**Chapter 3 Literature Review / Related Work**

Information about the related work done is given in the next section. It includes information about some of the previous systems that are related to DREAMXI in some manner. Reviewing the previous software is our primary motivation for having this section. It will attract readers' attention so they can comprehend and learn about the present similar websites or systems to DREAMXI. Furthermore, knowing the previous research can significantly improve our system.

**3.1 Definitions, Acronyms, and Abbreviations**

Some of the important acronyms, abbreviations, and definitions are given below:

**AI:** Artificial Intelligence

**Web App:** Web-based application

**Data Analytics:** Analyzing data for insights.

**ML algos:** Machine Learning algorithms

### 3.2 ****Player Recruitment in Professional Sports****

**This section will include some of the literature reviews that will help us to understand the players recruitment process and the techniques that football teams can consider while the recruitment processes.**

**3.2.1 **Use of Data Analytics in Player Performance Evaluation****

**The research paper “Performance analysis in football: A critical review and implications for future research” clearly shows that the Modern sports analytics involves gathering large amounts of data on player performance and using this data for decision-making.In their study of football performance, Mackenzie and Cushion (2013) emphasized the importance of objective data. They emphasized that, in contrast to human judgment alone, data-driven decision-making leads to better recruitment. Advanced performance metrics including defensive contribution, passing accuracy, and movement data are being used to assess players holistically.**

### 3.2.2 ****Machine Learning in Predicting Player Value and Fit****

The study “Actions Speak Louder Than Goals: Valuing Player Actions in Soccer” shows that the sports data is rapidly being subjected to machine learning (ML) algorithms in order to forecast player performance, market worth, and possible team fit. In this study, Decroos et al. (2019) proposed a data-driven approach for evaluating the contribution of soccer players to team performance that uses machine learning. According to their research, athletes who are likely to succeed in particular team positions can be predicted by models that have been trained on huge datasets. This backs up our project's notion of ranking and recommending gamers utilizing machine learning.

**3.2.3 **Player Similarity and Transfer Recommendation Systems****

**Developing player similarity models to suggest transfer targets is the subject of several studies. In their assessment of machine learning methods in sports analytics , Bunker and Thabtah (2019) talked about recommendation systems that use performance indicators to find similar athletes. These models directly support our project's objective of creating ranked transfer lists by assisting teams in finding reinforcements or replacements for particular roles.**

**3.2.4 The Role of AI in Talent Identification**

Lepschy et al. (2018) examined the application of artificial intelligence (AI) techniques, including decision trees and neural networks, in identifying football potential in young players. In their study(“The use of artificial intelligence in football: A systematic review”) they interpreted that AI-driven algorithms can detect patterns and predict a player's long-term potential, which is essential for teams that value strategic player signings.

**3.2.5 Limitations of Traditional Scouting and the Shift to Analytics**

Szymanski (2017) suggests in his research paper, classical scouting methods are often of a limited nature and can be responsible for costly transfer waste. He argues in favor of further use of modeling and data analytics to better select players, especially when dealing with massive player data sets. This indicates the need for our proposed method, which utilizes a web application to enhance and streamline the process of selecting players.

**3.2.6 Integrating Biographical and Performance Data for Player Evaluation**

**In research paper ”Spatio-temporal analysis of team sports. ”,** Gudmundsson and Horton (2017) talked about how improving recruitment results can be achieved by integrating biographical data (such age, height, and nationality) with on-field performance data. Their research shows that when both forms of data are examined simultaneously, teams are better able to assess a player's suitability.

**3.3 Online platforms and systems**

There have been various projects and systems that are designed to facilitate player recruitment and analysis in professional sports. They tend to utilize data analytics, statistics, and machine learning in order to improve the recruitment process for teams. Some of the prominent works and platforms in connection with this project are as follows:

**3.3.1 Wyscout**

One of the most popular tools used by professional football teams for player analysis and scouting is Wyscout. It offers a huge library of performance analytics, match videos, and player statistics. Wyscout is used by teams to find players according to market value, age, position, and performance indicators. Although Wyscout has a wealth of data, your project focuses on automating individualized recommendations based on team needs through machine learning.

### **3.3.2 **Instat Scout****

**Instat Scout is a scouting tool now available that provides deep performance analysis, video highlights, player statistics, and even player comparisons. This enables teams to evaluate the level of an individual player relative to other players in different leagues. It is a great tool, similar to Wyscout, but does not offer AI-assisted ranking and fit prediction for certain defined team objectives and deficiencies.**

****3.3.3** SciSports – Insight Platform**

SciSports Insight Platform analyzes player performance and value with a combination of advanced data analytics and AI. Their AI model, named “SciSkill,” foresees the player’s potential in terms of development over time. Additionally, SciSports applies machine learning techniques in assessing the degree of a player's potential integration into the team in terms of his personal playing style and tactical responsibilities. This closely relates to measuring player fit with the aid of machine learning, although SciSports is a subscription based service provider for professional users mainly from top level clubs.

### **3.3.4 **TransferLab by Analytics FC****

**Built by Analytics FC, TransferLab is a data-based scouting platform that enables clubs to locate and assess their transfer prospects. Users can create shortlists with selection filters of position and performance data, as well as utilize the comparative analysis feature of individual athletes. The list also provided rankings, which is similar to the aim of our project, but our project seeks to develop a web based application that is more flexible and user friendly for purposive recruitment using biographical and statistical information.**

****3.3.5** Football Manager (Game-based Data System)**

Football Manager also offers a simulation approach to gaming by handpicking players, managing, and fitting them into simulative teams while relying on a complex database that contains detailed information about each player. Some clubs use Football Manager's database for scouting purposes. Nonetheless, this program cannot provide a true professional recruitment system in real-time, but it shows what can be done with the integration of a large database of players and algorithms that simulate fit to what our system aims to accomplish.

**3.4 Related Work Summary Table**

**Table 3.4.1 Summary table**

|  |  |  |  |
| --- | --- | --- | --- |
| **Author** | **Methods** | **Results** | **Limitations** |
| Mackenzie and Cushion (2013) | Data Analytics for player performance | Objective data improves recruitment decisions; use of advanced metrics like passing accuracy, defensive contribution | Relies on data availability and quality; may overlook qualitative aspects |
| Decroos et al. (2019) | Machine Learning for predicting player value and fit | ML models predict player performance and fit based on large datasets | Requires large, diverse datasets; potential model biases |
| Bunker and Thabtah (2019) | Recommendation Systems using ML for player similarity | Performance-based similarity models for transfer suggestions | May lack contextual factors (e.g., team dynamics); dependent on feature selection |
| Lepschy et al. (2018 | AI (Decision Trees, Neural Networks) for talent identification | AI models predict young players' potential based on patterns in data | AI models may miss non-quantifiable traits (e.g., attitude, adaptability) |
| Szymanski (2017) | Critique of traditional scouting and use of analytics | Advocates for data analytics to reduce costly transfer mistakes | Traditional scouts' insights may still be undervalued; requires system overhaul |
| Gudmundsson and Horton (2017) | Integration of biographical and performance data | Enhanced player evaluation by combining personal and performance data | Challenges in collecting and standardizing diverse data types |

**Table 3.4.2 Related work Summary table**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name** | **AI Powered** | **ML Ranking** | **Biographical data** | **Performance statistics** | **User Friendly** | **Custom recommendations** |
| Wyscout | No | No | Limited | Yes | Yes | No |
| Instat Scout | No | No | Limited | Yes | No | No |
| SciSports | Yes | Yes | Yes | Yes | Yes | Yes |
| TransferLab | No | Partial | Limited | Yes | Yes | Partial |
| Football Manager | No | Partial  (simulation Based) | Yes | Partial  (Fictional data) | Yes | No(Game based simulation) |

**3.5 Conclusion**

The analysis of literature and existing platforms highlights the growing importance of data analytics, AI, and machine learning in the modern football player acquisition process. Research points out the limitations of traditional scouting methods while emphasizing the benefits of data-driven approaches for better decision-making. However, current platforms like Wyscout, Instat Scout, SciSports, and TransferLab often fall short in providing customized, AI-driven player rankings and fit recommendations. Our proposed solution, DREAMXI, aims to address these shortcomings by integrating biographical and performance data through an AI-powered web application, offering a flexible, efficient, and accurate player recruitment process tailored to specific team needs.