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Artificial intelligence technologies and it's applications in digital marketing

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Abstract---Purpose: This research paper aims to highlight the importance of using artificial intelligence (AI) technologies in digital marketing for economic institutions, as it plays a crucial role in achieving competitive advantage and helping the customer experience a smooth and efficient consumer journey. In our study, we adopted a descriptive-analytical method by identifying various study terms from primary and secondary sources and then analyzing them. **Results.** We chose to reference the international company Ooredoo, as it demonstrated significant marketing performance during the FIFA World Cup Qatar 2022. We concluded that achieving customer satisfaction and understanding their purchasing trends requires keeping pace with modern technological developments in the field of digital marketing, as it serves as a bridge between the two. **Scientific novelty:** The Scientific novelty aspect of the research is that it addressed two variables that are characterized by modernity in the field of business administration, which are electronic marketing and the uses of artificial intelligence. **Practical value.** The Practical value of the research is to link the uses of artificial intelligence to marketing policies and to know the extent of their impact in terms of value, quality and speed.

Keywords---Digital marketing, Competitive advantage, Marketing performance.

1. Introduction

In the era of globalization and technological advancement, global economic systems are witnessing a notable shift towards emerging digital technologies and the use of technology across all sectors. Artificial intelligence (AI) is considered one of the most important outcomes of this shift, evolving from a mere optional tool to a critical necessity for institutions to keep pace with rapid and continuous developments. AI offers technological solutions that positively impact the consumer's experience and behavior. It has revolutionized various fields, especially marketing, through its ability to analyze vast amounts of data, predict consumer behavior, and assist in adopting and implementing the most effective marketing decisions and strategies. This enables institutions to improve their competitive positioning and meet diverse consumer needs, thereby earning their trust and loyalty.

The experience of Ooredoo is one of the most prominent global examples in the field of telecommunications and information technology. This was demonstrated by its enhanced performance during the FIFA World Cup Qatar 2022, where the company adopted a marketing strategy heavily reliant on AI technologies. This allowed Ooredoo to achieve industry leadership while also facilitating the use of its various services by its customers.

1.1 Research Problem:

Artificial intelligence (AI) technologies have made marketing methods more engaging, effective, and suitable for the modern consumer, who increasingly seeks easier and more advanced marketing options and services. Based on this, we can pose the following research problem:

What is the importance of using AI technologies in digital marketing for emerging institutions, with reference to the Ooredoo experience during the FIFA World Cup Qatar 2022?

1.2 Importance of the Study:

The importance of this study stems from the significance of using AI in digital marketing for institutions and its positive impact on their marketing strategies, as well as improving the consumer experience. This is particularly relevant in light of the major shift towards digitization and the activation of modern technologies in various fields, especially marketing. Additionally, the study highlights the experience of a company that successfully applied AI technologies in its marketing strategies, aiming to understand and analyze this experience.

1.3 Objectives of the Study:

This research paper aims to achieve the following objectives:

- Understand AI and digital marketing;

- Explore the techniques of using AI in digital marketing;
- Highlight the importance of using AI technologies in digital marketing for institutions;
- Reference Ooredoo's experience during the FIFA World Cup Qatar 2022 and explore how it can be utilized.

1.4 Structure of the Study:

To comprehensively address the research topic, the following points will be discussed:

- 1) AI and digital marketing;
- 2) The importance of using AI technologies in digital marketing;
- 3) Reference to Ooredoo's experience during the FIFA World Cup Qatar 2022.

Review of literature

1. Artificial Intelligence and Digital Marketing

Technological advancements have made the use of artificial intelligence (AI) a necessity, transitioning from a desirable feature to an essential one, as institutions strive to keep up with the rapid and continuous developments across all fields, with digital marketing being one of the most prominent. Digital marketing serves as a bridge between the modern consumer and the various providers of goods and services.

1.2 AI and Its Various Technologies:

The term "artificial intelligence" (AI) was first coined by John McCarthy in 1955 during a proposed summer workshop at Dartmouth College, which was attended by many of the world's leading thinkers in the field of computing. As part of refining his ideas on AI, McCarthy also invented a programming language in 1958, which sparked interest in this field across various sectors and fostered its development over the years (Stanford, 2022). McCarthy defined AI as the science of engineering intelligent machines, which is most apparent in computer programs.

AI has also been defined as an important technology that facilitates daily social life by solving problems and directly supporting economic activities (Lu, 2018). It involves designing software and hardware systems to perform tasks and processes that require human-like intelligence. AI encompasses many subfields, including robotics, natural language processing, data analysis, and machine learning. It is also described as a machine's ability to interact with its surrounding environment by performing cognitive functions related to human capacities such as learning, perception, and creativity (Mazhoudi & Bousbia Salah, 2023).

In 2022, the total global investment by institutions in AI reached nearly 92 billion USD, with private investments making up the largest portion. AI investment has increased more than sixfold since 2016, highlighting the importance of its use in all sectors across the globe (Statista, 2023).

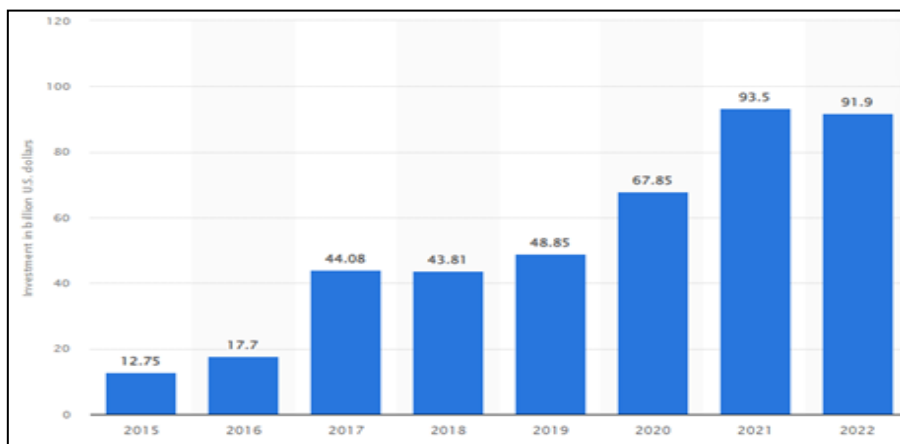


Figure 1: Total Global Enterprise AI Investment 2015-2022 (US\$ billion)
source : (2023 ,statista)

From the previous figure, we observe a significant increase in global investment in artificial intelligence (AI), rising from \$12.75 billion in 2015 to \$91.9 billion in 2022. This strong growth indicates the widespread use of AI across various sectors by both consumers and providers of goods and services, particularly with the spread of e-commerce and the digitization of various economic, educational, and administrative transactions. This growth can be attributed to several key factors, including:

- The rapid and ongoing technological advancements, especially in fields like education, customer service, computer science, and information technology;
- The pursuit of competitive advantages through AI technologies to achieve leadership in various fields;
- The digitization of different industries, which has generated massive amounts of data, creating opportunities for AI to extract valuable insights and support decision-making processes for both individuals and institutions;
- AI's ability to save time and reduce costs in the long term;
- The attraction of investors, customers, and capital owners, particularly in emerging markets that rely on technology and seek to introduce innovative products to the market.

AI Characteristics: Artificial intelligence (AI) possesses several features and advantages, including the following (Ziyad, 2020):

- **Predictive and adaptive capability**:** AI uses algorithms that detect patterns from vast amounts of information, enabling it to predict consumer behavior. This helps institutions understand customer preferences and adapt to their market environment.
- **Automated decision-making:** Through the collection of big data, AI can autonomously make decisions, provide insights, and boost productivity in a way that mimics human intelligence.
- **Continuous learning** AI employs algorithms to build analytical models that simplify task performance through trial and error.

- **Forward-looking intelligence** AI is a tool that allows people to rethink how they analyze integrated data and information, using these insights to make better future decisions.
- **Cognitive ability:** By simulating human intelligence, AI can understand and analyze various data sets to make optimal decisions.

With ongoing technological advancements, AI provides multiple features that help organizations conduct their activities with speed and efficiency. It has become an essential tool for improving performance, replacing traditional methods that often require more time and effort.

B. AI Technologies:

Artificial intelligence (AI) encompasses a wide range of techniques and methods that enable machines to perform tasks by simulating human intelligence, with the goal of enhancing customer experience and increasing efficiency. Below are some of the most important technologies (Murad, 2022):

- **Natural Language Processing (NLP):** These are computational frameworks designed to enable computers to understand, interpret, and interact with human language. NLP uses techniques like machine learning and linguistics to analyze data, respond to text and speech, and support tasks such as language translation and chatbots.
- **Expert Systems** This is a computer program that mimics human intelligence in decision-making. It uses a knowledge base of rules and data to provide solutions, recommendations, or accurate analyses for complex problems across various fields.
- **Artificial Neural Networks (ANNs):** This is a computational model inspired by the structure and function of interconnected neurons in the human brain. It consists of interconnected nodes organized in layers designed to process data and perform tasks such as classification, ranking, regression, and pattern recognition through iterative adjustments of connection strengths.
- **Genetic Algorithm Systems:** These are computational methods inspired by natural selection, involving the generation and evolution of a set of possible solutions to a problem through crossover and selection processes, gradually improving the solution to a specific problem.
- **Smart Customer:** This term refers to a person who makes informed purchasing decisions using available information, considering product quality, pricing, and personal needs. A smart customer aims to maximize value and satisfaction while being aware of different marketing influences.

The core principle of AI is to simulate human intelligence, going beyond how humans comprehend and interact in daily transactions. AI technologies are now equipped to understand and analyze large sets of data, facilitating prediction and decision-making processes, and creating value for institutions.

1.3 Digital Marketing:

Digital marketing is defined as the process of applying digital technologies and using media and communication channels to achieve various marketing goals (Constantinides, 2014). It is also known as the use of digital channels to promote

and deliver value to customers, with an emphasis on understanding their behavior and preferences and using digital data to improve marketing strategies and achieve institutional goals (Debra & Mary Lou, 2018). Kaplan and Haenlein describe digital marketing as a set of activities and processes that enable organizations to communicate and interact with their target audience through digital channels and platforms, with an emphasis on measuring and analyzing digital marketing performance (Kannan & Hongshuang, 2016).

From the above definitions, we can conclude that digital marketing is the process by which an organization promotes its products or services using digital media, thereby reaching the largest customer base and achieving its objectives at the lowest cost.

A. Digital Marketing Tools:

Digital marketing relies on several technologies, tools, and digital media to reach customers at the lowest cost and in the most effective ways. Among these tools are the following (Laabidi & Chaoui, 2022):

- **Website Marketing:** Organizations use websites to facilitate and ensure access to the largest possible number of consumers.
- **Social Media Marketing:** Social media plays a crucial role in building strategic relationships between companies and their customers by fostering connections. It also helps companies reach new customers by showcasing and promoting their products or services.
- **Email Marketing:** This is direct electronic marketing that relies on messages aimed at increasing sales or page views to help achieve the organization's objectives.
- **Mobile Marketing:** Utilizing smartphones as a medium between the organization and its customers to communicate with and reach them at minimal cost.

Additionally, there are several key elements to improve digital marketing performance, including:

- **Search Engine Optimization (SEO):** A term referring to enhancing the visibility of a website in free search engine results, thereby increasing visits and reaching a larger customer base.
- **Content Marketing:** A form of digital marketing that involves creating, publishing, and distributing content to target customers online.
- **Digital Advertising:** The process of promoting through the internet by sending marketing messages to attract customers using various digital technologies.
- **Distinctive Marketing Performance:** Organizations aim to satisfy their customers and understand their behavior and preferences in a way that guarantees excellence in their field and outperformance of competitors.
- **Service Quality:** Improving all aspects related to the product or service, including design, shape, and quality, to help the organization stand out from its competitors.

Effective use of digital marketing tools is the first step toward faster and more successful access to an organization's customers.

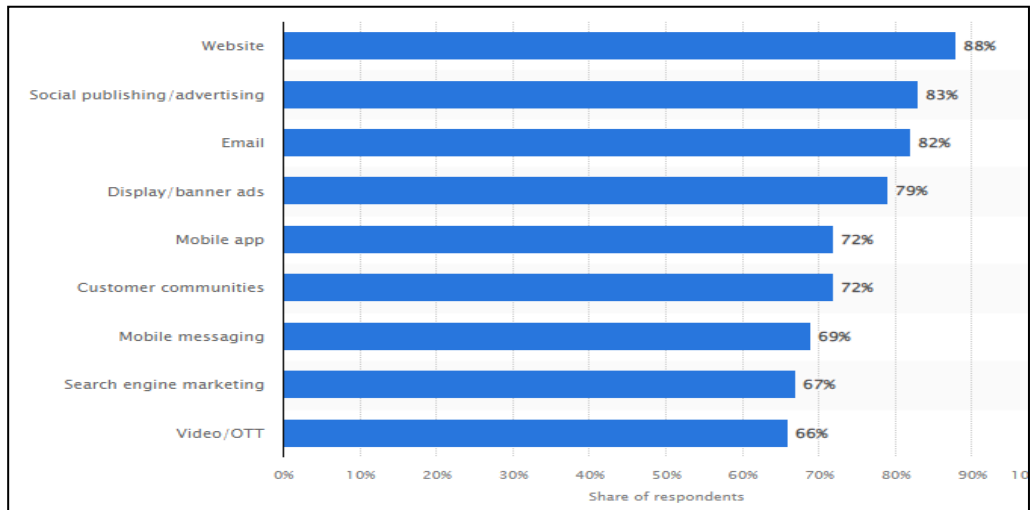


Figure 2: The most used digital tools in digital marketing strategies in the world – 2022

Source: (Statista, 2023)

In a survey conducted in early 2022 among marketing leaders from 29 different countries worldwide, 83 percent of organizations reported using social media as a digital channel for their marketing strategy, 72 percent used mobile applications, and less than 67 percent utilized search engine optimization (SEO). Artificial intelligence has become an inevitable necessity, especially with the rise in internet and smartphone usage globally. The optimal decision for organizations to keep up with this rapid pace is to employ the latest technological innovations across all their activities, particularly in marketing, as it forms the bridge between the company and its customers.

3. The Importance of Using Artificial Intelligence Techniques in Digital Marketing

The use of artificial intelligence has led to a significant leap in the marketing field by integrating various techniques into organizations' marketing strategies and enabling consumers to achieve a more effective and suitable consumption experience. Digital marketing utilizes artificial intelligence for a variety of reasons due to the substantial benefits it provides. Here are some of the main reasons for the widespread use of artificial intelligence in digital marketing (Dan Dumitriu and Mirona Ana-Maria Popescu, 2019):

- Data Analysis and Insights: Artificial intelligence can process vast amounts of data from various sources across digital platforms or social media by analyzing user behavior and interactions through digital media. This helps in gaining a better understanding of the market and acquiring valuable insights into consumer preferences, trends, and patterns.
- Personalization: AI allows for the customization of content and marketing experiences based on individual user preferences and behaviors. This

personalization enhances user engagement by providing relevant content to each user that aligns with their interests and inclinations.

- Automation: Artificial intelligence automates repetitive and time-consuming tasks such as sending emails, posting on social media, and managing advertising campaigns. This improves the marketing efficiency of organizations and reduces manual workload, allowing marketers to focus on more strategic aspects of their work.
- Predictive Analytics: AI can predict future trends by analyzing historical data, assisting marketers in making informed decisions regarding marketing strategies, launching new products, and creating content.
- Customer Support through Chatbots: AI-powered chatbots provide instant responses to customer inquiries, enhancing customer service consistently and effectively 24/7, regardless of the volume of inquiries.
- Content Generation: AI tools can generate content based on product descriptions needed by the customer and manage social media posts, thus accelerating and facilitating various business transactions.
- Ad Targeting and Optimization: AI algorithms analyze consumer behavior to improve ad targeting, ensuring that advertisements are shown to the most relevant audience, increasing market opportunities, and reducing advertising costs.
- Social Media Feedback: AI can analyze social media conversations and sentiments, helping marketers understand public opinion about their brand and products, thus facilitating the management of the organization's reputation and branding strategies.
- Fraud and Counterfeit Detection: AI can detect fraudulent activities and counterfeiting related to their brand, such as clicks on online ads directly linked to the organization's website, ensuring that marketing budgets are spent on legitimate interactions.

AI enhances an organization's ability to achieve efficiency, accuracy, and reach the right customer with the right message at the right time. It helps organizations make data-driven decisions and improve their advertising campaigns to achieve better results.



Figure 3: The evolution of the use of artificial intelligence in digital marketing
Source: (Dhapte, 2023)

We note from the previous figure that the value of artificial intelligence (AI) in marketing volume reached 10.10 billion US dollars in 2021, and it is expected to rise in 2022 to 77.40 billion US dollars by 2030, at a compound annual growth rate of 25.2% during the expected period (2022 - 2030). This is due to the realization of the necessity and inevitability of using artificial intelligence in marketing the company's products and services, which results in building a more convenient and effective consumer experience in various commercial transactions. Artificial intelligence technology is an inevitable strategic technology that works to achieve greater efficiency and more opportunities for the organization, and it also clearly achieves customer satisfaction and loyalty, thus acquiring its technologies turns into a competitive advantage for many institutions, but on the other hand, artificial intelligence is still a new and complex science that requires high expertise and multiple skills to be able to use and benefit from it to ensure its success.

1-4 Overview of the Organization and Its Investments in Artificial Intelligence

Ooredoo is a leading global telecommunications company that provides mobile and fixed communication services, as well as internet services, in accordance with the needs of both individual and corporate customers. Founded in 1987 and headquartered in Doha, the capital of Qatar, Ooredoo operates in the Middle East, North Africa, and Southeast Asia, with a presence in Qatar, Kuwait, Oman, Algeria, Tunisia, Iraq, Palestine, the Maldives, Myanmar, and Indonesia.

Ooredoo places great emphasis on the communities in which it operates. Accordingly, it has built its vision on enriching customers' digital lives by empowering them to connect and access the internet, while providing digital experiences that enhance their daily lives. Additionally, Ooredoo continues to invest to meet their increasing digital needs in the market efficiently and timely. By 2020, the number of its customers exceeded 118 million, with revenues reaching 28.867 billion Qatari riyals. Its shares are listed on the Qatar Stock Exchange and the Abu Dhabi Securities Exchange.

The organization has consistently shown interest in artificial intelligence and its integration into various activities. This is evident through its participation in the Third Middle East AI and Data Analytics Summit, held on October 27, 2022, in Doha, aimed at exchanging views on issues related to AI applications and data analytics, as well as best practices in enhancing business agility and scalability. This contributes to generating new cash flows for its revenues and strengthening its competitive position. Additionally, Ooredoo Qatar has successfully deployed cognitive programs on Microsoft Azure Cloud in collaboration with Ericsson, aiming to improve the experiences of 5G users by providing seamless and strong connectivity with high network speeds, low latency, and large data capacity. Ooredoo continues to improve its service delivery to customers by keeping pace with rapid technological advancements and providing the best opportunities through:

- Establishing a strategic partnership with Axon, a global leader in public safety technology.

- Achieving record numbers in data and call usage during the group stage of the FIFA World Cup Qatar 2022, due to the introduction of various artificial intelligence technologies in its services.
- Signing a multi-year agreement with BICS for managing voice services across group companies, marking the first partnership of its kind in the region.
- Entering into strategic agreements with Nokia aimed at enhancing the digital transformation journey at Ooredoo and improving customer experience.
- Signing a five-year strategic partnership with Ericsson in the field of 5G networks.
- Offering the BroadSoft service from Cisco, which is the first cloud communications service in Qatar used by businesses.
- Providing a new solution for protecting databases during processing or transfer for large enterprises and small to medium-sized companies, based on cloud technology.
- Launching Qatar's first virtual store, allowing customers to experience store visits through three-dimensional virtual technology.

Table 1: Ooredoo Technology Performance Indicators in 2022

Data volume growth rate	Total data volume	Total percentage of 4G internet usage	Total number of offices	Institution
%14.26	4,454,433,145	%92.08	32,994	ooredoo

Source: (ooredoo, 2022)

Ooredoo Qatar's customer base increased by 14% in 2022, with 460,000 customers activating their subscriptions during the fourth quarter of the year, which is above the normal subscription rate. This surge was attributed to the influx of fans during the FIFA World Cup Qatar 2022, significantly contributing to the company's expansion and helping it achieve a strong competitive position. The value of the Ooredoo brand reached approximately \$3.40 billion, and the number of users of its application exceeded 2 million.

4-2 Contribution of Artificial Intelligence to the Success of Ooredoo Qatar's Marketing Strategy During the 2022 World Cup

Ooredoo adopted a successful marketing strategy during the FIFA World Cup Qatar 2022, which helped it achieve a highly competitive position. This success is attributed to its accumulated efforts in adopting modern technologies over the years and integrating artificial intelligence into various activities, enabling it to build a strong competitive center in both local and international markets. Ooredoo enhanced its presence on social media, reaching the following follower counts in 2023:

- More than 850,000 followers on Facebook, with around 5,000 positive reactions from its customers.
- Over 430,000 followers on Instagram, with more than 10,000 posts interacting with customers.
- More than 570,000 followers on Twitter, with around 70,000 posts regarding the company's news and various achievements on local and global levels.

The company seized the opportunity of the 2022 World Cup to present the latest technologies that rely on artificial intelligence to facilitate its transactions with customers. Some of the notable activities it introduced include:

- Launch of a new procedure called "Know Your Customer" using artificial intelligence technology to verify users' identities and activate SIM cards, aiming to speed up and simplify the onboarding process for customers. This user-friendly method involves capturing a selfie with the customer's front camera and uploading a digital copy of their official ID to easily activate the SIM.
- Providing 5G network service to everyone in Qatar and incoming fans to enhance their consumer experience and provide access to ultra-fast internet with download speeds of 1 gigabit per second, ensuring reliable connectivity for spectators watching matches outside the stadium. Ooredoo was the first World Cup organizer to offer 5G network service.
- 4G and 5G network coverage in all eight World Cup stadiums and their immediate surroundings, with more than 8,466 multi-frequency antennas connecting over 500 kilometers of wireless frequency cables and more than 202 kilometers of fiber optics. The areas surrounding the stadiums were covered with 41 smart communication towers and over 45 outdoor locations at maximum power.
- Provision of mobile network services equipped with more than 5,000 cells, TETRA network services, and Wi-Fi services using the latest 5G/4G/3G/2G technologies across all stadiums.
- Enhancing communication networks by upgrading data transfer link capacities with international server devices associated with social media applications and websites like Facebook, Instagram, Snapchat, TikTok, and WhatsApp.
- Deploying a team of over 400 experts to handle various activities from the operations center, which includes the latest requirements and is supported by a network of many remote service centers operating around the clock.
- Offering a virtual voice assistant powered by artificial intelligence technology from Google Contact Center, available 24/7 to assist customers in nine different languages, including Arabic, English, Spanish, French, German, Portuguese, Japanese, and Korean.
- Providing more than 350 buses equipped with Wi-Fi systems operating around the clock.

Additionally, Ooredoo established several sales points to enable fans to obtain SIM cards at key locations such as airports, ports, hotels, and taxis, allowing it to assert its competitive position and achieve superiority in its marketing strategy. This contributed to record revenues after the conclusion of the FIFA World Cup, which is the most important sporting event globally. Some of the key results achieved during that period include:

- 533 terabytes of data usage including 136 terabytes through Wi-Fi services in the stadiums and their immediate surroundings.
- 39.9% of data usage via the 5G network at speeds reaching 240 megabits per second.
- 58.6% data usage on the 4G network at speeds reaching 20 megabits per second.
- More than 434,000 users benefited from its data services.
- 7.5 million voice calls recorded with an extremely high success rate of 99.95%.
- A 7% increase in its revenues reaching 8.0 billion Qatari riyals during 2022.

5- Conclusion and Study Results

The rapid technological advancement and the widespread availability of the internet have led to significant changes in consumer trends and behaviors across various demographics. This shift has forced businesses to abandon traditional methods and embrace digital transformations. Artificial intelligence (AI) has emerged as one of the most important outputs of technological evolution, becoming indispensable for organizations and consumers alike, particularly regarding digital marketing, which serves as a vital link between them. AI has brought about a qualitative leap in communication methods between marketers and their customers, enabling businesses to achieve leadership and competitive advantages through the ability to analyze and understand vast amounts of data, distinguishing individual preferences and behaviors, allowing them to design digital content and deliver offers with high precision. In this research paper, we highlighted various study variables and reached the following conclusions:

- Digital marketing has become an essential necessity for businesses, as it helps accurately identify and target specific customer segments, leading to more effective advertising campaigns.
- Digital marketing aids in building a strong online presence for brands across social media platforms.
- AI-driven marketing can utilize modern techniques that enhance the consumer experience while significantly reducing marketing costs.
- AI enables organizations to achieve leadership in their fields and build a strong competitive position.
- AI analyzes massive data sets in record time, allowing organizations to make strategic decisions efficiently.
- AI in marketing narrows the communication gap between the organization and its customers, facilitating feedback and enabling necessary changes to gain customer satisfaction and loyalty.
- Utilizing AI technologies in digital marketing reduces long-term marketing costs and simplifies various administrative and logistical transactions.
- AI allows for the simplification and improvement of marketing campaigns, as well as the mitigation of risks such as product imitation and minimizing human error.
- AI-powered chat systems handle consumer interactions on websites by simulating human intelligence to accurately respond to inquiries and assist them in browsing, linking them with an automated agent for customer service.
- Ooredoo is one of the most successful users of AI technologies in its field, particularly evident during the FIFA World Cup Qatar 2022, where it provided the latest technologies to ensure a successful and exceptional customer experience.
- Ooredoo launched several AI-driven services aimed at reaching the largest possible consumer base, such as the "Know Your Customer" service, achieving success in a record timeframe.
- AI-powered digital marketing is one of the key technologies enabling organizations to understand customer behaviors and adjust their strategies according to changing market conditions or customer needs, making it a significant advantage in a highly competitive business environment.

Regarding recommendations, the following can be suggested:

- Increase focus on AI across various organizational activities, especially in marketing, as it continuously connects with customers and their changing consumption trends.
- Conduct training programs within economic institutions covering marketing, administrative, and financial activities.
- Provide modern tools and resources that contribute to the development of AI technology in digital marketing.
- Encourage research in the field of AI and seek to derive benefits from the experiences of leading organizations.
- Work on adapting successful experiences from international economic institutions in the field of AI to Algeria, developing digital applications and online platforms in line with market and consumer requirements.

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