

Artificial Intelligence Impact on Customer Experience: Conceptualization, and a Proposed Model

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Abstract

This study investigates whether highly complex AI algorithms improve customer experience more effectively than simpler algorithms that reduce AI opaqueness. Additionally, it explores the impact of increased personalization on customer experience and whether limiting personalization is more effective in preserving trust in the brand. A review of the literature reveals that published research on this topic is scarce, with no studies providing comprehensive answers to the questions addressed in this field. This paper proposes a model for assessing the factors impacting customer experience while utilizing Artificial Intelligence chatbots for mobile services. A qualitative, exploratory approach has been adopted to qualify the developed model. The study contributes to the literature by presenting an effective model that will be empirically tested in future studies, enabling business owners to identify the primary factors to prioritize when designing an AI chatbot service.

Keywords

AI Chat bot Service; AI Customer Experience Antecedents; Trust; AI Opaqueness; Convenience; Personalization

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1. Introduction

AI is completely transforming the way customers interact with and perceive brands. Due to the limited empirical research in the topic of AI-enabled customer experiences, especially for mobile AI services, this study aims to scientifically analyze the AI integration in customer service could result in an improved customer experience and its impact on improving customer experience, and identifies the antecedents of such enhancement.

The primary focus is on the mobile telecom users. Although this relationship, especially in the context of shopping services, is addressed in the literature, there is a lack of a validated model that captures all the constructs along with their interconnected relationships within the field of mobile AI chatbot services.

To achieve this objective, the literature on AI-enabled customer experience and chatbot services has been thoroughly reviewed to identify all possible constructs that may impact these services; consequently, the preliminary conceptual model presented in Figure 1 is based on the service quality model Parasuraman et al. 1994 and the trust-commitment theory (Morgan & Hunt, 1994).

The preliminary model in this study integrates both perceived sacrifice and trust as mediating factors between personalization, AI-enabled service quality, and convenience on one side, and AI-enabled customer experience on the other side. Furthermore, it demonstrates that trust mediates the relationship between AI opaqueness and AI-enabled customer experience. According to the literature, Figure 1 presents various scattered constructs that could impact the AI-enabled customer experience.

To apply the principles of parsimony, an exploratory study has been conducted through candidate interviews. To focus on new constructs requiring testing while excluding those assessed as non-essential, from candidate's perspective, or whose impacts are well-established within the business, the exploratory study aims to identify significant constructs that may influence the AI-enabled customer experience but were not addressed in the existing literature review.

Candidates have been selected from the same working environment where the problem statement originated in order to maintain the context relevance of the study; consequently, this approach enables testing the influential variables that could impact the problem and add value to the business.

2. Literature Review

2.1. Constructs Review

2.1.1 AI Enabled Service Qualit

Chiou and Droge (2006) and Eisingerich and Bell (2008) emphasized that both functional and technical service quality significantly influence customers' evaluation of brands. Both the type of technology employed, and its implementation formulate the

character of the brand and its initial positioning in customers' mind, thereby establishing an initial level of trust.

Li and Shang (2019) and Gallarza et al. (2017) asserted that higher service quality leads to greater perceived value among users. Additionally, research by de Medeiros et al. (2016) explained that perceived sacrifice is a prominent factor in how customers assess service quality and value.

Based on all the mentioned findings, the following hypotheses are concluded:

H1.1: AI-enabled service has a direct positive impact on trust.

H1.2: AI-enabled service quality has a direct negative impact on perceived sacrifice.

2.1.2 Personalization

Komiak and Benbasat (2006) reported that customers correlated high level of personalization with the competence of the brand. Moreover, Aguirre et al. (2015) confirmed that offering multiple options leads customers to consider the brand's advice as more unbiased, consequently enhancing their preference for the brand.

Customers who appreciate a personalized experience may exhibit reduced sensitivity to perceived sacrifices, especially in the context of AI-enabled customer experiences (Knight, 2018). Shen and Ball (2009) argued that personalization strategies may increase the users' commitment toward a brand, while Searby (2003) indicated that trust is usually associated with the personalization success.

Based on these findings, the following hypotheses are proposed:

H2.1: Personalization has a direct positive impact on trust.

H2.2: Personalization has a direct positive impact on relationship commitment.

H2.3: Personalization has a direct negative impact on perceived sacrifice.

2.1.3 Convenience

Mobility can sometimes be a significant factor in enhancing customer satisfaction (Kuo et al., 2010); a significance which has been accentuated in the post COVID-19 era (Meyer, 2020). The advantage of convenience, including time savings and accessibility from any location, have been extensively studied, especially in the context of customer experience.

Customers' engagement with the brand experience is motivated by convenience, as it eliminates obstacles to accessing services anytime and anywhere (Roy et al., 2017). Convenience positively impacts customers' trust in both the brand as well as the used technology (Ong et al., 2012). Finally, organizations utilize convenience to reduce the perceived sacrifice experienced by its clients (Kim et al., 2014). Hence, the following hypotheses are presented:

H3.1: Convenience has a direct positive impact on trust.

H3.2: Convenience has a direct negative impact on perceived sacrifice.

2.1.4 AI Opaqueness

Siau and Wang (2018) confirmed the essential role of trust in ensuring customers' acceptance of technology; otherwise, such technology would not be able to evolve or progress. The main pillars of trust in technology-dependent services include confidence in both the innovating firm as well as the technology being used (Ghazizadeh et al., 2012). Hengstler et al. (2016) noted that the process of trust becomes more complicated with AI-enabled services, since trusting the process and technology is as important as trusting the brand. Therefore, trust is probably reinforced by transparency in algorithms and functional logic (Lee & See, 2004).

According to Huang and Rust (2020), the opaqueness of complex AI solutions, where recommendations lack transparency or straightforward explanation, can diminish trust, as customers may not comprehend the outputs. Ehsan et al. (2021) also highlighted that AI complexity, and consequently its transparency and opaqueness, negatively impact users' trust. The technology type and its implementation by a service provider may serve as a proxy for the provider's character from a consumer's perspective, aiding in the establishment of an initial level of trust. An AI-enabled service perceived by customers as respectful, considerate, responsive, and supportive has the potential to inspire the brand confidence (Clarke, 2019; Wang & Lin, 2017).

AI is inadequately comprehended by users due to a lack of awareness of the AI system's internal mechanisms, which are often intentionally obscured as a result of the proprietary nature of algorithmic technical details. Users remain uncertain about the processes and rationale concerning the decisions, predictions, or conclusions of AI systems. Hence, the following hypothesis is formulated:

H4: AI opaqueness has a negative impact on trust customers have in a brand.

2.1.5 Trust Keiningham et al. (2017) argued that customers are more likely to exhibit long-term commitment to brands when they have confidence and trust, resulting in a deeper and more sustained engagement. Consequently, applying this principle to AI customer service leads to a higher level of trust during a support session for a particular brand, which enhances customer experience. Njamfa (2018) confirms that while trust positively impacts the initial customer experience, this positive relationship also extends to subsequent experiences, hence recursively enhancing the overall customer satisfaction. Therefore, a strong relation between is confirmed between brand trust and customer experience, which becomes prevalent especially within digital services. Consequently, the following hypothesis is proposed:

H5: Trust has a positive direct impact on AI-enabled- customer experience.

Previous studies demonstrated the correlation between customer experience and trust, either by considering the direct impact of trust on experience, as explained by Ling et al. (2010), or its mediating role, as explained by Martin et al. (2015). Consequently, the existence of trust strengthens the impact of convenience on customer experience. Additionally, trust contributes to the success of personalization; a main pillar of AI services (Searby, 2003), and consequently influences the link between personalization and AI-enabled service experience.

Chou (2014) highlighted that the relationship between service quality and loyalty is mediated by trust. This study proposes the role of trust in maximizing the impact of service quality, convenience, AI Opaqueness, and personalization on AI-enabled-customer experience, thus confirming its function as a mediator.

Hence, it is hypothesized that:

H5a: Trust mediates the effects of personalization, convenience, and AI-enabled service quality on AI-enabled customer experience.

2.1.6 The Effect of Trust on Relationship Commitment As highlighted by Morgan (1991), trust significantly influences relationship commitment, and in addition to its direct impact on AI-enabled customer experience, it exhibits an indirect impact on this experience through the relationship commitment construct. Therefore, the following hypothesis is formulated:

H6: Trust has a direct positive impact on relationship commitment.

2.1.7 Relationship Commitment Shukla et al. (2016) argued that calculative or functional commitment involves considering the potential costs clients may incur when switching to another brand or service. According to Keiningham et al. (2017), despite the initial experience that might generate some level of commitment, this commitment will subsequently increase the customer experience. Therefore, the following is hypothesized:

H7: Relationship commitment has a positive and direct impact on AI-enabled-customer-experience.

2.1.8 Perceived Sacrifice Previous studies emphasize the necessity of evaluating the sacrifice clients make while encountering automated services, especially when options are limited (André et al., 2018). In the context of AI-services, two additional intangible sacrifices require consideration: the absence of human interaction, as well as the potential for social isolation (Davenport et al., 2020), both of which might contribute to an unfavorable customer experience. The minimal intervention of humans in the AI automated service can hinder purchasing, especially for new users who are unfamiliar with such services. Recent studies indicate that clients prefer a balance between human agents and automation (Gauvrit, 2019). Thus, the following hypothesis is posited:

H8: Perceived sacrifice has a direct negative impact on AI-enabled customer experience.

The study also proposes that perceived sacrifice serves as a mediating factor, as hypothesized by (Ameen et al., 2021). Similarly, Bilgihan et al. (2016) highlighted the importance of personalization. Moreover, personalization participates in decreasing the consumers' perception of sacrifice, as AI-enabled services are customized to satisfy their demands. Accordingly, the impact of personalization on AI-enabled customer experience is deduced. Furthermore, studies indicate that the perception of sacrifice decreases with the provision of high-quality service (Stamenkov & Dika, 2019).

Based on these findings, the following is hypothesized:

H8a: Perceived sacrifice mediates the effects of convenience-, personalization, and AI-enabled-service quality on AI-enabled customer experience.

2.2. Proposed Model and Preliminary Hypothesis Development

Based on the literature, the following conceptual model presented in Figure 1 can be concluded:

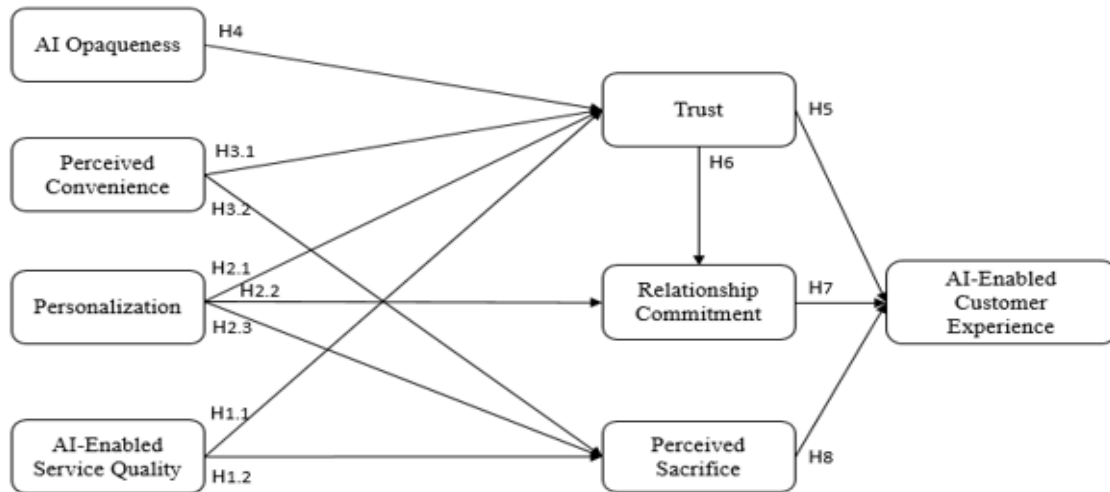


Figure 1. The Initial Proposed Model

Based on literature review and identified relationships, the researcher introduces all constructs that may directly or indirectly impact customer experience in the context of AI chatbot for mobile services, including trust and other well-known factors such as service quality. To explore these constructs, adequate qualitative interviews are needed to:

- Verify the model before empirically testing it on a larger sample, and
- Qualify the model to address business questions with parsimony, in order to remove factors that have already been extensively tested in previous studies and are no longer under question.

3. The Research Methodology

3.1. The Research Design

3.1.1 Methodology

This study employs an interpretive qualitative research approach, utilizing an inductive methodology to thoroughly understand the elements that could impact customer experience in the context of AI services for mobile companies. The adoption of an inductive approach is driven not only by the aim of presenting a comprehensive understanding and producing advanced knowledge, but also by the limited insights into this topic.

The research outcome is introducing a conceptual framework that clarifies such elements. Consequently, the constructivism paradigm has been followed, which implies the relativism ontology concentrating on the context, as described in the selected population or sample. Such ontology dictates an interactive, transactional, and subjective epistemology.

3.1.2 Population and Sampling

The approach involved interviewing a variety of IT experts working in the AI field, who were intensive users of AI mobile broadband services and employed by the mobile service company where the initial research questions were formulated. The sample size was determined based on the saturation of information, as it was observed that interviews with participants from 26th to 30th did not provide additional insights beyond those obtained from the first 25 interviewees. Therefore, the total of 30 interviewees was considered sufficient as a sample to fulfill the study's requirement.

A snowball purposive sampling method was followed in the interviews. Initially, participants were thoughtfully and purposively recruited to fully address the research semi-structured questions, and the list of candidates was updated based on the discussions from previous interviews.

3.2. Exploratory Study: The Results of Interviews per Theme

Based on the literature review, the researcher has identified four independent variables impacting AI-enabled customer experience through three mediating variables. Given that the problem statement origin is related to the business question of identifying the most important factors required for enhancing the AI-enabled customer experience in the context of mobile chatbot services, the researcher decided to interview business stakeholders in order to:

1. Explore whether there are further independent or mediating variables that could impact AI-enabled customer experience,
2. Exclude any variables identified during interviews as irrelevant to business interest, and
3. Eliminate any variables identified during interviews as well-known and self-evident, aiming to apply the principle of parsimony and avoid unnecessary detail.

A total of 30 interviewees were consulted, all of whom work for mobile service companies and are intensive users of chatbot mobile support services.

3.2.1 Theme 1 - Personalization Impact on AI customer Experience and Trust

Based on interviews, some interviewees reported that personalization positively impacts both their customer experience as well as their trust in a brand. Specifically, 18 Interviewees believed that personalization impacted both customer experience and trust, whereas 12 interviewees disagreed.

Consequently, the researcher has decided to retain Relations 1 and 2 in the summary table (Table 1) for the following reasons:

- 1- Literature has explored the impact of personalization on customer experience and trust in several studies. One article integrated three constructs into a single model although not in the mobile services field. Some studies reported a negative impact, while others reported a positive impact. Similarly, the opinions of interviewees were almost equally divided on this matter. Therefore, testing Relation1 is essential to understand whether personalization exerts a positive or negative impact on customer experience.
- 2- Similarly, 18 interviewees indicated that personalization negatively impacts trust in the brand, while 12 indicated the opposite. Hence, testing Relation 2 is also essential. Both Relation 1 and Relation 2 are demonstrated in Table 1 in the Appendix. The hypothesis assumes a positive impact.

3.2.2 Theme 2 - Perceived Sacrifices Twelve interviewees did not mention the perceived sacrifice at any point, and demonstrated no interest in this construct even when explicitly inquired about it during the discussion. Almost all other interviewees did not address the perceived sacrifice although being questioned twice, at the beginning and the end of the interview, about the variables impacting AI customer experience.

Within existing research, the perceived sacrifice was rarely mentioned as a variable impacting customer experience, with only one article addressing it, as the researcher highlighted in the literature review. Even in this article the variable correlation result was emphasized to be unusual and unexpected (Ameen et al., 2021).

Hence, based on all the above, Relations 10, 11, 12, and 13 in the summary table (Table 1) will be excluded to apply the principles of parsimony and concentrate on variables with significant literature gaps recommended by the business for testing as one of the dilemmas to address.

3.2.3 Theme 3 - Service Quality All interviewees highlighted that testing the service quality impact on customer experience or trust in brand is unnecessary, as it is considered self-evident. Nine interviewees completely ignored mentioning service quality, and the context of the discussion did not elicit explicit questions on this matter.

Additionally, 21 interviewees did not reference quality as a reason for enhancing customer experience or trust. However, when explicitly asked whether service quality could impact customer experience or trust, they affirmed with phrases like “out of question”, “for sure”, and “anyway”, all emphasizing the positive impact of service quality on both customer experience and brand trust. This indicates that the impact of service quality on trust and customer experience, as demonstrated in Relation 3 and 4 in Table 1, do not need to be further examined as it is implicitly understood.

3.2.4 Theme 4 - Convenience When asked the initial question: “From your point of view, what factors could impact your experience as a customer of such a service?”, almost all interviewees mentioned convenience in the list. Some referred to it as “ease of use”, a concept confirmed during the interview through further clarification.

Convenience is defined as the facility to access the service anytime, from anywhere, with user-friendly interfaces. In this regard, 12 interviewees noted that convenience has a positive impact on customer experience but does not influence trust in the brand. Conversely, 18 interviewees believed that convenience may impact both customer experience and trust in the brand.

In conclusion, convenience evidently impacts customer experience, as confirmed by all interviewees and supported by existing literature, and positively impacts trust, as noted by 18 interviewees. Hence, the researcher has decided to retain Relation 5 and Relation 6 as demonstrated in Table 1.

3.2.5 Theme 5 - AI Opaqueness Most interviewees consider AI opaqueness to have a significant impact on both trust in the brand as well as AI-enabled customer experience. As explained in the literature review section, few articles address both relations; moreover, the inclusion of this construct in the model is strongly supported by the interview results.

Twenty-four interviewees identified AI opaqueness as a factor impacting customer experience when responding to the initial question: “As a user of AI chatbot for mobile services, from your point of view, what factors could impact your experience as a customer?”. All interviewees highlighted that AI opaqueness impacts their trust in the brand, as the inability to understand how AI generates answers and recommendations reduces their trust. This dictates considering Relation 8 and Relation 9 in the summary table (Table 1).

3.2.6 Theme 6 - Relationship Commitment None of the interviewees mentioned relationship commitment, neither in response to the opening question nor the closing question of the interviews. Even when specifically inquired about it, they did not express any interest in the construct. Therefore, the researcher decided to exclude Relation 14 from the summary table (Table 1) in the model for the following reasons:

- 1- Although relationship commitment and trust are highly related and extensively discussed in the literature, few articles have examined the impact of relationship commitment on customer experience. Instead, the same articles had more focus on the impact of trust on customer experience, with relationship commitment often described as a construct driven by trust. Consequently, the literature does not provide a strong relationship between these constructs.
- 2- All interviewees disregarded the construct in the context of mobile AI chatbot services.

3.2.7 Theme 7 – Trust Twenty-seven interviewees highlighted that trust has a significant impact on customer experience. Among those who confirmed this relationship, some mentioned it in response to the initial general question posed by the researcher, while others confirmed such impact after being explicitly inquired about it during the interview. The researcher decided to retain the relationship for further testing due to the following two reasons:

- 1- In accordance with the literature, all independent variables in this research influence both trust and customer experience. Hence, examining trust as a mediating variable is essential for future research. Ameen et al. (2021) considered trust as a mediator, while Trawnih et al. (2022) categorized it as an independent variable.
- 2- The extent to which trust in a brand influences customer experience remains unclear in the context of personalization, AI opaqueness, and convenience.

3.2.8 Interviews Summary Relations 1, 2, 5, 6, 7, 8, and 9, as outlined in Table 1 in the Appendix, have been confirmed by qualitative interviews to be significant for business and require further testing to determine their magnitude of impact on customer experience. On the contrary, Relations 3 and 4 have been confirmed by qualitative interviews to be less important for business, to the extent that further testing is unnecessary. Improving service quality is considered a fundamental practice for enhancing customer experience and trust in services or products.

Furthermore, interviewees did not recognize perceived sacrifice or relationship commitment as constructs impacting customer experience in the context of AI chatbot services, even when explicitly asked about them during interviews and after reviewing their definitions as mentioned in section 4.1 of this research. Hence, Relations 10, 11, 12, and 13 are considered weak according to interviews results and therefore, should not be included in the model.

4. Conclusion

4.1 The Final Proposed Model

As discussed in previous sections, a comparison between the hypotheses derived from previous literature and the interview results indicates that some constructs should be removed from consideration, as they do not require further testing. Conversely, retaining the remaining constructs is essential.

The final proposed model includes the following constructs and hypotheses that will be tested in future research:

- *H1.1: Personalization has a direct positive impact on trust.*
- *H1.2: Personalization has a direct positive impact on AI-enabled customer experience through trust.*
- *H2.1: AI opaqueness has a negative impact on the level of trust customers have in a brand.*
- *H2.2: AI opaqueness has an impact on AI-enabled customer experience through trust.*
- *H3: Trust has a direct positive impact on AI-enabled customer experience.*
- *H4.1: Convenience has a direct positive impact on trust.*
- *H4.2: Convenience has a direct positive impact on customer experience through trust.*

Based on both literature and qualitative interviews, a simplified model has been developed, as demonstrated in Figure 2, which illustrates the impact of Artificial Intelligence on customer experience, either directly or through the mediating variable of trust.

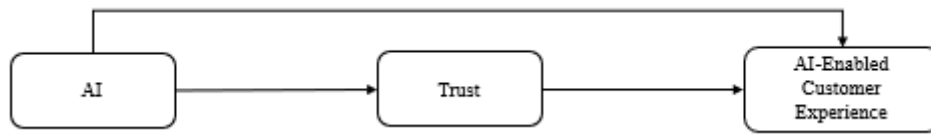


Figure 2. Simplified Model based on Qualitative Interviews and Literature

In the context of the study and based on the qualitative interviews, AI is characterized by three dimensions: convenience, opaqueness, and personalization. To measure the relationships between these dimensions and understand their relative impact on customer experience, regarding whether this impact is primarily mediated by trust or has a stronger influence when directly affecting customer experience, operationalizing the three dimensions is required.

Table 1 outlines the measures used to operationalize AI dimensions, trust, and customer experience, which were fundamental for formulating the questionnaire. Consequently, the model is presented as follows:

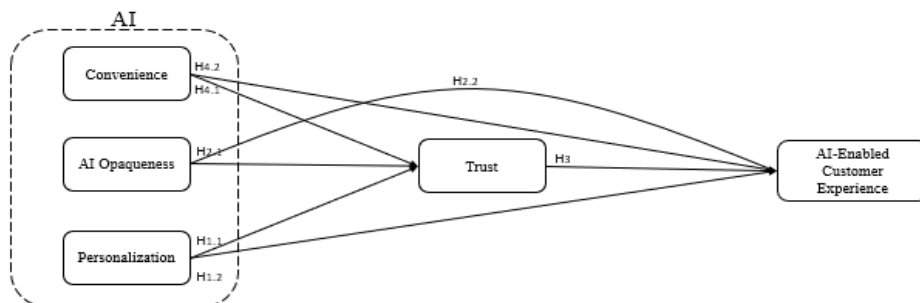


Figure 3. Updated Model Based on Qualitative Interviews and Literature

From another perspective, reflecting on the TAM model by Davis (1989), while it primarily focuses on actual use as a dependent variable rather than customer experience, convenience could serve as an effective reflection of ease of use.

While AI opaqueness could represent a new perspective on usefulness, personalization introduces a new approach in this research, directing the focus toward customer experience. Moreover, trust is crucial in this research, as evidenced by the feedback from interviewees as well as the literature, basically due to the role of AI in creating a new level of convenience, opaqueness, and personalization. These factors impact customers' trust in both the brand and the service, thus adding value to the research.

4.1.1 Managerial Implications The research provides valuable insights for business owners into the most important factors to consider before developing or acquiring a

new AI chatbot service for mobile support. It focuses on four main factors: convenience, personalization, AI opaqueness, and trust.

4.1.2 Future Research Empirically testing the proposed model would be highly beneficial for fully comprehending and prioritizing the factors impacting AI-enabled customer experience. Furthermore, research should examine whether trust acts as a genuine mediator in such context, or if the direct impact of the variables is more significant.

4.1.3 Limitations

The limitations of this study include insufficiency of time, in addition to the lack of both financial and human resources, which prohibited the researcher from examining the recursive relationships between antecedents. Future studies should consider how each of these success factors can and should be implemented within AI customer service.

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Appendix

Table 1. Variables Relationship

Relation #	Relation Description
1	Personalization has a direct positive impact on trust
2	Personalization has a direct positive impact on AI Enabled Customer Experience.
3	Service Quality positively impact the trust in the brand
4	Service Quality positively impact the AI customer experience
5	Convenience has a direct positive impact on trust.
6	Convenience has a direct positive impact on Customer Experience.
7	Trust has a positive direct impact on AI-enabled customer experience.
8	AI opaqueness has a negative impact on the level of trust customers has in a brand
9	AI opaqueness has an impact on AI Enabled Customer Experience
10	Perceived sacrifice has an impact on AI Customer Experience
11	Personalization has an impact on Perceived Scarifies
12	Convenience has negative impact on Perceived sacrifice
13	Service Quality impacts the perceived sacrifice
14	Relation Ship commitment has an impact on AI enabled customer experience