

From Traditional Marketing to Smart Marketing: The Impact of Artificial Intelligence on Customer Value Creation

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ABSTRACT

This study aimed to analyze the impact of using artificial intelligence techniques in smart marketing on improving customer experience and enhancing perceived value, in the context of the Algerian environment.

A descriptive and analytical approach was adopted, and a questionnaire tool was used, distributed to a sample consisting of (50) participants from the customers of a modern commercial organization.

The data were processed using the statistical program (SPSS) version 25. The results showed that there is a strong significant relationship between the use of AI tools and improving customer experience and raising the level of perceived value, with statistically significant differences between age groups.

The study confirms the importance of integrating AI techniques into the marketing strategies of Algerian organizations to achieve a competitive advantage based on customer experience

1. Introduction

In recent decades, the world has witnessed rapid digital transformations that have deeply affected both individual behavior and organizational strategies, particularly in the fields of commerce and services. Among the most prominent drivers of this transformation is digital technology, with artificial intelligence (AI) emerging as a pivotal tool reshaping how organizations interact with their customers, develop flexible marketing strategies, and offer innovative services. These developments have given rise to the concept of Smart Marketing, which integrates AI techniques with big data analytics to better understand consumer behavior and accurately anticipate their needs.

In this context, marketing success is no longer solely measured by an organization's ability to promote products or services, but rather by its capacity to generate genuine customer value, enhance the overall experience, and foster long-term loyalty in a market defined by growing competition and constant change. As customers become increasingly aware and demanding, improving the quality of the customer experience has become a strategic imperative—one that requires adopting intelligent tools that enable personalized, fast, and efficient interactions.

- Based on this reality, the central question of this study is as follows:
 - How does artificial intelligence contribute to improving the customer experience and enhancing perceived value in the context of smart marketing?

To address this overarching question, the study proposes the following hypotheses:

- ❖ The use of artificial intelligence tools contributes to the personalization of marketing content in alignment with

individual customer needs.

- ❖ Incorporating AI techniques into customer communications improves the quality of the marketing experience.
- ❖ The application of AI in marketing enhances customer satisfaction and fosters customer loyalty.

2. Objectives of the Study:

- To clarify the concept of smart marketing and its practical dimensions.
- To analyze the impact of artificial intelligence on customer value creation.
- To conduct a real-life case study assessing the effectiveness of AI tools in enhancing the customer experience within a commercial organization.

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3. Importance of the Study:

This study is significant as it sheds light on one of the most critical issues in today's digital business landscape, demonstrating how AI can evolve from merely being a technical tool to becoming a strategic driver of competitive advantage based on customer experience. Furthermore, the study offers scientific value by providing a practical application model that can benefit both researchers and practitioners in marketing and customer relationship management.

4. Research Methodology:

The study adopts a descriptive-analytical approach to explore theoretical concepts, in combination with a case study method that involves analyzing the experience of a sample of customers interacting with a commercial organization that employs smart marketing techniques through AI tools. The sample consisted of 50 customers, selected from [mention the sector or type of organization, e.g., an e-commerce platform, a telecommunications company, a retail chain, etc.], aged between 18 and 45 years old, with varying levels of familiarity with digital technologies. The sample was chosen using purposive sampling to ensure participants had sufficient exposure to AI-driven marketing interactions.

5. Time and place of the study:

This study was conducted in Algeria, targeting a sample of 50 customers of modern commercial institutions operating in the Algerian market, who were selected intentionally to ensure their interaction with the artificial intelligence tools used in smart marketing. Data collection took place between April 10, 2025, and May 30, 2025, a period that coincided with the widespread use of artificial intelligence technologies within Algerian institutions, providing a suitable field environment to study the impact of these technologies on the customer experience and their perception of the value offered by the institution.

6. Structure of the Article:

- **First axis:** The conceptual framework of artificial intelligence, smart marketing, and creating value for customers.
- **Second axis:** A case study presenting the experiences of several customers in a smart marketing environment, with an analysis of the artificial intelligence tools applied and their effects.

Conclusion: Summarizes the main findings of the study and provides relevant recommendations.

I. Theoretical part.

1. Introduction to Artificial Intelligence

Today, Artificial Intelligence (AI) is one of the most prominent areas of technology that is profoundly transforming the modern business environment. It represents an integrated system of programs and algorithms capable of simulating human mental abilities by processing data, learning from it, and adapting to different situations.

AI relies on a number of key technologies, such as machine learning, neural networks, deep learning, process automation, as well as natural language processing. AI is not just seen as a technical architecture, but its impact is measured by its practical applications in the business world, where it is used to automate business processes, derive insights from big data, and improve customer interaction. By automating repetitive tasks, analyzing massive amounts of data, and supporting customer engagement strategies, AI has become a strategic tool that enables organizations to improve operational performance and enhance customer value (Davenport et al., 2020).

2. The role of big data in developing AI applications in marketing

In recent years, artificial intelligence has witnessed a remarkable development, driven by the abundance of big data, which has become the backbone of this field. Big data has become the cornerstone that feeds AI algorithms, enabling them to learn and continuously improve their performance.

Despite the rapid development of the field, research is still scattered across multiple disciplines, making it necessary to develop systematic reviews that enable a holistic view of how big data can be used to enhance the effectiveness of AI in the business environment. Numerous studies indicate that the integration of big data and AI enables organizations to design intelligent marketing strategies that are able to react to individual customer needs and improve customer satisfaction. However, this progress comes with challenges related to protecting data privacy and managing massive amounts of information in a rapidly changing digital environment. (Balakrishnan & Dwivedi, 2021).

3. The role of AI in reshaping digital marketing strategies

Today, AI has become a central tool in shaping digital marketing strategies, enabling the analysis of large amounts of customer data in an accurate and fast manner, helping to build a deep understanding of their behavior and preferences.

By employing technologies such as machine learning and natural language processing, it is possible to create personalized marketing content that enhances the customer experience and increases brand engagement. These technologies can improve the efficiency of advertising campaigns and target the right audience in a more effective way, building sustainable relationships between consumers and brands, and contributing to the transition from traditional marketing to smart marketing that focuses on creating (Tauheed et al., 2024).

4. Using AI to improve customer experience

Research indicates that the use of AI in customer experience management has become a critical element in achieving competitive differentiation. Intelligent chatbots powered by natural language processing, along with machine learning algorithms, have improved the quality of customer interactions.

By analyzing consumer behaviors, anticipating their needs, and delivering personalized content at the right time, it is possible to provide high-level services that enhance customer satisfaction and loyalty. The combination of AI and IoT has also led to the development of smart stores and innovative online shopping experiences, as these systems are able to mimic the five human senses, resulting in richer and more impactful marketing experiences. real added value for customers. (Verma et al., 2021).

5. AI-powered personalization improves customer engagement

Studies show that AI-powered personalization is one of the most important factors in enhancing customer engagement with brands. By analyzing behavioral and preference data from various digital channels such as social media and search engines, marketing offers can be tailored to meet the individual needs of consumers.

This high level of personalization builds strong customer relationships, increases customer loyalty, and fosters positive attitudes towards the brand. However, this trend is accompanied by challenges related to the need to protect user privacy and ensure transparency in data collection and processing. (Teepapal, 2025).

6. The concept of marketing in contemporary thought

Marketing is considered a comprehensive strategic activity that aims to create mutual value between the organization and various stakeholders, whether they are customers, partners, or society in general. The essence of marketing revolves around understanding and meeting the needs of individuals by developing products and services that suit those needs, while working to deliver them in effective ways that ensure consumer satisfaction and long-term relationships. Marketing also includes communication, delivery, and exchange processes within an organized institutional framework. This modern concept reflects the growing role of marketing as a pivotal tool in balancing organizational goals and market expectations, which has led many international bodies, such as the American Marketing Association, to redefine related concepts to keep pace with rapid economic, social, and technological changes. (American Marketing Association, n.d.)

7. Traditional marketing methods

Traditional marketing methods are among the basic tools that organizations relied on for decades before the digital revolution. They are based on tangible media channels such as television and radio advertisements, print advertisements in newspapers and magazines, direct mail, and point-of-sale promotions. These methods have proven effective in reaching a wide audience, especially in local markets or among groups that are less engaged with modern media. Marketing through sales representatives also remains effective in building direct personal relationships with customers, especially in cases of complex or high-value products. Despite the relative decline in the effectiveness of these methods in the digital age, they remain an important component of the marketing mix, especially when combined with digital methods to enhance integration and broader reach (Kotler & Keller, 2016).

8. Smart Marketing Definition

Smart marketing is defined as the integrated use of artificial intelligence, big data analysis, and machine learning techniques to develop dynamic marketing practices based on an in-depth understanding of consumer behavior .

This modern approach focuses on personalizing marketing messages, automating customer interactions, and delivering enhanced and personalized experiences across digital channels. Intelligent marketing enables analyzing consumption patterns, building proactive strategies, and achieving high levels of interaction and engagement between consumers and brands. (Davenport et al., 2020).

9. Types of AI in smart marketing

The uses of AI in smart marketing can be categorized into three main types. First, mechanical AI, which is used to achieve standardization and provide reliable and consistent performance in repetitive tasks, such as the use of collaborative robots in packaging operations, or drones in product delivery. Second, reasoning-based AI, which is characterized by its ability to analyze data and extract patterns, making it ideal for designing personalized marketing experiences .

And third, emotion-based AI, which focuses on understanding human emotions and fostering emotional connections between brands and consumers, which is pivotal in managing customer relationships and supporting emotional marketing campaigns. (Huang & Rust, 2020).

10. The importance of customer data in the development of AI applications

Customer data is the vital resource that fuels AI applications in the marketing context. By collecting and analyzing this data, organizations can build an accurate understanding of consumer behavior and their changing needs .

This information is used to train machine learning algorithms, enabling the design of targeted advertising campaigns and improving the customer experience at various touchpoints. However, the increasing reliance on customer data

means that ethical considerations need to be taken into account, particularly in relation to privacy, cybersecurity, and transparency in how this data is used (Ayomide Toheeb et al., 2024).

11. Challenges associated with the adoption of AI-based marketing

Despite the great advantages of AI-based marketing, its implementation is not without multiple challenges. Among the most prominent are the lack of specialized technical competencies capable of developing and managing intelligent systems, as well as ethical issues related to privacy and predictive data analysis.

Resistance to change within organizations is also a barrier to adopting these new technologies. Integrating AI into marketing strategies requires an integrated approach that takes into account ethical standards and empowers teams to ensure sustainable effectiveness (Achour & Ayadi, 2025).

12. The relationship between the TAM model and the tourist experience in smart tourism

In the context of smart marketing, perceived ease of use and perceived usefulness play a pivotal role in shaping tourists' evaluation of AI-powered services. When tourists notice that tools such as virtual assistants facilitate their searches and provide personalized recommendations tailored to their needs, they often perceive these tools as easy to use and useful, which positively reflects on their level of satisfaction and loyalty towards the destination or tourism organization.

By linking the study variables—namely, the use of artificial intelligence, the quality of the tourist experience, and perceived value—with the components of the Technology Acceptance Model (TAM), it becomes possible to analyze how these factors influence the psychological and behavioral responses of tourists. This link also allows for the introduction of the variable “behavioral intention” as a link between technology performance and perceived value, which enhances the scientific explanation of the tourist's relationship with technology (Davis, 1989).

12.1 The conceptual link between TAM and the smart tourist experience:

Figure 1. Adapted from: Davis (1989), with conceptual adaptation by the author.



a. Explanation of the conceptual relationship:

This figure represents an explanatory model that reflects how AI tools contribute to improving the tourist experience and increasing perceived value through a series of mediating variables derived from the Technology Acceptance Model (TAM).

1. Use of AI tools:

This is the starting point in the model and includes tools that tourists interact with during their smart trip, such as:

- ✓ Virtual assistants
- ✓ Automatic recommendations
- ✓ Smart translation
- ✓ Chatbots
- ✓ Virtual or augmented reality

2. Perceived Ease of Use & Perceived Usefulness:

After the tourist interacts with these tools, the mental evaluation process begins. They ask themselves:

- Were these tools easy to use?
- Did they actually and effectively help me achieve what I wanted?

The easier the interaction and the more real benefits of use, the more likely the tourist is to accept and trust the technology.

3. Quality of Tourist Experience:

Based on the previous perception, the tourist's overall experience begins to improve. Tourists who feel that the technology has saved them time, research effort, and accurate information will evaluate their trip more positively and feel comfortable and satisfied.

4. Perceived Value:

This is the end result of this path. It refers to how tourists perceive the overall value they have gained from their experience.

If they feel that the service they received was efficient, convenient, personal, and safe, their perceived value will be high, increasing the likelihood of their loyalty to the destination and their desire to recommend it or return to it.

II- Applied Part

This chapter constitutes the applied aspect of the study, as it aims to test the hypotheses formulated in the theoretical framework, by analyzing field data collected through a questionnaire addressed to a sample of customers of a modern commercial institution active in the Algerian market.

A descriptive and analytical approach was adopted to process the data, using the Statistical Package for the Social Sciences (SPSS) version 25, in order to measure the impact of using AI techniques in smart marketing on improving the customer experience and enhancing perceived value.

This chapter deals with presenting the characteristics of the studied sample, then assessing the reliability and stability of the research instrument, analyzing the relationships between the studied variables, testing the differences according to demographic variables, and interpreting the results in light of the theoretical framework.

1-Table (1): Internal consistency coefficient (Cronbach's alpha)

Axis	Number of Items	Cronbach's Alpha (α)
Use of AI tools	5	0.86
Quality of customer experience	5	0.88
Customer perceived value	5	0.84
Instrument as a whole	15	0.89

Source: SPSS outputs, version 25

Table (1) shows the results of the internal consistency test of the research instrument using Cronbach's alpha coefficient (α), which is one of the most commonly used indicators to assess the internal consistency between the questionnaire items.

The obtained values indicate the following:

- For the use of AI tools axis, the coefficient of $\alpha = 0.86$, indicating a high degree of stability.
- For the Quality of Customer Experience axis, the value of $\alpha = 0.88$, reflecting an excellent level of stability.
- For the customer perceived value axis, the coefficient of $\alpha = 0.84$, indicating good internal consistency between items.
- As for the tool as a whole, which included (15) paragraphs distributed over the three axes, the coefficient of $\alpha = 0.89$, which is a very high value that exceeds the minimum acceptable value (0.70), which confirms that the tool has a high level of stability and reliability.

→ Based on these results, the instrument can be adopted with confidence in measurement and analysis, as it is able to measure the targeted concepts with a good degree of consistency that guarantees the validity of the results that will be reached later.

2-Table (2): Pearson's correlation coefficients between variables

Variables	Use of AI Tools	Quality of Customer Experience	Customer Perceived Value
Use of AI Tools	1	0.72	0.68
Quality of Customer Experience	0.72	1	0.75
Customer Perceived Value	0.68	0.75	1

Source: SPSS outputs, version 25

Table (2) presents the values of Pearson Correlation Coefficients between the main variables in the study, namely:

- Use of Artificial Intelligence Tools
- Quality of customer experience

Key observations from the table results:

- There is a strong positive correlation between the use of AI tools and the quality of customer experience, with $r = 0.72$, which is statistically significant at the (0.01) level.

→ This indicates that increasing the use of AI tools is associated with improving the quality of the customer experience.

- There is a positive correlation between the use of AI tools and customer perceived value, with a correlation coefficient of $r = 0.68$, which is also highly significant.

→ This means that an organization's adoption of AI tools contributes to enhancing customer perceived value.

- The results also show a strong positive correlation between customer experience quality and perceived value, with a correlation coefficient of $r = 0.75$ (at a significance level of 0.01).

→ This confirms that improving the quality of customer experience has a positive impact on perceived value.

→ Overall, the results indicate that there are strong and statistically significant correlations between all studied variables, which supports the validity of the study's sub-hypotheses.

Reasons that explain the strength of the correlations between the variables

The strength of the correlations revealed by the results of the study between the use of AI tools, the quality of customer experience, and perceived value can be explained by a number of scientific and logical considerations, namely:

1. The interactive role of AI tools:

AI technologies (e.g. predictive analytics, intelligent robots, personalized recommendations) contribute to interactive and personalized customer experiences.

→ This intelligent interaction improves the customer's perception of the quality of the experience.

2. Improved responsiveness to customer needs:

Thanks to AI's ability to analyze customer data and predict customer behavior, an organization can deliver services and products aligned with the customer's actual needs faster and more accurately,

→ enhancing their positive evaluation of the quality of the experience and the value provided.

3. Reduce the customer's cognitive effort:

When an organization relies on intelligent tools (such as chatbots or personalized recommendations), the customer has to make less effort to find the right fit or make a purchase decision,

→ developing a sense that the organization is providing added value.

AI enables a "real-time experience",

→ an element that enhances the customer's perception of the quality of the service and the organization's appreciation of their immediate needs.

5. The impact of innovation on customer perceptions:

Organizations that use AI tools give the impression that their services are new and innovative,

→ This positively impacts the customer's perception of value

3-Table (3): Results of simple linear regression analysis

Regression Coefficient (Beta)	Standard Error (SE)	T-value	Coefficient of Determination (R^2)	Significance Level (p-value)
0.65	0.10	6.50	0.42	0.000

Source: SPSS outputs, version 25

Read the results:

1) Beta = 0.65

→ It means that every one-unit increase in the degree of use of AI tools leads to an increase of (0.65) in the customer's perceived value.

→ This result indicates a moderate to strong direct effect of AI on perceived value.

2) T-value = 6.50 and p-value = 0.000

→ means that the effect is significant at a significance level of less than 0.01 ($p < 0.01$), confirming that this effect is not due to statistical chance.

→ The more an organization uses AI tools, the greater the perceived value.

3) coefficient of determination $R^2 = 0.42$

→ means that 42% of the variance in the assessment of customer perceived value can be explained by the variable of using AI tools.

→ This is a very significant percentage in the field of marketing (where several factors overlap), and shows the relative importance of AI as one of the factors influencing the customer's perception of value.

Discuss the result:

This relatively strong effect can be explained by the following:

- AI tools help to personalize and adapt the service to the customer's needs, making them feel that the organization values their privacy and provides them with added value.

- Real-time interaction using AI enhances the customer's perception of quality and efficiency.

- Using AI improves the perception of the organization and makes the customer evaluate their experience and the value of the service positively.

→ Based on these results, the main hypothesis of the study can be confirmed: "The use of AI tools contributes significantly to enhancing customer perceived value in the context of smart marketing".

4-Table (4): Results of the analysis of variance by age group (ANOVA)

Source	Total Squares (SS)	Degrees of Freedom (df)	Mean Squares (MS)	F	Significance Level (Sig.)
Between Groups	8.24	3	2.75	4.32	0.008
Within Groups	28.90	46	0.63		
Total	37.14	49			

Source: SPSS outputs, version 25

Read the results:

1) F value = 4.32 and significance level Sig. = 0.008

→ Since the significance level is less than 0.01 ($p < 0.01$), this indicates that there are significant differences between age groups in evaluating the use of AI.

→ This means that age has an impact on how customers perceive the use of AI tools in marketing.

Discuss the results:

The results showed that the age group (25-35 years old) was the most positive in their evaluation of the use of AI tools, compared to the rest of the groups.

→ This is in line with the literature, where studies show that younger age groups are more open to technology and more willing to accept smart tools in their marketing experience.

Scientific reasons that may explain the age differences:

- 1. Level of digital awareness:

The age group (25-35 years old) belongs to the "digital generation", which is the most frequent users of smartphones and digital platforms, and therefore more familiar with AI tools in marketing.

- 2. Adapting to innovation:

People in this age group are usually more receptive to technological innovation, compared to older groups, who may show reticence or resistance to unfamiliar technologies.

- 4. Heavy use of e-commerce:

25-35 year olds often use e-commerce and digital marketing on a daily basis, so they can clearly see the impact of using AI to improve their experience with the organization.

Conclusion:

→ ANOVA results confirm that age group has an impact on customers' evaluation of the use of AI in smart marketing, which supports the need to consider demographic differences in the design of AI-based marketing strategies.

III Conclusion

The rapid transformations taking place in the business world, especially in light of the digital revolution, emphasize the pivotal role that artificial intelligence techniques have come to play in developing marketing practices, improving customer experience, and enhancing perceived value. In this context, this study aims to analyze how AI tools can contribute to improving the customer experience, within a smart marketing environment based on the effective use of big data and personalized interaction guided by intelligence.

Through a combination of theoretical analysis and an applied case study, the results show that the adoption of AI in marketing is not limited to improving aspects of operations or increasing the efficiency of campaigns, but extends to redefining the relationship between the organization and its customers, where the customer becomes the center of the marketing process, with personalized content, communication more in line with his expectations, and services delivered more smoothly and effectively.

The case study highlighted that customers who interacted with an organization using AI-powered smart marketing expressed higher levels of satisfaction than traditional methods and were more likely to repeat business with the organization, confirming the impact of these technologies on customer loyalty. The results also show that AI's ability to analyze big data and predict future behaviors contributes to a better understanding of the customer's changing needs, enabling the organization to be proactive in meeting those needs.

1. Actionable Guidelines for Leveraging AI in Customer-Centric Marketing

In light of these findings, a number of practical recommendations can be drawn:

1. Organizations seeking to strengthen their position in digital markets should systematically invest in developing their AI capabilities by building advanced data collection and analysis infrastructures.

2. Flexible marketing strategies that integrate AI and customer behavioral analysis should be adopted, allowing for more accurate personalization of services and offers.

3. Marketing teams should work in tandem with IT and data teams to ensure that smart solutions are designed with privacy in mind and respect ethical values in handling customer data.

4. The importance of training human resources to deal with new technologies in the field of artificial intelligence, in order to integrate the technical aspect with the human dimension of the relationship with the customer.

2. Prospects for future research:

Despite the knowledge contributions of this study, the field remains open for further research on advanced uses of AI in marketing. Among the research avenues that could be explored are

- Studying the long-term effects of using AI on customer trust in a brand.
- Analyzing the ethical and legal dimensions of using AI to collect personal data.
- Exploring the experiences of different sectors (retail, banking, health, education) in employing AI to improve the customer experience.
- Develop models to measure "perceived value" from the customer's perspective in a smart marketing environment.

References

Journal Articles:

- [1] Achour, S., & Ayadi, S. (2025). Artificial intelligence in marketing: A strategic tool for enhancing business growth. *Journal of Economics, Finance and Business*, 10(1), 985–1000.
- [2] Balakrishnan, J., & Dwivedi, Y. K. (2021). Role of cognitive computing in global business management: Potential, prospects and promises. *Journal of Business Research*, 131, 635–645. <https://doi.org/10.1016/j.jbusres.2020.11.00>
- [3] Davenport, T., Guha, A., Grewal, D., & Bressgott, T. (2020). How artificial intelligence will change the future of marketing. *Journal of the Academy of Marketing Science*, 48(1), 24–42. <https://doi.org/10.1007/s11747-019-00696-0>
- [4] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319 – 340. <https://doi.org/10.2307/249008>
- [5] Huang, M.-H., & Rust, R. T. (2020). A strategic framework for artificial intelligence in marketing. *Journal of the Academy of Marketing Science*. <https://doi.org/10.1007/s11747-020-00749-9>
- [6] Tauheed, J., et al. (2024). Exploring the role of artificial intelligence in digital marketing strategies. *Journal of Business, Communication & Technology*, 3(1), 2024. <http://dx.doi.org/10.56632/bct.2024.3105>
- [7] Teepapal, T. (2025). AI driven personalization: Unraveling consumer perceptions in social media engagement. *Computers in Human Behavior*, 165, Article 108549. <https://doi.org/10.1016/j.chb.2024.108549>
- [8] Verma, S., Sharma, R., Deb, S., & Maitra, D. (2021). Artificial intelligence in marketing: Systematic review and future research direction. *International Journal of Information Management Data Insights*, 1, Article ID: 100002. <https://doi.org/10.1016/j.jjimei.2020.100002>

Books :

- [9] Kotler, P., & Keller, K. L. (2016). *Marketing Management* (15th ed.). Pearson Education. <https://books.google.com/books?id=UbfwtwEACAAJ>

Web Sources :

- [10] American Marketing Association (AMA). (n.d.). The definition of marketing. Available at: <https://www.ama.org/the-definition-of-marketing/>
- [11] Ayomide Toheeb, O., & co-authors. (2024). AI ethics in customer data usage. ResearchGate. Retrieved from <https://www.researchgate.net/publication/391629976>