



# IT IN THE ENTREPRENEURSHIP MANAGEMENT OF SPORTS COMPETITIONS, SPORTS VENUES AND SAFETY MANAGEMENT OF THE OLYMPIC GAMES

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## Abstract:

Information technologies have become indispensable for any entrepreneur who wants to invest in the sports industry through sports competitions at the biggest global sports event, the Olympic Games. Wearable sensors and artificial intelligence cameras enable the collection of a wide range of data. The IT sector is responsible for efficiently managing the organization of sports competitions, contributing to global media presence, raising interest and popularity of sports, and achieving record profits. Entrepreneurship and sports competition management involve the organization with the initiation of new profit realization, focused on novelties in the form of innovations, the satisfaction of both participants and the audience itself, and raising the brand and media visibility. The aim of the research is to show the connection between IT and the sports industry, and the impact of new technologies on the development of sports. In the paper, we used descriptive methodology to compare the development of sports and their benefits.

IT facilitates obtaining data on budgets, and infrastructure, which includes sports venues as supporting facilities, organization of sports competitions, transport, and logistics. Investing in sports venues at the Summer Olympic Games represents a long-term solution for sports development in the host cities if they are strategically planned and made with multi-functionality, long-term sustainability, and financial profitability. The impact of entrepreneurship in sports can best be seen in the investment in sports venues, although there is a danger that the investment in sports venues will not pay off after the sports competitions are over.

## Keywords:

IT, Sports Competitions, Sports Venues, Sports Management, Entrepreneurship in Sports.

## INTRODUCTION

Information technologies have become an indispensable part of any entrepreneur who wants to invest in the sports industry through sports competitions at the mega global sports event - the Olympic Games. The computer and the software it runs are essential elements of the modern societal paradigm and key to success for contemporary sports managers. [1] IT is necessary for the successful and facilitated organization of sports competitions for data analytics because it processes and collects large amounts of data, from logistics and transport, through sports performance,

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consumer needs, global market trends, and other supporting segments. Thanks to IT analyses, every entrepreneur in sports can get information that helps make strategic planning and marketing decision, whether it's about investing, developing a new product, or how to sell products and services. IT is essential for digital marketing, with an impact on public opinion. The average consumer receives daily information on sports topics and products that interest them through their mobile phone, social networks or email. Global sponsors have realized a long time ago that two-thirds of sponsorships are aimed at sports competitions precisely because of their popularity, the adrenaline that sports bring, and audiences, so they focused their financial investment on global sports competitions, such as the Olympic Games.

Recent research emphasizes that information technologies play a crucial role in transforming sports management by enabling data-driven decision-making, improving operational efficiency, and enhancing the overall experience of both participants and spectators. The integration of big data analytics, artificial intelligence, and digital communication platforms has significantly reshaped how sports events are organized and managed [2]. Furthermore, the increasing complexity of mega-events such as the Olympic Games requires advanced technological systems to ensure effective coordination, risk management, and security [3].

## 2. METHODOLOGY

In this paper, the author conducted theoretical research, using descriptive methodology, as well as comparative methodology through various examples to present the research in the most useful way possible. The methodology of AI and entrepreneurship in sports management research is specific to the sports industry, whether it is about the sports competitions management, security, sports venues management or the Olympic Games.

### 2.1. HYPOTHESIS

This study assumes that a higher level of implementation of information technologies is positively associated with improved efficiency of sports event management, enhanced safety systems, and greater long-term sustainability of sports venues.

### 2.2. RESEARCH OBJECTIVES

The objectives of this paper relate to the role of the IT industry in the sports industry, through the impact it has on the organization of sports competitions, the security management of sports facilities, with the example of competitions at the Olympic Games.

## 3. IT IMPACTS IN SPORTS COMPETITIONS

Today, AI technology is practically applied in the most popular sports, such as: football, basketball, cricket, baseball, American football, etc. Artificial intelligence in sports can be used in performance analysis and predictive modeling when creating athlete training regimens and playing strategies. Wearable sensors and artificial intelligence cameras enable the collection of a wide range of data, which is then processed by ML-based systems to provide coaches with insightful data. It can also be used to recognize rival playing styles, understand their strengths and weaknesses, and improve, individual and group performance. The number of wearable devices in the sports business is growing because of the increasing demand for analyzing and tracking player data. This produces detailed data on the player's ability and performance characteristics, including heart rate, speed, and acceleration. Virtual assistants and chatbots are being introduced to allow a specific team to communicate with fans on various topics, informing fans about ticket status, check-in locations, parking, and schedules, chatbots also communicate with them. In addition, AI algorithms help virtual assistant referees to be faster and more accurate in spotting violations of the rules of the game. Furthermore, AI can be applied to automated sports writing and ticketing, which will undoubtedly contribute to the growth of the market soon. [4]

- Sponsors of the Olympic Games receive the highest visibility in the media, much higher than in other industries. The largest global brands, such as Coca-Cola and McDonald's, have been sponsors of the Olympic Games since 1928 and 1976, respectively. The role of IT has greatly contributed to this. The entrepreneurial management that runs these companies is aware of the impact that the Olympic Games have on the whole world, wanting to offer their products to them and thus make a profit.
- Organizing the biggest sports competitions in the 21st century is impossible without the IT sector. Any information or answers to questions that are not clear to us can be obtained in a few minutes.



IT is essential for sectors such as: Organization and administration of all aspects of the Olympic Games, starting with the application and registration of athletes, agenda - competition schedule, transport and logistics, accreditation, ticket sales for competitions, accommodation, and security.

- Marketing and media via platforms for media monitoring of competitions, promotion of sponsors, and content via mobile phones, social media, and websites can be followed by an unlimited number of people at any time.
- Communication between the management sector, sponsors, athletes, judges, and audience, where information is quickly exchanged, and problems are quickly resolved through IT.
- Security is impossible to imagine without the IT sector, starting with video surveillance, through facial recognition software that was used for the first time at the Olympic Games in Beijing in 2008, as well as artificial intelligence that is increasingly used today to detect potential threats and eliminate them in time. Security management at mega sporting events has become increasingly dependent on advanced IT systems, including surveillance technologies, biometric identification, and real-time data processing. These technologies enable faster detection of potential threats and more efficient emergency response strategies. Previous studies highlight that risk management and security planning are among the most critical aspects of organizing global sporting events, particularly in the context of terrorism and large-scale crowd management [5].
- Results tracking and analytics enable real-time tracking of results during the competition, providing the audience, coaches, athletes, and analysts with information during the competition.
- Environment, with the help of the IT sector, receives information about the consumption of resources, in the form of waste management that remains after the competition through recycling, electricity consumption that can be replaced by solar roofs, and technical water consumption that can be replaced by rainwater.

The role of the IT sector is crucial in all segments of the organization of sports competitions at the Olympic Games because it facilitates the work of administration, analytics, ecology, marketing, media, sales management,

and the audience. The IT sector is responsible for the efficient management of the organization of sports competitions, which contributed to global media presence, raising interest and popularity of sports, as well as achieving record profits.

#### 4. ENTREPRENEURSHIP MANAGEMENT IN SPORTS

Entrepreneurship and sports competition management involve the organization with the initiation of new profit realization, with a focus on novelties in the form of innovations, the satisfaction of both participants and the audience itself, and raising the brand and media visibility. Entrepreneurs in sports must be able to prepare, in cooperation with the state, to apply for the organization of the Summer Olympic Games with the help of information technologies, using the data analysis of the previously held Olympic Games. IT facilitates obtaining data on budgets, infrastructure that includes sports venues as well as supporting facilities, organization of sports competitions, transport, and logistics. During analysis data related to these sectors, sports managers prepare documentation for the competition for the organizer of the Olympic Games. Next comes the preparation of the infrastructure, where IT enables managers to include all sports venues, hotel facilities, security, as well as traffic and transport with logistics in the preparation. The IT sector will use artificial intelligence, virtual reality, and other software solutions to present the competition. Communication is much easier thanks to the IT sector, both internal and external, related to all sports organizations, sponsors, state structures, and media. Without the IT sector, it is impossible to manage projects, organize online meetings, hold media conferences, and exchange documents for easier coordination. A crucial part of the competition is the simulation of the event itself, which involves solving all problems, starting with logistics, through security, crisis, and sports competitions. Every scenario that could happen during sports competitions must be prepared in advance. At the end, there is a presentation of the candidacy, where IT creates presentations and presents the candidacy of its city to the organizer. Video presentations create the impression of being present at the competition itself, with the task of convincing the decision-makers in front of the International Olympic Committee that they have chosen the best representative.



#### 4.1. AI IN THE SPORTS MARKET

Artificial intelligence in sports has a huge impact on audience engagement, game strategy, and the way athletes compete. Artificial intelligence and data analytics are widely used in sports today. Given the significant impact that precision technology has had on sports, artificial intelligence in sports has been increasingly used in recent years and is predicted to succeed in the industry. In 2020, the sports artificial intelligence market is estimated at \$1.4 billion. It is expected to grow to \$19.2 billion by 2030, at a CAGR of 30.3%. In terms of market share by sport, football accounted for more than one-quarter of the global artificial intelligence in the sports market in 2020. While, in terms of region, North America had the largest market share in terms of revenue in 2020, accounting for more than one third of the global artificial intelligence in the sports market. [4]

#### 4.2. IT IMPACTS ON SPORTS VENUES

Given the increasing importance of the internet as an essential tool for national development and global integration, identifying and analyzing factors that affect the expansion of internet usage can assist countries in creating appropriate infrastructures. [6] Artificial intelligence (AI) is very present in the biggest sports competition and professional sports. Teams looking for a competitive edge are using AI technologies for player training, performance, health, and safety. This includes things like:

- Cameras and sensors in equipment such as sneakers can continuously stream data to coaches so they can adjust to the situation. See Figure 1.
- Smart wearables that measure lung capacity, heart rate, and movement so sports doctors, physiotherapists, and team doctors can reduce injuries and help players recover faster. See Figure 2.
- Monitoring equipment that helps the coaching staff to analyze and predict the next move of the opposing team or individual competitor.



Figure 1. Sensors in equipment that provide data about athletes [7]



Figure 2. Sports technology for everyday use [8]



- AI programs that can analyze performance data to create personalized solutions for training, rest, and nutrition.
- Physical tests with AI can detect early signs of fatigue or stress-related injuries.

Investing in sports venues at the Summer Olympic Games represents a long-term solution for the development of sports in the host cities if they are strategically planned and made with multi-functionality long-term sustainability and financial profitability. Throughout history, we have seen sports venue that were built for sports competitions at the Olympic Games, which, due to poor strategic planning and ignorance of the importance of long-term financial sustainability, are neglected and functionally unusable. See Figure 3.

With examples like these, we can see how sports managers, in charge of organizing sports competitions, are capable or incapable of predicting the long-term sustainability of sports venues in which huge sums of money have been invested. Many sports managers see that everything works perfectly until the end of the competition, not caring too much about the fate of sports venues after the biggest sports competitions. For example, the English have successfully prepared the transition of their sports venues, such as Wembley Stadium, which was handed over to the West Ham United football club in 2016, after the 2012 London Olympics.

In this way, the profitability of investing in the construction of a sports venue proved to be financially justified. Long-term strategic planning for the successful functioning of a sports facility must be financially viable

through regular use, otherwise the sports facility will deteriorate over time due to lack of maintenance, while at the same time it will be unprofitable due to lack of use through the organization of sports competitions (fields, gyms, wellness centers, halls, swimming pools, and even entire stadiums for sports clubs) and other non-sports activities such as fairs, music concerts, corporate events (congresses, seminars, conferences), renting business space and infrastructure (cafes, restaurants, bars, sports and non-sports goods stores), advertising (sponsorships, banners, digital billboards inside and outside the facility), renting the name of the sports facility by the sponsor, charging for parking, selling VIP boxes. Long-term sustainability of sports venues remains one of the key challenges in sports management. Research indicates that many Olympic facilities face significant post-event underutilization due to inadequate planning and lack of strategic vision. In contrast, successful cases demonstrate that integrating multifunctional design and long-term commercial strategies can significantly improve financial viability and utilization rates [10]. Every sports venue facility must have a source of income from multiple sources to utilize its full economic potential. See Figure 4.

On the other hand, the evidence that the sports managers in charge of the organization in Brazil in 2016 were not at a high organizational level like the managers who organized the Olympic Games in London 2012 can best be seen in the neglect of their sports venues on the example of the Maracana, one of the most famous football stadiums, which was renovated before the sports competitions, only to be totally neglected today. See Figure 5.



Figure 3. Swimming pools after the 2004 Athens Olympic Games [9]



## 5. RESEARCH RESULTS

After conducting descriptive and comparative methodology, the author concluded that the sports industry cannot function successfully without adequate help and support from the IT industry, to manage sports competitions management, as well as sports venues management. Safety management is the number one priority in organizing the Olympic Games. In the future, the author predicted that AI would take a much larger role within the sports industry. Furthermore, the integration of digital technologies allows for more efficient communication between organizers, athletes, and spectators. Advanced data analytics can help optimize scheduling, reduce operational costs, and improve the overall experience for everyone involved. In addition, the use of cloud computing and real-time data processing ensures that critical information is always accessible and up to date.

As technology continues to evolve, collaboration between the sports and IT industries will become even more essential for innovation and sustainability.

The findings of this study are consistent with previous research, which suggests that the integration of information technologies significantly contributes to improving management processes, enhancing safety systems, and optimizing the use of sports infrastructure. The growing reliance on digital tools and data analytics further supports the transformation of the sports industry into a more efficient and sustainable system.



Figure 4. Wembley Olympic Stadium [11] taken over by F.C. West Ham United [12]

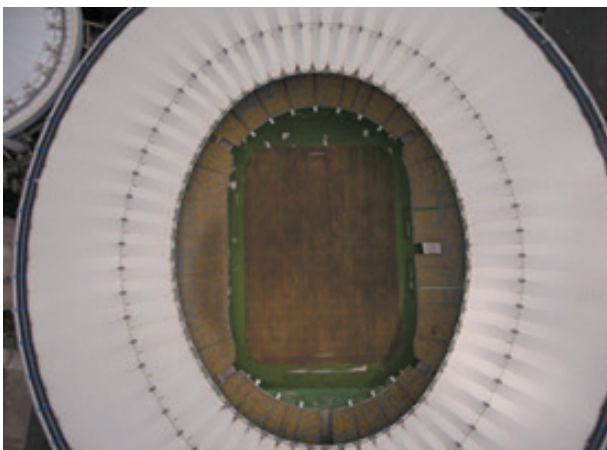


Figure 5. Maracana stadium in Brazil [13]



## 6. CONCLUSION

How important is the IT industry is the successful development of the sports industry can best be seen in example that today it is impossible to successfully organize sports competitions without the use of information technologies. We have shown examples of which areas IT is used in sports. The impact of entrepreneurship in sports can best be seen in the investment in sports venues, although there is a danger that the investment in sports venues will not pay off after the sports competitions are over. By comparing the studies, we have presented positive and negative examples of sports technology and investment in sport, and the investment in sports venues, which distinguish successfully from unsuccessful sports managers. IT accelerated the development of the sports industry, facilitated the organization of sports competitions, modernized the appearance and functioning of sports venues, increased security both at sports venues and outside, and improved methods for preventing hooliganism.

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