AI ACCOUNTABILITY SERVICES

# AI Automated Services


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## ABSTRACT:

The Vancouver Whitecaps Soccer Club thus wants to implement artificial intelligence in order to boost MLS chances through optimizing performance and decision-making. This paper is aimed at describing the usage of the artificial intelligence-generated data visualizations to influence the Whitecaps coaching team and assist it in a selection of players and further training of performers. Thus, we procured goals, assist probabilities, shots on target probabilities, pass completion probabilities, tackling and interception probabilities for each of the synthetic players. It also contains a TED-talk-style briefing to communicate these findings and suggestions.

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# 1. INTRODUCTION:

AI – Accountability Services (AIAS) is an experienced artificial intelligence and machine learning firm that offers organizations in diverse industries agile, sustainable, and efficient AI solutions. Deliberately built with the objective of creating and implementing AI technologies specifically for institutionalizing transparency, accountability and fairness. AIAS is a crucial player in ensuring that companies embrace AI-based systems and technologies while at the same time embracing and upholding appropriate and acceptable best practices in data management and use.

Our intern team was assembled to contribute to the development and application of AI across various industries. Our primary goal is to leverage artificial intelligence and machine learning in responsible ways to address a wide range of business challenges. We are assigned with AIAS's mission to develop effective AI solutions that deliver value while holding principles of honesty and fairness in the use of data.

## 2. PROJECT SCOPE and OBJECTIVES:

### Project Objective

- Demonstrate the impact of data-driven strategies on team performance.
- Utilize AI to create synthetic datasets that mimic actual player performance metrics.
- Design visual data representations that inform player selection and coaching strategies.

### Project Scope

**Synthetic Data Generation**: Generate credible player statistics depending on goals, contributions, shot accuracy, passing accuracy per game, ball carrying, and tackles and intercepts. These will be used to make assessment that will eventually provide a foundation for the identification of patterns in individual and team performance.

**Data Visualization**: Design compelling and easy to understand data analytics for presenting KPI statistics for the coaching staff. Such instruments are supposed to help make perception of the big volumes of information easier and turn it into the definitely usable tool for a tactical level of planning.

**Performance Metric Model (Key Performance selection Metric - KPM)**: Develop an off-ball/offensive, a defensive, and a passing -score model that works in parallel and consolidated. This model will also facilitate the ranking of players with the outstanding performers highlighted each time.

**Player Archetype Clustering**: Physically cluster players into positions or roles, including attacker, defender, and playmaker, for practice and match analyses with regard to individual performance. This makes it easy for the coaching team to build line up and even choose proper roles for each member.

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## 3. Methodology

Our approach involved:

- **Data Generation**: AI methods produced the simulations for number of goals, assists, shots on target, and passes accuracy as well as tackling and intercepting actions by players.
- **Data Visualization**: The generated data has been used to build a set of visualizations that would provide easy and easy-to-digest information essential for the coaching team.
- **Presentation Development:** To share conclusions, a TED-talk model has been developed, which allowed to give an analysis of findings and suggestions regarding the use of machine learning findings in influencing the game strategy and personal player progress.

## 4. Findings and Analysis

The data visualizations reveal performance metrics that can influence game outcomes:

- Goals and Assists: Visualizations, provide information such as players with the greatest scoring impact which helps coaches to create a better tier of forwards.
- Shots on Target and Pass Completion: Knowledge gained about shooting accuracy and passing efficiency offers the team knowledge about opportunities of possession and general scores.
- Tackles and Interceptions: Evaluation of defensive contributions is possible to help make line-ups and training emphasis for defense based on calculations from defensive statistics.
- These insights suggest that machine learning integration can significantly aid in decision-making, giving the Whitecaps a data-backed approach to player selection.

## 5. Recommendations

- Adopt Real-time Analytics: Submit AI tools during the match in order to make quick changes to tactics.
- Training Focus: Citing some of the specific areas that coaching most directly addresses, it is possible to list passing efficiency together with the positioning at the defensive end of the field.
- Continuous Data Refinement: The AI models' reliability will be maintained by updating and enlarging the dataset with new data from the internet.

## 6. Visualization

### Distribution of features

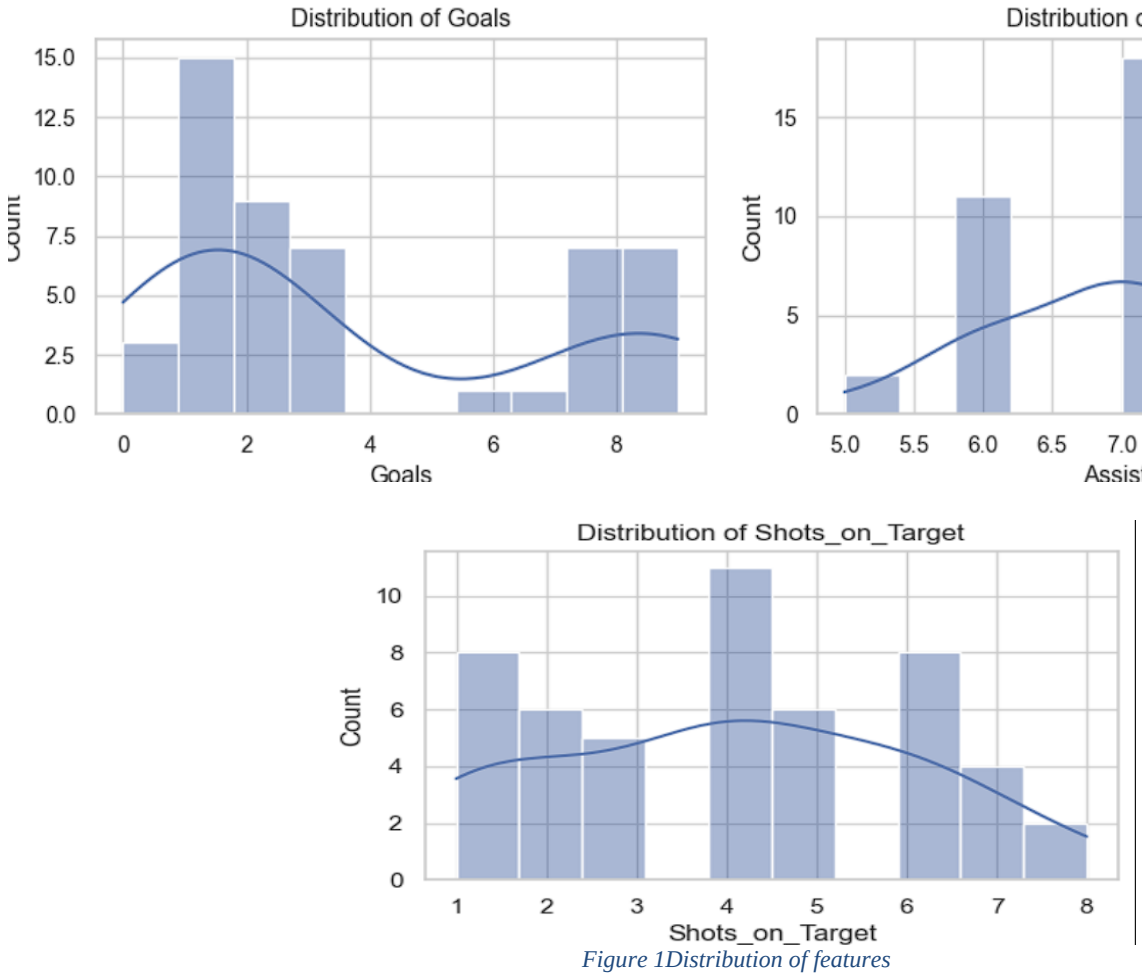


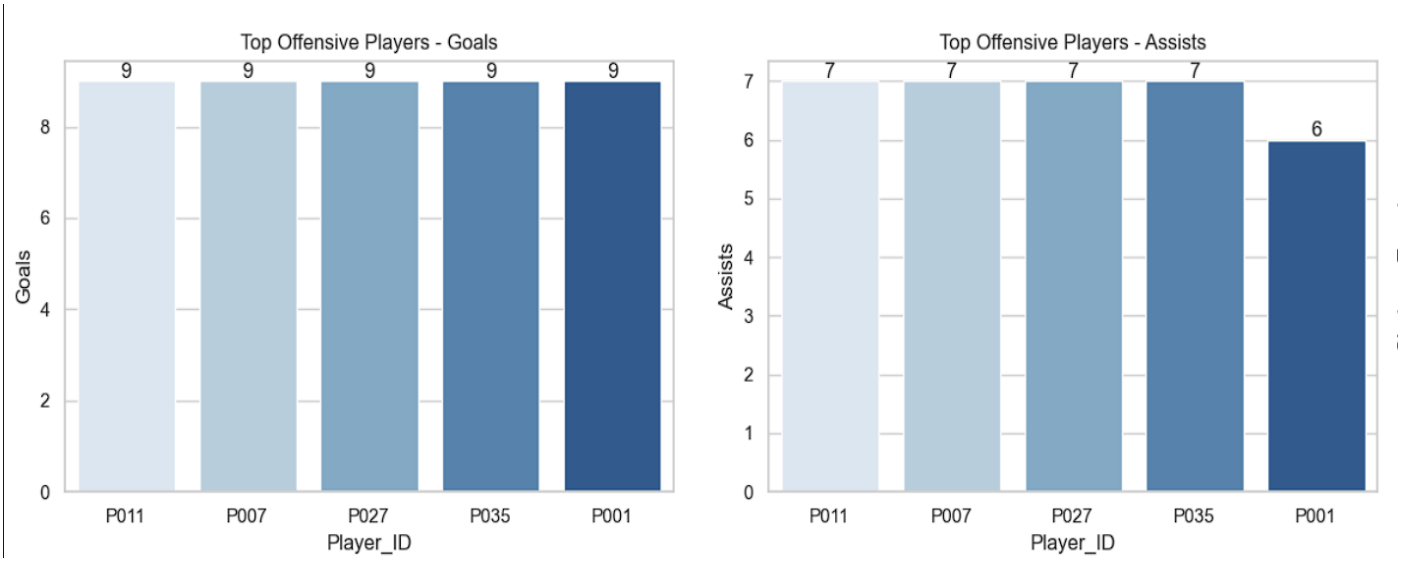

*Figure 1Distribution of features*

The histograms are an attempt to plot the over time frequency of goals, assists, and shots on targets by displaying the kernel density estimate on the same set. The respective frequency distributions of goals show that the former are

characterized by relatively low values while those of assists are rather oriented towards 7, and that of shots on target reaches the maximum at 4 with different variability.

## Top 5 Players by Performance Metrics

We will evaluate players performance based on KPM which is categorised into two:
Offensive metrics (e.g., goals, assists, shots on target).
Defensive metrics (e.g., tackles, interceptions), and passing accuracy.



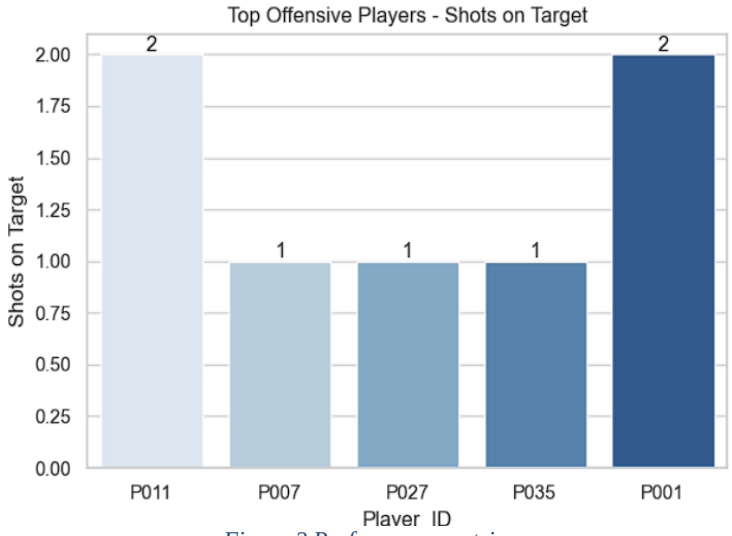




*Figure 2 Performance metrics*

The bar charts show the evaluation of the most attacking players according to the goals, assist, and shots on target. The entire player of P011, P007, P027, P035, and P001 shed the best goals and assists performance while all players but P001 have the most assist; All in all, P011 and P001 also produced the best shots on target among the players.

## Top Defensive Players - Tackles and Interceptions

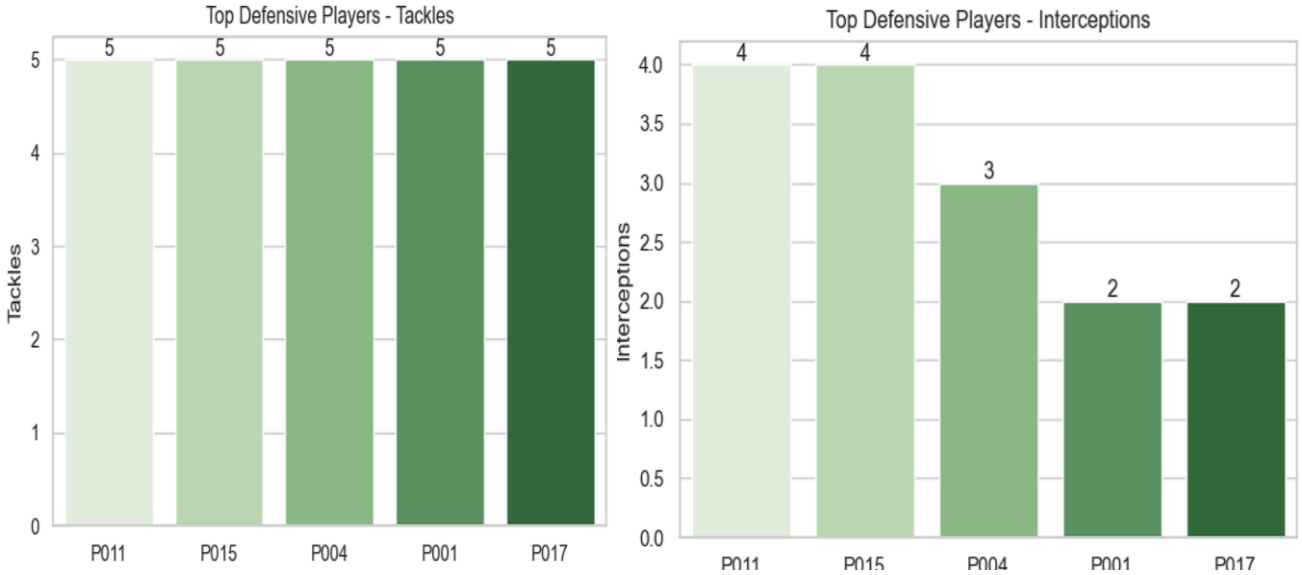



*Figure 3 Takels and Interception*

The bar charts highlight the top defensive players based on tackles and interceptions. All listed players achieved a maximum of 5 tackles, while P011 and P015 lead in interceptions with 4 each, indicating strong defensive performances by these players.

## Top Passers - Pass Completion Rate

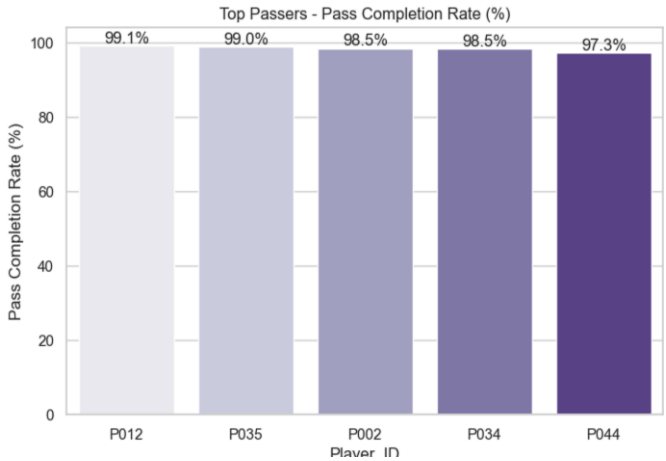



*Figure 4 Pass Completion*

The bar chart provided below grades pass completion rate on different players and according to this chart the highest pass completion rate was of P012 that is 99.1% while P035 has a 99.0% pass completion rate. Each player has extraordinary pass accuracy that shows great performance in passing which is key for teamwork.

## Radar Chart for Visualizing Player Performance

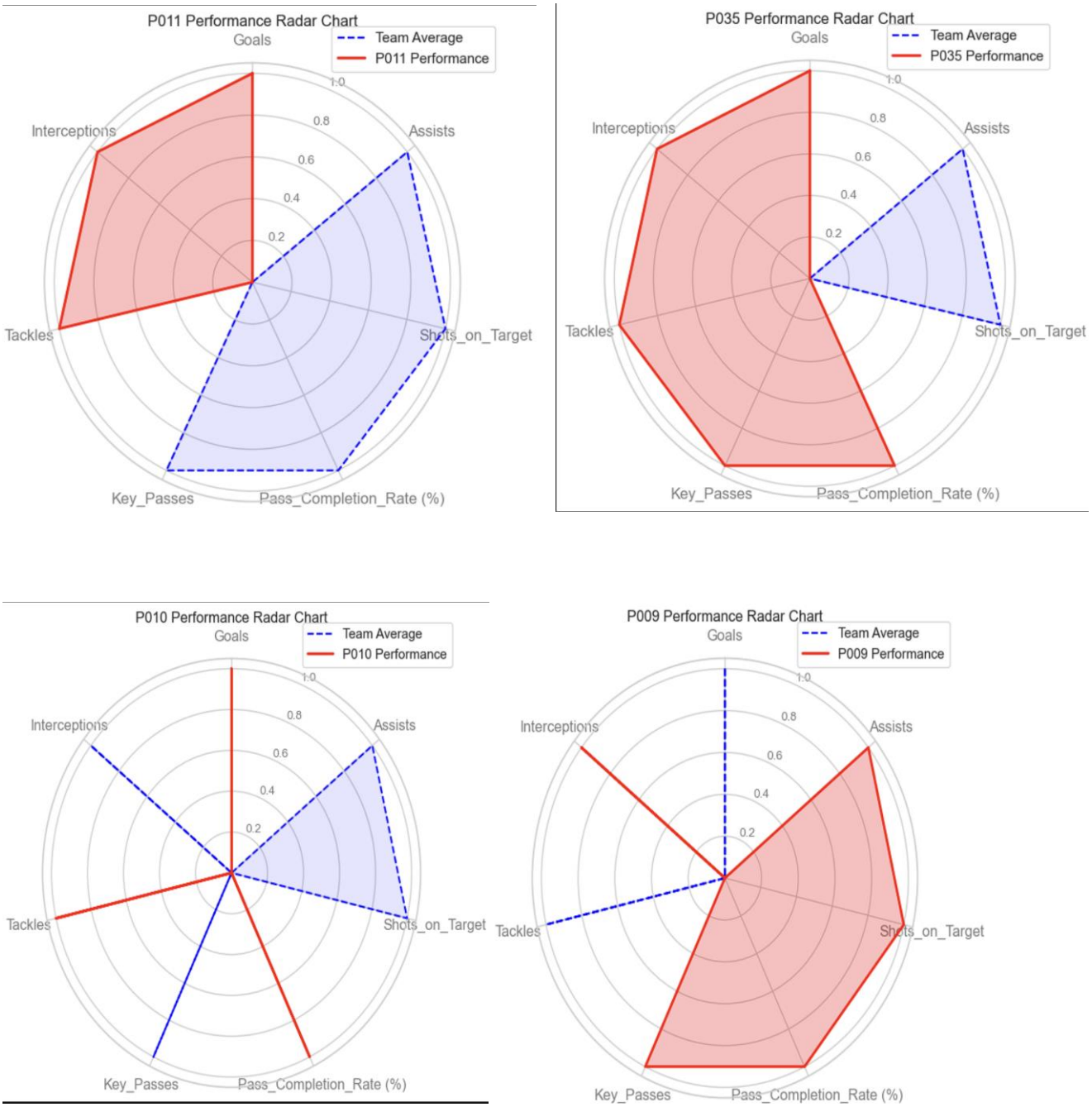



*Figure 5 Performance radar chart*

The radar charts include the performances of the players such as P011, P035, P010 and P009 in terms of goals, assist, tackles and pass completion rate compared to the overall team performance. Player P011 and P035 shows high propensity on both interceptions and tackles, P010 is more oriented on goals while P009 is highly efficient on shots on target and completion of passes, which demonstrates variety of strengthening in the team.

## Distribution of players Architypes

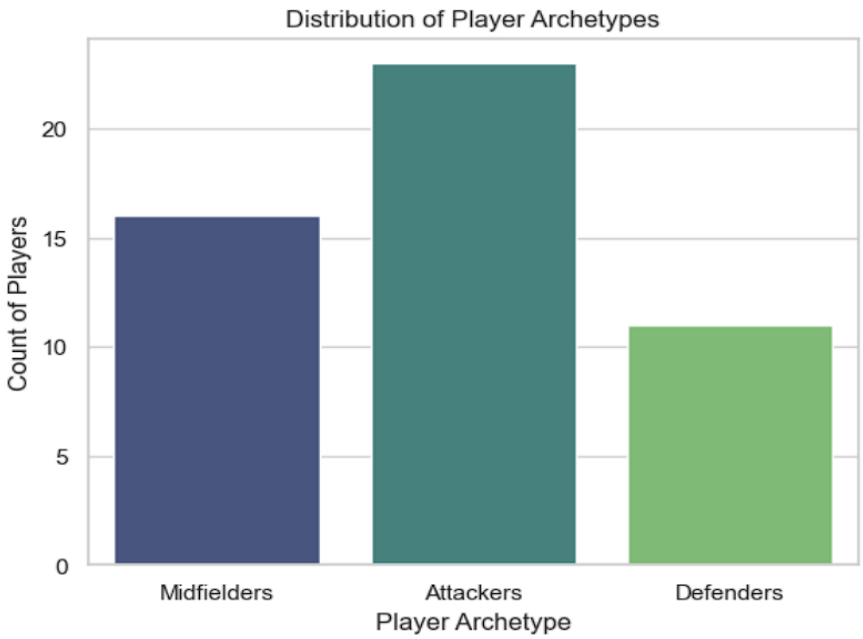



*Figure 6 Clustering players*

Clustering players based on KPMs helps identify player archetypes (e.g., attackers, defenders, playmakers), aiding in role-specific analysis.

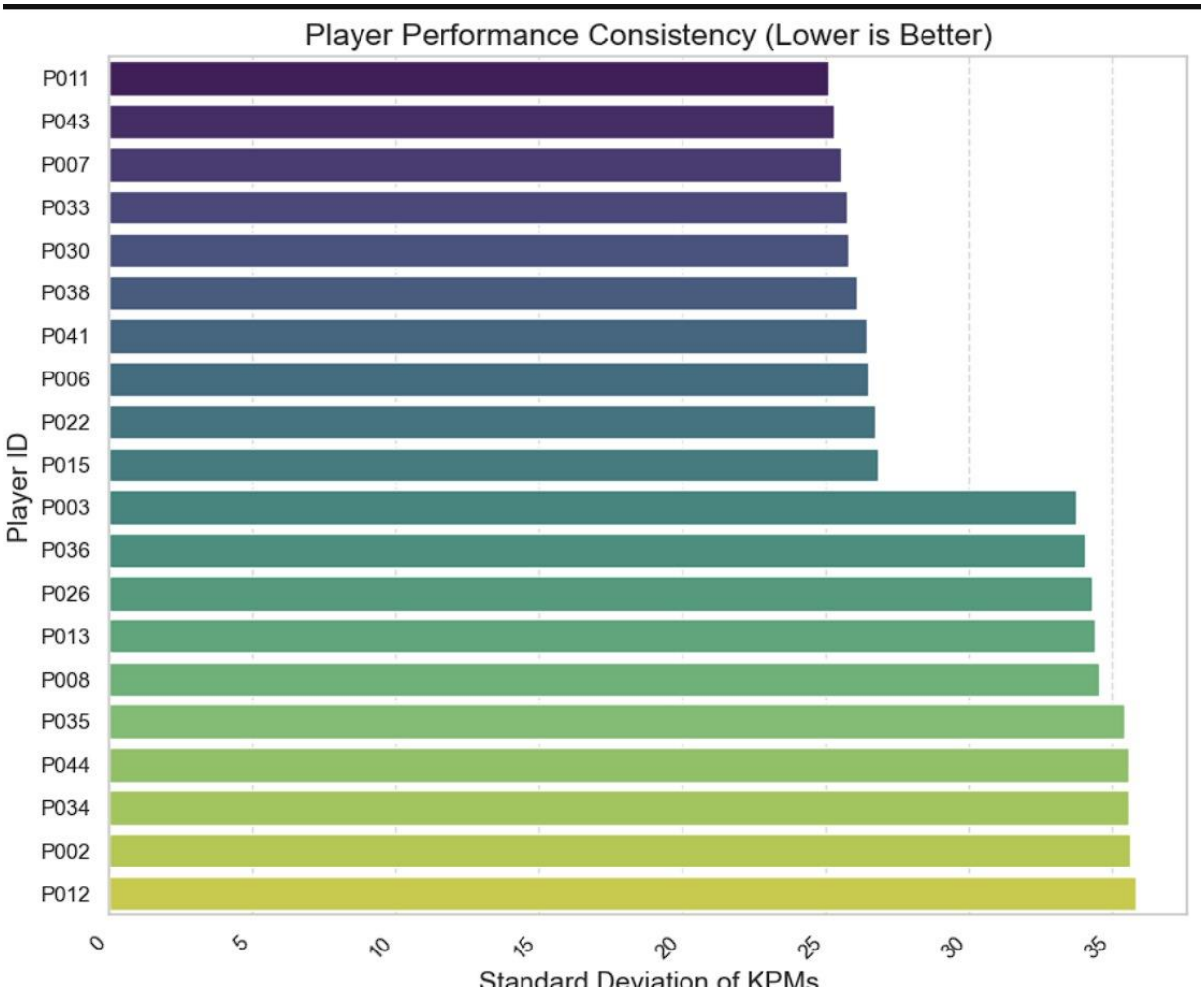



*Figure 7 Player Performance*

**How Coaches Can Use This Analysis:**
This report provides coaches with objective information about players justifying their performance, stability, and natural positions, and better decisions on positioning, role allocations, and training emphasis.

- **Top Performers:**
  Comparing Z-scores and radar charts, which can be seen below, makes it easy for coaches to identify players with high scores for particular skills, when it comes to choosing avanc-ed position players.

- **Consistency:**
  By assessing players with consistent and stable performance, the coaches are forced to protect such talents for the important positions in the team, in order to develop a strong foundation.

- **Archetypes:**
  Dividing players by position by means of ability shows how they fall into the structure of the team. Coaches are able to set roles and once a strategy is given it would improve on the teams cohesiveness and efficiency.

## 7.CONCLUSION:

The use of machine learning approaches in the performance of the players gives Vancouver Whitecaps FC a competitive advantage in improving player selection and total organizational performance. When the pattern of players' exploitation is recognized, the frequency of their manifestation is assessed, the compatibility with certain positions is considered, the coaching team receives statistically-based solutions that it is capable of offering a direct impact on the outcomes of games.

This paper helps the Whitecaps leverage on technology to get superior intelligence to aid in their planning and the ultimate quest for an MLS title. By adopting these factors, it will not only increase player utilization, but also shape new thinking in performance and career progression.

This comprehensive work is done with the aim to provide the concept about the existential and probable functions of AI and machine learning, which can be helpful for achieving the Whitecaps' strategic objectives.

## 8. AI DISCLOSURE:

To improve the readability and structure of this report, the support of artificial intelligence tools was used. AI was used to address the report's architecture and to check that technical descriptions were comprehensible to the stakeholders All analyses, recommendations, and software suggestions were based on model evaluations and collective group input. The last proposal and inventory optimization strategies are reflective of the team's knowledge in AI as well as inventory control to support Gadget Galaxy's values for business operations and customer fulfillment. AI tools were acting as an additional assistant with all the key information and important decision making based on the team's expertise.

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