

# TECHNICAL REPORT

## **Technical report of the Colombian football league**

By:

Kaleth Molina Diaz 20232020096

David Felipe García León 20231020202

For:

Professor Carlos Sierra

Universidad Distrital Francisco José de Caldas

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Faculty of Engineering

Systems Engineering

Systems Analysis

## **General representation of the system**

### **1. Elements:**

- Investment in players: Purchase of players, salaries and bonuses.
- Sponsors: Companies that provide capital in exchange for advertising.
- Television: Contracts with channels that broadcast the matches.
- Infrastructure: Stadiums, training centres, youth academies.
- Fans: Public that attends the matches and buys related products (shirts, tickets, merchandising).
- Organisation (DIMAYOR and Federation): Regulations, calendars, sanctions and institutional decisions.
- Media: Coverage, marketing and promotion of the league and its players.
- Coaches and technical staff: Making sporting, tactical and development decisions.

### **2. Processes (Interactions and internal dynamics of the system):**

- Sports competition: Teams compete for points, titles, and qualification for international tournaments.
- Training and player development: Clubs invest in academies to produce young players who can be promoted to the first team or sold.
- Negotiations for television rights: Leagues and clubs negotiate contracts with broadcasters and streaming platforms, which affect their income.
- Marketing and public relations: Clubs and the league promote their brands and generate interest among fans, which drives consumption of products and attendance at stadiums.
- Financial management: Clubs must balance expenses on salaries, transfers, infrastructure maintenance, among others, with income from tickets, sponsors, and television rights.

- Regulation and arbitration: DIMAYOR regulates the competition, applies sanctions, and controls financial fair play.
- Planning of tournaments and competitions: The structure of the tournament (matches, leagues, championships) influences the attractiveness of the league and the level of competition.
- Results and standings: Position in the table influences prize money, qualification for international tournaments and club reputation.

### **3. Results:**

- Sports results: Champions, qualifications to international tournaments, relegations.
- Revenues: From sponsorships, match tickets, broadcasting rights, merchandising.
- Talent development: Players who reach a competitive level and can be transferred or represent the national team.
- Audience: Size of the fan base and its level of commitment (stadium attendance, match viewing, purchase of products).
- Club brand value: National and international prestige of the club and the league.
- Sponsor satisfaction: Return on investment, visibility and brand positioning.

### **System sensitivity analysis**

To analyze the sensitivity of the system (the Colombian soccer league) we must study the factors that could be easily affected by changes made to the elements of the system and that directly impact the functioning and results of the system.

#### **1. Investment in players (transfers and salaries):**

- Sensitivity: Medium

- An increase in investment to sign high-quality players can increase team performance and improve the level of the league. On the other hand, a reduction in budgets could negatively affect competitiveness.

## **2. Ticket prices and stadium attendance:**

- Sensitivity: High
  - Variations in ticket prices can have a direct effect on attendance at matches. An increase in prices could lead to lower revenue if fans are not willing to pay more.

## **3. Television performance and broadcasting rights:**

- Sensitivity: High
  - The analysis could show that an increase in television rights revenue increases the financial stability of clubs, allowing for greater investments in infrastructure and players. On the other hand, if contracts are reduced, smaller teams could find themselves in financial crisis.

## **4. Sponsorship and marketing:**

- Sensitivity: High
  - The relationship between sponsorship and the league's image is key. A small change in public perception or the reputation of the tournament (due to scandals, quality of matches, etc.) can have an impact on the quantity and quality of sponsorships.

## **5. Sports performance (team results):**

- Sensitivity: Medium

- On-field performance is linked to financial stability, quality of coaches, infrastructure, and player ability. A slight variation in sports performance can influence qualification for international tournaments, which directly impacts revenue.

### **System complexity analysis**

Analysis of the Colombian football league reveals that its complexity is the result of several factors that make it difficult to predict and control how it works. Here are the key points:

1. **Diversity of actors:** The league is not just about teams and players, but also fans, media, sponsors and regulators. Each has different interests and resources, and their decisions are connected, creating a network of interactions that complicates the management of the system. A club's decisions can affect both fans and sponsors, making everything harder to control.
2. **Unpredictable interactions:** Sometimes small changes, such as an investment in a new player or a tactical adjustment, can have a much bigger impact than expected. It's like a chain reaction: something small can lead to big wins or losses. In addition, there are feedback loops, both positive and negative, that amplify these effects, making it very difficult to predict the results.
3. **Constant evolution:** Decisions made today, such as signing a player or building a new stadium, do not show their true effects until much later. This time factor adds another level of difficulty, as the league is constantly evolving, and the effects of current decisions may not be seen until several seasons later.
4. **Uncertainty in decision making:** Not all the information needed to make strategic decisions is always available. Unpredictable external factors, such as changes in the

economy or global events, can alter the rules of the game at any moment, further complicating club planning and management.

5. **Global competition:** The globalization of football adds more pressure to Colombian teams, as they must compete for players and sponsors in a global market where resources are much more limited than in other, more economically powerful leagues. This forces Colombian clubs to be more resourceful and efficient with what they have.
6. **Rules and regulations:** Rules imposed by entities such as FIFA and financial fair play regulations add an additional layer of complexity. Clubs not only have to be competitive on the pitch, but also comply with strict regulations limiting their spending and investments, making management that much more delicate.

### **Emerging Behaviors**

In Colombian football, interesting patterns emerge from the interactions between players, teams, fans and other actors; these emerging behaviors are difficult to predict when observed separately. Among these phenomena, the following stand out:

1. **Collective performance above individual capabilities:** Some teams achieve a performance superior to that expected thanks to the chemistry between players and good technical direction, even beating teams with more valuable players.
2. **Cycle of success and positive feedback:** When a team starts to win, this attracts more followers and income, allowing it to reinvest and continue to obtain good results.

3. **Uneven development between teams:** Teams with more income and resources tend to dominate the league, while those with fewer resources face more difficulties to compete.
4. **Impact of fans on performance:** Fan support, especially when the team plays at home, can significantly improve its performance.
5. **Oscillation in performance due to external factors:** Elements such as injuries, sanctions or economic crises can cause significant ups and downs in the performance of teams.
6. **Rivalries and sporting tensions:** Encounters between historical rivals create a special atmosphere that can influence the performance of players, generating often unpredictable results.
7. **Crisis and team collapse:** Poor administrative decisions and financial problems can lead some clubs into crisis or even to their disappearance.