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## DIGITAL MARKETING TECHNIQUES FOR BUSINESS INTELLIGENCE SYSTEMS USE AUTOMATED CHATBOT MACHINE LEARNING

*Mufadhol Mufadhol<sup>1</sup>, Agus Wibowo<sup>2</sup>, Joseph Teguh Santoso<sup>3</sup>*

<sup>1,2,3</sup>Department of Computer Science, STEKOM University, Semarang, Indonesia.

Email: <sup>1</sup>masyong29@gmail.com (ORCID: 0000-0003-1892-9216)

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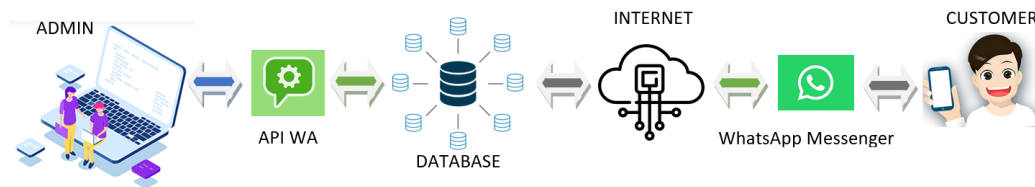
### ABSTRACT

Entering development in the industrial era 4.0 and during the pandemic caused by Covid 19, a smooth and sustainable business activity will continuously maintain and increase economic growth so that the welfare of people's lives will be guaranteed. One of the means to make and guarantee a smooth and sustainable business is by using digital marketing technology by utilizing WhatsApp messenger services. Companies in this businessman or entrepreneur usually do not have time to serve many customers, especially in the form of online services. A tool is needed to assist the company and a businessman or entrepreneur in answering and introducing new products and services to every customer.. This paper explains how to use an autoresponder as a robot to create an automatic message service on WhatsApp so that customers feel cared for and served and will ultimately feel satisfied. The autoresponder will be running on the artificial intelligence Conversation Platform model, sending information to customers in the form of text messages that have been stored in the database via a telephone number connected to the internet and also the WhatsApp service center. This method keeps the relationship between the company and the customer intact so that the business can go according to plan and without harming both parties in the transaction.

### INTRODUCTION

Indonesia's current economic growth, to be precise in the two quarter of 2020, has decreased even to a minus condition to the range of 5.32%, this has been stated by the National Statistics Agency (BSN), so that the economic rate is still far below the economic growth target that has been announced by the government (Pratiwi, 2020, p. 98-104). Welcoming the development of industry 4.0 which is accompanied by the pandemic condition of the corona virus disease (covid 19) where at this time almost

all activities are carried out digitally, not to be left behind in the business world has also begun to penetrate through digital marketing, techniques and how to use technology online automatically very influential on the sustainability and success of the business (Yahya & Sugiyanto, 2020, p. 188-203; Wibowo *et al.*, 2018, p. 2399-2405). Chatbot or chatterbot is a service that is supported by rules and can interact with users via a chat interface. Chatbot can replace the role of humans in answering questions and chatbots can also function without human supervision and be online as long as possible without time limit, chatbots can handle many consumers at once in answering the questions submitted. A recent research showed that 80% of customer inquiries have been completed by chatbots without human supervision (Haristiyani, 2020, p. 1-7). The chatbot service communication system using the WhatsApp application can be seen as shown in figure 1. It was found that due to busyness and many activities, an entrepreneur rarely communicates directly with his customers. Customers find it difficult to get information about products and services at a company (Ayuni, 2020, p. 112-128). The use of smartphones as communication tools as well as information technology can be used to build communication between entrepreneurs and customers (Santoso *et al.*, 2020, p. 2110~2116; Achlison & Mufadhol, 2018, p. 1-12).



**Figure 1.** Chatbot Messenger System

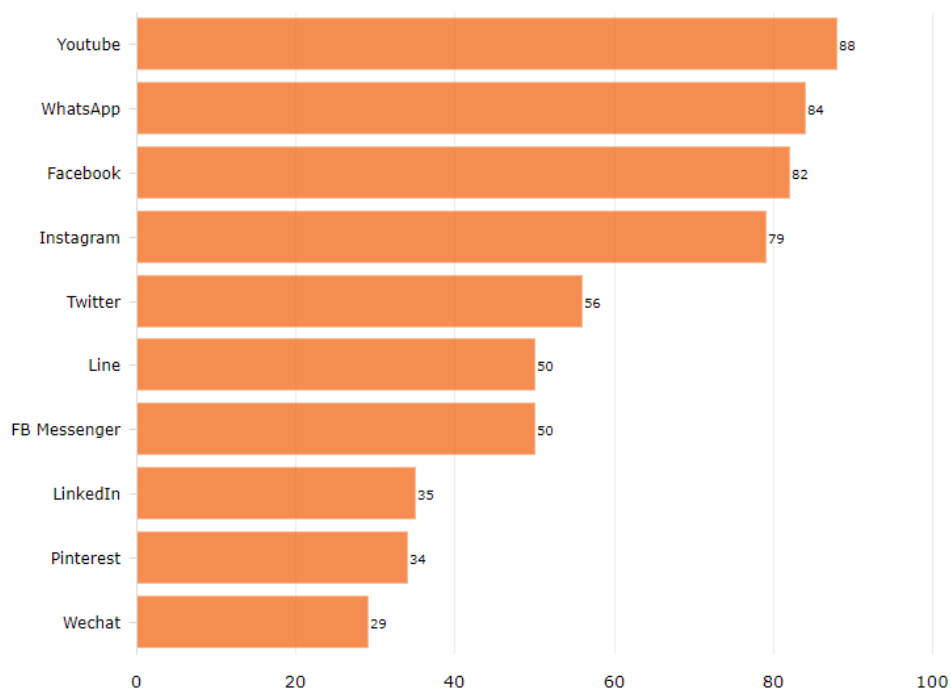
Message service via WhatsApp combined with Autoresponder through artificial intelligence conversation platform technology can help businesses use chatbots as digital customer care for 24 hours straight. Autoresponder as supporting software has been embedded in it in the form of machine learning technology which can simultaneously communicate the simplest and easiest way, namely chatting (Nagender & Patil, 2017, p. 15-22). Users only need to follow simple technical steps, first by determining the purpose and function of the chatbot to determine the conversation flow, language style, and grammar used in the chatbot. Then it ends by connecting the chatbot to be implemented in the messaging app in the form of whatsapp. The use of chatbots as digital customer care for business actors will result in cost and time efficiency, because the service system will answer automatically. Not only that, chatbots can also place orders and even share locations (Amalia & Suprayogi, 2017, p. 17-22).

## METHODOLOGY

This research involves several respondents from various departments under the auspices of computer laboratories, universities of science and computer technology, Semarang, Indonesia. The development of a chatbot system service is carried out using the research and development model (Mufadhol *et al.*, 2017, p. 1-5), rule based method as a rule in system activity (Mufadhol *et al.*, 2017, p. 2481-2483; Aryotejo & Mufadhol, 2020, p. 1-6), autoresponder as chatbot API (Young *et al.*, 2019, p. 9-17) and whatsapp application for carrier system (Arulmangainayaki *et al.*, 2020, p. 24-32), everything will be processed using machine learning are wrapped in packaging artificial intelligence.

### ***Digital Marketing Model***

The ease and convenience of using social media as a means of communication and interaction are currently experiencing a significant increase, this problem can be seen. Based on studies and research data collected by We Are Social and Hootsuite in 2020. Social media users in Indonesia have reached 150 million people, this means that around 57% of the entire population of Indonesia has used various social media, almost 99% of the use of social media is accessed using a smartphone (Lundquist *et al.*, 2014, p. 80-90; Ho & Cheng, 2020, p. 433-453; Abbas *et al.*, 2020; Ahmad *et al.*, 2018). Seeing facts like this, it is necessary to study and research on digital marketing to be used as a solution in developing and maintaining a business so that it continues and remains (Foen, 2017, p. 58-70; Aggarwal & Aakash, 2020, p. 361-376; Abbasi *et al.*, 2020). The rankings of the use in the social media can be seen in figure 2.



**Figure 2.** The Social Media Rank

The most active social media platforms used by Indonesians who are in the top five rankings are as follows. The YouTube application is in the first rank of 88%, this means that out of 150 million social media users in Indonesia, around 132 million people are already using Youtube. The second rank is the WhatsApp application with 84% users, this means that out of 150 million social media users in Indonesia, around 125 million people are already using WhatsApp. Then followed by Facebook which ranks third with a rating of 82%, Facebook is a social media application that can be said to be complete because we can communicate with other people, share videos, create a group or association, make a schedule together, and so on. Instagram is number four with a recorded usage of 79%, this means, of the 150 million social media users in Indonesia, around 120 million people have used Instagram. Then the fifth place is occupied by Twitter with 56% of users.

### ***Automatic Chatbot***

Chatbot is an automated program that was developed by a simple algorithm in artificial intelligence and is designed to be able to communicate directly with humans. Chatbot basically has two main components, namely Chat which can be interpreted as a conversation and Bot is a program that contains some data and if given input it will give an answer (Florian *et al*, 2018). Although many bots are able to interpret and respond to human input, the bots actually meant just the keywords in the input and respond with the most appropriate key words, or patterns of words that are the most similar of the data already exists in the database that was created earlier. Chatbot is currently useful and plays a role in helping businesses handle the thousands of messages that enter through various communication channels, Bot ensures all messages from customers can be handled quickly. Chatbot technology is widely used by business people because companies can save operational costs and providing active service for 24 hours. This will indirectly be an added value that makes consumers prefer the product. Moreover, it can save the amount of labor and increase the quantity of sales (Nylen & Holmstrom, 2015, p. 57-67; Al-Kumaim *et al.*, 2021; Arshad *et al.*, 2020).

### ***Machine Learning Systems***

The chatbot in its service interacts with users through text conversations. Chatbot work to replace the human role in serving the conversation through the messaging application and answer sentence by sentence written by the customer. Chatbots can understand and learn and interact like humans because of the artificial intelligence that has been implanted in them. Chatbots are developed on a machine learning-based framewok platform which is increasingly in demand by some users. The platform allows developers to be able to build chatbots without code or by combining them with certain programming languages (Adamopoulou & Moussiades, 2020, p. 1-18). Aautoresponder as a chatbot builder framework or bot builder has been used by several companies because it only requires a short response time in answering many users at once (Maglogiannis *et al*, 2020, p. 373-383; Ashraf *et al.*, 2020). Based on the explanation above, it is hoped that the chatbot service that is built with an autoresponder as a bot builder and the WhatsApp application as a chat channel platform can provide solutions to business people in carrying out activities in the form of managing new products and services as a form of news updates so that economic conditions are depressed companies can survive and thrive.

## **DISCUSSION**

### ***Business Intelligence Platform***

Information is an important component in life, especially in making decisions, currently there is a lot of information available, but how to make this information effective so that it can be captured quickly and easily understood and can make the right decisions (Wieder & Ossimitz, 2015, p. 1163-1171; Mufadhol *et al*, 2018, p. 244-252; Balakrishnan *et al.*, 2019; Jabarullah *et al.*, 2019). Business Intelligence is a set of techniques and tools to transform raw data into useful and meaningful information for business analysis purposes and can be used to handle unstructured data in very large quantities to help identify

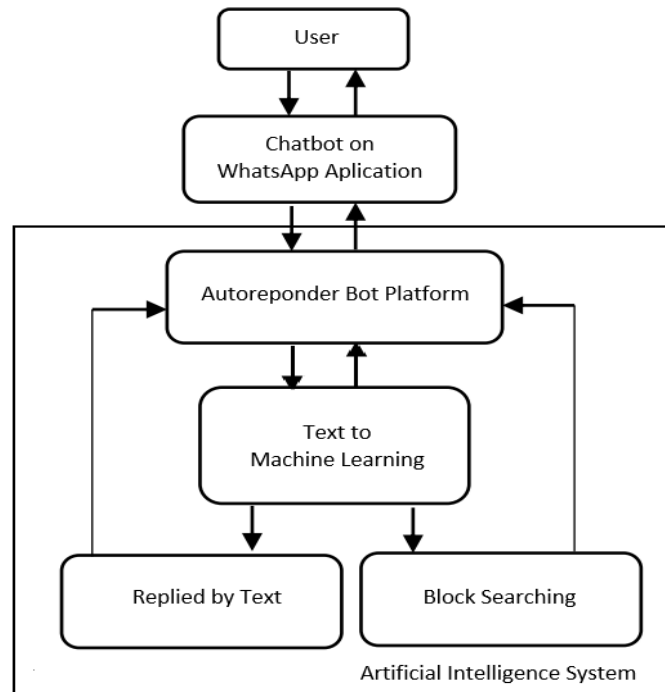
and develop and create new opportunities business strategies. Business intelligence technology can implement an effective strategy based on rules and experience to obtain a competitive market advantage and long-term stability (Eladaileh & Foster, 2019, p. 121-132). This research emphasizes the use of business intelligence technology in the form of digital marketing with chatbot techniques that can increase profits and reduce operating costs based on increased marketing which will have a direct impact on customer behavior patterns in purchasing goods and services based on increased marketing.

#### ***Commuunication Automatic services***

This research found that the existence of customer service in a company has a very important role in helping and serving customers with transactions (Chopra, 2014, p. 239-246), however found a new fact that the service of customer service that exists today there are some problems, such as limitations in serving customers, lack of responsiveness in serving the customer inquiries, less effective in managing the booking and less terpantaunya delivery process. The result of these problems is the loss of regular customers, which affects the decrease in sales turnover (Renee, 2002, p. 34-36; Khan et al., 2019; Maharani *et al*, 2019, p. 1-4). New techniques and methods are needed to develop information technology in dealing with problems faced today. The development of information technology is not limited to the management system but also applied to the relationship with the customer. This research tries to develop an artificial intelligence system through machine learning in the form of a chatbot which is expected to use the chatbot application system to make it easier to serve customers, make it easier to manage orders, and make it easier to monitor goods shipments and in the end can provide the right solution.

#### ***API and Database Server***

Autoresponder is a feature that is most widely used to broadcast messages in marketing activities. Autoresponders can be used to send serial messages automatically. Usually autoresponders are used to greet new customers automatically, so that every time there is a new customer, the company does not need to manually send messages again (Khanna *et al*, 2015, p. 277-284). This application process system can be seen as in figure 3.



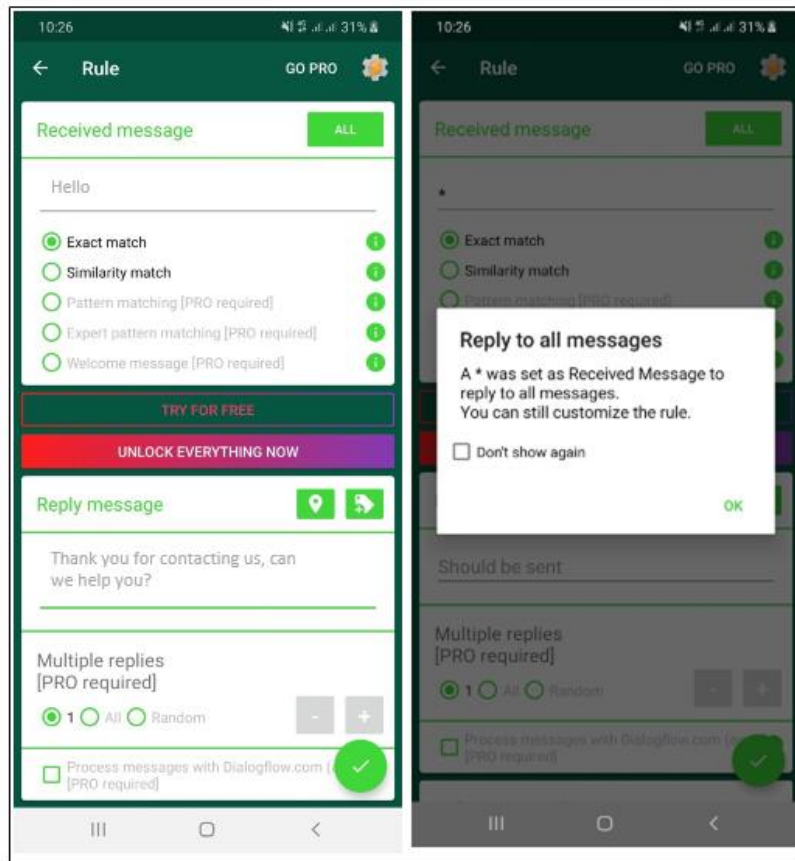
**Figure 3.** Application System Process

User as a customer will communicate with the system through chatbot messages embedded in whatsapp application services, this communication can be information services as well as new product information up to the ordering of goods and services. The artificial intelligence system process begins with an autoresponder for whatsapp as an API or application programming interface as well as a server and also a database container that will give machine learning commands in the form of text to be processed and processed using the algorithm according to what was implanted (Sutikno *et al*, 2016, p. 909-914). Machine learning will respond according to requests, the request can be in the form of commands to reply to answers to questions submitted in the form of written text or requests for finding solutions to problem solving cases to ordering services through block searching, then the results of this machine learning work will be returned to autoresponder for whatsapp to be sent back to the user in this case the customer (Aryotejo *et al*, 2018, p. 1-8).

#### ***Autoresponder Setting***

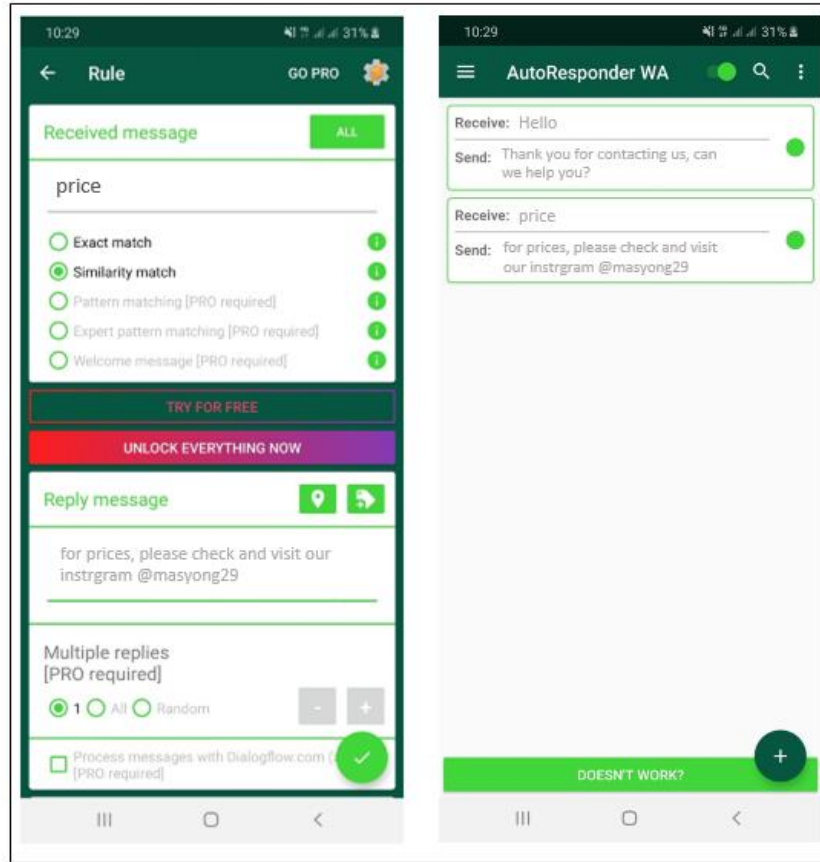
Autoresponder is an API developed to create chatbots on the WhatsApp application. Flexibility and complete facilities as well as easy use are considered when choosing this software as machine learning (Fahrudin *et al*, 2020, p. 133-143). There are several options in determining the chatbot facility as shown in figure 4, where each given program becomes a rule base which will later be used as an alternative to a series of answers to incoming message questions (Suriya & Kalaiselvi, 2018, p. 1-9; Parameswaran, 2018, p. 1-18). The welcome message option facility is used when the chat is first sent by the chat opponent or customer. making a chat opening word on the autoresponder chatbot can be written in the reply message section of the welcome message menu and this message only appears when the person chatting is not in the contact database

system.



**Figure 4.** The Choice of Program Rules

Exact match is the simplest option, in this option if an incoming message is similar or similar to a message that has been stored in the database, the chatbot on the autoresponder application will run an automatic reply to the customer as set in the database. The drawback of an exact match is when an incoming message does not match the message in question, the chatbot will not be able to answer. This deficiency can be corrected in the second option, namely the similarity match option, the similarity matching option can provide several rules by determining the key in the form of characters or words. When the engine finds a character or word match, the chatbot will work and look for available answers according to the keywords that have been determined in the machine learning program, as in figure 5.

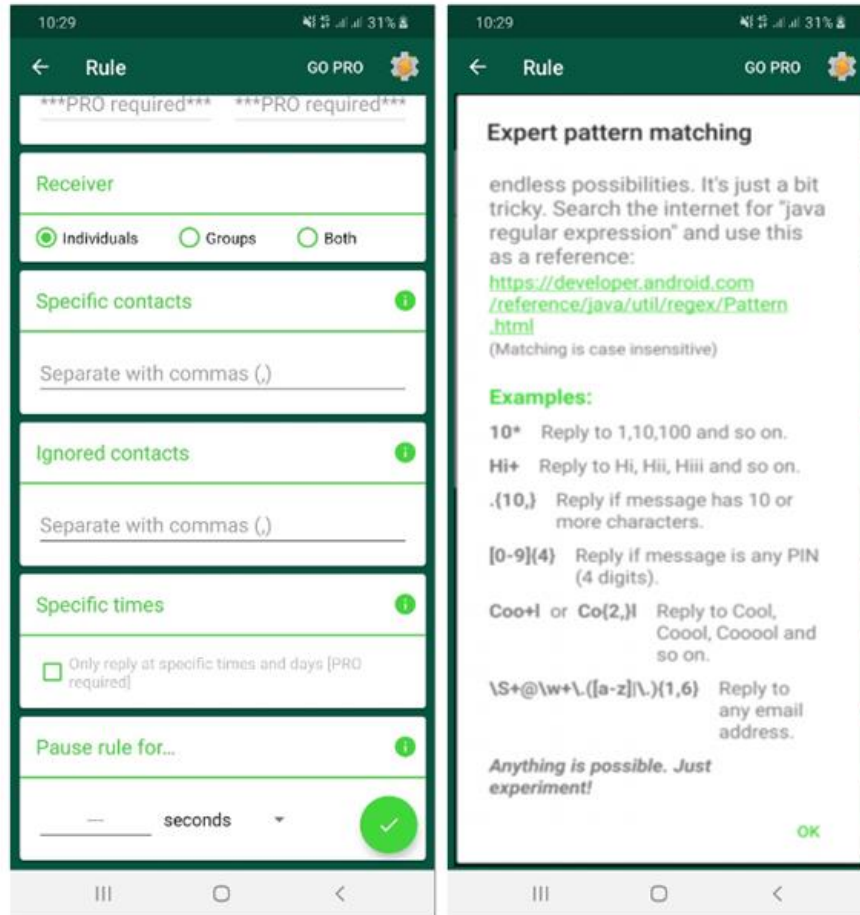


**Figure 5.** Similiraty Matching

The expert pattern matching method is the most complete method. This method can be used to handle message replies by using more complex rules, where this method can combine the use of characters and multi rules with different conditions and actions. for example  $10^*$  is conditioned if you want to reply to the numbers 1,10,100 and so on.  $Hi^+$  is a condition if you want to reply to Hi or Hiii messages (no matter how many i are behind),  $\{10,\}$  is a condition if the message is received in 10 characters,  $[0-9]\{4\}$  is a condition when the message is a 4 digit pin,  $Coo^+1$  or  $Co\{2,\}1$  is a condition where if you want to reply to a message Cool, Cooool and so on and  $\backslash S^+ @ \backslash w^+ \backslash. ([az] | \backslash.) \{1,6\}$  is a condition if you want to reply to a message in the form of an address e-mail. All of this can be seen in Figure 6 as below.

Another powerful feature of this automatic chatbot machine learning autoresponder is that it can send map location points accurately to chat opponents automatically by simply pressing the drop point maps button available in the reply message menu. Keep in mind that all these processes must be done online (Mufadhol *et al*, 2019, p. 1-6; Aryotejo & Mufadhol, 2019, 1-9; Sivarajah *et al*, 2017, p. 263-286) and to get a stable and optimal speed the internet network must be managed properly (Mufadhol *et al*, 2017, p. 464-470).





**Figure 6.** The expert pattern matching Rules

## CONCLUSION

The use of the chatbot system application in businesses can help ease customer service work in serving customer transactions and can even be used as a means of marketing new products and services. Autoresponder for WhatsApp is an application programming interface that can be developed with the concept of an artificial intelligence system to create machine learning-based applications to serve customers automatically through chatbot facilities. The speed and accuracy provided by the Chatbot application system is expected that customers can feel happy and satisfied so that they become loyal customers and the company can get new customers effectively and efficiently, which in turn can have an impact on the sustainability and sustainability of the company's existence in times of crisis that occur when this.

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