



Sports 4.0

TRANSFORMATION HANDBOOK

Transformation is in our DNA

The public health and economic crisis triggered by COVID-19 has focused our minds on the need for **a swifter economic and social transformation** – the only way we can count on a full recovery and get back on track for growth.

We believe that **digitalisation is key** to making this transformation possible. Technologies such as 5G, cloud storage, cybersecurity, AI, big data and IoT will be game-changing – as demonstrated by our extensive catalogue of solutions, applications and use cases. Our capacities and experience make us the perfect partner for businesses and local authorities as they take on the digital challenge.

We stand for a **fair, inclusive and sustainable digital transformation**. Our mission is to harness technology for people and planet, lightening the environmental load and offering our clients solutions that get them working more efficiently and sustainably.



Sport:

a key sector for society and the economy

Technology is key for increasing the visibility and impact of the world of sport. It allows fans to interact and opens up the possibility of broadcasting any sporting event live – giving everyone and not just the selected few the chance to enjoy them.

Continuous monitoring of the physical fitness of sportsmen and women, as well as of their technical abilities via technologies such as IoT and big data, enhances their performance and improves recovery – safeguarding their health and ultimately extending their professional careers.

The digitalisation of spaces and sporting arenas allows higher efficiency and sustainability standards to be achieved. It also offers fans the chance to enjoy a unique experience before, during and after the sporting event.



How we are revolutionising sport

ATLÉTICO DE MADRID FC

WANDA METROPOLITANO: DIGITALISATION OF SPACES

Thanks to our technological solutions, we turned Wanda Metropolitano into the first 100% digital stadium in Europe, creating a unique experience for match goers. A hyperconnected stadium in which an extremely powerful network infrastructure is able to house all the services that the club needs.



BARCELONA FC

REAL-TIME SPORTS SENSORISATION

Thanks to our 5G coverage and edge computing centres, we rolled out a sensorisation solution via which the data gathered from the players is processed in real time and performance stats are projected in augmented reality on the game's live video stream. This allows the coach and technical team to make better-informed decisions during the match or training session.



DEPORTIVO DE LA CORUÑA FC

ABANCA-RIAZOR STADIUM: THE BIGGEST INSTALLATION OF 5G COVERAGE OF ANY STADIUM IN EUROPE

Thanks to our new connectivity and computing capabilities, we rolled out a solution that enabled the automatic broadcasting of football matches thanks to 5G coverage and edge computing. The sporting event is automatically broadcast via a system of artificial intelligence that also uses additional solutions such as HeatMap and Kiss Cam.



How we are revolutionising sport

GRANADA FC

SPORTS PERFORMANCE

This new project forms part of the club's transformation master plan and consists in analysing sports performance, recruiting talent and efficiently managing resources. A comprehensive platform that will combine various data sets to turn Granada FC into a sustainable organisation that aims to compete at the highest level and establish itself as a benchmark in the world of football.



CAROLINA MARÍN

MATCH PREPARATION AND STATS ON ADVERSARIES

Tactical preparation for badminton matches is crucial to succeed in the sport. Thanks to artificial intelligence and the digitalisation of hundreds of thousands of data points gathered from video recordings, Telefónica has developed, together with Carolina's coach, a unique tool that provides countless stats on her direct rivals: detecting their strengths and weaknesses, the most likely trends for winning strokes... in short, a whole catalogue of intelligence that strengthens Carolina's innate talent and the hard work of both her and her team.





TESTIMONIALS

What our clients say...



René Abril | **Club Atlético de Madrid**

● ● ● **Atlético de Madrid Head of Technology and Digital Development**

'We wanted to design a stadium in which technology, and above all connectivity, would be a game changer. And for such a design we knew we needed to partner with Telefónica – a global leader in both telecommunications and corporate projects.'

Joan Ramón Tarragó | **Sports Performance Director of the Sports Science Department | Barcelona FC**



'Barcelona FC, together with GSMA, MWC and Telefónica, has developed an app using 5G that combines data from the WIMU PRO tracking system and recorded camera images automated in real time. This is a major step forward as this information – which up until now could only be obtained after the match or training session and was less automated – will help the technical team to make better on-the-spot decisions to improve tactical play and get the best out of their players whilst they are still on the pitch.'



Gabriel Barrós | **Deportivo de La Coruña FC**

● ● ● **Head of Communications**

'The automatic broadcasting of football matches gives us a far more efficient and versatile way of televising matches, training sessions and other sporting events for our supporters, as do additional services such as HeatMaps and Kiss Cam. Telefónica's 5G technology has shown us how its capabilities will transform the sporting experience in the coming years.'

Patricia Rodríguez Barrios | **Granada FC**

Board Member Granada CF



'This project transcends the boundaries of sport, a project via which we aim to create collaborative environments that could make a real impact on society. A process to transform football and make it a more professional industry by establishing synergies within our corporate group to turn Granada FC into a benchmark both at a sporting and at a business level and consolidate the club's sustainable growth.'

Atlético de Madrid FC: digitalisation of spaces



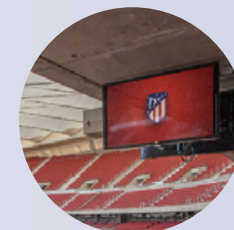
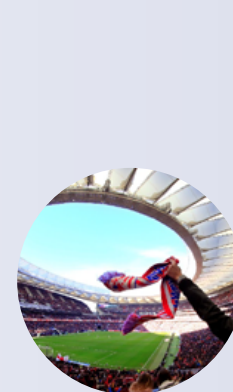
When it comes to sporting arenas, the Wanda Metropolitano stadium is now a global benchmark. It is one of the most innovative stadiums in Europe and the first smart stadium on the continent, and a project in which Telefónica has played a decisive role as its digital partner. As part of its data driven transformation process, the Club is also working on rolling out an analytical ecosystem that will allow it to centralise and manage data and develop bespoke use cases.

OBJECTIVES

Create a new cutting-edge stadium with state-of-the-art technology to give supporters a truly unique experience. Technology has turned the home of Atlético football fans into a new and innovative space where they can live and breathe the passion they share for their team like nowhere else.

BENEFITS

The technology deployed at the stadium allows the club to improve the efficiency and management of its resources, however it is the supporters who are the real winners. The stadium's network infrastructure means the connectivity for fans is as good as if they were connecting to their Wi-Fi at home, while the audiovisual deployment (the stadium's images + sound + lighting) creates an atmosphere that offers spectators a whole new way in which to enjoy the sport. Technology fuelling emotion.



FURTHER INFORMATION

Video: [Wanda Metropolitano: the first smart stadium in Europe.](#)

FC Barcelona: real-time sports sensorisation



Thanks to the 5G connected cameras and the massive computing capacity available at the edge, we are able to project –in real time and using AR technology– the more than 300 parameters extracted by the WIMU smart vests onto the video of the football match. This provides both a very user-friendly display for the technical team and a superior viewing experience for fans.

OBJECTIVES

To use 5G bandwidth, low latency edge computing, video, augmented reality and WIMU biometric sensors and RealTrack Systems and verify their technological viability and use for the football club.

BENEFITS

Obtaining biometric data for the players in real time enables coaches to make better-informed decisions in real time during a game: substitute a player in or out, change a player's position or ask them to step up their game, switch up their strategy... In short, everything a coach and his team does, but basing their decision on biometric data.



FURTHER INFORMATION

Video: [Sports metric monitoring in real-time.](#)

Deportivo de la Coruña FC: Abanca-Riazor stadium



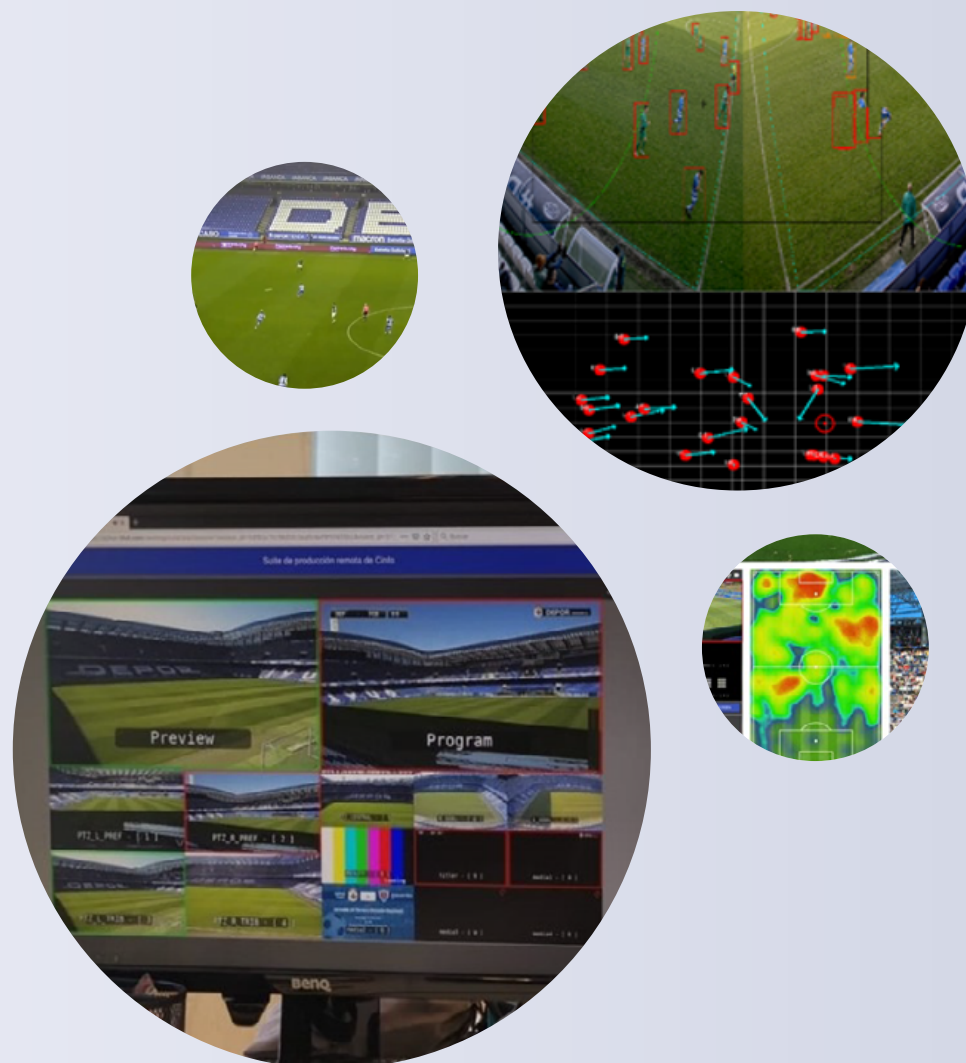
Installation of a dedicated 5G network in the Abanca-Riazor stadium to ensure large bandwidths and ultra-low latency to be able to seamlessly broadcast multiple video streams from the stadium to the cloud produced by edge computing and allowing for real-time robotic camera control and video analysis. This enables automatic TV broadcasting thanks to AI algorithms that analyse the game in real time, tag the players and angle and switch the cameras to generate a signal suitable for live TV broadcasting.

OBJECTIVES

Test the viability of a 5G communications solution with large upload bandwidths and latency levels that are low enough to allow for automatic broadcasting of sporting events using 5G.

BENEFITS

Ability to broadcast an event without having to deploy a mobile TV unit to the venue, which as a result will open up the possibility of watching live sporting events to everyone and not just a select few. It will also allow a lot more events to be professionally broadcast at a significantly lower cost, making it possible to enjoy quality live images of local and regional events, something which up until now was not profitable enough to make it viable.



Granada FC: sports performance

5G

IoT

AI

This new project forms part of the club's transformation master plan and consists in analysing sports performance, recruiting talent and efficiently managing resources. A comprehensive platform that will combine various data sets to turn Granada FC into a sustainable organisation that continually strives to compete at the highest level and establish itself as a benchmark in the world of football.

OBJECTIVES

Leverage new technology and digital solutions to increase the club's visibility and to develop and consolidate the Granada FC brand on the international market. This initiative forms part of the club's Transformation and Professionalisation Master Plan. The plan's first goal was to set up an ad hoc analytical tool that would optimise both sports performance and its processes for recruiting new talent.

BENEFITS

- Continuous monitoring of sports performance.
- Inputs to improve competitiveness of the first team.
- Agile decision-making.
- Cost savings on the transfer market.
- Integration of agile methods in internal teams.



Carolina Marín: competitive strategy



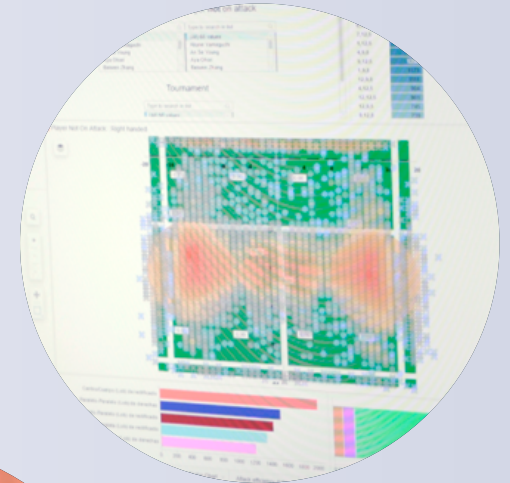
The fight to be the world's No 1 badminton player is an ongoing battle. A very popular sport in Asia, with millions of followers and big-name players that are continually battling it out with Carolina to hold that coveted top spot. That is why Carolina needs to know the weaknesses of her rivals be able to exploit them and plan strategies that have a high chance of succeeding. To do this, the information she uses must be exact and precise for each individual player. Hundreds of thousands of data points must be analysed to pinpoint and extract all the relevant information which then must be further analysed by her technical team so that she can apply it to her game strategy before a match.

OBJECTIVES

The goal is for Carolina Marín to be the Badminton women's world no 1, and to achieve winning the major tournaments (World Championship, Olympic Games) is a must. Cutting-edge technology plays an important role in helping her achieve these big wins – providing her with an in-depth knowledge of both her rivals and her own game. This knowledge is used to help optimise her training sessions and devise the best strategy for every competition and make her game even more effective.

BENEFITS

Generate an immense knowledge base on the game of her direct adversaries, allowing Carolina to develop as a player and get ahead by making decisions based on data – leaving less room for uncertainty and providing a higher probability of success. This dynamic tool designed by Telefónica is operated from the cloud, bringing new insights as soon as any new data is digitalised and incorporated into the platform.



Other cases from the sector

Technological solutions focused on improving the end-user experience, the performance of players and digitalising club's physical spaces – stadiums, etc.

360° BROADCASTING EVENTS WITH 5G



Developing the use of 5G for broadcasting sporting events. The new technology offers a new immersive way of watching events in real time via virtual reality without having to be physically in the place where the event is taking place.

IMPROVING SPORTS PERFORMANCE



Improves the performance of the team by looking at each player individually and carrying out an advanced analysis of the data compiled from the various available data sources and IoT sensors deployed.

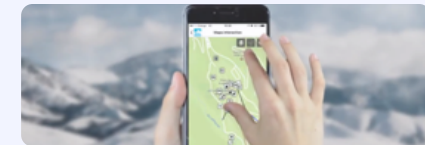


RECRUITING NEW PLAYERS



Each season a large part of every club's budget goes on strengthening their team line-up by buying new players that will be profitable both in the sporting sense and economically speaking in the event of a future transfer. Together with Movistar Estudiantes we have developed a big data transfer tool which allows clubs to identify the best players from the thousands that can be found on the national and international markets. This tool has been successfully applied in other sports such as football.

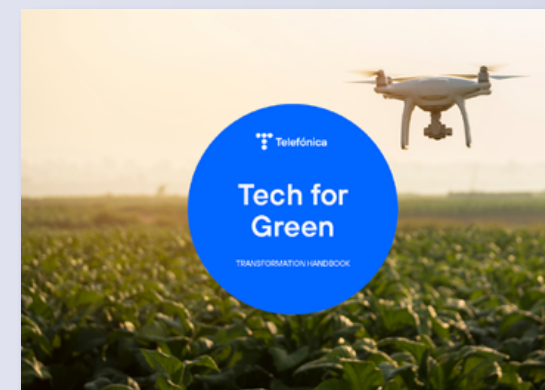
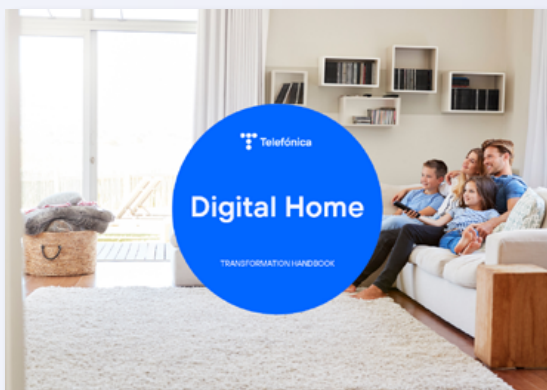
ENHANCING THE USER EXPERIENCE



Big data, drones, artificial intelligence and IoT are some of the innovative technologies that are reshaping sports fans preferences and their habits, helping to create unforgettable experiences.



Transformation handbook collection





Want to *find out* more?

tech.telefonica.com