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A Financial Management Maturity Model in Sports Organizations: A Novel Approach Using Artificial Intelligence

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ABSTRACT

This paper deals with the development of a financial management maturity model for sports organizations based on artificial intelligence. We jointly consider enhancing financial transparency, oversight and control, risk management, and using advanced technologies in sports organizations. The proposed scheme relies on a constructivist grounded theory approach. The research process involved data collection through in-depth interviews with five AI language models, ChatGPT, Claude, Google Gemini, Mistral, and LLaMA. In addition, these models were utilized as an alternative to traditional experts. Finally, extensive simulations were conducted to validate that 209 initial codes were identified, which were then refined to 44 codes and eventually consolidated into 11 key themes. These themes include financial transparency, oversight and control, budget planning, risk management, and the use of advanced technologies. Numerical results show the efficiency that these themes are interlinked in a chain-like manner and contribute to enhancing the financial efficiency of sports organizations.

Introduction

Artificial intelligence has rapidly become one of the main drivers of innovation in the modern world, bringing about extensive transformations in numerous fields, from industry to art (Adigwe et al., 2024). This technology is not limited to performing technical and computational tasks, but has also been able to help humans discover new ideas in creative and complex areas (Rehan, 2024). These AI capabilities, especially in areas related to content creation and creativity, have created opportunities to facilitate and accelerate writing and thinking processes (Grilli & Pedota, 2024). Now on the verge of using these technologies to improve traditional methods and offer innovative solutions (Zhou & Lee, 2024).

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Models of artificial intelligence language as powerful and alternative tools for experts in various fields have had a significant impact on management processes and decision-making (Algherairy & Ahmed, 2025). Their capabilities in data analysis, understanding complex texts, and providing accurate responses have made them a key tool in optimizing organizational performance (Zhang et al., 2025). From providing precise financial insights (Shemetev & Pelucha, 2022) to forecasting outcomes (Akhtar & Moridpour, 2021) and future behaviors (Melina et al., 2024), these models enable timely and intelligent decision-making. In modern organizations, especially in complex areas such as management and planning, the role of these technologies has become increasingly prominent, replacing traditional processes with innovative and effective approaches (Wang et al., 2024b).

Artificial intelligence language models are complex algorithms that can understand, generate, and interact with human language in a normal and fluent way by analyzing and processing vast amounts of textual data (Cong, 2025).Using deep learning methods and artificial neural networks, these models can learn from billions of sentences and phrases (Algherairy & Ahmed, 2025)and generate texts that are structurally and semantically similar to human-produced texts (Jia et al., 2024). One prominent feature of these models is their ability to interpret and generate complex texts, translate languages, summarize content, and even engage in conversations with humans (Husein, Aburajouh, & Catal, 2024).

Language models such as ChatGPT, Gemini, Claude, Mistral, GenAI, and Yi have achieved a special place in artificial intelligence and natural language processing with advancements in accuracy and understanding of human language, and each excels and is popular in specific areas (Amoz, 2024). Overall, AI language models are designed to understand, generate, and analyze human language by leveraging vast data and advanced deep learning techniques, playing a pivotal role in many research processes and industrial applications (Young et al., 2024). By continuously increasing their capacity and the number of parameters, these models have improved their accuracy and ability to comprehend texts, enabling them to answer complex questions and perform in-depth content analysis (Kirk et al., 2024). Consequently, they have become a powerful tool for managers and researchers, providing quick access to vast textual data and facilitating insightful and meaningful analyses (Cong, 2025)

In recent years, we have seen an increase in the use of artificial intelligence-based models for optimizing business strategies, improving financial performance in the sports industry, and financial management plays a vital role in any organization., but in sports organizations, this importance is doubly evident. Due to the complex nature of their operations, these entities require meticulous financial management to function competitively and secure their survival (Simion, 2022). From professional clubs to sports federations, they all rely on efficient financial management for budgeting, financial planning, and cost control. Given this critical need, the adoption of modern methods and the optimization of financial processes are of particular importance to enable sports organizations to successfully achieve their sports and business objectives (Pavlík & Vaceková, 2013).

Financial management in sports organizations is recognized as one of the most important pillars of success. Sports organizations, especially professional clubs, are usually faced with limited financial resources and unlimited needs (Tabuk, 2024). Financial management not only helps with optimal budget allocation but also enables organizations to make smart investments and avoid potential financial crises. Overall, good financial management allows these organizations to have sustained long-term performance while also achieving their sporting goals. It gives sports managers the opportunity to make more strategic and purposeful decisions to improve the organizations efficiency and productivity (Dastoom, ramzani nezhad, & sadeghi borujerdi, 2023).

Despite the utmost importance of financial management, this area in sports organizations faces its own unique challenges. One of the biggest challenges is the unpredictability of revenues and budgetary fluctuations due to various factors such as sporting results, sponsorships, and ticket sales (Razawi & Freydoni, 2023). In addition, unexpected costs arising from equipment maintenance, player salaries, and the need for new investments can put a strain on the budget. Furthermore, inefficient financial management can lead to bankruptcy and loss of competitiveness (Kamyab, Soltanhoseini, & Rahimi Sereshbaderani, 2023). Therefore, finding innovative and efficient

solutions in this area is essential for sports organizations to successfully navigate their financial challenges.

Sports organizations, especially at the professional and semi-professional levels, face numerous financial challenges such as lack of transparency in budgeting, inability to accurately predict costs and profits, and inefficient use of financial resources (Rezasoltani et al., 2024). In many of these organizations, old and manual systems are used for financial management, which are not only time-consuming but also prone to human errors and serious flaws in data analysis. Moreover, these methods often rely on decision-making based on limited and incomplete data, resulting in inadequate and inappropriate financial strategies.

It seems that current financial management methods in organizations are unable to effectively utilize the vast amount of data and provide superficial analysis. This leads to challenges such as market changes and cash flow forecasting (Tabuk, 2024). Therefore, there is a need for new approaches based on advanced technologies such as artificial intelligence and large language models to enhance financial management.

The maturity model is a structured framework that helps organizations assess their management processes at various stages of development and improvement. Additionally, maturity models can be used for descriptive, prescriptive, and comparative purposes, enabling organizations to understand their level of performance and how they can improve (Kucińska-Landwójtowicz et al., 2024). In the financial domain, the maturity model assists organizations in identifying weaknesses in financial resource management, budgeting, revenue and expense forecasting, and data analysis, and developing improvement plans for each of these stages. These models also enable decision-makers to optimize their financial processes using more advanced tools and methods, such as artificial intelligence and data mining (Rahmani et al., 2022).

It can be stated that sports organizations desperately need a maturity model due to the complexity and vastness of their financial activities. These organizations, especially at the professional levels, deal with a high volume of financial transactions, which are very challenging to manage without a structured framework (Ghafouri et al., 2021). The maturity model seems to help them improve their financial performance over time, make more strategic financial decisions, and predict and manage financial trends using more precise data and analysis. Moreover, these models likely enable organizations to learn from past mistakes and strive for increased transparency, efficiency, and profitability by continuously evaluating their financial processes.

Research shows that financial management in sports organizations has always faced challenges such as budgeting, cost control, and resource allocation. Studies such as Becker, Solberg and Heyerdahl (2023) indicate that the complex financial structure of these organizations, along with inaccurate predictions and unexpected costs, especially for smaller teams, lead to serious problems; in addition, studies by Goudarzi (2017) with the aim of designing and explaining an applicable financial management pattern in sports federations and Ghafouri et al. (2021) with the aim of identifying financial supply barriers in professional sports in Iran, emphasize the inefficiency of traditional financial management methods and believe that these methods are based on limited and superficial analyses. And also in continuation of previous studies, reference can be made to maturity models such as the financial maturity model available to individuals and organizations, helping management teams evaluate where their financial organization stands and where they should focus, as well as the financial reporting maturity model provided for organizations in control and financial planning and analysis to introduce simple internal financial reporting approaches that reduce risk and improve performance (Jalilvand & Moorthy, 2024).

Review of previous studies in the field of financial management of sports organizations shows that research has mainly focused on traditional methods such as budgeting and cost control, despite the emphasis on the importance of new technologies such as artificial intelligence. These studies have mostly focused on data analysis and error reduction. However, there is a significant gap in the research literature that has overlooked the use of large language models to develop a mature financial management model in these organizations. These technologies, which have been well utilized in other areas, can help bring about fundamental changes in the financial management of

sports organizations. Although the use of large language models of artificial intelligence as a new tool for financial analysis has not yet been widely explored. This research, as a scientific innovation, seeks to.

One of the fundamental problems of sports organizations is to address and improve traditional financial management systems, and it seems that large language models of artificial intelligence can play a significant role in improving the financial maturity of sports organizations. Therefore, it has been decided to use large language models of artificial intelligence to design and implement a financial management maturity model in sports organizations. In this method, instead of traditional interviews, questions related to the research are asked from these language models and the results will be used to develop the model. This novel approach, using the power of artificial intelligence, enables more accurate and efficient analysis of financial processes. Thus, this research can contribute to the advancement of theoretical foundations in financial maturity and serve as a reference for future research. Its ultimate goal is to present a comprehensive and innovative model for financial management maturity in sports organizations based on large language models of artificial intelligence, which can evaluate financial processes and improve efficiency.

Methodology

This study is a qualitative research that aims to explore and develop a financial management maturity model in sports organizations. The research is exploratory and fundamental in nature and uses an inductive approach to discover new insights. This study falls within the interpretivist paradigm and employs a grounded theory strategy with a constructivist approach as proposed by Charmaz (2014). The aim of this research is to explain and model the complexities of financial management maturity in sports organizations, and in this process, the perspectives of advanced artificial intelligence models were utilized.

One of the distinctive features of this study is its reliance on interviews with AI language models instead of using traditional experts and specialists. Data were collected through in-depth interviews with five AI language models that support the Persian language, including ChatGPT, Claude, Google Gemini, Mistral, and LLaMA. This approach is feasible due to the ability of these models to analyze and interpret large volumes of data and generate human-like texts (AlZu'bi et al., 2024).

The data for this study was collected through purposive sampling, and language models capable of understanding and generating precise responses in Persian were utilized. The ChatGPT, Claude, Google Gemini, and also Mistral and LLaMA models, specifically designed for complex pattern analysis, text generation, and providing insights based on large-scale linguistic data, were employed in these interviews.

The five language models used in this study are among the best artificial bits of intelligence available (Guangyu, 2024). The researcher could use other language models such as O1 if the data was not theoretically saturated. It should be noted that these interviews were conducted in September 2024 using the language models mentioned, and in order to use artificial intelligence as the interviewee, questions should be designed in a way that includes features such as a clear definition of the subject, specific and precise questions, use of simple language, division of questions into smaller sections, mentioning background and relevant data, ability to provide feedback and amend questions (Uparkar, 2024).

The questions are designed in line with the research objectives and focus on the financial complexities in sports organizations. Some of the questions include: What is the concept of financial maturity in sports organizations and what areas does it cover? What key factors influence financial maturity in sports organizations? Structural differences in sports organizations have what impact on financial management maturity? How can advanced artificial intelligence technologies help enhance the financial management model in sports organizations? What are the potential challenges and obstacles in implementing financial management in sports organizations? How can the results of these models be used to optimize financial processes and decision-making in sports organizations? Table 1 shows part of the response to a common question in these linguistic models.

Interviews with these five language models continued until theoretical saturation was reached. Data analysis was conducted using the constructivist grounded theory approach, according to Charmaz (2014), which includes four key processes: initial coding, focused coding, axial coding, and theoretical coding (Mulugeta et al., 2017).

Throughout the data collection and analysis process, a constant comparative method was employed. This iterative technique involves the constant comparison of data and codes at each stage of the analytical process, which are gradually refined as concepts are updated and new theories emerge (Chun Tie, Birks, & Francis, 2019). The grounded theory approach is particularly suitable for studies that aim to build new frameworks or models due to its flexible and open process (Mulugeta et al., 2017).

As part of the analysis, the research team engaged in writing reflective notes and contemplated the ongoing development of categories and concepts, as well as making connections between different data points. This reflective process helped clarify the theoretical foundations of the financial maturity model and ensured that the research remained consistently data-driven. Furthermore, by triangulating data from multiple artificial intelligence models, the study was able to provide a more comprehensive understanding of the financial maturity framework, as the diverse perspectives offered by the AI models enriched the final conceptualization. It should be noted that all relevant ethical protocols were followed throughout the study, and the research ethics code IR.IAU.KHUISF.REC.1403.334 was approved. To ensure compliance with necessary ethical codes and data management guidelines. Given the innovative use of artificial intelligence models as primary data sources, the research group ensured that the outputs of artificial intelligence are mutually reviewed and aligned with real financial methods.

Table 1. AI Language Models Response to a Common Question

Linguistic model	Question: How can advanced AI technologies enhance the financial management maturity model in sports organizations?
Chat GPT	Artificial intelligence can significantly enhance financial maturity by improving the accuracy of predictions and enabling more precise risk assessments. This technology can integrate up-to-date financial data, analyze market trends, and provide actionable insights that traditional systems often overlook. By predicting cash flow fluctuations and optimizing budget allocation, AI helps sports organizations make data-driven financial decisions that reduce risks and improve resource allocation.
Claude	The impact of AI technologies is quite significant. By utilizing predictive analytics and machine learning, sports organizations can go beyond basic financial management and enter an era of proactive budgeting. AI can identify hidden patterns in historical financial data and predict market shifts, enabling dynamic and adaptable financial planning.
Google Gemini	Artificial intelligence can optimize financial operations by providing automated financial reporting and instant auditing tools. These capabilities allow organizations to maintain financial transparency while optimizing their cost structures. The financial maturity model benefits from AI capabilities in continuous learning from new data and adjusting strategies accordingly.
Mistral	Artificial intelligence enhances financial maturity by improving scenario planning. This technology can simulate various financial scenarios and consider external factors such as market fluctuations or economic downturns. This helps organizations make more informed financial decisions and mitigate risks more effectively.
LLaMA	The use of artificial intelligence enables sports organizations to enhance their financial forecasting and investment planning. By leveraging extensive data analysis, AI can help predict long-term financial health and ensure that resources are allocated optimally to areas with the highest return on investment. AI-driven insights also contribute to the financial sustainability and continued growth of the organizations.

To increase the credibility of the findings, the research followed Anney (2014) criteria for qualitative research, emphasizing credibility, dependability, confirmability, and transferability. Various methods were employed to ensure data reliability and robustness of results, including:

1. Writing reflective notes that helped reduce potential biases in the process of interpreting the data.

2. Analytical diagramming, which visually demonstrated the relationships between concepts and categories as they emerged.

3. Triangulation with expert opinions, which involved comparing AI-generated insights with real-world sports organization financial management scenarios to ensure the model remained practicable and grounded in operational realities.

4. Consulting with financial managers and analysts in the sports industry, which was more about confirming the insights generated by AI models.

Furthermore, to ensure its reliability, solutions such as deep interviews with artificial intelligence language models, seeking opinions on data extracted from sports experts, auditors, and accountants of sports organizations, and analyzing texts in the field of financial management were used to increase the diversity of data sources to help enhance validity, and for the validation of the research, after encoding the data by three experts, the inter-coder agreement method was used. The results showed that the Cohens Kappa reliability coefficient between evaluators and the researcher in the interviews was 0.8, indicating 82% to 100% credibility of the qualitative analysis.

All relevant ethical protocols were observed during the study to ensure compliance with the requisite ethical codes and data management guidelines. Given the innovative use of AI models as primary data sources, the research team ensured that AI outputs were cross-examined and aligned with actual financial practices.

Results

In this study, the analysis of the interviews was performed using the constructivist approach of Grounded Theory. An example of the data analysis method is presented in Table 2.

Table 2. Coding in the Structuralist Approach

The text of the interview	Initial Encoding	Centralized Encoding	Axial Coding
One of our main challenges is that " budgeting is not done accurately and logically. Sometimes due to the lack of precise analysis, the budget is not allocated properly, and for this reason, we are forced to constantly change our financial plans. This reduces efficiency in financial ".decision-making	-Lack of accurate budget planning -Incorrect resource allocation -Constant change of financial plans -Reduced efficiency in financial decision-making	- Weakness in budget planning - Misallocation of financial resources - Impact of inefficient planning on financial decision-making	- Budget Planning
We are not managing cost " optimization well. A lot of financial resources are being consumed ineffectively and there are still preventable extra costs. I think we need to create a better system for cost management and financial resource optimization to avoid wasting ".resources	- Inefficient cost optimization - Ineffective resource consumption - Extra costs - Need for a cost management system and resource optimization	- Inefficient resource consumption - Existence of unnecessary costs - Need for a cost optimization system	- Cost Management and Resource Optimization

Based on the nonlinear nature of qualitative research, the coding process was repeated several times, and eventually, comprehensive and complete categories and themes were developed. Out of about 250 transcribed sentences from the interviews, after removing duplicates and irrelevant ones, about 209 initial codes were identified and marked by the researcher. Then, in focused coding, 44 codes were obtained, and finally, 11 axial codes were presented. The financial management maturity model in sports organizations has 11 specific axes, the formation of which is presented in Table 3. In this table, some open, focused, and axial codes related to the financial management maturity model in sports organizations based on AI language models are presented.

Table 3. Coding and formation of main axes

AI Language Model	Initial coding	Focused coding	Axial coding
ChatGPT Claude Mistral	-Transparent monthly reports - Online financial information - Accounting errors - Monitoring of misreporting - Accurate periodic financial reports - Digital access to financial information - Financial errors in auditing	-Improving reporting and access to financial information	Financial transparency
GPT-4 Claude LLaMA	- Periodic inspections - Financial transaction tracking - Financial checklists	-Advanced data analysis for predicting trends and identifying opportunities	
GPT-4 Claude	- Transparent reports between departments - Accurate information on budgets	-Improved financial interactions and communications	
GPT-4	- Accurate accounting software - Use of online monitoring panels	- Advanced monitoring tools	Financial monitoring and control
Claude GPT-4	- Daily performance reports - Audit reports - Analysis of the organizations financial performance	- Accurate financial performance reports	
GPT-4 Mistral	- Precise cost tracking - Financial balance sheets - Cash flow analysis	- Management of financial inflows and outflows	
ChatGPT LLaMA	- Optimized budgeting - Analysis of financial needs - Resource allocation with prioritization	- Efficient budget allocation	Budget planning
ChatGPT Mistral	- Revenue forecasting - Cost estimation - Potential budget variations	- Continuous budget evaluation and review	
GPT-4 Claude Google Gemini	- Project budget allocation - Consumption analysis - Tracking of project financial progress	- Budget management in projects	
GPT-4 Claude	- Analysis of fixed and variable costs - Management of unpredictable costs	- Control of anticipated costs	
ChatGPT Claude Mistral	- Analysis of annual revenue - Analysis of monthly costs - Analysis of revenue fluctuations Review of annual revenues Evaluation of periodic costs Examination of revenue	- Identification and analysis of financial patterns and trends	Financial data analysis

	changes		
GPT-4 Google Gemini	- Data mining algorithms - Financial modeling - Pattern analysis	- Use of data mining techniques	
Claude ChatGPT LLaMA	- Analysis of balance sheets - Analysis of profit and loss statements - Cash flow analysis	- Integrated analysis of financial statements	
GPT-4 Claude Google Gemini	- Risk analysis - Detection of market fluctuations - Assessment of potential crises	- Identification of financial risks	Financial risk management
GPT-4 Gemini LLaMA	- Formulation of countermeasures - Financial insurance programs - Analysis of high-risk investments	- Development of risk reduction strategies	
ChatGPT Claude	- Prediction of critical events - Assessment of diverse revenue scenarios - Measurement of the impacts of financial crises Forecasting of financial emergency conditions -Analysis of potential revenue scenarios	- Simulation and evaluation of various financial scenarios	
Claude GPT-4	- Monthly financial reporting - More thorough analysis of accounting systems - Implementation of accounting software	- Improvement of reporting systems	Accounting and reporting systems
GPT-4 Mistral	- Adoption of international methods - New reporting standards	- Standardization of accounting methods	
ChatGPT LLaMA	- Linking accounting systems with financial management systems - Consolidation of reporting systems	- Integration of reporting systems	
ChatGPT	- Management of inflows and outflows - Analysis of cash cycles - Forecasting of future financial flows	- Cash flow control	Cash flow and liquidity management
GPT-4 Claude Google Gemini	- Management of excess liquidity - Prediction of cash shortages - Planning for liquidity provision	- Cash optimization	
GPT-4 Claude	- Analysis of additional costs - Minimization of operational costs - Optimization of unnecessary expenses	- Identification of cost patterns	Cost management and resource optimization
ChatGPT	- Optimization of existing	- Expansion of sustainable	

Claude Mistral	resources - Proper management of human and financial resource allocation	resource approaches	
GPT-4	- Analysis of potential markets - Examination of lower-risk financial investments	- Identification of investment opportunities	Investment and financial resource acquisition
Claude ChatGPT Google Gemini	- Identification of financial supporters - Analysis of financing opportunities - Attraction of resources through investment	- Provision of new financial resources	
ChatGPT Mistral LLaMA	- Use of AI in financial analysis - Deployment of new software for financial data analysis - Utilization of AI algorithms for financial analysis - Employment of advanced systems for financial data analysis - Implementation of automated tools for financial analysis	- Creation of a technological ecosystem	Adoption of advanced technologies
GPT-4 Claude LLaMA	- Automated financial analysis - Intelligent reporting systems - Cost optimization through financial data analysis	- Optimization of financial processes and alignment with the market	
ChatGPT Claude Google Gemini	- Analysis of long-term costs of player contracts - Management of revenues from sponsorships and advertising - Budget planning for international competitions and events	- Financial approach in professional sports	Differences in financial approaches based on the type of sports organization
GPT-4 Claude	- Analysis of high costs in elite sports - Management of large financial resources	- Financial approach in elite sports	
ChatGPT Google Gemini	- General budgeting - Analysis of infrastructure costs - Public participation in budgeting	- Financial approach in mass sports	
GPT-4 Claude LLaMA	- Analysis of educational costs - Investment in educational infrastructure	- Financial approach in educational sports	

After examining the categories related to the financial management maturity model in sports organizations, 11 main axes were identified. The axes are chain-like and interconnected, and each axis strengthens the others. Financial transparency, as the first step, creates a platform for all

financial information to be accurately and regularly recorded and reported. Then, financial supervision and control enable the organization to manage this information and ensure its accuracy. Budget planning helps organizations allocate their resources strategically, and financial data analysis evaluates the results of this budgeting. Financial risk management, as a vital element, identifies and manages potential risks. Accounting and reporting systems accurately and standardly record information, optimizing cash flow and cash flow management. Alongside, cost management and resource optimization reduce unnecessary costs and increase efficiency, while investment and financing enable the organization to acquire new financial resources and use them effectively. Advanced technologies such as artificial intelligence and large language models contribute to more accurate data analysis, better predictions, and intelligent financial decision-making. Finally, the difference in financial approaches depending on the type of sport (educational, public, championship, and professional) allows organizations to adjust and optimize their financial maturity model according to their specific activities and goals. Figure 1 illustrates the financial management maturity model in sports organizations, based on AI language models.

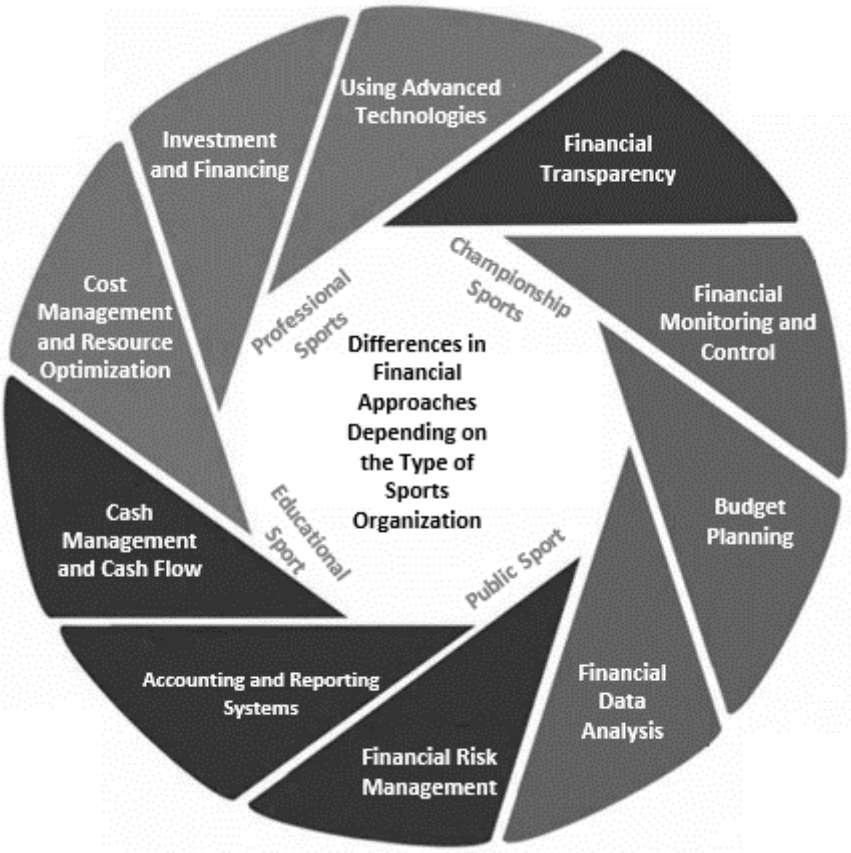

Figure 1. Financial Management Maturity Model in Sports Organizations, Based on Artificial Intelligence Language Models

Discussion and Conclusion

Financial management in sports organizations is one of the fundamental challenges to maintaining sustainability and long-term growth. Due to financial fluctuations and limited resources, sports organizations require efficient and up-to-date models for their financial management. Utilizing advanced technologies, especially artificial intelligence and large language models, can significantly improve transparency, accuracy in budget planning, and financial risk management. This research aims to design and implement a financial management maturity model, relying on AI data analysis, to effectively address the financial challenges faced by sports organizations.

After examining and analyzing the collected data, 11 main axes were identified in the financial management maturity model in sports organizations, each of which directly or indirectly affects the financial performance of sports organizations. These axes, including financial transparency, supervision and control, budget planning, risk management, and the use of advanced technology, are interrelated and help improve financial processes and increase the efficiency and productivity of organizations. In the following, the analysis and explanation of these axes and providing operational suggestions will be discussed.

Financial transparency, as a fundamental step in any financial management model, provides the necessary conditions for collecting and analyzing financial information Zhang et al. (2025) and helps increase stakeholders trust and reduce financial corruption in sports organizations. However, the main challenge for many of these organizations is the lack of transparency in financial reporting, which can lead to improper decision-making. Financial transparency helps prevent errors and corruption and facilitates improving financial performance. Therefore, it is recommended that managers and officials of sports organizations consider financial transparency as a key factor in their strategic decision-making by grading the maturity level of financial transparency to achieve an optimal level of transparency (Goudarzi, 2017).

Improving financial supervision and control, implementing advanced accounting software, and holding training courses for financial staff help strengthen supervisory and auditing skills. AlZu'bi et al. (2024) also emphasize that effective and preventive supervision can prevent financial crises. Additionally, establishing accurate and regular financial reporting systems, along with conducting internal and external review processes, is essential to ensure the accuracy and transparency of financial information. Financial supervision and control have a direct relationship with transparency and help organizations confirm the accuracy of data and identify irregularities. Without an efficient supervisory system, financial information may be misinterpreted and lead to incorrect decision-making. In this regard, it is recommended that sports organization managers evaluate the maturity level in financial reporting and fully integrate financial controls, delve into advanced data analysis, and achieve an optimal level of supervision.

Budget planning helps organizations optimize their financial resource allocation and prevent resource wastage. Precise financial planning can reduce unnecessary costs and improve financial efficiency. In sports organizations, which often face resource constraints, proper budget management can be a key to long-term survival and success. Utilizing advanced technologies, including artificial intelligence, can enhance budget prediction accuracy and optimize resource allocation (Wang et al., 2024a). It is recommended that organizations employ sophisticated tools for financial forecasting to enable more accurate allocation of their financial resources. Additionally, formulating long-term financial policies that allow for adjustments during critical situations can improve budget planning.

Budget planning helps organizations allocate their financial resources efficiently and prevent waste. In sports organizations facing resource constraints, proper budget management is essential for long-term survival and success. The use of new technologies, including artificial intelligence, can help with more accurate budget forecasting and optimal resource allocation(Wang et al., 2024a). It is recommended that sports organization managers first assess maturity in budget planning and use advanced tools for financial forecasts to allocate their financial resources more accurately. By developing long-term financial policies that allow for adjustments in crisis situations, they can achieve an optimal level of budget planning.

Analysis of financial data allows organizations to evaluate their financial performance in different periods and identify shortcomings. Based on accurate and up-to-date data, these analyses can predict financial trends effectively, and data analysis technologies and artificial intelligence software can also help in making better decisions. According toZhou and Lee (2024), the use of big data analysis and advanced artificial intelligence algorithms provides a deeper understanding of financial patterns. To improve these analyses, it is recommended that organizations systematically collect data and utilize advanced analysis techniques by assessing their maturity in financial data

analysis. Additionally, establishing specialized teams in this field can increase the accuracy of analyses and the quality of financial decision-making.

Financial risk management is one of the key factors in preventing financial crises, especially for sports organizations that rely on limited financial resources and income fluctuations. A comprehensive risk management program should include identifying and assessing potential risks and developing strategies to mitigate them. To improve risk management, it is recommended that organization managers use scenario analysis and simulation tools to identify and manage financial risks and advance to a more advanced level. In addition, developing financial insurance plans and creating emergency funds can help reduce the negative effects of financial crises (Rahmani et al., 2022).

Accounting and reporting systems help organizations manage their financial flows in a standardized manner. These systems should be able to integrate with other financial systems and produce accurate and reliable reports. It is recommended that financial managers in sports organizations use advanced and integrated accounting software to achieve excellence and innovation in accounting. Regular review of these systems is also recommended to improve their performance (Goudarzi, 2017).

Cash management allows organizations to accurately control their cash inflows and outflows and prevent cash shortages. Sports organizations, especially during periods of fluctuating revenues, face challenges in this area. To improve cash management, it is recommended that sports organization officials use detailed financial plans and cash forecasting tools to prevent cash shortages and achieve excellence in cash management. Additionally, creating a cash reserve program can help improve cash management (Tabuk, 2024).

Cost management and resource optimization help reduce unnecessary costs and optimize the use of financial and human resources. Sports organizations can increase their productivity by accurately analyzing their costs and identifying unnecessary expenses. It is recommended that organizations use cost analysis techniques and implement resource optimization programs. In addition, the use of new technologies is advised to reduce operational costs and increase productivity.

Cost management and resource optimization help organizations reduce unnecessary costs and use financial and human resources more effectively. Sports organizations can increase their efficiency by analyzing costs and identifying additional expenses. In order to achieve innovative cost management, it is recommended that organizations use cost analysis techniques and sustainable approaches by assessing their maturity level in this area. Additionally, leveraging new technologies to reduce operational costs and increase efficiency is advised.

Investment and financial resources are one of the key ways for the growth and development of sports organizations. Organizations must be able to identify suitable investment opportunities and attract new financial resources. Therefore, sports managers should first assess the maturity level in investment and financial resources of their organization in this area, evaluate the organizations situation by regularly examining investment opportunities and attracting investors and financial supporters, increase their financial resources, and reach a sustainable investment level. In addition, developing financial strategies through various methods such as holding events, sponsorships, and long-term investments can be effective.

Advanced technologies, such as artificial intelligence and big data analysis, play an important role in improving the financial processes of sports organizations. These technologies help organizations to analyze their financial data more accurately and make better decisions. As Zhang et al. (2025))Zhang et al., 2025(have shown, the use of innovative technologies in data analysis can lead to better decision-making and more accurate predictions. In addition, it is recommended that managers of sports organizations assess and evaluate the organizations maturity level in advanced technologies, and optimize their financial processes in this area using artificial intelligence software and big data analysis tools. Furthermore, training employees in the use of advanced technologies can help improve the financial performance of organizations.

One of the key points in the financial management maturity model is the difference in financial approaches depending on the type of sport and organizations related to it. Sports are divided into various levels such as educational, recreational, championship, and professional sports, each level having its own specific financial needs and structures. This maturity model should be adjusted in a way that clearly addresses the specific financial conditions of each level of sports. For example, organizations related to recreational sports such as municipal sports organizations or recreational federations, face different financial challenges and needs compared to championship or professional sports. These differences should be taken into account in financial planning and strategies.

In championship and professional sports, organizations such as federations, national Olympic committees, and sports clubs need more advanced and complex financial models. These organizations have more financial resources and need to pay more attention to budget planning, risk management, and the use of advanced technologies in order to succeed in the competitive environment of professional and championship sports. Similarly, in educational sports, organizations such as the health deputy of the Ministry of Education or the Physical Education Department of the Ministry of Science should have different financial strategies that focus on the education and development of youth and utilize financial resources in a different way.

Therefore, the main goal of this model is to show that financial management maturity in organizations related to various sports varies depending on the type and level of sports. Financial maturity in organizations related to educational, amateur, professional, and championship sports should be regulated and formulated according to the nature and goals of each of these levels. It is recommended that sports organizations formulate specific and appropriate financial strategies based on their level of activity, and specific financial policies should be employed at each level to improve performance and attract resources. Additionally, the use of technology-based models can help optimize financial resources and increase efficiency at each of these levels.

The financial management maturity model in sports organizations provides a comprehensive framework for improving financial processes. This model, focusing on financial transparency, monitoring and control, budget planning, risk management, and leveraging advanced technologies, helps organizations manage their financial resources optimally and prevent financial crises. The use of this model in various sports organizations, including educational, amateur, championship, and professional sports, can help adapt and improve financial strategies based on the specific needs of each sector. Additionally, by considering the financial differences between organizations related to different sports, this model facilitates optimization of financial processes based on the nature and level of each sport. Sports organizations implementing this model can create greater financial transparency and benefit from the advantages of better investment and financial support. This model not only helps improve financial efficiency, but also by determining the maturity of each financial area of sports organizations, it contributes to long-term financial sustainability and growth.

This research faced limitations such as lack of access to complete financial data of some sports organizations and differences in data sources. These factors may have affected the accuracy of some results. For future research, it is suggested that studies focus on long-term and real data from different sports organizations to provide a more accurate assessment of the models effects. Additionally, investigating the impact of new technologies such as artificial intelligence in financial management of sports organizations and adapting financial models to the specific needs of each type of sport can help improve this field. Furthermore, to assess the maturity of financial management in sports organizations, one can measure the financial processes of the organization by grading each of the components presented in this research.

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Author Contributions

All authors have contributed in conducting this research.

Conflicts of Interest

The authors declare no conflict of interest.

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