

Implementation of Chatbot in Increasing Communities Criminal Law Awareness in Indonesia

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Abstract:

Legal literacy is a prerequisite for a society to reach a level good legal awareness. The high level of community legal awareness is characterized by circumstances where all citizens obey and implement all applicable legal rules voluntary without supervision. Although the government has done a lot of coaching through continuous counseling, the current situation and conditions indicate that the level of legal awareness is still low, one of the main contributing factors is the amount of effort, time and cost required to carry out this activity. In addition, it is difficult for people to understand the sentence contained in the Criminal Code and the articles, which lead to the lack of understanding of the existing legal basis This contribution of this research is to increase communities' criminal law awareness by creating a Chatbot application that are able to give information about criminal law related with certain case faced by people. Criminal law intelligence Chatbot was built by implementing machine learning algorithm and NLTK.

Keywords — Chatbot, Criminal Law Code, KUHP, Legal Awareness, Indonesia

I. INTRODUCTION

Intelligence robot conversation or Chatbots is a computer program which perform interaction among human and machine using audio or messaging methods [1]. A Chatbot allows user to chat in the same manner that they would address a human, it could give information in any time, 24 hours a day. Chatbots can recognize a variety of human language problems and are able to react to relevant and constructive legal details in plain everyday language. This human-Chatbot communication is usually conducted thru a human-computer interaction (HCI)-based user interface [2, 3].

Chat bot provides a smart solution to increase community's legal awareness. Shubhashri et.al

create a Lawbo which could direct lawyers by supplying the correct information for the questions in question. They uses a variety of heuristics applied to data derived from Supreme Court decisions using in-house advanced, state-of-the-art parsers, dynamic memory networks (DMN) and GloVe word representation for natural language processing (NLP) [4].

Criminal law is a legislation that sets out what is outlawed and included in a criminal offense and defines what punishments may be implemented on those who do so. Criminal law sources distinguished from written legal sources and unwritten legal sources, in Indonesia one of the written legal source is contained in Kitab Undang-Undang Hukum Pidana (KUHP), which is consists of general definition (article 1-103), crimes (article

104 – 488), and violations (article 489 – 569). Thus, we could say that criminal law regulates violations and crimes against legal norms concerning the public interest. However, it is difficult for ordinary people in understanding the sentence contained in the Criminal Code and the articles, which lead to the lack of understanding of the existing legal basis. Without knowing clearly and precisely the contents of these rules, it is not possible for someone to be able to understand and then run it voluntarily without the need for supervision.

The objective of this research is to introduce a Chatbot in the legal or legal field in Indonesia. The Chatbot allows people get the law out of some sort of crime problem. And learn what crime problem that people have had, the system is user-friendly, such that the person can convey to the system all the crime issues they face.

II. LITERATUR REVIEW

There are two kinds of Chabot which is Generative Based Models and Retrival Based Model. Generative Models is a Chatbot that can interact in a human-style communication, while Retrival Based Model uses configured input data and responses. Chatbots replicate input in form of text or speech and do the interactions with person [5]. While [6] describe the Chatbot as an experience of interacting online while genuinely speaking with computers that is brought to life by natural language input. Others clearly describe it as a computer program that mimics interactions with users, using artificial intelligence [7].

Several studies have been conducted implementing Chatbot, in particular concerning Chatbot in law field [8]. LAWBO [9] combine heuristics applied on data extracted from Supreme Court judgments using in-house developed, state-of-the-art parsers, dynamic memory networks (DMN) and GloVe word representation for Natural Language Processing (NLP). Moreover, the studies [10, 11] explore the use of Chatbot in robot lawyer handle tasks which have been generally conducted by lawyers or young attorneys in legal firms.

NLTK refers for the Toolkit natural language. This framework is among the most effective NLP frameworks that provides modules to build. Computers recognize human language and respond

to it as an effective answer. The work performed by NLTK should be: Automated text Summary, Interpretation, Named entity recognition, relationship extraction, and sentiment classification.

III. RESEARCH METHOD

The architecture of the system can be seen in Fig.1. The user interact with the system by inputting lexical input to the system, then the system will perform preprocessing includes case folding and tokenizing. After that the system will generate response based on user query, firstly the system will do keyword matching for greetings, then after that the system will find the similarity between words query by the user and the words in the corpus using TF-IDF methods. The TF-IDF is measured as follows [12]:

$$TF = \frac{f_{f,d}}{\sum f_{t,d}} \quad (1)$$

$$IDF = \log \frac{N}{|\{d \in D: t \in d\}|} \quad (2)$$

$$TFIDF(t, d, D) = TF \cdot IDF \quad (3)$$

Where:

$f_{f,d}$: the occurrence of the word in document d

$\sum f_{t,d}$: the number of words in the document

D: The total of documents in the corpus

$|\{d \in D: t \in d\}|$: total of documents in D that includes t

Then, the system will returns responses to the user.

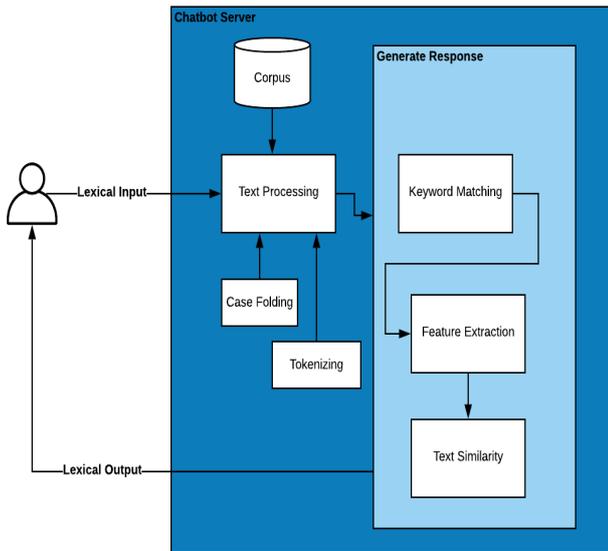


Fig. 1 Chatbot Architecture

The corpus used in this research is taken from Kitab Undang-Undang Hukum Pidana (KUHP) which consists of:

- Crimes Against State Security
- Crimes Against the Dignity of the President and Vice President
- Crimes against allied countries and against the heads of allied countries and their representatives
- Crime Against the Obligations and Rights of the State
- Crime Against Public Order
- Affair of honor
- A crime that endangers the public safety of people or property
- Crimes Against the General Authority
- Perjury and false statements
- Counterfeiting Currency and Banknotes
- Seal and Mark Counterfeiting
- Letter Forgery
- Crimes Against Origin and Marriage
- Crimes Against Decency
- Leaving People in Need of Help
- Insult
- Unlocking the Secret
- Crimes Against People's Independence
- Crimes Against Life
- Persecution
- Cause death or injury through neglect

- Theft
- Extortion and Threats
- Embezzlement
- Fraud
- Actions Harming Lenders or People who Have Rights
- Destroying or Damaging Goods
- Occupational Crimes
- Shipping Crimes
- Public Safety Offenses for Person or Property and Health
- Public Order Violation
- Violation Against the General Authority
- Offenses Regarding Origin and Marriage
- Offenses Against People Needing Help
- Violation of Decency
- Violations Regarding Land, Plants and Yard
- Job Violation
- Shipping Violation

IV. RESULT AND DISCUSSION

The main interface of chatbot system is shown in Fig.2, which consists of File, Options and Help. In the tab Options there are two sub menu which is Clear Chat and Exit, while in the tab Options there is Font and Color Theme.

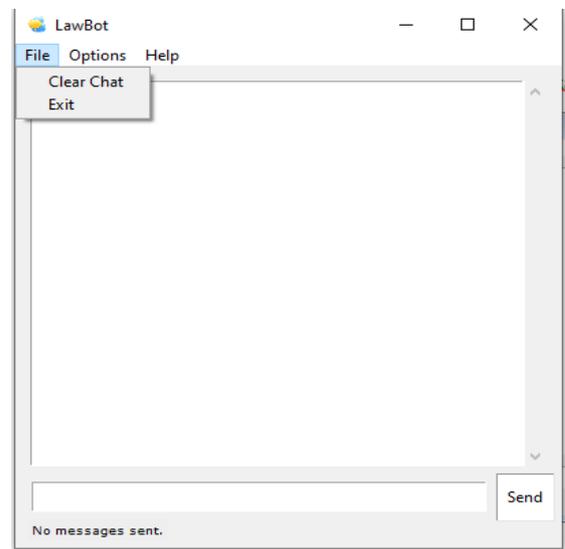


Fig. 2 Chatbot Main Interface

The user input the query in the text box and submit it by clicking send button, if the query is a

greeting then the system will response that greeting based on the keyword matchin result which is shown in Fig. 3.

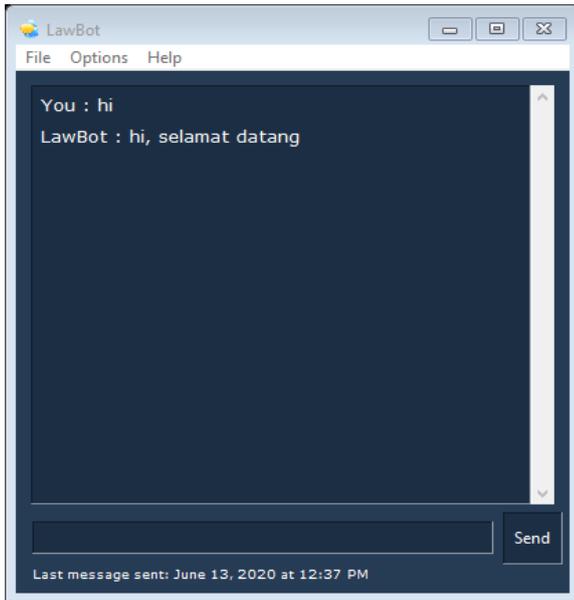


Fig. 3 Greeting Response

Meanwhile if the query is asking about certain things related with criminal law then the system will response based on what is written in the Criminal Code or Kitab Undang-Undang Hukum Pidana (KUHP) as shown in Fig. 4.

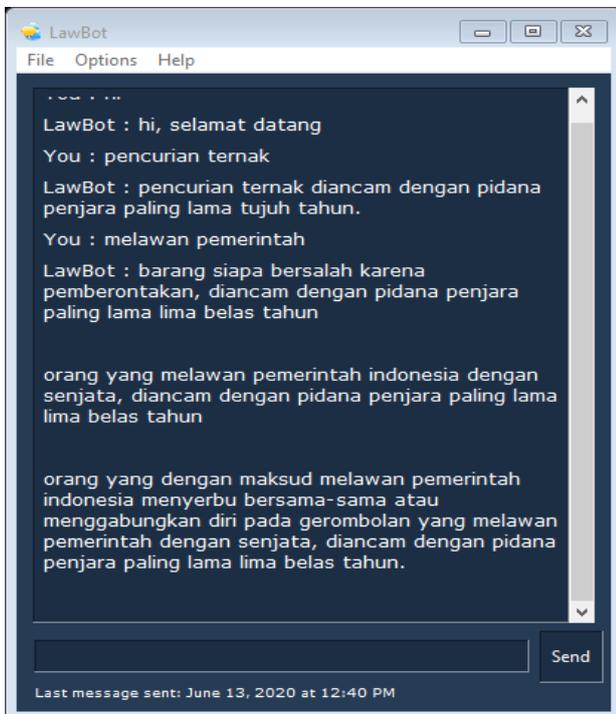


Fig.4 Response to User Query

We've tested different questions to test the functionality of the Chatbot. In this test, we have inserted questions that are identical to the issues in our corpus. The outcome evaluation is shown in Fig.5.

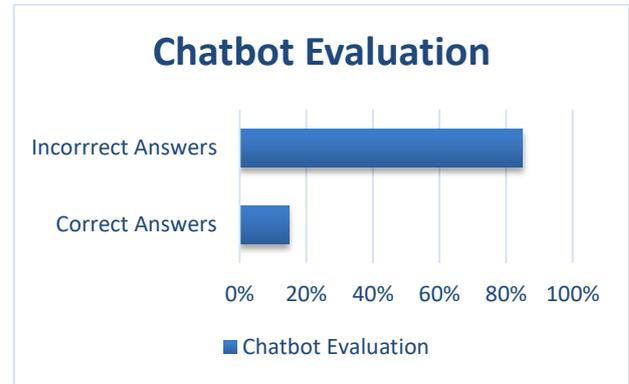


Fig.5 Chatbot Evaluation Result

The authors also distributed questioners to 100 respondents in order to get the information whether the system could improve their awareness of Criminal Code or Kitab Undang-Undang Hukum Pidana (KUHP), the result is shown in Fig.6.

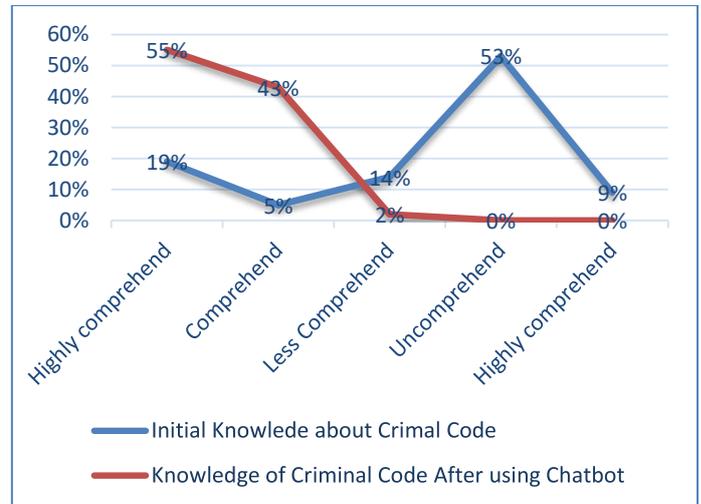


Fig. 6 Percentage of Criminal Code Understanding Level

V. CONCLUSIONS

In this research we developed Chatbot prototype related with the criminal code or legal field in Indonesia. The Chatbot allows people get the law out of some sort of crime problem. This study increase the awareness of ordinary people in

understanding the sentence contained in the Criminal Code and the articles. Methods used in this work could also be used in English or any other languages.

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