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# The Evolving Influence of Artificial Intelligence on Customer Engagement Dynamics

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## Abstract

This study examines the evolving influence of artificial intelligence (AI) on customer engagement dynamics, aiming to provide insights into how AI technologies can enhance engagement, loyalty, and trust among consumers. A quantitative research approach was employed with a causal research design. Data was collected from 140 individuals in the Kathmandu Valley, primarily undergraduate students aged 20-29 years, through a questionnaire utilizing a 7-point Likert scale. Correlation analyses were conducted using SPSS software version 23 to analyze the data. The study's findings highlight the transformative potential of AI in shaping customer engagement dynamics. By leveraging AI technologies, businesses can significantly enhance customer engagement and foster stronger relationships, ultimately driving competitive advantage and sustainable growth in an increasingly digital marketplace. The implications of this research suggest that understanding AI's capabilities can empower businesses to develop more effective customer engagement strategies. This presents opportunities for further investigation into the factors influencing the adoption and effectiveness of AI in customer engagement. Overall, this study contributes to the understanding of AI's role in customer engagement within the context of Nepal. Future research can provide valuable insights for businesses operating in emerging markets, informing the development of AI solutions tailored to the specific needs and preferences of local customers. By exploring these dynamics, organizations can better navigate the challenges of customer engagement in a rapidly changing technological landscape.

*Keywords:* artificial intelligence, big data, customer loyalty, customer engagement, customer trust

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## Introduction

By embracing the changes and fostering a culture of innovation, institutions can better prepare themselves for the challenges and opportunities presented by the evolving technological landscape (Mishra, 2023 a & b; Mishra, 2024). Artificial intelligence (AI) algorithms play a pivotal role in analyzing customer interactions, predicting preferences, and delivering personalized content that resonates deeply with audiences. This personalized approach not only enhances customer engagement but also fosters long-term loyalty. The evolving influence of AI on customer engagement has garnered increasing attention in recent years, with numerous studies exploring its implications. For example, Vidhya (2023) defines AI as a collection of technologies, including machine learning, deep learning, natural language

processing, and computer vision, while Rahmani (2023) describes it as the simulation of human intelligence in machines.

The concept of big data is also integral to understanding AI's impact; Kitchin and McArdle (2016) characterize it as large datasets produced in digital form, which can be analyzed through computational tools. Rahmani (2023) further emphasizes big data's utility in marketing, noting its ability to autonomously aggregate and classify vast amounts of data.

The integration of AI has significantly transformed customer engagement dynamics across various industries. The increasing adoption of AI-driven technologies—such as chatbots, augmented advertising, and personalized content—has led to substantial shifts in consumer behavior and consumption patterns. Customer engagement refers to the degree of involvement and relationship individuals have with a company's products or services (Harrigan et al., 2018). It can be perceived as a psychological state resulting from interactions or as actions beyond mere transactions motivated by specific circumstances (Brodie et al., 2011). The Marketing Science Institute (MSI) defines customer engagement as—customers' behavioral manifestation toward a brand or firm beyond purchase.

Research indicates that AI services can positively influence customer satisfaction, engagement, and loyalty, particularly within the e-commerce and home-sharing sectors, where loyalty has become a focal point for marketers. Recent years have seen a growing emphasis on customer loyalty, which has been a primary concern for marketers since the 1980s, prompting significant investments in customer relationship management programs aimed at fostering loyalty. Customer loyalty is characterized by an ongoing emotional connection between a business and its clients, encompassing both behavioral and attitudinal components. Behavioral loyalty involves repeat purchases, whereas attitudinal loyalty reflects a positive emotional bond with the brand (as cited in Vidhya, 2023).

The application of AI in marketing has been shown to enhance performance and improve corporate profitability and competitive advantage by building customer trust—defined as the strong relationship consumers have with a brand, rooted in the belief that the brand prioritizes their interests. Trust, as defined by Jarvenpaa, Tractinsky, and Saarinen, is the consumer's willingness to rely on a seller and take action in situations where such actions expose the consumer to vulnerability.

According to Forbes, the global AI market was valued at $136.55 billion in 2022, with NextMSC estimating its worth at approximately $207.9 billion in 2023. The relationship between AI and customer experience has become increasingly intertwined in the modern business landscape. As the range of AI-powered tools expands, businesses are discovering various innovative applications for both AI and machine learning technologies. One of the most impactful applications of AI in customer experience is its ability to enhance the understanding of consumer preferences. IBM reports that 34% of companies are currently utilizing AI, with an additional 42% exploring its potential. Furthermore, 35% of organizations are investing in training and reskilling their teams to effectively use new AI and automation tools globally. In the United States, 73% of companies have adopted AI in at least some areas of their operations (Emerging Technology Survey, 2023). Following the launch of ChatGPT, over half of the companies (54%) have implemented AI in various business areas (IBM).

In the Asia-Pacific region, the use of AI for customer engagement, particularly through chatbots, has gained significant attention. Seventy percent of customer engagement leaders in this region believe that AI chatbots have evolved into capable digital agents that can establish stronger emotional connections with customers through accurate and helpful responses (Zendesk). The demand for high-quality customer engagement facilitated by AI is further emphasized, with 78% of consumers in Asia-Pacific expecting chatbots to match the expertise of highly skilled human agents and provide immediate, reliable responses (Zendesk research).

In the context of the Nepalese market, approximately 20.77% of industries demonstrate readiness regarding technological sufficiency, 29.91% regarding management efficiency, and 39.23% regarding value creation potential for AI adoption (Devkota, 2022). Additionally, 56% of industries identify small market size and a lack of skilled manpower as significant challenges to AI adoption, while 44% believe that adequate government support would facilitate this process (Devkota, 2022). Nonetheless, around 30% of businesses in Nepal, including small and medium enterprises (SMEs), have begun integrating AI-powered chatbots and virtual assistants into their customer service operations to enhance efficiency and improve customer experience.

Overall, the integration of AI in customer engagement presents both opportunities and challenges, particularly in emerging markets like Nepal. Understanding the dynamics of AI's influence on customer behavior can help businesses tailor their strategies to meet consumer expectations and foster lasting relationships.

## Problem Statement

Recent studies highlight the significant advantages AI brings to marketing strategies, including enhanced personalization, proactive decision-making, and improved customer relationships. For instance, Vidhya (2023) found that AI-driven predictive models positively impact marketing by tailoring content to individual preferences, thereby enhancing customer engagement. Demonstrated that AI processing of big data fosters trust, satisfaction, and loyalty among customers through the AIM framework.

The COVID-19 pandemic further accelerated the adoption of AI technologies, as evidenced by Bag et al. (2022), who reported a substantial increase in user engagement and online sales in India due to AI applications. This trend highlights the necessity for businesses to adapt to evolving consumer needs through AI-driven solutions, as noted by Rahmani (2023), who emphasized the importance of dynamic marketing strategies, including virtual shopping and chatbots, for ensuring business profitability.

Despite the wealth of research conducted in developed countries, there remains a significant gap in understanding how consumers in developing nations, such as Nepal, adapt to and engage with AI technologies. The unique socio-economic context of Nepal may lead to different consumer behaviors and attitudes toward AI, making it crucial to explore these dynamics. Therefore, this study aims to investigate the effects of evolving AI on customer engagement, focusing on key aspects such as customer trust, engagement, and loyalty.

By addressing this gap, the research will contribute valuable insights into how AI can be effectively leveraged in the Nepalese market, ultimately guiding businesses in developing strategies that resonate with local consumers. This understanding is essential for fostering customer relationships and driving sustainable growth in an increasingly digital and interconnected marketplace.

## Research Objective

To examine the effect of evolving AI on customer engagement dynamics.

## Literature Review

The integration of artificial intelligence (AI) into marketing strategies has fundamentally transformed the landscape of customer engagement and personalization. Vidhya (2023) highlights the significant impact of AI-driven predictive models, which enhance personalization, proactive decision-making, and customer engagement by deciphering complex consumer behavior patterns. This transformative capability allows businesses to tailor their marketing efforts more effectively, creating a more resonant connection with their audience.

Yau et al. (2021) further emphasize the role of AI in processing big data to enhance customer relationships. Their study introduces the AIM framework, demonstrating a significant positive correlation between AI utilization and key customer relationship metrics such as trust, satisfaction, commitment, engagement, and loyalty. This framework underscores the necessity for businesses to leverage AI to cultivate deeper relationships with their customers.

The urgency of adopting AI technologies was particularly evident during the COVID-19 pandemic. Bag et al. (2022) found that AI significantly increased user engagement and online sales in India, linking satisfying online shopping experiences with higher repurchase intentions. This finding illustrates how AI can drive sales and enhance customer satisfaction, particularly in challenging market conditions.

Cheng and Jiang (2022) explored the effects of AI-powered chatbots on customer-brand relationships, revealing that while these technologies can improve communication quality, they may also negatively impact customer responses if not managed effectively. This highlights the need for businesses to balance AI-driven interactions with human touchpoints to maintain strong customer relationships.

Additionally, Perez-Vega et al. (2021) analyzed how AI can enhance online customer engagement by identifying behaviors that trigger AI systems to process customer information. Their findings suggest that AI-enabled systems can significantly improve online interactions, shaping future engagement through the interplay between AI and human responses.

Rahmani (2023) examined the necessity of dynamic marketing strategies that leverage AI advancements, including virtual shopping and chatbots, to meet evolving consumer needs and ensure business profitability. This research underscores the critical role of AI in adapting to changing market conditions and consumer expectations.

Sabry (2021) studied the impact of AI on communication strategies, finding that despite information saturation and short attention spans, companies can effectively engage potential customers through strategic targeting and compelling content across diverse platforms. This adaptability is crucial for maintaining relevance in a crowded marketplace.

Lastly, Chen et al. (2022) investigated the influence of customer trust in home-sharing platforms on engagement and loyalty, noting that AI-driven predictive models effectively analyze consumer behavior to enhance personalization and proactive decision-making.

While prior research has predominantly focused on developed countries, the technological adaptation and acceptance of AI in developing nations like Nepal may differ significantly. Therefore, this study aims to explore the effects of evolving AI on customer engagement dynamics, specifically regarding customer trust, engagement, and loyalty. By addressing this gap, the research will provide valuable insights into how AI can be effectively utilized in the Nepalese market, guiding businesses in developing strategies that resonate with local consumers. This understanding is essential for fostering customer relationships and driving sustainable growth in an increasingly digital and interconnected marketplace.

## Variable proposition

### *AI*

AI is defined as a range of technologies, including machine learning, deep learning, natural language processing, and computer vision, which have found myriad applications in marketing (Vidhya, 2023). Rahmani (2023) defines Artificial Intelligence (AI) as the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions.

### *Big data*

Big data is defined as the capacity of a marketer to compile and classify broad datasets with minimal manual work (Rahmani, 2023).

Vidhya (2023) defines the role of big data as the proliferation of digital platforms leading to an explosion of data, on which AI-driven predictive models thrive.

### *Customer Engagement*

Customer Engagement refers to individuals participating in and connecting with an organization's offerings or activities Brodie et al. (2011) defined Customer Engagement as "a psychological state, which occurs by interactive customer experiences with a focal object (e.g., a brand/destination)." However, customer Engagement as behaviors that

go beyond transactions and may be specifically defined as a customer's behavioral manifestations that have a brand or firm focus, beyond purchase, resulting from motivational drivers.

***Customer Loyalty***

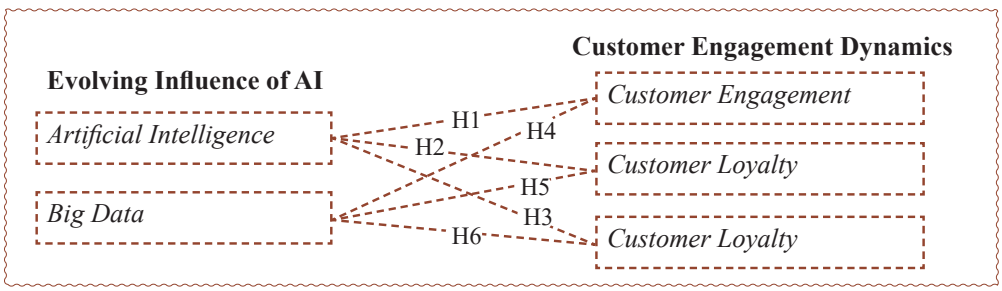
Customer loyalty has two components: behavioral and attitudinal. Customer loyalty influences companies both in the long term and short term because it helps to gain new consumers, and loyal customers are likely to re-buy or re-patronize products and services (Perez-Vega et al., 2021).

***Customer Trust***

Trust refers to the personal bond between customers and the focal object (like a brand). Customers rely on the focal object and believe that it acts in the customers' best interest. It is the confidence in the exchange partners' integrity and reliability (Sabry Riad Abdel Wanes, 2021).

**Figure 1**

*Conceptual Framework*




From the above literature review and the conceptual framework the associated hypothesis are formulated:

**H1:** AI has significant effect on customer engagement

**H2:** AI has significant effect on customer loyalty

**H3:** AI has significant effect on customer trust

**H4:** Big Data has significant effect on customer engagement

**H5:** Big Data has significant effect on customer loyalty

**H6:** Big Data has significant effect on customer trust

## Methodology

This study employs a quantitative research approach, focusing on the analysis of numerical data to assess causal relationships between the variables of interest. The research design is structured as a cause-and-effect framework, enabling the examination of how various factors influence consumer interactions with artificial intelligence (AI) platforms, particularly chatbots.

### Population and Sample

The target population for this study consists of individual consumers in the Kathmandu Valley who are likely to engage with AI technologies. A total of 140 respondents were selected based on the rule of thumb of 1/5, which suggests that a sample size of 140 is adequate for achieving statistical significance in this context. To ensure representativeness, a location-based sampling strategy was implemented, proportionately distributing the sample across different districts within the Kathmandu Valley. This proportional allocation was informed by population data obtained from official government sources. Given the lack of a specific database detailing the number of individuals interacting with chatbots and AI during online shopping in Nepal, convenience sampling was employed as the primary sampling method. This approach facilitated the recruitment of participants who were readily accessible and willing to engage in the study.

### Measurement and Scale

A structured questionnaire was developed to collect primary data, with measurements specifically tailored to align with the study's

objectives. The Likert scale, recognized for its effectiveness in capturing attitudes and opinions, was adapted to a seven-point format ranging from "Strongly Agree" to "Strongly Disagree," with each response assigned a corresponding numerical value for analysis. Key constructs were measured as follows:

**Trust in the Platform.** This construct was assessed using seven items adapted from Mittendorf (2017), yielding a reliability coefficient of 0.88.

**Customer Loyalty.** This variable was measured using items adapted from Bobalca et al. (2012), achieving a reliability coefficient of 0.92.

**Artificial Intelligence Dimensions**. Two dimensions—perceived usefulness (PU) and perceived ease of use (PEOU)—were evaluated using six items based on the work of Wixom and Todd (2005), with a reliability coefficient of 0.85.

**Customer Engagement.** This construct was assessed through three dimensions, encompassing vigor, absorption, and dedication, with a total of 12 items adapted with the reliability coefficients for these dimensions were 0.87, 0.90, and 0.90, respectively.

**Big Data.** This variable was measured using four items adapted from Dabbous et al. (2022) with a reliability coefficient of 0.87.

To ensure clarity and comprehension of the survey's intent and the variables under examination, a pilot test was conducted involving 20 participants. This pilot test utilized both online platforms, such as Google Forms, and physical questionnaires, allowing for feedback on the survey's structure and content. Overall, this methodology provides a robust framework for investigating the impact of AI on customer engagement dynamics, ensuring that the data collected is both reliable and relevant to the study's objectives.

## Analysis

After collecting the information through both online and physical means, a process of sorting, screening, and consistency checking is undertaken to ensure the reliability and validity of the data. Questions included in the survey were based on the 7-point Likert scale (1 being strongly disagree and 7 being strongly agree), and collected data was analyzed using SPSS. Moreover, internal validity is assessed through a Cronbach's alpha test, which measures the consistency of responses within each variable. The study aims to strengthen both the internal and external validity of its questionnaire, thereby strengthening the credibility of its conclusions.

**Table 1**

*Demographic Profile of the Respondents*

| | | Frequency | Percent |
|---|---|---|---|
| Gender | Male | 89 | 63.6 |
| | Female | 51 | 36.4 |
| | Total | 140 | 100 |
| Educational Level | Under 20 | 9 | 6.4 |
| | 20-29 | 114 | 81.4 |
| | 30-39 | 14 | 10.0 |
| | Above 50 | 3 | 2.1 |
| | Total | 140 | 100.0 |
| Educational Level | Bachelors level | 107 | 76.4 |
| | Masters level | 27 | 19.3 |
| | Above Masters | 6 | 4.3 |
| | Total | 140 | 100.0 |

| | | Frequency | Percent |
|---|---|---|---|
| Time Spent with AI | Less than 2 hours | 11 | 7.9 |
| | 2 to 6 hours | 79 | 56.4 |
| | 6 to 10 hours | 41 | 29.3 |
| | More than 10 hours | 9 | 6.4 |
| | Total | 140 | 00.0 |
| Ineration with AI | Very likely | 34 | 24.3 |
| | Likely | 64 | 45.7 |
| | Somewhat likely | 32 | 22.9 |
| | Not likely | 10 | 7.1 |
| | Total | 140 | 100.0 |

In Table 1, comprising 140 respondents, there is a noticeable gender disparity, with males comprising the majority at 63.6%, contrasting with females. A significant proportion of respondents fall within the age bracket of 20-29, accounting for 81.4% of the total. Moreover, an overwhelming 95.7% of respondents have attained Bachelor's and Master's degrees, indicating a highly educated sample.

Internet usage patterns reveal that the majority, at 85.7%, spend between 2 to 10 hours online, reflecting a significant digital presence among the respondents.

Additionally, a noteworthy 70% of respondents express a likelihood or strong inclination to interact with artificial intelligence (AI), suggesting a keen interest and acceptance of AI technologies within the sampled population. These statistics collectively paint a picture of a predominantly young, educated, digitally engaged cohort with a high propensity for engaging with AI.

**Table 2**

*Reliability Statistics*

| CL | |
|---|---|
| Cronbach's Alpha | No of Items |
| 0.944 | 5 |
| CE | |
| Cronbach's Alpha | No. of Items |
| 0.938 | 8 |
| CE | |
| Cronbach's Alpha | No. of Items |
| 0.922 | 5 |

Cronbach Alpha of the three variables CL (0.944) , CE (0.938) and CT (0.922) indicates a high level of internal consistency. This depicts the instrument is reliable and hence fulfills the purpose of finding the effect of evolving AI on consumer engagement dynamics.

Table 3 demonstrates the overall fitness of the regression model. In model 1, BD and AI have significant effects on Customer Loyalty. Model 2 shows that BD and AI have a significant relationship with Customer Trust. Model 3, shows that BD and AI has a significant effect on Customer Engagement. The p-value of less than 0.05, as demonstrated by the table, indicates that the overall regression model is statistically fit.

**Table 3**

*Demographic Profile of the Respondents*

| Unstandardized Coefficients | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **B** | **Std. Error** | **t** | **Sig** | **F.** | **Sig.** | **R-Source** |
| **Model1-Cll** | | | | | | | |
| Constant | -0.11 | .289 | -.039 | .969 | 63.148 | .000[b] | .480 |
| BD | | .518. | .096 | 5.384 | 0.00 | | |
| AI | .412 | .086 | 4.764 | .000 | | | |
| **Model 2-CT** | | | | | | | |
| Constant | .206 | .182 | 1.130 | .260 | 177.503 | .000[b] | .722 |
| BD | .796 | .061 | 13.102 | .000 | | | |
| AI | .172 | .055 | 3.158 | .002 | | | |
| **Constant 3-CE** | | | | | | | |
| Constant | .461 | .181 | 2.553 | .012 | 155.050 | .000[b] | .694 |
| BD | .458 | .060 | 7.595 | .000 | | | |
| AI | .450 | .054 | 8.310 | .000 | | | |

The value for R-square for Model 1 is 0.480, which indicates that 48.0% of the time Customer Loyalty is explained through Big Data and Artificial Intelligence. Further p-value is <0.05 which shows that the model 1 is significant. Whereas, p-value for Big Data and Artificial Intelligence is also <0.05 so we reject our null hypothesis, this indicates that Big Data and Artificial Intelligence has a significant effect on Customer Loyalty, this supports our hypothesis H2 and H5.

The value for R-square for Model 2 is 0.722, which indicates that 72.2% of the time Customer Trust is explained through Big Data and Artificial Intelligence. Further p-value is <0.05 which shows that the model 2 is significant. Whereas, p-value for Big Data and Artificial Intelligence is also <0.05 so we reject our null hypothesis, this indicates that Big Data and Artificial Intelligence has a significant effect on Customer Trust, this supports our hypothesis H3 and H6.

The value for R-square for Model 3 is 0.694, which indicates that 69.4% of the time Customer Engagement is explained through Big Data and Artificial Intelligence. Further p-value is <0.05 which shows that the model 3 is significant. Whereas, p-value for Big Data and Artificial Intelligence is also <0.05 so we reject our null hypothesis, this indicates that Big Data and Artificial Intelligence has a significant effect on Customer Engagement, this supports our hypothesis H1 and H4.

It is time to be prepared for future as Jagan Nath (2024) emphasizes the value of expert interactions facilitated by advanced digital platforms. These initiatives underscore the need for educational institutions to continuously evolve and adopt emerging technologies to enhance student engagement, promote knowledge sharing, and prepare future professionals for the challenges of a rapidly changing world.

## Conclusion

This study aimed to examine the effect of evolving artificial intelligence (AI) on customer engagement dynamics in the context of Nepal. The research framework encompassed variables such as AI, big data, customer engagement, loyalty, and trust. The findings from the regression models demonstrate significant relationships between these constructs, highlighting the pivotal role of AI and big data in shaping contemporary customer interactions.

The results indicate that big data and AI significantly influence customer loyalty, trust,

and engagement, with substantial explanatory power as evidenced by the R-square values. These findings support the hypotheses and emphasize the profound impact of the evolving AI landscape on customer engagement dynamics. The positive correlation between AI, big data, and various aspects of customer relationships, including trust, satisfaction, commitment, engagement, and loyalty, aligns with the study by Yau et al. (2021).

However, the contrast between our study's findings and the potential negative effects of AI-powered chatbot marketing efforts reported by Cheng and Jiang (2022) underscores the necessity for nuanced and strategic implementation of AI technologies in marketing endeavors. While the majority of studies, including those by Vidhya, et al. (2023), highlight the beneficial influence of AI on enhancing customer engagement dynamics, it is crucial to acknowledge variations in AI application and their specific implications for customer-brand interactions.

The emphasis on online customer engagement through AI-enabled systems by Perez-Vega et al. (2021) aligns with our study's broader focus on AI and big data's impact on customer loyalty, trust, and engagement. This diversity in research perspectives underscores the complexity of AI's role in shaping consumer behavior and interaction experiences, emphasizing the need for businesses in Nepal to carefully consider and strategically leverage AI technologies to gain insights into customer preferences and enhance their competitive edge in the market.

The study is limited to the urban area of Nepal, and the sample size may not be representative of the entire population. Additionally, the reliance on self-reported data introduces the potential for response bias. Future research could benefit from increasing the sample size and diversifying the demographic representation by including participants from various cities across Nepal, thereby enhancing the generalizability of the findings. Furthermore, given the growing prevalence of chatbot technologies in customer interactions, incorporating chatbots as a significant variable in future studies could offer valuable insights into their role in shaping customer engagement dynamics.

This study provides empirical evidence of the significant impact of AI and big data on customer engagement dynamics in the Nepalese context. The findings underscore the importance for businesses to strategically leverage AI technologies to gain insights into customer preferences, foster stronger customer relationships, and enhance their competitive advantage in the rapidly evolving digital landscape.

## Authors Note

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