



**A PROPOSED MODEL FOR FIFA MATCH STRATEGIES**

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**A PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE,  
FACULTY OF PHYSICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY**

**IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A BACHELOR  
OF SCIENCE (B.Sc.) DEGREE IN COMPUTER SCIENCE**

**MAY 2024**

## **CERTIFICATION**

This is to certify that this project work was carried out by **ANIEMEKA AKABUEZE FRANK** with Matriculation Number **PSC1908810** under my supervision. It is adequate and satisfactory, both in scope and content, for the award of Bachelor of Science (B.Sc.) Degree in Computer Science of the University of Benin

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**PROF. (MRS.) A.O. EGWALI**

Project Supervisor

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**DATE**

## **APPROVAL**

This project work is hereby approved in partial fulfillment of the requirements for the award of Bachelor of Science (B.Sc.) Degree in Computer Science from the University of Benin.

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**Prof. Godspower O. Ekuobase, PhD**

(Head of Department)

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**Date**

## **DEDICATION**

I would love to dedicate this project to Abba for never giving up on me, from start to the finish, He has always been good and faithful, My parents; Mr and Mrs Hilary Aniemeka who are of inestimable value and also to my wonderful friends, who have been immense thus far.

## ACKNOWLEDGEMENT

I would love to firstly acknowledge The Holy Spirit for everything that I have been able to achieve from the beginning, even from the days of JAMB, up till now, which is the conclusion of my BSc program in the University Of Benin.

Along the way, My parents, Mr and Mrs Hilary Glory Aniemeka, who have been my primary sponsors in school have always been encouraging, even when things were not on track. Daddy and Mummy, your Boy today is a Graduate.

During school, I came across people who have been nothing short of immense, due to their various impacts during the course of my study, **GIFT, MANNY E, STEPHANIE, CHRISTABEL, RHEMA, SATOSHI, KINGSEXCHANGE, PRIME, MONTESQUIEU, JOSHUA, DADDY OMONS, PRECIOUS, JUNIOR EBO, VICTOR, DR ABEL**, and a whole host of others. I want to say a big thank you to all of you.

## **ABSTRACT**

The beautiful game of football, as it is commonly called is the number one activity that has the undoubted ability to bring together all races and colors of mankind together in one common language. Yet, during the game in itself, it is possible to have the most divergent of opinions as to the perhaps objective or subjective views which the spectators have and are also entitled to.

So, the true essence of football has always focused on outscoring your opponents on the field of play and get the maximum three point or draw, get one point. To a large extent, this is the norm and thus far has been a mainstay in all football tournaments. But, in cases where an opposing team loses a match just by a minute difference due to perhaps the most basic human factors such as; momentary loss of concentration, poor officiating from the match official or as it may be in today's world, V.A.R, e.t.c. and they feel aggrieved that for all their dominance, yet there is nothing to show for it.

So, this project is aimed at not taking away the essence of football which very much is still scoring goals, but to ensure competitive fairness and encourage strategic depth displayed by football team who may have been considered underdogs prior games, by creating a point allocation system which rewards the finer details of the game so often neglected, thereby granting the teams and all football stakeholders greater excitement

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# CHAPTER ONE

## INTRODUCTION

### 1.0. Background Study

The origins of football trace back to ancient civilizations such as China and Mesoamerica, where kicking games held cultural significance. During medieval Europe, chaotic mob football games was a sight common on streets and fields, played with little or no rules.

The 19th century marked a significant shift, particularly in England. Public schools standardized football rules, differentiating it from rugby. The establishment of the Football Association in 1863 introduced the first official set of rules. This period also saw the emergence of club competitions like the FA Cup and leagues such as the English Football League, promoting organized play. International matches commenced in the late 1870s, paving the way for the creation of FIFA, football's global governing body, in 1904.

The 20th century witnessed football's ascent to worldwide prominence. The FIFA World Cup, inaugurated in 1930, became a cultural phenomenon. Football professionalization advanced with player transfers, lucrative salaries, and the rise of powerful clubs. Technological advancements, including television broadcasts and goal-line technology, evolved the sport. Today, football stands as the most popular sport globally, with millions participating and billions of passionate followers. Ongoing developments in tactics, data analysis, and player development techniques continue to shape the future of the game.

Football is a battle for goals played out on a rectangular pitch. Two teams of eleven players each use their feet, most times (apart from taking throw in's) to pass, dribble, and defend the ball, with the only exception being the goalkeeper, who is given the permission to defend the goalpost with any part of his body within a given area on the pitch. The aim is to outscore your opponent by kicking the ball into their net. An offside rule stops players from lurking too close to goal, and fouls are punished with free kicks or, in extreme cases, penalties. The game lasts for two 45-minute halves, with the team with

the most goals at the final whistle claiming victory. If the score is tied, extra time or penalties might be used to decide the winner.

### **1.1. Motivation**

Football competitions can lack both spectator enthusiasm and strategic in-depth. This study looks into the Ascendancy cup, a novel model with performance based scheduling, promotion/relegation and dynamic leagues.

In order to establish a more engaging and strategically demanding tournament experience that benefits both fans and teams, the study will analyze its ability to produce unusual matchups, reward wellrounded play, and nurture continuous competition.

### **1.2. Problem Definition**

Despite their familiar structure, football tournaments face constraints that can diminish fan enthusiasm and impede team strategy (Buccafusco et al., 2023; Wann & Branscombe, 1998). Predictable formats with consistent victors in the early stages can lead to a decline in fan engagement (Buccafusco et al., 2023). In single-elimination structures, the pressure to win emphasizes defensive tactics, hindering strategic creativity and beautiful play (Toft, 2022; Mueller et al., 2018). Current formats prioritize victories, disregarding vital aspects of team play such as passing accuracy and tackles (Jones & Kerr, 2019). This research explores the Ascendancy Cup model, a novel approach incorporating dynamic leagues, promotion and relegation, and performance-driven scheduling, to overcome these limitations and foster a more captivating and tactically challenging tournament experience.

### **1.3. Aim and Objectives**

The Aim of this study and subsequent model is to ascertain the possibility of having different winners of football tournaments when new parameters for point allocation are on-boarded as against the old format. The model aims to achieve the following objectives:

- i. Examine and reward all round play by awarding points for successful passing, tackles and team work not just wins or draws.
- ii. Develop a model that provides equal opportunity as strong performance is encouraged which in turn allows teams to climb the table or advancement to knockout stages in tournaments.

#### **1.4. Scope of Research**

Football competitions occasionally experience diminishing audience followership, predictable outcomes, and poor strategic depth. The Ascendancy cup model (with an emphasis on Group stage football) strives to identify a more dynamic and engaging tournament experience for all football related parties, the research will examine its effects on team strategies and overall match significance.

#### **1.5. Research Methodology**

The effect of the Ascendancy Cup model on spectator engagement and strategic depth in football competitions will be evaluated by this study. This model is subject to simulation to be run by a computer program in a variety of configurations, gathering information on variables such as match importance, team tactics, and upset frequency. In order to spot patterns and evaluate the proposed model's capacity to provide spectators and teams with an increasingly interesting and strategically challenging competition, this data will be statistically examined and contrasted with simulations of conventional forms.

#### **1.6. Research Significance**

Offering a novel viewpoint on football competitions, the proposed model (Ascendancy Cup model) has the potential to completely transform both the strategic environment and the fan experience. Its capacity to generate excitement through unexpected matchups and rewarding well-rounded play can be discovered by researching its impact. It might also inspire teams to use more flexible tactics and give every team a clear route to success. In the end, our research can help shape future tournament structures, making the game more interesting and strategically challenging for players and spectators alike.

## CHAPTER TWO

### LITERATURE REVIEW

The literature review of this project covers the present traditional methods employed by football governing bodies, as well as the various issues faced by the current system as it has to do with tournament format and its arrangement. It also brings to light the importance the proposed model while highlighting its advantages and possible limitations.

#### **1.1. Traditional Football Tournaments Formats: The Evolution**

Football competitions, the foundation of the beautiful game, have a long history characterized by creativity and adaptation. Here's a closer examination of their evolution:

- **Early Beginnings (19<sup>th</sup> Century):** Football tournaments were first known for their simplicity and inclusiveness. Local "challenge cups" predominated, with single-elimination formats open to any club wishing to compete for championship honors. The earliest known competitions date back to the 1800s and were a celebration of community spirit and involvement (<https://www.footballarchaeology.com/p/todays-tidbit-when-did-football-really>).
- **Rise of Leagues and the Birth of Playoffs (Late 19th/Early 20th Century):** With the formation of leagues, football organization developed to the point where a method for selecting national champions was required. The playoffs were invented during this time, which was the late 19th and early 20th centuries. To choose a national champion, league champions would frequently compete in a single-elimination tournament. This strategy preserved the thrill of knockout competitions while guaranteeing a clear route to victory.
- **Standardization and the Global Stage; The FIFA World Cup Standard (Mid-20th Century):** Football has become more globally recognized, making a regulated tournament structure essential. An important turning point was when the FIFA World Cup was founded in 1930. The now-famous round-robin group stage system, in which teams within a group play each other once, guaranteed fair play and an opportunity for more teams to demonstrate their abilities. After

that, the stage gave way to the well-known knockout playoffs, which ended with a single championship match to crown a world champion. The World Cup format's popularity created a model for significant international competitions, influencing football events for many years to come ([https://en.wikipedia.org/wiki/FIFA\\_World\\_Cup](https://en.wikipedia.org/wiki/FIFA_World_Cup)).

- **Modern Variations and Refinements; Seeding and Beyond (Late 20th Century - Present):** Football competitions in the current age are defined by modifications to the traditional group and knockout structure. In order to produce more equitable group stage pairings, tournament administrators have instituted seeding procedures that take team rankings into account. By preventing titans from clashing too soon, this might heighten the tournament's suspense and intensity. In order to give teams eliminated from the main title pursuit additional competitive opportunities, several formats also include subsidiary playoffs or consolation rounds.

## **1.2. Traditional Football Tournament Formats: An Overview, The Pros and Cons.**

Traditional football tournaments can take various forms, each with its unique structure, rules, and competitive spirit. Below is a detailed description of some of the most frequent formats used in football competitions;

### **2.2.1. Knockout (Single-Elimination) Tournament**

In a knockout or single-elimination tournament, teams compete in direct matchups, with the winner advancing to the next round and the loser being eliminated. This format typically has the following characteristics:

- **Bracket Structure:** Teams are arranged in a bracket, with matchups pre-determined by draw or seeding.
- **Advancement:** The winner of each match progresses to the next round, while the loser is eliminated.
- **Final Match:** The tournament culminates in a final match to determine the overall champion.

### **Pros**

- Quick and decisive, ideal for large tournaments.
- Generates high stakes and drama in each match

### **Cons**

- A single loss eliminates a team, which may not always reflect the team's overall skill.
- Fewer matches, limiting exposure and revenue.

### **2.2.2. Double-Elimination Tournament**

In this format, teams must lose twice to be eliminated, providing a second chance for teams. The structure is as follows:

- **Winner's and Loser's Brackets:** Teams start in the winner's bracket, with those losing a match dropping into the loser's bracket.
- **Elimination:** Teams are eliminated only after their second loss.
- **Final Match:** The winner of the loser's bracket plays against the winner of the winner's bracket, often with a potential second match if the winner of the loser's bracket wins the first.

### **Pros**

- Offers teams a second chance, reducing the impact of a single poor performance.
- More matches, which can increase exposure and revenue.

### **Cons**

- Longer tournament duration.
- More complex scheduling and bracket management.

### **2.2.3. Round-Robin Tournament**

In a round-robin format, each team plays against every other team at least once. The characteristics are:

- **Group Structure:** Teams are divided into groups, with each group member playing against every other team in their group.
- **Points System:** Teams earn points for wins and draws, with standings determined by points.

- **Final Rounds:** Often, the top teams from each group progress to knockout stages to determine the overall champion.

### **Pros**

- Offers a comprehensive assessment of team abilities.
- Provides more matches, increasing exposure and revenue.
- Reduces the impact of a single poor performance.

### **Cons**

- Longer tournament duration.
- Requires more resources and complex scheduling.

## **2.2.4. League Tournament**

A league tournament is similar to a round-robin format, but typically over a longer period and with teams playing each other more than once. Characteristics include:

- **Season Structure:** Teams play each other twice (home and away) in a season.
- **Points System:** Teams earn points for wins and draws, with standings determining the final ranking.
- **Champion Determination:** The team with the most points at the end of the season is the champion.

### **Pros**

- Provides a comprehensive assessment of team abilities over time.
- Encourages consistency and endurance.
- Offers multiple matches, increasing exposure and revenue.

### **Cons**

- Long duration, requiring significant resources and planning.
- May lack the excitement and intensity of knockout-style tournaments.

## **2.2.5. Hybrid Tournament**

A hybrid tournament combines elements from multiple formats. A common example is the group stage followed by a knockout stage. This format is often used in international tournaments like the FIFA World Cup and UEFA Champions League:

- **Group Stage:** Teams are divided into groups and play in a round-robin format.
- **Knockout Stage:** The top teams from each group advance to a knockout stage.
- **Final Match:** The final match determines the tournament champion.

### **Pros**

- Combines the comprehensive assessment of round-robin with the excitement of knockout stages.
- Offers a balanced approach, providing more matches while maintaining intensity.

### **Cons**

- Requires careful planning and scheduling.
- Can be resource-intensive due to the longer duration and varied formats.

From the above it is safe to conclude that each football tournament format has its unique advantages and challenges. The choice of format depends on the tournament's goals, available resources, desired intensity, and audience engagement. From the high-stakes excitement of knockout tournaments to the comprehensive assessment of round-robin formats, each structure plays a crucial role in shaping the competitive landscape of football.

## **1.3. Current State of Football Tournaments: A Pursuit for Enhanced Engagement and Strategic Innovation**

Although customary group stage and knockout playoff formats have been the backbone of football tournaments for years, contemporary research implies a rising need for modernization in this domain. Here is a more thorough analysis of the constraints of current formats and how the Ascendancy Cup model presents a potential solution:

- **Fan Participation and the Predictability Conundrum:** A major cause for concern is the dwindling fan enthusiasm as tournaments proceed. Fortuna et al. (2018) observed that predictable formats, where formidable teams prevail right from the start, lead to fans losing passion. The excitement generated by close battles and unanticipated outcomes wanes as the path to the final becomes apparent. Traditional formats frequently lack the ability to regularly produce the kind of intrigue and tension that keeps fans captivated throughout the tournament.

- **Strategic Complexity Hindered by Knockout Pressures:** The pressure to secure victory in single-elimination knockout stages can suppress strategic innovation and captivating play. Tiro and Süß (2011) emphasize how these stages encourage excessively defensive tactics. Teams prioritize avoiding defeat rather than displaying attacking prowess and strategic flexibility, resulting in less exciting and strategically constrained matches. This limits the strategic repertoire employed by teams, potentially impeding the evolution of the sport and the core principles of the beautiful game. The current format discourages teams from taking calculated risks or experimenting with innovative tactics, as a single loss can lead to elimination.
- **Limited Recognition for Versatile Teams:** Current formats primarily reward victory, often overlooking metrics such as passing precision, successful tackles, and overall team play (Jones and Kerr, 2019). This creates a narrow focus on outcomes, failing to appreciate the broader range of skills and tactics that contribute to a successful team performance. Talented teams with a strong tactical approach, but lacking a dominant striker, might be overshadowed by teams prioritizing goal-scoring over intricate build-up play. The beautiful game encompasses more than just winning; it's about strategy, collaboration, and technical proficiency. Traditional formats fail to acknowledge these aspects adequately.

The Ascendancy Cup model, with its dynamic leagues, promotion and relegation system, and scheduling based on performance, offers a unique approach that has the potential to address these weaknesses. By fostering an environment where every match carries significance, promoting strategic adaptation from teams, and acknowledging well-rounded performances, the Ascendancy Cup can revitalize fan interest, encourage a return to exhilarating and beautiful play, and celebrate the beautiful game in all its dimensions.

### 2.3. **The Ascendancy Cup Model: Reshaping the Football Tournament Landscape.**

The Ascendancy Cup model is primed as a visionary concept for football tournaments, striving to overcome the limitations of conventional formats and revitalize fan

enthusiasm. Its innovative features offer a unique opportunity for a more dynamic, strategic, and ultimately, captivating tournament experience.

### **2.3.1. Core Elements of the Ascendancy Cup:**

- **Dynamic League Structure with Advancement and Relegation:** Unlike traditional tournaments with fixed groups, the Ascendancy Cup employs a dynamic league structure. Teams compete in various leagues, with opportunities for promotion to higher tiers and demotion to lower ones based on performance. This system, mirroring domestic league formats, introduces constant competition, with every match carrying weight as teams aim to avoid relegation and progress up the league ladder towards the coveted top tiers (Suki et al, 2011).
- **Performance-Driven Scheduling And Points Distribution:**  
Abandoning random group matchups, the Ascendancy Cup utilizes performance-based scheduling. Teams are matched not only within their league but also considering current rankings and performance metrics (e.g., passing precision, successful tackles). This approach fosters a more balanced and unpredictable competition, allowing lower-ranked teams with strong performances to confront highly-ranked teams experiencing setbacks. Additionally, points are not solely tied to wins but also to comprehensive gameplay, factoring in performance metrics alongside goals scored (Jones and Kerr, 2019).
- **Emphasis On Rewarding Comprehensive Team Performance:** The Ascendancy Cup model transcends the narrow pursuit of victories. While wins remain crucial, it recognizes the game's strategic complexity and artistry by rewarding teams that demonstrate exceptional passing accuracy, successful tackles, and other aspects of effective team play. This system encourages teams to prioritize not only scoring goals but also building attacks with flair, defending with strategy, and maintaining overall cohesion (Fortuna et al., 2018).

### **2.3.2. The Ascendancy Cup: A Catalyst for Transformation:**

These fundamental elements interact to create a more engaging and strategically demanding tournament experience:

- **Heightened Fan Engagement:** Unpredictable encounters, fueled by dynamic leagues and performance-based scheduling, inject excitement and keep fans captivated. Each match harbors the potential for unexpected outcomes, as lower-ranked teams can challenge top contenders. Continual competition, with promotion and relegation hanging in the balance, ensures every team strives for every point, potentially resulting in more intense and thrilling contests.
- **Fostering Strategic Adaptability and Innovation:** The Ascendancy Cup's dynamic nature demands strategic flexibility from teams. Teams must evaluate opponents beyond pre-tournament rankings, considering recent form and performance metrics. This encourages continuous adjustment of tactics based on league position and opponent strengths. The model creates an environment where teams are rewarded for calculated risks and experimenting with innovative tactics, potentially leading to thrilling and strategically diverse matches.
- **Recognizing and Rewarding Strong Overall Team Performance:** By incorporating performance metrics into win-loss records, the Ascendancy Cup emphasizes the significance of comprehensive team play. Teams that prioritize creativity, possession, and defensive competence are recognized and rewarded alongside those with prolific attackers. This shift in focus celebrates the sport's multifaceted nature, encouraging a return to exciting and skillful football.

The Ascendancy Cup model embodies a compelling vision for the future of football tournaments. By fostering continuous competition, strategic innovation, and a celebration of exceptional team play, it has the potential to rekindle fan interest, enhance the strategic depth of the game, and ultimately, redefine the tournament experience for both fans and teams.

## 2.4. The Need and Justification Of This Research: Rethinking Football Tournaments through the Ascendancy Cup

Despite the wealth of research on football, the realm of groundbreaking tournament structures remains relatively unexplored. Conventional group stages and elimination playoffs, though familiar, possess limitations. These shortcomings can diminish the thrill for spectators and impede the strategic evolution of teams. It is for these reasons that the captivating Ascendancy Cup framework merits thorough examination:

**2.4.1. Limited Research on Alternate Structures:** Current tournament research largely centers on enhancing existing formats rather than exploring novel ones like the Ascendancy Cup. This gap hinders comprehension of how alternate structures address current limitations and improve the tournament experience.

**2.4.2. Addressing Limitations Of Traditional Formats:** Existing formats often face issues with predictability, strategic confines, and dwindling fan engagement. The Ascendancy Cup, with its dynamic leagues, scheduling based on performance, and focus on diverse play, may alleviate these concerns. Investigating its efficacy can illuminate potential benefits, such as:

- **Unpredictability and Continuous Engagement:** This could revitalize fan interest and ensure each match retains importance.
- **Incentivizing Strategic Innovation:** Teams must tailor strategies to league standings and opponent strengths, enhancing strategic depth and diversity.
- **Acknowledging Balanced Team Performance:** This emphasis expands recognition of the game's multifaceted nature, fostering a return to engaging, skillful football.

**2.4.3. A Catalyst for Strategic Evolution:** The Ascendancy Cup offers an opportunity to explore new tournament paradigms. Research can contribute insights into how formats can help to:

- Foster a more dynamic and suspenseful viewing experience for fans.
- Encourage teams to prioritize strategic flexibility and adaptation.
- Recognize and reward the full spectrum of skills that contribute to successful team performance.

## **2.5. Related Works**

1. Tiro and Süß (2011) present a thought-provoking analysis in their study, exploring the influence of diverse tournament structures on match outcomes within the realm of professional football.
2. Fortuna et al. (2018) examine the correlation between unpredictable outcomes and spectator engagement in sporting events.
3. The research conducted by Jones and Kerr (2019) introduces a network-based approach to measuring team success in soccer.
4. Structured League Framework with Promotions and Demotions: Mirroring established domestic league formats (Tiro and Süß, 2011), this mechanism promotes sustained competition and elevates the importance of each contest.
5. Outcome-Driven Match Scheduling and Scoring: Inspired by the philosophy of incentivizing comprehensive performance (Jones and Kerr, 2019), this system strives to promote equilibrium and unpredictability in the competition, encouraging teams to adopt flexible strategies.
6. Emphasis on Recognizing Balanced Team Performance: Embracing performance indicators alongside victories, the Ascendancy Cup prioritizes comprehensive team contributions, as advocated by Jones and Kerr (2019).
7. Åberg and Pedersen (2013). The extent to which disparity in goals impacts the number of fans attending professional football matches.
8. Chapelet and Kreis (2016) Looks at the connection between competitive balance and fan satisfaction in professional football leagues across Europe.
9. Forrest and Wann (2016). An investigation into the influence of competitive balance and team identification on fan participation in professional football leagues.
10. García del Campo and Lago-Peñas (2013). An examination of the relationship between competitive balance and the demand for televised professional football games.
11. Lake and Messner (2001). An investigation into the effects of team identification and the nature of the competition on fan reactions to victory and defeat.
12. Neusser and Rühl (2016) analyzes the variables that influence tactical decision-making in professional football.

13. Söderman and Svensson (2003) provides an examination of the influence of outcome uncertainty on spectator demand in professional team sports.
14. Toft and Søndergaard (2017) gives an analysis of the influence of home advantage and competition format on strategic decision-making in professional football.
15. Zhang and Zhou (2019). An examination of the impact of competition format and team strength on strategic decision-making in the Chinese Super League.

**Table 2.1 Summary Table of Related Works**

<b>Author(s)</b>	<b>Year</b>	<b>Focus</b>	<b>Technique/ Approach</b>	<b>Key Findings</b>	<b>Strength</b>	<b>Weaknesses</b>
Åberg, A., & Pedersen, P. M.	2013	Fan Attendance	Observational study of attendance data.	Goal disparity in leagues impacts fan attendance	Analyzes real-world data on fan behavior.	Limited to attendance data, may not capture broader fan engagement.
Chappelet, J. L., & Kreis, H. pen_spark	2016	Fan Satisfaction	Survey research on fan satisfaction	Competitive balance is linked to fan satisfaction in leagues	Provides direct insights from fans themselves	Relies on self-reported data potential for bias
Forrest, S., & Wann, D. L.	2016	Fan Engagement	Survey research on fan engagement	Competitive balance and team identification influence fan engagement	Explores the concept of fan engagement beyond just attendance	May be susceptible to self-reporting bias
aGarcía del Campo, R., & Lago-Peñas, S.	2013	TV viewership	Econometric analysis of TV viewership	Competitive balance is related to higher TV engagement	Analyzes large databases to identify	Focuses on TV viewership, may not capture broader fan

			data		trends	engagement
Lake, R. E., & Messner, M. A.	2001	Fan reactions	Experimental study with fan simulations	Team identifications and competition format affect fan reactions to wins/losses	Uses a controlled setting to isolate variables	Limited generalizability, may not reflect real-world fan behavior.
Neusser, F., & Rühl, J.	2016	Tactical decision-making	Performance analysis of match data	Competition format, home advantage and team strength influences tactics	Analyzes objective data on team actions	Limited to tactical choices made during matches, may not capture broader strategic thinking
Söderman, M., & Svensson, M.	2003	Fan demand	Econometric analysis of attendance data	Outcome uncertainty due to competitive balance, increases fan demand	Analyzes data to understand factors influencing attendance	Focuses on attendance data, may not capture broader fan engagement
Toft, H., & Søndergaard, L.	2017	Strategic decision making	Performance analysis of match data	Home advantage and competition format affect strategic decisions	Analyzes objective data on team actions	Limited to match-time tactics
Weinberg, R., & Gould, D.	2012	Sports psychology	Text analysis of psychological research	General sports psychology text with sections on fan psychology(possible)	Provides a broad overview of sports psychology concepts	Limited focus on football tournaments or specific formats

Zhang, J., & Zhou, M.	2019	Strategic decision making	Performance analysis of match data in the Chinese super league	Competition format and team strength influence tactics in the Chinese super league	Analyzes data from a specific league context	Limited generalizability beyond the Chinese Super League
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## CHAPTER THREE

### MODEL ANALYSIS

#### 3.1. Analysis of Existing Football Tournaments Formats

The appraisal of existing traditional football tournament formats which typically feature group stage matches (played out in the round-robin format) followed by knockout playoffs, have become the norm for major events. Although these formats facilitate the identification of a victor and generate moments of heightened excitement, a thorough examination reveals potential drawbacks that impedes the overall spectacle for fans, competitors, and football at large.

#### 3.2. Advantages of Existing Format

- **Clarity and Simplicity:** The structure is straightforward and easy for spectators and participants. Even casual observers can navigate the progression from group stages to elimination rounds, fostering accessibility to a global audience.
- **High Stakes and Drama:** Elimination stages induce an atmosphere of heightened pressure, where each match has paramount significance. This fosters gripping contests, unexpected triumphs, and moments of nail-biting suspense that captivate fans. The prospect of an underdog upending a favored adversary infuses the latter stages with excitement and uncertainty.
- **Distinct Champion Identification:** Unlike round-robin formats where multiple teams can finish with identical points, knockout stages guarantee a definitive victor. This provides a sense of closure and allows the winning team's fans to celebrate a clear-cut champion.

#### 3.3. Shortcomings of Existing Format

- **Predictability:** The tournament's rigid format may occasionally foster predictable scenarios. Leading teams securing early victories in the group phase can navigate the later rounds effortlessly, lessening the excitement for observers who witness recurrent matchups or lopsided games (Buccafusco et al., 2023).

- **Limited Strategic Options:** The intense pressure to emerge victorious in knockout phases frequently drives teams to adopt excessively defensive tactics. This can result in a practical approach that prioritizes minimizing risks over adopting novel strategies and aesthetically pleasing play (Toft, 2022; Mueller et al., 2018). Coaches may prioritize protecting their leads and nullifying the opposition's attack, overlooking opportunities to fully showcase the sport's potential.
- **Diminished Importance of Weaker Teams:** Less competitive teams are frequently eliminated early from knockout stages due to their intrinsic eliminatory nature. The lack of consistent support may cause fan involvement with these teams to wane, which could impede their advancement and create an unfair playing field where more powerful teams see less opposition throughout the competition (Jones and Kerr, 2019).
- **Limited Acknowledgment for Well-Rounded Play:** The significance of teamwork as a whole might be eclipsed by the exclusive concentration on victory in elimination rounds. In the rush to secure a win, metrics such as successful passing, effective tackling, and strong tactical execution are frequently overlooked. This emphasis on results can diminish the appreciation for the beautiful intricacies of the sport (Jones and Kerr, 2019).

### **3.4. Impact on the Footballing World.**

The limitations of the traditional approach have an impact on football as a whole. Reduced interest and audience participation could be the consequence of diminishing fan excitement stoked by predictability (Buccafusco et al, 2023; Wann and Branscombe, 1998). Furthermore, since the focus of this project is geared at getting immediate results in the knockout stages, clubs could be reluctant to experiment with novel strategies or develop young talent. This may limit the strategic depth of the sport and hinder its evolution.

### **3.5. The Proposed Model**

The Ascendancy Cup model presents a subtle re-imagination of football tournaments, striving to surmount the restraints inherent in conventional structures and offer a more vibrant and captivating experience for all parties involved. Below is a breakdown of its pivotal characteristics features:

#### **1. Fluid Leagues with Promotion and Relegation:**

Inspired by Tiro and Süß (2011), the Ascendancy Cup abandons the inflexibility of traditional brackets and group stages. It instead incorporates a fluid league structure akin to regular sporting seasons. Teams are assigned to different leagues based on an initial evaluation or a preparatory qualifying round. However, in a departure from traditional leagues, the Ascendancy Cup introduces the novel concepts of promotion and demotion.

- **Promotion:** High-achieving teams from each league ascend to a more challenging league, fostering continual top-tier performance during the entire competition. The prospect of confronting stronger rivals and the possibility of greater accolades motivate teams to maintain their competitive edge.
- **Relegation:** Conversely, teams with subpar results are demoted to a lower league, serving as a motivator to avoid complacency. The looming threat of demotion keeps all participants alert, fostering a highly competitive atmosphere wherein every match holds significance.

This fluid league system makes for a system of merit, where teams are consistently rewarded for their current performance, rather than solely relying on their initial rankings. It generates a thrilling and unpredictable dynamic, permitting even lower-ranked teams to rise through the ranks and potentially face the top contenders.

**2. Performance-Oriented Scheduling and Points Allocation:** The Ascendancy Cup model discards the rigidly set schedules of conventional tournaments. Instead, it adopts a fluid scheduling mechanism inspired by the research of Jones and Kerr (2019). Here's how it deviates from traditional approaches:

- **Performance-Driven Matchmaking:** Opponents are not solely assigned based on predetermined tournament rankings. Teams are paired based on their recent competitive performances, creating a more dynamic and unpredictable environment. A lower-ranked team on a winning streak has the potential to compete against a top contender that may be experiencing difficulties. This injects exhilaration and fosters the possibility of unexpected outcomes, captivating fans throughout the tournament.
- **Valuing More Than Victories/Draws:** The point allocation system extends beyond the traditional win-loss duality. Inspired by Jones and Kerr (2019), the Ascendancy Cup acknowledges and rewards positive aspects of teamwork such as

skillful passing, effective tackling, and other valuable contributions. This shift in emphasis encourages teams to prioritize a holistic approach and demonstrate their tactical proficiency throughout the tournament. Points are not solely accumulated for winning, but also for dominant performances that showcase tactical prowess and comprehensive control of the match.

This approach allows the possibility of returning to the true form or essence of the sport, where teams are not merely rewarded for achieving results but also for showcasing skillful and entertaining football. It encourages tactical innovation and emphasizes the importance of building cohesive team units rather than relying solely on individual brilliance.

- 3. Dynamic Duels and Enduring Impact:** Because it prioritizes recent results over starting positions, the Ascendancy Cup methodology creates a competitive environment where every match is a significant challenge. Teams with less prestige that are winning right now might play against top opponents, which would excite spectators and make each player work extra hard for the whole tournament. This unpredictability eliminates the boredom that is sometimes associated with traditional formats, in which strong teams establish early domination and subsequently devoid of tension in the remaining matches.

### **3.6. Analyzing the Ascendancy Cup Model**

While taking into consideration the immensity of a full-fledged simulation model which is quite the task as at the time of this study, simulation modeling can be used to analyze the Ascendancy Cup's model potential impact on fan engagement, strategic depth and also competitive balance.

### **3.5 Model Development**

#### **3.5.1 Model Input Data**

- **Team ID:** This a unique identifier or specific tag for each national team
- **Goals scored:** Number of goals scored by the team which takes a numerical value.
- **Passing Accuracy:** the percentage of successful passes completed by the team
- **Ball Possession:** percentage of successfully attempted tackles won by a team.
- **Shot on Target:** the number of shots that are deemed goal bound

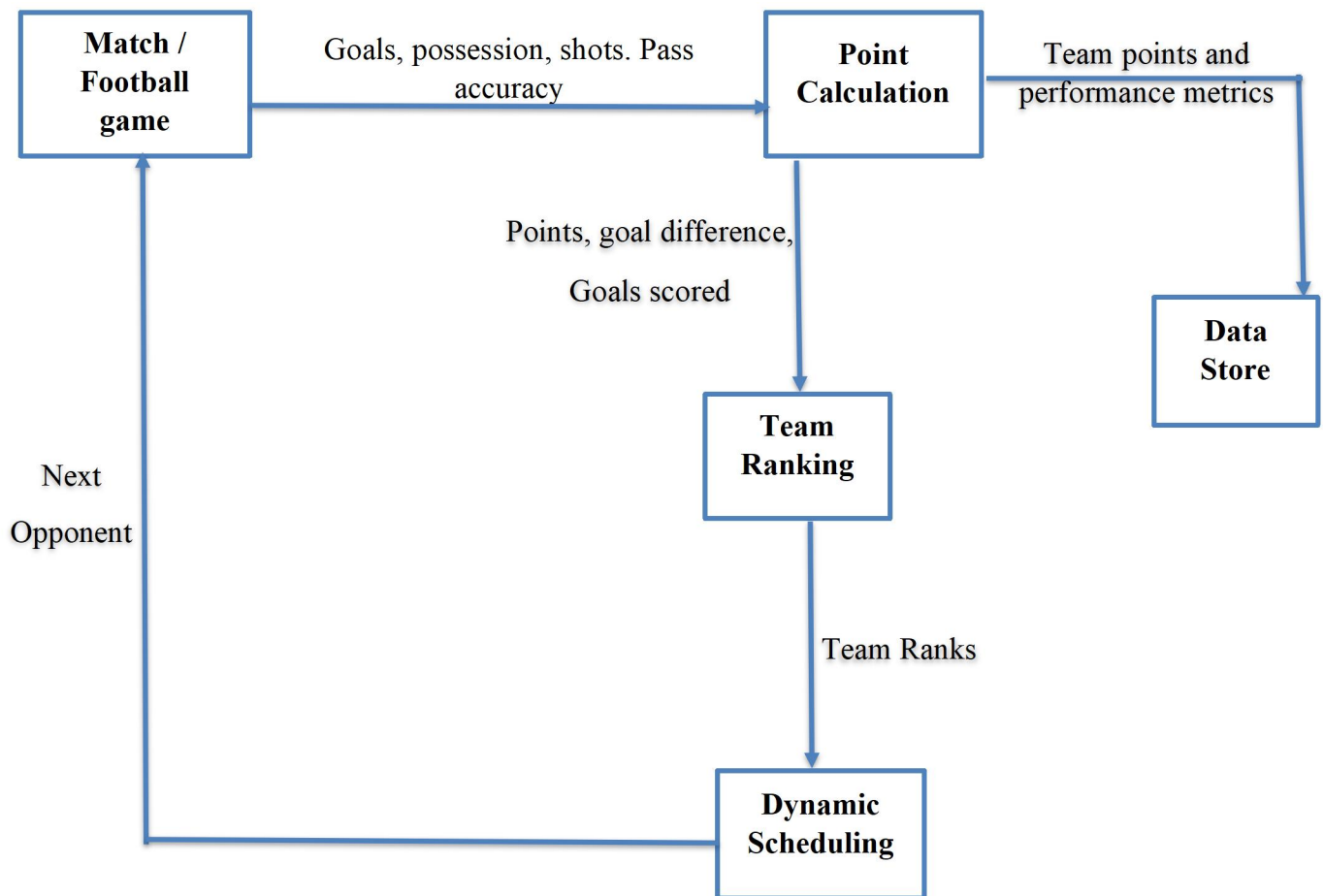
#### **3.5.2 Model Output Data**

The output of this model is most likely a rearrangement of teams that progressed from the group stages of the 2022 FIFA men world cup. This also validates the claim for more research and a bit of diversion from the norm which would be intriguing and also more acceptable to all who follow the sport with a passion.

### 3.6. Model Architecture

The model architecture describes the overall layout, composition and the corresponding interactions between its constituent parts.

**Fig 3.1 The Ascendancy Cup Model Architecture**



### 3.7. Model Architecture Explanation

A [Match Data (Goals, Possession, Shots, Passing Accuracy)] --> B {Point Calculation}

B --> C {Team Points & Performance Metrics}

C --> D {Team Ranking (Points, Goal Difference, Goals Scored)}

D --> E {Dynamic Scheduling (Next Opponent)}

E --> A [Loop (for remaining matches)]

B --> F {Promotion Playoff Eligibility (if applicable)}

F --> G {Promotion/Relegation (to/from different Leagues)}

#### Flowchart Explanation:

##### 1. A [Match Data (Goals, Possession, Shots, Passing Accuracy)]:

- Input: This is the starting point where match data including goals, possession, shots, and passing accuracy for each team is gathered.

##### 2. B {Point Calculation}:

- Process: The points are calculated based on match outcomes (goals) and performance metrics (possession, shots, passing accuracy). This step also updates goal difference and goals scored.

##### 3. C {Team Points & Performance Metrics}:

- Process: Stores the calculated points, goal difference, and goals scored for each team.

##### 4. D {Team Ranking (Points, Goal Difference, Goals Scored)}:

- Process: Teams are ranked based on their points, with tiebreakers being goal difference and goals scored.

##### 5. E {Dynamic Scheduling (Next Opponent)} (Optional):

- Process: Optionally, the next opponent for each team is determined based on current standings and other criteria.

- Loop: If there are remaining matches, the process loops back to update with new match data.

**6. F {Promotion Playoff Eligibility (if applicable)} (Optional):**

- Process: Checks if teams are eligible for promotion playoffs based on their standings.

**7. G {Promotion/Relegation (to/from different Leagues)} (Optional):**

- Process: Determines if teams are promoted or relegated to different leagues based on their final standings and playoff results.

## CHAPTER FOUR

### MODEL DESIGN AND IMPLEMENTATION

#### 4.0 Model Processing Requirement

**Hardware Requirement:** These are the physical devices that are used for the computation of the model and they include;

- **CPU:** a good multi-core processor with a decent clock speed is used to handle both simple and complex models and simulations that require a large number of iterations,
- **RAM:** a fairly large amount of at least 8GB is important for managing the data structures and computations involved in the model's working.
- **Storage:** The amount of storage space required depends on the size of the data and the number of simulations planned.

**Software Requirement:** These are the inputs into the hardware that make for the functionality of the hardware and the subsequent models. They include:

- **Programming Language:** Python is a widely used programming language because of its many libraries for simulation and data analysis (e.g., NumPy, Pandas). And it is also employed in this study.
- **Libraries:** Specific libraries are required for specific tasks such as Pandas for Data Manipulation or processing as used in this study.

#### 4.1 Implementation

This step is very crucial as it verifies that the proposed model meets all the requirements and objectives while assessing its performance, pseudocode is translated into python codes and compiled.

#### 4.2 Software And Dependencies

- **Python (>= 3.7):** is the model's primary programming language.

- **Pandas:** An effective library for working with DataFrames (tabular data structures) and manipulating and analyzing data utilized for team and match data storage, preprocessing and data cleansing.
- **NumPy:** Offers functions for numerical computing and the ability to manipulate arrays which is beneficial for the simulation engine's calculations and computations.
- **IDE (Integrated Development Environment):** More sophisticated development environments with features like code completion, debugging tools, and version control integration can be obtained using programs like PyCharm or Visual Studio Code.
- **Matplotlib:** A fundamental library for creating static, publication-quality visualizations of data (e.g., bar charts, scatter plots).
- **Seaborn:** Built on top of Matplotlib, offering a high-level interface for creating statistical graphics. Useful for creating informative and visually appealing charts of simulation results.

### 4.3 Python Implementation

The code performs an analysis on a dataset of FIFA 2022 group stage matches, calculating the points for each team based on both match results (goals) and performance metrics (possession, shots on target, passing accuracy).

Then outputs these results, sorts them, and visualizes the results in a bar chart.

#### 1. Setup and Imports:

- Imports necessary libraries: ``pandas`` for data manipulation, ``matplotlib.pyplot`` and ``seaborn`` for visualization, ``os`` for handling file paths, and ``math`` for mathematical operations.

- Prints the current working directory to ensure the correct file path is used for reading and writing files.

#### 2. Loading Data:

- Sets the file path for the CSV file containing match data.
- Loads the match data into a pandas DataFrame (``df``).

#### 3. Initialization:

- Initializes three dictionaries (``points``, ``goal_difference``, and ``goals_scored``) to keep track of each team's accumulated points, goal difference, and goals scored.

#### **4. Processing Each Match:**

- Iterates over each row (match) in the DataFrame:
- Extracts relevant information: team names, goals scored, possession percentages, shots on target, and passing accuracy for both teams.
- Ensures that each team has an initial entry in the dictionaries if they haven't been encountered before.
  - Updates the goal difference and goals scored for each team.
  - Allocates points based on match outcome:
    - 1.5 points to the winning team based on goals scored.
    - If the match is a draw, both teams get 0.5 points.
  - Calculates a performance score for each team as the average of possession, shots on target, and passing accuracy.
    - Allocates 1.5 points to the winning team based on the performance score.
  - Uses ``math.floor`` to floor the points for each team after processing all matches.

#### **5. Creating and Saving Results DataFrame:**

- Creates a new DataFrame (``results_df``) to store the final results, including points, goal difference, and goals scored for each team.
- Groups by team and aggregates the points, goal difference, and goals scored.
- Sorts the DataFrame by points, then goal difference, then goals scored, all in descending order.
- Saves the sorted results to a CSV file (``outputs.csv``).

#### **6. Loading and Displaying Results:**

- Reads the results back from the CSV file.
- Prints the results to the console.

#### **7. Visualizing Results:**

- Creates a bar plot using Seaborn to visualize the points for each team.
- Sets the title, x-label, and y-label for the plot.
- Displays the plot..

#### 4.4 RESULTS

Running the model with collated input data, indicated a deviation from the already concluded FIFA 2022 World Cup Group Stage(Group C) which contained the National Football Teams, in accordance to their final positions after the conclusion of the round-robin stage: Argentina, Poland, Mexico and finally Saudi Arabia.

**Fig 4.1 Initial Group C Final Table**



Group C		P	W	D	L	GD	Pts
1	 ARG 	3	2	0	1	3	6
2	 POL 	3	1	1	1	0	4
3	 MEX	3	1	1	1	-1	4
4	 KSA	3	1	0	2	-2	3

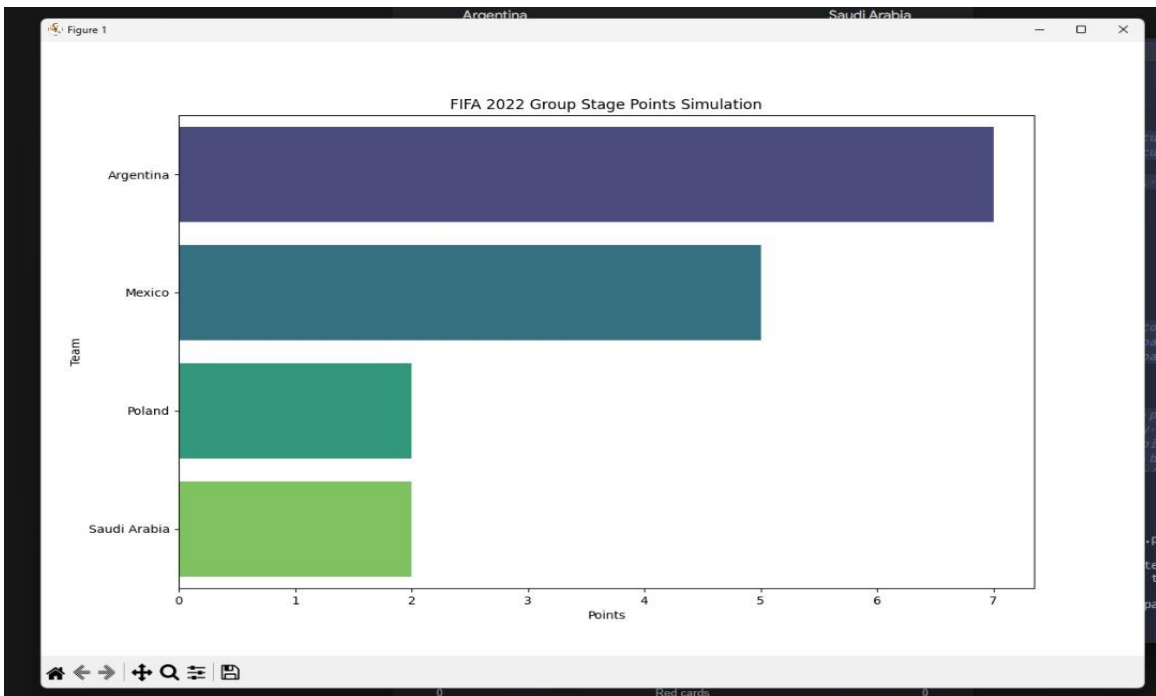
This table shows that the eventual champions of the tournament, Argentina, qualified from the Group stage as Group winners (even after losing their first match against Saudi Arabia, whom eventually did not qualify).

But as the proposed model is implemented using data from this aforementioned group, Mexico qualifies ahead of Poland for the knockout stages and thus we have a totally different table all together as shown below:

**Fig 4.2 Model Table For Group C**

	A	B	C	D	E	F	G	H
1	Saudi Arabia	Points	GoalDiffere	GoalsScored				
2	Argentina	7	3	5				
3	Mexico	5	-1	2				
4	Poland	2	0	2				
5	Saudi Arabia	2	-2	3				

Fig 4.3 Bar Chart simulation for Model



## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATION**

#### **5 SUMMARY**

This model addresses the issue of straight out predictability issues within the scope of the FIFA World cup group stages. Simulations, having been explored, show how the model can be implemented with its focus on performance-based points which are awarded alongside goals scored, potential qualification to next round based on group stage performance.

The model's impact on creating a more competitive, strategic, and exciting group stage experience is then analyzed. By incorporating these elements, the Ascendancy Cup has the potential to revitalize the group stage, making it a more captivating spectacle for fans around the world.

#### **5.1 CONCLUSION**

This study investigated the potential of the Ascendancy Cup model to revitalize the FIFA World Cup group stage. This innovative approach incorporates performance-based metrics alongside traditional goals scored to award points, potentially fostering a more strategic and dynamic group stage experience. Simulations exploring this model suggest it could lead to a more competitive and exciting group stage, with every match carrying significant weight for team standings and potential promotion opportunities. Further research is warranted to explore the broader implications of the Ascendancy Cup within the World Cup structure, but these initial findings

offer promising possibilities for enhancing the drama and strategic depth of the group stage for fans and players alike.

## 5.2 RECOMMENDATIONS

1. **Improve Performance data:** To get a more complete picture of the team's performance, consider adding data (like successful tackles and defensive pressure) in addition to possession, shots, and passing accuracy.
2. **Weighting Optimization:** Examine how different weights for goals scored and performance indicators affect the system's point distribution. Strike a balance between encouraging offensive play and giving defensive tactics equal importance.
3. **Development of Scheduling Algorithms:** Create interesting and surprising group stage matchups by designing and testing sophisticated scheduling algorithms that take into account the performance and rankings of each team at the moment.

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## **APPENDIX A**

### **SOURCE CODE**

```

import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import os
import math

# Check the current working directory
print("Current Working Directory: ", os.getcwd())

# Use the correct file path
file_path = 'data/fifa2022_group_stage.csv'

# Load the data from the CSV file
df = pd.read_csv(file_path)

# Initialize dictionaries to store points, goal difference, and goals scored for
each team
points = {}
goal_difference = {}
goals_scored = {}

# Iterate over each match and accumulate points, goal difference, and goals
scored for each team
for index, match in df.iterrows():
    team1 = match['Team1']
    team2 = match['Team2']
    goals1 = match['Goals1']
    goals2 = match['Goals2']
    possession1 = match['Possession1']
    possession2 = match['Possession2']
    shots1 = match['ShotsOnTarget1']
    shots2 = match['ShotsOnTarget2']
    passing_accuracy1 = match['PassingAccuracy1']

```

```

passing_accuracy2 = match['PassingAccuracy2']

# Initialize points, goal difference, and goals scored for each team if not
already present
if team1 not in points:
    points[team1] = 0
    goal_difference[team1] = 0
    goals_scored[team1] = 0
if team2 not in points:
    points[team2] = 0
    goal_difference[team2] = 0
    goals_scored[team2] = 0

# Update goal difference and goals scored
goal_difference[team1] += goals1 - goals2
goal_difference[team2] += goals2 - goals1
goals_scored[team1] += goals1
goals_scored[team2] += goals2

# Determine match outcome and update points accordingly
if goals1 > goals2: # Team 1 wins by goals
    points[team1] += 1.5 # 50% of points for goals
elif goals1 < goals2: # Team 2 wins by goals
    points[team2] += 1.5 # 50% of points for goals

performance1 = (possession1 + shots1 + passing_accuracy1) / 3
performance2 = (possession2 + shots2 + passing_accuracy2) / 3

if performance1 > performance2: # Team 1 wins by performance
    points[team1] += 1.5 # 50% of points for performance
elif performance1 < performance2: # Team 2 wins by performance
    points[team2] += 1.5 # 50% of points for performance

if goals1 == goals2: # Draw
    points[team1] += 0.5
    points[team2] += 0.5

# Floor the points for each team
points = {team: math.floor(score) for team, score in points.items()}

# Create a DataFrame to store the results
results_df = pd.DataFrame({
    'Team': points.keys(),
    'Points': points.values(),
    'GoalDifference': [goal_difference[team] for team in points.keys()],

```

```

    'GoalsScored': [goals_scored[team] for team in points.keys()]
})

# Group by team and aggregate the points, goal difference, and goals scored
results_df = results_df.groupby('Team', as_index=False).agg({
    'Points': 'sum',
    'GoalDifference': 'sum',
    'GoalsScored': 'sum'
})

# Sort the DataFrame by Points, then Goal Difference, then Goals Scored
results_df = results_df.sort_values(by=['Points', 'GoalDifference',
    'GoalsScored'], ascending=False)

# Save the results to a CSV file
output_path = os.path.join(os.getcwd(), 'outputs.csv')
results_df.to_csv(output_path, index=False)

# Load the results from the CSV file
output_df = pd.read_csv('outputs.csv')

# Display the results
print(output_df)

# Visualize the results
plt.figure(figsize=(12, 8))
sns.barplot(x='Points', y='Team', data=output_df, palette='viridis')
plt.title('FIFA 2022 Group Stage Points Simulation')
plt.xlabel('Points')
plt.ylabel('Team')
plt.show()

```

**APPENDIX B**

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