address along with the user's API key and search keyword.

```

function apiHoax(keyword){
  $ch = curl_init();
  curl_setopt($ch, CURLOPT_URL, "https://yuditira.turnbackhoax.id/api/hoax/content/" . $keyword . "/21668034E809522D0858994656CE86EF9383
  81F859720790518553C486C5848C972834845E48274C771E6F13C748621124E538355E5F84E1B1D9639A2331");
  curl_setopt($ch, CURLOPT_RETURNTRANSFER, 1);
  curl_setopt($ch, CURLOPT_FOLLOWLOCATION, 1);
  $data = curl_exec($ch);
  curl_close($ch);
  return $data;
}
    
```

**Figure 6. Process user requests along with API Key**

3. The server will forward the request to the Turnback Hoax API.
4. Turnback Hoax API will check the Hoax Turnback Database.
5. The results of the check will be returned to the Hoax Turnback API in JSON format



**Figure 7. Checking result**

6. The JSON format from the Turnback Hoax API will be sent to the Server
7. From the server forwarded to the LINE messaging API for processing.
8. The LINE messaging API will display results on the LINE bot

**2.11 Technology used**

This research will use the LINE Messaging API technology to process responses from bots and the Turnback Hoax API to retrieve Hoax databases.

**2.12 Rule Based Method**

The contents of the request body will be determined by user input based on the Rule Based method. The rules contained in this study can be seen in the following table:

**Table 1. Rules Base Table**

No	Input	Output
1	/help	The user will receive a message with an explanation about the chatbot and the commands that can be performed
2	/menu	Users will receive a message in the form of a main menu in the form of a carousel which has 3 choices namely help, facts today

		and check the Hoax
3	Check the hoax	The user will receive a command prompt to enter a keyword
4	Keyword	The user will receive a message in the form of a Carousel menu related to the input keyword
5	canceled	Users will be directed back to the main menu
6	Today's facts	Users will be directed to the Hoax Turnback webview
7	News details	Users will be directed to the Hoax Turnback webview

### 2.13 Use case Diagram

Use case diagrams on the system to be built illustrate the interaction between actors and activities contained in the system [9]. The following is a use case diagram on the system to be built:

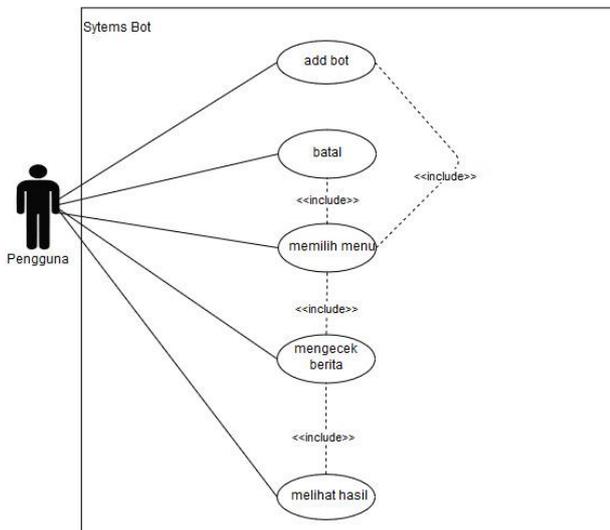


Figure 8. Use case diagram

### 2.14 User State

User state is an event or condition that occurs during a user-to-chatbot interaction. In designing a system requires scenario planning of every action a user may take. Here is a user flow image of the chatbot design:

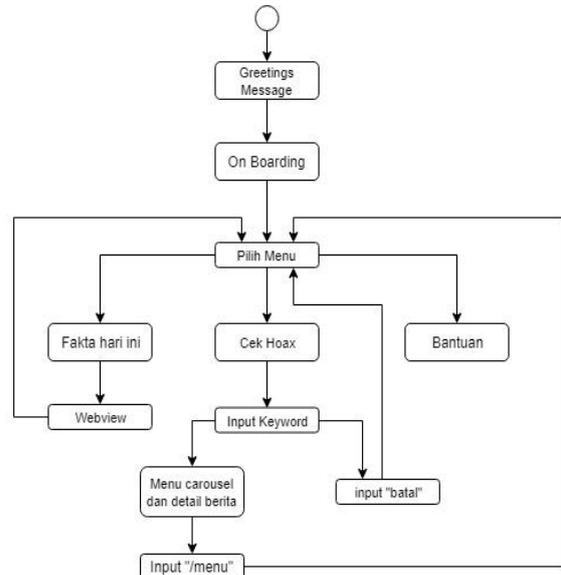


Figure 9. User State

### 2.15 System Implementation

Implementation of the system is the stage for applying the design done to the system so it is ready to operate.

### 2.16 System Testing

The next stage is the system testing phase of the application being built. This stage is the most important thing that aims to find errors or deficiencies in the application being built. This test intends to find out whether the application made has met the criteria in accordance with the purpose of application design or not. Testing of this application system will use testing strategies, alpha testing (black-box) and beta testing.

### 2.17 Alpha Testing

Alpha testing is done using a black-box method that focuses on the functional requirements of the software. Testing this program uses the black-box method. Black-box testing is a program based on the functional testing of the program. The purpose of this black-box method is to find a malfunction in the program. Testing with the black-box method is done by providing a number of input data to the application which is then processed according to its functional requirements to see if the application is then processed according to its functional requirements to see whether the application produces outputs that are used and in accordance with the functions of the program. If the input data provided by the process produces outputs that match the functional requirements, the application has been made correct. But if the output produced does not

match the functional requirements, there are still errors in the application.

### 2.18 Testing Scenario

Testing is done by trying all the possibilities that occur and testing is done repeatedly if the test found an error will be carried out a search or repair to correct errors that occur. If it has finished making improvements, it will be done continuously so that the best results are obtained. Alpha testing plan that will be performed on this software can be seen in the following table:

**Table 2.** Test Plan Table

Test Feature	Testing Points	Type of Testing
Greetings	Users add bots as friends	Blackbox
On boarding	The on-board menu appears	Blackbox
help	Choose help	Blackbox
Today's facts	Choose facts today	Blackbox
Check the Hoax	Input 'hoax check' or select hoax check	Blackbox
Cancel	Menginputkan 'batal'	Blackbox
Search	Input keywords	Blackbox
News details	Select news details	Blackbox

### 2.19 Likert Scale

Questionnaire calculations using a Likert scale. The steps for calculating the questionnaire are as follows:

1. In the questionnaire, given 5 choices of answers and the score of each answer.

**Table 3.** Rating Weight

Category	Value
Strongly agree	5
Agree	4
Doubt	3
Agree Less	2
Disagree	1

2. To calculate the ideal score (criteria) of the maximum weighted value = 5, and the number of respondents = 27, using the formula:  

$$\text{Criterion} = \text{maximum weight value of } X \times \text{respondents, so the results are obtained } 5 \times 27 = 135$$
3. To find out the number of answers from respondents in the form of a percentage the following formula is used:  

$$P = (\text{total score}) / \text{criterion} \times 100\%$$

Information:  
P: Percentage value sought

Total Value: Number of frequencies X Weight

4. The score obtained is then entered into the Interval Rating Scale form



**Figure 10.** Interval Rating Scale

## 3. CLOSING

### 3.1 Suggestions

Based on the results of the AntiHoax chatbot test, the following conclusions are obtained:

1. Chatbot can make it easier for users to distinguish Hoax news and real facts.
2. Chatbot can help LINE users so that users are not distracted by the Hoax news.

### 3.2 Conclusion

This chatbot only focuses on news search because it is connected to a database of one news portal. Therefore there are several suggestions that can be used as a reference for the development of this software in the future towards a better direction so that it can keep up with technological developments. The suggestions for developing AntiHoax chatbot are as follows:

1. Add news sources other than the Turnbackhoax news portal.
2. Eliminating keyword restrictions for maximum search
3. Add word dictionaries to Chatbot to further enrich interactions between users and chatbots

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