



FOOTBALL PERFORMANCE ANALYST

MODULE 1.
TECHNOLOGY AND
ROLE OF THE
PERFORMANCE
ANALYST

**- CONMEBOL -
EVOLUCIÓN**

Module 1. Technology and Role of the Performance Analyst

Football is among the most practiced and well-known sports in the world, consequently there is a growing application of science in daily practices from professional teams to the youngest children's teams. The development of football for men and women is visible in its technical, tactical, physical, and mental aspects.

The search for methodological improvements in the football game causes many concepts to be reviewed or to be even better understood by professionals in the area. Many times, quantifying variables related to individual actions such as speed, distance traveled, number of passes, shots, and many other variables of the athletes in the most diverse game positions, cannot represent all the greatness of this collective sport.

Every day we see that the search for individual and collective information by coaches, clubs, and national teams only increases.

Along with the increase in information, comes the technological implementations that give speed, organization, and more information for decisions and conduct to be made to build new workouts and consequently improve the game. Technology companies invest heavily to create solutions for clubs and national teams with the single ultimate goal: the best information, at the highest speed for the best decision making. (Cortsen & Rascher, 2018; Giblin G.; Tor E. & Parrington L., 2016; Gulhane, T.F., 2014)

So we find more and more technological resources being deployed in sports. But it wasn't always like this, so I want to demonstrate this evolution. The world is experiencing a very rapid technological evolution in the last 50 years in all areas. We can see that the transformations have been immense. (Kerr, 2016; Omoriege R.O., 2016)

While most processes were recorded on paper, written by hand, we now live in a digital era, all computerized, and where the use of Artificial Intelligence is a reality.

Figure 1: Evolution of football technology for performance analysis



Source: Own design.

Computerized systems become even more efficient according to the amount of information they receive and behaviors that are repeated.

And in football?

In the same way, when the first scholars wrote everything down in their notebooks, we now go through the athlete's behavioral reading through artificial intelligence. It is possible to identify facial expressions and detect fatigue, mood, and others. It is already possible through mathematical models to predict actions a few seconds before they occur, to be ahead. This processing takes into account a complexity of data that would be impossible to human eyes.

Everything is an evolutionary process.

Thanks to the early football scholars who exercised the notational process of information, describing the events of the game as a sequence of plays or even the frequency or repetitions of certain technical actions. Imagine that all athletes were "noted" in their respective actions. Each technical action of both teams, a lot of information was not possible to be written down, but that's how it was in the beginning. Hundreds, thousands of pages with rich information that demanded a lot of time to be compiled to arrive at the best information and consequently the best decisions from these results extracted from the games.

With the arrival of VHS camcorders it was possible to record the entire event, the game, making it easier to watch repeatedly and extract more and better information. At this time,

it was already possible to analyze athlete by athlete in a technical way and athlete in the tactical performance, consequently the collective.

Certainly one of the most important technological advances that not only allowed to have every event recorded, but also allowed to show the athletes points of improvement and for a better understanding of the game ideas.

All this recorded on VHS tapes and shown on TVs. We are talking about a few decades ago, recent and rapid evolution to filming today on digital media.

Yes, technology came to replace VHS cassette tapes with a digital coding system, where photos and footage, no longer needed to be relayed or traversed on video cassettes.

It has become possible to have all the photos without spending days and days for developing. All stored within computerized systems, the digital media.

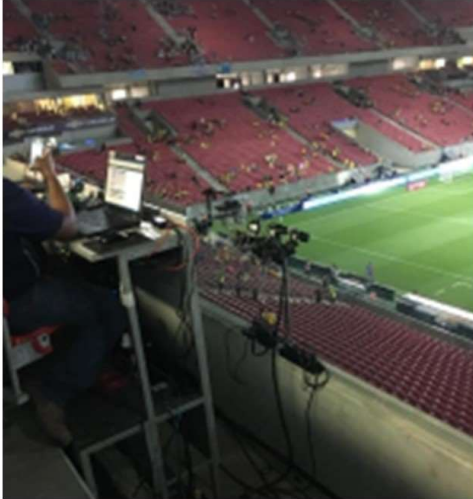
In the nineties with the accessibility of computers, it became even easier and possible to create notes, spreadsheets, view digital videos, and exchange information with other users.

At this time we began to generate a greater amount of information, and following all this evolution came more software, more technology, and more speed in recording and collecting information to be analyzed and transmitted to coaches, clubs, and national teams with the goal of improving the sport even more.

The use of video editors for digital recordings was a success, playlists could be created to facilitate the study and explanation of information. Each day a new visual feature was used with the goal of providing clarity and information.

This allows the constant and more assertive growth of training processes, games, and the improvement of athletes.

Figure 2: Football evolution through the use of technology



- Shrinking the digital gap.
- Technological growth.
- Access to leagues around the world.
- Coaches as a source of knowledge.
- Registering technical data/tactical and physical.
- Information of group and individual video.
- Detailed statistical information.
- Optimizing work time.
- Technical talks focused on videos.
- Sharing information with football players.

Source: own design.

Football-specific tools are developed year by year and tend to keep up with the most developed technologies available in our era.

We went from paper notes, notebooks, and VHS tapes, to computerization with the arrival of computers, to robust information systems such as data platforms, databases, and artificial intelligence.

Companies have specialized in developing technologies for football, some with solutions to training routines focused on physical monitoring such as frequency meters, gps, cameras with systems to identify athletes and their physical actions generating very complete reports. Some others focused on solutions that can, in real time, create playlists and individual, group, and collective tactical, technical, and decision-making reports, replacing video editors and hours in front of the cameras looking for information.

In addition, technologies for recording every workout have also evolved, such as type of cameras, quality, angles, etc. Today the use of more than one camera in training is very common. Whether they are positioned on tripods, network systems without the need for someone to move it, drones, long tripods to get better angles and with viewfinders to facilitate viewing and believe us, autonomous cameras that identify the players by artificial intelligence and follow them in an automated way. These cameras can already be

programmed to turn on and off at specific times, doing all the recording and data collection (Cortsen & Rascher, 2018; Custodio H. & Marocolo T.M., 2019).

In addition, assistants, coaches, and athletes can access the real-time videos directly on the training field on a video monitor. This makes it easier to understand and adjust the training more quickly. The evolution is visible.

When it comes to games, we already have several technologies that generate physical, technical, and tactical reports in real time, sending information to the assistants and coaches during the match.

This information can be on video through protocols planned in the technical commission, and can also be in numbers of the frequencies of events or even via radio with verbal communication in real time.

Football is an art with the application of many sciences. The development of the sport has made numerous areas benefit from technological innovations. It is clear the physical development of the players with physiology, medicine, statistics, biomechanics, training, behavior, and decision making, among others.

It is no longer possible to reach the highest level without investing in science and technologies within football.

In the list below you can see the range of possibilities of the application of these technologies in search of information around the world fully applied to football, after all the digital exclusion has decreased and access is increasing:

- Today it is possible to access visual information and statistics from virtually every league in the world;
- Coaches have expanded their sources of knowledge;
- You can record technical, tactical, physical, and decision-making data;
- In the videos we find individual, group, and collective information;
- Detailed statistical information;
- Optimization of work time;
- Technical lectures focused on videos;

FOOTBALL PERFORMANCE ANALYST

- Sharing of information with athletes, including sending specific videos to their phones with information necessary for their evolution;
- Didactic illustrations in the videos and projections of "ideal" images overlapping the real one.

All of this promotes interdisciplinary work in the sports area, collaborating with the evolution of the football player and improving the interpretation of information for decision making.

The information is there, only those who don't want to use and evolve don't want to.

Thus, a professional role has emerged to assist coaches with such technological procedures, in operationalizing the technologies and extracting the information that can enhance training and play.

This professional is known as a performance analyst in football and the work process as performance analysis.

Figure 3: Contributions of the performance analyst to football



- Contributes to planning.
- Optimizes individual and collective performance.
- Improves understanding of the rival and self.
- Improves understanding of the game.
- Supports the implemented model of play.
- Minimizes the risk of adverse results.
- Gets us closer to proposed objectives.
- Supports the feedback between player and coach.
- Contributes to strategy execution and game plan by technical staff.

Source: Own design.

The work process seeks to develop the understanding of the actions that take place in training and matches to assist coaches, clubs, and national teams in decision making, improving performance towards the best individual, group, and collective results in football.

The analysis can be focused on tactical, technical, physical, and mental, such as the decision-making for each situation the player faces.

To do so, the analyst uses the available technological resources to create a database, generating references and visualizations of behavior patterns to present to the coach, athlete, club, federations, or whoever needs such information.

After all, years ago the performance analyst simply recorded the training session or game, creating specific summaries or playlists to provide to coaches and athletes. Filming and editing the videos were his main functions.

Nowadays, the performance analyst has gained prominence and new functions, evolving in the use of technology to obtain great information. A demand for information that needs to be filtered before presenting it to coaches and athletes, showing what really makes sense and leads to good transformations.

Believe me, for a long time analysts sent gigantic reports to coaches who had little time to read them between one training session and the next. That is why it is necessary for the analyst to assume the role of information assistant and filter the data. For this to happen, he needs to have excellent references of football concepts and to know the proposals of the clubs and coaches.

In addition, keep up with the development of hardware and software that together will produce even more diverse data and information. It needs to be stored in large databases (Big Data) and analyzed.

Here we address one more step, being prepared with relevant information to present to the coaching staff, athletes, and management. Here it is worth pointing out that there are several methods to present the information. There are coaches who prefer to show mistakes and give guidance so that the situation can be improved. However, there is another way of presenting information only with a positive bias, where the focus is on the right situations and encouraging them to repeat themselves.

These are possibilities of transmitting information visually, aurally, or even by explaining it in practice. This gives the athlete several ways to learn and perform better and better.

The analyst may be asked to present information about his own team or opponents when it comes to games, as well as to explain about athletes analyzed for buying and selling, what we call the market.

Whether through meetings with the athletes and coaching staff, individual conversations, sending audiovisual materials to the whole group, or personalized for each player. The important thing is to be assertive with the information. Good information at the right time.

For all this to happen, we need to be clear about each person's role within the coaching staff and respect hierarchies. The coach is the decision maker of what should or should not be done, what is desired and what he believes is best for the team, so the analyst is an agent of information for the coach, club or national team.

This quote by Jules Henri Poincaré is worth reflecting on:

"Just as houses are made of stones, science is made of facts. But a pile of stones is not a house, and a collection of facts is not necessarily science."

A constant challenge between numerical (quantitative) and observational (qualitative) information. Therefore, in our training here we remember the importance of good planning in technical commissioning so that the analysis objectives and information are aligned and with clear references to success and failure, ideal or not ideal, right or wrong, positive and negative.

The analyst needs to compare with the references exposed in a meeting with the coaching staff, so as not to run the risk of just giving his own opinion and running away from the coach's objectives.

In parallel, these planned ideas are inserted and transformed into protocols so that during each practice, game or training, the best information is obtained.

Everything will become more fluid in daily practices when the protocol is inserted into software to record and collect the data. Generating an organized database that makes sense to everyone.

It is very common to see performance analysts with equipment such as camcorders, computers, and tablets in order to record (film) the whole event and obtain data (apply the protocol within the software) in real time, or for procedures immediately after the practices.

Thus, this data can be analyzed quantitatively or qualitatively in search of strengths or improvements and whether the objectives of each training exercise or game model are being achieved. This analysis ranges from individual, group, and collective focus.

When we list the main duties and responsibilities of a performance analyst we find:

FOOTBALL PERFORMANCE ANALYST

- Film the games and training sessions;
- Produce pre-game analyses of one's own team and the opponent;
- Applying the protocol during games and trainings (coding) and creating reports and playlist of the post-game and post-training footage. Often and depending on the reality of each club or national team, information during training and matches.
- Creating an easily accessible database and videos and applying statistical procedures that identify patterns and trends in the team or athletes.
- Create a virtual environment for athletes and coaching staff to access each training session.
- Create a display environment for athletes and coaching staff at the training grounds.
- Ensure the maintenance and proper functioning of all analysis equipment.
- Interpretation, analysis, and dissemination of data to all involved.

In this way, the performance analyst will be contributing directly to:

- the team's planning work;
- in optimizing individual and collective performance;
- in deepening the knowledge of the opponents and the team itself;
- helping in the better understanding of the game;
- in the implementation of the game model;
- minimizing the risk of adverse outcomes;
- approach to the proposed objectives;
- providing constant feedback between coach and athletes;
- and in the execution of the coaching staff's strategic and game plan.

In the current scenario, we can find several types of analysts, because in each place there is a different reality. Here are some of them:

Scenario 1: Analyst Coach, where in the coaching staff are the coach, assistant coach, goalkeeper coach and physical trainer. This way, who performs the analysis is the coach himself.

- Usually in amateur and semi-professional soccer;
- He makes his own analyses (they are his eyes);
- Has few human resources;
- Has few financial resources.
- Open analysis;
- Takes a lot of time;
- Uses basic video editing programs.

Figure 4: Organizational chart and characteristics of the analyst trainer



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- Open analysis;
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- Uses basic video editing programs.

Source: Own design.

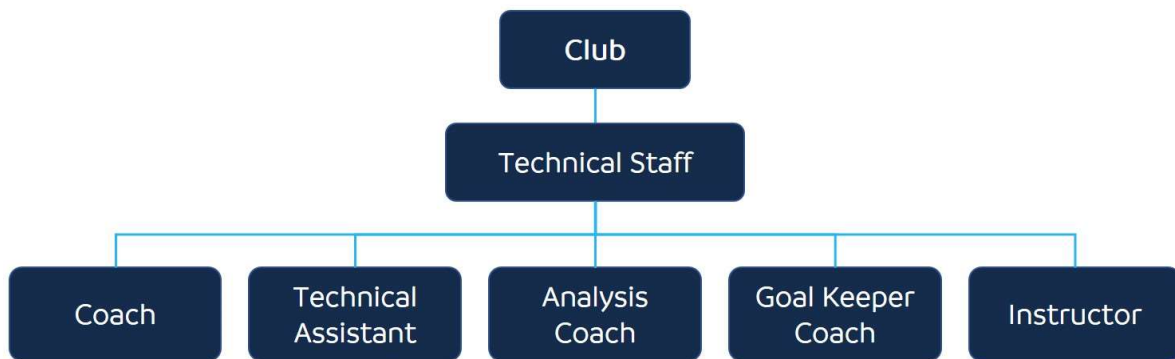
Scenario 2: Coach's Analyst, here we add the coach's analyst or assistant analyst. The components are: the coach, assistant coach, goalkeeper coach, analyst/assistant and physical trainer.

- Usually in professional soccer;
- Part of the technical commission;
- Can be a technical assistant and/or analyst;
- Create your own analysis;

FOOTBALL PERFORMANCE ANALYST

- Involved in the work methodology of the technical commission;
- Make the connection with the club's analyst;
- Use analysis programs and data platforms that are usually requested from the club (depending on each reality).

Figure 5: Organigram and characteristics of the training analyst



- Usually in professional soccer;
- Part of the technical commission;
- Can be a technical assistant and/or analyst;
- Create your own analysis;
- Involved in the work methodology of the technical commission;
- Make the connection with the club's analyst;
- Use analysis programs and data platforms that are usually requested from the club (depending on each reality).

Source: Author's own design.

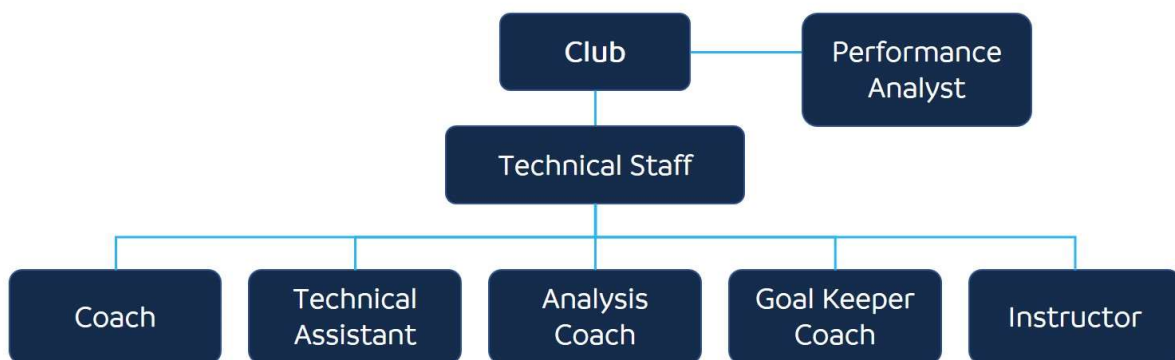
Scenario 3: Club Analyst, which aims to analyze performance and generate the database for the club and connected to the coach's analyst. The members are the same as in the previous scenario, varying only in the number of professionals in the coaching staff, being: the coach, assistant coach, goalkeeper coach, analyst/assistant and physical trainer.

- Usually in professional soccer;
- Hired by the club;

FOOTBALL PERFORMANCE ANALYST

- Adapt to the needs of the coaching staff;
- Ability to compress the game model proposed by the coaching staff;
- Provides analysis of your own team and your rival;
- Provides real-time (in-game) analysis;
- Records and analyzes the trainings;
- Use programs and platforms usually provided by the club (depending on each reality).

Figure 6: Organizational chart and characteristics of the performance analyst



- Usually in professional soccer;
- Hired by the club;
- Adapt to the needs of the coaching staff;
- Ability to compress the game model proposed by the coaching staff;
- Provides analysis of your own team and your rival;
- Provides real-time (in-game) analysis;
- Records and analyzes the trainings;
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Source: Own design.

From this perspective, let's see how some national teams work. In the words of Reinaldo

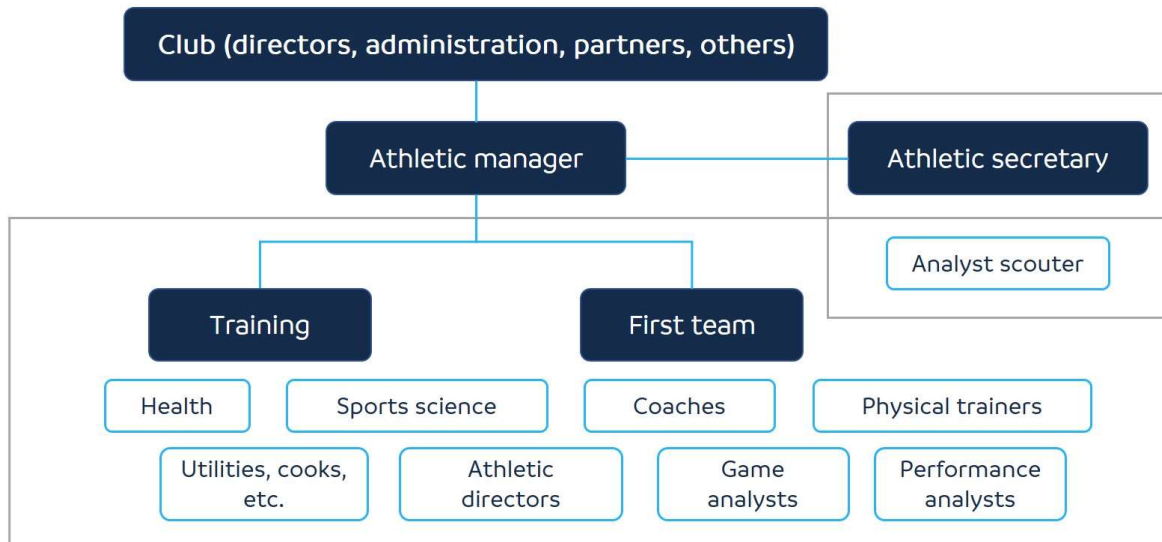
Rueda:

It is a permanent communication that we have with the performance analyst on a daily basis, carrying out these monitoring and follow-ups, this evaluation before the games during the weekends when our players are in competition so that the coach has a broad knowledge at the time of making decisions for the roster. Regarding the rivals, we are always studying, making reports and, well, always drawing the best conclusions to make good decisions (2020, interview with Conmebol for the preparation of this program). As a complement, perhaps there is the pigeonholing to the weekend . We have the Copa Sudamericana, Libertadores, Champions, UEFA Champions League, Chilean League, Chilean Cup, and so on in all countries. This means that we have to be evaluating more than 12 games a week. For example, the case of the Mexican League, the Turkish League, the Italian League, the English League, the Spanish League, and the Chilean League, which covers Monday, Tuesday, Thursday, Friday, Saturday, and Sunday. On Monday we will try to have as much information as possible about our team and, when we have already defined the next opponents, we will review the closest and most updated information about them.

Scenario 4: Scouter Analyst, aims at a longitudinal work of attraction, talent detection and market. He follows an information structure that interconnects several sectors of the club, however, his information mostly reaches the managers and directors.

- Usually in professional soccer;
- In charge of scouting talent, especially young players;
- He looks for players for the Club, especially the first team;
- Create the videos of the players to hire;
- Creates reports about the players to be brought in for the testing period;
- Putting together promotional videos of the Club's players;
- The importance of their work is seen in the medium term;
- Use internal club management platforms and videos that give access to all the leagues and competitions in the world (depending on each reality).

Figure 7: Organizational chart and analyst scouter characteristics



Source: Author's own design.

Many teams have adhered to the creation of a specific department for training, game and market analysis. It is often called the intelligence department, because it is about applying scientific methods to get the best information.

These departments can act from the beginning of sports to the highest performance, whether with the longitudinal monitoring of athletes, prospecting for talent, buying and selling, and information aimed at improving the team. In other words, it will be very common to find analysts who are specialists in some subsets of attributions. They are the experts in each area within the analysis that, like technology, are in constant evolution.

A new era of knowledge production that coaches and teams will need this analysis professional to support among so much information, managing and updating databases. Whether with the use of software, hardware, or other types of accessories/tools, they will constantly contribute to planning, studying, and sending the best information.

And for you? As a performance analyst. Which competencies should you develop?

I start with the point that, even if said before, I must repeat. Respect the hierarchy within football. It is the coach who will make the decisions and indicate the game model. For the

good functioning of the function it is fundamental to build an environment where the coach, management, and athletes have full confidence in the analyst.

The analyst should:

- to be fully knowledgeable about soccer.
- Master technical, tactical, physical, and mental elements that involve the sport.
- Understand to give the best feedback.

To do this, look for constant references from the coaching staff, the club's philosophy, the institution's history, etc. All of this as a way of being clear about where you are and where you are aiming at.

It is worth remembering, if the data source is bad, the results are bad. Invest time in planning and find the best variables to study the training sessions and the games. And with clarity and good communication explain the results obtained through analysis.

Whatever your current specialty is, whether it is data science or the concepts proposed in the literature, common sense in coaching is required. Ask, clarify, and create interaction routines and seek to broaden your view of the training and the game.

The best analysis procedure is the one that generates good information that will be used in practice and generating constant evolution of the athletes and the team.

Technologies help a lot, they give speed! But it is the intelligence in building the use of them that will make the difference.

Welcome to the world of football analysis.

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