

## **DATA VISUALIZATION TECHNIQUES**

### **GROUP: 4**

### **Lab Exercise 3**

Operational Dashboard + Executive Scorecard (Advanced Level)

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### **Group Members**

Simran Nisarg Modi

Muhammad Bilal Dilbar Hussain

Dheeraj Puttapaka

Mansi Waman Rajadhyaksha

Sai Karthick Kalidoss

Falgun Khimasiya

King Yim Chan

**Objectives:**

- Optimize Goal Conversion Rate by identifying KPIs, patterns, addressing issues, and performing root cause analysis.
- Measure the efficiency of converting shots on target into goals.
- Track the total number of goals scored over a specified period.
- Identify the lowest attacking position achieved by players.
- Track the player's conversion rate by country and years
- Measure the freekick accuracy of players
- Analysis of weak goals conversion rate using 5 Whys Analysis Technique:

**Insights and Patterns:**

With the techniques we learned until now, we were able to observe the below given insights and patterns.

**League Teams With Total Goals & Avg Player Rating:**

- Determine and enumerate the teams that have scored the most goals overall in all seasons.
- Examine whether there are trends over time or if specific clubs are the leading scorers on a regular basis.
- Find out which seasons had the most goals scored overall and which teams made the biggest contributions to those totals.

**Best Young Players:**

- Recognize the age range of the top young players.
- Determine the age range in the dataset qualifies as "young" players.
- Examine the top young players' nationalities.
- Find the players who get high ratings on a regular basis.

**Top 50 Goals vs Targets:**

- Display the top 50 goals' distribution graphically to highlight the range of goal types—penalties, free kicks, headers, and open-play goals, among others.
- List the players with the top 50 goals scored.
- Examine if the list is dominated by any players or if it is split among different goal scorers.
- Examine the times (e.g., early, late, per half) at which the top 50 goals were scored during games.

**Matches played vs Goals scored:**

- Examine the changes in a player's career goals scored over the course of their career.
- Determine when times of year are best for scoring goals.

**Goals Conversion Rate:**

- Divide the total number of goals by the total number of shots to find the overall goal conversion rate.
- Determine the proportion of shots that end up in goals.
- Determine which positions convert at a higher or lower rate.

**Player Growth Depending on Expected Goals:**

- Determine each player's growth trajectory by contrasting goals achieved in real time with goals predicted over various seasons.
- Find the players who routinely score more goals than they should or less than they should.
- Examine whether these patterns hold true during other seasons.

**Problems/Issues Found:**

- **Low Goal Conversion Rate:**
  - Some players may have a consistently low goal conversion rate.
  - Ineffective finishing or lack of quality scoring opportunities.
- **Inconsistent Total Goals:**
  - Fluctuations in total goals scored.
  - Inconsistencies in offensive performance or difficulties breaking down specific types of defenses.
- **Low Freekick Accuracy:**
  - Certain players might have a poor free-kick accuracy rate.
  - Poor finishing or insufficient opportunities for high-quality scores.
- **Prediction of Goals based on player Rating:**
  - High-rated players might face increased pressure to perform, impacting their goal-scoring consistency.
  - Low-rated players might receive less playing time or fewer opportunities on the field impacting their scope of scoring goals.

**Root Cause Analysis:**

- **Low Goal Conversion Rate:**

**Root Cause:** Lack of clinical finishing during key moments.

**Action:** Implement targeted finishing drills in training, analyze match scenarios, and provide psychological support if needed.

- **Inconsistent Total Goals:**

**Root Cause:** Tactical vulnerabilities against certain defensive strategies.

**Action:** Conduct in-depth analysis of matches against specific opponents, adjust offensive strategies, and focus on exploiting opponent weaknesses.

- **Low Freekick Accuracy:**

**Root Cause:** Clinical failings at crucial junctures.

**Action:** Conduct focused free-kick exercises during practice, examine game situations, and offer counseling if necessary.

- **Prediction of Goals based on player Rating:**

**Root Cause:** Performance Expectations.

**Action:** Utilize Tableau to illustrate the relationship between player ratings and their goal-scoring consistency. Analyze variations in performance in high-pressure situations by adding more related data in dashboard (e.g., crucial matches, tournaments). Also, highlight instances where limited game time affects their goal-scoring opportunities.

## **Analysis of weak goals conversion rate using 5 Whys Analysis Technique:**

Analyzing the goal conversion rate for a football team using the 5 Whys analysis technique can help identify the underlying factors influencing the team's effectiveness in converting goal-scoring opportunities. Here's a step-by-step breakdown:

### **Define the Problem:**

Start by clearly defining the problem. In this case, the issue is a low goal conversion rate. For example, the team may be creating enough goal-scoring opportunities but not converting them into goals.

- **Ask the First "Why":**

Problem: Low goal conversion rate.

First Why: Why are the goal-scoring opportunities not being converted into goals?

Example Answer: Players are not taking accurate shots on goal.

- Ask the Second "Why":

Second Why: Why are players not taking accurate shots on goal?

Example Answer: Players may be under pressure from opposing defenders during goal-scoring opportunities.

- Ask the Third "Why":

Third Why: Why are players experiencing pressure from opposing defenders during goal-scoring opportunities?

Example Answer: Opposing teams may have identified weaknesses in our offensive strategies, allowing them to press and disrupt our attacks.

- Ask the Fourth "Why":

Fourth Why: Why have weaknesses in offensive strategies allowed opposing teams to disrupt our attacks?

Example Answer: The team may lack variety in attacking strategies, becoming predictable to opponents.

- Ask the Fifth "Why":

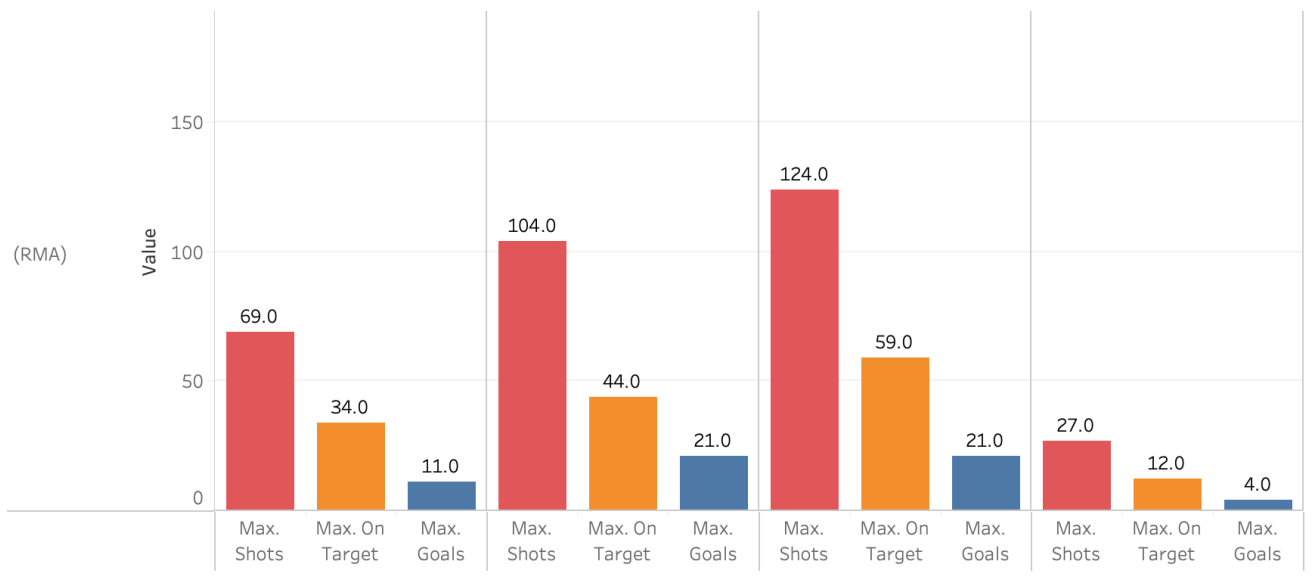
Fifth Why: Why does the team lack variety in attacking strategies, making them predictable?

Example Answer: The coaching staff may not be providing sufficient tactical diversity in training sessions.

Insights and Solutions:

**Analysis Outcome:** The root cause is identified as a lack of tactical diversity in training sessions, leading to a predictable attacking style.

**Solution:** Implement a more diverse and dynamic training regimen that focuses on various attacking strategies. This might involve simulating different game scenarios, encouraging reactivity in the final third, and working on specific drills to improve accuracy in front of goal.



Recent snapshot of Dashboard:



Fig 1. Dashboard

Recent snapshot of Scoreboard:



Fig 2. Scoreboard