

Increase competitiveness with 5G technology

5G guide for businesses

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Introduction

5G technology is much more than the next step after 3G and 4G. It is a network that surpasses the speed and reliability of the human brain, allowing the migration of critical applications to a mobile network.

5G guarantees the continuity of operations and smooth work in all situations. It enables many new business opportunities based on the collection and use of real-time data.

5G uses various frequencies that offer various benefits. Low frequencies cover a wide area and penetrate through obstacles but have limited speed.

High frequencies provide superfast connections, but they have a short range and are easily reflected off objects. Medium-range frequencies are in between. 5G can intelligently combine these frequencies and provide optimal connectivity in different situations.



2019

- Telia's 5G network

starts operating.

- 2020
 - 5G network in largest urban areas 48 towns, 550 base stations (about 40% of people).

2021

- 148 towns (about 65% of the populace) - 5G Yritysnetti business
- subscriptions available - 5G expands to less populated areas

at 700 MHz.

2022

- 5G network covers about 75% of the populace
- 5G deployed at high 26 GHz frequencies – Telia 5G Standalone,
- i.e., the core of the network, represents 5G technology.

2023

- 5G coverage has expanded to Eastern and Northern Finland about 90% of the
 - 5G network covers population.

2025

- 5G as a digital platform for services that can make dreams come true and solve future challenges.

Coverage

The most important features of 5G are:

High speed and low latency

5G can momentarily reach speeds of 20 gigabits per second (Gbps). That means you can download a move in 8K resolution in 25 seconds or transfer large amounts of data to the cloud or edge almost instantaneously. 5G also has significantly lower latency than 4G, which means it responds faster. The latency of 5G can be less than milliseconds, while 4G has a latency of about 50 milliseconds. This enables real-time communication and control between different devices.

Reliability and guaranteed performance

5G provides specialised applications and enterprise networks with the ability to guarantee network quality and capacity in accordance with their needs. For example, 5G can separate critical and non-critical applications and assign different priorities and resources to them. 5G can also create private networks that are isolated from other traffic and offer high security and reliability.

Intelligent network management and quality-of-service optimisation

5G is a software-based network that can dynamically adapt to various situations and requirements. For example, 5G can detect network congestion and load as well as route traffic more efficiently. 5G can also leverage cloud and edge computing by bringing them closer to users and applications. In addition, 5G can use artificial intelligence and machine learning to optimise network operation and quality of service.

Platform for IoT solutions, security applications, AR and VR solutions, and autonomous devices

5G is an ideal platform for IoT solutions that collect data about products, devices and machines and transfer them with zero latency for artificial intelligence or other applications to analyse or refine. 5G also serves as a platform for a variety of security applications, such as group voice, surveillance cameras and alarm systems. 5G also enables new kinds of experiences with AR and VR solutions which require high speed and low latency. In addition, 5G supports the operation of autonomous and remotely controlled devices, such as robots, drones and vehicles.



5G accelerates industry projects and creates entirely new opportunities in areas such as smart cities and healthcare. Experiments in different fields have demonstrated the concrete benefits of 5G and proven that it can play an important role in enhancing efficiency and creating new innovations. 5G is the technology of the future, which will change both the world and business operations.

Why does your company need 5G?

Companies are often interested in 5G technology as part of a wider-ranging solution that also makes use of IoT or applications such as augmented reality. 5G offers opportunities for many sectors.

When planning a 5G project, consider not only the basics, such as schedule and funding, but also the risks and properly preparing for them, and secure the necessary expertise. An expert partner can be included in project to provide support for the organisation's own specialists.

5G use cases

- Video analytics
- Critical communication
- Flexible alternative to optical fibre
- Media production
- Autonomous vehicles and remote-controlled devices
- Cloud gaming



Seven reasons why your company needs 5G

1. To improve your company's productivity and efficiency

5G provides faster, more reliable connections and enables real-time data transfer and analysis. With 5G, you can leverage cloud and edge computing, artificial intelligence and machine learning, as well as IoT solutions in different business processes.

2. To enable your company's innovation and competitiveness

5G enables new business models, services and products. With 5G, you can create new experiences and solutions for your customers and partners, for example, through AR and VR technology, autonomous devices and remote control.

3. To improve your company's flexibility and adaptability

5G enables software-based network management and optimisation. With 5G, you can customise network quality and capacity for various applications and locations as well as create private networks that are isolated from other traffic and offer high security and reliability.

4. To support your company's sustainability

5G enables more energy-efficient and low-emission operations. With 5G, you can take advantage of smart solutions that help you save resources, reduce waste and emissions, and promote well-being.

5. To drive your company's digitalisation and transformation

5G enables the integration and compatibility of new technologies and platforms. With 5G, you can use various digital solutions that help you improve your customers' experience, business processes, work and decision-making.

6. To boost your company's security and preparedness

5G allows critical applications to operate in a mobile network. With 5G, you can make use of a variety of security applications such as group calls and remote diagnostics to help you protect your assets, staff and customers, as well as prepare for various disruptions and crises.

7. To support your company's growth and modern knowledge work

5G enables reliable and stable connections. With 5G, you can make use of a variety of global solutions, such as telecommuting, distance learning and remote healthcare, helping you to expand your operations and create new collaboration opportunities around the world.

Network slicing revolutionises the way corporate networks are implemented

Network slicing is one of the undisputed benefits of 5G. This means that the wireless network can be divided into various partitions or slices that are customised to the needs of different kinds of functions and processes for each individual business or organisation.

For example, separate networks can be created for production control, the headquarters and branch offices, and logistics control. The network can be customised depending on what kind of a network service the particular slice needs.

Network slicing also helps ensure the capacity for each specific organisation, using a virtual private network.

In practice, this means that ten percent of the network's capacity in a certain area, for instance, could be assigned to a particular site such as a factory, hospital or port operating in the vicinity. In such cases, the network as a whole is designed to withstand specific traffic in addition to other network use in the area.

This allows the organisation to have constant access to the required capacity, regardless of what is happening elsewhere in the network. For users and devices, a network is formed without installation work. Isolated traffic also improves security.

Benefits of network slicing

- Customisation The network can be customised as based on various applications and needs.
- Reliability The network works stably and reliably in all situations.
- Security The network is isolated from other traffic and protected from outside threats.

5G networks enable a local private network optimised for customer-specific needs, and are also suitable for sites outside the general mobile network, such as mines.

When a dedicated mobile network is customised for a company or specific requirement, massive amounts of data can be managed and processed automatically in such a way that critical applications always have access to the capacity they need. This enables the implementation of various automated production processes, ensuring that production does not stop due to network problems.

Network slicing is particularly suitable for applications and industries that require high speed, low latency, high reliability or security.

5G will make its way into your sector too – but how?

5G is transforming business operations and presenting companies with new opportunities for growth. Thanks to 5G connections, you can monitor supply chains in real time, increase occupational safety by managing machinery remotely, and both collect and process different types of data quickly and reliably. In addition, fast connections make remote working more efficient. This is how 5G will affect your sector.

Industry 4.0 is revolutionising the operations of industrial companies

Industrial users have been among the first in society to seize the possibilities of 5G. Using an ultra-fast wireless connection and licensed frequency range enables processes to be automated, efficiency to be enhanced, and disruption to be minimised.

When every machine and device is connected to the network via a wireless connection, the company gains real-time status information about individual machines and the whole entity. The production situation is always up to date, and various functions can be controlled remotely.

In addition, a 5G connection facilitates employees' work and the maintenance of machinery. A reliable 5G network enables group communication with smart devices instead of separate walkie-talkies. Thus, the number of portable devices can be reduced, thereby making work easier.





Thanks to broadband connectivity, communication can be safely enriched to include not only push-to-talk but also video and data. Reception and sound quality are also greatly improved.

Augmented and virtual reality solutions provide factory employees with an up-to-date overview as they walk round the factory.

When a machine or device indicates a need for maintenance via IoT sensors and the wireless network, it can also offer visual data on matters such as the spare parts required.

Device maintenance can also be implemented using AR and VR solutions that enable experts to be consulted, even if they are on the other side of the world. One example of a 5G use case in industry is video analytics.

Artificial intelligence requires high-resolution videos for analytics purposes in real-time. Therefore, the implementation relies on a fast and reliable connection. Video analytics make it possible to detect production errors and intervene immediately. Two use cases

5G and AR provide visualised, real-time data at Stora Enso's plant

A 5G pilot project run by Stora Enso and Telia improved the reliability of Stora Enso's production plant. Thanks to a 5G connection, experts gained easy, visualised access to real-time maintenance data at the factory using augmented reality. The 5G network, in combination with the computing capacity of the Telia Helsinki Data Center, creates a platform that allows factories to leverage solutions such as AR and VR, which require a large amount of capacity on a large scale, regardless of geographic location.



5G brings security to Boliden

Robust industry processes require robust security measures. Boliden Harjavalta has introduced a solution based on Telia's 5G connectivity, which safeguards the safety of slag transports in the Suurteollisuuspuisto Industrial Park in Harjavalta.

Read more (in Finnish)

Cost savings and real-time monitoring for the transport and logistics sector

The most important 5G applications in the area of transportation are remote-operated vehicles and machines, as well as autonomous vehicles. These will make logistics efficient and safe while reducing workforce expenditure. 5G also offers a solution for the real-time monitoring of logistics chains from start to finish. The technology will soon enable entirely latency-free monitoring.

Remote control makes it possible to work in places that are difficult or dangerous to access without compromising the safety of employees. For example, various port functions, such as unloading cargo, can be controlled remotely and automated using autonomous devices. Furthermore, different parties in the port area can share status information in real time, which makes their activities safer and more efficient. This also boosts cost-efficiency as one person can remotely control several vehicles.

In the future, ultra-fast connections will also be used by smart warehouses, which can be automated thanks to robotics, IoT sensors and fast network connections. In a smart warehouse, a robot picks the goods, and sensors make the delivery process transparent. When all of the products in a warehouse have IoT sensors, the status of the delivery can be viewed in real time, and warehouse management can be optimised.



In smart cities, almost everything is networked

Connecting a city's residents, traffic, buildings and infrastructure to the 5G network creates safety and efficiency, as well as cost savings for society. The smart city of the future will be entirely networked – buildings, vehicles and the city's infrastructure will be connected to the network via various sensors. For the city's residents and businesses, this will mean better, safer and smoother services.

Smart traffic flows through smart cities. Autonomous vehicles, such as buses and trains, will reduce workforce expenditure and allow the city to provide a more comprehensive transport network to the residents. As robotic buses do not need drivers, there could be more bus lines and buses without increasing the workforce expenditure. Smart traffic also means less congestion. Video analytics and IoT sensors can be used to control traffic, and this can take place in real-time thanks to the latency-free 5G network.

Artificial intelligence analyses the collected data and helps the employees responsible for controlling traffic to make the right decisions. Real-time traffic data can be offered to public transport passengers as well as other road users. Use case

Mall of Tripla leads the way for a smart city

The Mall of Tripla has used a 5G network and IoT sensors to collect data on congestion, flows of people, temperatures, humidity and air quality. The technology has also been used to monitor the direction of cyclist travel, among other things.

The data shows which routes inside the shopping centre are the most popular, as well as which are the busiest days of the week in terms of footfall. The experiment is a working example of how the cities of the future will be able to work with partners to present companies new opportunities and data-based support for matters such as selecting a commercial unit.

Collecting, transferring and processing large amounts of data requires the low latency and high capacity of a 5G network.

Read more (in Finnish)



Smart hospital

Healthcare is one of the users of 5G connectivity because it offers opportunities for improving patient care and hospital operations, including increasing employee safety.

5G enables a reliable and fast mobile network that replaces outdated communication systems and ensures the continuity of critical functions.

5G can also be used to build dedicated virtual private networks for hospitals for a range of purposes by using network slicing. This ensures that voice, alarms, and transfers of patient data, for example, always get the capacity they need, regardless of what happens elsewhere on the network.

5G also makes it possible to prepare for critical situations such as broken optical fibres or power outages that result in the potential unavailability of the public mobile network. 5G can provide a hardened mobile network that guarantees the functionality of healthcare and communication, also in the event of disruptions.

Thanks to 5G, healthcare services can be provided regardless of time and place. For example, remote medical services benefit from high-quality video transmitted over a 5G connection, which enables accurate diagnosis and treatment planning. When it no longer matters where the doctor and patient are physically located, healthcare services will become better available regardless of the area of residence. In addition, people helping a patient can be guided over a video connection before the emergency services personnel arrive.

In the future, healthcare services will have access to an enormous amount of customer data which can be collected during patient visits and with the aid of sensors and wearable devices, helping to support proactive treatment. If necessary, large amounts of data can be transferred in real time via 5G.

For instance, a faster and more reliable connection makes remote monitoring possible, allowing care providers to monitor the patient's state of health in real time and, if necessary, intervene quickly. 5G can be used to carry out remote consultations, allowing a physician to assess the patient's condition and give treatment instructions remotely. All these services can improve home care and make the patient's everyday life easier.

The digitalisation of home care can free up time for customers and increase safety in many ways. For example, technology can facilitate the work of care workers, support older people in independent living at home, increase their sense of security, monitor health development more closely and anticipate changes in service needs.





5G is revolutionising the energy sector

In the future, electricity will not just be fed into the grid from large, centralised power plants – it will also come from the other end of the distribution network. This change is being driven by factors such as the prevalence of smaller wind turbines and other power plants, as well as consumer solar panels, which enable more electricity to be generated than the owner can consume.

In the new, more complex distribution network, 5G technology and IoT solutions provide opportunities to forecast, prevent and control disruptions in real time. This enables smaller power plants, like wind turbines, to be managed remotely. Thanks to 5G connections, users can receive real-time information on their consumption and prices.

Without electricity, the digital society will go dark. The energy sector needs high-quality connections and sliced networks in order to safeguard the functionality of the electricity network. Sliced networks can ensure that power plants always have the capacity they need.

5G supports remote work

Modern work means an easier everyday life and the freedom to work at any time and in any place. Remote work has swiftly become commonplace, and it has had a demonstrably positive effect on employees' occupational wellbeing and motivation, as well as their work efficiency.

5G provides additional capacity that enables large files to be downloaded and uploaded via mobile connections and allows stutter-free video meetings. By optimising your corporate network, you can ensure that the connections work under all circumstances.

5G enables entire sites to be networked with flexible, fibrelike connections. However, it is equally suitable for helping to work from home or on the road. A fast 5G connection ensures that remote work goes just as smoothly as in the office.

5G as part of a Mobile Company Network

Sallila Energia utilised a Mobile Company Network to read its metering devices in the field in real time



Cloud gaming

5G provides significantly faster and more reliable connections than previous generations, enabling the streaming of higher-quality and more responsive games.

With 5G, cloud gaming can reach a whole new level, because it can:

- Reduce latency to less than 10 milliseconds, making the game smoother and more responsive, which is particularly important in VR games, for example.
- Offer high bandwidth, allowing gameplay streaming in 4K or even 8K resolution. This improves the graphic quality and immersiveness of games, which, in turn, increases player engagement.
- Expand network coverage as an alternative to fibre connections. This opens up new markets and opportunities for both players and game developers.

Edge computing is a technology that further improves the performance and user experience of cloud gaming. In edge computing, game data is processed close to the players, reducing latency and improving the user experience.

Together, cloud gaming and 5G can create great gaming experiences on any device with a screen and Internet connection.

There is no need to install the game and process the data on the device, but the game is played directly from the cloud to the device screen. Demanding game data processing can be moved away from the user device to a shared cloud platform.





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