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Telefónica

Digital transformation of industries	
Process & product	
✓	
✓	
Need to test the 5G technology	
Developing / testing technical solutions, processes approach, cross-sectoral co-innovation	
✓ Strong external co-innovation and internal support	
✓ Across several sectors, society at large	
✓ 5G deployment and services	
👍 With some funding support	

A 5G testbed for Industry 4.0

Towards a new industrial revolution

Europe's future industrial competitiveness hinges on our innovation powers and our ability to complete the green and digital transitions. Making Industry 4.0 a success is therefore vital, and a task for, amongst others, Europe's telecoms companies.

Properly digitalising an industrial factory is key to improving flexibility and efficiency and enabling real-time decision making. It is not a small task as it requires connecting, processing, and acting on massive amounts of data in real time and with centralised data management. The ability to achieve this digital transformation, with 5G, edge cloud and digital twin technologies will be one of the founding blocks of Europe's future industrial competitiveness.

Co-innovation and 5G testbeds accelerate the journey to Industry 4.0

The 5G smart factory trial[1] had the goal to build the Smart Factory concept and to test advanced technologies behind Industry 4.0. As a joint project by Mobile World Capital, Gestamp and Telefónica, this innovation builds on multi-sector cooperation in a 5G testbed context. It was a pioneering experience for both Gestamp and Telefónica, not to mention a technological

challenge, as the technologies used were in their infancy in 2019 (5G, Edge Cloud -MEC, IoT, AI simulation, Digital Twin).

Telefónica has launched several clusters and testbeds across Europe to innovate in 5G technologies and test applications and processes, collaborating with industries, businesses, and governments to unleash the potential of 5G. These trials and testbeds are the basis of co-innovation with different sectors in early stages of the technology, accelerating innovative use cases and applications from the lab to the market. Examples, include the Nokia-Telefonica "Early 5G Innovation Cluster" in Germany[2] for testing first 5G services in a dense urban area; or Telefonica's public call in the UK[3] for companies to join early trials of 5G technology, both in 2018. In Spain, which is also a European leader in 5G trials, key initiatives are Telefonica's 5G ecosystem with more than 80 innovation trials and use cases and the 5GTonic Innovation Hub founded by Telefónica and IMDEA Institute, a public-private open research, innovation, and co-creation laboratory focusing on 5G.

The project entailed testing different innovative technologies and processes, to bring 5G use cases from the lab to the market. We achieved a first demonstration of a digital factory based

1 5G: The technology behind Industry 4.0. Video: https://www.youtube.com/watch?v=i-bSKA4Evz4

2 Nokia and Telefónica Germany built up joint "Early 5G Innovation Cluster" in Berlin (2018): https://www.telefonica.de/news/press-releases-telefonica-germany/2018/12/nokia-and-telefonica-germany-built-up-joint-early-5g-innovation-cluster-in-berlin-new-cellular-sites-will-enable-developing-and-testing-new-5g-services.html

3 O2 UK offers 5G Testbed opportunity to every company in the FTSE 100 (2018) https://news.virginmediao2.co.uk/archive/o2-offers-5g-testbed-opportunity-to-every-company-in-the-ftse-100-in-a-pioneering-move-to-improve-national-output-and-boost-the-economy/

on 5G coverage with public network and Edge Computing solutions, obtaining low latencies and improving performances. This was a preliminary step towards an industrial private 5G network, a solution now offered by Telefónica. We also tested the first 5G router equipment and devices.

Moreover – as a big step towards Industry 4.0 – we optimised and automated manufacturing processes, including with artificial intelligence-based support tools and digital twin environment, testing and improving solutions according to customers' needs.

How to launch a 5G testbed?

As in most of the 5G innovative use cases, this project too was born within a small, dedicated group within Telefónica, leveraging our large organisation's knowledge and resources, but agile enough to apply learnings fast. In this case, we have not used any public funding, which other Telefónica's 5G trials have benefited from. Our public call for proposals attracted the interest of several companies in different 5G trials. Linking the supply and demand side was key to optimising the development and commercialisation of the solution. Listening to customers' needs instead of presuming to already understand them, is key for successful co-innovation.

Making 5G work is bigger than just our business interest. We have posted the results of all trials to help other companies from different sectors understand how 5G innovations may apply to them and how to accelerate their digital and green transformation, boosting competitiveness.

Public sector involvement and regulatory adaptation will be key

This collaboration to test and incentivise new technologies development and adoption is an excellent example of how public institutions can help innovation become a key success factor.

To bring innovation from the lab to the market two aspects are essential:

First, an innovation-friendly framework that allows for "out of the box" initiatives and provides business models with legal certainty. The regulatory framework needs to enable technological innovation and remove regulatory hurdles to this process.

Second, accelerating time-to-market is just as important for innovation as supporting research. Concretely this means incentivising and funding testbeds and sandboxes for testing innovative

technology solutions and new business models, as well as supporting the scale up of key technology-based projects, for example by rewarding cross-sectoral cooperation.

Looking at the basics, it is obvious that our industries can only transform if our society invests in STEM education to create the necessary expertise and skills. Moreover, for a strong skills pool, we need to retain European talent and attract external talent. Here we need governments to send clear signals (such as European visas to facilitate entrepreneurship or tax incentives for individuals).

In short to keep Europe as an innovation powerhouse, we need to walk the talk when it comes to testing new concepts in a real-life environment. We have to embrace that innovation is learning by doing and promote this however we can.