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Leveraging AI Predictive Analytics for Marketing Strategy: The Mediating Role of Management Awareness

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Abstract. This study examines the mediating role of management awareness on the relationship between AI characteristics as a predictive tool and marketing strategies. Prior research on this intersection is limited. A survey of (294) marketing managers in Jordanian pharmaceutical firms analyzed the impact of AI (scalability, adaptability, accuracy, automation, explainability, and interactivity) on marketing strategies, with management awareness as a mediator. Regression analysis reveals management awareness significantly mediates the effect of AI characteristics on marketing strategies. The findings suggest management awareness is key to effectively leverage AI predictive analytics to formulate data-driven marketing strategies. The study contributes empirical evidence on enabling factors in deploying AI for competitive marketing strategy.

Keywords: Scalability, Adaptability, Accuracy, Automation, Explainability, Interactivity, Artificial Intelligence, Predictive Analytics, Marketing Strategies, Managerial Awareness

1. Introduction

Almeida and Ribeiro (2019) argued that over the past few decades, AI has gradually infiltrated the business world and has become an integral part of the daily organizational operations carried out by the organization in order to achieve its strategic goals and reach the competitiveness it aspires to. Bughin et al (2018) stressed that the roots of AI in the business world go back to the fifties of the last century, when scientists began to understand the principle of computer work and explore the services that computerized technologies can provide to humanity. At that time, the use of computers in business was just an idea, but AI was not widely applied until the eighties and nineties of the last century (Chen and Wang, 2019).

Davenport and Ronanki (2018) argued that the earliest applications of AI were in the field of expert systems that were adopted to "mimic" the decision-making practices and activities of human experts in limited domains. Gartner (2019) added that these limited areas in which expert systems were employed included finance, demand, engineering, and analysis in order to assist in processing financial data and provide advanced ideas for engineering designs.

The beginning of the twentieth century marked a quantum leap for the use of AI in the business world, as AI technologies were introduced in customer service, supply chain management, and marketing. With the passage of time, AI techniques have become one of the means used in the field of machine learning, which is able to learn from the pattern and algorithms of big data in order to reach analyzes and predictions and reach results and recommendations (Li et al, 2019).

Recently, with the continuation of research and studies, and the development of AI in all its forms, natural language processing (NLP) and big data analytics (BDA) techniques have emerged in order to enrich the business world in various areas such as chatbots, image recognition and customer interaction mechanisms (Manyika et al, 2017; Wu et al, 2019). On a more sophisticated level, AI applications have emerged as a way to monitor productivity, improve performance, and point out risks and challenges through feedback that can be interpreted by decision makers.

2. Hypotheses Development

Mogaji et al (2022) aimed to demonstrate the importance of managers' perception and understanding of artificial intelligence in the field of marketing financial services and their ability to identify opportunities and challenges associated with the employment of AI in the field of marketing financial services. The study adopted the quantitative approach and through distributing a questionnaire to a sample of (455) general managers from financial services organizations in (4) countries (United Kingdom, United States of America, Nigeria, and Vietnam). The study concluded that the **awareness of managers** towards the use of AI in marketing financial services is of high importance. Managers in developed countries such as (America and the United Kingdom) enjoyed a high level of understanding compared to developing countries such as (Nigeria and Vietnam), which Managers' understanding of the uses of AI in marketing financial services was below average. The study also concluded that there are many factors affecting the employment of AI in the field of financial services, including data privacy and security, and the need for training and qualification in order to employ it in marketing.

Flavián et al (2022) aimed to demonstrate the factors that influence the intention to adopt AI in the field of organizational services marketing through the mediating role of technological readiness and awareness for the use of analysis applications in AI. The study adopted the survey method and included (707) consumers in Spain, and they were inquired about their intention to use AI in the various services provided to them by organizations. The study concluded that the readiness and **technological awareness** of individuals are the main determinants in making the most of AI, that is, users who are

more conscious and aware of artificial intelligence have a higher intention to use these applications compared to those who are less aware and conscious.

Eriksson et al (2020) aimed to demonstrate the role of AI in formulating marketing strategies based on identifying the potential benefits and challenges of adopting AI in marketing. The researchers reviewed previous literature that linked marketing to AI. The study concluded that employing AI in the field of marketing contributes significantly to improving the formulation of marketing strategies, **providing accuracy**, identifying market trends, in addition to employing big data resulting from operational processes in organizations in order to reach rational decisions. The study also identified a set of potential challenges to employing AI in marketing, including concerns related to data security and protection, the need for human intervention, and bias in marketing practices.

Huang and Rust (2021) aimed to develop a strategic framework that combines marketing and AI, and to demonstrate the best practices of AI in the marketing field, in addition to providing guidance to managers and marketers. The study reviewed previous literature that dealt with marketing and AI, and the study reached the development of a framework that combines artificial intelligence and AI that includes four areas, namely (data strategy, technology strategy, organizational strategy, and customer strategy). The study also presented best practices for benefiting from AI in marketing, such as setting goals and standards, transparency, ethics, and continuous evaluation.

Borges et al (2021) aimed to show the main areas of employing AI in the field of strategic decisions, specifically in the digital age. Previous literature was reviewed for the years 2010-2020, and the study concluded that AI would enhance organizational processes by focusing on big data and decision-making, in addition to integrating artificial intelligence into organizational processes and administrative activities in order to ensure the best outputs.

Chintalapati and Pandey (2022) aimed to identify the previous literature, which dealt with the use of AI in marketing. The previous literature for the years 2010-2020 was reviewed and the study came to the conclusion that the employment of AI in marketing is related to the introduction of AI in vital areas of marketing such as targeting potential customers, communications, analyzing big data resulting from marketing operations, forecasting market changes and **automating marketing operations**.

Araz et al (2020) aimed to identify the importance of data analytics in AI in operational risk management. That is, the importance of AI and related data analytics should be demonstrated in order to manage operational risks in organizations and provide guidance to managers and marketers on the mechanism of activating AI analytics in the field of risk management. Multiple previous literature on the subject was reviewed, and the study concluded that data analytics in AI within the organization's operational practices contributes to challenging and evaluating risks, in addition to monitoring and predicting the source of risks and expected challenges and supporting the organization in making more effective decisions. The risks addressed in the study included data security and protection, data quality, reliability, reliability, and the need for human skills and expertise in order to deal with AI techniques in data analytics.

Peyravi et al (2020) aimed to identify the AI in the field of marketing and the potential benefits to be gained by the organization from the application of data analytics techniques in AI. The previous literature was reviewed and the study came to the conclusion that AI in marketing is characterized by being **scalable**, that is, it is able to develop and improve the mechanism of reaching potential customers and maintaining existing customers through prediction capabilities and the ability to direct the decision-making process.

Arsenijevic and Jovic (2019) aimed to demonstrate the role of chatbots and the mechanism of their employment in marketing through AI. Many previous literatures were reviewed, and the study concluded that employing AI through chatbots would help improve customer experience, increase

customer engagement, increase efficiency, and provide appropriate recommendations through AI and its **interactive** approach.

According to what was mentioned earlier, and in accordance with the previous studies; researcher was able to reach the overall literary gap in the study which indicated there was a lack of empirical studies that dealt with the mediating effect of management awareness about the positive role played by AI analytics in the marketing field. Moreover, the gap in current study might be explained as examining the - and not the techniques - of AI analytics in the marketing field in terms of (Scalability, Adaptability, Accuracy, Automation, Explainability, Interactivity). Such variable - if studied - could constitute a motive for organizations to employ AI Analytics in the marketing field in a more in-depth manner, and a method capable of forming insights and predictions that help the organization in making early decisions about the possible impact of the marketing campaign on the organization's competitiveness and marketing capabilities.

Liu et al (2021) aimed to demonstrate the impact of the predictive capabilities of AI on marketing strategies through the importance of management awareness of the active role of AI in marketing. The responses of (366) managers in various marketing industries in China to a questionnaire designed for the study were analyzed. The study concluded that there was a positive role for the predictive nature of AI in the field of marketing which is activated and benefited through the management being fully aware of the importance of these predictions. That is, management awareness plays an important role in taking advantage of the insights generated by artificial intelligence to make effective marketing decisions.

Based on above argument and previous studies, the current research study aimed at examining the mediating influence of management awareness on the relationship between characteristics of AI as a predictive tool (Scalability, Adaptability, Accuracy, Automation, Explainability, Interactivity) and marketing strategies among a sample of marketing managers within pharmaceutical industry sector in Amman- Jordan. Reaching the aim of study will be achieved through answering the following questions:

RQ1: What is the relationship between predictive analytics in AI and marketing strategies?

RQ2: Can Management awareness have a positive mediating influence on the relationship between predictive analytics in AI and marketing strategies?

From that, objectives of study will be as follow:

- Identify the characteristics of predictive analytics as an AI tool including (AI scalability, adaptability, accuracy, automation, Explainability)
- Explore the relevance of marketing strategies with AI tools
- Focus on the mediating influence of managerial awareness in increasing the positivity of the relationship between predictive analytics in AI and marketing strategies.

Researcher managed to draw the relationship between chosen variable as in the following figure, and from which study hypotheses were extracted:

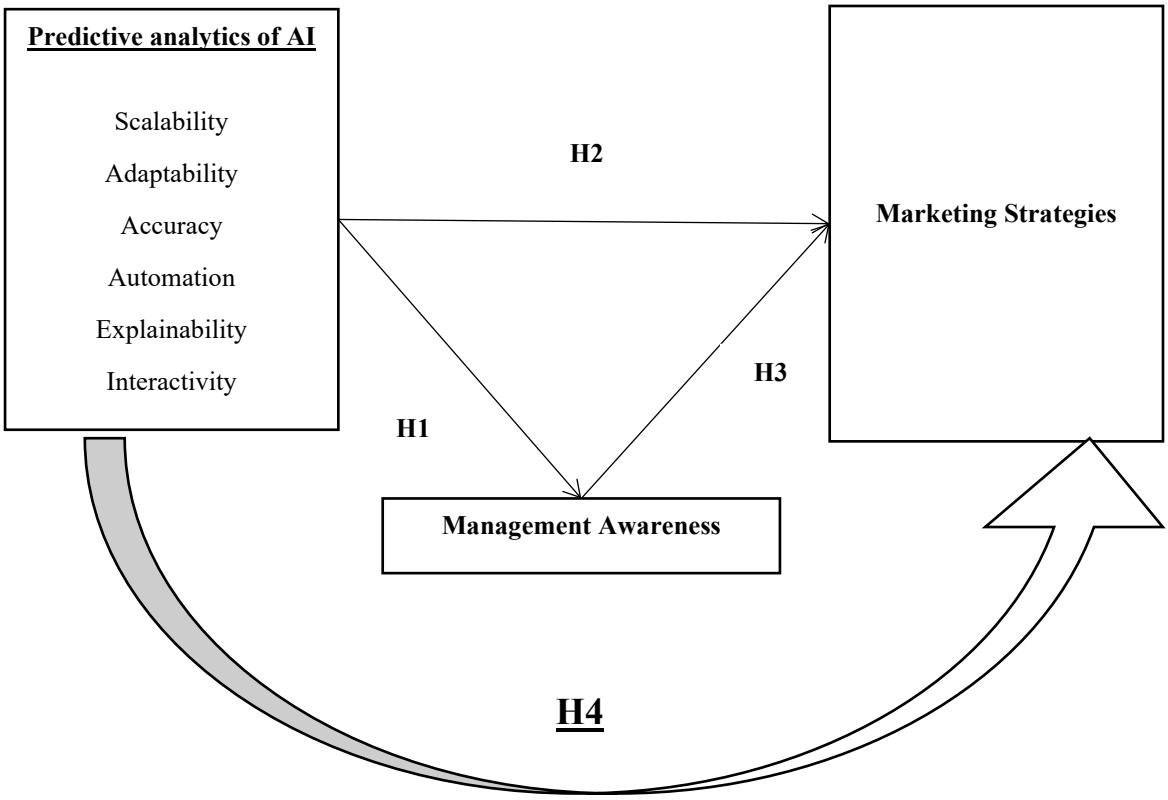


Fig.1: Study Model [Javed et al (2023); Katrakazas (2022); Gebreegziabher et al (2023)]

Launching from above model, the following set of hypotheses was reached:

H1: Characteristics of predictive analytics of AI has a statistically significant influence on managerial awareness

H2: Characteristics of predictive analytics of AI has a statistically significant influence on marketing strategies

H3: Management awareness has a statistically significant influence on marketing strategies

H4: Management awareness mediates the relationship between Characteristics of predictive analytics of AI and marketing strategies

3. Literature Review

3.1. Artificial Intelligence in Marketing Environment

According to Zhang et al (2021c), the entry of AI into the marketing environment was represented in several ways, which led to the creation of differences in the way organizations and customers interact with different marketing strategies. The beginning of the entry of AI into the world of marketing was through predictive analytics, which included the employment of machine learning algorithms derived from huge amounts of data, which presented results related to the future behavior of customers (Zhou and Yan, 2021). An example of this is the use of AI in analyzing customer data related to purchasing preferences, different demographics, and patterns that are directly related to customer preferences, in

addition to the pattern of web browsing behaviors and patterns related to customers' purchasing decisions (Rizwan et al, 2021).

Javed et al (2023) argued that employing AI in marketing environment is based on AI having multiple characteristics that aid marketing in different ways. Such characteristics mentioned by Katrakazas (2022); Zhang et al (2021b) and Gebreegziabher et al (2023) included:

- **Scalability**

This characteristic refers to the ability of AI to deal with data of different sizes and sources, and it has a great potential to expand or decrease according to the needs of the organization and the nature of the data that flows to it. In addition, scalability allows marketers to use many insights and ideas that are the result of big data which allows marketers to make different marketing decisions that are in the interest of the organization or marketing campaign based on information sourced from a wide range of data. An example of scalability in AI is the adoption of cloud-based machine learning technologies, such as "BigQuery ML" from Google Cloud or "SageMaker" from Amazon Web Services

- **Adaptability**

AI data analytics technologies are characterized by the ability to predict and adapt to potential changes in the market, paving the way for the organization to adapt to potential changes, and helping decision makers to change strategies in line with the changing market and consumer preferences. This feature allows marketers to stay ahead of market trends and be able to change the organization's strategies to what is best for the organization in order to meet new needs. An example of adaptability is the adoption of predictive marketing algorithms that are able to adjust their behavior based on market change.

- **Accuracy**

AI analytics can be at a high level of accuracy by employing multi-source big data, and provide predictions that give clues and signals about the changing competitive and market conditions accurately. From these accurate processes, marketers will be able to rely on the outputs of AI and its analyzes to make informed decisions that are reliable and accurate, and thus identify the challenges and opportunities that would face the organization during the marketing campaign. Accuracy as an example in AI is deep learning such as (CNN) or recurrent neural networks (RNN).

- **Automation**

AI technologies and analytics can automate the operations and routine tasks of the organization in order to free up more time for marketers in order to do complex things such as drawing up public policies and adopting the most appropriate strategies. In addition, the automation of processes and routine tasks gives the organization an opportunity to be more creative by simplifying tasks and reducing costs, and thus making informed decisions based on a faster and better response to customer inquiries. Like adopting predictive analytics software that can automate many routine marketing tasks

- **Explainability**

The idea that information, AI outputs, and analyzes can be interpreted is something that is inherently positive for the organization, as clear interpretation contributes to the process of predicting potential risks and threats, and leads the organization to be aware of strengths, exploit them, and weaknesses and strengthen them. In addition, the ability to interpret provides transparency and confidence, which would help decision makers to adopt marketing strategies in a common style based on the exchange of ideas and their balance. Such as employing decision trees or rule-based systems that can provide clear explanations for the predictions they make.

- **Interactivity**

The idea of interaction is one of the most important outputs of AI and its data analytics. As interaction as one of the characteristics of AI and its techniques saves the organization from employing the human factor in order to ensure customer engagement and access to the required feedback. Moreover, it must be noted the active role of interaction through AI and its ability to provide various recommendations to decision makers that include response to customers, feedback, opportunities, threats, challenges, and required development points. Like hiring chatbots or virtual assistants who can interact with customers in real time

3.1.1. Predictive Abilities of AI Techniques

According to Cui et al (2021) and Kwon and Lee (2021), AI was able, through its years of employment in many administrative, engineering, marketing and medical fields, to provide various forecasting services through many applications. Rizwan (2021) argued that these applications adopted algorithms in order to analyze the huge amount of data that results from organizational processes, and to analyze the patterns from which the algorithms emerge in order to predict future outcomes.

Sánchez-Monedero et al (2021) and Zhang et al (2021a) indicated that many AI applications have high predictive power such as:

- Regression analysis

It is a technique that employs statistical models in order to analyze the relationship of one or more of the independent and dependent variables and to show the results of this relationship based on future indicators.

- Decision trees

A set of hierarchical models that adopt a series of binary decisions that classify data into different categories and predict certain outcomes based on the input data.

- Neural networks

Machine learning algorithms designed to be used to mimic the skills of the human mind, help predict certain outcomes based on different patterns within big data.

- Support vector machines

Group of algorithms that analyze and identify specific patterns that are capable of predicting and are effective in classifying data and converting it into interpretable information.

- Random forests

Algorithms that collect and compare decision trees and give future predictions related to large and complex data.

The ability of AI to deal with, classify and analyze big data provides the organization with insights and predictions that improve its decision-making mechanism (Wang et al, 2021). In addition, these different predictions and visions give a preliminary picture of the future with regard to marketing campaigns, market changes, and the competitiveness of the organization, and based on them, the organization can deal with these variables and make the most appropriate and efficient decision for the organization (Yu et al, 2021).

3.2. Marketing Strategies

The world of marketing today is characterized by speed and development, and staying at the forefront of marketing efforts has become an obsession for organizations of different interests and commercial

inclinations (Almeida and Santos, 2021). Choudhury and Sharma (2021) and Davenport (2020) stresses that the development of marketing strategies is of high importance as it directly affects the effectiveness of marketing efforts in the organization. As for Karimi and Walter (2021) argued that achieving strategic goals and high revenues can only be available to the organization by working on developing marketing strategies and relying on analysis, creativity, and a deep understanding of the market and customer needs. Kim and Kim (2021) confirmed this when he points out that market research contributes to enhancing the organization's understanding of the competitiveness required of it through the collection and analysis of big data and market survey.

As for Lee and Lee (2021a), dealt with the idea of defining the target audience and stating the marketing objectives, which is the best way to ensure measurable marketing strategies that guarantee success. On the other hand, Singh and Kumar (2021) pointed out that developing the foundations of the marketing mix in marketing strategies is crucial in indicating the extent of the organization's knowledge of the nature of its target audience and the mechanism of developing modern systems in order to stand on the foundations required to ensure the success of marketing strategies.

AI entered the marketing environment through organizations hiring chatbots and virtual assistants to their marketing campaigns with the help of NLP natural language processing, where organizations adopted specific algorithms in order to interact with the user in real time and provide many recommendations that would create a stronger relationship with customers and increase the sales (Liu et al, 2021b). Mulyanto and Anggraeni (2021) and Wang and Lee (2020) indicated that the entry of AI into the world of marketing has enhanced the organization's ability, and provided it with new and innovative capabilities and methods in order to enhance its marketing campaigns.

3.3. Management Awareness

According to Dsai and Dharwadkar (2021) managerial awareness is the ability of the organization's management to realize and understand the results of decisions and actions adopted in the organization. Lee and Lee (2021b) defined managerial awareness as the level of perception, awareness and understanding that managers have regarding internal and external organizational factors that would affect the organization and its practices. While Kim (2021) saw it as the ability of the organization's management to identify and understand the strengths and weaknesses of the organization and the mechanism of benefiting from them to achieve the desired goals.

Gao and Zhang (2021) stated that in the context of marketing, managerial awareness refers to the level of understanding and awareness of managers of the market, customers, competitors, and the marketing objectives of the organization. Liu et al (2021b) asserts that administrative awareness in the field of marketing is based on the ability to identify existing trends and opportunities in order to direct them, including the interest of the organization, and to develop its ability to respond to market changes in the most effective way. As for Ma et al (2021), pointed out that the marketing awareness of the administration helps to activate the foundations of the organization's making of marketing decisions based on customer insights and attitudes. In addition to the importance of various marketing researches in order to determine the possibility of developing and implementing marketing campaigns that are in line with the organization's pre-established goals.

3.4. The Intersection between AI, Marketing Strategies and Management Awareness

According to Mikhanikov (2022), AI is supposed to have an influence on marketing theory and practice through increasing investment in AI development, and mitigating the growth of unstructured data and its importance for insights into consumer behavior. In addition to that, AI can help marketing strategies in terms of personalization, textual information analysis and emotional analysis of statements; this can highlight the evolution in AI-enabled analytics and increasing impact on companies. The key takeaway

is that artificial intelligence has the potential to –significantly - enhance marketing effectiveness through capabilities like data analytics, personalization and automation. Ljepava (2022) also agreed on the same idea arguing that AI help organizations metigate numerous challenges and deliver greater customer value through innovative solutions across marketing strategies and domains. Author added that AI solutions support marketing decision-making throughout the five steps of the marketing process (analysis, strategy, tactics, customer relations, and value proposition creation). Based on that, AI applications are expected to play an important role in marketing decisions and functions due to its capabilities for analyzing data, predicting behavior and optimizing tactics.

From another perspective, Mogaji and Nguyen (2022) aimed to better understand bank managers' awareness of AI, the challenges they face in providing AI technologies, and key stakeholders involved in marketing financial services. This was done through an exploratory, qualitative research using semi-structured interviews with 47 bank managers in developed and developing countries, including the UK, Canada, Nigeria and Vietnam. Results of study indicated that managers are aware of AI's potential; however, they face challenges in accelerating AI adoption.

4. Methods and Materials

4.1. Methodological Approach

Quantitative methodology was chosen in order to collect primary data from respondents of study. The suitability of quantitative approach is attributed to its ability to collect data from a larger sample size and then run on a statistical software in order to reach the required insights.

4.2. Tool of Study

A questionnaire was the main tool of current study. The questionnaire was built on likert 5-point scale by the researcher and through the aid of previous studies (Chintalapati and Pandey (2022); Mogaji et al (2022); Flavián et al (2022); Huang and Rust (2021); Borges et al (2021); Araz et al (2020); Peyravi et al (2020); Arsenijevic and Jovic (2019) The questionnaire appeared in two main sections. The first took into perspective demographics of study sample (gender, qualifications, age and experience), while the other section presented statements related to study variable as in the following table. Statements measuring variables included “AI analytics easily adapts to customer changing behavior making it easy to predict the needed development” for scalability in AI, in addition to “AI analytics managerial awareness support organizational efforts to make the optimum benefits of marketing strategies” to measure management awareness.

Table 1. Distribution of Statements on Variables

Variable	# of Statements
Predictive analytics of AI	
Scalability	5
Adaptability	5
Accuracy	5
Automation	5
Explainability	5
Interactivity	5
Marketing Strategies	5
Management Awareness	6
Total	**41**

4.3. Population and Sampling

Population of study consisted of all marketing managers within pharmaceutical industry sector in Jordan. A convenient sample of (350) respondents was chosen to respond to the questionnaire. After application process, researcher was able to retrieve (294) properly filled questionnaires which indicated a response rate of (84%) as statistically accepted.

4.4. Statistical Processing

Questionnaire was uploaded online for the sake of collecting primary data. The questionnaire was on likert 5point scale which collected primary data that ranged between 1- strongly disagree to 5 strongly agree. This has managed to present numerical/ quantitative primary data that are eligible for analysis. Social Package for Social Sciences SPSS was adopted to tackle and screen primary data. Cronbach's Alpha test was run to highlight the reliability and consistency of study tool as in the table below. Results indicated that Alpha value for all variables was higher than 0.70 which was statistically accepted. Other statistical tests used in current study included:

Table 2. Alpha Value

variable	Alpha value
Scalability	0.718
Adaptability	0.775
Accuracy	0.731
Automation	0.705
Explain ability	0.729
Interactivity	0.779
Marketing Strategies	0.775
Management Awareness	0.771

5. Results and Discussion

5.1. Demographics of Sample

Frequency and percentages were calculated in order to identify the trends of sample responses. Results in the table below indicated that majority of the sample were male forming (66.7%) of total sample who held MA degree forming 62.9% of the sample with an experience that ranged between 11-15 years forming 42.5% of the total sample.

Table 3. Demographics

		f	%
gender			
	Male	196	66.7
	Female	98	33.3
Education			
	BA	36	12.2
	MA	185	62.9
	PhD	73	24.8
Experience			
	Less than 5 years	31	10.5
	6-10	107	36.4
	11-15	125	42.5
	More than 16 years	31	10.5
	Total	**294**	**100.0**

5.2. Questionnaire Analysis

Mean and standard deviation were calculated for the statements of questionnaire. Results indicated that all statements in variable scored higher than mean of scale 3.00 which meant that the questionnaire was positively received by study sample. The highest variable in terms of mean was (accuracy) and scored 4.07/5.00 compared to the least mean 3.87/5.00 which was scored by (interactivity).

Table 4. Descriptive Statistics

Statement	Mean	Std. Deviation
AI-based predictive analytics makes huge amounts of data scalable and easy to deal with	3.98	.85
AI deals with the continuous grow of data without compromising its accuracy	3.48	1.30
AI scale huge amounts of data better than the traditional methods and tools	4.16	.80
AI is able to scale large amounts of data in real time and with maximum accuracy	4.13	.92
AI is able to sale up and down according to needs and with maximum flexibility	4.22	.89
Scalability	**3.99**	**.66**
Flexibility of AI to adapt to changes makes it highly adaptable	3.65	1.09
AI tools are always able to learn from new data and makes predictions according to it	4.04	.92
The adaptability of AI tools makes it suitable for varied industries including finance, healthcare and constructions	4.01	.84
AI analytics is able to increase competitiveness of organization as it can predict changes in the market	4.09	.80
AI analytics easily adapts to customer changing behavior making it easy to predict the needed development	4.01	.84
Adaptability	**3.96**	**.66**
AI can deal with complex and complicated data with the maximum accuracy	4.07	.90
AI analytics is able to uncover patterns and trends that are difficult for humans to detect	4.24	1.08
AI is able to improve accuracy overtime through learning from new data	4.02	.93
Regression analysis of AI-based predictive analytics can provide accurate results	4.12	.88
The accuracy of AI-based predictive analytics is able to identify potential risks and opportunities	3.90	.85
Accuracy	**4.07**	**.59**
AI-based predictive analytics is able to automate data collection, cleaning, and analysis.	3.63	.88
Automation in AI is time and cost effective	3.81	.90
AI can automate repetitive tasks which makes complex tasks easier	3.85	.79
The automation of tasks detect patterns and trends in data which increase accuracy	4.18	.70
Automaton of tasks in AI can be run in data from different sources like social media, IoT devices, and customer data.	4.15	.68
Automation	**3.92**	**.54**
Predictions and output of AI are all explainable which makes it easy to understand	3.98	.97
Explainable output increases trust which enhance decision-making	4.14	.83
Explainable AI output are east to visualize especially in complex data	4.10	.81
Explainability of AI-based predictive analytics identify risks and potential opportunities.	4.01	.80
With AI detailed reports, analysis and outputs are easy to read and segment	4.02	.87
Explainability	**4.05**	**.54**
AI analytics has the ability to interact with users and gain feedback	3.76	.89
Through AI analytics, the possibility of refining and re-polishing feedback is accurate	3.70	.97
Interactivity of AI analytics use trends and patterns to locate risks and opportunities.	4.04	.96
Interactivity in AI analytics leave nothing unnoticed	4.00	.94
Through interactivity in Ai, more engagement takes place with customers which lead to more data	3.83	1.14
Interactivity	**3.87**	**.72**

AI can highlight customer behavior and preferences which makes marketing strategies more attainable	4.06	.98
AI analytics can mitigate customer data from multiple resource like social media, website traffic and marketing emails	4.02	.95
AI analytics help the organization locate sales opportunities through personalized recommendations	3.96	.91
AI analytics supports marketers to take measures in order to attract more customers and retain current customers	3.95	1.00
Feedback, complaints and sentiments are all analyzed into worthy information through AI analytics	3.68	1.00
Marketing Strategies	**3.94**	**.70**
It is essential for organization's marketing department to be aware of AI analytics to stay competitive in today's data-driven business environment.	3.95	1.04
Through AI analytics valuable insights, the management has more power to make the right decisions in marketing	4.12	.91
Identifying potential risks and opportunities through AI analytics makes is easy for management to make the right marketing strategies	4.07	.89
AI analytics managerial awareness support organizational efforts to make the optimum benefits of marketing strategies	4.02	.85
Through AI analytics awareness, the management can make predictions of the best access to the market through marketing strategies	4.01	.95
Management awareness of AI analytics tools can help organizations to identify areas for improvement in their marketing processes	3.73	.96
Management Awareness	**3.98**	**.64**

5.3. Multicollinearity Test

VIF and Tolerance were calculated for each independent variable to see if there was multicollinearity between the variables as in table 5 below. According to the statistics shown, VIF values were less than 10, whereas Tolerance values were more than 0.10.

Table 5. Multicollinearity Test

variable	Tolerance	VIF
Scalability	.602	1.661
Adaptability	.501	1.997
Accuracy	.458	2.183
Automation	.502	1.991
Explain ability	.525	1.904
Interactivity	.620	1.614

5.4. Hypotheses Testing

Table below showed that all of the mentioned indicators fall within reasonable bounds, as recommended by the studies and references listed; this allowed the researcher to trust the study model's output and disseminate the study's findings with confidence.

Table 6. Fit Model

Indicator	AGFI	$\frac{X^2}{df}$	GFI	RMSEA	CFI	NFI

Value Recommended	**> 0.8**	**< 5**	**> 0.90**	**≤0.10**	**> 0.9**	**> 0.9**
References	(Miles and Shevlin, 1998).	(Tabachnick and Fidell, 2007)	(Miles and Shevlin, 1998).	(MacCallum et al, 1996)	(Hu and Bentler, 1999).	(Hu and Bentler, 1999).
Value of Model	0.894	3.11	0.986	0.062	0.976	0.959

			Direct impact	Indirect impact	Total Impact	C.R.	P	result
Management awareness	<---	AI	0.731		0.731	9.378	***	accept
marketing strategies	<---	AI	0.167	0.453	0.62	2.424	.015	accept
marketing strategies	<---	Management awareness	0.62		0.62	9.870	***	accept

H1: Characteristics of predictive analytics of AI has a statistically significant influence on managerial awareness

This hypothesis is accepted (C.R. = 9.378; P < 0.05; = 0.000). This means that Characteristics of predictive analytics of AI has a statistically significant influence on managerial awareness

H2: Characteristics of predictive analytics of AI has a statistically significant influence on marketing strategies

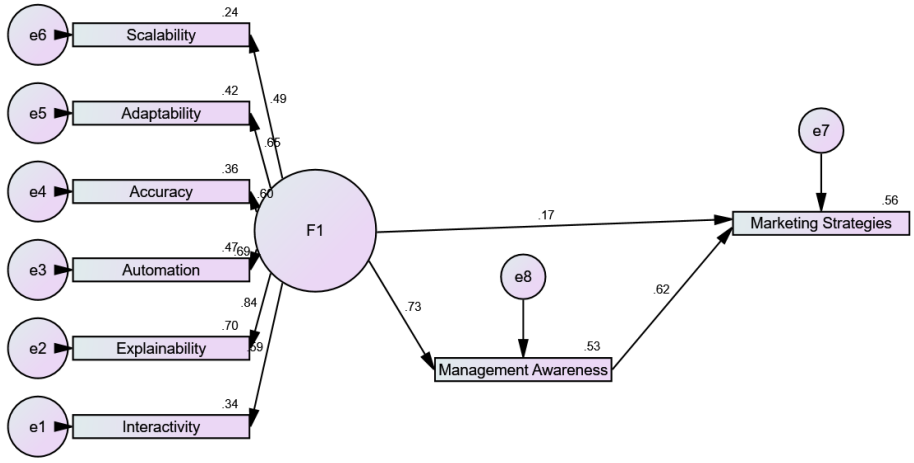
This hypothesis is accepted (C.R. = 2.424; P < 0.05; = 0.015). This means that Characteristics of predictive analytics of AI has a statistically significant influence on marketing strategies

H3: Management awareness has a statistically significant influence on marketing strategies

This hypothesis is accepted (C.R. = 9.87; P < 0.05; = 0.000). This means that Management awareness has a statistically significant influence on marketing strategies

H4: Management awareness mediates the relationship between Characteristics of predictive analytics of AI and marketing strategies

This hypothesis is accepted (Indirect impact= 0.453; P < 0.05; = 0.015). This means that Management awareness mediates the relationship between Characteristics of predictive analytics of AI and marketing strategies



5.5. Discussion

The current study aimed at examining the mediating influence of management awareness on the relationship between AI as a predictive tool (Scalability, Adaptability, Accuracy, Automation, Explainability, Interactivity) and marketing strategies from perspective of managers of pharmaceutical industry sector in Jordan. Quantitative approach was adopted, and (294) individuals responded to a self-administered questionnaire. SPSS was employed to tackle the gathered primary data. Results of study reached the following findings:

- Respondents seemed to have a good level of awareness regarding the predictive abilities of AI application in marketing environment
- pharmaceutical industry organizations which were took as a sample in current study appeared to have employed many AI technique in their marketing strategies including big data analytics and chatbots.

Study was able to confirm and accept the main hypothesis of study which argued that "Management awareness mediates the relationship between Characteristics of predictive analytics of AI and marketing strategies". That was because the study accepted the prior hypotheses that confirmed the existence of a relationship between AI as a predictive tool and marketing strategies from one side, and with management awareness from another.

Predictive abilities of AI techniques effects managerial awareness

The study showed that the predictive capabilities of the characteristics of AI in the marketing environment contribute to increasing administrative awareness of the importance of AI and related technologies. This is what agreed Chintalapati and Pandey (2022) when they pointed out that the predictive capabilities of AI help managers to stand on the future results of their marketing practices, which would help in the process of making the right decision at the right time. In addition, the study found that there is a great ability of AI to improve prediction by analyzing big data and showing patterns more accurately regarding the future results of marketing strategies, which would lead the organization towards changing strategies in proportion to the changes taking place in the market.

Predictive abilities of AI techniques effects marketing strategies

The study was also able to confirm that the predictive nature of AI techniques have the ability to influence marketing strategies in terms of updating and modifying the adopted strategies in a way that matches the changes taken place in the market. This included the competitiveness that are faced by organizations, customers' needs and requirements not to mention the places of development that an organization has to go through in order to make sure that its marketing strategies are able to achieve its aim and perspective.

This was in agreement with Mogaji et al (2022) when they emphasized that developing marketing strategies in accordance with AI predictions contributes to keeping pace with market dynamics and analyzing and understanding how changes should be applied to marketing strategies. Flavián et al (2022) also agreed with this result and confirmed that realizing the target market and the various areas of changes in it help to enhance marketing objectives, the development of the marketing mix, which would drive growth and revenues.

Management awareness has the ability to influence marketing strategies

It cannot be denied that awareness in all organizational operations, development can be of great help for decision makers and marketing managers in taking the right decision in the real time, and in a way

that matches the required needs and development of the marketing environment. In that sense, the study confirmed the third hypothesis that argued that when the management has the needed awareness of marketing needs and changes, marketing strategies are more willing to be more effective and beneficial for the organization. Study also proved that managerial awareness plays an important role in shaping the future of marketing strategies and enhancing the success of various marketing businesses. This is done by maintaining the organization's position among the organizations that are at the forefront of realizing market changes and the business environment and the mechanism for developing marketing strategies in order to reach successful, low-cost strategies that are compatible with various developments. This result agreed with Huang and Rust (2021) and Borges et al (2021) previously.

The relationship between AI predictive nature and marketing strategies is mediated by management awareness

The current study started from the assumption that management awareness mediates the relationship between AI predictive analytics and marketing strategies, and this was proven through analysis. The study found that management awareness was able to provide a crucial link between AI and marketing strategies. Marketing efforts normally come up with huge amount of data, which AI can analyze, classify, and provide with accurate and improved information to the organization for the purposes of interpretation and read the different strategic visions of the marketing landscape.

Moreover, the accuracy, effectiveness, and appropriate timing depend on the extent of management's awareness of the possibility of interpreting these visions and predictions, which are within the competence of managers. In this context, Araz et al (2020); Peyravi et al (2020) and Arsenijevic and Jovic (2019) arrived at a similar conclusion when they discussed that the predictive nature of AI and its accurate characteristics contribute significantly to enhancing the foundations of decision-making. This usually leads to a higher ability to read the market due to the increased ability of managers to read deeper marketing information and competitive differences that may appear during the marketing process.

6. Conclusion of Study

6.1. General Conclusion

As it was mentioned earlier in the literary gap, there was a lack of empirical studies that dealt with the mediating effect of management awareness about the positive role played by AI analytics in the marketing field. Therefore, the current research study aimed at examining the mediating influence of management awareness on the relationship between characteristics of AI as a predictive tool (Scalability, Adaptability, Accuracy, Automation, Explainability, Interactivity) and marketing strategies among a sample of marketing managers within pharmaceutical industry sector in Amman- Jordan. Through the results of the study and its discussion, it can be said that the role of AI in marketing is likely to be hybrid, where AI applications and analyzes provide insights and information related to marketing strategies, but managers must interpret these insights and apply them to reality.

6.2. Theoretical and Practical Implications

As a practical implication, the current study can be used as a guide for organizations to become aware of the importance of AI analytics in predicting, managing and evaluating risks and challenges in order to make a decision that is in the interest of the organization.

6.3. Limitations of Study

Current study was limited to pharmaceutical organizations which are operating in Jordan, Amman through the fiscal year 2021-2022. In addition, the current study was limited to marketing managers working within pharmaceutical organizations in Jordan. Some bias may occur through the study in

terms managers dealing with AI tools and applications as their understanding was better to AI tools compared to other managers within the same industry.

6.4. Recommendations of Study

Based on above discussion and conclusion; researchers recommend the following:

1. Providing adequate training and qualification on AI applications in marketing, as the study found that managers who are aware of AI and its applications tend to have a positive attitude towards its use in marketing services.
2. The importance of recognizing technology readiness and awareness in organizations as a means of shaping managers' attitudes toward an emerging technology in marketing such as AI.
3. Employing AI in the field of targeted advertising by identifying the segments of society that are expected to be interested in ads, and thus predicting and reaching potential customers.

6.5. Future Studies

The study proves the need to conduct empirical studies that address the optimal use of AI in various organizational contexts. In addition to that, there appeared a need to conduct studies dealing with an analysis of the organizational and managerial effects of AI on the decision-making process within the organization

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