

# Private 5G: take transformation to the next level

How wireless connectivity can be  
the platform for innovation over  
the next decade



## Private 5G: a quantum leap for innovation and digital transformation

Each step in the digital transformation of our world has opened up new opportunities for both society and business. For Fujitsu, DX has always been a human-centric concept. Innovation and change should focus on boosting growth and making life better for people, individually and collectively.

The arrival of 5G and its combination with Edge Computing is another stage in that journey. It's the next chapter in how we can accelerate existing technologies and leverage the power of IoT, AI, and data analytics. That's why the market share of Private 5G networks is growing across all sectors. According to Grand View Research (quoted by the GSMA), the global market is 'expected to grow' by an impressive 47.5% per year until 2030 when it will be worth a massive \$36 billion. And that rapid expansion will be a 'game-changer' across verticals like manufacturing, energy and utilities, transportation and logistics, aerospace and defence, oil and gas, mining and the public sector.

The development of Private 5G has been in the pipeline for a few years, and it will continue to develop over the next decade. The course of wireless connectivity evolution so far has been one of steady improvements and enhancements. 5G is different. The combination of enhanced mobile broadband, ultra-reliability and low latency as well as massive machine-type communication will turbo-charge digital transformation.

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**5G represents a quantum leap in the ability to integrate devices such as sensors, cameras, extended reality and augmented reality (XR and AR), robots and drones all in real-time.**

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## Ambitious and steady wins the race

Fujitsu's approach is focused on ensuring that you achieve real value in practical ways which have lasting benefits. Fujitsu's approach is based on measured (and measurable) change. The time to start doing that is now. There's no need to do too much, too quickly. We advise starting small, learning what works and what doesn't, and using that experience to enhance your deployment of 5G as you go and as your use case develops or changes.


And the use cases, once you start to look, are numerous. For instance, the Forestry Research Institute of Sweden, Skogforsk, is transforming the way it sustainably manages its forests which are, naturally, situated in remote areas. They are able to enhance operator safety and increase efficiency by using autonomous vehicles at the heart of an array of sensors and camera connected via their Private 5G network to a Teleoperation Lab that can control, track, monitor, assess, and share data in real-time using 4K HD images. **You can find more use cases on page [11](#) to [14](#).**

Enterprises and organizations like Skogforsk are using real world experience to carefully plot their adoption of 5G. They know that there is much more that can be achieved to further their environmental care of both their own natural resources and those connected to their forests, but they want to base their next steps on practical experience as well as evolving technologies. **That's why it is important to start taking advantage of the 5G opportunity now.** That will enable organizations to discover how 5G – which can also be used as a service - can benefit them faster and get ahead of competitors.

## Private 5G: characteristics

- High speed connectivity and communication
- High bandwidth
- Low latency
- Supports massive Machine Type Communications (mMTC)
- Takes IoT to the next level
- Transforms data collection in real time through sensors, cameras, all data collection devices
- Opens up wide possibilities for autonomous vehicles
- Enhances automation
- Delivers 4K HD imagery in real-time for expanded use of AR, VR + XR
- Greatly expands the edge so you get more from Edge Computing
- Real-time monitoring for employee safety as well as site security.





## Manufacturing and public sector organizations are pioneers

The ability to do more at the edge is the key to why the manufacturing sector is pioneering many of the use cases for Private 5G. The public sector, at all levels – local, regional, national – is also rapidly working on exploiting the power of Private 5G. That's because enterprises can gain extra bandwidth, achieve low latency, use more spectrum, and benefit from higher reliability. It enables organizations to make quicker and better decisions where it matters. It also means that Operational Technology (OT) and IT can work together seamlessly and data from OT can be used for data analytics.

What underpins all possible use cases for Private 5G is the ability to gather, process, and then utilize massive amounts of data generated by IoT devices. The true promise of IoT is now able to be delivered. And at the edge where most of those devices are. Autonomous machines, vehicles, and other technologies can now do more with less human intervention on either the factory floor, in forests, mines or ports. The edge is the source of most data. So, it makes sense to ensure that you have the bandwidth, low latency, and processing power to use that data to make timely decisions which protect people, places, and business outcomes.



**"5G is going to be the story of the next decade for all kinds of organizations. 5G is the true game changer that will drive the evolution of connectivity so that we can reap the incredible potential of AI, Machine Learning, and Edge Computing. It is also, the moment when IoT comes of age and can achieve exponential growth."**

**Mats Plahn, Fujitsu Global Head of Business  
Development and Innovation**

## Private 5G: technical overview



Can support 10Gb/s upload and 20Gb/s download



Latency of the Radio Access Network is down to 1ms to support high latency sensitive applications



Network coverage per cell improved to 10Mb/s/m with minimum data rate of 100 (download) and 50Mb/s (upload)



Device density improved to 1 million per km



Improved mobility with reliable coverage at speeds of up to 120km/h (500km/h possible)



# Advantages of a Private 5G network



We need 5G because **society and business is demanding greater mobile flexibility** and better decision making at the edge of almost everything we do. That's why global mobile data traffic is doubling each year, with the average device is using more than 10GB of data. But the arrival of 5G isn't just about everyday connectivity. The role out of 5G on public networks has already started in many countries.



**5G will drive the next generation of applications** such as IoT, autonomous vehicles, and the ability to use Augmented Reality/Virtual Reality and operate remotely. The benefits are obvious: improved service at the point of contact with people, reduced costs, increased efficiencies, better surveillance of production processes, and premises, greater use of intelligent/autonomous robots and vehicles, as well as improved security.



The vast improvement in speeds and improvements in both coverage and latency mean that **connectivity is real-time and so is richer and more reliable**. And those benefits are enhanced when organizations build their own enterprise networks.





## Commercial benefits

Private 5G is a standalone, dedicated network that's built for a specific organization, in a specific place, for a specific purpose. It delivers the same technology benefits as public 5G but, crucially, gives you more control over your network. You can set policies, services, data recovery and storage on your own terms, focused on your specific objectives and the outcomes you want to achieve. And when it comes to security, because devices are part of your private network, they come with security features built in and have to be registered before they can connect with your network. That's different to Wi-Fi which only requires a network name and a password for additional devices to be connected.

The advantage of all those attributes is that you get more flexibility and can focus coverage on remote places and applications, deliver coverage for large indoor spaces or campuses, and even access more spectrum than would be available from a public network. You can customize your network, be in full control of your own connectivity, and so achieve a consolidated network strategy across your enterprise. That's why forecasts show that [Private 5G will achieve a market size of over \\$8.3 billion by 2026](#), with a CAGR (Compound Annual Growth Rate) of 47.5% from 2022 to 2030.

Private 5G can cover areas of many different types, sizes, and locations. They can be implemented to suit a wide range of business types and traffic circumstances and are flexible enough to grow in both complexity and scale as organizations develop their use cases. They can be entirely private, on-premises, or hybrid, which means they can be integrated with a Service Provider network.



## The IoT inflexion point

The arrival of the IoT has long been predicted and there are many 'things' out there which are connected, but the rollout of 5G will kickstart a new era for ubiquitous IoT devices. That's because its lower latency and greater reliability, combined with high data transmission rates (measured in Gigabyte per second), will enable a greater density of devices. That means IoT deployments can grow exponentially. You can make the most of IoT within your networks to achieve greater efficiencies, automate more processes and workflows, monitor data, make repairs, and boost security of both people and information.

**5G is a real-time opportunity.** The benefits of speed and bandwidth mean that you can leverage IoT devices to optimize the connectivity of industrial control equipment across, for instance, a single large factor or a group of production facilities.



## An innovation platform that transforms use cases

Simply, 5G, and especially Private 5G, will change every sector of the economy and society. There are use cases you know about which will be enhanced by the ability to do much more at the edge, and there are use cases we haven't even thought about which can be developed based on the power of Private 5G. Here are just a few use cases that are possible right now.

### Healthcare

Network connectivity and security are critical to modern hospitals, clinics, and distributed health services within the community. Hospitals can create their own Private 5G networks to create a self-contained environment which supports people and devices as they care for patients. Ultra-reliable communications speed data sharing (for quick diagnosis, emergency response etc.) through distributed devices able to benefit from HD video to achieve speed and clarity.

Security is vital both in terms of operational integrity as well as data privacy and a private network can ring-fence healthcare environments successfully. Remote consultation, surgery, and inter-hospital co-operation and monitoring are all enhanced.

## Manufacturing and Industry 4.0

The arrival of Industry 4.0 has been talked about for a while, but Private 5G will accelerate its development and value. Factory-wide 5G networks will enable a higher level of device concentration within factories and industrial facilities (especially in remote locations). Integration with supply chains will smooth the movement of parts and finished products in and out of the factory. Devices can communicate at great speed and quality across complex production lines to respond to changing customer/market needs.

A private network means that security is enhanced to avoid cyber-attacks. Higher speeds, lower latency, and more granular (timely) data mean that each aspect of the production line can be monitored more closely, problems anticipated, and human behaviors observed to boost safety, enhance efficiency and productivity, and achieve the best value per manufactured product as it comes off the line.





## Smart transport and logistics

Railway stations, airports, bus hubs can all have their own Private 5G network to leverage the power of digital to keep people and machines moving in and out and on time. The ability to enhance the passenger experience and integrate data from retail outlets and other services means that the commercial as well as operational aspects of transport hubs can yield more value to both partners and users.

Private 5G helps minimize a transport hubs dependence on third-party MSPs by designing their own reliable and secure infrastructure to reap the benefits of digital transformation. And when it comes to moving 'things' instead of people, Private 5G networks achieve the same benefits in ports, warehousing facilities, and delivery networks. Use of autonomous vehicles will also be more feasible.

## Agriculture

Farming is, by definition, a remote and distributed activity. Farms, forests, and even fisheries will be able to create their own networks to make the most of IoT and Edge Computing to benefit from cutting edge digital communications wherever they are based. Real-time data processing means they can react to changes in weather, animal behavior/conditions, and market demands.

Sensors in even the most remote fields can provide not just data but visuals so that swift decisions can be made to protect crops or livestock. 5G's capabilities mean that it's easier to employ IoT devices (including autonomous vehicles and equipment) to carry out tasks and make the most of data management to improve yields, achieve efficiencies and reduce costs.



## Smart stadiums, campuses, and malls

Most sports fans will tell you that the truly smart stadium is still not a reality, despite the hype. A Private 5G network can make it real. The same is true for shopping malls and large retail locations on the edges of cities and academic campuses where the demand for connectivity by students is intense.

Because 5G can be configured to operate over relatively short ranges, it's possible to create a dense environment without interfering with public Wi-Fi or cellular signals. The same benefits that airports or factories or hospitals can achieve. Enhanced communication and security with better user experience.

**New use cases are becoming apparent in every sector as 5G is rolled out. It's clear that the possibilities are endless. With the right partners, you can achieve an enormous range of advancements as long as you have the right Private 5G ecosystem. That's how you benefit from greater speed, lower latency, and higher density.**

## Creating the right ecosystem is key

Arriving at a production-level system which combines IoT, and shop-floor Operational Technology effectively demands Edge Computing and real-time connectivity, and this effectively demands extensive management. That's because there are multiple touchpoints which need to be planned, deployed, verified, and managed. Only the largest organizations could hope to do that on their own, but that is not always the best focus for the companies. Why take on the responsibility for a wide range of applications, services, technologies, and components which need to be integrated properly? The most efficient approach – in terms of costs and manpower – is to create an ecosystem of partners to manage the Private 5G solutions.

Success depends on a clear roadmap which delivers quick wins whilst preparing for the steady evolution of how 5G will impact all areas of production, customer relations, supply chains, and R&D. A myriad of sensors, robots, cloud resources, on-premise installations, virtual machines, machines, many multiples of SIMs in all kinds of places (close and remote), and the need to visualize both your tech estate and the data that flows through it and across it means that your choice of partners is vital.



## Fujitsu: the 'turnkey service for Private 5G'

Fujitsu enables to focus on the business challenges which your organization is facing right now. You can focus on solving them while adapting to new methods, technologies, and systems as they evolve. The focus should always be on achieving change step-by-step through the right partnerships and the best technologies available right now.

We can bring everything together as a systems integrator so that you benefit from the services and technologies from multiple vendors – from mobile operators to cloud providers to start-ups with radical new technologies and capabilities. We provide an extensive partner network to you so you can benefit from a Private 5G solution to drive value and achieve specific outcomes in the short-term, and then learn from the experience and build further on the technology you have with new technology as it arrives on the market and is integrated in our partner ecosystem. It can be thought of as a streaming service of technologies that provides all the elements, expertise, and component technologies you need to find the best ways to use Private 5G profitably. You don't have to build / buy everything yourself; you can benefit from innovation as it occurs and evaluate use cases to achieve the best outcomes.

Private 5G networks are the next step in your digital transformation. The technology and its capabilities are evolving, but you don't have to wait to see how they turn out. At Fujitsu, we believe that Private 5G is good for business, people and, most importantly, our planet.



## Why Fujitsu:



We advance your **digital transformation** and enhance its reach to a wide range of devices like cameras, all kinds of sensors and IoT devices



Deliver a **Private 5G innovation platform** perfectly orchestrated and optimized, focused on your needs and objectives



Get **fully managed 5G connectivity** as a service – on a pay-per-use basis



Your employees can focus on the business topics, **we deliver the solution** to make it happen

We believe that is important to begin to leverage the potential of Private 5G networks right now. That's because this is a good time to adopt the technology early, but it's important to do it with a focus on use cases which can yield the most value and provide vital learning. Early adopters don't have to go all in; you can develop your business case as you discover what works for you. That's the best way to achieve gain long-term value from the evolution of Private 5G. And quick wins will set you apart from your competitors.

In conclusion, it's clear that Private 5G networks will help accelerate your digital transformation journey and take it to the next level. **We can help you curate, create, and deliver value at every stage of the 5G revolution.** Our 5G discovery workshops will give you the insights you need to understand the potential of Private 5G networks and help you match that to your specific situation and objectives.

## Connect with Fujitsu

Your next step is to think about where Private 5G might benefit your organization the most in the short-term. We'll work with you to address your unique needs and advise you about how you can make the most of Private 5G networks and Edge Computing.

Together we will aim for quick wins as we build your long-term 5G strategy focused on your objectives, values, and needs.

**Let's talk about how we can take your Private 5G to the next level.**

[Learn more about Fujitsu Private 5G here](#)



