

Impact of Artificial Intelligence on Customer Experience

Bipasha Rajkhowa, Aniket Das

Abstract: *With the increasing competition in the market today, the customers have a variety of options to choose from. The biggest challenge faced today by any business is to understand and deliver the exact requirements of the customers to retain the existing customer base and acquire new customers. The key to this is meeting and surpassing customer expectations leading to the goal of customer satisfaction through enhanced customer experiences. Upcoming technologies like Artificial Intelligence provide widespread opportunities to understand dynamic customer behavior and trends. However, not much exploration is done in academic research as to what factors primarily impact customer experience and the emerging significance of AI in this domain. Hence, the objective of this study is to understand the impact of artificial intelligence on customer experience. The paper adopts a quantitative approach wherein a survey was conducted across 207 participants to understand the impact of AI-enabled chatbots to deliver better personalization, quality of service, and hassle-free service to achieve better customer experience. The study provides implications to academicians as it contributes to the literature on the impact of AI on customer experience, helps practitioners in exploring and analyzing the various useful aspects of such emerging technologies in reshaping market trends, the companies and the society at large by providing a better experience to the customers, thus enabling a healthier customer relationship.*

Keywords: *Artificial Intelligence, Customer Experience, Chatbots, Hassle free service, Personalization, Quality of Service.*

I. INTRODUCTION

The emergence of digital transformation has led to a revolutionary change in the business paradigm in the last few years. Artificial Intelligence (AI) plays a significant role in the current technological dive by provisioning better data extraction, exploration, and utilization, resulting in more accurate predictions and performance in the market scenario. Artificial intelligence can be defined as a branch of computer science that aims in developing smart machines capable of performing tasks requiring human intelligence. [1] Artificial Intelligence can also be understood as the process "of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience". (2020) [2] Recent years has seen increased in artificial intelligence implementation in various aspects of marketing to deliver better customer value with the help of deep learning . (2019) [3] [4] With the increase in competition in the market, customer satisfaction has become the epitome of every business strategy.

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Customer experience refers "to the total of all experiences the customer has with the business, based on all interactions and thoughts about the business". [5] It is stated that about 95% of all interactions with customers will take place through mediums supported by artificial intelligence by 2025. (2017) [6] Artificial intelligence helps in providing a more friendly, convenient, and interactive experience to the customers resulting in better customer satisfaction and driving customer loyalty. AI-enabled customer journey analytics exploits the most out of billions of customer data by drawing relationships in the data and predicting future occurrences with high accuracy along with pointing out the key drivers and potential interceptions. [7] AI not only facilitates in reducing the churn rate of the customers but is also successful in creating bundles of innovative opportunities for companies to enhance loyalty and sales, improvise their operational efficiency, improve their decision making abilities, and put forth more relevant products and services. [8] As AI has become a key driver in redefining customer service, a study in this domain has gained widespread popularity in the last few years. However, there are a few studies emphasizing the key elements resulting in this change in the concept of customer experience. Therefore, to bridge this gap in academic literature, this study focuses on how customized approach to customer needs, improved service quality, and seamless service abilities implemented through AI has been able to provide an improved experience to the customers.

II. LITERATURE REVIEW

2. AI and Customer Experience

Customer experience is an insight which the customer holds about the brand or company based on their experience or interaction with the brand or business. In this study, the dependent variable is Customer Experience and the independent variables are Hassle free service, Quality of Service (QoS), and Personalization. Several papers have been written by various authors on how AI tools are impacting the customer experience. The paper by Alice Pavaloiu (2016) [9] studies the impact of AI on global trends in various domains and offers a perspective upon the changing external environment, marketing, and management which in turn is changing the attitude of the customers to interact with B2C businesses. The paper by Emma Ojapaska (2018) [10] states that customers today require a fast and individualized service that might not even require human interaction. It also notifies that companies are rapidly adopting chatbots to improve customer interaction, customer engagement, ordering process, and automatic resolution of repetitive queries resulting in positive customer experience.



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The paper by BaeBrandtzaeg and AsbjørnFølstad (2017) [11] stated that people are keen on adopting chatbots primarily because it is productive such that, it provides an ease to obtain information, speeds up processes and is available 24*7. It further tells that customers find interaction with the chatbots entertaining and is a default customer support which sums up other factors driving the use of chatbots for better customer experience by companies.

2.1 AI and Personalization

Personalized marketing is a form of target marketing that uses data points and automation to provide individualized content to the customers to enhance engagement and customer experience. The paper by André et al, (2017) [12] talks about how the recent developments in AI-driven markets and micro-targeting of customers have helped in individualizing content recommendation for the customers thus making the choices more personalized and easy to choose from. The paper by James Cannella (2018) [13] talks about how personalization in marketing helps in meeting individual customer demands throughout their journey without invading their privacy. The paper explains the concept of hyper-personalization to understand customer views better and refine their marketing strategies. The paper by Darius Zumstein and Sophie Hundertmark (2017) [14] [15] states that chatbots helps in providing personalized interaction with the customers, enabling them to reach out to the companies anytime and anywhere. It also tells about how chatbots help in the collection of customer data about product, service, and content preferences, usage patterns enabling new user touch points to improve convenience and provides customized service through deep learning.

2.2 AI and Hassle-free service:

Hassle-free service refers to a trouble-free, systematic, and problem-free service, where the customers get their needs fulfilled without any barriers and confusion. The paper by Maximilian Görgens (2019) [16] [17] talks about how blended AI which is an amalgamation of artificial intelligence and human intelligence and data analytics can be used to improve digital marketing and provide a hassle-free service to the customers. The paper by Adam et al, (2020) [18] talks about how customers find their interaction with chatbots more accessible and flexible without having to wait for a response to their calls and messages for long durations, thus making the procedures simple and hassle-free. The paper by Bertacchini et al, (2017) [19] talks about moving robots and chatbots from back end to front end of shops these days, is improving customer experience by reducing the time consumed in the cumbersome processes of billing, searching of the required items in the shop and behaving as a shopping companion to the customers. It also explains how these AI-powered robots are capable of knowing customer preferences by connecting to the store's database and are thus able to provide a hassle-free service to them.

2.3 AI and QoS

Quality of Service is the overall experience of the customer during the product or service acquisition journey. The paper by Dash et al, (2019) [20] talks about how AI helps in increasing quality of service by reducing

development cycles, improving efficiency and faults in manufacturing and supply chain. The paper also explains how AI helps in making more accurate predictions thus reducing inventory expenditures, and increase profits by better lead identification, optimization of prices, and most importantly speed up the process of product delivery, helping to enhance the customer experience. The paper by Ivanov and Webster (2017) [21] [22] states about the rapid adoption of bots and artificial intelligence to improve the QoS especially in the domains of tourism and hospitality. It also states that this improved service quality is due to better interactive methods of service delivery, communication, and customer engagement.

III. CONCEPTUAL FRAMEWORK

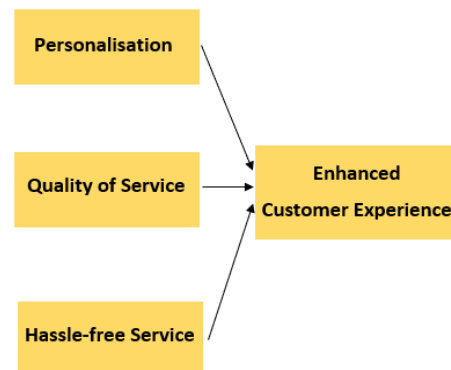


Figure 1. Conceptual Framework of Impact of AI tools on Customer Experience

Figure 1 demonstrates a theoretical model of the Impact of AI tools on Customer Experience. The study analyses the literature and provides a conceptual model for improving Customer Experience by utilizing AI tools.

Artificial Intelligence is a booming technology and is the buzz word of the industry which is being adopted by organisations in various sectors. There are many AI based appliances and equipment that aid in improving customer's experiences. Through Figure 1 we advocate that Personalization using Artificial Intelligence tools, Improved Quality of services using Artificial Intelligence tools, providing hassle free service to customers using Artificial Intelligence tools leads to improved consumer experiences. The following subsections further discuss the research methodology, data analysis, results & discussions, hypotheses testing, managerial implications, and conclusion.

Based on the literature reviewed and the theoretical framework, the hypotheses which have been advocated are:

H1: Personalization using Artificial Intelligence tools leads to Enhanced Customer Experience

H2: Quality of Service using Artificial Intelligence tools leads to Enhanced Customer Experience

H3: Hassle-free Service using Artificial Intelligence tools leads to Enhanced Customer Experience

H4: Personalization, Quality of Service, Hassle-free Service using Artificial Intelligence tools leads to Enhanced Customer Experience



IV. RESEARCH METHODOLOGY

A survey was conducted on 207 young and middle-aged individuals, to understand if use of chatbots by telecom operators will lead to improvement in overall customer experience. A questionnaire was circulated to understand people’s perspective on using Chabot’s services on their telecom operator’s website and mobile application. The study makes use of both uses both primary as well as secondary for analysis. Secondary data was used for the study for understanding the various AI tools which can enhance customer experience and primary data was used to examine and analyse the impact of these AI tools on customer experience for telecom operators.

Interpretive group of methods (Qualitative Study) is used for understanding the perspective of customers regarding the use of Chabot services by the telecom operators. The reason for choosing chatbots as the AI tool was that as chatbot is the most common AI tool and hence the population of our survey is well acquainted with chat bot and its functionalities and its potential benefits.

V. DATA ANALYSIS, RESULTS AND DISCUSSIONS

5.1 Profile of Respondents

Table 1 represents the demographics and geographies of the survey population for the study. It shows an even distribution of the survey population. However, it can be noted that due to network enhancement by the network providers, the survey population is skewed towards only 4G Network and as this study is based on cutting edge technology such as Artificial intelligence the questionnaire was restricted mainly towards younger population who understand technology and can reap the underlying benefits.

Table 1: Profile of the Respondents

Variable	Percentage
Gender	
Male	52.1%
Female	47.9%
Connection Type	
Prepaid	59.4%
Post paid	40.6%
Network Type	
Only 3G Enabled	10.6%
Only 4G Enabled	68.2%
Both 3G and 4G	21.2%
Age	
15-24 Years	25%
25-35 Years	22.3%
36-45 Years	31.4%
46-55 Years	19.3%
56 and above	2%

5.2 Scale reliability (Cronbach alpha and KMO Bartlett test)

Reliability defines the consistency of various measures used to conduct the research. Reliability can be defined as the degree to which test consistently measures an attribute. Cronbach’s Alpha (α) is considered as the basic and the most famous tool for measuring the scale reliability of a research. Alpha of 0.7 is an acceptable reliability and is accepted as the threshold value of scale reliability test. In this case, the survey questionnaire uses a 5-point rating scale and the reliability is checked with Cronbach’s Alpha Value which is found to be 0.803 as given in Table 2.

Table 2: Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
0.803210	15

KMO determines the proportion of variance in the variable that can be resulted from an underlying factor. KMO tests whether the partial correlations among variable are less significant. The basic guidelines for KMO values are:

- Less than 0.05 is taken as poor
- Within the range 0.5 and 0.6 is taken to be average
- Within the range 0.6 and 0.7 is taken to be acceptable
- Within the range 0.7 and 0.8 is taken to be good
- More than 0.8 is considered excellent

Bartlett’s test of Sphericity

This test aims to determine whether the correlation matrix is an identity matrix (the diagonal value is 1) and the off-diagonal values are zero. This concludes that the values do not depend on each other and thus the factor model is inappropriate. If the p value of the test is less than 0.05, identity matrix can be eliminated.

Table 3 data shows that, KMO value is 0.762 which is considered good. By that we can ensure that the study is appropriate for factor analysis. However, the Bartlett’s test shows the value is 0.000 which is less than 0.005 meaning the factors that form the variable is satisfactory. The outcome reveals that there are no high correlations or coefficient among the items.

Table 3: KMO and Bartlett’s Test Result

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.762
	Approx. Chi-Square	188.723297
Bartlett's Test of Sphericity	Df	6
	Sig.	0.00

5.3 Hypothesis Testing

5.3.1 Linear Regression

Linear regression is primarily used for predictive analysis. The overall idea of linear regression is to understand how the independent variable is significant predictors of the outcome variable.

In this case we want to understand how the independent variables i.e. Personalization, Quality of Service and Hassle-free service using artificial intelligence tools leads to enhanced customer experience.

5.3.2 Hypothesis

H1: Personalization using artificial intelligence tools lead to Enhanced Customer Experience

H2: Quality of Service using artificial intelligence tools lead to Enhanced Customer Experience

H3: Hassle-free Service using artificial intelligence tools lead to Enhanced Customer Experience.

H4: Personalization, Quality of Service, Hassle-free Service using AI tools leads to Enhanced Customer Experience.



5.3.3 Analysis

H1: Personalization using AI tools leads to Enhanced Customer Experience

The dependant variable is Customer experience and the independent variable is personalisation.

Table 5 represents that 80.7% of the variance in Customer Experience is caused by Personalization. Annova (Table 6) shows that explained variance is more than unexplained variance and therefore F is significant. Coefficients (Table 7) show that Personalisation is a positive contributor to Customer Experience as the significance value is close to 0.

Customer Experience = (0.503) Personalisation + 2.827

Based on the analysis, the H1 stands accepted.

Table 4: Variable Entered/Removed for Personalisation

Variables Entered/Removed ^a			
Model	Variables Entered	Variables Removed	Method
1	Personalisation ^b		Enter

a. Dependent Variable: Customer_Exp

b. All requested variables entered.

Table 5: Model Summary for Personalisation

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.898 ^a	.807	.806	.896

a. Predictors: (Constant), Personalisation

Table 6: ANOVA Table for Personalisation

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	691.168	1	691.168	861.806	.000 ^b
	Residual	165.212	206	.802		
	Total	856.380	207			

a. Dependent Variable: Customer_Exp

b. Predictors: (Constant), Personalisation

Table 7: Coefficients table for Personalisation

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.827	.260		10.889	.000
	Personalisation	.503	.017	.898	29.357	.000

a. Dependent Variable: Customer_Exp

H2: Quality of service using AI tools leads to Enhanced Customer Experience

The dependant variable is Customer Experience and the independent variable is Quality of Service

Table 9 represents that 42% of the variance in Customer Experience is caused by Quality of Service. Annova (Table10) shows that explained variance is more than unexplained variance and therefore F is significant. Coefficients (Table 11) show that Quality of Service is a positive contributor to Customer Experience as the significance value is close to 0.

Customer Experience= (0.225) Quality of Service + 6.159

Based on the analysis, the H2 stands accepted.

Table 8: Variable Entered/Removed for QoS

Variables Entered/Removed ^a			
Model	Variables Entered	Variables Removed	Method
1	QoS ^b		Enter

a. Dependent Variable: Customer_Exp

b. All requested variables entered.

Table 9: Model Summary for QoS

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.205 ^a	.042	.037	1.996

a. Predictors: (Constant), QoS

Table 10: ANOVA Table for QoS

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.066	1	36.066	9.057	.003 ^b
	Residual	820.314	206	3.982		
	Total	856.380	207			

a. Dependent Variable: Customer_Exp

b. Predictors: (Constant), QoS

Table 11: Coefficient table for QoS

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.159	1.358		4.534	.000
	QoS	.225	.075	.205	3.009	.003

a. Dependent Variable: Customer_Exp

H3: Hassle-free service using AI tools leads to Enhanced Customer Experience

The dependant variable is Customer Experience and the Independent variable is Hassle-free service.

Table 13 represents that 43.9% of the variance in Customer Experience is caused by Hassle-free Service. Annova (Table 14) shows that explained variance is more than unexplained variance and therefore F is significant. Coefficients (Table 15) show that Hassle-free Service is a positive contributor to Customer Experience as the significance value is close to 0.

Customer Experience=(0.702) Hassle-free Service – 1.629

Based on the analysis, the H3 stands accepted.

Table 12: Variable Entered/Removed for Hassle-free Service

Variables Entered/Removed ^a			
Model	Variables Entered	Variables Removed	Method
1	Hasslefree_Service ^b		Enter

a. Dependent Variable: Customer_Exp

b. All requested variables entered.

Table 13: Model Summary for Hassle-free Service

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.662 ^a	.439	.436	1.528

a. Predictors: (Constant), Hasslefree_Service



Table 14: ANOVA Table for Hassle-free Service

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	375.675	1	375.675	160.991	.000 ^b
	Residual	480.705	206	2.334		
	Total	856.380	207			

a. Dependent Variable: Customer_Exp
b. Predictors: (Constant), Hasslefree_Service

Table 15: Coefficients Table for Hassle-free Service

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.629	.940		-1.733	.085
	Hasslefree_Service	.702	.055	.662	12.688	.000

a. Dependent Variable: Customer_Exp

H4: Personalisation, Quality of Service and Hassle-free service using AI tools leads to Enhanced Customer Experience. The dependent variable is Customer Experience and the Independent variables are Personalisation, Quality of Service and Hassle-free service.

From Table 17, we see that 97% of the variance in Customer Experience is caused by Personalization, Quality of Service and Hassle-free Service. ANOVA (Table 18) shows that explained variance is more than unexplained variance and therefore F is significant. Coefficients (Table 19) show that Hassle-free Service, Personalisation and QoS are positive contributors to Customer Experience as the significance value is 0.

$$\text{Customer Experience} = 0.428\text{QoS} + 0.374\text{Hasslefree_Service} + 0.411\text{Personalisation} - 9.984$$

Based on the above analysis, the H4 stands accepted.

Table 16: Variable Entered/Removed for all independent variable

Variables Entered/Removed ^a			
Model	Variables Entered	Variables Removed	Method
1	Personalisation, QoS, Hasslefree_Service ^b		Enter

a. Dependent Variable: Customer_Exp
b. All requested variables entered.

Table 17: Model Summary for all independent variable

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.987 ^a	.975	.974	.327

a. Predictors: (Constant), Personalisation, QoS, Hasslefree_Service

Table 18: ANOVA Table for all independent variable

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	834.574	3	278.191	2602.574	.000 ^b
	Residual	21.806	204	.107		
	Total	856.380	207			

a. Dependent Variable: Customer_Exp
b. Predictors: (Constant), Personalisation, QoS, Hasslefree_Service

Table 19: Coefficients Table for all independent variable

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-9.894	.362		-27.337	.000
	QoS	.428	.013	.391	33.229	.000
	Hasslefree_Service	.374	.015	.353	24.552	.000
	Personalisation	.411	.008	.735	53.346	.000

a. Dependent Variable: Customer_Exp

VI. MANAGERIAL IMPLICATIONS

Customer Experience is something that is very difficult to quantify, however, the linear regression equations help us understand the requirement of Personalisation, Quality of Service and Hassle-free service using AI tools as a positive contributor to Enhanced Customer Experience.

Chatbots will help the telco's drive up Customer Experience and use of technology to satisfy and retain customers in a price-competitive market. Telco's with their huge user bases will have a considerable effect on the Customer Engagement on its successful implementation.

Depending upon the requirement of the organisation, chatbots can differ on its functionality. It can range from a simple WhatsApp API integration to AI Algorithm allowing the bot to learn from different user interaction. The implementation of the Chatbot application largely depends on the organisation that is implementing the process. It can either be in the technical support field as well as customer interaction field. The right choice is to select an AI tool that aligns with the business objective of the implementation.

The implementation of chatbots for telcom companies is a much-needed step in a hypercompetitive market for improving their services leading to better user engagement, enhanced customer experience and cost-saving that will help the company to improve its service level.

VII. CONCLUSION

The intensive competition in the market today has made customer satisfaction a key parameter of concern for the companies. The objective of this study was to understand the increasing impact of the various tool and techniques of artificial intelligence in delivering a hassle-free, superior quality, and personalized experience to the customers. For this, a quantitative analysis approach has been adopted. From the study, we can see that various tools of artificial intelligence such as chatbots, virtual assistants, and content curation have been able to give a satisfactory business experience to the customers thus creating better brand loyalty. AI has resulted in more accurate predictions that help in providing a smooth service to the customers in the least amount of time. AI has made it possible to personalize the channels of approach and communication with the customers thus strengthening the engagement and trust associated with the brand.

H1	Personalization using AI tools leads to Enhanced Customer Experience	Accepted
H2	Quality of Service using AI tools leads to Enhanced Customer Experience	Accepted
H3	Hassle-free Service using AI tools leads to Enhanced Customer Experience.	Accepted
H4	Personalization, Quality of Service, Hassle-free Service using AI tools leads to Enhanced Customer Experience	Accepted

However, along with the benefits of AI come the concerns for privacy among the customers. The display of similar content on various online platforms as searched by the customers previously might impact a segment of the market negatively, as they might not entertain involvement in their preferences and choices.



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Customers do want personalized service but are unwilling to share their personal information. Nevertheless, with the emergence of technologies like blended AI, privacy can be regained. Future research can be proposed in the area of how AI can integrate with other technologies like RPA, Natural Language Processing and data analytics to impact the growing market trends and CRM in the upcoming years. Secondly, research can be initiated as to how AI tools can influence the market amidst COVID-19 pandemic.

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