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Relation of Chatbot Usage Towards Customer Satisfaction Level in Indonesia

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ABSTRACT

In customer service for businesses in Indonesia, chatbot are predicted to be a pillar of business, especially chatbot that are able to reach customers proactively, provide availability 24 hours a day, even fulfill requests and answer customer questions quickly which has an important value in customer satisfaction factor in use of chatbot in Indonesia. The world of chatbots is very diverse to study from various aspects such as from a technological point of view, the study of natural language conversation of chatbots done by Shawar and Atwell concluded that chatbots are useful as a "tool", entertainment tools, also learning and practice tools, as well as tools to help with e-commerce and other fields. Another chatbot study compared the ability of offline customer service agents in general on marketing and how to represent an online business with a chatbot and its effect on improving relationships with customers. In conclusion, chatbots provide an efficient alternative solution to conventional customer service in reducing the repetitive tasks of human admins in solving customer problems, or allowing the ability to respond to various customer needs.

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1. INTRODUCTION

The word "Chatbot" consists of the terms "chat" and "robot". Chatbot functions to simulate human language with the help of Natural Language Processing (NLP) in conversation-based software programs. Chatbots can be accessed via cellphones and computer users to communicate and interact with businesses, companies, organizations, agencies, and individuals[1]. Chatbot also provides personalized support with integrated service quality to meet customer needs or complaints 24 hours a day [2]. Chatbots are predicted to dominate the customer market by Gartner (2016) and they state in 2020 [3]. Especially in the business field, Chatbots have [4] a positive impact on customer satisfaction through their ability to improve customer service provided by businesses because they appear to be flexible concerning time and thus, can offer customer needs anytime anywhere[5].

The first Chatbot platform in Indonesia according to Media Indonesia (2018) was introduced by Kata.ai. Kata.ai was formed in 2016 with a business-to-business (B2B) business model to facilitate

people's lives through technology. The application of chatbots has penetrated various industries, for example, Indonesia already has chatbots in the field of law which aim to make it easier for peozple to interact to ask questions about marriage law, divorce law, and inheritance law [6].

Meanwhile, in the agricultural industry, BASF Indonesia launched the first farmer data collection chatbot in Indonesia, as an assistant to ask and answer questions for Indonesian farmers regarding the farming process. Moreover, most bank companies in Indonesia have developed chatbots as their customer service such as Bank BRI, and Bank BCA, Bank BNI and in the telecommunications industry there are Telkomsel, and XL [6]. In the fast moving consumer goods (FMCG) industry, there is a Chatbot from Unilever Indonesia named Jemma for virtual customer service, and a Chatbot owned by Urban Icon for buying and selling fashion products such as bags and watches. Chatbots are expected to provide a better service experience to customers when customers complain or request information [7]. The advantages derived from using chatbots in companies include 1) Chatbot will provide information that is relevant to questions from users, so they don't have to wait long to get a response from the business[8]. This one benefit, of course, also allows businesses to be more productive because they won't be overwhelmed when answering questions from users [9], 2) Chatbots are also able to provide better customer satisfaction, because the chatbot is available 24 hours non-stop so it can answer customer questions at any time [10], 3) Businesses that use chatbots certainly don't need to spend more money to pay employees to minimize mistakes made, because minor or serious errors can be minimized when using services from chatbots. Because, every answer will always be right according to the instructions given before [11].

In the several references obtained, there are several previous studies that can be used as comparisons. The first case is in a study entitled "Design and Implementation of Natural Language Processing Software for the Development of Indonesian-Speaking Chatbots" by Nandang Rudiyanto [12]. Nandang Rudiyanto's research started awareness of chatbot technology which is a development of artificial intelligence technology that allows a machine/computer to speak natural languages like humans. A chatbot is a conversation simulator in the form of a computer program capable of interacting with users in natural language [13][14]. Conversations made by typing content will be discussed and the chatbot will respond. The similarities between the research that the author will carry out and the research conducted by Nandang Rudiyanto are the work cycle and the nature of the automation of the chatbot itself in Indonesian. The difference in the problems that occur from research from Nandang Rudiyanto is the nature of the automation of the chatbots that have been carried out. Researchers will discuss implementation and usage cycles that affect chatbot providers themselves, which are businesses and companies in Indonesia that make the level of customer satisfaction a parameter of the success of chatbots.

Another research is the creation of chatbot applications in East Java tourism with this application, tourists will be able to get information on tourist attractions by asking questions and answers to the system like a discussion model. The equation in this study is that the chatbot application has automation based on questions that result from direct discussions, so that the questions applied are questions that are often asked by the community. The difference from this research is that the applications that were created were applications that focused only on the problem of research objects, and so the applied mechanisms could not be used for different research objects [15].

Related to the relevant theories and issues above, this research aims to present a practical analysis of what factors can affect customer satisfaction with chatbot applications, as well as compare the level of customer satisfaction with customer service in businesses that already use chatbots. and customer service in businesses that don't use chatbots (the conventional approach). This research also helps and shows related businesses the important points that result in customer satisfaction by using chatbots, so that they can help implement chatbots in these businesses in building customer relationships and increasing their customer satisfaction levels. The aims and benefits of this research are to produce variables that measure the level of customer satisfaction with the use of chatbots in customer service in Indonesia and to increase the effectiveness of customer service using chatbots in customer service in Indonesia. This research is directed at companies that provide chatbot application

services to their customers, this is directed with the aim that chatbot applications can continue to grow with the various services they have. In this case the researchers focused on banking and telecommunication companies. The reason for this is because the service has implemented the technology mechanism via telephone line, making it easier for researchers to be able to compare using chatbot technology with various customer experiences, and makes it easier for researchers to be able to carry out further research on the same customer. The research aims at customer satisfaction and the customer's ability to use the chatbot application technology.

2. METHOD

2.1. Research Methodology

In this study, the research method used is descriptive. Descriptive method is a method of looking at the state of a group of people, an object, a set of conditions, a system of thought, or a class of events in the present. Where the purpose of this descriptive method is to describe systematically and accurately, with descriptions, facts, and relationships between the phenomena studied. The descriptive method is suitable to be applied in this study by following the flow or research model.

2.2. Data Collection

The data collection method was obtained directly from the research subjects. The data collection steps used in this study are:

1. Literature Study

   To obtain secondary data, researchers used a literature survey to collect data. This research was conducted by researching, researching and examining various documents from journals and readings related to the research topic. Adapun topik yang diambil adalah;

   a. Chatbot

      One of the artificial intelligence programs designed to be able to communicate directly with humans as users is a chatbot. What makes a regular chatbot different from a chabot with a natural language processing system is the simplicity of the algorithm used. While many bots can interpret and respond to human input, in reality, this chatbot only interprets the keywords entered and responds with the keywords or word patterns that best match the data from the previously created database[16]–[19]. The first chatbot technology started in the 1960s. The purpose of making this chatbot is to test whether chatbots can trick users into thinking they are communicating with humans. This test is known as the "Turing Test". If the user cannot identify the chatbot as a computer program, then the chatbot is classified as artificial intelligence[20]. One of the famous chatbots is Eliza (Dr. Eliza) which was developed by Joseph Weizenbaum at MIT (Massachusetts Institute of Technology). Eliza simulates a conversation between a psychiatrist and a patient in natural English. The first chatbot was Eliza which was created from 1964 to 1966 by Professor Joseph Weizenbaum at MIT (Massachusetts Institute of Technology), to study natural language communication between humans and machines. Eliza acts as if she is a psychologist who can answer questions from patients with reasonable answers or answer them with back questions [12]. Eliza is a chatbot pioneer, Eliza is known as a chat program whose profession is a psychiatrist. Eliza simulated a conversation between a psychiatrist and her patient using conventional methods that can reflect the patient's feelings by asking questions such as: "How do you ...", "Why do you feel like ...", "What do you think about . ..". This program will look for certain word patterns in the input provided by the user, and then provide the appropriate output [12].

   b. Customer/Consumer Satisfaction

      Many experts define consumer satisfaction based on their respective perspectives, even though there is no single definition that is a common reference for consumer satisfaction, but in essence they say the same substance about consumer satisfaction. According to Kotler and Keller, they stated that customer satisfaction is a person's feeling of pleasure or disappointment that arises after comparing the expected performance of a product (result) with the expected performance (or result). If performance is not as expected, consumers will not be satisfied. If performance meets expectations, the consumer is satisfied. If performance exceeds expectations, consumers are very satisfied/happy [21].

According to Fandy Tjiptono, the word "satisfied" comes from the Latin "satis" (meaning a lot, to be complete) and "facio" (to do or do). Customer satisfaction is a perceived purchase situation relative to the equality or disproportion of results versus the sacrifices made. Meanwhile, according to Swan in Fandy Tjiptono, customer satisfaction is defined as an assessment that is realized or felt whether the performance of a product is relatively good or bad, or whether the product in question is good or bad, according to its designation or not [22]. Satisfaction is measured by the extent to which customer expectations are met. Meanwhile, customer loyalty is a measure of what customers want to buy back. Based on the understanding of the theory according to the experts above, it can be concluded that customer/consumer satisfaction is a person's feeling of pleasure or disappointment that arises after comparing the results (outcomes) of the product with what has been expected.

2. Field Study

This study was conducted by collecting data directly through the resources owned (going into the field) with a questionnaire technique which is a data collection technique by spreading questions. Is a technique of collecting data from a number of people or respondents through a set of questions to be answered [23][24][25]. By providing a list of these questions, the answers obtained are then collected as data. Later, the data is processed and concluded to become research results. Some experts have their own definition of what a questionnaire is. For example, Narbuko and Achmadi (1999) said the definition of a questionnaire is a list of a series of questions related to a problem or field to be studied. On the other hand, Sugiyono (2010) defines a questionnaire as a data collection method by giving respondents a set of questions or written statements to answer. Basically, the purpose and benefits of the questionnaire are to obtain some data or information that is relevant to the research topic. Generally, this method is more widely used in quantitative research to describe the relationship between variables.

In this study, researchers used a questionnaire as a tool in comparing community assessments by taking samples so that a conclusion was obtained that the application of technology was appropriate or not in accordance with community needs.

The designed questionnaire is a questionnaire that contains variable levels of customer satisfaction with a scale of 1-5. This questionnaire was given to 40 respondents who did not have job specifications or gender, the researchers only gave a minimum age limit of 21 years to respondents who would fill out the questionnaire.

3. Data Collection

The data collected is a questionnaire which is divided into 2. Questionnaire 1 is a collection of variables that determine the level of customer satisfaction with businesses or companies in Indonesia that use chatbot-based customer service. Later these variables will be compared with Questionnaire 2 which determines the level of customer satisfaction with businesses or companies in Indonesia whose customer service has not used chatbots. Of the 40 respondents who have been given the questionnaire, they are divided into 20 respondents who will fill out Questionnaire 1 from the specifications of five respondents who have used chatbot-based customer service for businesses or companies in Indonesia, while 20 respondents will fill out Questionnaire 2 from the specifications of the five respondents who have never used chatbot-based customer service in businesses or companies in Indonesia.

4. Data Processing

To measure from the data processing results of a questionnaire, Then the method used is a qualitative approach. This is because the goal reached to determine customer satisfaction in using the chatbot app, [26]–[28].

a. Discussion of Questionnaire 1 (Respondents Who Have Interacted with Chatbot-Based Customer Service)

Making Questionnaire 1 begins by preparing 4 variables (A, B, C, and D) which contain questions on indicators of the level of customer satisfaction whose answers consist of 1-5 responses, point 1 means unsatisfactory, point 2 means less, point 3 means enough, point 4 means satisfactory, and point 5 which means very satisfying. After the questionnaire was given to 5 respondents, the authors analyzed and gave an average of the answers given in the questionnaire to the 4 variables that contained indicator questions for the level of customer satisfaction [29].

The result of the analysis of Questionnaire 1 is variable A which asks 5 respondents about the level of response speed provided by chatbot-based customer service in businesses or companies in Indonesia getting an average value of 4.25 which means very satisfying. These results can be seen in table 1 and figure 1.

Table 1. Questionnaire Questions and Test Results 1-1

Question No.1	**How Fast is your request or question processed by a chatbot-based customer service?"**				
Answer Category	Not satisfy	Less	Enough	Satisfy	Very Satisfy
Respondent	0	0	5	5	10
Sample	20	20	20	20	20
Amount	(10 Respondent x 5) + (5 Respondent x 4) + (5 Respondent x 3) + (0 Respondent x 2) + (0 Respondent x 1) = **85**				
Results	85/ 20 = **4.25**				

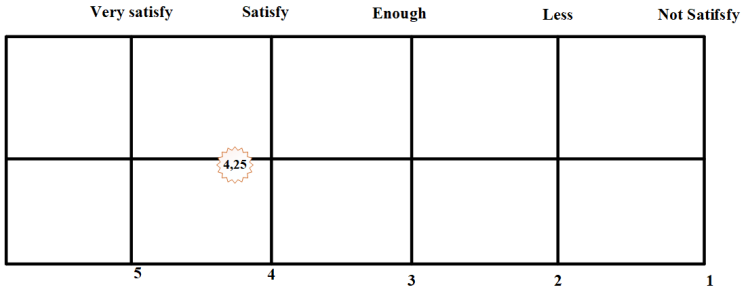

Figure 1. Questionnaire Questions and Test Results 1.1

Furthermore, variable B which indicates the respondent's relevance to the response given by the chatbot gets an average value of 3.5, which means enough. These results can be seen in table 2 and figure 2.

Table 2. Questionnaire Questions and Test Results 1.2

Question No.2	**How relevant are the answers you got from the request you submitted in chatbot-based customer service?**				
Answer Category	Not satisfy	Less	Enough	Satisfy	Very Satisfy
Respondent	0	0	10	10	0
Sample	5	5	5	5	5
Amount	(0 Respondent x 5) + (10 Respondent x 4) + (10 Respondent x 3) + (0 Respondent x 2) + (0 Respondent x 1) = 70				
Results	70/20 = 3.5				

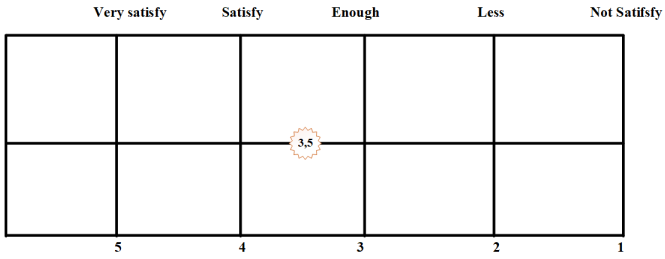

Figure 2. Questionnaire Questions and Test Results 1-2

Then, variable C which indicates the respondent's operational hours for the service provided by the chatbot gets an average value of 4, which means satisfactory. These results can be seen in table 3 and figure 3.

Table 3. Questionnaire Questions and Test Results 1-3

Question No.3	**What about chatbot-based customer service? you feel helped by the service operating hours which is available?**				
Answer Category	Not satisfy	less	Enough	Satisfy	Very Satisfy

Respondent	0	0	0	12	8
Sample	20	20	20	20	20
Amount	(8 Respondent x 5) + (12 Respondent x 4) + (0 Respondent x 3) + (0 Respondent x 2) + (0 Respondent x 1) = **88**				
Results	88/ 20 = 4,4				

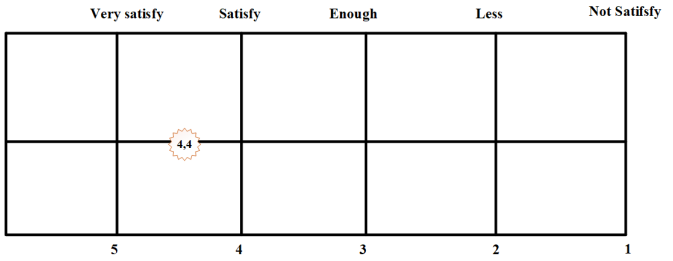

Figure 3. Questionnaire Questions and Test Results 1-3

Finally, variable D, which indicates respondents' convenience in the sentences used and the personalization provided by the chatbot, gets an average value of 3, which means sufficient. These results can be seen in table 4 and figure 4.

Table 4. Questionnaire Questions and Test Results 1-4

Question No.4	**With what chatbot-based customer service? you feel comfortable with the response given like the sentences used and personalization?**				
Answer Category	Not satisfy	Less	Enough	Satisfy	Very Satisfy
Respondent	0	4	1	10	5
Sample	20	20	20	20	20
Amount	(5 Respondent x 5) + (10 Respondent x 4) + (1 Respondent x 3) + (4 Respondent x 2) + (0 Respondent x 1) = **78**				
Results	78/ 20 = 3,9				

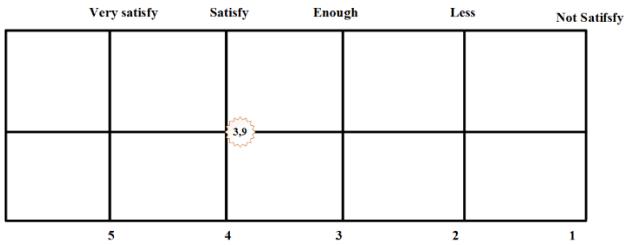

Figure 4. Questionnaire Questions and Test Results 1-4

From the summary of the average values described by the researchers, namely A = 4,25, B = 3.5, C = 4.4, and D =3.9, it can be generated that the averaged value of the variable determining the level of customer satisfaction with chatbot-based customer service in businesses or companies in Indonesia is = 4.0125. Summary of the overall value can be seen in table 5.

Table 5. Result

No questionnaire	**Average Value**
1	4,25
2	3,5
3	4,4
4	3,9
Overall average	**4.0125**

b. Discussion of Questionnaire 2 (Respondents Who Have Never Interacted with Chatbot-Based Customer Service)

Similar to Questionnaire 1, the creation of Questionnaire 2 begins with preparing 4 variables (A, B, C, and D) which contain indicator questions for the level of customer satisfaction whose answers consist of responses 1-5, point 1 means unsatisfactory, point 2 means less, point 3 means enough, point 4 means satisfactory, and point 5 means very satisfying. After the questionnaire was given to 5 respondents, the author analyzed and gave an average of the answers given in the

questionnaire to the 4 variables that contained indicator questions for the level of customer satisfaction.

The results of the analysis of Questionnaire 2 are variable A which asks 5 respondents about the level of response speed provided by conventional customer service (without chatbots) in businesses or companies in Indonesia getting an average score of 2.1 which means less. These results can be seen in table 6 and figure 5.

Table 6. Questionnaire Questions and Test Results 2-1

Question No.1	**How quickly your request or question is processed by conventional customer service (without chatbots)?**				
Answer Category	Not satisfy	Less	Enough	Satisfy	Very Satisfy
Respondent	5	10	3	2	0
Sample	20	20	20	20	20
Amount	(0 Respondent x 5) + (2 Respondent x 4) + (3 Respondent x 3) + (10 Respondent x 2) + (5 Respondent x 1) = **42**				
Results	42/ 20 = 2,1				

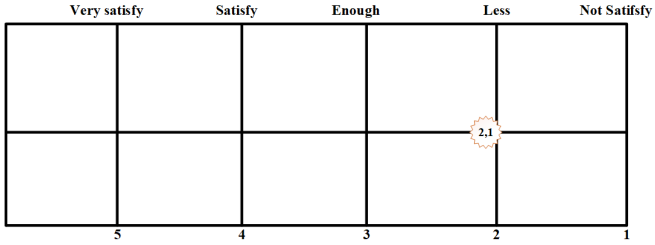

Figure 5. Questionnaire Questions and Test Results 2-1

Furthermore, variable B which indicates respondents regarding the relevance of the response given by conventional customer service gets an average value of 4.25 which means more than satisfy. These results can be seen in table 6 and figure 6

Table 7. Questionnaire Questions and Test Results 2-2

Question No.1	**How relevant are the answers you got from the request you submitted in conventional customer service (no chatbots)?**				
Answer Category	Not satisfy	less	Enough	Satisfy	Very Satisfy
Respondent	5	0	0	15	5
Sample	20	20	20	20	20
Amount	(5 Respondent x 5) + (15 Respondent x 4) + (0 Respondent x 3) + (0 Respondent x 2) + (5 Respondent x 1) = **85**				
Results	85/ 20 = 4,25				

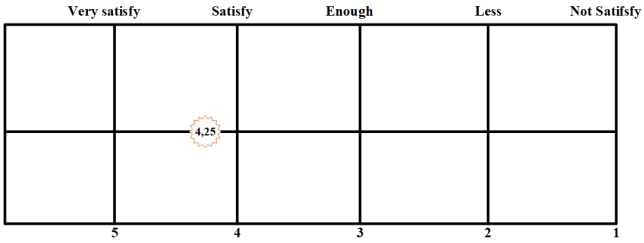

Figure 6. Questionnaire Questions and Test Results 2-2

Then, variable C which indicates the respondent's operational hours of services provided by conventional customer service gets an average value of 2.1, which means less. These results can be seen in table 8 and figure 7

Table 8. Questionnaire Questions and Test Results 2-3

Question No.1	**With conventional customer service (without chatbots) Do you feel helped by the hours of operation available services?**				
Answer Category	Not satisfy	Less	Enough	Satisfy	Very Satisfy

Respondent	5	10	3	2	0
Sample	20	20	20	20	20
Amount	(0 Respondent x 5) + (2 Respondent x 4) + (3 Respondent x 3) + (10 Respondent x 2) + (5 Respondent x 1) = **42**				
Results	42/ 20 = 2,1				

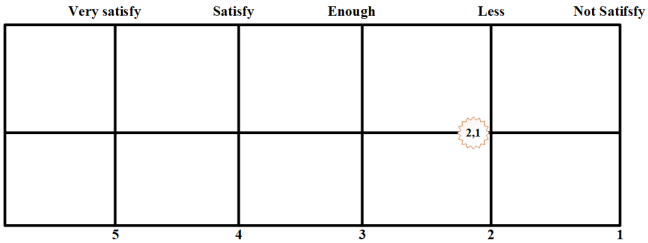

Figure 7. Questionnaire Questions and Test Results 2-3

Finally, variable D, which indicates respondents' convenience in the sentences used and the personalization provided by conventional customer service, gets an average score of 4.15, which means more than satisfy. These results can be seen in table 9 and figure 8

Table 9. Questionnaire Questions and Test Results 2-4

Question No.1	**With conventional customer service (without chatbots) Are you comfortable with the response given? like the sentences used and personalization?**				
Answer Category	Not satisfy	less	Enough	Satisfy	Very Satisfy
Respondent	3	0	0	5	12
Sample	20	20	20	20	20
Amount	(12 Respondent x 5) + (5 Respondent x 4) + (0 Respondent x 3) + (0 Respondent x 2) + (3 Respondent x 1) = **83**				
Results	83/ 20 = 4,15				

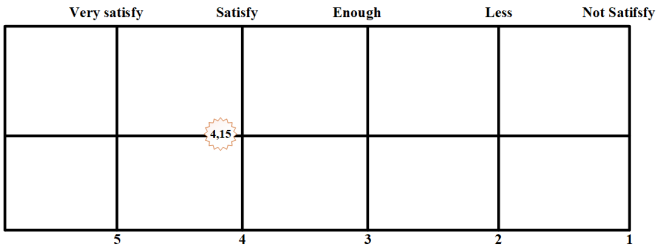

Figure 8. Questionnaire Questions and Test Results 2-4

From the summary of the average values described by the researchers, namely A = 2.1, B = 4.25, C = 2.1, and D = 4.15, it can be generated that the accumulated value of the determining variable determines the level of customer satisfaction with chatbot-based customer service in businesses or companies in Indonesia, totaling = 3.125. Summary of the overall value can be seen in table 10.

Table 10. Result.

No questionnaire	**Average Value**
1	2
2	4,25
3	2.1
4	4,15
Overall average	**3.125**

3. RESULTS AND DISCUSSION

The results of research on the Use of Chatbots in Indonesia on the Level of Customer Satisfaction in the Digitalization Era assisted by Descriptive Research Methods, Literature Studies, and Field Studies can produce 2 Questionnaires that provide determining variables proving that adding chatbots to customer service in Indonesia is proven to improve the level of customer satisfaction, especially in terms of speed and relevance of response, which makes customer service in Indonesia more effective and efficient.

This phrase is proven by the accumulated results of the variable determining the level of customer satisfaction contained in Questionnaire 1 (Respondents Who Have Interacted with Chatbot-Based Customer Service) showing an accumulated value of 4.0125, while the accumulated value of the variable determining the level of customer satisfaction contained in Questionnaire 2 (Respondents Who Have Not Have interacted with Chatbot-Based Customer Service) shows an accumulated value of 3.125 which is smaller than the accumulated value of Questionnaire 1, the level of satisfaction of respondents regarding the usefulness of the application is in the high range which indicates that this application is acceptable[30], which means that it is easy for the community to use. For categorical data, most of the respondents had a high level of satisfaction with an accumulated value of 15 and there were no respondents in the below average satisfaction category. This is because the application used is whatsapp/chat based which is almost used by most ordinary people. This application is more practical than other virtual chat applications that require people to download separate applications or access the web. Research conducted by Nadarzynski, Miles, Cowie, & Ridge [31] which uses different applications such as Alexachatbot shows the level of satisfaction or the level of acceptance of respondents in the low category with an average usability score of only 67% if in percent units, proving that chatbots in customer service in Indonesia have succeeded in increasing customer satisfaction levels.

So then, the chatbot app is of great help to the company with a view to improving service. Will remain, some factors to consider in using that application. As for that factor, among other things :

1. Using the platform used by the customer
   In this case the company should do research on customers, How does society tend to interact whether through social or other media. So after knowing that, The company can specify a chatbot application to a customer [32].
2. Using a clear plot of conversation
   The most important thing in making a chatbot is a clear conversation line. In designing the chatbot line of conversation, Better use style of language used regularly used by many people. It's going over closer you up to customers and make an impression that the customer is not talking to robot, but a human being. And conversation has a clear, understandable interaction, no complicate the customers [33].
3. Using an easy and interesting interface
   User interface or user interface design is next important thing noteworthy. The user interface design itself speaks of design or the application grooves that configure how users interact with the application. Usually users want an attractive, easy-to-use application design.

With technology evolving then will give a far-reaching influence on the company or communities based on the level of need that will get go up. Then the chatbot will be one of the approaches to using technology from the customer's side or the community's. As for the profits of the company implementing the chatbot app, among others:

1. Gain time
   One of the most important advantages of using chatbot is can save time for customers who want to get some information. Chatbot will give you relevant information on questions from the consumer. So they don't have to wait long to get a response from the businesspeople. Benefit this one of course it can allow for a business more productive because it wouldn't be overwhelmed when answering questions from users [34].
2. Gives the customer satisfaction something better
   The next advantage of chatbot is able give a better sense of satisfaction for customer's. Despite, chatbot is always available during 24 non stop so it can answer customer questions at any time. As explained by Due, When customer questions cannot be answered quickly, They will be resentful and will no longer allow us to use our business. However, in chatbot surely that is can be avoided [35].
3. Not required big expense
   Business that uses chatbot there is absolutely no need to eject larger funding to pay a salary worker. In fact, reporting from a few that research do, the company that uses chatbot can reduce cost customer service until 30% [36].

4. Lessen Mistake
   The limitations that owned by humans is increase activity or that work do so it would affect in performance work anyone and can cause that mistake do. But, that thing can be avoided when using service from chatbot [37]. chapter, Each answer will always be in accordance with the instructions given. So, all kinds of mistakes can be avoided so the customer won't misinformed.

4. CONCLUSION

In this study, the authors investigate the application of chatbots to the level of customer satisfaction in customer service in Indonesia and show that this research can become an original basis for the influence of using chatbots in Indonesia. This is concluded by the determinant variables designed to determine the level of customer satisfaction in the aspects of response speed and relevance which make customer service in Indonesia more effective and efficient. Even though chatbot interaction technology can offer efficiency and effectiveness, this technology can sometimes cause users to become dissatisfied, especially in the personalization of answers and user engagement aspects.Therefore, the authors have a solution so that in the future the findings designed above can be improved starting from the variant of the resource and creating new variables that can indicate an increase in the level of customer satisfaction with chatbot-based customer service in Indonesia. Furthermore, for the development of this research, it can be developed to analyze the influence of the use of chatbots in Indonesia on the level of business profit (revenue) which later can become a stepping stone in the transformation of conventional customer service to chatbot-based, evenly businesses and companies in Indonesia

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