Fact Sheet

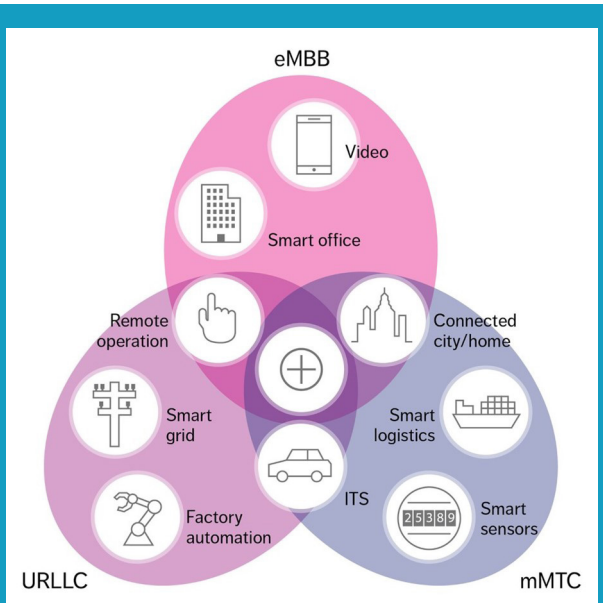
FarrPoint

5G Services

5G's architecture and technology has been developed in a different way to previous mobile generations, with the intention to support a variety of use cases leading to a multi-service capability, sometimes known as a network-of- networks. Instead of just connecting people, 5G also connects machines at scale and with high performance.

5G is often marketed as a nirvana solution to address all our connectivity needs and provide wonderous new solutions to change our lives. An element of that 'hype' is useful and probably essential to raise interest, excite, drive new thoughts, and help build momentum that will sustain through to actual deployment and service implementation. Within FarrPoint, we are equally enthused about the potential for 5G, but take a pragmatic approach to consider what this means in practice.

A common representation of 5G use cases is shown in the following diagram, highlighting the 3 groupings of: Enhanced Mobile Broadband, Machine to Machine Type Communications and Ultra Reliable Low Latency Communications.



Source: The 3g4G Blog

5G Markets

1	2	3
Enhanced mobile broadband	**Massive machine type communications**	**Ultra-reliable low latency communications**

Markets

Enhanced Mobile Broadband

Enhanced mobile broadband is an obvious market and one which mobile operators will promote through their initial rollouts. Urban centres will see increasing coverage, 5G handsets will be bought and data will be devoured. Cities and towns will want to be included, bringing the opportunity for the public sector to commercialise their assets to encourage coverage and network density. The challenge becomes how to drive this improved mobile broadband service into more rural towns and villages. Increased sharing of infrastructure across mobile operators will help this but the business case will still be difficult. Changes in the way spectrum is allocated should also open up opportunities for rural connectivity.

Massive machine-type communications

High capacity massive machine type communications support extensive sensor networks that can be adopted across the public sector and manufacturing for example. These networks have the potential to support the delivery of public services from smart cities to smart communities and are important for clients across local government, health and transport.

Ultra-reliable low latency communications

Ultra-reliable low latency communications will have use in specific industry sectors wherever there is a need for automation and robotics for exampleinstance. Whilst this element of 5G is slightly further out in development, it remains important to consider these use cases, particularly in the energy, health and manufacturing sectors.

1	2	3
Enhanced mobile broadband	**Massive machine type communications**	**Ultra-reliable low latency communications**

Examples and Use Cases

Overview

5G has the potential to support many different sectors as an overall underpinning connectivity solution, from remote agriculture and fishing through to industrial manufacturing. In all cases we are looking to boost productivity, reduce waste and increase global competitiveness. Understanding the multiple use cases as a whole, rather than looking at a sector in isolation, is we believe the key to understanding the full potential for 5G.

Health and Social Care

Within the health and social care sector, connectivity is required to support a range of services such as the increasing use of wearables and smart consumer devices, self-management of conditions, medication monitoring and the use of predictive analytics to improve user safety within the home. Within a hospital setting, 5G can support extensive sensor networks to track medical resources and support machine-to machine devices which can revolutionise techniques like robotic surgery. This same underlying network can support ultra-reliable low latency requirements and provide the capacity for extensive sensor networks.

Transport

The transportation industry was one of the earliest adopters of IoT and many major cities have implemented smart devices in public transportation to ease navigation, including smart signs, street lighting and road monitoring. Development in other transport sectors include autonomous ferries, multi sensor trains to predict and reduce maintenance problems and port management and surveillance where sensors detect ship movements and use video to monitor catches and cargoes.

Agriculture

Within agriculture, food production needs to become more efficient with increased production and decreasing use of resources. The first step in digital technology adoption is the use of sensors to help optimise results and reduce costs with examples such as soil sensors, environmental sensors and animal tracking sensors. Future steps can lead to more automation with the introduction of robotics and machine learning, all supported through 5G networks.

Climate Impact

The drive to net zero carbon emissions in response to climate change will involve a reduction of current emissions (requiring more sensors and measurements) and an expansion of renewables. Machine maintenance is a large cost in energy production but 5G supported IoT can be used to help reduce these costs and improve efficiencies.

Creative Industries

In creative industries, the high bandwidth and low latency characteristics of 5G could radically disrupt this industry. This could include VR/AR in live news, music and sporting events, interactive ecommerce and game streaming all driving consumer takeup and demand for 5G services.

Public Sector

5G potentially offers additional roles for the public sector. The public sector is an owner of assets which are attractive for the location of 5G small cells in more urban areas where densification is required. There is therefore a role for public sector bodies in identifying and bringing these assets to the market to aid the delivery of 5G services in their locality. New regulatory developments on access to 5G spectrum, provides the opportunity for other parties, including potentially the public sector, to obtain spectrum and provide their own 5G network in certain geographies.

Rural Communities

And finally, the public sector will undoubtedly be required to support the provision of 5G to the more remote areas through what could be a variety of measures: further planning reform, access to sites, funding of sites and/or site upgrades, enablement of backhaul, or even innovative use of spectrum

FarrPoint's 5G Services

Test Beds & Trails

Support service design, funding applications, delivery management and project evaluation.

Barrier Busting

Identify public assets, develop commercial models and technical models to assist deployments and balance development goals with public good.

Strategy

Understand use cases, why is 5G needed, how could it be implemented, what is the best commercial model given use case and potential supply chain.

Education

Conduct market research, develop white papers and positioning papers and describe potential use cases and the benefits that 5G can bring.

Investment Models

Develop the business case for investment, considering delivery models, asset use, mapping and modelling, spectrum use, private/public roles, integration into BAU.

Coverage

Conduct independent coverage analysis of existing 5G services and post implementation of newly funded 5G infrastructure.

Client Benefits

- Clarity: Provides clarity that there is substance and evidence to back-up the market hype.
- Bespoke Use Cases: Use cases presented are tailored and bespoke to each client requirement.
- Evidence: Supporting evidence and rationale is provided for each key driver (economic, social etc.).
- Compliance: Rules, policy and compliance are demystified.
- Technical Expertise: Clarifies technical considerations and assumptions.

For more information

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