Examining AI's impact on Customer Experience: Marketing Automation as a Mediator Among Egyptian Youth in Phygital Stores

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Abstract

This study examines the mediating role of Marketing automation in the relationship between Artificial Intelligence (AI) and Customer Experience (CX) from the perspective of Egyptian youth in Phygital stores. Quantitative deductive research was used through convenience sampling. Four hundred and fifteen valid online responses from Egyptian youth aged 18–29 who engage with phygital stores through a cross-sectional design. Data was analyzed using SPSS to test the proposed hypotheses including reliability analysis, correlation analysis, and mediation testing through SEM. The paper provides empirical insights indicating that AI positively affect CX. Additionally, Marketing automation partially mediates the relationship between AI on CX. In which findings highlight that while AI directly affects CX, its full potential when it is added to this relationship, marketing automation systems that change AI-driven data and capabilities into personalized, timely, and efficient customer interactions. The study offers marketers valuable insights for crafting superior customer experience tailored to Egyptian youth in phygital stores by understanding the underlying mechanism through marketing automation. It allows organizations to analyze and process enormous amounts of customers' information in real time, gaining actionable insights into customer behaviors, perceptions, and preferences. Further, the contextual emphasis on digitally literate Egyptian youth in an emerging phygital environment has managerial relevance for marketers and retailers seeking to optimize multichannel approaches in comparable markets, one of the first studies to empirically confirm the partial mediation effect.

Keywords Artificial Intelligence, Marketing Automation, Customer Experience, Egyptian Youth and Phygital Stores.

1. Introduction

Incorporating artificial intelligence has sparked substantial discourse since its introduction (Kreuzer et al., 2024). AI has been an essential part of human daily life and what is more it has advanced to the point that it can be used in all fields and sectors, profoundly influencing business practices (Manoj et al., 2023). In addition to marketing automation, which is one of the buzzwords that has gained considerable attention recently, as ideology seeks to automate traditional manual marketing tasks (Akhilasai et al., 2022). Besides, owing to globalization, countries' boundaries have broken down, and the world has become interconnected, which makes the customers more educated and unwilling to accept less than superior value (Huseynli, 2022). This superiority can be summarized in customer experience. As a result, AI, marketing automation, and customer experience have emerged as key concepts in the marketing field.

2. Literature Review

Although substantial research has been conducted on Artificial intelligence, marketing automation, and customer experience, significant gaps remain in understanding the interrelationships among these areas. Vihavainen (2024) emphasizes a critical need for more comprehensive research on integrating AI-

powered marketing automation into customer experience. Also, Guendouz (2024), supporting the assertion that there is a critical need for more in-depth research in AI-powered marketing automation in CX management to optimize benefits and address technical complexities. Furthermore, there is an urgent need for more studies on customer experience in the context of "Phygital" context, particularly to deepen our understanding of customer experience in a multichannel context (Lemon & Verhoef, 2016). In which phygital store refers to “a seamless integration of physical and digital elements to create a holistic shopping experience” (Babu et al., 2022; Erdem, 2023), that integrates the best of both world experiences by harnessing physical stores' strengths, like touch and feel products as well as face-to-face interactions, with the ease and personalization provided by digital technologies (Banik & Gao, 2022). And since recent studies indicate that young people care more about their experience than others, which significantly influences the future direction of businesses (Madhavi & Frow, 2017). Hence, the current paper focuses on Egyptian youth aged 18 to 29, as defined by CAPMAS (2025), as a key demographic group.

To address the above research gaps, an extensive review of the literature was conducted, and the preliminary model was created. This research aim is filling a crucial gap in the literature by empirically examine the impact of artificial intelligence on customer experience with a mediating role of marketing automation in the context of Egyptian youth in phygital stores.

3. Research Questions

Accordingly, four research questions emerged:

RQ1. Does Artificial Intelligence impact Marketing Automation among Egyptian youth in phygital stores?

RQ2. Does Marketing Automation impact Customer Experience among Egyptian youth in phygital stores?

RQ3. Does Artificial Intelligence impact Customer Experience among Egyptian youth in phygital stores?

RQ4. Does Marketing Automation mediate the relationship between Artificial Intelligence and Customer Experience?

4. Research Objectives

1) To examine the impact of Artificial Intelligence on marketing automation among Egyptian youth in phygital stores.

2) To examine the impact of marketing automation on Customer Experience among Egyptian youth in phygital stores.

3) To examine the impact of Artificial Intelligence on Customer Experience among Egyptian youth in phygital stores.

4) To investigate whether marketing automation mediates the relationship between artificial intelligence and customer experience.

5. Significance of the Study

The significance of this research lies in its contribution to both academic literature and practical applications. Today 89% of business leaders and market leaders indicated that the competitive factor for businesses is customer experience (HA, 2021). In addition, other studies in the field of modern marketing automation indicate that businesses utilizing automated software improve lead conversion rates by 107%, increase average deal size by 40%, and enhance forecast accuracy by 17% (Todor, 2016). Hence, this study investigates the mediating role of marketing automation in the relationship between Artificial Intelligence and Customer Experience among Egyptian youth in phygital stores. And hence forward the total Egyptian youth represents around 21% of total Egypt’s population (CAPMAC, 2025). This focus is particularly relevant in the Egyptian youth segment, a demographic characterized by high rates of digital engagement and unique consumer behavior patterns but relatively unexamined by AI-marketing studies. The identification can offer actionable insight to marketers and retailers grappling with streamlining their strategies in a changing market landscape. Above all, this research addresses a fundamental void by illuminating the indirect influence of AI on customer experience, with both theoretical advancements and practical suggestions for the application of marketing automation to enhance the overall customer experience in the phygital retail setting.

6. Literature Review

6.1 Artificial Intelligence (AI)

In today's technological era, advancements and innovations are taking place at lightning speed (Alam et al., 2022; Yadav & Dwivedi, 2023). Like every other domain, AI significantly influenced marketing (Shahid & Li, 2019). Nowadays adopting AI is both an opportunity and a necessity, as competitors' use of AI can drive better decision-making and offer a competitive edge (Guercini, 2023). As a result, a huge transformation has occurred in the marketing landscape in academic research, and business contexts (Shahid & Li, 2019). Large players such as IBM,

Amazon, Microsoft, Google, and Facebook have invested enormously in AI to acquire the merit of being the competitive first mover (Batra, 2019). They have made such investments, leading to more convenient marketing tasks like AI assistants, user journey, Search Engine Optimization, Visual recognition, Customization and consumer analysis (Mustak et al., 2020). So, dealing with artificial intelligence has been regarded not as science fiction but instead, it is viewed as a tool of survival (Shahid & Li, 2019; Manoj et al., 2023).

Artificial Intelligence does not stem from a single founder but has developed over time through the contributions of various researchers. Starting with Alan Turing the English mathematician, who set up the foundation for AI in his study "Computing Machinery and Intelligence" in 1950 (Haenlein & Kaplan, 2019). It displayed the machines' way of thinking. Besides, he presented the Turing Test to assess how a machine could show smart manners, for instance, learning, logical reasoning, and problem-solving (Haenlein & Kaplan, 2019). That's why Turing was called the father of AI. He was then succeeded by John McCarthy, the founder of the term AI in 1956 declaring the official beginning of AI as an academic system at the Dartmouth Conference in 1956 (Ray, 2022).

Although definitions vary, AI is commonly a means of solving problems to help humans through its relationship with machines and streamline operations for humans (Tai, 2020; Manoj et al., 2023). Some define it as a System's interpretation of external data correctly, based on previous learning to achieve specific goal through Adaptive flexibility (Haenlein & Kaplan, 2019; Mustak et al., 2020). Others define it as an evolution of systems and machines imitating human intelligence in which algorithms and complex models give machines the ability to learn, modify, and enhance independently (Mureșan, 2023). In essence, AI is a technology that allows computer systems to learn and make decisions relying on data with minimal human intervention (Simion & Popescu, 2023).

6.2 Marketing Automation

Marketing automation has become a multi-billion business nowadays (Immonen, 2022). It is considered as a critical approach for businesses to stay competitive due to the great development of technology and the change in supply-demand dynamics (Natterer, 2021; Todor, 2016). Marketing automation has become indispensable for modern marketing, supporting all-size businesses (B2B, B2C) to streamline efforts using devices such as email platforms, lead scoring CRM software, and reporting to engage customers (Belouadah, 2023).

Marketing automation is not a new concept despite acquiring remarkable attention in recent days (Belouadah, 2023). The concept traces back to the late 1990s with the launch of the first Customer Relationship Management platform aiming to excel data for both marketing and sales for enterprise customers. Marketing automation systems are not able to operate independently; they must be integrated with other means like CRM and ERP systems to be effective. Moreover, to be applied effectively process modifications must be made within the organization (Belouadah, 2023).

Marketing automation is conceptualized in various ways within the literature, primarily through two distinct lenses: operational and strategic (Akhilasai et al., 2022; Järvinen & Taiminen, 2016; Mero et al., 2022). From an operational perspective, it is viewed as technological computerized application support marketers to achieve their work-related objectives (Järvinen & Taiminen, 2016 Fundamentally, marketing automation is primarily utilized to automate marketing processes (Natterer, 2021). On the other hand, the strategic view considers it a supporter of company plans, and developer of operations, marketing culture and corporate structures (Järvinen & Taiminen, 2016). Consequently, marketing automation is conceived to be a vital resource of strategic marketing and is identified as a focal point of businesses communication strategy. Also, it is considered to be a chief factor in communication and customer engagement strategies, enhancing competency and excellence of marketing (Mero et al., 2022).

Ultimately, it is a key trend not only involved in transforming the operational aspects such as managing email correspondence, and social media posts but also a more comprehensive level; strategic aspects, such as customer retention through timely content delivery (Akhilasai et al., 2022; Guercini, 2023). It helps businesses to follow up with customers across digital touchpoints, such as website visits and social media interactions, offering beneficial knowledge of customers' favors (Belouadah, 2023). As well as saving time by instant replay throughout the day (Zumstein et al., 2021). Hence, studies in the field of modern marketing automation indicate that businesses utilizing automated software improve lead conversion rates by 107%, increase average deal size by 40%, and enhance forecast accuracy by 17% (Todor, 2016).

6.3 Customer experience

Customers are the most valuable and the primary source of revenue of any company. With advancements in technology, firms acquire the ability

to assess, measure, and operate customer relationships individually (Dinu et al., 2020; Weidig et al., 2024). As customers in such a complicated world, they need more justice on different levels; economically, socially, and environmentally. Therefore, customers turned into experienced hunters. Once they get an outstanding experience, that becomes their new benchmark in evaluating the next one (Patil et al., 2023). Nowadays, the competitive advantage is translated into the level of experience a company can offer to its customers (Dinu et al., 2020). Surviving in a competitive and unstable market is challenging, as it demands not only good prices with superior quality (HA, 2021). According to Caruelle et al., (2023), most marketing managers acknowledge that their companies compete based on customer experience. As a result, companies must find creative ways to excel in offering great customer experience (HA, 2021).

Customer experience concept is not newly founded, but it was introduced by many businesses a long time ago with its origins tracing back the beginning of 2000 (Chahal & Dutta, 2014); Specifically, by Holbrook and Hirschman in 1982, in which they were considered to be the establishers of the customer experience dimensions, behavioral impacts as well as to formulate marketing strategies (Brun et al., 2017; Chahal & Dutta, 2014). Other researchers date the notion even further, referring to publications by Adam Smith, John Maynard Keynes, Lawrence Abbott, and Wroe Alderson in the mid-20th century, where they affirm the idea of the customer's satisfaction through the purchase process not only their needs of products (Keyser et al., 2015). However, other scholars highlighted that in the 17th century; CX was first identified when the Coffee houses in London is described by Sir Francis Bacon by saying “The coffee was consumed as an experience, not as a commodity of product” (Turnbull, 2009). Conversely, some originated it to the 1960s, during the development of consumer behavior and marketing theories (Lemon & Verhoef, 2016).

Customer experience concept is differently defined by different authors (Chahal & Dutta, 2014). Huseynli (2022), defined customer experience as overall qualities that were perceived by the customer while interacting with the company. Additionally, it was defined as “holistic in nature, incorporating the customer’s cognitive, emotional, sensory, social and spiritual responses to all interactions with a firm” (Lemon & Verhoef, 2016 p. 70). Other researchers are in favor of Lemon & Verhoef’s opinion by stating that customer experience is the cognitive, emotional, and social response created by customer’s reactions through dealing with different companies directly or indirectly in the purchase process (Zhang et al., 2023). CX refers to the customers’ perception, feelings, and mindset about the product or service when they engage in consumer activities (HA, 2021).

7. Hypotheses development and conceptual framework

7.1 Does Artificial Intelligence impact Marketing Automation among Egyptian youth in phygital stores?

The strong relationship between AI and marketing automation has been proven by many researchers. As mentioned by Akhilasai et al., (2022) that marketing automation is not only powered by AI, but also it is proved by Guercini; marketing automation works better in association with AI in particular with collecting and analyzing data (Guercini, 2023). Moreover, AI seems to allow marketing automation to increase marketing competency as well as more optimized processes resulting in reduced manual work (Vihavainen, 2024). In 2022, a survey by Statista showed that 32% of marketers incorporate artificial intelligence with marketing automation systems to make effective use of paid advertising and customized email campaigns which in turn has led to stimulating process optimization and overall efficiency (Volkmar et al., 2022).

Besides, combining both AI and marketing automation is viewed by Guercini as a strategic decision that can boost organizations' marketing strategy (Guercini, 2023). In addition to previous views, Abdul Rahman et al., (2020) stated that with the implementation of various technologies paired with AI and marketing automation offers more influential interaction with customers at minimal cost (Abdul Rahman et al., 2020). Furthermore, Vihavainen’s findings proved that integrating AI and marketing automation provokes more advantages for marketing (Vihavainen, 2024). To sum up, AI with marketing automation has a great impact on the companies that achieve their goals and gain value by leveraging AI’s advanced automation and targeting capabilities (Guercini, 2023). Therefore, it is proposed that:

H_1: There is a significant positive relationship between Artificial Intelligence and Marketing Automation.

7.2 Does Marketing Automation impact Customer Experience among Egyptian youth in phygital stores?

According to Belouadah, Customer experience has been remarkably improved by using marketing automation which facilitates and customizes relevant communications and offers at accurate, proper times

(2023). In addition, Dinu et al., (2020) added that customer experience enhancement, given by the relevancy among the benefits of marketing automation software, has impact on lead acquisition and customer retention. Moreover, marketing automation enables further management and influences customers through the buying process, which can enhance customer journeys and experiences besides automated communications (Rae, 2016). According to that, it is proved that by leveraging marketing automation, brands can guarantee relevant, tailored relationships with customers with no interfering messages which can lead to extra effective and intimate customer experience (Belouadah, 2023). Therefore, it is proposed that:

H2: There is a significant positive relationship between Marketing Automation and Customer Experience.

7.3 Does Artificial Intelligence impact Customer Experience among Egyptian youth in phygital stores?

According to Ullah's findings, artificial intelligence has a statistically significant impact on customer experience (Ullah, 2024). Also, Daqar & Smoudy (2019) added that improved customer experience can be achieved in any firm through highly personalized customer service using AI while reducing time and costIn addition, other studies have shown that highly AI-personalized content and recommendations are positively effective for customer experience (Nwachukwu & Affen, 2023). Additionally, rapid technological and digital progress in AI has been proved by many other studies to reinforce customer experience with multiple customer experience tools and analytics which have prevailed recently (Batra, 2019). Moreover, it has been proved that artificial intelligence technology can enhance wide-ranging marketing activities with a particular emphasis on enhancing customer experiences (Abdul Rahman et al., 2020; Wang et al., 2023).

In 2018, Blake Morgan, a futurist specializing in customer experience, examined and proved the aspect of how AI positively affects customer experience (Daqar & Smoudy, 2019). Furthermore, Nwachukwu & Affen (2023) emphasized the significant impact of AI on customer experience, stating that artificial intelligence empowers customer data by interpreting big data in ways beyond our capabilities. Eventually, it has been mentioned that many organizations increasingly adopt AI to improve personalized customer experiences (Abdul Rahman et al., 2020; Terenggana, 2024). Therefore, it is proposed that:

H3: There is a significant positive relationship between Artificial Intelligence and Customer Experience.

7.4 Does Marketing Automation mediate the relationship between Artificial Intelligence and Customer Experience?

Prior research has identified the rising relevance of marketing automation in the context of AI. According to Vihavainen (2024), there could be increased value in incorporating marketing automation powered by AI to improve different dimensions of consumer experience. Guendouz (2024) also identifies marketing automation powered by AI to be increasingly relevant to managing consumer experiences, with its efficient implementation being able to simplify, personalize, and improve overall consumer services. Therefore, it is proposed that:

H_4: Marketing Automation mediates the relationship between Artificial Intelligence and Customer Experience

The conceptual model and hypotheses are shown in Figure 1

Figure 1: Proposed Research Model

8. Methodology

Quantitative research was conducted to examine the research model. Responses from Egyptian youth shoppers who have made a purchase at least once of Phygital stores in Egypt were collected as data for the research. Such context is convenient for displaying great customer experience (Srivastava and Kaul, 2016). A self-administered structured quantitative questionnaire was distributed through a survey, using a convenient sampling method, which was employed due to practicality and accessibility along with the time constraints in the research process. Google Forms (google forms. com) and social media platforms such as FB, LinkedIn, email, and in person were used to distribute the survey. The phygital store was defined in the introductory section of the questionnaire, initially by asking participants about their previous usage of the phygital store. After that, they had to state their age. After obtaining the two screening questions needed, they were invited to take part in the survey. Those who accepted the invitation were offered to fill in the questionnaire. A total of 455 respondents were reached between June 15 and July 20, 2025. However, 17 of the participants did not

qualify in the screening questions, 18 did not respond, and five did not completely respond to the survey. Ultimately, 415 complete responses were received, making a response rate of 90%.

8.1 Items and Measurement Validation

A quantitative, structured, closed-ended survey design was adopted, employing a questionnaire-based survey strategy. This approach was selected to efficiently collect standardized data from a large number of respondents, ensuring the systematic gathering of reliable quantitative evidence aligned with the study's objectives.

All the items originated from previous research. A scale was used to measure Artificial Intelligence, adopted from Singh et al., (2023). Marketing Automation scale was adopted from Nilsson & Tsakmaki (2019). As for Customer Experience scale, it was adopted from (Banik and Gao, 2022). The items were stated on a five-point Likert scale ranging from "Strongly disagree" (1) to "Strongly agree" (5).

8.2 Data Analysis

SPSS (Version 26) software was used as it is well-established and reputable software in the field of quantitative data analysis. Both descriptive and inferential statistical methods were used. Descriptive statistics represented by the mean, median, and standard deviation measures were calculated so as to gain an understanding of the central tendencies of the quantitative variables under study. In addition, the hypotheses of the study were tested using inferential statistics represented by the correlation and regression analyses.

In order to perform more advanced analysis, the research utilized SEM allows for assessment of causality by determining statistical significance of path coefficients, in combination with various goodness-of-fit indices to consider the suitability of the model. In addition, Path Analysis in SEM was used for measurement of relationships between variables in the proposed framework of research to explain their interdependencies statistically.

9. Results

Reliability and validity of the collected data are examined before verifying the model. Cronbach's alpha (α), average variance extracted (AVE), and factor loadings were used to assess the research reliability and validity. The model measurement showed strong reliability and validity across all constructs. As indicated in (Table I), Cronbach's Alpha values range from 0.773 to 0.825, and factor loading (FL) is greater than 0.50, indicating good data reliability. Validity test was examined by employing confirmatory factor analysis (CFA) through SPSS. The data considered suitable for factor analysis ranged from 0.604 to 0.724, as evidenced by acceptable Kaiser-Meyer-Olkin (KMO) values and significant Bartlett's Test of Sphericity indicated statistically substantial values ($p < 0.001$), suggesting that the data are suitable for factor analysis.

Table (I): Reliability and validity of the questionnaire in each category by using Cronbach's Alpha coefficient

Constructs	Number of Statements	Cronbach's Alpha	KMO	Bartlett's Test	AVE
Artificial Intelligence	14	0.773	0.712	185.914 (0.000)	0.714
Marketing Automation	3	0.782	0.604	120.637 (0.000)	0.545
Customer Experience	19	0.825	0.724	184.365 (0.000)	0.624

Discriminant validity was assessed (Table II), confirming that each construct is distinct from others in the model, as no correlation estimates are greater than the square root of the AVE test results shown in (Table I), which indicates satisfactory discriminant validity. Additionally, it is shown that all the items had the highest loading factors in the construction that they were intended to measure. As a result, the models' validity and reliability were found acceptable. Although the Average Variance Extracted AVE values for AI, marketing automation, customer experience, and its three dimensions were calculated with a cutoff value of 0.50, this reveals that all items examined in this research have high validity, as shown in Table I.

	Artificial Intelligence	Marketing Automation	Customer Experience
Artificial Intelligence	0.845		
Marketing Automation	0.476**	0.738	
Customer Experience	0.664**	0.439**	0.790

Table (II): Fornell-Larcker criterion

Referring to descriptive statistics (Table III), it showed generally positive perceptions of Artificial Intelligence and marketing automation in the phygital store environment, with means ranging from 3.686 to3.819, all displayed relatively high mean values, showing that respondents viewed AI-enabled phygital environments. However, normality tests revealed significant deviations from normality (Table IV), as evidenced by p-values < 0.001 for both the Kolmogorov-Smirnov and Shapiro-Wilk tests.

Table (III): descriptive statistics for research constructs (n=415)

	Sample Size	Minimum	Maximum	Mean	Standard Deviation
Artificial Intelligence	415	1.67	4.8	3.735	0.491
Marketing Automation	415	1.33	5	3.819	0.686
Customer Experience	415	1.86	5	3.686	0.510

Table (IV): normality tests

	Kolmogorov Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Independent Variable						
Artificial Intelligence	0.081	415	0.000	0.962	415	0.000
Mediator Variable						
Marketing Automation	0.141	415	0.000	0.961	415	0.000
Dependent Variables						
Customer Experience	0.066	415	0.000	0.981	415	0.000

Consistent with current literature, these findings highlight the significance of having strict measurement models when assessing intricate relationships like those among AI, marketing automation, and customer experience. Pearson's correlation coefficients are reported in Table V. Correlation analysis highlighted strong positive relationships between AI and Customer Experience (r = 0.664), This suggests that when the implementation of AI increases, customers perceive more favoring overall experience. As well as between Marketing Automation and Customer Experience (r = 0.439), which point out the importance of artificial intelligence and marketing automation in shaping customer interactions.

Table (V): Pearson's Correlation Coefficients

	Artificial Intelligence	Marketing Automation	Customer Experience
Artificial Intelligence	1		
Marketing Automation	0.476**	1	
Customer Experience	0.664**	0.439**	1

The relationship between Artificial Intelligence (AI), marketing automation, and customer experience was investigated using Structural Equation Modeling (Figure 2) to assess the study's hypotheses (Table VI). The findings show that Artificial intelligence had a significant direct positive impact on marketing automation (β =0.666, p < 0.05), confirming H1, which goes in line with current literature (Akhilasai et al., 2022; Guercini 2023; Abdul Rahman et al., 2020; Vihavainen 2024; Volkmar, Fischer, and Reinecke 2022). The value of β = 0.666 indicates that Artificial intelligence affects marketing automation by 66.6%, or it can be interpreted that 1% increase in Artificial intelligence will have an impact on increasing marketing automation by 66.6%.

Table (VI): path coefficients and significances

Structural Path	Path Coefficient	C.R (t-value)	Std. Error	Sig.
Marketing Automation ← Artificial Intelligence	0.666	11.021	0.60	***
Customer Experience ← Marketing Automation	0.118	3.867	0.031	***
Customer Experience ← Artificial Intelligence	0.611	14.337	0.043	***

The results also support H2 showing marketing automation had a significant direct positive impact on customer experience (β = 0.118 p < 0.05). This study is, therefore, in accordance with previous studies when it comes to marketing automation and customer experience (Belouadah, 2023; Dinu, Radu & Vaduva, 2020; Natterer, 2021; Rae, 2016). The value of β = 0.118 indicates that marketing automation affects customer experience by 11.8%, or it can be interpreted that 1% increase in marketing automation will have an impact on increasing customer experience by 11.8%. This implies that the more the phygital stores use marketing automation, the higher the impact on Egyptian youth customer experience.

Finally, H3 is strongly supported, showing Artificial intelligence has a significant direct positive impact on the customer experience (β =0.611, p < 0.05) confirming hypothesis H3. The beta value between AI and CX is at β= 0.611, which aligns with the previous studies mentioned that there is a strong link between the two variables (Abdul Rahman et al., 2020; Batra, 2019; Daqar & Smoudy, 2019; Nwachukwu & Affen, 2023; Ullah, 2024). The value of β = 0.611 indicates that artificial intelligence affects customer experience by 61.1%, or it can be interpreted that a 1% increase in artificial intelligence will have an impact on increasing customer experience by 61.1%.

This implies that the more use of artificial intelligence, the higher the impact on customer experience. We subsequently tested the mediating role of marketing automation in the relationship between AI and customer experience (Table VII). The results reveal that marketing automation partially mediates the relationship between AI and customer experience.

Table (VII): direct, indirect, and total effects

Model	Direct Effect	Indirect Effect	Total Effect	Interpretation
Customer Experience ← Artificial Intelligence	0.666	0.078	0.744	Partial Mediation

Table (VIII): goodness of fit indices

Indices	Abbreviation	Recommended Criteria	Results	Conclusion
Normed Chi-Square	$\frac{\chi^2}{DF}$	$1<\frac{\chi^2}{DF}<5$	3.116	Good Fit
RMESA	Root Mean Square Error of Approximation	< 0.05 Good Fit < 0.08 Acceptable Fit	0.021	Good Fit
NFI	Normed Fit Index	> 0.90	0.987	Good Fit
RFI		> 0.90	0.921	Good Fit
IFI		> 0.90	0.901	Good Fit
TLI	Tucker-Lewis Index	> 0.90	0.989	Good Fit
CFI	Comparative Fit Index	> 0.90	0.930	Good Fit

In the Structural Equation Model (SEM)– Model, customer experience is treated as the dependent variable, with marketing automation as the mediator. Results in table VI indicate that AI significantly impacts both marketing automation ($\beta = 0.666$, $p < 0.001$) and customer experience ($\beta = 0.611$, $p < 0.001$). Marketing automation also significantly affects customer experience ($\beta = 0.118$, $p = 0.031$), and its role as a partial mediator is supported, with a total effect of 0.744. The fit indices for the model, presented in Table VIII, all meet the recommended thresholds, indicating a good overall fit between the model and data.

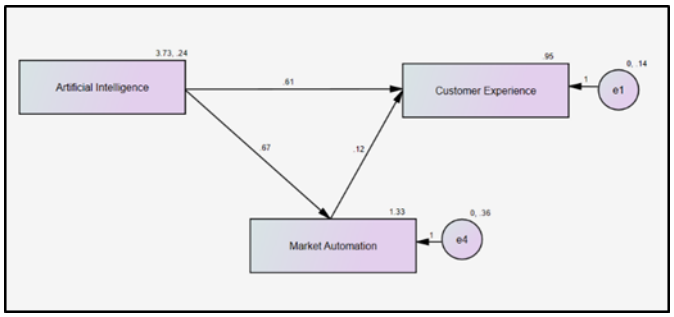

Figure 2: Structural Equation Model (SEM)

10. Discussion

After presenting the analysis results of this research to examine the impact of AI on customer experience with the mediating role of marketing automation among Egyptian youth in the phygital context, all the research hypotheses have been accepted. The summary of the findings shows that this demographic profile of Egyptian young youth aged between 18 and 29 are youthful, potentially tech-savvy group, likely to engage with modern technologies such as AI and marketing automation. A significant number of respondents' perceptions are affected by the use of AI and marketing automation. This demographic analysis is significant as it reveals that AI and marketing automation are relevant to a generation that is both acquainted with and willing to use technology for both academic and personal development.

For the First Research Hypothesis (H1): "There is a significant positive relationship between Artificial Intelligence and Marketing Automation". This relationship is supported by Ahmad (2025), who showed that integrating AI into marketing automation enhances overall marketing performance. Although the study was conducted in the UK, the findings support evidence for the positive association between AI and marketing automation.

For the Second Research Hypothesis (H2): "There is a significant positive relationship between Marketing Automation and Customer Experience". This relationship is supported by Rae (2016), which emphasizes that marketing automation has an impact on customer experience. The study shows that marketing automation can enhance the overall experience during the entire process.

For the Third Research Hypothesis (H3): "There is a significant positive relationship between Artificial Intelligence and Customer Experience". The findings of the current study confirm a significant positive relationship between Artificial Intelligence and Customer Experience. This result aligns with previous research, conducted by Terenggana (2024), which support a strong positive relationship between AI and customer experience, despite differences in geographical contexts. Their research, conducted among Maxim application users in Surabaya, Indonesia, reached conclusions that are consistent with the present study's findings. Similarly, evidence from the e-commerce landscape in Pakistan, as highlighted by Ullah (2023), underscores the profound impact of AI on customer experience, further reinforcing the broader influence of AI across diverse markets. The convergence of these findings strengthens the validity and generalizability of the relationship identified in this study. Therefore, H3 is supported.

For Research Hypotheses 4, it was not proven yet by other researchers, as it is one of these research contributions. The results confirmed that customer experience is significantly and indirectly affected by Artificial Intelligence with the partial mediation of marketing automation. This implies that the combined effects of AI and marketing automation are maximized. AI shows proficiency in analyzing large amounts of customer data to identify their patterns and preferences, whereas marketing automation technology implements these results of AI in real-time by sending out customer-specific promotions and communication. This integration of AI and marketing automation technology adds value to customer engagement and experiences by emphasizing the complementary nature of these technologies with respect to customer experience of phygital stores amongst Egyptian youth.

11. Theoretical Implications

The study makes several significant theoretical contributions to existing knowledge. First, it builds a novel theoretical framework that merges AI, marketing automation, and customer experience. This evolved from interdisciplinary research that co-relates technology and marketing fields. This is a consequential theoretical novelty in grasping the merging of these concepts. Second, the analysis results demonstrate an acceptable fit for the model that integrates marketing automation as a mediator. While previous studies have highlighted the importance of marketing automation (Akhilasai et al., 2022; Belouadah, 2023; Guercini, 2023; Järvinen & Taiminen, 2016; Abdul Rahman et al., 2020; Todor, 2016), our study is pioneering in empirically testing this factor as a mediator in the theoretical model connecting AI and customer experience.

Additionally, the findings of our study highlight the impact of AI on customer experience, a relation mentioned in previous research (Ameen et al., 2021; Daqar & Smoudy 2019; Terenggana 2024; Ullah 2023; Wang et al., 2023). Nevertheless, this study specifically focuses on the interaction between Egyptian youth customers and the phygital store's experience, a field that has never been examined in this area before. This application adds relevance and richness to prevailing theory through context-specific knowledge. Moreover, customer perspective is the focus of the study, as it builds upon and expands previous studies that primarily considered only the business perspective (Abdul Rahman et al., 2020; Vihavainen, 2024).

12. Practical Implications

The findings offer priceless understanding to represent an essential guide and actionable insights for mangers and marketers operating in phygital stores targeting Egyptian youth. In which the findings highlight that while AI directly affects CX, its full potential when it added to this relationship, marketing automation systems that change AI-driven data and capabilities into personalized, timely, and efficient customer interactions. Marketers can capitalize on these insights by using not only AI technologies—as machine learning algorithms, chatbots, and predictive analytics—but also marketing automation platforms that maximize the deployment of AI insights. For instance, customer preferences and behavior can be analyzed by AI, however personalized promotions, notices, or content delivery are triggered by marketing automation. Understanding the partial mediation impact, it is advised that marketers adopt an integrated approach whereby artificial intelligence and marketing automation co-function rather than function in isolation. Such a strategy can work to enhance targeting precision, engagement of customers, and loyalty among the digitally literate youth in Egypt, and hence overall customer experience effectiveness of marketing campaigns in increasingly complex phygital retail environments.

13. Research Limitations and Future Research Recommendations

Despite reaching satisfactory findings compared to the hypothesis, there are still some limitations. First, future researchers should consider the use of probability sampling methods; this will increase the representativeness of the sample and make the results more generalizable across the wider population. Moreover, the variation of individuals' related experience with a certain phygital store can be assessed differently in each phase of the buyer journey. Hence, future research could include longitudinal research to gauge changes in customer experience when dealing with AI and marketing automation., limited time and financial resources have impeded the growth of research. For this reason, the research does not involve the comparative research between Egypt and other nations that would have granted a broader perception of the way in which AI and marketing automation can differently influence the customer experience. Future studies could address this gap and explore cross-cultural differences in CX across diverse national contexts.

Only quantitative analysis was conducted and statistically analyzed, however, conducting qualitative research would have been better for the research results. In addition, the analysis was based on 415 responses. However, future researchers can conduct a large sample size to strengthen the generalizability of the findings. Furthermore, this study focuses on young Egyptian consumers in Phygital stores, future studies could investigate different retailers and industries, although the rest of the range of ages can also be studied.

13. Research Conclusion

In conclusion, emerging technologies such as AI and marketing automation are considered game changers in the way they are revolutionizing business practices and influencing revenue. This study establishes a conceptual model to examine the relationship between AI and customer experience with a mediating role of marketing automation from the perspective of

Egyptian youth in the context of a phygital store environment. Findings indicated that AI significantly fosters CX, yet it achieves its complete capabilities in integration with marketing automation systems. Such systems convert AI-based data and capabilities into customized, timely, and effective interactions. Overall, this study contributes to the insight of the literature, bringing worthwhile interpretation to researchers and practitioners alike, highlighting the importance of AI and marketing automation integration to remain competitive in dynamic retail environments.

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