

Impact of Chatbots on Customer Satisfaction in Food Delivery Apps

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Abstract— Artificial intelligence (AI) is a branch of computer science concerned with building smart machines capable of performing tasks that typically require human intelligence. Since there are advancements in machine learning and deep learning which is creating a shift in every industries sectors and handling various type of operations even better than humans. Majority of the repetitive tasks are now replaced with AI which was previously done by humans. Every organization is looking to replace the minimum qualified manpower with AI robots which can do similar work with more efficiency and if we talk about the chatbots, A chatbot is a computer program that simulates human conversation through voice commands or text chats or both. Since the time chatbots have entered the digital world, every marketer is curious to use them as a major tool to daily interact with their customers. Chatbots attend to customers at all times of the day and week and are not limited by time or a physical location. This makes its implementation appealing to a lot of businesses that may not have the manpower or financial resources to keep employees working around the clock. Now a days, in food delivery app business like Zomato, swiggy, chatbots are used to solve customers' queries or problems, but chatbots are really effective in that business model? The target customer of this business model are the people who don't have time to go outside to take a food, they want convenience at their home or not ready to take a pain, so their queries should also be solved in the most convenience way. A chatbot is used to serve the user request. It is crucial for the chatbot to plan how to perform the task requested by a user. Chatbot responds to each user request by learning from the conversation so as to what the request is. There is no doubt that machines are much better when it comes to working efficiently but they cannot replace the human connection that customer executive makes with their customers as the customers find the real interaction more reliable and engaging. Machines cannot develop a bond with humans which is an essential attribute when comes to customer service. It's now so much easier for customers to complain about bad service, meaning it's much harder for brands to satisfy customers' wants and needs. To interpret the efficiency of chatbots on customer satisfaction and to determine if customers still prefer human interaction, this study is conducted. In order to conduct the research' primary data is collected. Sample size is 191 respondents. The samples are collected from the population already interacted with the chatbot technology in different food delivery apps. Further, Statistical tools like correlation, regression, percentages using SPSS are used to analysis the data.

Keywords: Artificial Intelligence, Chatbots, Food delivery apps, Customer support, Customer Satisfaction

I. INTRODUCTION

With the influx of technology in our daily life, introduction of this in different sectors of businesses is inevitable. One of the advancements in this is Artificial Intelligence. AI gives machines the capability to have an intellect level and act accordingly. This intelligent behaviour can be helpful to replace humans as it can imitate the human behaviour and can do the same work arguably more effectively and efficiently. Due to this unparalleled ability of Artificial Intelligence, it is becoming more and more necessary for the companies to use this technology to reap the benefits. One of the industries that has introduced this technology in their operations is Food Delivery Apps. To replace the Human element in customer support AI is used in the form of Chatbots. These Chatbots interact with the customers and solve their queries. It simulates a generic human conversation. With the help of the words and phrases put in by the customers, these chatbots interpret and process the information and gives out a pre-set answer. Another advancement in the chatbots is Machine Learning (ML), by which the machine keeps learning from the user's inputs and can predict better. This is more interactive to use and maintains a level human conversation, which currently is lacking. In the Food Delivery App space, this technology is fairly new and still requires much improvement, on which our study is based on.

II. LITERATURE REVIEW

The main objective behind the study is to analyze the application of Artificial Intelligence in Retail industry. There has been an exponential growth of AI in retail & its application in tracking customers, customer support, logistics, Inventory management, etc. Following are the researches on AI done by the researchers.

Seranmadevi and Senthil Kumar (2018) have researched about the contribution of quality, customer relationship management and big data in designing futuristic retail model and analyzing the intension of retailers and shoppers in experiencing the emergence of AI. L Xue (2019) had investigated consumer responses and expectation towards Virtual commerce (V-commerce). The best consumer response is hedonic consumers and 18-34 aged consumers, who are more likely to adapt V-commerce. Pednekar, Prabhu, Chawan, Gharat and Chokhavatia (2019) says that with the continuous development of internet of things (IOT) and AI there is an increase in services provided by various online services and with the recent advances in IOT in our day to day life the need of automation has increased specially for the quality control of perishable grocery products. Na Liu, Ren, Choi, Hui, San-Fun Ng (2013) had researched about advantages and drawbacks of different kinds of analytical methods for fashion retail, sales

forecasting and evaluation of respective forecasting methods over past 15 years is revealed and different retail sales forecasting models are discussed. Chaturvedi and Karthik (2019) had researched on the online food ordering companies and found out that people are facing issues connecting with the customer support, so companies should concentrate on the AI like chatbots to improve customer satisfaction.

There have been a lot of research done on the application of Artificial Intelligence in the retail processes, but there is still a gap in the research of the effectiveness of the artificial intelligence in retail sales & if it is feasible to replace the Manpower with AI. And to achieve that it requires balance and the equal emphasis on people's management and skill development.

III. RESEARCH METHODOLOGY

The descriptive Study design is undertaken for this research. Data is collected through a primary survey. A questionnaire is used for the primary survey. The questionnaire was prepared using the interval scale. The questionnaire was sent through e-mail, Facebook or WhatsApp to around 220 people. Out of those, 148 people responded. Later, all the incomplete questions from the data collected have been cleaned. Question is open and close ended depending upon the information that needed to be elicited. I am also using the scaling technique to assess the attitude of the customer. After collecting the results, the author has done the data analysis using statistical technique of regression and correlation analysis in SPSS and MS- EXCEL. There are ten questions which are used to measure the factors described below that effect customer satisfaction using chatbots in food delivery apps.

A. Variables –

1) Dependent Variables –

Customer Satisfaction – This is the end result which we want to know, the customers who are using chatbots service for there problem and queries are satisfied with it or not.

2) Independent Variables –

- Problem Understanding – Satisfaction of customers depends upon problem understanding also, if chatbots are not able to understand the concern then for sure it going to affect satisfaction level.
- Ease of Use – How easy and convenient is to use chatbots impacts the customer's satisfaction.
- Trust On chatbots – Whether the customer really trusts on the solution given by chatbots or not also affects the satisfaction level.
- Ability to solve the problem – Whether chatbots are able to solve the problem of customers also affects the level of satisfaction.
- Time taken to solve the problem – How much time chatbots take to solve the queries or problems also effect the level of satisfaction.

B. Research Hypothesis

For trust on technology -

- H0 – Trust on the technology affects the Customer Satisfaction

- H1 – Trust on the technology doesn't affects the Customer Satisfaction
- For understanding ability -
- H0 – Understanding Ability affects the Customer Satisfaction
- H1 – Understanding Ability doesn't affects the Customer Satisfaction

C. Research Objectives

- To analyze the efficiency of chatbots on customer satisfaction.
- To check whether understanding has an impact on the customer satisfaction of chatbots.
- To check whether trust has an impact on the customer satisfaction of chatbots.

IV. DATA ANALYSIS & INTERPRETATION

- 1) In this question, our purpose was to ask the respondents how frequently they use any of the food delivery apps.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very often	84	56.8	56.8	56.8
	Often	15	10.1	10.1	66.9
	Average	23	15.5	15.5	82.4
	Rarely	12	8.1	8.1	90.5
	very rarely	14	9.5	9.5	100.0
	Total	148	100.0	100.0	

Table 1: How frequently you use food delivery app

- So from the above responses it can be concluded that most of the respondents use food delivery apps very often that holds the share of 56.8%. 10.1% respondents use food delivery apps often while 15.5% respondents use the food delivery apps on an average (Table 1). 8.1% respondents use the food delivery apps rarely and the remaining respondents use the app very rarely that accounts for a share of 9.5%.

- 2) In this question, our purpose was to ask the respondents whether they had raised any complaints on the food delivery apps or not

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	130	87.8	87.8	87.8
	no	18	12.2	12.2	100.0
	Total	148	100.0	100.0	

Table 2: Ever raised a complaint?

- As a result, out of the 148 respondents, 130 respondents have raised complaints online that means almost 88% of the users have raised their complaints. and the rest of the respondents that is around 12% haven't raised any complaint ever while using any of the food delivery apps (Table 2).

- 3) In this question, our purpose was to ask the respondents that how much time did a chatbot took to answer the query of the respondents that they had raised on any of the food delivery platform

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-30	9	6.1	6.1	6.1

	sec				
	30 sec - 1 min	16	10.8	10.8	16.9
	1-2 min	36	24.3	24.3	41.2
	more than 2 mins	87	58.8	58.8	100.0
	Total	148	100.0	100.0	

Table 3: Time to answer

- So from the above responses it can be seen that query of 6.1% of the total respondents was solved by the chatbots within 30 seconds (Table 3). Query of 10.8% of the total respondents was solved by the chatbots between the time frame of 30 seconds - 1minute. 24.3% of the respondents were able to get the solution of their query between the time frame of 1-2 minutes. And talking about the rest that is the majority of the respondents (about 58.8%), for solving their query, the chatbots took more than 2 minutes.
- 4) In this question, our purpose was to ask the respondents whether they prefer to solve their query while chatting with the chatbots or by calling the customer executives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chatbots	30	20.3	20.3	20.3
	customer executive	118	79.7	79.7	100.0
	Total	148	100.0	100.0	

Table 4: Preference for Chatbot or not

- During our study, we found that most of the users (almost 80%) still prefer to talk to customer executives rather than a chatbot because they think that talking directly to the customer executives will help them in getting their query solved more quickly and accurately (Table 4). And only 20% respondents prefers to talk to the chatbots which is very less that means the respondents still have some kind of trust issues on the chatbots as they think their query would be solved or not and they think it would be easy for them to directly talk to the customer executive and tell them their query and get the solution.

		Trust on the solution by Chatbots	Experience with Chatbots
Trust on the solution by Chatbots	Pearson Correlation	1	-.479**
	Sig. (2-tailed)		.000
	N	148	148
Experience with Chatbots	Pearson Correlation	-.479**	1
	Sig. (2-tailed)	.000	
	N	148	148

** . Correlation is significant at the 0.01 level (2-tailed).

Table 5: Correlations between ‘trust on the solution by chatbots’ and ‘experience with chatbots’

- Correlation between ‘trust on the solution by chatbots’ and ‘experience with chatbots’ is highly significant, which means that the trust of the customers on the

chatbots gets affected with their experience of chatbots (Table 5).

		Experience with Chatbots	Understanding ability of Chatbots
Experience with Chatbots	Pearson Correlation	1	-.526**
	Sig. (2-tailed)		.000
	N	148	148
Understanding ability of Chatbots	Pearson Correlation	-.526**	1
	Sig. (2-tailed)	.000	
	N	148	148

** . Correlation is significant at the 0.01 level (2-tailed).

Table 6: Correlations between ‘understanding ability of chatbots’ and ‘experience with chatbots’

- Correlation between ‘understanding ability of chatbots’ and ‘experience with chatbots’ is highly significant, which means that the understanding ability of the chatbots affects the experience of customers with chatbots (Table 6).

V. REGRESSION

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.543 ^a	.294	.285	.792

Table 7: Model Summary

Predictors: (Constant), Trust on the solution by Chatbots, Understanding ability of Chatbots

- R square is 0.294 which indicates that 29% of variation has been accounted in the experience of the customers with chatbots (dependent variable) by the trust of the customers on chatbots and understanding ability of the chatbots (independent variable) (Table 7).
- Because regression maximizes R square for our sample, it will be somewhat lower for the entire population, a phenomenon known as shrinkage. The adjusted r-square estimates the population R square for our model and thus gives a more realistic indication of its predictive power.

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	37.918	2	18.959	30.245	.000 ^b
	Residual	90.893	145	.627		
	Total	128.811	147			

Table 8: ANOVA

a. Dependent Variable: Experience with Chatbots

Predictors: (Constant), Trust on the solution by Chatbots, Understanding ability of Chatbots

- This table indicates that the regression model predicts the Experience of chatbots significantly well. Sig(.000) indicates the statistical significance of the regression model that was run. Here, $p < 0.0005$, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable therefore it is good fit for the data (Table 8).

Model	Unstandardize d Coefficients	Standardize d Coefficient	t	Sig.
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				s	
		B	Std. Error	Beta	
1	(Constant)	4.885	.204		23.886 .000
	Understanding ability of Chatbots	-.365	.100	-.377	- 3.642 .000
	Trust on the solution by Chatbots	-.188	.097	-.200	- 1.935 .055
a. Dependent Variable: Experience with Chatbots					

Table 9: Coefficients^a

- 1 point increase on the Understanding of chatbots corresponds to 0.37 points increase on the experience with chatbots (Table 9).
- 1 point increase on the Trust on chatbots corresponds to 0.19 points increase on the experience with chatbots.
- Given only the scores on our predictors, we can predict job performance by computing:-

$$\text{EXPERIENCE WITH CHATBOTS} = 4.898 + (.037 * \text{Understanding of chatbots}) + (0.19 * \text{Trust on chatbots})$$

VI. FINDINGS AND CONCLUSIONS

- 1) Majority of the customers use any of the food delivery apps and among these, the majority of the consumer's complaint was solved by the chatbots by taking more than 2 mins so it can be concluded that it took some time for the chatbots to understand the problems of the consumers and give them the required solution.
- 2) The satisfaction level of the consumers has increased automatically when they talk directly to the customer executive rather than addressing their problem to the chatbots.
- 3) The experience of chatbots does affect the number of orders on food delivery apps. If the chatbot is unable to solve the query of the customer or it takes time to solve that query, then it demotivates the customer to continue with his future orders.
- 4) The understanding ability of the chatbots affects the experience of customers with the chatbots and thus alternatively customers can have a positive or negative experience with the chatbots.
- 5) The trust of the customers on the chatbots gets affected based on their experience of the chatbots, so if the experience of the customers with the chatbots is good then the customers are more likely to rely and trust upon the solution given by the chatbots and vice-versa.

VII. FUTURE SCOPE OF STUDY

As per the current circumstances, the study was conducted in the initial stages of the roll-out of AI in Chat support as Chatbot, so the knowledge of the technology to the end-users is pretty limited and the efficiency of the technology cannot be measured precisely. As time goes on and people are used to the technology the research can be improved and the findings will portray the result more accurately.

Due to Covid-19, we were not allowed to go out and collect more data for the study, our data collection reach

was limited, so after this pandemic, data can be collected beyond the said boundaries.

This research was only limited to Indian users and apps which are available in India so this research in the future can be conducted on a global level for a better picture of customer satisfaction regarding the use of chatbots in food delivery apps.

VIII. RECOMMENDATIONS

- 1) The consumers do not have trust in the Chatbot solution of support. As they still prefer the Human element in customer support. So not only the companies should teach and inform the customers about the technology but also add a human element in solving their queries.
- 2) As the food delivery app business is a new concept in an Indian market and it's still growing, large no. of New users sign up daily on these apps so in order to make new consumers comfortable with this kind of concept they might need a human touch while getting their problem solved as they might drop the idea to use this app if there queries not getting solved quickly.
- 3) The companies should not depend on the Chatbots entirely to solve some unique and nuanced queries there should be a support executive available.
- 4) The concept of chatbots can be improved later on when the companies have enough data from common customer queries, by which they can use machine learning to improve the efficiency and predicting ability of the Chatbots.

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