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## **Sports Management Platform**

The scope for growth of a neighbourhood club

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Master Thesis

presented as partial requirement for obtaining the Master Degree in Information Management

**NOVA Information Management School**  
**Instituto Superior de Estatística e Gestão de Informação**

Universidade Nova de Lisboa

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**SPORTS MANAGEMENT PLATFORM**

THE SCOPE FOR GROWTH OF A NEIGHBOURHOOD CLUB

by

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Master Thesis presented as partial requirement for obtaining the Master's degree in Information Management, with a specialization in Knowledge Management and Business Intelligence

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## **STATEMENT OF INTEGRITY**

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

*Lisbon, 28 May*

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## **ABSTRACT**

Technology is becoming increasingly present in modern times and age, and for this reason, it may progressively become a tool that can improve our quality of life and facilitate the way we work. With the advancement of technology, the era of data and information culture has been consolidated and has come to improve our experiences in the digital world as users and consumers.

This study seeks to understand how neighbourhood clubs can grow if they use a platform that organises all their information and allows them to get a better experience of all the human and financial resources available to them. The use of these platforms makes processes faster and more efficient, thus resulting in growth.

Information management platforms already exist in various areas, including football, but they require a financial investment that is not possible for most neighbourhood clubs.

Neighbourhood football clubs focus on the development of their juniors, hence end up being unable to focus on areas that allegedly are of a lower priority.

## **KEYWORDS**

Sports; Platform; Decision support; Sport Management

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## LIST OF ABBREVIATIONS AND ACRONYMS

<b>BC</b>	Before Christ
<b>DSR</b>	Design Science Research
<b>ECA</b>	European Club Association
<b>FA</b>	Football Association
<b>FPF</b>	Portuguese Football Federation
<b>IT</b>	Information Technology
<b>NSG</b>	New Sport Generation
<b>SAP</b>	System Analysis Program Development

# 1. Introduction

## 1.1. Context

We increasingly live in a global world where technology, especially information and communication technology, is changing the way we work and communicate, as well as the way companies create and capture value. Not only does it help us do things better and faster, but it also enables profound changes to be made in the way organizations work. (Cascio & Montealegre, 2016). The use of computers in sports was reported as early as the mid-1960s (Sykora et al., 2015). This vertiginous growth is visible in several areas, and football is no exception.

Examples of areas that make the connection between the world of sports and the world of technology are sports performance, sports clubs, event management and fan experience. (Ráthonyi et al., 2018)

Digitalization has been identified as one of the main trends changing society and business, causing changes within companies due to the adoption of digital technologies in the organization or operating environment. (Parviainen & Tihinen, 2017). Digitalization can help the club in different fields: infrastructure and security management, talent scouting, team management, sponsorship, and supplier management. Digitalization extends the ecosystem of sports organizations, in the form of new IT stakeholders, such as software providers and data providers. (Ráthonyi et al., 2018)

Considering that sports are a reality in any society and that soccer remains the king club, there is a need for tools that facilitate the management of clubs and allow them to grow exponentially. We have the example of the German soccer team that was a success in the World Cup by using data analytics and was largely supported by the software provider SAP (integrated transactional business management system). (Xiao et al., 2017)

However, due to the unfamiliarity of clubs or even the lack of monetary means, this partnership between technology and sports, is not widely adopted by Portuguese teams and, consequently, athletes and clubs may not be reaching their maximum.

With this paper, I intend to explore the possibilities of growth in a neighbourhood club.

The connection between soccer and neighbourhoods is very old. The first soccer clubs belonged to community institutions like churches and work teams and helped people adapt to life in the cities of 19th-century England (Sondaal, 2013).

Nowadays, technology is increasingly present in the sports world in all aspects. Football clubs try to keep up with this evolution but often, mainly for economic reasons, they are not able to follow this evolution. Because they are smaller clubs, their needs are different from a bigger club and for that reason, a realistic tool that adapts to these conditions is necessary.

Soccer clubs have different strategic objectives, depending on their missions and priorities. For instance, giant and middle-level soccer clubs have different missions. (Coskun et al., 2020)

The management of soccer clubs is responsible for fulfilling the expectations of a wide variety of stakeholder groups, such as fans, players, employees and staff, sponsors, suppliers, shareholders, broadcasters, sports media, local authorities, soccer associations, government, and legal authorities. (Coskun et al., 2020)

More and more clubs are using different platforms to organize their teams and athletes, to manage the information of all members, and to promote the club on the Internet. The talent search system has also been revolutionized. Given the availability of a huge amount of statistical data generated by various sensors and analytical tools, the scouting/recruiting of players tend to become more and more based on real data and values and less on scouts and what they observe (Steinberg, 2015).

## **1.2. Motivation**

Soccer clubs have to work in a strictly competitive environment, redefine their market position and adjust their decision-making process. (Dimitropoulos, 2015)

Kikulis (1995) and Smith (2004) argue that the organizational reform, that occurred in 1980, required more technical and administrative expertise, which led to additional professional control in decision-making. This has challenged the values that have influenced the functioning of these organizations since their inception (Dimitropoulos, 2015).

For smaller clubs and neighbourhood clubs, using a platform that facilitates sports management is not an easy task. These types of platforms are becoming more and more common, but the cost associated with them is also higher.

By developing a platform, which is free for smaller clubs and self-sustainable, it will be possible to grow economically and performance wise.

The growth of neighbourhood clubs can mean the development of their neighbourhoods. We can think of everything as a chain. Clubs need employees to provide their services (players, coaches, team managers and club management). These employees earn their income and spend part of it in the region, thus helping the economic growth of the region. (Hamm & Fischer, 2015).

Studies show that socio-environmental factors, including the neighbourhoods in which children live and grow up, are key determinants of the neighbourhood children's developmental outcomes (Goldfeld, 2015).

With this, we can conclude that a free platform would enable clubs, that do not have the financial resources, to manage and administer their tasks and with that potentially grow. In

facilitation of this aspect, it appears evident that this platform would allow the clubs to manage the training of teams, their facilities, and their members efficiently.

### **1.3. Objectives**

The research objective is to create a platform architecture that would allow neighbourhood clubs to manage their team's member and have an active presence on the internet.

To achieve this goal, the following intermediate objectives were defined:

- Study neighbourhood club context and its management requirements.
- Study the most relevant existing club management platforms.
- Design a new platform architecture that can be used by the neighbourhood clubs.
  - Define the system requirements.
  - Define a sustainable business model.
  - Develop a marketing plan to sustain the site through advertisements and sponsors.
- Evaluate the architecture.

### **1.4. Study relevance and importance**

The economic difficulties that most neighbourhood clubs experience become mainly a gap between the factual performance of these clubs and their potential future performance.

A platform capable of being self-sustained and free of charge for smaller clubs would allow them to represent the athletes at their best as well as the full club potential, besides providing a better foundation for decision-making.

As a result of this growth, the neighbourhood clubs would be able to take an even stronger presence in the lives and raising of the children and contribute to their healthy upgrowing with sports in their lives.

On the other hand, considering that most clubs do not have IT professionals, it could be a person without a professional connection to the IT area using the systems, which would allow more people to get closer to the digital world and create more automation of all processes and communication. modern and futuristic. Customer service skills and friendliness may be the first thing customers think of, but stable and comprehensive club management software will allow everyone to do what they do best. The organization is handled more appropriately, and the club can grow and prosper (*Features of Club Management Software That Can Help Grow Your Business*, 2014).

## 2. Methodology

Design Science Research (DSR) has as its main objective to improve human knowledge with the creation of innovative artefacts and the generation of design knowledge through revolutionary solutions (A. Hevner et al., 2004), and also to increase human and organizational capabilities through the creation of new and more innovative artefacts

With the objective of this research, which is to explore what may develop growth of neighbourhood soccer clubs, and that this growth will manifest with the use of a management platform, it is possible to claim that development of an innovative solution is the key. Therefore, DSR was the chosen research methodology. In this case, the artefact to be created is the architecture of a platform that can support neighbourhood soccer clubs.

### 2.1. Design Science Research (DSR)

Design Science Research, according to Peffers (Peffers et al., 2007), is developed through 6 steps: problem identification and motivation, objectives for a solution, design and development, evaluation, and communication. These steps can be executed in the order of Figure 1 or in a way that is more beneficial to the project.

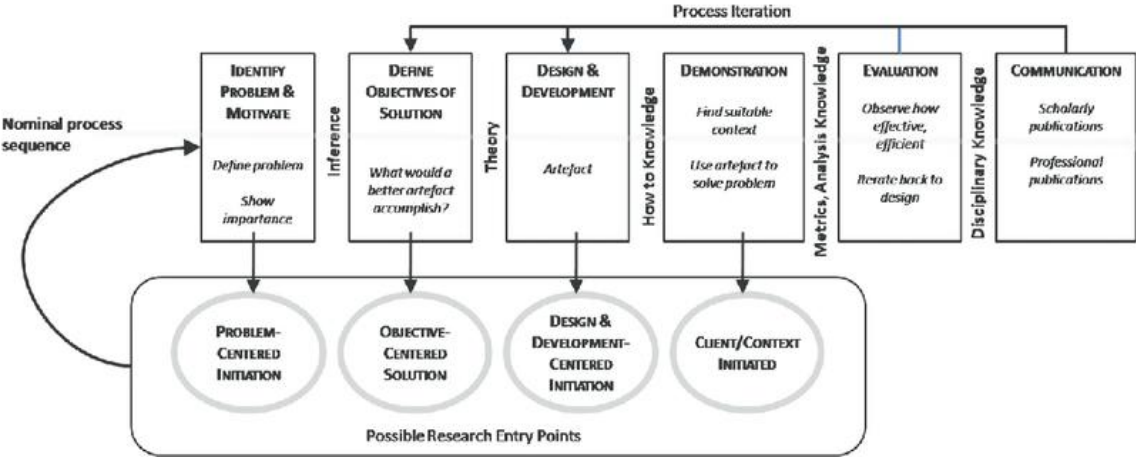


Figure 1 – Design science research methodology process model (Peffers et al., 2007)

Step 1 - Identifying the problem and its motivation: In this step, the research problem and why its investigation is necessary (What? and Why?) It is also important to build the artefact that will bring the solution to this problem.

Step 2 - Definition of the objectives for the solution: Based on the knowledge we already have about the problem; the objectives of the solution are outlined as well as its requirements.

Step 3 - Design and development: In this step, the artefact is created and its architecture and functionality is defined.

Step 4 - Demonstration: In this Step, the use of the artefact is demonstrated through various experiments and simulations to see if it is sufficient to solve the problem.

Step 5 - Evaluation: In this Step, the effectiveness of the artefact is observed by comparing the proposed objectives for the solution with the results obtained. It may be necessary to go back to previous steps (3 and 4) to make improvements to the artefact.

Step 6 - Communication: The last step is the moment of disclosure of the problem and the importance of the solution proposed for it, in addition to the presentation of the developed artefact.

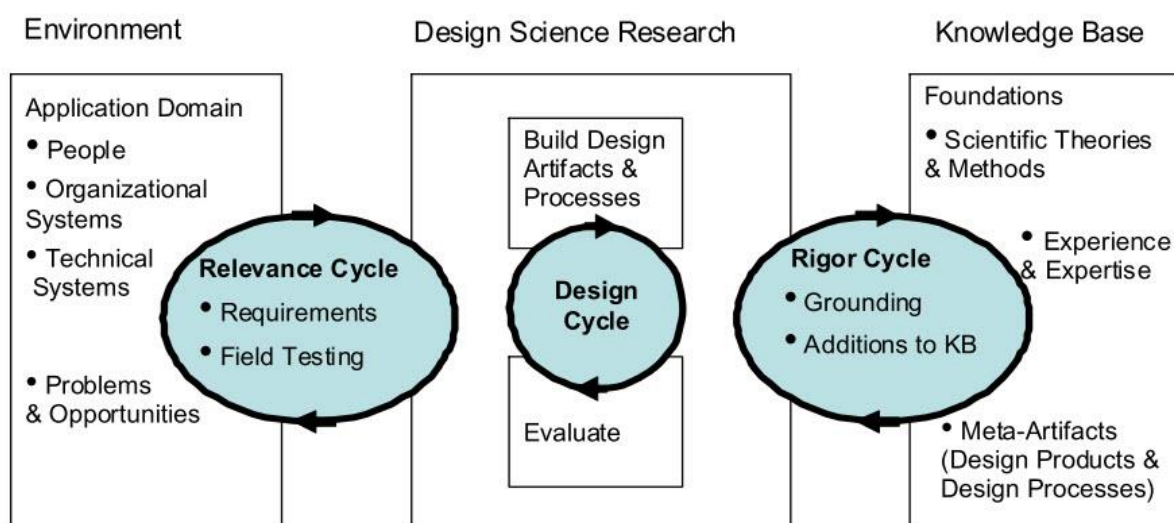


Figure 2 – Hevner's Design Science Research Cycles (Hevner A. R., 2007)

The Design Science Research, according to Hevner (A. Hevner et al., 2004), is based on 3 inherent research cycles:

- Relevance Cycle
- Design Cycle
- Rigour Cycle

The Relevance Cycle is the link between the contextual environment of projects and design science activities and is motivated by the desire to improve the environment through the introduction of new and innovative artefacts and the processes for building these artefacts (Simon, 1996). An application domain consists of the people, organisational systems, and technical systems that interact to work towards a goal.

The neighbourhood clubs will be the main clients of the platform, and, for that reason, it is necessary to make an analysis and understand the main functionalities essential to them in this kind of platform.

To achieve this, we extended a survey to the technical/sporting management of clubs spread over several associations in Portugal (AFSetúbal, AF Viseu, AF Lisboa) for the feedback to be more generalised and not based on a single region of the country.

The Design Cycle iterates between the core activities of constructing and evaluating research artefacts and design processes. This cycle is a cornerstone of any scientific design research project as it is this cycle of activities that iterates most rapidly between the construction of an artefact, its evaluation, and subsequent feedback to further refine the design. Simon (Simon, 1996) describes this cycle as creating design alternatives and evaluating the alternatives against requirements until a satisfactory design is achieved.

The Rigor Cycle provides past knowledge to the research project to ensure its innovation. It requires researchers to research thoroughly and reference the knowledge base to ensure that the designs produced are research contributions rather than routine projects based on the application of well-known processes (A. Hevner et al., 2004). In short, the Rigor Cycle links design science activities with the knowledge base of scientific foundations, experience and expertise that inform the research project. These 3 cycles must be present and easily identified in a design science research project (A. R. Hevner, 2007).

## **2.2. Research Strategy**

The financial reality of neighbourhood football clubs does not allow for the implementation of a platform. This study aims to develop a free platform that meets the needs of these clubs, as well as the expectations of sponsors and larger clubs.

But against odds, we outlined a research plan with the following steps:

Step 1 - Identify the problem and its motivation: Neighbourhood football clubs do not have the financial resources to implement a platform that can manage all their information and that helps them to grow. In this research, the aim is to design a free platform capable of meeting the needs of sponsors and larger clubs. The bigger, and the more professional the clubs are, the more they would have to pay to use this platform. With this scenario, we have managed to make the platform survive as well as be free to neighbourhood clubs.

At this stage, the growth rate of the neighbourhood clubs is investigated. It is also at this stage that the questionnaire is extended to the neighbourhood clubs for understanding of the requirements needed for the platform.

Step 2 - Definition of the objectives for the solution: After the extension of the questionnaires, we will analyse them and define the main functionality and features of the platform to be an efficient solution to the problem presented.

Step 3 - Design and development: We will design the artefact (platform).

Step 4 - Demonstration: Due to the short time available for the development of this thesis, it was not possible to build a complete application based on the proposed architecture. The time constraints prevented the detailed implementation and development of all the features planned for the platform. So instead of a fully functional application, we focussed on developing a robust design and clearly defining the requirements and functionalities needed. This design will serve as the basis for future developments, allowing the platform to be implemented according to the established objectives upon availability of sufficient resources and time.

Stage 5 - Communication: In this final stage, all the necessary functionalities of the platform, the artefact and the development of the thesis based on the conclusions drawn must have been presented.

### 3. Context of Neighbourhood Clubs

Contextualization of a subject is crucial to provide a clear and detailed view of the topic covered, allowing readers to understand the topic comprehensively. This establishes the relevance of the study within the research field, justifying the need for and importance of the proposed investigation.

Contextualization helps to effectively communicate the ideas and importance of the study to a broader audience, including those who may not be familiar with the specific topic. Furthermore, it identifies where research can contribute in innovative ways, adding new insights to the field.

#### 3.1. Overview

Neighbourhood clubs face a completely different reality than the larger clubs. For some football clubs it is a business worth million, while for others it is a place for training, learning, and where the people, who live in that area come together. However, despite having such different realities, the needs are very similar and must be aligned appropriately to the size of the club, the number of members, and all the professionals. Neighbourhood clubs are more likely to achieve their goals if they are continuously encouraged to reinforce their technical teams with more qualified, specialized, and diversified personnel for maximum support of their athletes. Professional clubs urgently require proper governance with the goal of maintaining cost-effectiveness and actively working with their supporters, advertisers, sponsors and departments - to manage the use of funds for athlete training and sporting events. (Berdyew R.A., Volchkova V.I., Savosina M.N. Volga Region State Academy of Physical Culture, Sport and Tourism Kazan, 2016).

Nowadays clubs are not only represented by the technical team that is present at each game. As a deliberate part of the strategy of being a training club, they have achieved growth in terms of human resources in support of other complementary sports disciplines, improving their training of athletes, such as the achievement of the certification of training entities in football: *“Certificação de Entidades Formadoras”*.

In both the larger clubs and the smaller neighbourhood clubs, there is coordination and collaboration amongst teams of people who are dedicated to work on providing the best training to the club’s athletes. These teams often consist of coaches, physical therapists, and coordinators/directors.

## 3.2. Management Requirements

After analysing the various existing sports management platforms and all their features it is easy to realize that there are crucial functions in all of them. To better understand them we can divide the club organisation into two sections: technical and administrative.

The technical section of the club consists of all the material related to the athletes and coaches while the administrative section involves all the necessary “back office”.

The platforms analysed in this section were 3: Softingal, EMJOGO.PT and FOOTBALLISM.

Softingal is an IT company with 25 years of existence in the Portuguese business market and is composed of a team of professionals, who are passionate about the development of software solutions. They are characterized by their high performance, work process-oriented interfaces, intuition, and innovation. They have a New Sport Generation (NSG) club management software that simplifies the certification process of clubs by ensuring that all departments have the information centralised on a single platform. («Software Gestão Desportiva - Formação Desportiva e Torneios - Softingal», 2022).

EMJOGO.PT is a management software intended to simplify and modernise how sports clubs work. It is a platform aimed at football, futsal, basketball and other team sports clubs with tools for all the needs of the club, teams and members.

FootballISM is a platform that manages, in detail, not only the sporting evolution but also the school, social and personal side of each player. According to the website itself, it is the only digital platform in the market able to analyse scouting, training evaluation and competition, as well as management of facilities and equipment, medical, nutritional, legal elements, and asset management in a fully integrated and transversal environment.

After analysing the main functionality of these platforms and discovering what they have in common, we were able to conclude which functions are essential in this particular type of platform. For ease of organisation, the functions are divided into categories:

- Athlete management
  - Academic background
  - Medical and nutrition
- Financial management
- Sports management
- Scouting
- Back office and administration

### **3.2.1. Athlete Management**

Based on a variety of theories, management functions are inventoried as planning, organisation, leadership, control, and personnel. In other words, we can say that sports performance organisations that are able to adequately perform management functions, may be expected to produce better achievements. (Gunnigle & McDonnell, 2008).

The functions of sports management are to plan, organize, staff, direct, motivate, lead, manage, monitor and evaluate (Lesmana et al., 2020) and in this section, these are all directed towards athletes. The resources associated with the management of the athlete will allow you to manage 360° of the life of each athlete, to make the records and their evaluations without forgetting the academical life. As mentioned before, the neighbourhood clubs are very important not only for the sportive life of each athlete but also for their personal development.

Every piece of medical history of each athlete should also be present in this section because, progressively, the clubs are paying increasing attention to the health of their athletes. With the tool they can easily follow injuries, of each athlete.

### **3.2.2. Financial Management**

Financial management is often associated with back office and administration. However, it is very important in its uniqueness and must have relevance in the club. As already mentioned, financial problems are likely to be a constant in this type of club and therefore it cannot be underestimated. Most of the clubs complain that the financial problems are impediment to growth and development and can harm their athletes. Whether there is a lot of money or a little money, it must be well managed, hence a very important section in the platforms.

### **3.2.3. Sports Management**

By investing in a good sports management platform, clubs, neighbourhood clubs, solve a lot of traditional and specific management problems, not least the financial management (purchase and sales, personnel and contract management), as well as specific tasks of a sports club (managing the preparation of athletes and the work with fans, maintaining membership fees, managing sports facilities, maintaining sports statistics). By automating all these functions, they can facilitate the work and also reduce the number of headcounts allocated to them. (Berdyew R.A., Volchkova V.I., Savosina M.N. Volga Region State Academy of Physical Culture, Sport and Tourism Kazan, 2016)

### **3.2.4. Scouting**

Sports analysis, and more specifically scouting, have evolved in recent years due to the increased availability of large amounts of data (tracking). Especially when it comes to tactical behaviour, data science could change the way we think about football (Kempe et al., 2018). For this reason, it is increasingly important to have a department dedicated to this topic and where it is possible, to identify the players to follow, to register the observations and to profile the players in order to decide early on which players fit on the team best.

### **3.2.5. Back Office and Administration**

Back office and administration concern all management of the departments, that are part of the club, yet have no direct interference with the athletes/public, besides having a supportive role aimed at improving athlete and club performance. The composition of this segment is mostly administrative and office management, technological support, and data management. In most of the neighbourhood football clubs, there is a team responsible for all this area.

## **3.3. Challenges and Opportunities**

All the platforms mentioned above (Softingal, EMJOGO.PT and FOOTBALLISM) are costly and it is in this perspective and based on this research, that the platform to be created is different. The main objective is to offer a platform to neighbourhood clubs, which is free of charge and able to survive through support from sponsors and those interested in the growth of these clubs.

## 4. Literature Review

In this chapter, literature review, we will contextualize current research by helping to relate previous research with the work developed. To develop a structure that will guide the study, a solid theoretical basis is necessary that brings together relevant models, concepts and theories. According to Hannah Snyder, to be considered relevant and reliable, a literature review must be clear and convey confidence and veracity.

### 4.1. Sport Management

#### 4.1.1. Sports – Football

According to dictionaries, sports means “An activity involving physical exertion and skill in which an individual or team competes against another or others for entertainment” (SPORT | Meaning & Definition for UK English | Lexico.Com, 2022). Sport can be experienced in many different ways, professional or amateur, team or individual, but most of the time it is a form of entertainment, for those practising and those watching, and a way to improve health.

Sport has been part of our society for over 3000 years and in the beginning had the purpose of survival, training for war and hunting. As a result of this, we understand why so many early games involved throwing spears, stakes, and stones, and fighting against opponents. With the first Olympic Games (a global multi-sport event with thousands of athletes participating in various sports that still takes place today) in 776 BC, the Ancient Greeks introduced formal sports to the world. (Bellis, 2019).

Modern football has its origins in England during the 19th century when the Football Association (FA) was founded. It saw its main development during the second half of the century, quickly integrating into British everyday life due to the ease with which the most basic principles were understood. Going back in history, around the 2nd century BC, it was already customary to kick the skulls/heads of defeated enemies. A few years later the skulls were replaced by leather balls, which had to be kicked by Chinese soldiers between two stakes driven into the ground, the sport was known as Tsu'Chu. (Express, 2006).

Football arrived in Portugal in the last decades of the 19th century, more specifically in 1875 in Largo da Achada situated in Camacha, Madeira. It is possible to read in many chronicles that it was a young British student, Harry Hinton, who started what is considered the first game of “foot-ball” in Portugal. (History of Football in Portugal | Portuguese Football Federation, 2021). It was initially played by the noble classes but soon developed into a democratic sport with no direct association with social status. In 1969, Portugal suffered an “academic crisis”, which manifested itself through football at the helm of Académica de Coimbra, the students' club. (Serrado & Serra, 2010).

Football, the king sport, is one of the best-known sports in the world, and the most played in Portugal, being seen today as a gigantic business that moves large amounts of money every year. Each football match is played by two teams of 11 players (in total there are 18, 11 on the pitch and 7 substitutes). The teams consist of goalkeepers, defenders, midfielders, and forwards. In addition to the players, each team also has a technical team that prepares it for the game, controls the tactics of the game and the substitutions during the match (maximum of three). The two teams that are facing each other on the field are fundamental, but without a third team, the refereeing team, the game does not happen. The objective of the refereeing team is to ensure that everyone complies with the pre-defined rules. Games can be played on natural or artificial surfaces and last for 90 minutes. Each half consists of 45 minutes, although the referee may add extra minutes if there are long stoppages during the game.

Football is the sport that moves the most crowds and, thanks to its growing popularity as well as the amount of financial interest in the game, it is one of the most widely researched team sports. Notably, many subject areas have taken advantage of the scientific knowledge gained from football, including the natural and physical sciences, medicine, and social sciences. (Coskun et al., 2020) However, football has been facing an economic transformation over time and there has been a significant change in the way football clubs are run. (Doidge et al., 2019).

When it comes to youth football, Portuguese clubs have excelled at the European level. In September 2021, Sporting Clube de Portugal won the ECA Youth Football Award for its “Player-Centred Model” - the academy's vision for player development. “The project focuses on player development through a multidisciplinary approach of innovation and integration across all technical, tactical, scientific and technological areas, along with a strong educational programme to support and encourage academy players.” (Five Inspiring Clubs Win at the ECA Awards 2021, 2021). As far as training levels are concerned, according to their age, the more than 150 thousand federated players in Portugal can be enrolled in the following categories: Júnior A (Júnior – Under 19); Júnior B (Juvenil – Under 17); Júnior C (Iniciado – Under 15); Júnior D (Infantil – Under 13); Júnior E (Benjamin – Under 11); Júnior F (Traquina - Under 9); and Júnior G (Petiz – Under 7). (Artigo 7.o - Categorias - Regulamento do Estatuto, da Categoria, da Inscrição e Transferência de Jogadores - BDJUR).

Concerning the concept of “education” associated with youth football, the president of the Portuguese Olympic Committee, José Manuel Constantino, argues that it is no longer a question of guaranteeing the sporting quality of professional clubs, but rather a question of economically improving human resources. (Constantino, 2002) On the other hand, Antão believes that clubs and football schools should promote the best conditions for young athletes throughout the whole training process because there is an increasing number of young people passionate about football. (Verde Antão, 2006). The process of developing an athlete is the direct responsibility of the coach because in his duty lies the tasks to guide and

to prepare the athlete for the training and competition. (Mesquita, 2005). Beyond the responsibility at a more sportive level, the coach also ends up having an important role in the more formative-educative aspect of the athletes, thus bringing the importance, initially mentioned, to the neighbourhood clubs. Considering all these responsibilities associated with managing football clubs, the clubs must take on the demands and not forget the logistical, organisational and administrative aspects that are indirectly fundamental to the success and smooth running of the training process.

#### **4.1.2. Sports Management**

Management is the process of dealing with or organizing tasks or people and in the sports situation, it is no different. Sport management involves any combination of skills related to planning, organizing, directing, controlling, budgeting, leading, and evaluating within the context of an organization or department whose primary product or service is related to sport or physical activity (DeSensi, Kelley, Blanton and Beitel, 2003). Sports management and the associated skills, required to manage a sports team, club or venue has been a topic of much research in recent times.

According to Soriano, manager of many companies in different sectors, argue that their situation appears different from all the others, but in reality, there are a few common characteristics to all of them. These characteristics are a consequence of human activities because they all have a logic that moves and controls them, a logic that can act in a more or less visible or even appreciable way. Therefore, anyone who wants to succeed in a human activity must identify and understand the logic behind it, reinterpret it and adapt it to new realities and challenges. Identify and understand the logic behind a given human activity. (Soriano, 2010).

As previously mentioned, nowadays we easily recognise the vast influential role that sport plays and, for this reason, the administration of a club has to be able to respond to this transformation and adapt in the best way to the constantly changing needs of the industry.

According to Drucker, management must play a key role in performance accountability (Drucker, 2002). According to the author, a manager must focus on five essential functions for an organisation to operate efficiently. These are:

- 1) Determination of objectives.
- 2) Designing the organisation;
- 3) Motivation and Communication;
- 4) Elaboration of norms;
- 5) Training human resources.

Following the studies conducted by (Danylchul, K. & Chelladurai, P, 1999), we noticed that financial management, leadership, politics, conflict resolution, fundraising, and other issues related to athletes are the most important areas, which should demand more attention from

the responsible club management. Chelladurai further states that to be fully effective in management, human resource management is the most important aspect of management.

According to Quirk & Fort, the economic power of clubs is a determining factor in their sporting performance, specifically in their ability to pay better salaries and “attract players of better quality. “In national football, the players' market is free, and there are no barriers that hinder its efficiency, such as those that existed in English football (salary cap), or the one that still exists in Spanish football (limitation on the number of extra-EU players). (Quirk & D. Fort, 1999)

## **4.2. Club Management Platforms**

“Sport has become an economic sector in its own right and is the main dimension. There is football and other sports. It has become the most popular sport in the world. “(Minquet, 2004).

There is an increasing tendency of supporting club management by platforms. The platforms are mainly a set of tools that allow their users/clients, in this case the clubs, to streamline and automate their day-to-day operations so that they make their services and processes more efficient.

The evolution of the “socio-sports” environments has made the process of managing sports facilities more and more complex. People working in the area are now required to have a broader and more advanced knowledge base than before and therefore need management tools, such as IT platforms, which may help them even more in their profession and doing their job in the best possible way. (Gallardo-Guerrero et al., 2008).

## **4.3. Web / Internet**

The internet is increasingly present in our lives and sport is no exception.

According to Kahle & Meeske (1999), and quoted by Valente (2018), the relationship between football and the internet is the result of 6 factors:

1. The Internet is a huge source of information storage, being highly valued by sports customers, especially club fans.
2. The immediacy of the Internet. The fact that the Internet can be immediate is an important feature for followers of sporting events.
3. The Internet allows interactivity, sports customers appreciate the possibility of expressing their opinion on the sporting phenomenon.
4. The Internet has a global reach - sports customers, even if geographically distant, can follow the topics of their interest.
5. Allows access to more esoteric sporting preferences, for example, to sports that do not have a large local presence.

6. The Internet is a mass medium, but it is also an individual medium, as it allows users to search for topics that interest them.

## 5. An Architecture for Neighbourhood Club Management

### 5.1. Assumptions

In this chapter, the fundamental premises that underpin the research will be presented. Assumptions have the main function of establishing the limits and conditions under which a study is developed as they provide the logical basis by which the methods and techniques were chosen. By explaining these premises, we seek to facilitate the perception of the conditions assumed.

The idea of this thesis arose from a small analysis of the discrepancy that exists between neighbourhood football clubs, with fewer financial conditions and other, more developed clubs.

Nowadays, many clubs only have a presence in the digital/technological world through social networks. In terms of club management, membership recruitment etc., it is still necessary to physically go to the club for inquiry related to any of those processes. Imagine if all this was done through a system? The creation/utilisation of this platform will allow the work to be done more efficiently and productively, hence achieving better results.

According to the research carried out and based on the needs identified in the “Neighbourhood Club Context” chapter, it is reasonable to assume that an IT platform, that supports the management of a neighbourhood football club, should encompass the following areas:

- Athlete management
- Financial management
- Scouting
- Back office and administration

Covering these areas, the platform will be capable of helping clubs with their day-to-day needs. We are aware that there are several areas that could be explored to increase this growth but based on the reality of Portuguese clubs, these appear to be the most useful and necessary.

## 5.2. Architecture

The architecture consists of two layers: one is aimed at club management and the other at members.

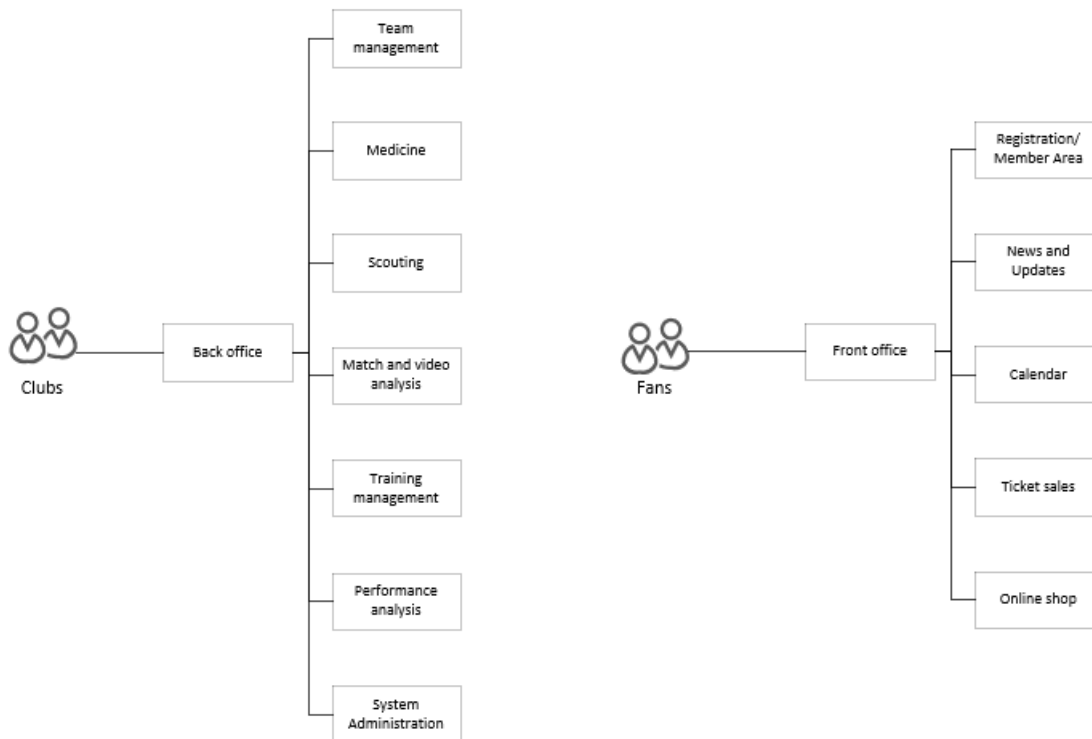


Figure 3 – Main Architecture

The section aimed at the club consists of tools such as:

- Team management
- Medicine
- Scouting
- Match and video analysis
- Training management
- Performance analysis
- System Administration

Team management in football is a complex art that goes beyond simply selecting talented players. In a club, managers face numerous challenges, from managing the personalities of individual players and coaches, to formulating winning strategies. In this context, the ability to lead and motivate a team becomes crucial for long-term success.

A successful football team is not just a group of talented players, but a cohesive unit with a strong team culture. To achieve this, coaches must work to create an environment where camaraderie, collaboration, and mutual responsibility constitute fundamental values. This culture not only strengthens the bonds between players, it also creates a solid foundation for facing challenges as a team.

Football medicine is a multidisciplinary area that requires a team of health professionals, including doctors, physiotherapists, nutritionists, and psychologists. The integrated approach ensures that players not only recover from injuries but also maintain optimal physical and mental performance. It continues to evolve with advances in sports medicine and technology, ensuring the most effective and up-to-date care for athletes. Football medicine has certain key focal points, such as injury prevention.

Injury prevention is a fundamental component of football medicine, which may include specific training sessions in order to strengthen muscles and joints that are more susceptible to injury, balanced diets and adequate hydration strategies, rest management and recovery, including sleep overload and overtraining. On the other hand, injuries are common in football, and a quick and accurate diagnosis followed by effective treatment is essential.

Scouting is essential for clubs looking to maintain or improve their competitive level. Through scouting, it is possible to discover new talents, analyse potential reinforcements and even anticipate the movements of rivals. The scouting process is not just about finding skilful players, but also about identifying players who fit the club philosophy and style of play.

Game and video analysis in football is an essential practice for coaches, technical teams, and players to improve individual and collective performance. This approach provides valuable insights into tactics, strategies, strengths, and weaknesses, allowing for continuous adjustments and improvements. The effective use of this practice contributes significantly to the success and constant evolution of the competitive football scene.

The data collected during performance analysis is used to provide individualised feedback to players. This feedback is crucial for development, as it highlights areas for improvement, and strengths and offers specific insights into how a player can contribute more effectively to the team. Coaches use performance analysis to adjust and develop team strategies. This can include changes to tactical formations, specific approaches to games against different opponents and adaptations to match conditions. In some cases, performance analysis is used in real-time during matches. Coaches and analysts can provide instant information to the technical team about emerging trends, opponents' weaknesses, or necessary tactical adjustments.

From the fan's point of view, the platform should cover several areas to provide a complete and engaging experience for fans, such as:

- News and Updates
- Calendar
- Ticket sales
- Online shop
- Registration/Member Area

A news and updates section on a sports platform is vital to keeping fans informed and involved. By providing real-time information on events, matches, transfers, and other relevant developments, we are promoting ongoing fan engagement. In addition, the regular release of news demonstrates transparency, which leads to greater trust and strengthens the emotional connection between the club and the fans.

The inclusion of a calendar is crucial to provide detailed information on match dates, times, and venues, as well as past results and statistics. The calendar is essential for supporters to plan to attend matches, be informed about special competitions, and keep up to date with changes to the schedule. The calendar also encourages participation in events other than matches, contributing to a more engaging and planned experience for the fan community.

Online ticket sales provide convenience for both fans and club management. It allows purchase at any time, facilitates efficient ticket management, extends sales reach globally and improves the fan experience. Data collection enables personalised marketing strategies, reduces the possibility of fraud, and increases security. It also enables targeted promotions, product cross-selling and upselling. Capacity management is facilitated, avoiding overcrowding, and accessibility is guaranteed for fans with special needs. Incorporating this system into the platform not only enhances the fan experience but also provides essential tools for the efficient management of ticket sales, contributing to commercial success and fan satisfaction.

Integrating an online shop to sell official club products such as shirts, scarves and other merchandising items is a fundamental strategy for both monetising and strengthening the club's brand, as well as building fan loyalty by creating a convenient and personalised shopping experience.

Finally, the member's area and the option to register/membership status on a sports platform are key components in fostering a sense of belonging and loyalty among fans, as well as being vital to the business model. Offering the option of becoming a club member via the platform facilitates the process and allows fans to feel closer and an integral part of the club family, which reinforces loyalty and ongoing support. Members represent a recurring and predictable source of revenue for the club, through membership fees or monthly instalments. This income can be crucial to the club's financial stability, not forgetting the exclusive benefits that incentivise supporters to become part of the club's membership.

### 5.3. Evaluation and Discussion

The interviews to assess the usefulness of a platform with the characteristics presented above had two objectives:

- The company that owns the platform
- Clubs that use the platform

The questions addressed to the marketing director of the “EMJOGO” platform were:

1. What are the most popular tools on your platform?
2. Have you noticed improvement of your clients' financial/sports results since they started using the platform? In what ways?
3. What was the biggest challenge when you launched the software? And today?

The most popular features are sports management and payment management. When analysing the clubs that use the software “EM JOGO”, the feedback was, that the clubs have managed to reduce unpaid/overdue fees and make the athletes' monthly payments faster and more efficient. At the same time, they appear to have more control of data in clubs with fewer resources, as it is all centralised and automated for certain processes, that usually require a lot of manual labour. The biggest challenge, that they experienced, was when the software was launched and the associated process of determining the real needs of the clubs and then adapting the software to those needs. Currently, the lack of dynamism in the sector is one of the problems they seem to face.

Regarding clubs already using the platform, the questions were:

1. Why did you start using a platform?
2. What are the platform's strengths and weaknesses?
3. Which tool do you use the most?
4. Did your financial and sports results improve while using the platform?

Clube de Futebol de Sasseiros and Atlético Clube Alfenense are two clubs that have implemented a platform to help manage and organise their sporting activities, especially certification by the Portuguese Football Federation (FPF).

Both clubs were motivated to use the platform with special focus on the FPF certification requirement, with the goal of modernising and optimising their administrative and technical processes. For Atlético Clube Alfenense, the emphasis was on the technical and tactical aspects as well as organisation, while Clube de Futebol de Sasseiros valued the centralisation of data on a single digital location, eliminating the use of paper as well as improving data accessibility.

Although they are not exploring the financial side of the platform, both clubs highlighted improvements in the organisation- and management-related aspects of the training

sessions. Atlético Clube Alfenense mentioned that the training area as the most used tool, while Clube de Futebol de Sasseiros uses various tools, such as the training unit, mesocycle, clinical part and assessments to improve the performance and monitoring of players.

Both organisations emphasised the importance of the platform in terms of improving sports organisation, providing greater management and history of athletes. The use of the platform appears to be in line with the clubs' optimisation and modernisation objectives, contributing to more efficient and detailed management of their activities, especially in the context of the certification required by the FPF.

For Fornos Futebol Clube, a club in the process of being created, the adoption of a platform for sports and administrative management would be fundamental to ensuring that club meets the standards and requirements demanded by sports organisations, such as certification from the Portuguese Football Federation (FPF). In addition, a modern platform would allow centralisation and efficient organisation of information related to teams and athletes, by replacing manual processes and paperwork with an accessible digital system.

The platform's strengths would enable them to improve their technical and tactical organisation, supporting a more efficient management of training and player performance. In addition, having all the information related to their teams in one place would make it easier to access and analyse the data. However, they would need to carefully assess whether the platform meets specific needs, especially in terms of customisation and adaptation to the particularities of the club.

The most useful tool would be a tool that allows them to manage and closely monitor the progress of training and player development. This could include features such as training plans, performance analysis, clinical management, and individual player assessments. They would have to prioritise a setup that would help them maximise the potential of each athlete and optimise team preparation. Although their main motivation might be to encourage the sport and improve organisational performance, they hope that implementing this platform will also have a positive impact on their long-term financial results. By improving operational efficiency and athlete tracking, they believe they can optimise resources and potentially attract additional investment and sponsorship.

## 6. Conclusions

### 6.1. Synthesis of the Developed Work

Management is the process of dealing with or governing tasks or people and in the sports situation, it is no different. Sport management involves any combination of skills related to planning, organizing, directing, controlling, budgeting, leading, and evaluating within the context of an organization or department whose primary product or service is related to sport or physical activity (DeSensi, Kelley, Blanton and Beitel, 2003). Sports management and the associated skills, required to manage a sports team, club or venue has been a topic of much research in recent times.

The presence of technology in our lives is increasingly evident and impactful. It has fundamentally transformed the way we live, work, and relate to each other. Technology has emerged with the aim of simplifying tasks and improving efficiency in our daily activities, and this purpose extends to various areas, including sport, such as football.

In football clubs, technology plays a crucial role. For example, advanced performance analysis systems provide detailed data on players' performance during training and matches. This helps coaches identify strengths and weaknesses, allowing for strategic adjustments to optimise the team's performance. The technology also enhances tactical and strategic analysis, allowing coaches to study match videos, identify patterns of play and make more informed decisions during matches.

To build this architecture, Design Science Research (DSR) was considered the most appropriate methodology, hence a viable artefact.

The project began by identifying the problem and its motivation. It was necessary to understand how football has evolved in Portugal and around the world, what role it plays in society and what difficulties it faces in keeping up with the development of technology.

After the identification of the problem, the objectives of the solution were defined and literature reviews were carried out, which formed the theoretical and analytical background for the development of the architecture.

In the third phase, Design and Development, the architecture of the information management platform was developed, once all the requirements had been met and all the research had been carried out.

During the last phase, Evaluation, the platform was presented to the clubs and they were asked if their needs had been met in comparison to their expectations for a platform with this objective as well as what added value they were potentially able to identify.

## **6.2. Research Limitations**

The limitations of this thesis project are primarily derived from time constraints and the defined scope. This research was designed to complete the requirements of a master's thesis within specific deadlines as well as to consider other areas that might need to be addressed.

Due to time constraints, it was not possible to develop the software in due time for the architecture to be implemented.

The lack of adequate club resources as well as viable sources in general, made it difficult to obtain detailed and comprehensive information to form a proper foundation for the research. Moreover, the collaboration and support of the relevant clubs or organizations were key to accessing specific data or valuable insights relevant to the topic. However, there was a slight amount of reluctance from these clubs to make the necessary resources available or to actively collaborate in the development of the research.

This reluctance against cooperation from the clubs can be attributed to various reasons, such as time and internal resource constraints, lack of ability to engage in the research or concerns about confidentiality. As a result, we faced significant challenges when trying to gather relevant data and information to adequately support the research.

## **6.3. Future Work**

As we look to the future of sport and club management, an innovative perspective is emerging: the integration of sponsorships as a foundation for making sports management platforms completely free for football clubs with less financial resources. This model not only opens the doors for less “favoured” clubs but also creates a sustainable structure that benefits everyone involved, turning the sport into a vehicle for inclusion and community development.

Living in an increasingly interconnected world, sports management platforms have become an essential tool for optimising operations, from player management to performance analysis. However, for many clubs, especially those with tighter budgets, adopting to these advanced technologies can be a significant financial challenge. It is in this context that we envision a future where sponsors play a key role in democratising access to these platforms.

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