Observatório do Emprego

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## Tech trends for 2021

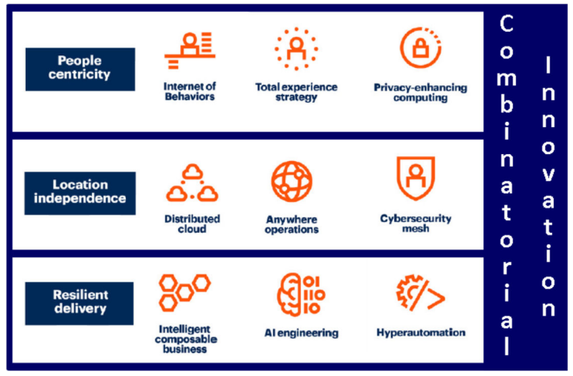
The year of 2020 was dominated by the Covid-19 pandemic which directly influenced technologies since they played an essential role to keep companies' operation. The pandemic's uncertainties were also reflected in the technological trends expected for 2021, which will be increasingly used and improved in order to help managers to guide their organizations at least in the next five years.

In this context, the Gartner consultancy presented the main strategic technology trends for 2021, based on the methodology of Hype Cycles, which provides a representation of the maturity of the adoption of technologies and how they may be relevant to solve real business problems, and also verifying the evolution of a certain technology over time. Therefore, these trends for 2021 are divided into three main groups: people centricity, location independence and resilient delivery.

The people centricity focuses on the need of digital processes to allow the professionals work and the continuation of business, even with the restrictions and changes of the pandemic. The internet of behaviors is a technology that captures the "digital dust" of a user to influence its behavior. Another trend is the total experience, which combines isolated disciplines, such as multi-experience customer experience employee experience and user experience, in order to create a better experience for all parties. In addition, privacy-enhancing computation encompasses technologies to protect data and allows its safe processing and analysis in a reliable environment.

Location independence reflects the changes, namely due the COVID-19, regarding the physical location of: employees, customers, suppliers and organizational ecosystems. The distributed cloud is a trend which offers public cloud options for different physical locations, such as the local public cloud; the cutting-edge cloud of the internet of things (IoT) and the mobile edge cloud 5G. Another trend is the operations anywhere which aims the supporting customers and working independently of the place, but also the management of the business services deployment in a distributed infrastructure. Cybersecurity Mesh is a trend which address to ensure the access and the safe use of applications based on cloud computing and distributed data from uncontrolled devices.

The resilient delivery is associated with the necessity of the companies to find solutions for their business regardless the market volatility. The Intelligent composable business trend is related to technologies which aim to become the business processes more intelligent and adaptable, with a quick and easy access to data in order to make more agile decisions.




## IT Portuguese professionals and the COVID scenario

The COVID-19 pandemics led to deep changes in society, economy and labour market, but also anticipated the adoption of some key technology trends which were only forecasted for the upcoming years. This fact may be explained by the need for companies to respond and adapt to the consumers faster demands due sanitary issues and restrictions, that were imposed by the pandemic context.

During this time, it is estimated that many companies have anticipated their digitalization in three to four years in order to improve their relationship with the costumers, as well as their supply chain operations and their internal processes.

The lockdown period and the quarantine made people resort to online platforms many of their daily activities, including the purchase of food products and clothes, as well as for entertainment purposes. This led to an improvement in the logistics systems to support the e-commerce. The boost in research on robotics was impressive, as well as the growth in the use of drones and robots for activities such as disinfection or for home delivery.

Supply chains became more vulnerable due to factors such as the disruption in production systems, their dependency on paper-based records, their lack of flexibility or even the different levels of export bans on some items, such as individual protection equipment. Several technologies associated with the Fourth Industrial Revolution, including: Big Data, cloud computing, Internet-of-Things ("IoT") and blockchain, were essential in order to adapt the supply chain to respond to consumers' needs.

Likewise, remote work was enabled by the increase in use of technologies such as: virtual private networks (VPNs), voice over internet protocols (VoIPs), platforms for virtual meetings, cloud technology, work collaboration tools and facial recognition. Similar technologies were used to turn distant learning possible, as well as other including virtual reality, augmented reality, 3D printing and artificial-intelligence.

Interesting advances were recorded in the use of 3D printing to mitigate supply chain shocks and export bans, such as those applied to personal protective equipment. 3D printing offers flexibility in production. Several companies mentioned the adoption of these technologies, and referred several factors they considered important for success in this context, such as: the overcoming to the lack of technological talents, the use of more advanced technologies and the acceleration on experimentation and innovation.

In this context, a survey conducted by the Aveiro Labour Observatory, between May and July of 2020, allowed for the identification of 10 key skills for the business in the ICET sector, that were hard to find in the local market. Therefore, the Observatory continues its activities in order to identify the necessary skills and qualifications to anticipate these technology trends in companies, and keeping their competitiveness in the market and attracting talents to Aveiro.

Source: https://pixabay.com/photos

Peralta, H. (2021). Falta de profissionais nas TI faz disparar salários em Portugal .
Pereira, S. (2021). Empresas desesperam por trabalhadores qualificados

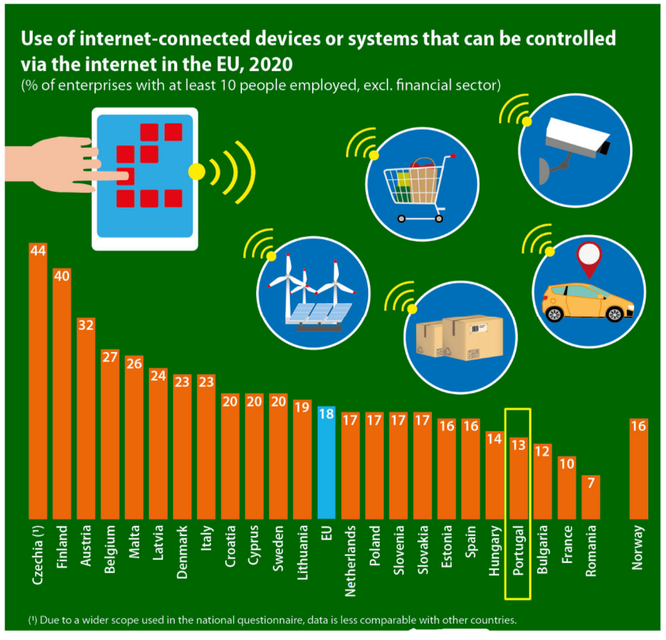
# Did you know that...

In combination with other emerging technologies from the 4th Industrial Revolution, the internet of things (IoT) was one of those which had its use boosted due the COVID-19 pandemic. From sensors to thermostats and thermometers, around the world, there are a variety of 'smart' physical objects connected for collecting and sharing data over the internet. These results in a high level of digital intelligence and autonomy, which are changing the way we live and work. The connected devices fall into three main scopes: consumer IoT (for example: wearables); business IoT (smart companies and precision agriculture); and IoT of public spaces (waste management). It is estimated that every day, these devices generate 1 billion GB of data.

According to the 'State of the Connected World' report of the World Economic Forum, by 2025, 42 billion devices will capture data related to how we live, work, move around our cities and operate the machines on which we depend. Another article from the World Economic Forum 'What is the Internet of Things?', based on an analysis of data from 2018 of more than 640 IoT deployments, shows that 84% of these deployments meet the Sustainable Development Goals of UN.

The internet of things may be further enhanced by three key technologies: AI, 5G network and Big Data. Associated with artificial intelligence, the IoT may influence four segments: wearables, smart homes, smart cities and smart industries. In the article '4 key areas where AI and IoT are being combined' of the World Economic Forum, by 2023, it is estimated that the global wearable device market will exceed 72 billion €. While, the market value for the "smart homes", between 2020-2025, will reach 246 billion €. The report also points out that, by 2022, more than 80% of corporate IoT projects will incorporate AI.

According to a McKinsey report 'Growing opportunities in the Internet of Things', in 2019, approximately 25% of companies used IoT technologies, while it was only 13% of them in 2014. In the European Union, it is estimated that one fifth of companies with more than ten employees already apply IoT technologies. However, according to data from Eurostat, Portugal is below the European average, with only 13%, which means that, only one in eight Portuguese companies uses this technology.




Source: *https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210312-1?redirect=%2Feurostat%2F*

# Digital tech to help people with disabilities

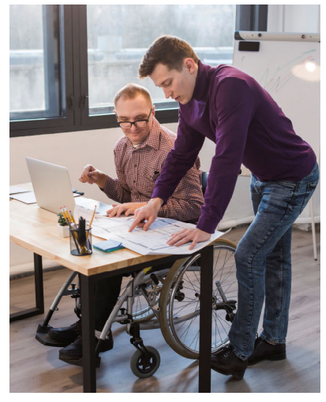
Worldwide, more than 15% of the population has some type of disability, which often limits their access to the labor market and to perform certain activities. The development of new digital technologies may help achieve the equality at work, but also making these people more self-confident and self-sufficient.

While technologies such as: AI, extended reality (XR), robotic process automation, internet of things and blockchain, have evolved in order to be a basis for many products and services, which are reducing time-consuming activities practiced by humans. These activities are mainly a weakness for many people with disabilities. This transformation has allowed to reduce these weaknesses and the disabled people with the rest of the employees.

Therefore, disabled people are discovering in these technologies an opportunity for innovation. AI, for example, has been used as a tool to improve the quality of life for people with visual disability by the description of the surroundings, people recognition, images and printed documents reading, scanning bar codes in stores to provide a description of products. For people with cognitive disabilities, the use of an "action block" makes it possible to perform more easily common everyday actions, by a touch in an image or button on the screen of a mobile phone. As well as applications which are activated by voice. Meanwhile, the introduction of live subtitles in online meeting applications has significantly contributed to the work of users with hearing disabilities. The extended reality eliminated the problem of distance by creating a decentralized workplace, allowing employees with movement disabilities to be virtually in the field, performing assignments and work tasks remotely.

However, to ensure that the benefits of these technologies are for the all society, companies point out three ways to make these technologies more inclusive for disabled people. The first one is the inclusion of these people in the development of projects in order to have the vision of the "final consumer". The second is the key role of the leaders of companies / industry in the inclusive products design, since it is proven the innovation generated with an inclusive design which encourages a broader use of the product and the opening of new markets. Finally, it is necessary invest in technologies addressed to the assistive equipment market with a direct impact on the quality of life and productivity of many people, as it provides new accessible or autonomous opportunities.

The University of Aveiro is a partner in the Erasmus+ project "Co-Education in Green" which aims to empower adult educators in community education, giving emphasis on environmental and accessibility issues for people with disabilities. Thus, they will become leaders in their local communities and promote cooperative projects of transformation of shared spaces into greener and more accessible areas for all. To learn more about the project, access: https://coeducationingreen.eu/en



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**To learn more about the Aveiro Labour Observatory: http://observatoriodoemprego.web.ua.pt/**

**To learn more about the Urban Innovative Actions: https://www.uia-initiative.eu/en/uia-cities/aveiro**

**To learn more about the project: https://www.aveirotechcity.pt/pt/atividades/observatorio-do-emprego**


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Main Urban Authority

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Funding