

Private 5G at the edge – the great unshackling

Mats Plahn, Global Head of Business Development and Innovation, 5G and Edge, Uvance

If data lies at the heart of digitalization, then freedom from the need to shuttle it around it via cables — with wireless technologies — can take things to another level.

Private 5G is the next step in this great unshackling. Three capabilities of 5G stand out in particular: enhanced mobile broadband (eMBB), ultra-reliable low latency communication (URLLC) and massive machine-type communication (mMTC). They open up scenarios that would be extremely hard for other wireless communication technologies to deliver.

The potential of new private 5G market segments is finally coming into focus after a slow start — superbly explained recently [in a paper by my colleague Carlos Cordero](#) as caused by a combination of lack of spectrum, a lag in technology availability, and solution complexity. The relative absence of visible use cases led some to believe that private 5G was a mirage: an attractive vision on the horizon that never gets any closer. That pessimism is changing rapidly.

An ecosystem mentality

What's driving this change in mentality is that Innovators are realizing the potential to adopt 5G to perform existing use cases more efficiently or to enable new use cases that were not previously practical.



Typically, multiple players need to interact to overcome the problems of co-creating new applications and services that address these use cases. Those participants need broad expertise of co-creation, networking, digital transformation and a host of other ICT factors. It is highly unlikely that a single supplier is ready and waiting who can deliver all these capabilities. Hence the increasing importance of ecosystems (and an ecosystem mentality).

It is early days and we are still just scratching the surface of what 5G can do. These ecosystems are creating a cocktail of capabilities. Private 5G is the network on which you build quantifiable business value today and the potential to create

future disruption. The more capabilities you add, the better the economies of scale will be.

Private 5G opportunities

Although we are still in the overture stage with Private 5G, Fujitsu's primary involvement in the technology enables us to already detect which use cases are growing fastest.

[According to Grand View Research](#), the global Private 5G market is expected to grow by 47.5% per year until 2030 when it will be worth \$36 billion. The likely predominance of Europe in private 5G is why Fujitsu has focused its analysis on the region. Our research looked at four segments aligned with our view of customers' needs – sustainable manufacturing, trusted society, healthy living, and customer experience.

Delivering 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 with a higher level of device concentration within industrial facilities, integration with supply chains, and devices that can

communicate at great speed and quality across complex production lines to respond to changing customer and market needs.

The immediate drivers here are the interrelated costs of managing workloads by visual inspection, a shortage of skilled engineers, and ensuring work environment safety.

Within this segment, augmented maintenance will be the largest opportunity, already representing \$5.3 billion by 2025 according to our own data. This technology addresses challenges in many markets of recruiting enough skilled employees and the accelerating rate of retirement in markets such as Germany of qualified engineers. Augmented technologies enable much greater use of remote skills and the use of less-skilled labor for complex tasks. It is a classic "Edge" use case, where high bandwidth, low-latency connectivity across a distributed workforce is essential.

People enablement using advanced digital simulation in uses cases involving, for example, enabling remote inspection by qualified engineers of high-definition images of faulty equipment, is the second largest market at just over \$3 billion and robotic manufacturing is third at nearly \$2.7 billion. In the same way that enabling people in distributed manufacturing environments plays to 5G's strengths, so will robotic manufacturing increasingly rely on giving robots or other IoT devices the ability to move around factories, unshackled by cables.

Trusted society

The dominant use case in this segment will be fixed video surveillance. CCTV is a massive global use case and embraces millions of distributed devices generating large streams of digital video data. Private 5G can enable this kind of use case over the air, with reliable, high-bandwidth 5G wireless technologies making it much easier and faster to set up and utilize, compared with wired devices. Sized at \$2.4 billion, this opportunity dwarfs the next largest use case, smart transport and logistics which is expected to reach \$530 million to help address the overhead of constant monitoring of large numbers of distributed vehicles and operators across large areas. Other opportunities include drone and robotic inspection (\$323 million), the provision of location-free entertainment (\$226 million) and smart stadiums (\$153 million).

Healthy living

We see two dominant initial use cases in the European healthcare market: Surgical robots (\$572 million), where reliability and low latency are about as important as it's possible to get, and virtual telemedicine (\$412 million) where the opportunity is generated by the proliferation and geographical spread of both users and points of expertise. Robotic telepresence (\$160 million) and next-gen training (\$109 million) are the two other substantial use cases here.

Customer experience

In customer experience, the drivers are improvements in how organizations deliver services to end customers – primarily in the B2C space, but with increasing innovation in the B2B space. Their objectives are usually labor and other cost savings and improving the consumer experience. One cannot be at the expense of the other. Companies that can improve the customer experience while driving down costs are using technology to deliver decisive advantages over their competitors.

In this segment, we have identified two primary use cases. The first is drones for inventory management, where there is scope to automate and reduce costs while improving delivery times for end customers, and which we size at \$128 million in Europe to 2025. Drones are a clear-cut "unshackled" technology, where private 5G will be essential as the data demands of inventory management complexities increase in the coming years.

The second CX use case is smart warehousing for retailers, which we size at \$161 million up to 2025 in Europe. In the drive to automation to meet demand for same day deliveries while containing costs, 5G will bring about changes for traditional warehousing practices and make smart warehouses a much more common feature in the logistics industry.

Delivering business value from private 5G

Each of these use cases shows where thinking is already advancing to create business value with private 5G. Delivering that value requires a combination of engineering and research capabilities and knowledge of managing a 5G network and keeping it secure. Even that is not enough - co-creation and service creation cultures within a correctly configured ecosystem of partners are also essential prerequisites for integrated solutions and management of programs needs to include the complete stack.

Some customers may have the engineering and research parts of the equation, but few of will have the necessary 5G network experience. That's where they are looking for support. Other customers are looking for full-stack support. They want turnkey solutions that will enhance their current operations.

Right now, it is the first category of customer that is becoming active in the market. We expect the second type to become more visible over time. They will want and expect a focus on infrastructure that is fast and straightforward to deploy, avoiding CAPEX investment by pay-per-use model.

If this complex mix of characteristics seems too much to expect, there are partners positioned to work with both customer categories. To find out how that can help your organization create business value with private 5G, [get in touch with the experts](#).

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Mats is Global Head of Business Development and Innovation in the field of 5G and Edge at Fujitsu Uvance. He is the founder of several companies in the telecom sector and has held senior positions in companies such as Philips, SAAB, Sigma, Trio and as a senior management consultant within strategy and business development.



Prior to Fujitsu, Mats worked as senior advisor at TeliaCompany within mobile services and enterprise business. He graduated from the Royal Institute of Technology in Stockholm with a Masters in Electrical Engineering and Mobile communication.