
Telefónica
MWC2023
MAKING
INNOVATION
HAPPEN
Transformation Handbook

MAKING **INNOVATION** HAPPEN

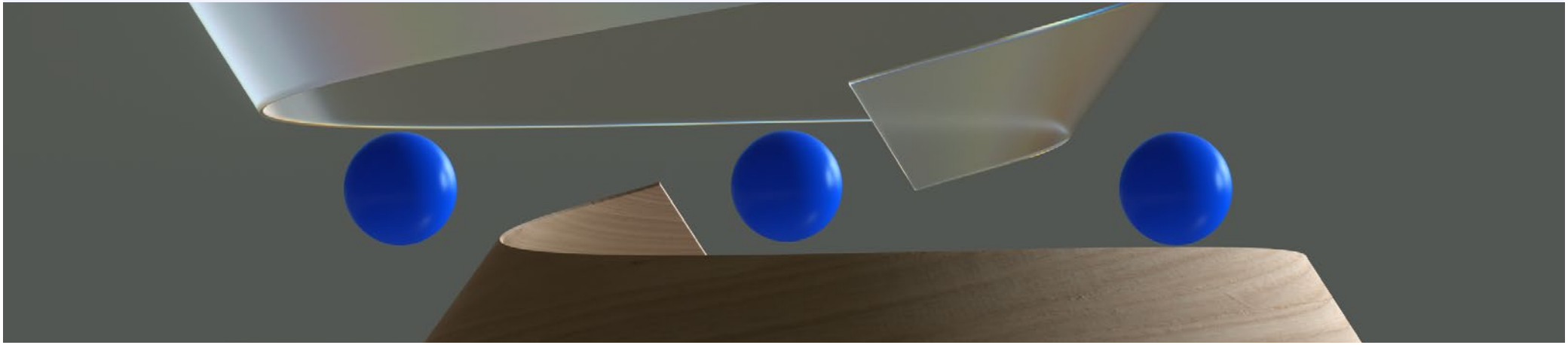
With almost 100 years of experience working in an ever-changing world, we have learnt that **when we combine talent with human creativity, we can bring about greater social progress**, and that technology is a key factor in unlocking that talent.

Our commitment to progress based on **innovation, sustainability and inclusion**, only makes sense if we use this **technology for the benefit of everyone**, everywhere, across all nations. That's because technology helps us to connect each and every day, whether that be with our families, customers or businesses.

We have always envisioned **different ways of doing things**, which has kept us at the **forefront of technological progress** and enabled us to respond quickly to our clients' needs. Over the last 15 years, we have invested nearly €180 million in disruptive projects for startups, while also surpassing our commitment to provide 50% of Spain with 5G coverage.

At Telefónica, we believe that **innovation only makes sense if it improves people's lives**.

CASE INDEX



Back to index

Edge Computing **Network Slicing**

Programmable Network **Privacy by Design**

Telefónica Open Gateway

Networks are the key to building the services of the future. The telecoms sector together with the GSMA have established a **global industry initative** to **transform networks into future-ready platforms**. We can achieve this through **standardised and interoperable APIs**.

We are opening up **telco and network capabilities** through **global APIs, which in collaboration with AWS, Google Cloud, Microsoft Azure and Vonage** for service creators.

Objectives

This initiative is driving a new wave of **innovation** that will benefit the entire **digital ecosystem, users and businesses** around the world.
At Telefónica, we are transforming our network into a **developer-ready platform**, based on solid values that guarantee users privacy and control over their data.

Results

This initiative aims to accelerate the development and growth of new services in areas such as fintech, digital identity, anti-fraud, smart mobility, gaming, Web3, the metaverse or communications. We have showcased a number of early use cases, such as enhancing the real-time user experience for mobile gaming and high-performance applications, thanks to the advanced network features already being used by Blacknut and Zoom.

Discover

Web
Find out more about Telefónica Open Gateway

GO

Back to index

XR Web3 Metaverse Blockchain

Web3 and the Metaverse

The Internet (R)Evolution

Telefónica sees Web3 and the Metaverse as an opportunity to **bring people's lives closer together**, by creating experiences that allow them to interact in a much more human way.

This new reality is changing the way we connect, entertain ourselves, learn, shop and do business. At Telefónica, we are embracing this new reality by making our network the springing stone for the Metaverse.

Objectives

We offer a range of products and services that give people a reliable way to connect to new Web3 and Metaverse technologies. We are using **AR/VR, NFTs, tokens, blockchain and crypto** to transform our customer relationships and provide them with new experiences.

Results

We have successfully developed the **Movistar Immersive Experience** app, our first virtual world. Users can watch sports and exclusive Movistar Plus+ content in 180°, 360° or multi-camera mode. They can also access a showroom and browse our products with the help of Aura, enjoy Okuda's artwork and very soon receive phone and video calls.

Discover

Web
Find out more about Web3 and the Metaverse

GO

Back to index

5G Cloud Robotics AI

Industrial metaverse Computer Vision

Remote digital twin

Using 5G mobile robotics

We are entering a whole new technological paradigm, focused on automated, real-time exploration and 3D capture of unknown remote environments and areas that need to be monitored. With the dynamic application of 5G, robotics and cloud computing, we can create and power a digital twin in real-time. This can then be used to create a 3D reconstruction of a particular location, where an accurate understanding of that location is essential. We can also use computer vision technology to identify specific elements within these locations, which can then be used for logistics, remote maintenance or perimeter security.

Objectives

We want to help industry to automate its processes, using the latest technology with a dual purpose: optimise resources and reduce risks to workers. Our 5G network provides the ultra-high bandwidth needed to transmit a massive LiDAR point cloud (360,000 points per second) simultaneously with video streams, used as the basis for artificial vision solutions. This technology ensures a highly reliable connection, essential in critical environments.

Results

The Boston Dynamics Spot robot, equipped with Leica's advanced mobile LiDAR technology and additional cameras (HD, 360°), performs 3D scanning along remote-controlled or fully automated routes, collecting 3D data from its environment. This data is then sent via 5G to the integrated management platform, developed using Google Cloud infrastructure. Google's Vertex AI is also used in this case, to apply artificial vision models. These models can monitor ORP compliance, detect accidents or hazards, and perform remote readings and automated inventory tasks.

Discover

Case study
"5G robotics for industrial facilities supervision."

GO

Case study
"5G Slicing for critical applications"

GO

Case study
"Making a mark: Tele-walking for a real inclusion."

GO

Back to index

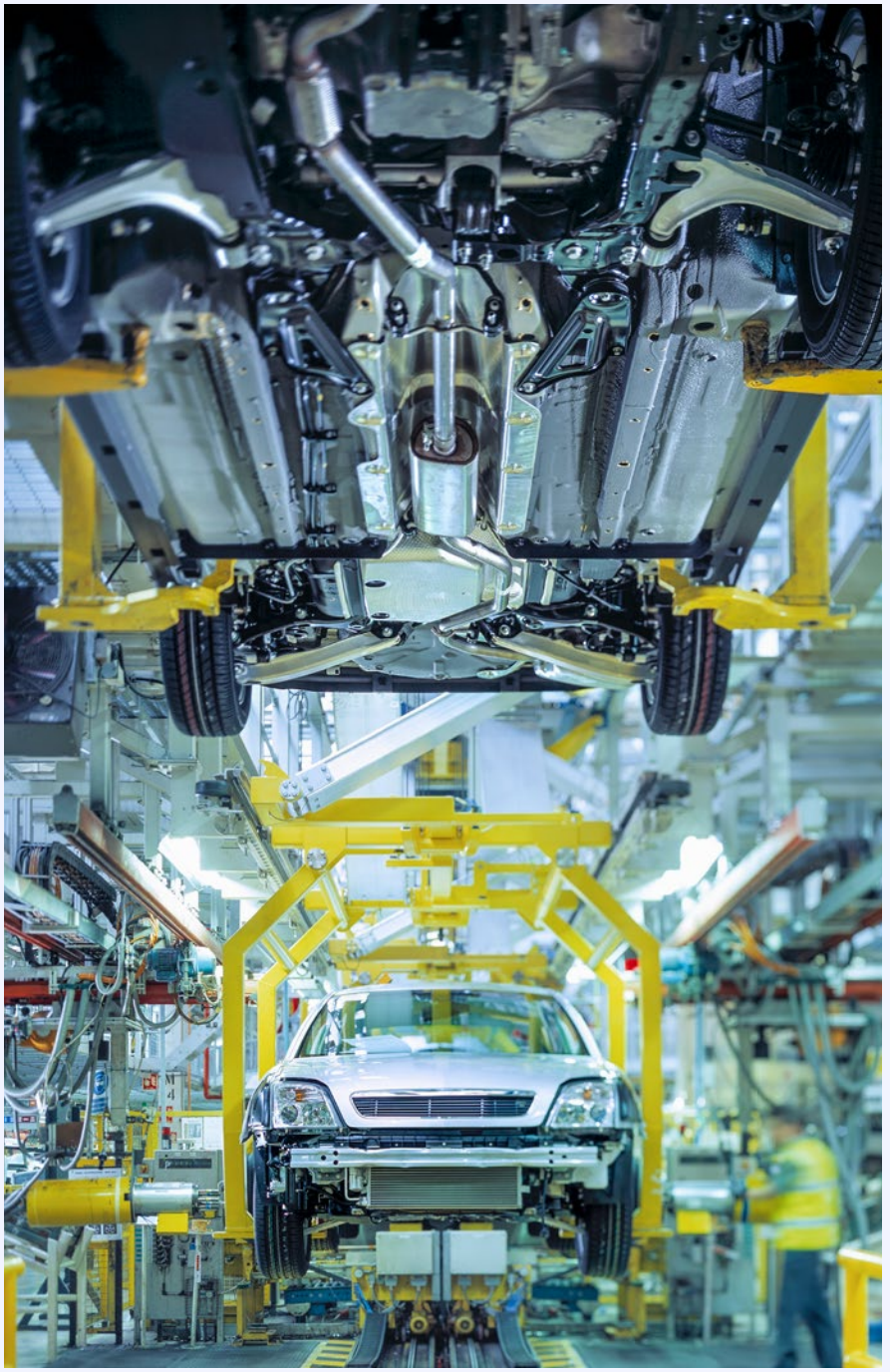
5G Edge Computing

Deep Learning Artificial vision

Digital twins

A key factor for smart industry

Digital twin solutions enable us to simulate specific industrial processes for a wide range of purposes, such as optimising manufacturing processes, increasing production, detecting faults, improving quality and reducing manufacturing errors, making this technology a highly valuable decision-making tool. 5G and edge computing play a key role in these solutions, ensuring data from industrial equipment is captured and processed in real-time, so that action can be taken immediately.



Objectives

Digital twins have now become a key tool in the digital transformation of industry. Their ability to manage and analyse large amounts of data enables them to identify patterns and trends, helping industrial companies to become more productive. With their ability to communicate and collaborate, digital twins can help improve operational efficiency and reduce the time taken to respond to market changes, creating smart and flexible factories.

Results

The main industry improvements being reported from digital twins include faster decision-making, greater efficiency and productivity (with OEE rising to 87.5%-95% and production time down by 25%), lower production costs and higher product quality. All of these benefits enable factories to reduce their consumption of raw materials and energy, creating fewer emissions and less waste, making them more sustainable.

Discover

Press release
"Telefónica and Gestamp promote the digitalization of the industry.."
GO

Video
"5G: The technology behind Industry 4.0."
GO

Article
"Celsa completes the European project IoT4Digitaltwin with Geprom"
GO

Artículo
"Success Case SEAT. Digital Twin simulation of logistic flows AGVs."
GO

Back to index

5G Fibre Edge computing

Holographic Telepresence

Your journey to a virtual world

This project was promoted by the Ministry of Economic Affairs and Digital Transformation through Red.es and co-financed with ERDF funds. The aim was to create a three-dimensional digital holograph of a person in real-time, with applications such as holographic telepresence, which uses augmented reality to interact with a remote person or object as if they were right in front of us.

Holographic Telepresence

Objectives

We wanted to create new and practical use cases in virtual worlds and the metaverse, pushing the boundaries of technology such as edge computing and 5G communications. The aim was to capture volumetric video in real-time for use in professional applications such as collaboration, training, virtual TV systems, telepresence and immersive gaming.

Results

This holographic telepresence system, developed in collaboration with Evercoast and Intel, was the first to successfully capture a person's volumetric video and broadcast it in real-time to any virtual environment or augmented reality projection, leveraging the capabilities of fibre optics, edge computing and 5G, with an end-to-end time of less than 800 ms. The system has been used in collaborative work environments such as fashion, rehabilitation training routines and in a variety of marketing and advertising campaigns. We are currently exploring its integration with virtual TV sets and 3D environments.

Discover

Press release

"Telefónica's holographic telepresence, protagonist with Carolina Marín at MWC."

GO

Video

"Holographic telepresence with Carolina Marín."

GO

What they say about us

"This project brings us closer to a future in which the safety of people and the execution of dangerous tasks are radically transformed. The most disruptive technologies come together to allow us to interpret and operate in the real world from a faithful and fully secure virtual scenario."

Eduardo Gómez de Tostón
General Director at Alisys

"The partnership between Telefónica and Google Cloud has enabled us to deliver services with minimal latency in the Madrid region, thanks to our combined innovation in the areas of telecommunications, artificial intelligence and data analytics."

Brice Crabbe
Head of Iberia, Telco partners,
Google Cloud

"5G and network slicing are undoubtedly two of the technologies that will allow us to take the guest experience – which forms the backbone of our business – to the next level, while improving the efficiency of our hotels, both in terms of our processes and the resources we use."

Tomeu Fiol
Global Hotel Technologies Director
en Meliá Hotels International

"The 4G/LTE network we are deploying enables the use of technologies such as Artificial Intelligence, IoT and Autonomous with the aim of increasing the safety of our operations, as well as generating gains in efficiency and sustainability. It also extends connectivity to our employees and the communities around the company, fulfilling our purpose of improving lives and transforming the future."

Marcia Costa
Executive Manager,
IT Infrastructure Services

What they say about us

Back to index

5G SA | Network Slicing | Edge Computing

SailGP

5G SA coverage for the world's fastest competition

This initiative was developed for the Spain Sail Grand Prix held in Cadiz in September 2022. The idea was to bring a more sustainable approach to the race, which forms part of SailGP's Impact League. Our solutions aimed to facilitate the transition towards clean energy, while also testing the use of critical 5G communications for transferring sensitive data such as video and real-time analysis of data from the multiple sensors all over the boats.

Objectives

To provide coverage along the racecourse, enabling drones to broadcast video via 5G and connect with sensors on the Spanish team's F50 boat. The client's objective was to broadcast from the sky in a more environmentally-friendly way (drones vs. helicopters) and use Telefónica's network to obtain data from the boat's sensors in real-time.

Results

During the SailGP competition held from 23-25 September 2022, Telefónica deployed a mobile unit with 5G NSA and SA coverage and mechanisms capable of network slicing, in order to ensure the highest quality of service. The mobile unit's antennas were positioned so as to ensure coverage around the racecourse, which was then used to broadcast video from three drones equipped with cameras and 5G SA video encoders made by Aviwest. Data was also collected in real-time from the sensors on the Spanish team's F50. We were able to achieve a stable and high-quality mobile network link, which enabled data to be sent from the boats reliably and as quickly as possible.

Discover

Video

"SailGP: Excitement is broadcasted in 5G"

GO

Back to index

SandaS GRC

Renfe

A privacy office like no other

Companies that provide essential services or operate critical infrastructure, are facing increasing demands and threats when it comes to data protection and cybersecurity. In an effort to strengthen its security, Renfe decided to create a **Privacy Office**. They chose to work with Telefónica Tech and its **consulting subsidiary** Govertis, which **specialises in cyber security, privacy, GRC, IRM and compliance**, to cover both legal and technical aspects. Telefónica Tech is committed to **providing a comprehensive service to our customers**, which is why we have guaranteed both the Privacy Office professionals and Renfe that they can count on our support, guidance, and specific knowledge.

Objectives

We set out to create a Privacy Office for Renfe, made up of **legal, technical and document management specialists**. This diversity of knowledge and experience enables Telefónica Tech's staff to provide clients with peace of mind, while helping them to **achieve their strategic vision** of how data protection and cybersecurity should be managed. This strategic vision combines **the legal, organisational and technical aspects of cybersecurity, with information security and data protection. By integrating these areas and creating synergies**, the various entities within the Renfe Group can achieve their objectives in each of these areas.

Results

Since the launch of Renfe's Privacy Office, a number of key measures have been initiated and consolidated. These include **strengthening the record of processing activities, monitoring which providers have access to the data that Renfe is responsible for, establishing a methodology for risk analysis and impact assessment, approving internal regulations, and closely monitoring mailboxes for data subjects exercising their rights and for the DPO**. Other notable achievements include raising the Group's awareness of the role and **functions of the Data Protection Officer, encouraging collaboration between the Privacy Office and other key areas** such as training, recruitment, marketing, procurement, customer experience and legal advisory, and the creation of a Committee that represents all the different Group entities.

Discover

Study case

"In a context in which companies that provide essential services..."

GO

Video

"A privacy office like no other".

GO

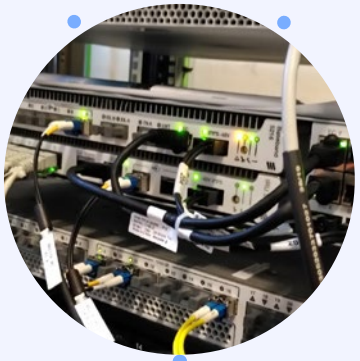
Back to index

5G SA | Edge Computing | Network Slicing | Mobile Broadband | Low Latency

Network Slicing

Network slicing is a technology that will provide our customers with a range of customised, dedicated and configurable networks. This technology allows a network to be segmented into multiple slices, each of which can be configured with different network capabilities, enabling us to offer unique services to each of our clients. For example, a slice could be set up with guaranteed bandwidth or ultra-low latency.

For the network slicing it is crucial to use 5G Stand Alone networks, which not only enable minimal latency and high bandwidth performance but also increase network flexibility and efficiency.



Objectives

The main objective of this pilot is to test out network slicing technology to meet the needs of our client, Meliá, and to bring this technology to the hotel sector using Telefónica's commercial network. As part of the pilot, we deployed 5G coverage inside the Hotel Meliá Serrano in Madrid, where we created a series of slices. The client can define different slices for different services within the hotel, including critical services such as surveillance cameras, communications services for hotel staff, 5G video streaming for events, or to ensure connectivity in events with high user density.

Results

In collaboration with Meliá, we have implemented the functionality of network slicing on the 5G SA commercial network, a pioneering experience in Europe, making the Meliá Serrano hotel in Madrid the first hotel with these characteristics.
Several slices were defined within the hotel, guaranteeing the service and assigning different resources to each of them, dynamically adjusted according to demand.

Discover

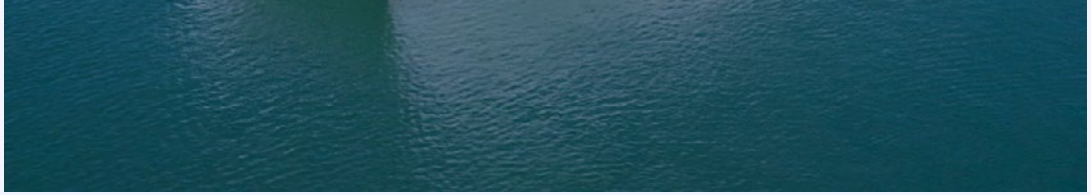
Press release
"Telefónica and Meliá Hotels International develop 5G use case."

GO

Video
"Network slicing in Meliá Serrano Hotel."

GO

Back to index



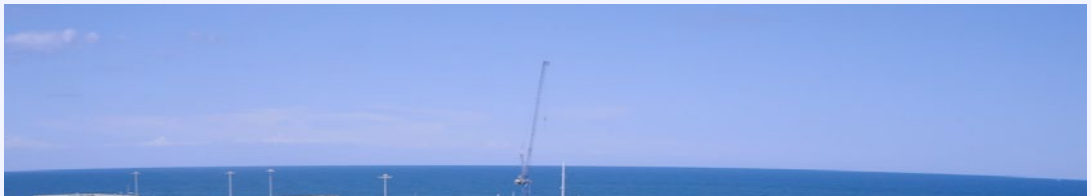
5G SA Extended Cell Range

Baleària

5G shore-to-ship coverage

This 5G shore-to-ship solution uses land-based antennas to provide 5G communications to ships sailing up to 100 km from the shore. The solution enables a wide range of services such as data transmission, connectivity for ship infrastructure, diagnostics and remote control. In this 5G coverage, we enabled a specific feature for long-distance communications, known as Extended Cell Range.

This project used 5G SA coverage in the 700 MHz band, transmitted from a site near Denia at an altitude of around 400 metres to maximise range. The antenna faces out to sea, towards the Denia-Ibiza route used by the Baleària fleet. One of Baleària's ships, the Eleanor Roosevelt, has been equipped with high-gain antennas on the upper deck. These are connected to a 5G SA router, installed in the ship's communications room to provide 5G connectivity.



Objectives

The main objective of this project is to test the range of 5G coverage at sea with land-based antennas, using the lowest 5G band. This provides the ship with communications for systems that have lower latency than current satellite-based communications.

Results

We achieved stable coverage up to 85 km from the coast, with latencies between 30 and 50 ms, up to ten times lower than traditional satellite coverage. This solution is therefore perfectly suited for moderate bandwiths on this type of route.

Discover

Video

"Baleària: 5G comes aboard ."

GO

What they say about us

At Movistar Plus+ we are constantly exploring new technologies to find new ways to reach our viewers. Combining systems such as holographic telepresence with our augmented reality graphics applied to the world of TV sets can open up exciting possibilities."

Francisco Javier Riloba
Head of Media Production, Movistar Plus+

"Telefónica won the project in a public tender. Telefónica submitted the best offer, both from a technical and a financial point of view. We assessed how they responded to the requirements we set, the people who would be involved in delivering the service and the company's experience in providing a guaranteed service."

Francisco Lázaro
Data Protection Officer, Renfe

"I would call the F50 catamaran an extreme IoT device with 30,000 data points. This collaboration with Telefónica allows us to deliver all this data to the viewer as quickly as possible."

David Warren
Chief Digital Officer de Sail GP

"5G technology opens up a wide range of possibilities for us. It will enable us to improve all on-board communications, giving us much quicker access to the ship's telemetry on land, while also allowing the ship to receive all the data from the land in real time."

Francisco Abril Hita
Head of IT Infrastructure at Baleària

What they say about us

Back to index

NB-IoT IoT Kite Platform GPS Cloud

Connected beacons

Spain's Directorate-General for Traffic (DGT) has decreed that from 1 January 2026, all vehicles **must be equipped with a connected V16 signal**, also known as a connected beacon. Until then, drivers can continue to use warning triangles, unconnected V16 signals and connected V16 beacons as they become available on the market.

These new connected beacons will transmit the location of the broken-down vehicle, enabling the DGT to optimise traffic flow and road safety. The device will also allow the driver to signal that they are stopping their vehicle using light signals, without having to get out onto the road as they would with a warning triangle.

Objectives

Telefónica Tech has developed a solution to **provide Narrow Band-IoT (NB-IoT) to manufacturers of the new connected beacons**, including:

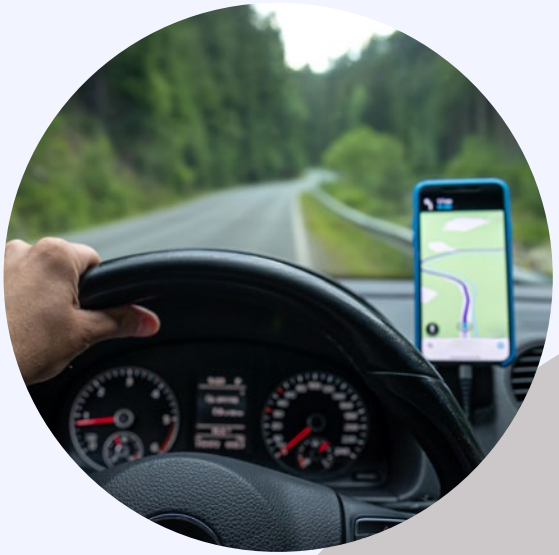
- At least **12 years of connectivity using state-of-the-art NB-IoT**, which uses a tiny amount of the device's battery, giving it a longer lifespan and ensuring coverage across the whole of Spain.
- **Management for this connectivity via the Kite Platform, which provides numerous connectivity management functions**, while also managing the data from each beacon to ensure it is securely sent to the DGT 3.0 platform.
- **Devices for connecting and lighting the beacons**, integrating all the electronics required to operate the new beacons.
- **Technical support for our clients** via The Thinx, our IoT laboratory.

Results

Telefónica Tech has the capabilities and experience to help manufacturers **successfully meet the challenge of equipping every vehicle in Spain with these new beacons**.

Our connectivity solution is currently integrated into the beacons of **more than 14 manufacturers who already work with us**, with whom we plan to **connect millions of beacons in the coming years**. Some of these manufacturers have also used Telefónica Tech to design and manufacture connectivity and lighting devices for their own beacons.

Telefónica Tech aims to be the driving force behind this project, which **will connect the beacons of more than 30 million vehicles in Spain**.



Discover

Press release
"Telefónica Tech connects FlashLED's smart beacons"

GO

Back to index

OT&IIoT Deception

Threat Intelligence AI

Aristeo

An OT network for predictive threat collection and analysis in cyber intelligence and geo-strategic operations

Aristeo is **the brains behind this specialised industrial cybersecurity solution**. It uses **decoys made from real industrial hardware** to collect threat data. These decoys can be deployed anywhere in the world, giving Telefónica's analysts the flexibility, global overview and quality of information they need to **analyse the current cyber threat landscape in critical sectors and cyber defence**. Their analysis focused on the European continent, with one northern European country as the main subject of the report.

Objectives

The overall objective was to analyse current **cyber threats to critical infrastructure in the renewable energy sector**. The client was also specifically interested in approaching the analysis from a military perspective (a potential attack on this infrastructure).

For this specific objective, **Aristeo decoys were placed in a country of the client's choice, but comparisons were also made with other countries in Europe**, where Aristeo decoys were also used.

Results

We identified several patterns that varied depending on the location of the decoy. One of these patterns was a **huge variation in threat location data depending on the location of the decoy**.

Another striking pattern was a variation in the **list of users and the dictionaries used in brute force attacks**. The nature of these threats also varied.

We also **identified "home-grown" botnet activity in the client's sector and cybercriminal gang activity (TTP)**.

Discover

Aristeo Web
Discover all the cybersecurity events detected.

GO

Private 4G LTE network

VALE mining company

VALE is the **Brazilian-based mining company operating the world's largest open pit mine. In 2019, the company selected Vivo as its technology partner to deploy a private 4G LTE network**.

Thanks to Telefónica Tech's solution, the mining company now uses **private wireless services to automate its drilling rigs and trucks**. When it first went live, the network was used to operate **six automated off-road trucks, and it now operates 14 trucks and two automated drilling rigs**.

Private LTE enables the performance of each individual application to be fine-tuned, while also providing **a single wireless platform throughout the mine** to support all critical communications requirements.

Objectives

The main objectives of this solution were to **make the company's operations safer**, while **improving efficiency and sustainable practices**. They were also interested in carrying different types of traffic on the same network, such as data, voice and video.

The company also wanted to **provide better connectivity for its employees and communities living near the mine**.

Results

We achieved a **95% increase in production** and a 24% **reduction in fuel consumption (10,000 tCO_2eq per year)** compared to a conventional fleet.

The network now provides **communications coverage for over 10,000 employees in areas with poor connectivity**, while also improving accessibility for employees with disabilities (reduced mobility), who can now perform physical tasks remotely using mobile devices.

VALE has identified 56 communities that now have access to 4G network coverage.

Last but not least, **the automated vehicles have not caused a single accident since their introduction in September 2019**, highlighting the success of the project.

Discover

VALE Web

"We exist to improve life and transform the future. Together."

GO

IA NLP Voice to text Streaming

Live Shopping

On Movistar Plus+

IKEA and Adolfo Domínguez have launched the Live Shopping experience on Movistar Plus+. This feature broadcasts live or pre-recorded events and allows viewers to learn more about a brand's products, **ask a specialist for assistance** and shop interactively.

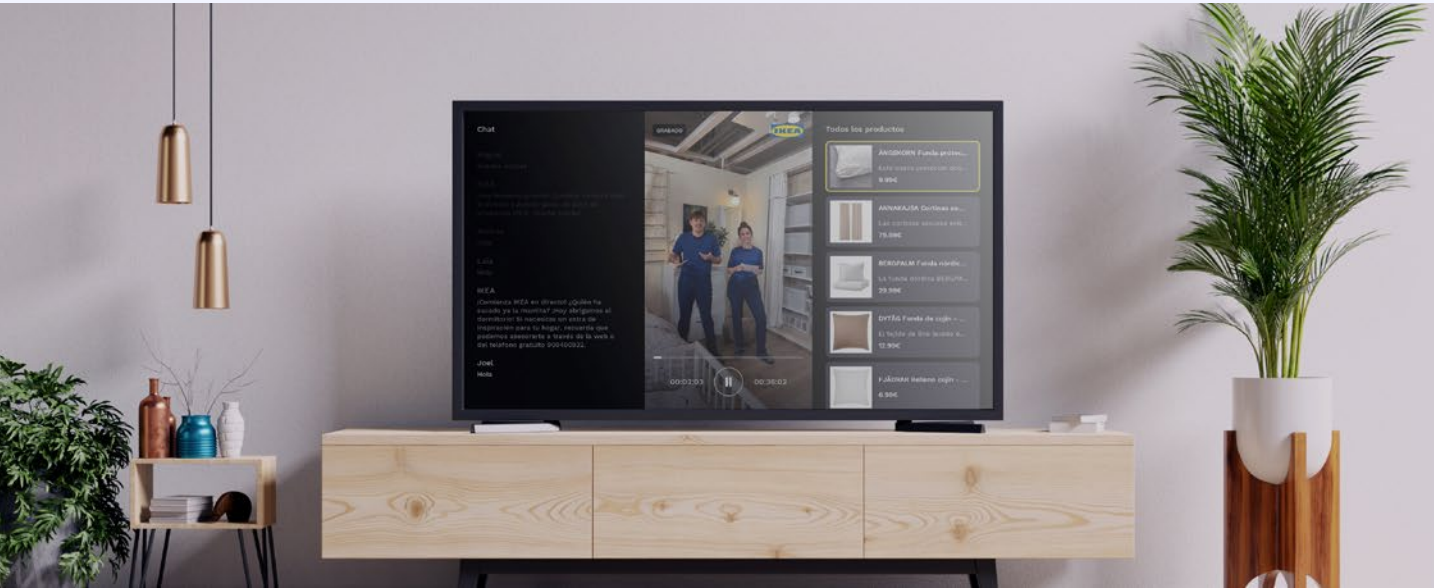
The IKEA Living App offers decorating tips from interior designers. Customers can also access a live chat, view more details and make a purchase. Adolfo Domínguez customers can watch events on TV after they are broadcast, see all the products featured by the influencer, **find out more details about the clothes** and then make a purchase.

Objectives

We offer a new space on Movistar Plus+ for companies and partners to create an innovative point of sale, where they can showcase their catalogue of products and services **on the big TV screen**, growing their business potential by reaching new customers. We offer a new and personal way of shopping with a specialist, creating an experience that the whole family can share.

Results

In the last few months, more than 500,000 users have enjoyed Living Apps experiences for free in the Movistar Plus+ "Apps" section. Customers can also shop with *Hogar Selección de Movistar* in partnership with Amazon, interact with social media on the big screen with TikTok Extra and Twitter, or learn with LinkedIn Learning and Amautas, among others.



Discover

Press release
IKEA Live Shopping
GO

Video
Live Shopping
GO

Cloud Data Center **BI+Analitics** **Tu Empresa Segura (Premium)**

CATESA

The importance of innovation

CATESA, is a company dedicated to tax, legal and labour advice, as well as economic consultancy for companies and individuals. It has over 30 years of experience in the sector and is **a clear example of how a business can successfully tackle its digital transformation thanks to value propositions such as the one offered by Fusión Digital Pymes**.

Objectives

The business relied on **very traditional processes**, so the main objective was the search for a **comprehensive digital transformation**, focusing on innovation and new technologies.This challenge required a **global solution for both communications and IT products and services**.

Results

The company **improved its communications**, gave employees **greater mobility** with their workstations, created a **collaborative workspace**, provided the company with **specialised technical support from any location, and stored all its documents securely in the cloud**, thanks to Telefónica Tech's Tu Empresa Segura (Keeping Your Company Safe) service.

This commitment to digitalisation continued with the arrival of the European Next Generation Funds, through the Digital Kit Programme. They have continued to transform and innovate their business thanks to **data analytics services and the improvement of their relationship channels with their customers** using services such as social networks.

Discover

Web
CATESA

GO

What they say about us

"Your Tech Expert has been a real lifesaver for our company."

Lidia Andrés
Head of Digital Transformation
at CATESA

"We continue to adapt to the needs of our customers and the new shopping habits of younger generations, developing new formats that allow us to reach people in a much more practical and specialised way."

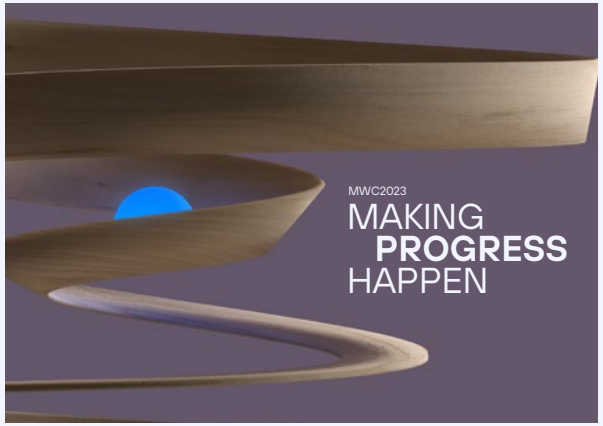
Gabriel Ladaria
Director of Marketing & Insights
at IKEA Spain

"Adolfo Domínguez is embracing innovation by combining sustainability and technology. Movistar Plus+ are the ideal partner for bringing our fashion events to the television screen."

Ana Oca
Global Head of Marketing

What they say about us

Telefónica



Find out more in our

Transformation Handbooks