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[USABILITY AND RESPONSIVENESS OF ARTIFICIALLY INTELLIGENT CHATBOT ON CUSTOMER E-RETAILING EXPERIENCE]

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ABSTRACT

Artificial Intelligence (AI) is rapidly transforming how marketers are interacting with the customer today. This paper investigates the intricacies of the relationship between usability and responsiveness of artificial intelligence chatbots on customer satisfaction in e-retailing, while examining the mediating role of both extrinsic and intrinsic values on customer satisfaction. The sample comprised of 390 active users of ecommerce in Lahore, Pakistan, who had frequent interactions with chatbots. The data was analyzed using Pearson correlation and Process Haye's. The findings revealed a significant relationship between usability, responsiveness, and customer satisfaction. Furthermore, extrinsic and intrinsic values during online customer experience were found to have significant and full mediation on the relationship between usability, responsiveness and customer satisfaction. The findings of the study provide useful implications for marketing practitioners to leverage AI technologies in optimizing their marketing endeavors.

Keywords: Chatbot Usability, Chatbot Responsiveness, Technology Acceptance Model

Introduction

The goal of artificial intelligence (AI), an innovative area in the realm of computer science, is to build intelligent systems that are capable of replicating human intelligence and doing tasks that would normally require intervention from humans. An industry-wide shift in traditional customer service is observed in the form of chatbot marketing to provide efficient and affective digital solutions (Desaulniers, 2016; Forbes, 2017; Fryer, 2019). Chatbots, a prime example of AI application, have made significant strides in usability and responsiveness, playing an important role in customer satisfaction (Belanche et al., 2019; Cheng & Jiang; 2020b; Davenport, 2020). Chatbots are a subset of AI that mimic human-like communication through the use of natural language processing, machine learning, and decision-making algorithms that makes them helpful for tasks such as customer service, virtual help, and information retrieval (Pappas, 2014).

Customer satisfaction is greatly influenced by the usability of AI chatbots and how quickly they respond to consumer inquiries. This study inspects the role of AI and chatbots in boosting customer satisfaction in the Pakistani online retailing context through recognizing important factors of consumer satisfaction with chatbots and quantifying the influence of AI technology on the overall customer experience (Haleem, 2022). To better identify how consumers perceive connections with chatbots, this study employs two established theoretical frameworks: The Technology Acceptance Model (TAM) and the Information System Success Model (ISSM) (Davis, 1989; McLean, 2004). TAM's assumes technology acceptance to be influenced by two main elements: perceived ease of use and perceived utility. It states that individuals are more likely to accept a technology if they find it user friendly and believe it can help them meet their requirements or solve their problems (McLean, 2004).

Despite the fact that use of chatbots is gaining momentum, academicians and researchers need to look into how chatbot marketing efforts can improve overall user satisfaction. This paper explores the influence of AI chatbot usability and responsiveness on customer satisfaction in e-retailing. It identifies the complex dynamics involved in customers' interactions with AI chatbots, focusing on achieving a more human-like

conversational experience and conveying apposite consumer services and value. Furthermore, it also examines the mediating role of intrinsic and extrinsic values in these relations.

Literature Review and Hypotheses Development

Intrinsic Value as a mediator between Chatbot usability and Customer Satisfaction

Chatbot usability and intrinsic value have emerged as important predictors of customer experience and satisfaction. Chaves (2022) suggests that the ease, with which users may communicate with a chatbot to successfully and efficiently accomplish their goals, is referred to as chatbot usability. You et al., (2023), who investigated the effects of chatbot interface design on user satisfaction, discovered that chatbots, with visually interesting and straightforward interfaces, had higher usability ratings and were happier with their entire experience.

The term intrinsic value refers to the internal motives and convictions that shape the views and behaviors of individuals (Deci, 1985). In the case of AI chatbots, intrinsic value might appear as an awareness of independence, ability, and connection during the contact (Deci, 2004). Previous studies have found a favorable association between chatbot usability and user satisfaction (Venkatesh, 2016). Given that, intrinsic value includes aspects such as independence and expertise, consumers tend to perceive extremely useful chatbots as more competent of achieving their demands, hence increasing their intrinsic value perception. According to research, intrinsic value has a substantial impact on consumers' attitudes and behaviors towards technology (Deci, 2004; Sundar, 2019). Users that sense a higher degree of intrinsic value in their communications with chatbots are more inclined to be satisfied with their whole encounters, as they sense more involved and satisfied during the contact. Therefore:

H₁: Intrinsic value of online customer experience mediates the relationship between AI chatbot usability and customer satisfaction.

Extrinsic Value as a mediator Chatbot Responsiveness and Customer Satisfaction

Chatbots' responsiveness, which refers to their usefulness and efficiency in responding to consumer requests, is seen as an important factor influencing customer satisfaction (Jeewoo, 2022; Jungkun, 2022). Customers feel more comfortable and appreciated when chatbots respond rapidly, are easy to reach, in addition always available when required (Roy, 2018), and they like interacting with a chatbot (Chung, 2020). Generally, responsiveness refers to quickness of response or service efficiency (Tiwana, 1998; DeLone, 2001).

Response time serves as a social cue, eliciting social responses. Unlike human users, who take their time reading and responding to messages, chatbots may answer practically immediately. Extrinsic value that refers to the perceived advantages and usefulness that customers gain from utilizing a product or service, identified as a crucial element determining customer satisfaction. Extrinsic value refers to the concrete benefits that clients feel from utilizing chatbot, such as time saving, convenience, and access to information (Chang et. al, 2009). Factors such as cost and time saving, as well as other extrinsic advantages encourage consumers.

Moreover, extrinsic value serves as a bridge between chatbot response and customer satisfaction by providing quick, relevant and relievable responses (Kim, 2020). Responsive interactions satisfy users' immediate demands while also contributing to

their impression of extrinsic value. When consumers see a chatbot as not just responsive but also capable of providing extra advantages, their level of satisfaction is likely to rise, which shows mediation. Extrinsic value therefore acts as an important factor between responsiveness and customer satisfaction during chatbot conversations. Therefore,
H₂: Extrinsic value of online customer experience mediates the relationship between AI chatbot responsiveness and customer satisfaction.

Extrinsic Value as a mediator between Chatbot Usability and Customer Satisfaction

Extrinsic value can be related to the utilitarian attributes of chatbots, which are the cognitive benefits or practical advantages users gain from interacting with the technology (agarwal, 2017). A chatbot with high system quality is easy to use, reliable, and provides quick responses, which can improve user satisfaction with the technology. Both of these attributes contribute to the extrinsic value of chatbots by providing users with practical benefits and enhancing their overall experience and satisfaction with the technology (Brah, 2006).

Online customer experience refers to the overall impression and satisfaction a customer feels when interacting with a brand or organization through digital networks, such as websites, mobile apps, social media platforms, and online chat services (Campbell, 2020). Usability and customer satisfaction are closely intertwined concepts in the realm of online customer experience. Usability refers to the ease of use and the user-friendliness of a website, app, or any digital platform, whereas customer fulfillment is a degree of how products or services delivered by a company meet or exceed customer expectations (Chesbrough, 2006). Usability plays a critical part in shaping the online customer experience and openly affects customer satisfaction. A focus on usability, combined with ongoing measurement and improvement efforts, can help businesses create a positive online experience that meets customer needs, reduces frustration, builds trust, and ultimately leads to higher customer satisfaction and loyalty (Tiwana, 1998).

It is seen that the role of chatbots in influencing customer satisfaction and the subsequent impact on the usability (Fryer et al., 2019). It develops online customer experience is positively influencing the positive relationship between the chatbot usability and customer satisfaction that considers both the utilitarian (cognitive) and hedonic (affective) attributes of chatbots and their effects on customer satisfaction.

H₃: Extrinsic value of online customer experience mediates the relationship between AI chatbot usability and customer satisfaction.

Intrinsic Value as a mediator between Chatbot Responsiveness and Customer Satisfaction

Intrinsic values profoundly influence how customers interact with chatbots. Fulfilling these psychological needs during interactions fosters a sense of self-determination, thereby enhancing the overall customer experience (Boyd, 2022). This intrinsic value proposition is pivotal as it mediates the connection between chatbot responsiveness and consumer satisfaction.

Understanding the interplay between intrinsic values and chatbot responsiveness is thus imperative for optimizing customer service outcomes and fostering positive attitudes towards chatbots. (Jiménez-Barreto, 2021). The relationship between intrinsic value from social media use and chatbot responsiveness and customer satisfaction is

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complex (Trivedi, 2019). Personality traits influence social media usage patterns, with extraverts favoring interaction, while neurotic individuals prefer contemplation (Correa, 2010).

Openness to new experiences correlates with increased engagement. Understanding these dynamics is crucial for improving chatbot responsiveness and customer satisfaction across various sectors (Cordero, 2022). Mediating factors play a vital role in forming the relationship between functionality and satisfaction. Likewise, similarity in communication style between customers and chatbots has been found to impact satisfaction through perceived credibility, transparency, informativeness, enjoyment and engagement (Drift, 2021). Therefore,

H₄: Intrinsic value of online customer experience mediates the relationship between AI chatbot

Methodology

Research Design

This study is cross-sectional in nature and the setting is Non-contrived, because data from respondents collected under normal working conditions through online survey without any interference. To understand the relationships between various factors descriptive, Non-experimental, quantitative, and correlational research design is adopted.

Population & Sampling

A sample of 390 respondents including both males and female customers using e-commerce websites in Lahore, Pakistan was deployed using convenience sampling method. "Convenience sampling refers to a type of nonprobability or nonrandom sampling where members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included for the purpose of the study (Naseri, 2022).

Instrument and Measures

A Questionnaire was formulated in English having closed-ended questions incorporating 5-point Likert scale, ranging from 1 (strongly agree) to 5 (strongly disagree). Existing scale from the literature were adopted for this research. To measure customer satisfaction, the item scale, consisting for four items). A sample item includes: I am satisfied with the chatbot. For Chatbot usability, we adopted (Chen, 2021; Rose, 2012; Finstad, 2010) item scale, which consisted of nine items. A sample item includes: The chatbot can help you easily find your way around online shopping websites, searching with the chatbot saves me time. For Chatbot Responsiveness, an item scale consisting of four items was adopted from (Chen, 2021; Rose, 2012; Finstad, 2010). A sample item includes: The chatbot responds quickly, communicating with the chatbot is simple.

Extrinsic Value consisted of six items and Intrinsic Value consisted of four items and they both were measured using an item scale proposed by (Chen, 2021; Chung, 2020; Rose, 2012). A sample item for extrinsic value include: The chatbot makes me feel as if it is speaking to me personally as a customer. Whereas, the sample item for intrinsic value includes: The chatbot assists me in gathering extra information on goods or services.

Statistical Tools and Techniques

The statistical tool used is IBM SPSS version 25 and the statistical techniques, used to analyze the data, was Pearson's Correlation. For hypotheses testing, Hayes' process was deployed.

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Data Analysis & Results

Table 4.1

Descriptive Analysis of Variables

Variables	Minimum	Maximum	Mean	Std. Deviation
Chatbot Usability	1.00	4.56	2.2415	0.72970
Chabot Responsiveness	1.00	4.75	2.2481	0.77797
Extrinsic Value	1.00	5.00	2.2662	0.76296
Intrinsic Value	1.00	5.00	2.2863	0.82921
Customer Satisfaction	1.00	4.56	2.2415	0.72970

The descriptive analysis shows that the variables related to chatbot performance and customer satisfaction indicate similar range, with minimum values of 1.00 and maximum values ranging from 4.56 to 5.00. The means for chatbot usability (2.24) and customer satisfaction (2.24) are slightly lower compared to chatbot responsiveness (2.25), extrinsic value (2.27), and intrinsic value (2.29). Standard deviations range from 0.729 to 0.829, exhibiting moderate variability in responses across the variables.

Table 4.2

Reliability Analysis (Cronbach's Alpha)

Variables	Items	Cronbach's Alpha
Chatbot Usability	9	0.865
Chabot Responsiveness	4	0.710
Extrinsic Value	6	0.809
Intrinsic Value	3	0.70
Customer Satisfaction	4	0.713

Cronbach's alpha was used to evaluate the validity and internal consistency of the item scale. The table 4.1 shows that chatbot usability, exhibits high internal consistency, reflected by a Cronbach's alpha of 0.865, chatbot responsiveness shows acceptable reliability with a Cronbach's alpha of 0.71, extrinsic value and intrinsic value with alpha values 0.809 and 0.70 also indicates good reliability. Lastly, customer satisfaction shows adequate reliability with an alpha value of 0.713.

Table 4.3

Pearson Correlational Matrix

Variables	CU	CR	EV	IV	CS
CU	1				
CR	.737**	1			
EV	.713**	.712**	1		
IV	.613**	.615**	.734**	1	
CS	.744**	.655**	.719**	.655**	1

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

The table 4.3 shows significant correlations among all variables. Chatbot usability (CU) has a strong correlation with chatbot responsiveness (CR) ($r=.737$, $p < 0.01$), with extrinsic value (EV) at ($r=.713$, $p < 0.01$), with intrinsic value (IV) ($r =.613$, $p < 0.01$), and with customer satisfaction (CS) at ($r = .744$, $p < 0.01$) . Secondly, chatbot responsiveness (CR) has a strong and significant correlation with extrinsic value (EV) ($r = .712$, $p < 0.01$), with intrinsic value (IV) ($r =.615$, $p < 0.01$), and with customer satisfaction (CS) ($r =.655$, $p <$

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0.01). Similarly, extrinsic value (EV) shows a strong and significant positive correlation with intrinsic value (IV) ($r = .734$, $p < 0.01$) and customer satisfaction (CS) ($r = .719$, $p < 0.01$). Lastly, intrinsic Value (IV) also shows a significant but moderate correlation with customer satisfaction (CS) ($r = .655$, $p < 0.01$).

Table 4.4
Process Haye's (Model 6)

Y = CS						
X = CU						
M1 = EV						
M2 = IV						
Predictor	Outcome = EV					
	(Coeff)	(SE)	(t)	(p)	(LLCI)	(ULCI)
Constant	.596	.088	6.791	.000	.423	.769
CU	.745	.037	20.011	.000	.672	.818
Predictor	Outcome = IV					
	(Coeff)	(SE)	(t)	(p)	(LLCI)	(ULCI)
Constant	.334	.096	3.480	.001	.145	.523
CU	.208	.055	3.786	.000	.100	.316
EV	.656	.053	12.473	.000	.552	.759
Predictor	Outcome = CS					
	(Coeff)	(SE)	(t)	(p)	(LLCI)	(ULCI)
Constant	.214	.079	2.718	.007	.059	.369
CU	.447	.045	9.889	.000	.358	.536
EV	.261	.050	5.200	.000	.163	.360
IV	.172	.041	4.190	.000	.091	.253
Total, direct and indirect effects of X on Y						
Total effect of X on Y						
	Effect	(SE)	(t)	(p)	(LLCI)	(ULCI)
	.762	.035	21.962	.000	.693	.830
Direct effect of X on Y						
	Effect	(SE)	(t)	(p)	(LLCI)	(ULCI)
	.447	.045	9.889	.000	.358	.536
Indirect effect of X on Y						
	Effect	BootSE	BootLLCI	BootULCI		
Ind1	.195	.048	.105	.292		
Ind2	.036	.016	.010	.070		
Ind3	.084	.028	.031	.141		

In Model 6 of the PROCESS Haye's, the impact of chatbot usability (CU) on customer satisfaction (CS) through two mediators; extrinsic value (EV) and intrinsic value (IV) is measured. The model shows that CU to have a significant direct effect on EV ($R^2 = .508$, $p < .001$, $\beta = .745$). Whereas, EV significantly influences IV ($R^2 = .555$, $p < .001$), with CU and EV coefficients of .208 and .656 respectively ($p < .001$). The final outcome variable, CS, is significantly affected by CU, EV, and IV ($R^2 = .642$, $p < .001$, $\beta = .447$, $\beta = .261$, and $\beta = .172$ respectively). The total effect of CU on CS is .762 ($p < .001$), with a direct effect of .447 ($p < .001$) and a total indirect effect of .315 ($p < .001$). Specific indirect effects are noted

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through EV (Ind1 = .195), IV (Ind2 = .036), and the sequential mediation of EV and IV (Ind3 = .084). The analysis confirms significant mediation pathways, highlighting the importance of EV and IV in linking CU to CS.

Table 4.5
Process Hayes's (Model 6)

Table 4.5						
Results of Model 6						
Y = CS						
X = CR						
M1 = EV						
M2 = IV						
Predictor	Outcome = EV					
	(Coeff)	(SE)	(t)	(p)	(LLCI)	(ULCI)
Constant	.697	.083	8.378	.000	.533	.860
CR	.698	.035	19.966	.000	.629	.767
Predictor	Outcome = IV					
	(Coeff)	(SE)	(t)	(p)	(LLCI)	(ULCI)
Constant	.358	.093	3.838	.000	.175	.542
CR	.201	.051	3.906	.000	.100	.302
EV	.652	.052	12.426	.000	.548	.755
Predictor	Outcome = CS					
	(Coeff)	(SE)	(t)	(p)	(LLCI)	(ULCI)
Constant	.367	.083	4.406	.000	.203	.530
CR	.238	.046	5.195	.000	.148	.329
EV	.368	.054	6.774	.000	.261	.474
IV	.204	.044	4.580	.000	.116	.291
Total, direct and indirect effects of X on Y						
Total effect of X on Y						
	Effect	(SE)	(t)	(p)	(LLCI)	(ULCI)
	.629	.037	17.085	.000	.556	.701
Direct effect of X on Y						
	Effect	(SE)	(t)	(p)	(LLCI)	(ULCI)
	.238	.046	5.195	.000	.148	.329
Indirect effect of X on Y						
	Effect	BootSE	BootLLCI	BootULCI		
Ind1	.257	.057	.153	.375		
Ind2	.041	.017	.012	.076		
Ind3	.093	.026	.044	.146		

Interpretation

In Model 6 of the PROCESS Hayes, the analysis explores the influence of chatbot responsiveness (CR) on customer satisfaction (CS) through two mediators, extrinsic value (EV) and intrinsic value (IV). The analysis indicates that CR has a significant effect on EV ($R^2 = .507$, $p < .001$), $\beta = .698$). EV significantly impacts IV ($R^2 = .556$, $p < .001$), with CR and EV ($\beta = .201$ and $\beta = .652$ respectively). The final outcome variable, CS, is significantly influenced by CR, EV, and IV ($R^2 = .581$, $p < .001$), with coefficients of .238, .368, and .204,

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respectively ($p < .001$). The total effect of CR on CS is .629 ($p < .001$), with a direct effect of .238 ($p < .001$) and a total indirect effect of .390 ($p < .001$). Specific indirect effects include the pathways through EV (Ind1 = .257), IV (Ind2 = .041), and the sequential mediation of EV and IV (Ind3 = .093). The analysis highlights significant mediation pathways, demonstrating the roles of EV and IV in the relationship between CR and CS.

Discussion

It can be inferred from the results that chatbot adoption in online retailing could improve customer experience and, consequently, consumer satisfaction in terms of responsiveness and usability. Our findings on AI chatbot usability and responsiveness in Pakistani e-retailing align with (Chen, 2021) study, which reported similar user satisfaction levels in the USA. However, Chen's multi-group research indicates that the influence of chatbot usability on extrinsic values varies by country. While Chen found lower chatbot efficiency in Asia, our study shows high efficiency in Pakistan, likely due to local adaptation. These comparisons highlight the unique contributions of our study to understanding AI chatbot implementation in Pakistani settings.

The usability of the chatbot significantly influences intrinsic and extrinsic values of online customer experience (Fornell, 1994). Chatbots that score high on usability provide a customized experience, solve customers' problems, make customers feel comfortable and valued, and cause customers to view retail businesses that adopt chatbots as innovative. Also, the responsiveness of the chatbot has robust positive effects on intrinsic and extrinsic values of customer experience, such that customers can receive benefits with little effort and acquire additional information from the chatbot. The relationship between customer satisfaction and chatbot usability/ responsiveness is strongly mediated by intrinsic and extrinsic values of online customer experience

Also, the perceived extrinsic values of customer experience positively influence customer satisfaction. Specifically, customers are pleased and satisfied when they can receive customized conversation, get their problems solved, as well as feel comfortable and valued when interacting with a chatbot. In addition, when customers think that the company adopting the chatbot is innovative, they will recommend it to others. Similarly, perceived intrinsic values of customer experience positively influence customer satisfaction. It could be that customers are satisfied when they receive benefits as well as additional information from using the chatbot with little effort, and this motivates them to recommend the chatbot to others. This evidence indicates that positive customer experiences of the usability and responsiveness of a chatbot create a high level of customer satisfaction.

Conclusion

The study delves into AI chatbot usability and responsiveness in Pakistani e-retailing, correlating them with intrinsic and extrinsic values, customer satisfaction, and overall online experience. It emphasizes the importance of technology acceptance and ease of use in driving chatbot adoption. Improved usability fosters customer satisfaction by enhancing the experience, while responsiveness ensures easy access to information, highlighting chatbots' effectiveness as customer support. The research reveals how intrinsic and extrinsic values mediate the relationship between customer satisfaction and chatbot usability/responsiveness, underlining the need for customer-centric design. With the growing utilization of AI chatbots in Pakistan's e-commerce landscape, the study

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suggests their potential to transform online shopping experiences, stressing the significance of customer-centric strategies for sustained growth.

Managerial Implications and Future Directions

Despite the contributions of this study, there is room for further exploration. First, it is essential to allow organizations to prioritize not only the improvement of intrinsic aspects, such as user experience and enjoyment, but also extrinsic factors like practicality when considering ways to boost chatbot use. Second, to achieve maximum customer satisfaction, timely delivery and usability must be emphasized. For a more satisfying chatbot experience, user-centric design should address functional, experiential, and responsive components. Moreover, sustaining engagement and value requires continuous improvement of response mechanisms.

Third, recognizing the influence of user demographics on chatbot usage patterns can help tailor features and content to specific user groups, aligning with their needs and expectations. Improving chatbot usability alone is insufficient. Prioritize the responsiveness of chatbots to ensure quick and relevant responses, which significantly improve perceived usefulness and enjoyment. Continuous monitoring and improvement of response mechanisms are essential. This study also has several valuable implications for managers. Online retail businesses should identify which elements of usability and responsiveness in chatbots, along with which extrinsic and intrinsic values in customer experience, best fit their business model.

Additionally, the regular data collection and analysis of user feedback will help in improvement of iterative refinements of chatbot features that ultimately is helpful for maintaining high usability and responsiveness. Lastly, diversity and authenticity of sample is recommended for diverse backgrounds in alignment for future research advancement.

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