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Effect of Artificial Intelligence on Customer Relationship Marketing in Saudi Context

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Abstract: The study aimed to measure effect of artificial intelligence and customer relationship marketing in the Saudi companies listed in the stock market. The study used the quantitative approach. The study population consists of all Saudi companies listed in the Saudi stock market that use artificial intelligence in marketing communication. The fifty companies in seven key sectors are the population consisting of aviation services, food retail, health care, banks and communications, health insurance, and education. The number of customers in these companies reached millions because they provide shopping goods. The unit of analysis was employees in the communication, marketing, public relations, and AI departments estimated 252 people. The questionnaire is the primary tool for data collection. The statistical program AMOS was used. The study concludes that AI in marketing communication activities and customer relationship marketing is highly applicable in Saudi companies. The study found a statistically significant positive impact of AI in marketing communication activities on customer relationship marketing in such companies. In the end, the study presents a set of recommendations that encourage AI in marketing applications, especially in customer relationship marketing
Key Words: Artificial Intelligence, Marketing Communication, CRM, Acquiring Customer, Customer Value, Personalization Contact, Saudi Arabia
JEL Classification codes:M3 ، M31 ، M15

1. Introduction :

Artificial intelligence is one of the manifestations of the digital era, and its roots back to the 1940s when computers were innovated (Swedish, 2019). Despite the long appearance; the literature has no comprehensive definition of AI, and it is still part of the machinery or computer practices in a smart way. The literature confirms that the digital revolution in the twentieth century was the focal point in spreading AI in communication, marketing, administration, medical and engineering sciences (Alonso et al., 2020). Currently, Businesses are considering AI and its applications as crucial factors for effectiveness and efficiency, and smart ways to employ these applications in the core functions of Businesses. AI is an indicator of business performance and competitive advantage (Kumar & et al., 2018).

Artificial intelligence is the art of the machinery industry, and Ertal (2018) added the concept of the smart automated arm used in factories to execute routine works that need muscle power and does not require complex mental activities such as welding and painting in automotive factories. The Expert Systems applications are also used in accounting and financial software to analyze events and occasions at the same level as the expert (Al-Nsour, 2024). Other literature also looks for Artificial intelligence deeply and widely used because of multiple indicators and uses in machine learning, deep learning, research techniques, and sounds and images (Bouzid, 2022). Artificial intelligence is the automation of systems characterized as intelligent, data entry processes and doing tasks and duties in

the best way that increases success. Guruduth Banavar considers that AI contains a set of applications aiming to simulate human behavior in a way that makes the business functions intelligent (Korinek & Stiglitz, 2019). Patterson.W. Dan adds that AI represents the power of conclusions to solve problems, understand natural languages, and assimilate sensory perception and other possibilities that require human intelligence (Holmi, 2021).

Artificial intelligence is one of the most successful fields when moving from research to commercial use in many sciences. AI has proven competence in medicine, industry, education, and health (Bhbosale & Multani, 2020). AI forms have also varied from Neural Networks, Algorithms Genetic, Intelligent customer systems, and Systems Intelligent expert systems that are most popular in work environments and other sectors and businesses (Ali et al., 2022). AI makes managerial activities easier and a source of excellence, planning and executing activities, and progress and business evaluation criteria (Al-Nsour et al., 2024;Al-Mohammadi, 2023).

Rapid access to data networks and databases in the twenty-first-century expansion and multiplicity of communication tools (Al-Ayyaf & Al-Nsour,2024); as a result, the organizations moving into the intelligent business model, AI has explicitly penetrated their business systems. The innovation, good planning, production, transfer, and distribution of products were features of AI area that meet the needs of individuals and groups (Graetz & Michaels, 2018). AI creates integrated communication and marketing activities, developing customer behaviors, building customer relationships, and enhancing market presence (Abid Haleem et al., 2022). AI fulfills the customer's needs with e-modern tools and products, and businesses looking for communication function quickly, interactively, and at less cost (Graetz & Michaels, 2018).Businesses were looking for new ways to call customers, increasing their engagement and interaction with the organization (Boddu et al., 2022). Practices prove the relationship between integrated marketing communication activities and AI applications (Alshaibani, 2024), and the results were imperative, especially in providing information that can be easily and quickly accessed at a lower cost) Al-Nsour, 2024). AI is also an innovative way to avoid time and spatial barriers that make communication less efficient (Al-Masri & Agha, 2021).

Successful Companies have used AI in customer communication, and modern systems have become a way to personal communication, build trust, foster empathy, maximize customer value, and promote profitable contact (Prabowo et al., 2019). The commitment, communication, exchange, and shared values between the company and customers were new elements of AI by Prasad & Aryasri (Ibta, 2021). As a result, AI becomes an effective tool in designing communication strategies based on customers, a successful way to personalize communication, orient customers to business products, and motivate purchasing decision-making (Schwalbe & Wahl, 2020). It is necessary to say that the accumulation of information in a single communication system design of appropriate communication activities, quick feedback and response, and interaction with customers about complaints and suggestions (Ali et al., 2022; Al-Nsour et al., 2021). The single communication system based on AI maximizes satisfaction and loyalty value and profitability, customer retention, designing customer relationship marketing strategies(Bin Khunin & Al-Nsour,2024), and planning programmed and targeted communication processes (Verma et al., 2021).

2. Research Objectives:

The main objective of the research is to determine the use of artificial intelligence in enhancing customer relationship marketing in Saudi companies in the financial market. It has a sub objectives as follows:

- Assess the degree of artificial intelligence utilized in marketing communication among Saudi companies listed on the stock market.
- Determine the customer relationship marketing in the stock market in KSA.
- Measure the impact of artificial intelligence on the customer relationship marketing of Saudi companies in the stock market.

- Recognize the requirements of artificial intelligence in Saudi companies listed in the stock market.
- Recognize the obstacles to using artificial intelligence in Saudi companies listed in the stock market.

3. The Research Significance :

- The study seeks to make a theoretical presentation through the literature on the concept of artificial intelligence and its related concepts, thus seeking to bridge the theoretical and cognitive gap, the lack of literature that has researched the use of artificial intelligence, how it is employed in marketing communication and fostering profitable relationships with customers in Saudi companies listed in the stock market.

- The significance of modern technology in managing and planning customer information systems is crucial. This enables Saudi companies to utilize interactive communication systems within the country, enhancing their competitive edge in the market.

- It is expected to provide key findings, recommendations, and implications for decision-makers in Saudi companies. These insights on how to use modern technologies in the local community are consistent with the Kingdom's Strategic Vision 2030 and consider the Kingdom as a capital of AI for 2024.

4. Literature Review:

4.1 The Artificial Intelligence: Concept and Importance

The intelligence term includes mental abilities like analyzing, planning, problem-solving, and simulation (Lies, 2019). Intelligence terms include also thinking abstractly, collecting and coordinating ideas, capturing languages, and learning (Bouzid, 2022). Psychology has studied intelligence behaviorally separately from creativity, personality, and memory wisdom (Ullrich et al., 2024). From an AI perspective, it is a branch of computer science that makes computers operate similarly to human intelligence in learning, deduction, and decision-making (Lies, 2019).Dan and Patterson added that AI is concerned with formulating computer systems based on intelligent formulas, the conclusions to complex problems, understanding natural languages, and perception (Ullrich et al., 2024; Al-Nsour, 2023). The tasks may depend on human intelligence through visual perception, speech recognition, decision-making, and Interlingua translation (Fredström et al., 2022).

At the communication level, AI has facilitated intelligent information management, planning and implementing activities, and achieving excellence and progress (Ullrich et al., 2024). AI has become a standard for progress, intelligent production, transporting, and distributing products that meet community needs (Hajirah, 2018). AI has also become a digital marketing tool for customer retention, and it is a part of the e-marketing industry in large enterprises and SMEs. Smart Insights survey (2022) has shown that 55% of companies consider artificial intelligence as a part of their marketing programs and social media. The survey results show that AI enables marketers to collect and analyze vast sizes in social platforms, E-mails, and web networks quickly. AI maintains customer relationships, enhances the marketing campaigns' performance, and improves return on investment (ROI). It also found that 76% of consumers hope to understand their expectations so AI can do this mission accurately and precisely and create a personal customer experience (Jo, 2020). In improving customer experience using AI, four developments stand out: chatbots, predictive and targeted content, content industry, and image recognition technology (Bouzid, 2022).

AI systems improve customer service and provide targeted and relevant content for customers (Jo, 2020). Here, marketing and artificial intelligence integrate with market forecasting systems, process automation, and decision-making, efficient tasks of humans, and providing valuable outputs to marketers (Neuhofer et al., 2021). AI technology has also allowed market segmentation into

distinctive customers, focusing on their needs, creating long-term relationships with the brand, and building loyalty (Jo, 2020). AI has made marketing strategies intelligent, influential, and consumer-friendly (Ismail, 2021). Many companies use AI technologies to improve customer experience (Jarek & Mazurek, 2019).

4.2 Artificial Intelligence in Marketing Communication:

AI is necessary for actionable insights, customized services, and simplifying marketing efforts to outperform competitors (Rabby et al., 2021). Marketing communication is heavily user to data, so artificial intelligence is the best way to process data, develop efficient digital strategies, and expand their business with low financial resources (Li et al., 2021). The technological revolution caused the rapid advancement of telecommunications, the expansion of the information scope, the rapid collection and storage of information, and the transition worldwide. These changes create a "global market" and reduce distances, and there is no longer a national or regional market and move into a single market with unlimited products (Daqar & Smoudy, 2019). International marketing is increasingly evolving with the growing marketing information and products and channels (Chung et al., 2022).

AI techniques merge marketing with market forecasting systems, processes and decision-making, tasks, and outputs to marketers (Fulgoni, 2014). AI enables companies to acquire customers, increase businesses based on advertising platforms, and understand social platforms (Christian et al., 2023). Artificial intelligence techniques have also explored data and analyzed different social networks (Prabowo et al., 2019), thereby helping marketers to work effectively via networks (Ismail, 2021) and adopt the appropriate social marketing approach (Asdudi, 2022). AI presents a personalized advertising experience, shapes the customer's journey, influences purchasing decisions, and creates brand loyalty (Chung et al., 2022). AI divides the market into distinctive segments and understands how to motivate them, focusing on the particular needs of the public and building long relationships (Jarek & Mazurek, 2019). Studies confirm that features anticipate consumer behaviors and establish strong consumer-brand relationships (Christian et al., 2023).

Chatbots have also allowed for audio or text conversations and become one of the most marketing channels in social media platforms - such as advertisements or emails - to provide customer service, collect customer data, and deliver targeted messages (Al-Nsour, 2024). The heavy use of AI improves customer experience and personalizes content rather than manual searches, so Google Now and Apple Siri are examples of this technology (Milne-Ives et al., 2020). AI penetrates new fields such as finance, retailing, and the banking industry. AI reflects on direct operations with the customers, designing intelligent assistants to address frequent questions and customer needs, and personal and e-shopping experiences (Al Mubarak, 2017; Marr, 2019).

4.3 Effect of Artificial Intelligence on CRM:

AI supports alternatives for marketers while dealing with customers. AI Applications assess their preferences and purchase decisions (Boerman et al., 2021). Customer care increases satisfaction, loyalty, customer value, and profitability (Longitude, 2013). Artificial intelligence builds and maintains customer relationship marketing strategies (CRM) (Al-Nsour & A, 2024), especially if we know that the customer is one of the business assets, source of profits, and key to development and progress (Chatterjee et al., 2021).

Studies have shown the strong positive impact of AI applications on business goals, competitive position (Al Mubarak, 2017), and growth of sales (Rashid, 2011). Artificial intelligence applications in marketing have become one of the most used methods in planning communication processes with target markets (Araf, 2023). The relationships between AI technologies and marketing strategies features like market forecasting, process automation, and decision-making (Ismail, 2021), as

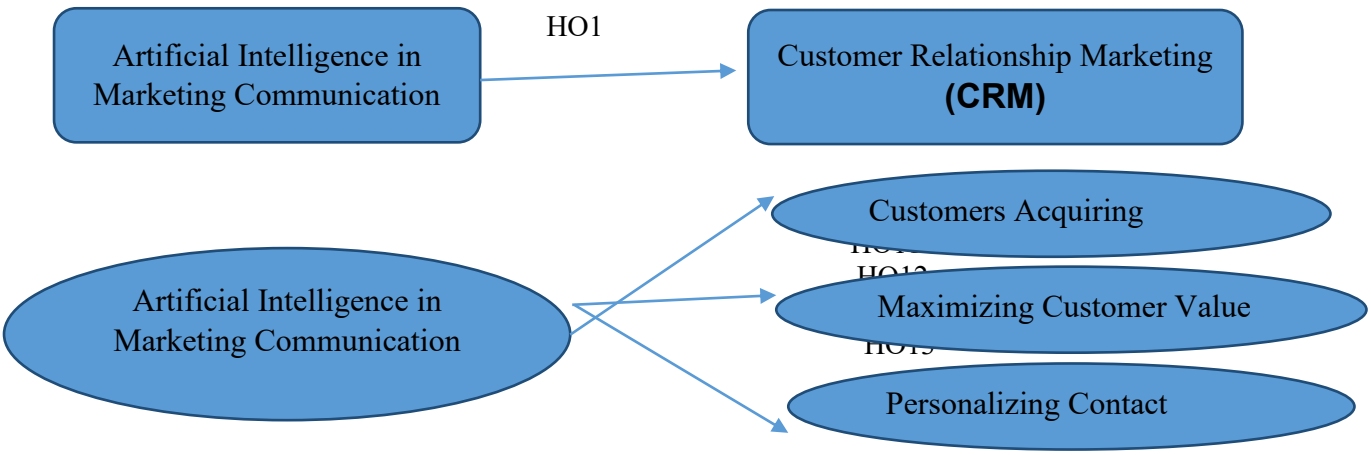
well as increasing the efficiency of tasks performed by humans, providing valuable outputs to marketers,data mining, and identifying active parts on social platforms (Al-Nsour,2024;Marr, 2019).

From marketingperspective;these networks are effective in collecting and extracting information from big data sources and help to improve the communication role, effective market segmentation, cost-based performance measurement and accuracy (Al-Nsour,2023), as well as classification of purchasing patterns, forecasting and market analysis (Bloom, 2020). The use of artificial intelligence technologies has also been found to play an important role in companies' performance, contributing to an increase in the efficiency and effectiveness of marketing. (86%), help analyze data and debrief new information by (79%), and promote innovation by (74%) and improved decision-making mechanism by (71%) (Łapińska, et al 2021).From a marketing perspective, these applications enables collect information and big data for communication purposes, effective market segmentation, cost-based performance measurement(Raid et al., 2024), accuracy, classification of purchasing patterns, forecasting, and market analysis (Bloom, 2020). Artificial intelligence technologies play a role in business performance and increase the efficiency and effectiveness of marketing by (86%), analyze data and data mining by (79%), innovation by (74%) and improve decision-making by (71%) (Łapińska et al., 2021).

Finally, AI technologies are an element of business success because they provide ease and effective communication with customers and provide the necessary data for marketing innovation in the company (Ismail, 2021). The AI applications accurately forecast demand and supply, consumer trends, and the efficiency of inventory management, shipping, and transportation using intelligent robots (Bolton et al., 2018). AI helps marketers determine the business vision and future direction through text analysis called "Text mining" and machine learning algorithms in banking, tourism, digital retail, customer analysis, and market segmentation (Dekimpe, 2020). According to previous literature showing AI relationships with customer relationships marketing, the research hypothesis can be formulated as follows:

- ***The statistically positive impact of AI on the customer relationships marketing of Saudi companies listed in the stock market is 5%.***

The theoretical framework and previous studies discussed artificial intelligence and several sub-variables constituting customer relationship marketing, which can propose a conceptual framework for this study. This conceptual framework answers research questions and objectives. The conceptual framework consists of IV (artificial intelligence), and DV (customer relationships marketing). The DV consists of three sub-dimensions (Acquiring Customers, Maximizing Customer Value, and Personalizing Contact). The shape and direction of relationships between IV and DV according to the study (Shaikh et al., 2023), the study (Li et al., 2023), the study (Natarajan, 2022), and the study (Ledro et al., 2022), study (Bachir, 2021), and study (Jarek & Mazurek, 2019).



5. Research Methodology:

5.1 Research Method:The quantitative method is the most appropriate for the current research because it depends heavily on numerical data (Blumberg et al., 2008). More specifically, the current study measured the level and direction of relationships between IV and DV variables: artificial intelligence and customer relationship marketing. This research can describe attitudes and situations of the study phenomena. The descriptive research can answer how AI affects customer relationship marketing in Saudi companies.

5.2 Sampling Method: The study focuses on all Saudi companies listed on the stock market that utilize AI applications in their communication activities. The pilot study identified 50 companies using AI for marketing communication in their branches and headquarters in Riyadh. Additionally, the total number of employees in artificial intelligence departments across Saudi companies is 252. The full survey technique was employed for this study. There are 50 companies listed in the Saudi stock market. The unit of analysis consists of all staff members in AI, communication, marketing, public relations, sales, and customer relationship management in Saudi companies. The total number of employees in targeted companies reached 252 persons. The full survey method was employed.

5.3 Research Tool: The fully structured questionnaire consists of Closed-Ended questions. This study adopted the questionnaire according to the literature and previous studies related to the topic related to the uses of artificial intelligence and customer relationship marketing.

5.4 The Measurement: The study employed a five-point Likert scale ranging from (1) to (5) to evaluate the compatibility between each item and the respondents' opinions. A score of (5) indicates a very high response, (4) signifies a high response, (3) represents a moderate response, (2) denotes a low response, and (1) reflects a very low response. Descriptive analysis included calculations of the arithmetic mean, standard deviation, and relative percentage, to assess the impact of artificial intelligence on customer relationship marketing. The data analysis primarily utilized Analysis of Movements AMOS. Amos is a powerful structural equation modeling (SEM) software helping support research and theories by extending standard multivariate analysis including regression, factor analysis, correlation and analysis of variance.

5.5 Research Tool:A fully structured questionnaire was developed to address the research questions. The items were based on studies related to the research topics, including works by Shaikh et al. (2023), Li et al. (2023), Natarajan (2022), Ledro et al. (2022), Bachir (2021), Jarek & Mazurek (2019), Khris (2020), and Abdalat (2019). The initial version of the questionnaire included more than 75 closed-ended questions, utilizing a five-point Likert scale. To validate the questionnaire, the two researchers conducted a Confirmatory Factor Analysis (CFA) to test the significance of the proposed items. This analysis resulted in a refined set of 39 items that met statistical significance and were included in the final questionnaire distributed to the target population. Additionally, a group of specialists was engaged to review the preliminary items, assessing their relevance, clarity, and ability. The final electronic questionnaire was created using Google Drive and shared with employees of the studied companies. The Likert Five Points Scale, a widely used measure in survey research, was employed, offering five response levels: strongly agree, agree, moderate, disagree, and strongly disagree. The questionnaire also included several open-ended questions inviting suggestions and recommendations for enhancing the application of artificial intelligence in marketing communication.

6. Descriptive Analysis:

6.1 The Independent Variable (AI) consists of 14 items, with responses ranging between high and very high levels. The arithmetic mean is 3.89, and the standard deviation is 0.66. This indicates that the level of AI in marketing communication is considered high, with an approval rating of 75.6% among respondents.

6.2 The Dependent Variable (customer relationship marketing) consists of 25 items classified into three sub-variables: customers acquiring, maximize customer value, and personalizing contact. The arithmetic mean of the dependent variable is (3.963) and standard deviation (0.88). It means that customer relationship marketing in major Saudi companies is high, with (77.7%) of respondents expressing approval. The three sub-variables are as follows:

1) Acquiring Customers (DV11) consists of eight items with high to very high response levels. The arithmetic mean is 3.96, and the standard deviation is 0.87. This indicates that the customers' acquiring level was high, with 77.767% of respondents approving.

2) Maximizing Customer Value (DV13) consists of 10 items between high and very high response levels. The arithmetic mean is (3.97) and the standard deviation (0.89). It means that the maximizing customer value in Saudi companies is high by the approval of (77.6%) of respondents.

3) Personalizing Contact (DV13) consists of 7 items between high and very high response levels. The arithmetic mean is (3.9626), with a standard deviation (0.884). It means that the level of contact personalization in Saudi companies is high by approval (77.9%) of respondents.

7. Validity and Reliability:

7.1 Reliability: It estimates the internal consistency between items in the latent variables (Hair et al., 2021). Cronbach's Alpha is the widely used measure of reliability. The statistical rule says that test value exceeds 0.7 is permitted. Table 1 indicates that test values for the latent variables (IV and DV) are more than o.7. So, they are statistically accepted and can be used in analysis and testing hypothesis (Hair et al., 2021).

7.2 Individual Item Value: It measures the validity test. Validity is the consistency between a set of items in the same phenomenon. It measures the correlation of the current test value and other tests measuring the same constructs in the scale (Hair et al., 2017). This means that each item must be related to the other in the scale. The statistical rule says that the permitted value must exceed 0.7. Table 1 shows values greater than the permitted value (0.7). So, they are statistically accepted and can be used in analysis and hypothesis testing (Hair et al., 2021).

7.3 The normal Distribution Test is one of the most important statistical tests to describe the scatter pattern of study variables. The normal distribution is a probability distribution describing the similarity of variables and their tendency to be the midpoint, and it is also known as the Gaussian distribution "bell curve" to determine the level of scatter of data collected (Jiang & Nguyen,2021; The Kolmogorov-Smirnov (K-S) statistics is one of the techniques examines the normal distribution, and the decision-making rule states that the K-S below the probability error (0.05), means that the data is not normally distributed and vice versa. Table 2 indicates that the K-S values are more than (0.05) for all variables. Therefore the data are identical around the midpoint and track the normal distribution.

Table 1: Discriminate Validity – Cross Loading

Construct	IV	Acquiring Customers	Maximizing Customer Value	Personalizing Contact
Item 1	**.703**	**.819**	**0.767**	**0.784**
Item2	**.734**	**.866**	**0.780**	**0.813**
Item3	**.737**	**.895**	**0.861**	**0.833**
Item4	**.755**	**.826**	**0.860**	**0.864**
Item5	**.759**	**.838**	**0.864**	**0.842**
Item6	**.762**	**.820**	**0.902**	**0.905**
Item7	**.397**	**.864**	**0.822**	**0.900**
Item8	**.737**	**.825**	**0.856**	**-------**
Item9	**.715**	**-------**	**0.867**	**-------**
Item10	**.777**	**-------**	**0.914**	**-------**
Item11	**.753**	**-------**	**-------**	**-------**
Item12	**.765**	**-------**	**-------**	**-------**
Item13	**.741**	**-------**	**-------**	**-------**
Item14	**.740**	**-------**	**-------**	**-------**
Cronbach's Alpha	**0..856**	**0.944**	**0.955**	**0.939**
Kolmogorov-Smirnov	**0.284**	**0.200**	**0.200**	**0.288**

8. Research Outcomes and Discussion:

8.1 There is a Statistically Positive Effect of Artificial Intelligence on the Customer Relationship Marketing in Saudi Companies at the significance level 0.05.

The study resolved a hypothesis that "there is a statistically positive impact of artificial intelligence on the customer relationship marketing in Saudi companies listed in the stock market at the significance level 0.05. Thus, the IV of AI in marketing communication. The table below (2) indicates that the calculated critical ratio for regression weight (CR) of AI in CRM (2.658), which is greater than the tabulated value (1.96), and the P-value 0.001 is less than 0.01.Means that the artificial intelligence in CRM in Saudi companies listed in the stock market is significant. Table 3 shows the result of path analysis to the multiple regression between the IV (artificial intelligence) and DV (customer relationship marketing). The calculated CR value for AI is greater than the tabulated value (1.96), in addition to the significance level of IV (0.001)is less than the probability of errors (0.01). The AI has a significant impact on the customer relationship marketing. The standard error of all IV dimensions is less than (50%), meaning a lower level of variance in the research model. The coefficient of determination is (0.55) for the IV (artificial intelligence in marketing communication) explained 55% of total changes in IV (CRM)—the remaining value of 45% refers to random error or the neglected IVs in the model.

Table No. (2) Results of Regression Analysis of the Artificial Intelligence and CRM

Latent Variale	β_i	S.E.	C.R.	P-Label
Constant	**3.319**	**.290**	**11.455**	**0.00**
AI	**.179**	**.067**	**2.658**	**.008**

Source: AMOS Output.

According to the above results, we accept the hypothesis indicating a statistically positive impact of artificial intelligence on the customer relationships marketing of Saudi companies in the stock market at 0.5. That result is consistent with studies that have covered the same topic. It has shown that the impact of artificial intelligence on customer relationship marketing cannot stop, and the future of AI is promising and has a lot of surprises and developments. Studies confirm that companies based on artificial intelligence in customer relationship marketing have a competitive advantage when delivering personalized, effective, and innovative customer experiences. Researchers (Mishra & Mukherjee, 2021) confirmed that AI plays a role in Amazon as an e-commerce leader worldwide. Amazon become aware of the AI benefits and enhances the user experience. A study (Ledro et al., 2022) proposed three areas of AI in CRM: big data, machine learning techniques, and strategic management of AI. A study (Nguyen et al., 2021) showed that the timing of AI has affected brands and the relationships between the quality of AI and customer endorsement. In detail, AI has a positive role in developing the user experience, customer care, and customer-enterprise relationships. The international evidence supports investing in AI to understand customers' expectations and improve their perceptions of products.

The table below (3) presents three sub-hypotheses that assess the impact of artificial intelligence (AI) on Customer Relationship Marketing (CRM). The three dependent variables (DVs) examined are customer acquisition, maximizing customer value, and personalizing contact. The study found no statistical impact of AI on customer acquisition in Saudi companies. This finding is consistent with Khan's (2021) study in Sweden, but it contrasts with the research conducted by Barnett and Marlo (2019) and Cannella (2018) in the USA. Additionally, the study found no statistical impact of AI on maximizing customer value in Saudi companies. This result aligns with Chandrashekar's (2017) findings in the USA but contradicts Murphy's (2007) research, which confirmed the positive impact of AI on maximizing customer value. Finally, the study demonstrated the impact of AI on personalizing contact in Saudi companies. This result is consistent with Mazen's (2009) findings in Denmark but differs from Murphy's (2007) conclusions.

Table No. 3: Results of Regression Analysis of AI on CRM

DV	β_i	S.E.	C.R.	P-Label	R^2
Acquiring Customers	0.104	0.1375	0.764	0.258	.031
Maximizing Customer Value	0.039	0.1425	0.276	0.7875	0.003
Personalizing Contact	0.198	0.1395	4.924	0.004	0.57

Source: AMOS.

8.2 What are the Artificial Intelligence Requirementsfor Customer RelationshipMarketing in Saudi Companies?

The focus on artificial intelligence (AI) has primarily centered on financial aspects, with 74.6% of respondents highlighting the necessity of sufficient funds to invest in AI applications. Additionally, two-thirds of respondents indicated that technical issues are continuously important. Furthermore, 50% of respondents mentioned upgrading equipment and techniques. Financial resources and AI applications are critical for the sustainability and survival of companies. Adequate funding is essential for investing in these AI applications, crucial for successful customer relationship management (CRM) strategies and building strong customer relationships (Al-Sahli & Al-Nsour,2022). Research suggests a significant link between emerging market trends and understanding consumer behavior and decision-making, providing sufficient financial investment in AI applications, risk management, and assessment. There is a growing demand for AI applications in areas such as wealth management and virtual assistants that offer personalized advice to customers. Additionally,

these applications can help design effective business strategies, adopt automated trading systems, and conduct marketing research in Saudi companies (Lilyanova, 2024).

On the other hand, legislative and legal requirements like instructions support the use of AI applications within the limits of the law. It has a high response in the third-ranking with approval (63.7%) of the respondents. The literature justifies the need for rapid processing, and the analytical power of the AI-driven computer has become invisible to businesses. With increased amounts of personal data on digital platforms, there is a growing need to trust AI applications in routine life. Legal and legislative requirements also explain technology in different business environments (Remus et al., 2016). Chatbots, addressing business problems in financial services, health care, and law, exploratory use of artificial intelligence in legal contexts, complementing human intelligence and enabling it to have a combination of intellectual and emotional features are issues that highlight the legal need and impose more legislation that protects the customer (Pistone et al., 2016).The human requirement for qualified, well-trained marketers ranks fourth, with 63.2% of respondents. According to the literature, new recruitment decisions now involve algorithms and machine learning tools. Marketing recruitment systems are increasingly incorporating AI applications. For instance, in late 2023, New York City issued guidelines to reduce bias in the hiring process. These guidelines require employers to inform candidates based in New York about the significance of AI, recognizing it as a crucial job qualification and skill necessary for employment decisions (www.tilleke.com, 2024).

Administrative requirements related to AI applications and their connection to business units ranked fifth, with 53.8% of respondents indicating their importance. The Regulatory requirements like the organizational readiness to adapt to changes in AI applications, ranked sixth. This requirement received a high level of perception, with an arithmetic mean of 3.57 and a standard deviation of 0.95, as approved by 52.2% of respondents. Research indicates that artificial intelligence affects three key management and organizational components: job satisfaction, personality, and attitudes. The findings revealed that AI tools improved staff job satisfaction, reduced cognitive biases, promoted collaborative thinking, and fostered a culture of data-driven decision-making (Younis et al., 2024).The continued use of artificial intelligence techniques in organizations highly affected all managerial functions, shaping the organizational structures, changing the functions and roles of their administrative parts, and reshaping the relationship between units and staff (Cemoglu et al., 2022). Experience presents that artificial intelligence has provided broad and critical insights into administrative and human cooperation in organizations. AI has provided evidence about the linkage between human and algorithmic capabilities and their relationship with workers' skills and the business environment. Studies have also added that the reliance on artificial intelligence provides many advantages starting from worker productivity, welfare, and the quality of the working environment (Bankins et al., 2024).

8.3 What are the Obstacles Facing the AI in Customer Relationship Marketing in Saudi Companies?

The survey results show the obstacles (determinants) of artificial intelligence (AI) in the marketing communication of Saudi companies listed in the stock market. The privacy, security, and protection of personal and sensitive data are the first obstacles to a high degree, according to (74%) of the respondents. Such results are consistent with all studies related to the security challenges of AI, so it is among the obstacles hindering AI in businesses. A study showed that 98% of companies consider the AI model necessary for business success, and 77% faced violations in AI systems during 2023. Therefore, 94% of IT leaders worldwide in businesses consider AI security to be a top priority in 2024 (https://www.helpnetsecurity.com/).

A lack of understanding of AI systems ranks second in importance, with 72.5% of respondents indicating a high level of response. Although discussions about AI are widespread, there are many misconceptions, fears, and misleading beliefs regarding its future impact on marketing, 369

employment, and society. The labor, goods, and services markets, as well as the business environment, need to evolve in ways that support the application of AI technologies without succumbing to undue fear or exaggeration. Studies have shown that members of the U.S. Congress have a limited understanding of artificial intelligence. Similarly, executives and managers in information and technology also demonstrate insufficient knowledge of AI systems despite recognizing the significance of AI technologies in the 21st century (Andriole, 2024).

The study shows the bias and incomplete data facing the fair and comprehensive strategies of the company. This obstacle has the third rank with a high degree of response. The lack of reliable and accurate AI systems has the fourth rank according to (66%) of respondents. The AI studies focused on fake and biased, inaccurate, or harmful information is the most significant risk of artificial intelligence. Many applications develop harmful, fraud, and propaganda content. Other technologies have developed fake images, audio, and video. Some suspicious actors have used this information to provide illegal access to sensitive information, and it has become a security challenge to accompany the use of artificial intelligence. Those risks have focused on machine learning, the artificial intelligence system, and the supply chain (Bankins et al., 2024). The high costs of developing and upgrading AI infrastructure have the fifth place, with approval (56.1%) of the total sample. The continued application of AI tools in marketing communication requires adequate capital, so keeping these technologies in use is heavily based on financial resources (Lilyanova, 2024).

The lack of access to well-qualified data for various organizational needs ranks seventh among challenges, with a significant response rate indicating concern. Data storage challenges are ranked eighth, as reported by 53.8% of respondents. In Saudi companies, these issues stem from unreliable AI technologies, which are affected by the size of the organizations and a shortage of specialists in artificial intelligence. According to 61% of U.S. business leaders, AI applications require sufficient financial investment. This concern underscores the necessity for developing ongoing strategies and business mechanisms to address these challenges. There is a pressing need to integrate security measures into the AI lifecycle and provide training for data scientists, engineers, and developers. Monitoring and prompt responses to emergencies are essential. A robust plan is crucial to tackle problems related to data quality, data storage capabilities, and requirements for rapid and effective expansion (Younis et al., 2024).

9. Recommendations:

In light of previous findings, the number of recommendations may presented as follows:

- Because many machine learning algorithms process a large amount of data in a short time. The trends and needs are misleading for businesses in Saudi Arabia. Therefore, major global IT companies guess the future needs of AI applications, linking them to insights and developments in their business market, customer information, orders, and financial information for businesses.

- Designing and implementing daily and strategic business plans related to artificial intelligence, analyzing enterprise data sources: potential customers, orders, sales, customer interactions, social media, and finance departments. These data can provide important information for making decisions related to the future of AI in local businesses.

- Holding specialized courses and workshops for leaders and employees in the company. It focuses on work mechanisms and how to link them to artificial intelligence applications. These events should focus on daily business and tasks, draw results, predict consumer trends, customer service and logistics, and inventory planning.

- Disseminating details of the legal and ethical dimensions associated with artificial intelligence and its different applications in the company. A transparent approach to artificial intelligence

for stakeholders and customers is essential. Fostering trust and accountability relationships with them is crucial.

10. Conclusion:

The research objective is to measure the impact of artificial intelligence on customer relationship marketing of Saudi companies listed in the stock market. The study concludes that artificial intelligence in marketing communication is highly applicable by the approval of 77.5% of respondents. The level of customer relationship marketing in Saudi companies listed in the stock market is high, with the approval of 77.7% of the respondents. Customer relationship marketing has three sub-variables: Acquiring customers, maximizing customer value, and personalizing contact. Acquiring customer level, maximizing customer value level, and personalizing contact are highly applicable in Saudi companies. The study concludes that artificial intelligence has a statistically positive impact on customer relationship marketing to Saudi companies in the stock market. The AI explains 55% of the changes in customer relationship marketing. At the sub-hypothesis level, there is no statistical impact of AI on acquiring customers and maximizing customer value, while the statistical impact of AI in marketing communication on the personalizing contact in Saudi companies.

11. Future Research:

This text emphasizes the benefits of artificial intelligence in emerging fields such as health, media, tourism, and public relations. It involves conducting research on workers' competencies in marketing communication and public relations. The focus includes exploring the motivations and justifications that encourage the use of AI applications. Additionally, the research employs new methodologies, including qualitative methods and observational techniques.

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