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The Impact of Artificial Intelligence on Managerial Decision-Making in Sports Organizations

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Abstract

This study aimed to investigate the effect of artificial intelligence on managerial decision-making effectiveness in sports organizations in Tehran. This applied study employed a quantitative, cross-sectional, correlational design. The statistical population comprised managers, deputy managers, department heads, supervisors, and senior administrative experts working in governmental sports organizations, national federations, municipal sports institutions, professional clubs, and private sports organizations in Tehran. Using multistage sampling, 210 eligible participants were included in the final analysis. Data were collected using a researcher-developed Artificial Intelligence Application in Sports Organizations Questionnaire and a researcher-adapted Managerial Decision-Making Effectiveness Questionnaire. The instruments assessed artificial intelligence infrastructure, intelligent data analysis, application in managerial processes, organizational readiness, decision quality, decision speed, information accuracy, predictive capacity, and decision transparency and consistency. Content validity was confirmed by experts, and construct validity and reliability were assessed through confirmatory factor analysis, Cronbach's alpha, composite reliability, and average variance extracted. Data were analyzed using Pearson correlation, multiple regression, and partial least squares structural equation modeling with 5,000 bootstrap resamples. Artificial intelligence had a positive and statistically significant effect on overall managerial decision-making effectiveness ($\beta = 0.74$, $t = 19.47$, $p < 0.001$) and explained 55% of its variance. Significant effects were also found on decision quality ($\beta = 0.67$, $p < 0.001$), decision speed ($\beta = 0.59$, $p < 0.001$), information accuracy ($\beta = 0.72$, $p < 0.001$), predictive capacity ($\beta = 0.75$, $p < 0.001$), and decision transparency and consistency ($\beta = 0.56$, $p < 0.001$). Multiple regression analysis showed that artificial intelligence infrastructure, intelligent data analysis, managerial application, and organizational readiness jointly explained 61% of the variance in decision-making effectiveness, with managerial application emerging as the strongest predictor ($\beta = 0.34$, $p < 0.001$). Artificial intelligence substantially improves managerial decision-making in sports organizations, particularly by strengthening prediction, information accuracy, decision quality, and operational responsiveness. Its effectiveness depends on integrating intelligent systems into managerial processes alongside appropriate infrastructure, organizational readiness, human oversight, and ethical governance.

Keywords: *Artificial intelligence; Managerial decision-making; Sports organizations; Predictive analytics; Organizational readiness; Sports management*

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1. Introduction

Artificial intelligence has emerged as one of the most influential technological forces reshaping contemporary organizations, altering how data are processed, problems are defined, alternatives are evaluated, and managerial decisions are made. In conventional managerial systems, decisions have often depended on managers' experience, intuition, limited organizational reports, and retrospective analyses of past performance. Although these approaches remain valuable, they may be insufficient in environments characterized by large volumes of heterogeneous data, rapidly changing stakeholder expectations, increasing competitive pressure, and the need for timely and evidence-based action. Artificial intelligence offers a different decision architecture by enabling organizations to analyze extensive datasets, identify complex patterns, generate forecasts, automate routine judgments, and support managers in comparing multiple courses of action. Its contribution to management is therefore not limited to operational automation; rather, it increasingly influences strategic planning, human resource allocation, financial control, risk assessment, organizational communication, and performance evaluation. Recent studies have described artificial intelligence as a general managerial capability that can strengthen information processing, improve the accuracy and speed of decisions, and support organizational responsiveness when it is integrated appropriately with managerial knowledge and institutional structures [1]. At the same time, the growing use of artificial intelligence has created new forms of algorithmic leadership in which managerial authority, evaluation, and control are partly mediated by computational systems, thereby changing the relationship between human judgment and organizational governance [2].

Managerial decision-making is a multidimensional process involving the identification of organizational problems, collection and interpretation of information, generation of alternatives, assessment of possible consequences, selection of an appropriate response, and evaluation of the resulting outcomes. The effectiveness of this process depends on the quality, relevance, completeness, and timeliness of the information available to managers, as well as their ability to interpret that information within the organization's strategic and social context. Artificial intelligence can contribute to each stage of decision-making by reducing information overload, integrating data from multiple sources, detecting relationships that may not be visible through conventional analysis, and presenting predictive or prescriptive recommendations. Integrated architectures combining data analytics, business intelligence, and machine learning demonstrate how organizations can convert dispersed operational data into structured managerial knowledge and actionable forecasts [3]. Such systems can enable managers to shift from reactive decision-making, which responds to problems after they occur, toward proactive and anticipatory decision-making based on predicted developments. However, the value of artificial intelligence does not arise automatically from the presence of technology. Its effectiveness depends on the organization's data infrastructure, employee capabilities, managerial acceptance, governance procedures, and capacity to align artificial intelligence tools with actual decision requirements. Accordingly, artificial intelligence should be understood not merely as software but as an organizational resource whose value is produced through interaction with human expertise, institutional processes, and managerial responsibility.

The emergence of agentic artificial intelligence has further expanded the potential scope of machine-supported management. Unlike earlier analytical systems that primarily responded to predefined requests, agentic systems can pursue goals, coordinate multiple analytical tasks, generate intermediate plans, and adapt their actions in response to new information. This transition may increase the autonomy of artificial intelligence within organizational workflows and allow it to participate more actively in planning, monitoring, and problem-solving [4]. Agentic artificial intelligence may also affect organizational ambidexterity by assisting managers in balancing exploitation of established capabilities with exploration of new opportunities, particularly when managerial decisions require the simultaneous consideration of efficiency, innovation, and uncertainty [5]. Nevertheless, greater technological autonomy intensifies questions regarding responsibility, explainability, managerial oversight, and the psychological readiness of employees to accept algorithmically generated recommendations. Managers may benefit from intelligent systems that rapidly produce alternative scenarios, but they must still determine whether those scenarios are strategically appropriate, ethically defensible, and compatible with the organization's values. Consequently, contemporary managerial decision-making is increasingly based on augmented intelligence, in which human and artificial capabilities complement one another rather than one completely replacing the other. The concept of person–artificial intelligence bidirectional fit emphasizes that effective decision support requires reciprocal adjustment: artificial intelligence systems must be designed to correspond with users' tasks and cognitive needs, while managers must develop the competencies necessary to interpret, challenge, and appropriately apply system outputs [6].

The managerial benefits of artificial intelligence are especially relevant in sports organizations because these organizations operate within complex and highly dynamic environments. Sports organizations must simultaneously manage athletic performance, financial resources, human capital, facilities, technologies, media relations, sponsorships, fan engagement, event operations, security, and regulatory obligations. Their decisions frequently involve uncertainty and time pressure, and the consequences of poor decisions may affect athletes, employees, spectators, sponsors, and the public. Unlike organizations whose outputs are relatively stable, sports organizations are influenced by volatile performance results, injuries, competitive schedules, public visibility, and rapidly changing audience behavior. Therefore, managers require systems capable of integrating sporting, administrative, financial, and behavioral data. Artificial intelligence has already demonstrated considerable value in sports science by assisting with athlete monitoring, workload management, injury-risk prediction, tactical evaluation, and the analysis of training and competition data [7]. It can empower sports scientists and decision-makers by transforming data from wearable devices, video analysis, medical assessments, and performance tracking into information that supports training, health management, and long-term athlete development [8]. These applications indicate that artificial intelligence is becoming embedded not only in technical performance analysis but also in broader systems of sports governance and organizational management.

In team sports, artificial intelligence can support decisions concerning player selection, tactical planning, opponent analysis, talent identification, training design, and the distribution of competitive workloads. Machine learning models can process data that exceed the capacity of manual analysis, thereby enabling coaches and managers to detect patterns across players, matches, and seasons [9]. However, the managerial significance of these technologies extends beyond the playing field. Sports executives can use intelligent analytics to evaluate organizational performance, forecast revenues and costs, optimize scheduling, identify emerging markets, analyze fan behavior, and support sponsorship negotiations. In sport startups, artificial intelligence can facilitate innovation, service customization, customer analysis, resource optimization, and the development of data-driven business models [10]. From a strategic perspective, the interaction between artificial intelligence and management is expected to shape the future competitiveness of the Iranian sport industry by changing how organizations identify opportunities, allocate resources, formulate strategies, and respond to environmental change [11]. Artificial intelligence-enabled surveillance systems may also improve sports security management by identifying unusual patterns, supporting crowd monitoring, and strengthening the ability of managers to respond to safety threats at sporting events [12]. These varied applications demonstrate that artificial intelligence can influence almost every managerial domain within sports organizations, yet the extent of its organizational impact depends on how consistently it is incorporated into decision processes.

The adoption of artificial intelligence in organizations is influenced by technological, structural, managerial, and environmental conditions. A systems approach to technology adoption suggests that organizations must consider the interdependence of infrastructure, processes, people, strategy, and external pressures rather than treating adoption as a single purchasing decision [13]. The availability of suitable databases, compatible software, technical expertise, financial resources, and reliable digital networks constitutes a necessary foundation, but these resources alone do not guarantee successful use. Managerial support, employee participation, organizational learning, and clear implementation objectives are equally important. Research on artificial intelligence adoption in supply chain management has shown that perceived usefulness, technological readiness, organizational capacity, competitive pressure, and implementation challenges jointly shape the acceptance and utilization of intelligent systems [14]. Similar mechanisms are likely to operate in sports organizations, where technological capabilities may vary considerably across ministries, federations, municipal institutions, professional clubs, and private organizations. In settings with fragmented information systems, inconsistent data collection, or limited analytical expertise, managers may be unable to derive meaningful value from artificial intelligence even when the technology is technically available. Therefore, assessing artificial intelligence in sports management requires attention to both the existence of technological infrastructure and the organization's readiness to use it.

The digital background of senior executives may be particularly important in determining whether artificial intelligence becomes an active managerial resource. Executives with greater technological knowledge are more likely to recognize the strategic value of artificial intelligence, allocate resources to digital transformation, and support experimentation with intelligent tools [15]. They may also be better prepared to evaluate the limitations of algorithmic recommendations and integrate them with contextual knowledge. Conversely, managers who lack digital literacy may either resist artificial intelligence or use it uncritically, both of which can weaken decision quality. The implementation of artificial intelligence in administrative settings also requires appropriate policy frameworks, coordination mechanisms, and institutional support, as implementation outcomes depend on the alignment of technology with organizational objectives and public expectations [16]. Managerial capabilities therefore function as an important bridge between artificial intelligence's technical potential and its actual contribution to innovation and organizational performance [17]. This bridge includes the ability to define suitable problems for artificial intelligence, ensure data quality, interpret results, communicate recommendations, and revise decisions when system outputs conflict with practical or ethical considerations.

Human resource management represents another domain in which artificial intelligence can influence managerial decision-making. Sports organizations make frequent decisions regarding recruitment, promotion, performance appraisal, staff development, workload assignment, and retention. Artificial intelligence can facilitate these processes by analyzing employee data, identifying competency gaps, forecasting workforce needs, and supporting evidence-based personnel planning. Research on human resource analytics has demonstrated that data-driven approaches can improve the systematic use of workforce information, although their adoption depends on organizational acceptance, analytical capabilities, and the integration of analytics into managerial practice [18]. At the same time, artificial intelligence-enabled human resource management raises concerns related to privacy, surveillance, bias, transparency, and employees' ability to contest algorithmically influenced decisions. Middle-level managers have expressed ethical concerns regarding the use of artificial intelligence in employment-related processes, particularly when systems rely on opaque criteria or produce decisions that may affect individuals' opportunities and professional identities [19]. These concerns are highly relevant to sports organizations, where evaluations may influence coaches, athletes, administrators, and support personnel, and where managerial decisions often combine objective performance indicators with qualitative judgments about leadership, teamwork, commitment, and potential.

Communication is also central to the relationship between artificial intelligence and managerial decision-making. Managers do not merely generate decisions; they must explain, justify, negotiate, and implement them through communication with employees and stakeholders. Artificial intelligence can support communication by summarizing reports, translating technical information, generating scenarios, and producing personalized messages. Nevertheless, it may also alter interpersonal relationships, organizational discourse, and perceptions of managerial authenticity. The sociology of managerial communication in the era of artificial intelligence highlights how digital systems can reshape the flow of information, the distribution of knowledge, and the nature of interaction between managers and organizational members [20]. In sports organizations, this issue is particularly significant because managers communicate with diverse groups, including athletes, coaches, medical personnel, administrative employees, sponsors, media representatives, fans, and regulatory bodies. Decisions generated with the assistance of artificial intelligence must therefore be communicated in ways that preserve trust and clarify the continuing role of human accountability. If employees perceive that managers are simply following algorithmic instructions, acceptance of decisions may decline, especially when the decision is unfavorable or difficult to understand.

The ethical dimension of artificial intelligence has consequently become inseparable from its managerial value. Algorithmic systems may reproduce historical inequalities, privilege easily measurable indicators, or generate recommendations that are difficult to explain. Responsible management requires clear standards for data governance, privacy protection, bias assessment, transparency, accountability, and human oversight. Knowledge mapping in algorithmic ethics emphasizes that organizations must develop governance mechanisms that connect technological design with responsible managerial conduct [21]. The risks are not limited to deliberate misuse; they may also result from poor-quality data, inappropriate model selection, overreliance on automated outputs, or the transfer of tools from one context to another without sufficient validation. Leaders therefore face the challenge of obtaining the benefits of artificial intelligence while preventing technological dependence and preserving the legitimacy of organizational decisions [22]. In sports settings, ethical concerns can arise when artificial intelligence is used to evaluate athletes, predict injuries, monitor employee behavior, allocate opportunities, or assess security risks. Because these decisions may affect careers, health, reputation, and access to organizational resources, managers must ensure that intelligent systems support rather than undermine fairness and professional judgment.

Responsible leadership provides a useful framework for understanding how artificial intelligence should be incorporated into managerial decision-making. Artificial intelligence-driven capabilities can enhance leaders' ability to recognize stakeholder interests, anticipate social consequences, and use evidence in complex decisions, but these capabilities must be governed by ethical awareness and accountability [23]. Managers should be able to identify circumstances in which algorithmic recommendations are useful, circumstances in which additional human review is required, and situations in which the use of artificial intelligence may be inappropriate. This need is particularly important in consulting and advisory contexts, where artificial intelligence may assist with assessment, pattern recognition, and recommendation generation but cannot fully replace relational understanding, contextual interpretation, and professional responsibility [24]. Sports managers similarly require a balanced approach. For routine and data-intensive tasks, artificial intelligence may improve speed and consistency, whereas strategic, ethical, and interpersonal decisions may require a greater degree of human deliberation. Thus, the most effective model is not unrestricted automation but carefully designed collaboration between human managers and intelligent systems.

Artificial management tools may also contribute to the systematic observation and evaluation of managerial processes. Online managerial tools can record actions, track performance indicators, compare organizational units, and generate continuous feedback that supports both research and practice [25]. In sports organizations, such tools can create integrated dashboards linking financial performance, athlete development, operational activities, audience engagement, and administrative outcomes. The availability of these dashboards may improve decision transparency and enable managers to identify deviations from plans in real time. However, the use of online tools must be accompanied by accurate data entry, consistent indicators, and clear definitions of organizational performance. Otherwise, managers may become increasingly dependent on indicators that provide an incomplete representation of organizational reality. The effectiveness of artificial intelligence therefore depends on whether decision models reflect the strategic priorities and social complexities of the sports organization rather than merely the variables that are easiest to measure.

Despite the expansion of artificial intelligence applications, a notable gap remains in the empirical examination of its effect on managerial decision-making within sports organizations, particularly in the Iranian context. Much of the available sports literature has focused on athlete performance, training analysis, injury prevention, and technical applications, while comparatively less attention has been given to the administrative and strategic decisions made by sports managers. Research on artificial intelligence in general management has identified substantial potential for improving efficiency, forecasting, and decision quality, yet sports organizations possess distinctive structures and stakeholder relationships that may influence these effects. Iranian sports organizations also vary in their technological resources, managerial expertise, institutional mandates, and exposure to data-driven systems. As a result, findings derived from commercial enterprises or technology companies cannot be applied directly without empirical investigation. It is necessary to determine whether artificial intelligence infrastructure, intelligent data analysis, operational integration, and organizational readiness are associated with more effective managerial decisions in this specific organizational field.

Understanding this relationship has both theoretical and practical importance. Theoretically, it can extend research on artificial intelligence-supported management by examining how technological capabilities operate within sports organizations, where performance, governance, public accountability, and human factors are closely interconnected. Practically, the findings can help sports policymakers and executives identify which dimensions of artificial intelligence require investment and which organizational conditions are necessary for successful implementation. Evidence regarding the influence of artificial intelligence on decision quality, decision speed, information accuracy, predictive capacity, and decision transparency can guide the design of managerial information systems and professional development programs. It can also help organizations avoid an exclusively technology-centered approach by emphasizing the importance of leadership, ethical governance, employee competence, and institutional readiness. Given the increasing strategic relevance of artificial intelligence to the future of sport management, empirical evidence is needed to clarify whether and how its adoption contributes to more effective managerial decision-making.

Accordingly, the aim of the present study was to investigate the effect of artificial intelligence on managerial decision-making effectiveness in sports organizations in Tehran.

2. Methodology

This study employed a quantitative, applied, and cross-sectional correlational design to investigate the impact of artificial intelligence on managerial decision-making in sports organizations. The statistical population consisted of managers, deputy managers, department heads, supervisors, and senior administrative experts working in sports organizations located in Tehran, Iran. These organizations included the Ministry of Sport and Youth, the General Directorate of Sport and Youth of Tehran Province, national sports federations, municipal sports organizations, professional sports clubs, and selected public and private sports institutions. The participants were required to have direct involvement in organizational planning, resource allocation, performance evaluation, personnel management, strategic decision-making, or the use of digital information systems in sports administration. A total of 240 questionnaires were distributed among eligible individuals, of which 218 were returned. After excluding eight questionnaires because of substantial missing responses or patterned answering, data from exactly 210 participants were included in the final analysis. Participants were selected through a multistage sampling procedure. First, sports organizations in Tehran were classified into governmental, federative, municipal, club-based, and private-sector categories. Several organizations were then selected from each category, and eligible managers and senior experts were recruited proportionately from the selected institutions. Inclusion criteria were having at least a bachelor's degree, a minimum of two years of managerial or professional experience in a sports organization, involvement in at least one organizational decision-making process, and willingness to participate in the study. Individuals who submitted incomplete questionnaires or reported no involvement in managerial or administrative decisions were excluded. Before data collection, the objectives and procedures of the study were explained to all participants. Participation was voluntary, informed consent was obtained, and respondents were assured that their information would remain confidential and would be analyzed only in aggregated form. No personally identifying information was collected, and participants were informed that they could withdraw from the study at any stage without any negative consequences.

Data were collected using a structured questionnaire composed of three sections. The first section gathered demographic and occupational information, including age, gender, educational level, organizational position, years of professional experience, type of sports organization, and previous experience using artificial intelligence or data-driven decision-support systems. The second section measured the application of artificial intelligence in sports organizations through a researcher-developed Artificial Intelligence Application in Sports Organizations Questionnaire. The instrument was developed after reviewing the theoretical literature on artificial intelligence, management information systems, data analytics, organizational decision support, and digital transformation in sports administration. It contained 24 items covering four dimensions: artificial intelligence infrastructure and accessibility, use of intelligent data analysis, application of artificial intelligence in managerial processes, and organizational readiness for artificial intelligence adoption. The infrastructure and accessibility dimension evaluated the availability of digital databases, intelligent software, analytical platforms, and technical resources. The intelligent data analysis dimension assessed the use of artificial intelligence to process performance data, predict organizational outcomes, identify patterns, and produce managerial reports. The managerial process dimension examined the application of artificial intelligence in planning, budgeting, human resource management, performance monitoring, risk assessment, and resource allocation. The organizational readiness dimension measured managerial support, employee competence, data quality, ethical awareness, and the organizational capacity to integrate artificial intelligence into existing administrative procedures. All items were rated on a five-point Likert scale ranging from 1, representing "strongly disagree," to 5, representing "strongly agree." Higher scores indicated a greater level of artificial intelligence adoption and utilization within the organization.

The third section assessed managerial decision-making using a researcher-adapted Managerial Decision-Making Effectiveness Questionnaire. This section consisted of 25 items measuring five dimensions: decision quality, decision speed, information accuracy, predictive capacity, and decision transparency and consistency. Decision quality referred to the extent to which managerial choices were evidence-based, appropriate, and aligned with organizational objectives. Decision speed represented the ability of managers to process information and select suitable courses of action within an appropriate period. Information accuracy assessed the completeness, relevance, reliability, and timeliness of the information used in managerial decisions. Predictive capacity measured the ability to anticipate operational challenges, performance trends, resource requirements, and potential risks. Decision transparency and consistency evaluated whether decisions were explainable, systematically documented, comparable across similar situations, and less dependent on personal bias. Responses were recorded on a five-point Likert scale ranging from 1, “strongly disagree,” to 5, “strongly agree,” with higher scores reflecting more effective managerial decision-making.

The content validity of the data collection instruments was evaluated by a panel of 10 experts in sports management, organizational behavior, information technology, and artificial intelligence. The experts examined the items in terms of relevance, clarity, comprehensiveness, and consistency with the study objectives. Their comments were used to revise ambiguous statements, remove repetitive items, and improve the correspondence between the items and their intended dimensions. Face validity was assessed through a pilot administration involving 20 managers and senior experts from sports organizations who were not included in the final sample. The respondents were asked to evaluate the wording, comprehensibility, response format, and approximate completion time of the questionnaire. The pilot findings confirmed that the items were understandable and suitable for the target population. Construct validity was subsequently examined using confirmatory factor analysis. Factor loadings, average variance extracted, composite reliability, and discriminant validity were assessed to determine whether the observed items adequately represented their respective latent constructs. Internal consistency was evaluated using Cronbach’s alpha and composite reliability coefficients. Coefficients greater than 0.70 were considered acceptable, indicating satisfactory reliability of the overall questionnaires and their dimensions.

The questionnaires were distributed both electronically and in printed form according to the administrative preferences of the participating organizations. Before distribution, formal permission was obtained from the relevant organizational authorities. Participants completing the electronic version received a secure questionnaire link, whereas printed questionnaires were delivered and collected in sealed envelopes. To reduce social desirability bias, participants were instructed to answer the questions according to the actual conditions of their organizations rather than their expectations regarding ideal managerial practices. The approximate completion time was 15 to 20 minutes. Completed questionnaires were screened for missing data, inconsistent responses, and uniform response patterns before statistical analysis.

Data were analyzed using IBM SPSS Statistics and SmartPLS software. Initially, the collected data were coded, entered into the statistical software, and screened for accuracy. Questionnaires with substantial missing information or clearly patterned responses were removed before the main analysis. For questionnaires with only a small number of missing values, the missing responses were replaced using the mean score of the relevant dimension, provided that the proportion of missing data did not exceed the predetermined acceptable threshold. Descriptive statistics, including frequency, percentage, mean, standard deviation, minimum, maximum, skewness, and kurtosis, were calculated to summarize the demographic characteristics of the participants and the distribution of the main study variables. The normality of the variables was examined through skewness and kurtosis indices and the Kolmogorov–Smirnov test. Multicollinearity among the predictor variables was evaluated using tolerance values and variance inflation factors. Values of the variance inflation factor below 5 were interpreted as indicating the absence of serious multicollinearity.

The measurement model was evaluated before testing the structural relationships. Indicator reliability was examined through standardized factor loadings, and items with acceptable loadings were retained in the model. Internal consistency reliability was assessed using Cronbach’s alpha and composite reliability, with values of 0.70 or higher considered satisfactory. Convergent validity was examined through the average variance extracted, and values of 0.50 or higher were interpreted as demonstrating that the latent construct explained an adequate proportion of the variance in its indicators. Discriminant validity was assessed using the Fornell–Larcker criterion and the heterotrait–monotrait ratio. The structural model was then evaluated by examining path coefficients, coefficients of determination, effect sizes, predictive relevance, and overall model fit indices.

Pearson correlation coefficients were calculated to examine the bivariate relationships between artificial intelligence utilization and the dimensions of managerial decision-making. Multiple regression analysis was used to determine the extent to which artificial intelligence infrastructure, intelligent data analysis, application in managerial processes, and organizational readiness predicted managerial decision-making effectiveness. Structural equation modeling based on the partial least squares approach was subsequently employed to test the direct effect of artificial intelligence on managerial decision-making as a latent organizational relationship. The statistical significance of the structural paths was determined through a bootstrapping procedure with 5,000 resamples. Path coefficients with t-values greater than 1.96 and p-values below 0.05 were considered statistically significant. The coefficient of determination was used to identify the proportion of variance in managerial decision-making explained by artificial intelligence. Effect size indices were also calculated to determine the practical contribution of each artificial intelligence dimension to the prediction of managerial decision-making. All statistical tests were two-tailed, and the significance level was set at $p < 0.05$.

3. Findings and Results

The final statistical analysis was conducted on data obtained from 210 managers, supervisors, department heads, and senior administrative experts employed in sports organizations in Tehran. Of the participants, 132 individuals, representing 62.9% of the sample, were men, and 78 individuals, representing 37.1%, were women. The mean age of the participants was 41.37 years, with a standard deviation of 7.82 years, and their ages ranged from 27 to 59 years. Regarding educational attainment, 44 participants, or 21.0%, held a bachelor's degree, 128 participants, or 61.0%, held a master's degree, and 38 participants, or 18.1%, held a doctoral degree. In terms of organizational position, 38 participants, representing 18.1%, were senior managers or deputy managers, 61 participants, representing 29.0%, were department heads, 47 participants, representing 22.4%, were supervisors, and 64 participants, representing 30.5%, were senior administrative or professional experts who were directly involved in organizational decision-making. The participants had an average of 12.46 years of professional experience, with a standard deviation of 6.31 years. Furthermore, 146 participants, equivalent to 69.5% of the sample, reported previous experience using data analytics, automated reporting tools, intelligent information systems, or artificial intelligence-based decision-support applications, whereas 64 participants, equivalent to 30.5%, reported no substantial previous experience with such systems. Regarding organizational affiliation, 57 participants worked in governmental sports organizations, 43 worked in national sports federations, 39 worked in municipal sports organizations, 41 worked in professional or semi-professional sports clubs, and 30 worked in private sports institutions. These demographic and occupational characteristics indicated that the sample included respondents with diverse managerial responsibilities, educational backgrounds, organizational affiliations, and levels of exposure to intelligent technologies in sports administration.

Table 1. Descriptive Statistics and Correlations Among the Main Study Variables

Variable	Mean	Standard Deviation	Minimum	Maximum	Skewness	Kurtosis	1	2	3	4	5
1. Artificial intelligence infrastructure and accessibility	3.42	0.68	1.67	4.83	-0.31	-0.22	1.00				
2. Intelligent data analysis	3.36	0.71	1.50	4.88	-0.28	-0.19	0.64**	1.00			
3. Artificial intelligence application in managerial processes	3.29	0.73	1.38	4.88	-0.24	-0.35	0.59**	0.68**	1.00		
4. Organizational readiness for artificial intelligence	3.47	0.66	1.75	4.92	-0.36	-0.14	0.61**	0.57**	0.63**	1.00	
5. Managerial decision-making effectiveness	3.58	0.62	1.84	4.92	-0.41	0.08	0.58**	0.66**	0.70**	0.63**	1.00

As shown in Table 1, the mean scores of all principal variables were above the theoretical midpoint of 3.00, indicating that the participants generally perceived the level of artificial intelligence utilization and managerial decision-making effectiveness in their organizations as moderate to relatively favorable. Organizational readiness for artificial intelligence had the highest mean among the four dimensions of artificial intelligence, with a mean of 3.47 and a standard deviation of 0.66. This finding suggested that managerial support, employee capabilities, data-related preparedness, and institutional willingness to adopt artificial intelligence were comparatively stronger than the actual operational use of artificial intelligence in managerial activities. Artificial intelligence infrastructure and accessibility had a mean of 3.42 and a standard deviation of 0.68, whereas intelligent data analysis had a mean of 3.36 and a standard deviation of 0.71. The lowest mean was observed for the application of artificial intelligence in managerial processes, with a mean of 3.29 and a standard deviation of 0.73. This pattern indicated that although sports organizations had begun to develop digital infrastructure and organizational readiness, the systematic use of artificial intelligence in planning, budgeting, resource allocation, personnel management, risk assessment, and performance evaluation remained less developed. Managerial decision-making effectiveness had a mean of 3.58 and a standard deviation of 0.62, reflecting a moderately favorable assessment of decision quality, speed, accuracy, predictive capacity, transparency, and consistency.

The skewness values ranged from -0.41 to -0.24, and the kurtosis values ranged from -0.35 to 0.08. Because all skewness and kurtosis values fell within the commonly accepted interval of -2 to +2, the distributions of the variables did not show substantial departures from normality. The correlation coefficients revealed statistically significant positive relationships among all dimensions of artificial intelligence and managerial decision-making effectiveness. The strongest correlation was observed between the application of artificial intelligence in managerial processes and managerial decision-making effectiveness, with a correlation coefficient of 0.70 and a significance level below 0.01. Intelligent data analysis was also strongly associated with managerial decision-making effectiveness, with a correlation coefficient of 0.66. Organizational readiness for artificial intelligence had a correlation of 0.63 with managerial decision-making effectiveness, whereas artificial intelligence infrastructure and accessibility had a correlation of 0.58. These results indicated that greater access to intelligent infrastructure, more extensive use of analytical technologies, broader integration of artificial intelligence into managerial activities, and stronger organizational readiness were each associated with higher levels of effective managerial decision-making. The correlations among the four artificial intelligence dimensions ranged from 0.57 to 0.68. Although these relationships were moderately strong, none of the coefficients exceeded 0.80, suggesting that the dimensions were related but empirically distinguishable and that serious multicollinearity was unlikely.

Table 2. Measurement Model Assessment for the Study Constructs

Construct	Number of Items	Factor Loading Range	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Artificial intelligence infrastructure and accessibility	6	0.72–0.86	0.88	0.91	0.63
Intelligent data analysis	6	0.74–0.88	0.90	0.92	0.66
Artificial intelligence application in managerial processes	6	0.71–0.89	0.91	0.93	0.68
Organizational readiness for artificial intelligence	6	0.70–0.85	0.87	0.90	0.60
Decision quality	5	0.75–0.88	0.89	0.92	0.69
Decision speed	5	0.72–0.86	0.87	0.90	0.64
Information accuracy	5	0.76–0.90	0.91	0.93	0.72
Predictive capacity	5	0.73–0.89	0.90	0.92	0.68
Decision transparency and consistency	5	0.70–0.84	0.86	0.89	0.61

Table 2 presents the results of the measurement model assessment. The standardized factor loadings for the items measuring the study constructs ranged from 0.70 to 0.90. All retained indicators therefore exceeded the minimum acceptable loading of 0.70 and demonstrated satisfactory correspondence with their intended latent constructs. Among the artificial intelligence dimensions, the application of artificial intelligence in managerial processes showed factor loadings ranging from 0.71 to 0.89, while intelligent data analysis showed loadings ranging from 0.74 to 0.88. The loadings for infrastructure and accessibility ranged from 0.72 to 0.86, and those for organizational readiness ranged from 0.70 to 0.85. For the managerial decision-making dimensions, the strongest item loading was 0.90 within the information accuracy construct, while the minimum loading of 0.70 was observed within decision transparency and consistency. These findings demonstrated that the observed indicators adequately represented their designated constructs.

Cronbach's alpha coefficients ranged from 0.86 to 0.91, exceeding the recommended threshold of 0.70 for all constructs. The highest Cronbach's alpha coefficients were obtained for artificial intelligence application in managerial processes and information accuracy, both of which had values of 0.91. The lowest coefficient was obtained for decision transparency and consistency, with a value of 0.86; however, this value remained well above the acceptable threshold. Composite reliability values ranged from 0.89 to 0.93, further confirming the internal consistency of the measurement instruments. The average variance extracted values ranged from 0.60 to 0.72 and were greater than the minimum criterion of 0.50 for all dimensions. Information accuracy had the highest average variance extracted value, at 0.72, indicating that 72% of the variance in its observed indicators was explained by the underlying construct. Organizational readiness had the lowest average variance extracted value, at 0.60, which nevertheless indicated satisfactory convergent validity. Collectively, the acceptable factor loadings, Cronbach's alpha coefficients, composite reliability coefficients, and average variance extracted values confirmed the reliability and convergent validity of the measurement model and supported proceeding to the assessment of the structural relationships.

Discriminant validity was additionally assessed using the Fornell–Larcker criterion and the heterotrait–monotrait ratio. The square root of the average variance extracted for each construct was greater than its correlations with the remaining constructs. Moreover, all heterotrait–monotrait ratios were below 0.85. These findings indicated that each construct explained its own indicators more strongly than it explained indicators belonging to other constructs. Therefore, the artificial intelligence dimensions and the managerial decision-making dimensions represented conceptually related but statistically distinct components of the overall model.

Table 3. Multiple Regression Analysis Predicting Managerial Decision-Making Effectiveness

Predictor Variable	Unstandardized Coefficient B	Standard Error	Standardized Beta	t	p	Tolerance	Variance Inflation Factor
Constant	0.74	0.17	—	4.35	<0.001	—	—
Artificial intelligence infrastructure and accessibility	0.12	0.05	0.13	2.31	0.022	0.49	2.04
Intelligent data analysis	0.22	0.05	0.25	4.48	<0.001	0.43	2.33
Artificial intelligence application in managerial processes	0.29	0.05	0.34	5.82	<0.001	0.39	2.56
Organizational readiness for artificial intelligence	0.19	0.05	0.20	3.74	<0.001	0.48	2.08

Model summary: $R = 0.78$; $R^2 = 0.61$; Adjusted $R^2 = 0.60$; $F(4, 205) = 80.13$; $p < 0.001$; Durbin–Watson = 1.91.

The results of the multiple regression analysis presented in Table 3 indicated that the four dimensions of artificial intelligence jointly and significantly predicted managerial decision-making effectiveness. The overall regression model was statistically significant, $F(4, 205) = 80.13$, $p < 0.001$. The multiple correlation coefficient was 0.78, and the coefficient of determination was 0.61, demonstrating that the four artificial intelligence dimensions collectively explained 61% of the variance in managerial decision-making effectiveness. The adjusted coefficient of determination was 0.60, which was only slightly lower than the unadjusted value and suggested that the predictive capacity of the model was not substantially inflated by the number of predictors. The Durbin–Watson statistic was 1.91, which was close to the expected value of 2.00 and indicated that the residuals were independent and that there was no meaningful autocorrelation in the regression model.

All four predictor variables had positive and statistically significant regression coefficients. The application of artificial intelligence in managerial processes was the strongest predictor of managerial decision-making effectiveness, with a standardized beta coefficient of 0.34, $t = 5.82$, and $p < 0.001$. Holding the other predictors constant, a one-standard-deviation increase in the application of artificial intelligence in managerial processes was associated with an increase of 0.34 standard deviations in managerial decision-making effectiveness. This result suggested that the direct integration of artificial intelligence into planning, resource allocation, budgeting, human resource management, performance monitoring, and risk evaluation had the greatest contribution to improving managerial decisions in sports organizations.

Intelligent data analysis was the second strongest predictor, with a standardized beta coefficient of 0.25, $t = 4.48$, and $p < 0.001$. This result indicated that the use of artificial intelligence to analyze organizational data, identify patterns, produce forecasts, and generate evidence-based reports made an independent contribution to decision-making effectiveness. Organizational readiness for artificial intelligence also significantly predicted managerial decision-making, with a standardized beta coefficient of 0.20, $t = 3.74$, and $p < 0.001$. This finding showed that managerial support, employee competence, data quality, ethical preparedness, and institutional willingness to adopt intelligent systems were important conditions for effective decision-making. Artificial intelligence infrastructure and accessibility had the smallest but still statistically significant standardized effect, with a beta coefficient of 0.13, $t = 2.31$, and $p = 0.022$. Therefore, the availability of digital databases, intelligent software, analytical platforms, and technical resources contributed positively to managerial decision-making, although its independent contribution was weaker than the contributions of operational application, intelligent analysis, and organizational readiness.

The tolerance values ranged from 0.39 to 0.49, and the variance inflation factors ranged from 2.04 to 2.56. Because all tolerance values were above 0.20 and all variance inflation factors were substantially below 5.00, the results indicated that multicollinearity did not pose a serious problem in the regression model. Consequently, the regression coefficients could be interpreted as the distinctive contribution of each artificial intelligence dimension after controlling for the effects of the other predictors.

Table 4. Structural Model Results for the Effect of Artificial Intelligence on Managerial Decision-Making Dimensions

Structural Path	Path Coefficient	Standard Error	t-Value	p-Value	Effect Size f^2	Result
Artificial intelligence → Decision quality	0.67	0.047	14.26	<0.001	0.81	Supported
Artificial intelligence → Decision speed	0.59	0.055	10.73	<0.001	0.54	Supported
Artificial intelligence → Information accuracy	0.72	0.041	17.56	<0.001	1.08	Supported
Artificial intelligence → Predictive capacity	0.75	0.039	19.23	<0.001	1.29	Supported
Artificial intelligence → Decision transparency and consistency	0.56	0.058	9.66	<0.001	0.46	Supported
Artificial intelligence → Overall managerial decision-making effectiveness	0.74	0.038	19.47	<0.001	1.21	Supported

Structural model indicators: R^2 for overall managerial decision-making effectiveness = 0.55; Adjusted R^2 = 0.55; Q^2 = 0.39; standardized root mean square residual = 0.061; normed fit index = 0.91.

As reported in Table 4, the structural equation model demonstrated that artificial intelligence had a positive and statistically significant effect on overall managerial decision-making effectiveness in sports organizations. The standardized path coefficient for the effect of artificial intelligence on overall managerial decision-making effectiveness was 0.74, with a t-value of 19.47 and a significance level below 0.001. Because the t-value exceeded the critical value of 1.96 and the p-value was below 0.05, the principal hypothesis of the study was supported. The positive path coefficient indicated that greater adoption, utilization, and organizational integration of artificial intelligence were associated with substantially more effective managerial decision-making. The coefficient of determination for overall managerial decision-making effectiveness was 0.55, indicating that artificial intelligence explained 55% of the variance in the overall decision-making construct. This represented substantial explanatory power for an organizational behavior model and demonstrated that artificial intelligence was a major predictor of managerial decision effectiveness in the sports organizations included in the study.

Artificial intelligence had significant positive effects on all five dimensions of managerial decision-making. The strongest effect was observed for predictive capacity, with a path coefficient of 0.75, $t = 19.23$, and $p < 0.001$. This result suggested that artificial intelligence most strongly enhanced managers' ability to anticipate future performance trends, estimate resource requirements, identify potential operational risks, and predict the consequences of alternative managerial actions. The effect size for this relationship was 1.29, indicating a very large practical effect. Artificial intelligence also exerted a strong effect on information accuracy, with a path coefficient of 0.72, $t = 17.56$, and $p < 0.001$. The corresponding effect size was 1.08, which demonstrated that artificial intelligence substantially improved the completeness, reliability, timeliness, and relevance of information available to sports managers.

The effect of artificial intelligence on decision quality was also positive and significant, with a path coefficient of 0.67, $t = 14.26$, and $p < 0.001$. The effect size of 0.81 showed that the use of artificial intelligence contributed substantially to the selection of more evidence-based, appropriate, and strategically aligned decisions. Artificial intelligence had a significant effect on decision speed, with a path coefficient of 0.59, $t = 10.73$, and $p < 0.001$. This finding indicated that intelligent systems facilitated faster data processing, reduced the time required to compare alternatives, and enabled managers to respond more rapidly to organizational challenges and changing environmental conditions. The effect size for decision speed was 0.54, representing a large effect.

The smallest structural coefficient was observed for decision transparency and consistency, although the effect remained positive, statistically significant, and practically meaningful. The path coefficient was 0.56, the t-value was 9.66, and the p-value was below 0.001. The effect size of 0.46 indicated that artificial intelligence contributed to more systematic, explainable, documented, and consistent decisions, although its influence on this dimension was weaker than its influence on prediction, information accuracy, decision quality, and decision speed. This comparatively smaller effect may indicate that transparency and consistency depend not only on technical capabilities but also on organizational policies, ethical standards, managerial accountability, and the interpretability of artificial intelligence systems.

The effect size for the overall relationship between artificial intelligence and managerial decision-making effectiveness was 1.21, indicating a very large effect. The Stone–Geisser predictive relevance coefficient was 0.39, which was greater than zero and demonstrated strong out-of-sample predictive relevance for the endogenous construct. The standardized root mean square residual was 0.061, which was below the recommended maximum value of 0.08 and therefore indicated an acceptable correspondence between the observed and model-implied correlation matrices. The normed fit index was 0.91, exceeding the generally acceptable criterion of 0.90. Taken together, the explanatory power, predictive relevance, effect size values, and model fit indices indicated that the proposed structural model provided an adequate and substantively meaningful representation of the relationship between artificial intelligence and managerial decision-making in sports organizations.

Overall, the findings demonstrated that artificial intelligence was positively related to managerial decision-making and significantly predicted decision quality, decision speed, information accuracy, predictive capacity, and decision transparency and consistency. Among the components examined, the practical application of artificial intelligence in managerial processes emerged as the most influential independent predictor in the regression model, while predictive capacity showed the strongest outcome-level effect in the structural model. The findings therefore suggested that the benefits of artificial intelligence were greatest when intelligent technologies were not limited to basic infrastructure or data storage but were actively integrated into managerial analysis, forecasting, planning, resource allocation, monitoring, and organizational problem-solving.

4. Discussion and Conclusion

The present study investigated the effect of artificial intelligence on managerial decision-making in sports organizations in Tehran. The findings demonstrated that artificial intelligence had a positive and statistically significant effect on overall managerial decision-making effectiveness. Artificial intelligence explained a substantial proportion of the variance in managerial decision-making and significantly improved all examined dimensions, including decision quality, decision speed, information accuracy, predictive capacity, and decision transparency and consistency. Among these outcomes, the strongest effect was observed for predictive capacity, followed by information accuracy and decision quality. The application of artificial intelligence in managerial processes also emerged as the strongest independent predictor of decision-making effectiveness, whereas intelligent data analysis, organizational readiness, and technological infrastructure made additional significant contributions. These results indicate that the managerial value of artificial intelligence is not limited to the availability of digital technologies but becomes more pronounced when intelligent systems are actively integrated into planning, forecasting, resource allocation, performance evaluation, and organizational problem-solving.

The significant positive effect of artificial intelligence on overall managerial decision-making effectiveness is consistent with the view that intelligent technologies can strengthen the informational and analytical foundations of management. Artificial intelligence enables managers to process large volumes of heterogeneous data, identify relationships that may remain unnoticed through conventional analysis, and evaluate several decision alternatives simultaneously. Al-Zahrani and colleagues argued that artificial intelligence can enhance managerial functions by improving planning, organizing, controlling, and decision support, particularly when organizations align technological capabilities with managerial objectives [1]. Similarly, Champa and Segall emphasized that integrated architectures combining business intelligence, data analytics, and machine learning can convert fragmented organizational information into actionable knowledge for decision-makers [3]. The present findings support these arguments by showing that artificial intelligence was strongly associated with more effective managerial decisions in sports organizations. Sports managers frequently confront complex decisions involving athletes, employees, budgets, facilities, competitions, stakeholders, and public expectations. Under such conditions, the ability of artificial intelligence to aggregate and analyze multiple forms of data can reduce uncertainty and improve the coherence of managerial responses.

The finding that the operational application of artificial intelligence in managerial processes was the strongest predictor of decision-making effectiveness is particularly important. The mere existence of software, digital databases, or technological infrastructure does not necessarily improve decisions unless those resources are incorporated into actual managerial routines. The results suggest that sports organizations gain the greatest benefit when artificial intelligence is used directly in budgeting, human resource planning, risk assessment, performance monitoring, strategic planning, and resource allocation. This interpretation is consistent with the systems approach proposed by Ramírez-Gutiérrez and colleagues, according to which successful technology adoption depends on the interaction of technology, organizational processes, human resources, strategy, and environmental conditions [13]. It also aligns with Shahzadi and colleagues' review showing that organizational value from artificial intelligence arises when adoption is supported by implementation capacity, process integration, technological readiness, and managerial commitment [14]. Therefore, the findings indicate that sports organizations should move beyond symbolic or limited adoption and develop mechanisms through which artificial intelligence becomes embedded in routine and strategic decision processes.

Artificial intelligence had its strongest effect on predictive capacity. This finding indicates that intelligent systems are especially valuable in enabling sports managers to anticipate future trends, identify risks, forecast resource needs, and estimate the probable consequences of alternative decisions. Sports organizations operate in uncertain environments in which athletic performance, injuries, sponsorship revenues, audience behavior, competitive outcomes, and operational demands can change rapidly. Artificial intelligence can analyze historical and real-time data to identify patterns and produce forecasts that improve anticipatory management. Mateus and colleagues described artificial intelligence as an important tool for integrating performance, training, and health data in ways that support proactive rather than reactive decisions in sport [8]. Sirawattana and Poolsamral similarly noted that artificial intelligence can improve the prediction and management of athlete performance through advanced data processing and analytical modeling [7]. Although these studies focused primarily on sports science, the same predictive logic applies to organizational management. By combining administrative, financial, operational, and performance data, artificial intelligence can help managers forecast workload, resource shortages, event-related risks, and organizational outcomes before problems become critical.

The strong effect of artificial intelligence on information accuracy also confirms that intelligent technologies can improve the quality of information used in managerial decisions. Traditional decision-making in sports organizations may depend on delayed reports, incomplete records, personal impressions, or data stored separately across organizational units. Artificial intelligence can integrate these sources, detect inconsistencies, and provide managers with more timely and relevant information. The systematic use of human resource analytics, for example, has been shown to strengthen workforce planning by transforming employee data into evidence for recruitment, development, and performance decisions [18]. In sports organizations, similar analytical processes can be used to assess staff performance, identify competency gaps, evaluate athlete support services, and monitor organizational productivity. Flak also demonstrated that online managerial tools can systematically collect and evaluate information about managerial activities, thereby supporting more evidence-based management [25]. The present findings therefore suggest that artificial intelligence improves managerial decision-making partly by increasing the reliability, completeness, and timeliness of the information available to decision-makers.

Artificial intelligence also had a strong positive effect on decision quality. This result indicates that managers who use intelligent systems are better positioned to select alternatives that are evidence-based, strategically aligned, and appropriate to organizational circumstances. The effect can be explained by the ability of artificial intelligence to compare multiple options, estimate possible outcomes, and reduce some forms of cognitive bias. Bieńkowska and colleagues emphasized that effective management increasingly depends on a bidirectional fit between people and artificial intelligence, in which managers contribute contextual judgment while intelligent systems contribute analytical capacity [6]. This complementary relationship is particularly relevant in sport, where quantitative indicators cannot fully capture motivation, team dynamics, stakeholder sensitivities, or organizational culture. Artificial intelligence can improve the evidentiary basis of decisions, but the manager must still interpret recommendations in relation to ethical, strategic, and interpersonal considerations. Norton and colleagues made a comparable argument in consulting psychology, noting that artificial intelligence can strengthen assessment and recommendation processes but should remain integrated with professional judgment and contextual understanding [24]. The present findings support an augmented decision-making model in which artificial intelligence enhances, rather than replaces, managerial expertise.

The positive effect of artificial intelligence on decision speed can be attributed to its ability to automate routine analyses and rapidly process information that would otherwise require considerable managerial time. Sports organizations often operate under intense time constraints, particularly during competitions, crises, contract negotiations, event management, and security incidents. Intelligent systems can quickly summarize data, identify urgent deviations, and present decision alternatives, thereby reducing the interval between problem recognition and managerial action. The rise of agentic artificial intelligence may intensify this advantage because such systems can perform interconnected tasks, pursue specified goals, and update recommendations in response to new information [4]. Agentic systems may also support organizational ambidexterity by helping managers respond efficiently to current operational requirements while simultaneously exploring future opportunities [5]. In sports organizations, this capability may allow managers to respond more rapidly to scheduling disruptions, financial changes, athlete-related concerns, and stakeholder demands. Nevertheless, faster decisions are not automatically better decisions; therefore, organizations must ensure that time efficiency does not reduce reflection, ethical evaluation, or human oversight.

Although the effect of artificial intelligence on decision transparency and consistency was statistically significant, it was weaker than its effects on predictive capacity, information accuracy, and decision quality. This pattern may reflect the fact that transparency is not produced solely by analytical accuracy. Some artificial intelligence systems generate complex outputs that managers and employees cannot easily interpret. Consequently, an organization may benefit from more accurate predictions while still encountering difficulty explaining how a recommendation was generated. Barreno-Alcalde and colleagues emphasized that responsible algorithmic management requires governance mechanisms addressing explainability, accountability, fairness, and ethical control [21]. Hong also identified concerns among managers regarding opacity, bias, privacy, and the difficulty of contesting artificial intelligence-supported human resource decisions [19]. These issues may be especially sensitive in sports organizations when algorithmic recommendations affect athlete selection, staff evaluation, promotion, funding, or access to opportunities. The comparatively smaller effect on transparency therefore suggests that technical adoption must be accompanied by explainable models, documentation standards, and clear accountability procedures.

Organizational readiness significantly predicted managerial decision-making effectiveness, demonstrating that the success of artificial intelligence depends on managerial support, employee competence, data quality, and institutional willingness to change. Organizations may possess advanced software but fail to obtain meaningful outcomes when employees lack training or when managers do not trust the systems. Yu and colleagues found that the digital background of executives can influence the level of artificial intelligence utilization within enterprises because digitally experienced leaders are more likely to recognize technological opportunities and support implementation [15]. Odeibat similarly argued that managerial capabilities are essential for translating the innovation potential of artificial intelligence into organizational capability and performance [17]. The present findings extend this reasoning to sports organizations and indicate that technological development should be accompanied by leadership development, staff education, data governance, and organizational learning. In the Iranian sport context, where organizations may differ substantially in financial resources, infrastructure, and administrative culture, readiness is likely to determine whether artificial intelligence remains an experimental tool or becomes an effective component of management.

The positive contribution of intelligent data analysis is also consistent with research on artificial intelligence applications in sport. Narimani and colleagues described the growing use of artificial intelligence in team sports for performance analysis, tactical assessment, and decision support [9]. Rashki and colleagues identified multiple functions of artificial intelligence in Iranian sport startups, including customer analysis, service development, innovation, and resource optimization [10]. Piri Ataei and colleagues further argued that artificial intelligence is increasingly intertwined with strategic management and is likely to influence the future direction of Iran's sport industry [11]. The current study provides empirical support for these perspectives by showing that intelligent data analysis contributes not only to technical sports performance but also to managerial decision-making across organizational domains. This broader use may include forecasting revenues, evaluating programs, analyzing stakeholder behavior, optimizing service delivery, and monitoring strategic objectives.

The findings also have implications for leadership and accountability. Artificial intelligence-driven capabilities may strengthen responsible leadership by enabling managers to consider more evidence and anticipate a broader range of consequences [23]. However, artificial intelligence can also change the distribution of managerial authority. Spoelstra and Butler noted that algorithmic leadership introduces new forms of control in which organizational behavior is increasingly guided by computational rules and performance metrics [2]. This development can improve consistency but may also weaken managerial discretion or create overreliance on measurable indicators. Upadhyay emphasized that organizational leaders face significant challenges in maintaining human judgment, accountability, and ethical responsibility when using artificial intelligence [22]. Therefore, the positive findings of this study should not be interpreted as support for unrestricted automation. Rather, they highlight the value of human–artificial intelligence collaboration in which managers retain responsibility for final decisions and use intelligent systems as analytical partners.

Artificial intelligence may also reshape managerial communication. Iosif argued that artificial intelligence changes organizational communication by altering how information is generated, circulated, and interpreted [20]. In sports organizations, managerial decisions must be communicated to athletes, coaches, administrative personnel, sponsors, media organizations, and governing bodies. Even when an artificial intelligence-supported decision is analytically sound, it may be resisted if stakeholders do not understand its rationale. The adoption of intelligent systems should therefore be accompanied by communication practices that explain how data were used, what limitations remain, and why human judgment continues to matter. This is particularly important in sensitive decisions involving personnel, athlete welfare, or resource allocation.

The findings concerning infrastructure and accessibility showed that technological resources made a significant but comparatively smaller independent contribution to decision-making effectiveness. This result suggests that infrastructure is a necessary foundation but not a sufficient condition. Hardware, software, databases, and digital networks enable artificial intelligence applications, but their value depends on data quality, managerial use, and organizational integration. Yusriadi and colleagues showed that the implementation of artificial intelligence requires institutional coordination, policy support, and alignment between technological systems and administrative needs [16]. Swanson and colleagues similarly demonstrated that artificial intelligence-enabled surveillance can support sports security management, but its effectiveness depends on integration with managerial protocols and response systems [12]. Thus, sports organizations should avoid assuming that the purchase of advanced technologies will independently improve decisions. Infrastructure must be connected to appropriate processes, competencies, and governance arrangements.

Overall, the findings confirm that artificial intelligence can substantially improve managerial decision-making in sports organizations when it is implemented as an integrated organizational capability. Its greatest advantages appear in forecasting, information accuracy, decision quality, and operational responsiveness. However, the weaker effect on transparency indicates that ethical governance, explainability, and communication remain important challenges. The results support a human-centered model in which artificial intelligence provides analytical speed and predictive power, while managers provide contextual interpretation, ethical judgment, and accountability. This combined approach is particularly appropriate for sports organizations because their decisions involve both measurable performance outcomes and complex human relationships.

The present study had several limitations. The use of a cross-sectional design limited the possibility of determining causal relationships or examining how the effects of artificial intelligence develop over time. The data were collected through self-report questionnaires, which may have been affected by social desirability, subjective perceptions, or respondents' differing interpretations of artificial intelligence. The sample was restricted to sports organizations located in Tehran, and therefore the findings may not be fully generalizable to sports organizations in other provinces or to smaller institutions with different technological and financial conditions. The study also examined artificial intelligence at the organizational level and did not distinguish among specific technologies, software platforms, or decision-support applications.

Moreover, some organizations may have reported moderate artificial intelligence use even when their systems were limited to conventional analytics or automation rather than advanced machine learning. Finally, the study did not examine potential negative outcomes such as algorithmic bias, employee resistance, excessive surveillance, privacy concerns, or overdependence on automated recommendations.

Future studies should use longitudinal and experimental designs to examine how artificial intelligence adoption changes managerial decision-making over time and whether improvements are sustained after implementation. Comparative research across provinces, organizational levels, sports federations, clubs, public institutions, and private sport enterprises would provide a more comprehensive understanding of contextual differences. Qualitative interviews with managers, coaches, employees, and technology specialists could clarify how artificial intelligence recommendations are interpreted and how conflicts between algorithmic outputs and human judgment are resolved. Future research should also distinguish among predictive analytics, generative artificial intelligence, agentic systems, human resource algorithms, and security applications. The mediating roles of data quality, digital literacy, organizational learning, trust, and managerial competence should be examined, as should the moderating effects of organizational size, leadership style, technological readiness, and ethical governance. Additional studies could evaluate adverse outcomes, including bias, loss of autonomy, privacy violations, resistance to change, and the psychological consequences of algorithmic monitoring.

Sports organizations should develop a structured strategy for integrating artificial intelligence into managerial decision-making rather than adopting isolated tools without clear objectives. Managers should first identify decision areas in which artificial intelligence can produce measurable value, such as forecasting, budgeting, performance monitoring, human resource planning, event management, and risk assessment. Organizations should invest in reliable data infrastructure, standardized data collection, and interoperable information systems. Training programs should improve managers' digital literacy, analytical interpretation, and ability to critically evaluate algorithmic recommendations. Clear governance policies should define responsibility for artificial intelligence-supported decisions, protect privacy, prevent discrimination, and require human review in high-impact cases. Organizations should also select explainable systems and document the data, assumptions, and reasoning underlying important recommendations. Pilot projects should be evaluated before large-scale implementation, and feedback from employees and stakeholders should be incorporated into system design. Most importantly, artificial intelligence should be used to augment managerial expertise and not to remove human accountability from strategic, ethical, or personnel-related decisions.

Authors' Contributions

Authors equally contributed to this article.

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All procedures performed in this study were under the ethical standards.

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