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The Impact of Artificial Intelligence on Sports Marketing: Applications and Limitations

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ABSTRACT

The current study was conducted to identify the impact of artificial intelligence on sports marketing (applications and limitations). This research is a sequential mixed-methods study (qualitative-quantitative). The participants in qualitative phase consisted of 15 sport management experts who were interviewed. In the quantitative section, the statistical population included members of the sports management academic community that was selected through random sampling approach. Kolmogorov-Smirnov test, confirmatory factor analysis, and path analysis were used in the quantitative part of the study. The structural equation method with partial least squares method was used to measure the validity of the model, and the research hypotheses. According to the results of the study, there are 8 effective factors of artificial intelligence applications in sports marketing, including predicting sales and prices of sports products/services, identifying revenue growth opportunities, automating sales processes of sports products/services, personalized recommendation systems through analyzing customer behavior of sports products/services, tracking satisfaction with sports products/services, and advertising. Additionally, there are 5 factors identified as limitations of artificial intelligence in sports marketing, including limited understanding of human elements, concerns about data privacy, costs, and technical issues. The findings can help sports marketers to better utilize artificial intelligence for better delivery and customer satisfaction of sports products and services.

Introduction

Artificial Intelligence (AI) will become an integral part of every commercial entity across the globe in the long term. The new trends in AI-driven automation reflect substantial changes in the AI landscape. It is evident in the form of reconfigured ideas, interests, and investments in the field of AI

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adoption by the enterprise (Dimitrieska, Stankovska, & Efremova, 2018). Also, AI can solve the problems which might occur in the future (Nalini, Radhakrishnan, Yogi, Santhiya, & Harivardhini, 2021). Artificial intelligence has the potential of creating new industries, technologies, and environments altogether. Artificial Intelligence (AI) will become an integral part of every commercial entity across the globe in the long term (Sestino & De Mauro, 2022). The new trends in AI-driven automation reflect substantial changes in the AI landscape. It is evident in the form of reconfigured ideas, interests, and investments in the field of AI adoption by the enterprise (Verma, Sharma, Deb, & Maitra, 2021). AI is primarily concerned with user retention and lead conversion in digital marketing. It can guide a user in the direction that aligns with the business's goals by using intuitive AI chatbots, intelligent email marketing, and other digital marketing services (Hermann, 2022). Several factors determine the impact of AI on digital marketing. ML (motor learning), a subset of AI, is concerned with computer programs that access data and use it to learn independently. It compiles data from various places, including social media accounts, menus, online reviews, and websites. AI then uses the information to produce and deliver content relevant to the audience. AI software enables in-depth online analysis of their customers (Javaid & Haleem, 2020). Also, AI applications in digital marketing can sift through billions of data points on the internet and tell precisely what it needs to know for business (Hamdan et al., 2021). It will describe what price will get the most conversions, when is the best time to post, what subject line will get the most attention, etc. Intelligent marketers stay current with all trends. It simplifies jobs and allows for more creativity and out-of-the-box thinking (Mitić, 2019). It also adds value to the customers who benefit by implementing AI into sport marketing strategy, businesses can use the available data better and reach out to potential sport customers with attractive commercials at more convenient times (Lai & Yu, 2021). Digital marketing gives a visibly pleasant experience for sport clients with AI for advertising across social media and digital platforms. These platforms thoroughly assess users' information before directing them to offers appropriate to their wants (Dumitriu & Popescu, 2020).

Sports marketing landscape has changed rapidly over the past few years. In 2011, only 150 companies offered marketing solutions, and today the number of these companies has increased to 5,000. The increase in the number of marketing solutions means that marketers have to take into account the constant changes in the market more than ever before to stay ahead of their competitor (Mikalef, Conboy, & Krogstie, 2021). AI is a fascinating and cutting-edge technology that complements a company's current content strategy. This technology is a broad term that encompasses a wide range of technologies such as natural language processing, ML, deep learning, computer vision, and many others. ML significantly impacts the digital marketing scenario because of its ability to analyze data and provide analytical tools (Devang, Chintan, Gunjan, & Krupa, 2019). As a result, it assists marketing teams in conducting needs-based analyses. AI is a vast and ongoing technological evolution with far-reaching consequences. As a result, it is advised to embrace AI in sports marketing to foster innovation and improve productivity in the coming years (Frank, 2021).

On the other hand, sports industry has been rapidly growing over the past few years, and with it, the need for effective marketing strategies has become even more important. The use of Artificial Intelligence (AI) in marketing has become increasingly popular due to its ability to analyze data and provide valuable insights (Pitt, Eriksson, Dabirian, & Vella, 2018). AI technology has the potential to revolutionize the way sports marketing is done. It can help marketers to analyze large amounts of data, identify patterns, and predict consumer behavior. This can lead to more effective marketing campaigns and better targeting of consumers (Arsenijevic & Jovic, 2019). One of the main benefits of using AI in sport marketing is its ability to personalize content. With the help of AI, marketers can create personalized content that is tailored to the interests and preferences of individual consumers (Hermann, 2022). This can lead to higher engagement rates and increased brand loyalty. Another benefit of using AI in sport marketing is its ability to analyze social media data. Social media platforms such as Twitter, Facebook, and Instagram are a goldmine for marketers, as they provide valuable insights into consumer behavior (Grandinetti, 2020). With the help of AI, marketers can analyze social media data and gain insights into consumer sentiment, preferences, and behavior (Siau & Yang, 2017). Finally, AI can also be used to optimize advertising campaigns. By analyzing data on consumer behavior, AI algorithms can identify the most effective advertising channels and

strategies. This can lead to better ROI and more efficient use of marketing budgets (Capatina et al., 2020).

In relation to the current study, it is worth mentioning the research conducted by Nalbant and Aydin (2022) titled "Literature Review on the Relationship between Artificial Intelligence Technologies and Digital Sports Marketing and Sports Management." The study examined the use of artificial intelligence and digital technology in digital sports management and digital sports marketing, with a focus on the potential of various technologies such as artificial intelligence, artificial neural networks, the metaverse, virtual reality, and augmented reality in competitive sports. Additionally, Pourzarnegar (2022) conducted a study titled "The Viewpoint of Sports Clubs' Managers on Sports Marketing," which found that the main components of price, product, place, and promotion have a positive and significant impact on sports marketing. Furthermore, Grandinetti (2020) conducted a study titled "How Artificial Intelligence Can Change the Core of Marketing Theory," which analyzed three categories of AI applications: AI-based shipping-then-shopping, AI-based service robots, and AI-based smart products and domestic robots. The study found that all three categories are related to mass customization, which places the customization process within a broader perspective of consumer needs management. This shift in approach means that marketing should focus more on managing consumers' needs rather than directly satisfying them. Haleem et al. (2022) also conducted a literature-based study titled "Artificial Intelligence (AI) Applications for Marketing," which highlighted the various ways in which AI can create a more personalized brand experience and improve user engagement and loyalty. Language-based AI is used as sales tools, payment processors, and engagement managers to enhance the user experience. Personalizing content through observation, data collection, and analysis is also made possible with AI. Finally, Li and Xu (2021) conducted a study titled "Application of Artificial Intelligence in Basketball Sport," which showed the potential of AI in analyzing basketball team and player performance, predicting competition results, analyzing and predicting shooting, creating an AI coaching system, developing an intelligent training machine and arena, and preventing sports injuries.

The use of AI in sport marketing is not just a trend; it is a scientific necessity. The sports industry generates vast amounts of data, and without the help of AI, it would be impossible to analyze this data effectively. AI algorithms can analyze data at a much faster rate than humans, and they can identify patterns and trends that would be difficult or impossible for humans to identify (Grandinetti, 2020). Moreover, AI can help to improve the accuracy of marketing campaigns. By analyzing data on consumer behavior, AI algorithms can identify the most effective marketing channels and strategies. This can lead to higher conversion rates and more efficient use of marketing budgets (Prentice, Dominique Lopes, & Wang, 2020).

while AI has the potential to revolutionize sports marketing, there are also several potential disadvantages that need to be considered. These include privacy concerns, lack of personalization, and potential bias. Sports marketers need to be aware of these potential disadvantages and take steps to mitigate them, such as ensuring data privacy and accuracy, and testing algorithms for bias. By doing so, they can harness the power of AI to create effective and engaging marketing campaigns while ensuring that they are ethical and responsible in their use of technology (Jo, 2020).

Despite this extensive list, marketing still lacks a cohesive understanding of how AI technologies have been applied thus far and how they should be in the future. That is, it needs analyses to scrutinize and synthesize the use of AI in sports marketing and pave a concrete path for future-focused academic research. The use of AI in sport marketing is a relatively new concept, and there is a lack of understanding of its scientific necessity. Although AI has been proven to be effective in finance, it is unclear whether it can be used effectively in sports marketing. Therefore, the scientific problem statement is to investigate the effectiveness of AI in sport marketing and determine its scientific necessity.

According to the issues raised, the main question of this research is what are the uses and limitations of artificial intelligence in sports marketing? findings of this study will contribute to the understanding of the scientific Applications and limitations of using AI in sports marketing.

Methodology

This study employed a mixed research methodology, specifically a sequential exploratory design that incorporated both qualitative and quantitative methods. Data was gathered through fieldwork, including interviews with 15 sports management experts and professors who were either actively involved in or researching sports marketing. Discussions with these experts centered on the concepts and practical applications of artificial intelligence. This sample size was deemed sufficient to achieve theoretical saturation according to established scientific source. The sampling approach used in this section was purposive and non-random. The interviews lasted for a minimum of 30 minutes, and the Delphi method was employed in three stages to analyze the data and determine the potential uses and drawbacks of artificial intelligence in sports marketing. During the first stage, a semi-structured interview was conducted using a questionnaire that was developed based on the background literature review. The questionnaire was provided to the researchers before the interview, and the interview itself was conducted over the phone. In the second stage, a Delphi questionnaire was organized, and the collected data was coded and summarized from the open questionnaire. This stage's questionnaire was designed quantitatively using the Likert scale and provided to experts to remove any ambiguous, repetitive, or imprecise items. After the analysis, developed eight categories of factors in the applications section and five categories of factors in the limitations section on a Likert scale were developed. Finally, in the third stage, the final questionnaire after scoring by experts as the final questionnaire in the quantitative part. Reliability, transferability, verifiability, and reliability in coding and data summarization for the accreditation of the qualitative part, were considered. In the quantitative part, all members of the sports management faculty were included in the statistical population, and the sample size was 130 randomly selected according to Morgan's table. The face and content validity of the questionnaire was confirmed by 15 experts and the construct validity of the questionnaire was confirmed by confirmatory factor analysis. Composite reliability indices (CR) and Cronbach's alpha for all constructs and the entire questionnaire were higher than 0.7. Also, Kolmograph Smirnov test was used to check the distribution of data and structural equation modeling with partial least squares approach was used to test the model and research hypotheses. Also, in this research, SPSS version 26 software and Smart Pls software were used for data analysis.

Results

In this study, 99% of the participants had a doctorate degree and 1% had a master's degree in sports management. Also, 52% of the participants were faculty members of government universities of the Ministry of Science, 31% were faculty members of Payam Noor University, and 17% were faculty members of Azad University.

The results of the confirmatory factor analysis of each research variable were obtained separately for each variable, the results of which are shown in table number one. It should be noted that in order to reduce the variables and consider them as one variable, the obtained factor load should be more than (0.3) (Yang, 2005).

Table 1. Factor loadings of indicators of the impact of artificial intelligence on sports evaluation: applications

Component	Number	Indicators	Factor load
Sports product/service sales forecast	1	Checking the information of sports product/service competitors	0.887
	2	Investigate the conditions of the sports product/service market	0.768
	3	Checking the sales history of sports products/services	0.766
	4	Providing information for selling sports products/services at the right time	0.804

Forecasting the price of sports product/service	5	Forecasting the amount of demand for sports products/services	0.814
	6	Forecasting the seasonal trends of registration in sports complexes and holding competitions	0.691
	7	Investigating the features of the sports product/service	0.680
	8	Prediction of the date of presentation of a new sports product/service	0.488
	9	Prediction of sports product/service trends	0.518
Identify opportunities for income growth	10	Determining the time and place of the sports product/service supply	0.114
	11	Attracting potential and new customers for sports products/services	0.470
	12	Keeping old customers of sports product/service	0.728
	13	Identifying customers with the value of sports product/service	0.842
	14	Identifying the needs of sports product/service customers	0.869
Automating sports product/service sales processes	15	Organizing communication with sales representatives of sports products/services	0.813
	16	Communicating with customers of sports products/services through e-mails	0.861
	17	Reducing workload	0.805
	18	Reduce human error	0.640
Round-the-clock support for customers of sports products/services	19	Using chatbots and increasing interaction with customers of sports products/services	0.893
	20	Finding suitable products for sports product/service customers	0.908
	21	Check the status of sports product/service supply	0.918
Personalized recommender systems by analyzing the behavior of sports product/service customers	22	Identifying the taste of sports product/service customers	0.708
	23	Estimating the purchasing power of sports product/service customers through their past purchases	0.643
	24	Identifying the location and area of residence of the sports product/service customer	0.783
	25	Identifying the buying habits of sports product/service customers	0.710
	26	Identifying the personality of the sports product/service customer	0.674
	27	Accurate identification of the target community	0.784
	28	Helping customers make better decisions	0.663
Pursuing the satisfaction of sports product/service	29	Using facial recognition cameras to measure the level of satisfaction with the purchase of sports products/services	0.833
	30	Follow up on the level of satisfaction using chatbots	0.862
	31	Targeted advertisement of sports product/service	0.830

Advertisement of sports product/service	32	Optimizing the time and content of sports product/service advertisements	0.883
	33	Convince the customer of the sports product/service	0.877
	34	Cognitive advertising (simultaneous presentation of different ads according to each person's taste, for a large number of people)	0.826

-Research findings using structural equation modeling (Smart-Pls)

In this part, by stating the research hypotheses and using the results of the structural model test, we are looking to test the research hypotheses and analyze the results. It is reminded that:

α=0.05	α/2=0.025	α/2=1.96
α=0.01	α/2=0.005	α/2=2.57
α=0.001	α/2=0.0005	α/2=3.32

To analyze and measure the model of this research, data analysis using the structural equation model has been used. Structural equation modeling is a statistical model for investigating linear relationships between latent (unobserved) variables and manifest (observed) variables. In other words, structural equation modeling is a powerful statistical technique that combines a measurement model (confirmatory factor analysis) and a structural model (regression or path analysis) with a simultaneous statistical test. Through these techniques, researchers can reject hypothetical structures (models) or confirm their compliance with the data. In order to analyze the conceptual model of the research, SmartPLS software was used.

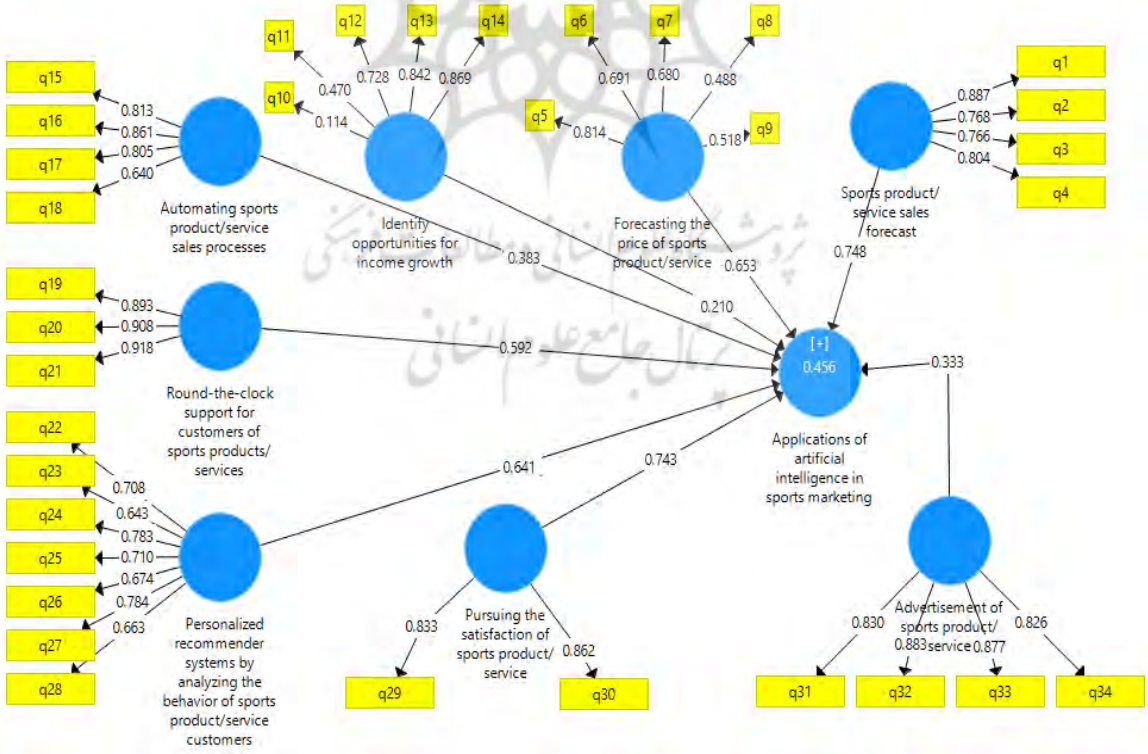

Figure 1. The Final Structural Model of The Research with Values of Factor Loadings and Path Coefficients (Beta)

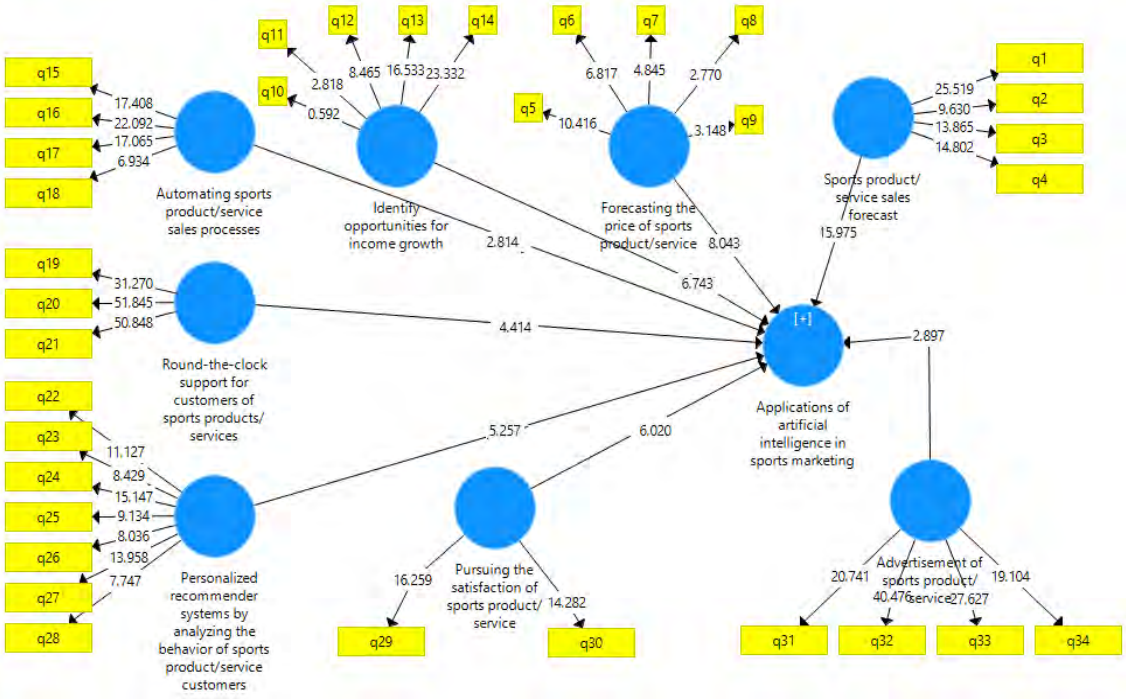

Figure 2. The Final Structural Model of The Research with Critical Values (T-Statistics)

Table 2. The results of direct, indirect, total and effect sizes of the internal model of the research

Assumptions	T value	Impact factor (β)
Sports product/service sales forecast → Applications of artificial intelligence in sports marketing	15.97	**0.74**
Forecasting the price of sports product/service → Applications of artificial intelligence in sports marketing	8.04	**0.65**
Identify opportunities for income growth → Applications of artificial intelligence in sports marketing	6.74	**0.21**
Automating sports product/service sales processes → Applications of artificial intelligence in sports marketing	2.81	**0.38**
Round-the-clock support for customers of sports products/services → Applications of artificial intelligence in sports marketing	4.41	**0.59**
Personalized recommender systems by analyzing the behavior of sports product/service customers → Applications of artificial intelligence in sports marketing	2.25	**0.64**
Pursuing the satisfaction of sports product/service → Applications of artificial intelligence in sports marketing	6.02	**0.74**
Advertisement of sports product/service → Applications of artificial intelligence in sports marketing	2.89	**0.33**

The results showed that sports product/service sales forecast, sports product/service price forecast, identification of revenue growth opportunities, sports product/service sales process automation, 24/7 support for sports product/service customers, system Personalized recommenders through analyzing the behavior of sports product/service customers, tracking satisfaction with sports product/service and advertising sports product/service on the applications of artificial intelligence in sports marketing with path coefficients of 0.74, 0.65, and 21, respectively. 0/0, 0/38, 0/59, 0/64, 0/74 and 0/33 and the critical value 15/97, 8/04, 6/74, 2/81, 4/41, 2/25, 02 6 and 2.89 have had an effect.

The second evaluation criterion of the internal model is the path coefficients, in order to check their significance, the self-adjustment procedure was used. These coefficients, along with their corresponding T-statistics, significance levels, and confidence intervals for direct effects are given in Table 2.

The third evaluation criterion of the model is to calculate the goodness of fit index of the model in partial least squares. In structural equation modeling with the help of Pls method, unlike the covariance-based method, there is no index for the overall evaluation of the model. But an index called goodness of fit (GOF) was proposed by Tenenhaus et al. (2005). This index considers both measurement and structural models and is used as a measure to measure the overall performance of the model. The limits of this index It is between zero and one, and Wetzles et al introduced three values of 0.01, 0.25 and 0.36 as weak, medium and strong values for GOF, respectively. This index is calculated manually as the average of R^2 and the average of shared values index:
GOF=√avrage(Comunalitie)*R^2

This index is the square of the product of two average communality values and the average determination coefficient (average R Square).

Table 3. The results of the general fit of the model with the GOF criterion of artificial intelligence applications

Endogenous variables	R^2	Communality	GOF
Sports product/service sales forecast	-	0.274	GOF = $\sqrt{0.456 * 0.440}$= 0.663
Forecasting the price of sports product/service	-	0.411	
Identify opportunities for income growth	-	0.231	
Automating sports product/service sales processes	-	0.365	
24/7 support for sports product/service customers	-	0.575	
Personalized recommender systems by analyzing the behavior of sports product/service customers	-	0.329	
Pursuing the satisfaction of sports product/service	-	0.259	
Advertisement of sports product/service	-	0.516	
Applications of artificial intelligence in sports marketing	0.456	1.000	

The GOF index of this model is 0.663, which indicates the overall desirability of the model.
In the next section, the limitations of using artificial intelligence in sports marketing were discussed.

The results of the confirmatory factor analysis of each research variable were obtained separately for each variable, the results of which are shown in table number four. It should be noted that in order to reduce the variables and consider them as one variable, the obtained factor load should be more than (0.3).

Table 4. Factor loadings of artificial intelligence impact indicators on sports marketing: limitations

Component	Number	Indicators	factor load
Limited understanding of the human element	1	Inability to understand the nuances of human emotions and preferences to offer sports service/product sales proposals	27.782
	2	Lack of understanding of cultural differences and local nuances to offer sports service/product sales proposals	52.412
Data privacy concerns	3	Endangering of users' personal data	13.378
	4	Cyberattacks on users' personal data and loss of sports brand reputation	26.144
Cost	5	Data processing cost	8.605
	6	Development and training of artificial intelligence models	7.233
	7	Establishment and maintenance of technology	17.530
	8	The cost of hiring an expert in sports and technology	7.052
Technical issues	9	Data quality	4.673
	10	Limited access to data	9.804
	11	Bias in the data	11.825
	12	Complexity of exercise	8.323
Ethical concerns	13	The possibility of prejudice and discrimination	38.259
	14	The possibility of manipulating user behavior	40.113

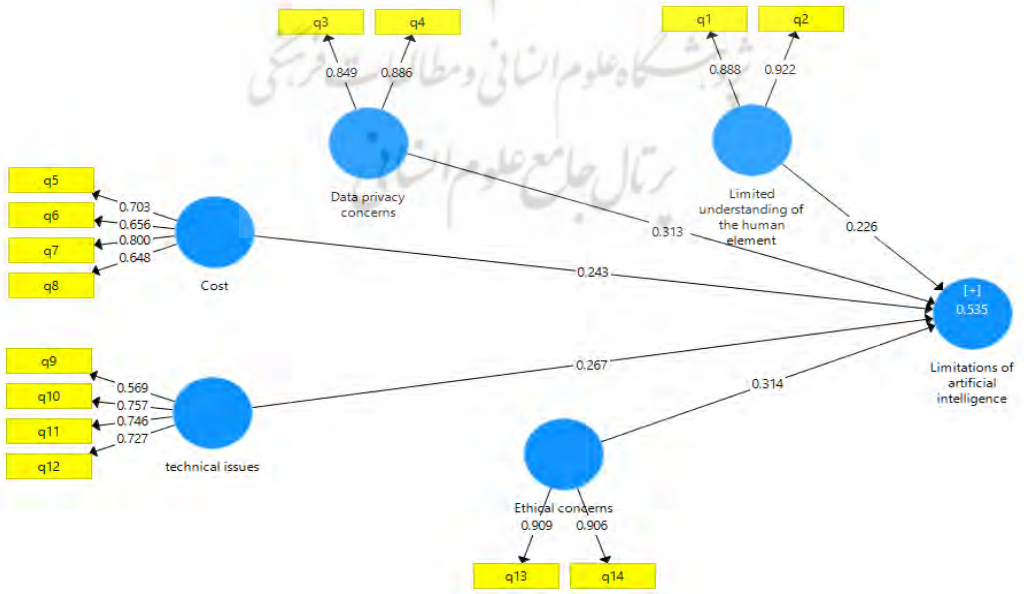

Figure 3. The Final Structural Model of The Research with Values of Factor Loadings and Path Coefficients (Beta)

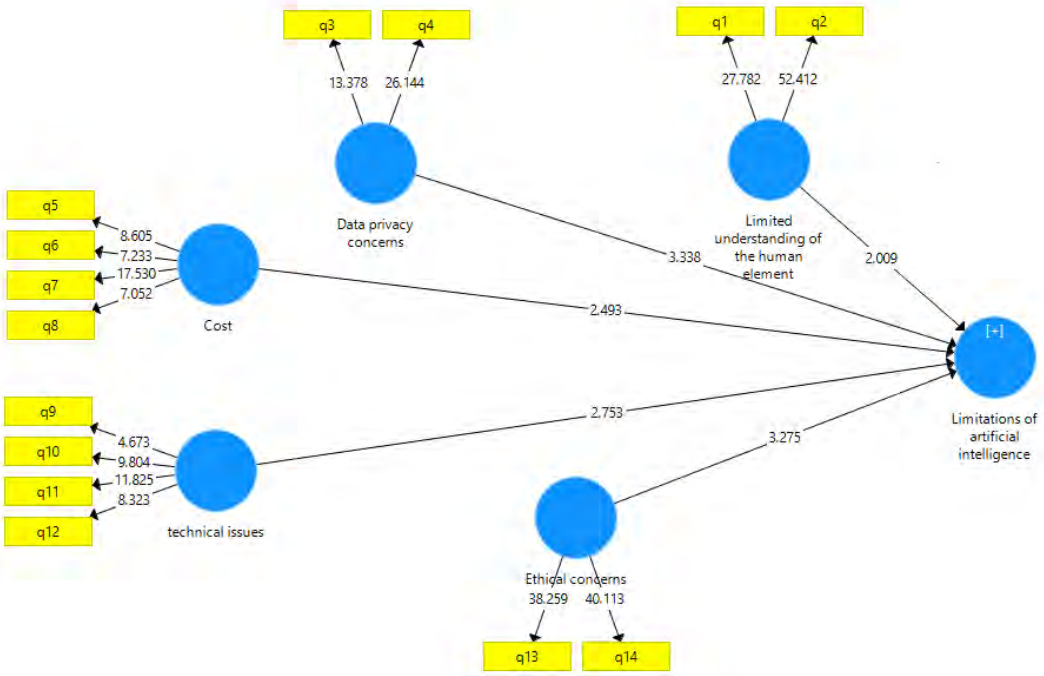

Figure 4. The Final Structural Model of The Research with Critical Values (T-Statistics)

Table 5. The results of direct, indirect, total and effect sizes of the internal model of the research

Hypotheses	T value	Impact factor(β)
Limited understanding of the human element → Limitations of artificial intelligence	2.009	0.22
Data privacy concerns → Limitations of artificial intelligence	2.33	0.313
expense → Limitations of artificial intelligence	2.49	0.24
technical issues → Limitations of artificial intelligence	3.75	0.26
Ethical concerns → Limitations of artificial intelligence	3.27	0.314

The results of structural equation path analysis in the field of artificial intelligence limitations showed that limited understanding of the human element on artificial intelligence limitations with a path coefficient of 0.22 and a critical value of 2.009, data privacy concerns on artificial intelligence limitations. With a path coefficient of 0.313 and a critical value of 2.33, the cost of artificial intelligence limitations with a path coefficient of 0.24 and a critical value of 2.49, technical problems with artificial intelligence limitations with a path coefficient of 0.26 and a critical value of 75. 3 and ethical concerns have had an impact on the limitations of artificial intelligence with a path coefficient of 0.314 and a critical value of 3.27.

Table 6. Results of overall model fit with the GOF criterion of artificial intelligence limitations

Endogenous variables	R^2	Communality	GOF
Limited understanding of the human element	-	*0.337*	GOF = $\sqrt{0.456 * 0.416}$= 0.644
Data privacy concerns	-	0.260	
Cost	-	0.205	
technical issues	-	0.386	
Ethical concerns	-	0.311	
Limitations of artificial intelligence	0.535	1.000	

The GOF index of this model is 0.644, which indicates the overall desirability of the model.

Discussion and Conclusion

This research was conducted with the aim of how the utilization of artificial intelligence affects sports marketing: its applications and limitations.

According to the results of the research, the first use of artificial intelligence in sports marketing was to predict sales of sports products/services. Sales forecasting is an integral part of business management. This is done by predicting the future through past data, industry trends, and market research. With the help of artificial intelligence algorithms and taking into account influencing factors such as time, competitors' information, market conditions and past sales history, it is possible to make an accurate forecast of sales, and with the passage of time and the machine learning capability of this forecasting system improved Optimum sales forecasting can also affect pricing performance (Prentice et al., 2020) .Predictive analysis, as an application of AI in marketing, has the potential to unleash a powerful pull across all of our marketing activities. Predictive analysis driven by AI can take existing data and extract enormous value from it (Haleem, Javaid, Qadri, Singh, & Suman, 2022) .

Also, the results of the present research showed that predicting the price of sports products/services is another application of using artificial intelligence in sports marketing. One of the most effective applications of artificial intelligence in marketing and sales, which is achieved by the ability to process big data, is the automatic determination of the price of a large number of products. In other words, artificial intelligence has the ability to predict the price of a product based on various factors, including demand, seasonal trends, product features, and the release date of new versions. By expanding the applications of artificial intelligence in marketing and sales and by using deep learning algorithms, it is possible to continuously measure the dynamic conditions of the market and consider the competitive environment to determine the optimal price (Devang et al., 2019).

Also, floating pricing for providing sports club services as well as sports goods increases the desire and motivation of customers to buy. The existence of auctions or periodic discounts can have a significant impact on the sales of a product. On the other hand, those who were willing to pay more for a product now pay less. Artificial intelligence solves this problem by providing the best solutions for floating pricing and offering discounts to a specific group of customers. For example, during Black Friday 2017, Amazon changed the price of 28% of its products at least once a day, which was done by artificial intelligence systems (Lai & Yu, 2021).

Also, according to the research findings, the identification of income growth opportunities is also one of the applications of artificial intelligence in sports marketing. A platform equipped with artificial intelligence predicts when and where clubs or sports product manufacturers should market their products to have the greatest impact. Attracting new customers along with keeping old customers is one of the goals of these types of systems, and without a doubt, identifying the needs of customers is one of the prerequisites to achieve these goals. In other words, smart platforms in this field show

marketers what to do to maximize revenue growth and outpace competitors. AI can capture the entire digital ecosystem of customers and then evaluate the data and identify revenue growth opportunities for brands. In other words, businesses have the ability to identify their valuable customers with the help of artificial intelligence systems (Vladimirovich, 2020). Artificial intelligence tools estimate customer lifetime value, future potential for customers to buy, or other related indicators by processing big data. With the help of these criteria, businesses can become skilled in personalizing communication with customers as part of the customer relationship management process. AI plays a significant role in assisting businesses in understanding their customers' needs and providing a personalized user experience. Companies can target and reach customers more efficiently by collecting their purchase history and social media data (Shaily & Emma, 2021). AI technology plays a significant role in ad performance optimization.

On the other hand, considering that the sales process is based on finding and identifying potential buyers, it is difficult for the marketing team to identify all potential buyers 100%. With the help of deep learning, artificial intelligence has made it possible for marketers to easily collect customer contact information and classify their customers' preferences.

Automating sports product/service sales processes is another application of artificial intelligence in sports marketing. With the help of artificial intelligence, many basic sales activities are performed automatically, which can have a great effect on saving time and energy. Activities such as entering sales data, organizing communication with representatives and customer support can be done automatically, easily and with great accuracy. Artificial intelligence seamlessly and intelligently integrates data from various sources into a customer relationship management (CRM) system. It can also be used to automatically send ordered emails to different people or representatives.

While many of us excel at extracting insights from vast amounts of data, most of us waste much time when it comes to getting useful information from complex data (Marinchak, Forrest, & Hoanca, 2018). In such cases, AI may assist by easing workload and saving time. Predictive analysis, as an application of AI in marketing, has the potential to unleash a powerful pull across all of our marketing activities.

Another application identified in this research is round-the-clock support for sports product/service customers. AI enables us to give clients intelligent, simple, and convenient customer support at every point in their journey. Marketing automation approaches are based on automating repetitive marketing operations and activities. AI applications in marketing are especially important for marketing automation. AI captures and interprets client data in real-time using ML and applies those findings on a vast scale. AI makes it easier to separate, sort, and prioritize this data. AI-powered marketing automation tools are revolutionizing marketing automation strategy. AI helps marketers to interact with their clients effectively. The AI marketing components include the most cutting-edge technologies for bridging the gap between a large amount of customer data available and probable actions that could be taken in future. The rise of digital media has resulted in an avalanche of big data, allowing marketers better to analyze their campaigns and transfer value across channels. Effective AI-powered solutions give marketers a centralized platform for handling massive volumes of data (Sestino & De Mauro, 2022).

According to the findings of this article, personalized recommender systems through analyzing the behavior of sports product/service customers are also one of the applications of artificial intelligence in sports marketing. One of the main uses of artificial intelligence in marketing and sales is to facilitate the delivery of the right message to the right person at the right time. In other words, with the help of artificial intelligence, customers' behavior can be analyzed, their tastes can be understood and their purchasing power can be estimated based on their past purchases. This personalization requires collecting a large amount of information about buyers' habits and analyzing this big data (Dingus & Black, 2021). With the help of deep learning algorithms, online sellers can continuously and simultaneously monitor each of the signs and symptoms with slight changes in the customer's taste and choice and adapt their products to the customer's needs in the best possible way. Deep learning techniques, along with statistical methods and prediction models, analyze customer behavior and identify the desired product for him. At first, according to the recent searches of potential customers and the review of stylish people and similar choices, intelligent systems in search engines extract the

details of the searched product. Then they generate suitable offers and list them on a personal page. Therefore, consumers are helped to find the desired product quickly.

Another application of artificial intelligence in sports marketing is to track the satisfaction of the sports product/service. Artificial intelligence is able to recognize the mood of customers during the purchase process. Facial recognition systems are used to perform this function (Xu, Lv, Li, Sun, & Sheng, 2022). Cameras are installed in suitable inspection places and if there is a feeling of dissatisfaction in the customer while shopping, the store representative will talk to him to find out the reasons for the customer's dissatisfaction and fix it.

Finally, sports product/service advertising is also an application of artificial intelligence in sports marketing. Targeted advertising is a type of advertising that targets audiences with specific characteristics based on market segmentation. In this regard, artificial intelligence-equipped systems create a special profile for each customer by collecting and processing purchase behaviors, comments and online posts (Jo, 2020). These systems are constantly updated by machine learning technology and by checking people's digital footprints. Then, with the help of artificial intelligence capabilities, big data related to each person can be processed and divided according to data mining algorithms. For example, Google, with the help of artificial intelligence, by studying customer behavior, such as the number of clicks on searched content or sites, recognizes the interest and behavior of the user and provides businesses with the opportunity to advertise their Targeted, show only to interested users. In fact, the focus of this type of advertising is on identifying the right audience, which can be as effective as the creative content of the advertisement.

In addition to the wide and numerous applications that artificial intelligence can have in sports marketing, its use also has limitations. One of the limitations identified in this research is limited understanding of the human element. AI may not fully understand the emotional and psychological factors (Elhajjar, Karam, & Borna, 2021). AI solutions in sport marketing have their limitations when it comes to understanding human elements. While AI algorithms can analyze data and predict user behavior, they lack the ability to understand the nuances of human emotions and preferences. For example, AI may recommend a product or service based on a user's past behavior, but it may not understand that the user's behavior was influenced by external factors such as a special occasion or a one-time event. This can lead to inaccurate recommendations and a poor user experience. Furthermore, AI may struggle to understand cultural differences and local nuances that can affect marketing messages. For instance, a marketing campaign that works well in one country may not be effective in another due to differences in cultural norms and values. Therefore, sports organizations must balance the use of AI with human insights and expertise to ensure that marketing messages are relevant, engaging, and respectful of users' cultural backgrounds and preferences. Human input can help refine AI algorithms and ensure that they align with the organization's values and goals.

Also, Data privacy concerns is the other limitation of using AI in sport marketing. use of AI in sport marketing may require the collection of personal data, which raises concerns about data privacy and security. Data privacy is a major concern in the implementation of AI solutions in sport marketing. AI algorithms require access to large amounts of personal data, such as user behavior, preferences, and demographics, to effectively target and personalize marketing messages (Mikalef et al., 2021). However, this data can be sensitive and must be handled with care to protect the privacy of individuals. Sports organizations must comply with data privacy regulations such as the General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA) when collecting and processing personal data. Failure to comply with these regulations can result in significant fines and damage to a brand's reputation. Moreover, there is a risk of data breaches and cyberattacks that can compromise the personal data of users (Chintalapati & Pandey, 2022). These incidents can lead to legal action against the sports organization and cause irreparable damage to their reputation. Therefore, sports organizations must prioritize data privacy and implement robust security measures to protect the personal data of their users when using AI solutions in sport marketing.

Also, implementation of AI solutions in sport marketing can be expensive, especially for smaller sports organizations with limited budgets. The cost of implementing AI solutions includes the cost of acquiring and processing data, developing and training AI models, and deploying and maintaining the technology. Additionally, the cost of hiring specialized expertise in both sports and technology can also be a significant expense. These costs may be prohibitive for some sports organizations,

preventing them from fully leveraging the potential benefits of AI in their marketing efforts. Therefore, cost is one of the technical difficulties that limit the use of AI in sport marketing.

AI systems may require significant technical expertise to implement and maintain, which may be a challenge for sports organizations with limited technical resources. There are several technical difficulties that limit the use of AI in sport marketing, including: 1. Data quality: The quality of data used to train AI models is crucial for their accuracy and effectiveness. However, sports data is often incomplete, inconsistent, and unstructured, which makes it challenging to use AI for predictive modeling. 2. Limited access to data: Some sports organizations may not have access to the necessary data to train AI models. This could be due to restrictions on data sharing or lack of resources to collect and analyze data. 3. Bias in data: AI models are only as good as the data they are trained on. If the data used to train the model is biased, then the model will also be biased. This can lead to inaccurate predictions and recommendations. 4. Complexity of sports: Sports involve complex interactions between players, teams, and environments. AI models need to be able to account for these complexities to provide accurate predictions and recommendations. Over all, while AI has the potential to revolutionize sport marketing, there are several technical challenges that need to be addressed before it can be widely adopted.

The use of AI in sport marketing raises ethical questions about the potential for bias and discrimination in decision-making processes. One of the ethical concerns with AI in sport marketing is the potential for bias and discrimination. AI algorithms rely on data to make predictions and recommendations, but if the data used is biased or incomplete, it can lead to unfair and discriminatory outcome (Grandinetti, 2020). For example, if an AI algorithm is trained on data that is predominantly male, it may not be able to accurately predict the behavior of female users. This could result in marketing messages that are not relevant or engaging to female audiences, leading to a loss of potential customers. Another ethical concern is the potential for AI to manipulate user behavior. AI algorithms can analyze user data to determine what messages and incentives are most likely to influence user behavior. While this can be used for positive outcomes, such as encouraging healthy habits or promoting sustainability, it can also be used to exploit users for financial gain. For instance, AI algorithms could be used to encourage users to make purchases they don't need or to engage in risky behaviors. This raises questions about the responsibility of sports organizations to use AI ethically and transparently, and the need for regulation to ensure that AI is used in a way that benefits society as a whole.

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