HOW TO: DECIDE IF 5G IS RIGHT FOR YOUR ORGANISATION

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What is 5G?

The fifth generation of mobile data, 5G promises to offer truly transformational opportunities for businesses.

While undoubtedly faster than its predecessor – typically around 200Mbps and up to 1GBbps, compared to download speeds of up to 60Mbps for 4G – 5G also brings with it greater capacity and lower latency, allowing for the simultaneous connection of thousands of 5G enabled devices, and the rapid, secure transfer of huge amounts of data.

With a wide variety of connected devices gathering and sharing information in real time, 5G can provide a variety of possibilities. From reducing road and traffic accidents, monitoring site safety, guiding autonomous vehicles or production lines that can automatically adjust processes – with 5G, the opportunities are infinite.

Manufacturing in the West Midlands

A recent study[1] found that 74% of manufacturing decision-makers are considering upgrading their communications networks by 2022. 5G has a leading role to play in the future of the industry.

This is particularly important in the West Midlands, home to over 20,000 SMEs. The region creates 20% of all UK manufacturing output and contributes 3.6% to the UK GVA (the measure of the value of goods and services produced in an industry or sector). Of the region's contribution to the GVA, 14.8% of the value contribution comes from manufacturing, making the West Midlands the highest contributor of manufacturing output of all UK regions[2].

[1] Nokia and ABI Research identify key trends in manufacturing investment to enable Industry 4.0, 2020
[2] THE WEST MIDLANDS REGION STATE OF AFFAIR: Small and Medium Enterprises – SMEs – Internationalisation support. 2017

What are the benefits that it can bring to manufacturing?

Improving efficiency is important for all manufacturers to reduce waste and increase capacity. To drive this efficiency, manufacturers are required to work quickly with an increased reliance on their networks to provide cost savings, enhance sustainability and increase outputs. It is the networks that will connect the devices and drive this efficiency, which is why 5G is proving to be so pivotal for manufacturers.

The adoption of digital technology in existing and new production facilities will result in significant manufacturing productivity improvements, with an anticipated improvement of 30% to 35% by 2030[3]. Analysis by BCG suggests that manufacturing sector growth between just 1.5% and 3% can deliver an annual growth of approximately 0.5% of GDP[4].

5G capabilities

The strength and benefits of 5G lie in its widespread capabilities, including:

- **Enabling Internet of Things (IoT)**

  The Internet of Things (IoT) refers to a system of interrelated, connected objects that are able to collect and transfer data over a wireless network without human intervention. With more connected objects than ever before, only 5G can manage a large volume of devices communicating over the network. With 5G enabling IoT, the technology does the work.

- **Automated and real-time data collection and processing**

  Only 5G has the ability to collect the large volumes of data captured from IoT devices as its produced and process into a system at high speed. The speed and volumes of data collection via 5G enables organisations to make smarter data-driven decisions in real-time.

- **Latency as low as 1ms**

  With latency (or lag) down to speeds of just 1 millisecond, connections and data-sharing can happen instantaneously. This means automated decisions can be made based on real-time findings.

- **Private networks with built-in security**

  5G private networks come with built-in security as standard, meaning businesses can be assured their data being shared over 5G, such as confidential performance data or IP addresses is protected. Only authorised persons can approve what devices can connect to and use the network.

- **One network for multiple applications**

  Only one 5G network is required, regardless of multiple machine applications. The network can effectively process all of the data from multiple sources and streamline to one system.

- **Dedicated network slicing**

  A 5G private network provides you with bandwidth of frequency to use. Network slicing is the process of dedicating a certain amount of this bandwidth for 5G technology in the working environment to a specific application (known as use cases) by sharing secure isolated network slices.

  Each use case requires its own network slice, and 5G private networks are built in a manner that allows speed, availability, capacity and coverage to be allocated in logical slices to meet the needs of the use case. With a percentage of your network solely dedicated to a certain use case, organisations can guarantee a continuous level of service and 'slice' their 5G private network as they choose as their business needs evolve.

- **Business grade availability of 99.999%**

  'Business grade' ensures that you have a connection that's reliable and fast enough to meet your business needs. Business Grade availability details how likely it is that the network will 'go down' or be interrupted.

[3] MADE SMARTER Review. Gov.uk, 2017.
[4] BCG: Is the UK ready for the Fourth Industrial Revolution? 2017

5G offers Business Grade availability of over 99.999%, compared to a good 4G network that delivers up to 99.1% availability. In real terms, this translates to the potential downtime of over 4,700 minutes (or nearly 3 and a half days) for 4G, and only five minutes of downtime of the 525,600 minutes in a year for 5G.

This means the network is robust and reliable enough to handle all business needs, including those at most critical, with minimal risk of interruption.

I'm satisfied with Wi-Fi – why do I need 5G?

Wi-Fi and 5G offer complementary functionalities and to the end-user can appear to achieve similar results. Although a lower initial cost to deploy, Wi-Fi is an open network with lower bandwidth capabilities. It will continue to be the predominant technology for homes and offices but can often slow businesses down.

5G's capabilities mean that it can easily capture much larger volumes of data, share large files, allow IoT devices to communicate with each other and produce results much quicker than a Wi-Fi network. With WiFi, users are normally asked to connect to one 'box' and are handed over when moving to another area which can interrupt connectivity. 5G is continuously connected with a seamless handover between radio access points.

Whereas a Wi-Fi network is usually managed on an unlicensed spectrum, 5G networks are typically managed by operators and use a dedicated licensed spectrum or private network with built in security. Because of this, Wi-Fi networks are more prone to interference due to the number of devices that use the frequency and can be accessed by almost anyone.

What can I do with 5G?

5G opens the door to a world of possibilities. Working with development partners, WM5G is currently undertaking a range of live use cases to demonstrate what can be done with 5G to accelerate productivity in manufacturing environments.

Key among these is the testing at AE Aerospace, the first UK SME to deploy a 5G private network. Using the network, AE Aerospace are testing if they are able to:

- Maximise machine time through an automated planning process
- Locate gauges in their factory using sensors and calibrate only when necessary
- Undertake quality inspections with an automated camera, set-up to recognise the quality threshold of parts.

Working with WM5G, technology partners Worcestershire 5G (W5G) and BT, The Manufacturing Technology Centre (MTC) near Coventry is also installing a first of its kind Nokia 5G Stand Alone private network to explore a number of use cases including:

- A vision inspection system to analyse parts featuring an industrial mobile robot that can transport assets across the factory
- A collaborative robot arm with a camera that takes pictures of the parts, instructing the mobile robot to move as required.

The use cases are helping manufacturers to see how 5G technology works in their day-to-day environment. We're encouraging organisations to explore the range of live use cases and take a closer look at their operations to identify any production or process pinch-points.

Once you have identified the core business problem, get in touch with one of the WM5G manufacturing team to explore the routes through which you can explore, test and apply 5G.

What does the commercial model around a 5G private network look like?

There are many ways that 5G can help manufacturers improve their commercial model. The most operational impact will lie where 5G can speed up and streamline industry processes, depending on which 5G service grade(s) will work for your business.

Ian Bouquet-Taylor, Operations Director at AE Aerospace, the first UK SME to install a private 5G network and currently trialling 5G use cases said:

"We see the opportunity presented by 5G as a way to both increase our efficiencies through automation and to drive skills development within our workforce. Adopting new technologies enables our team to develop their careers, preserving their jobs while upskilling them as the workforce of the future.

"Through our current 5G trial, we're looking at how we reduce the amount of paperwork and effort to run the business as we grow. We want to become more competitive, enable our future growth and the ability to deliver more to our customers using our existing resources.

"5G provides the opportunity to better understand our working conditions and react to changes much quicker than before. We can highlight situations where efficiency and productivity are lost and rectify them, freeing up capacity which can accommodate additional work.

"We are developing our glass-factory concept which in essence, is the ability for our customers to not only see where their parts are in the system and expected delivery date against their plan - but to also see where future capacity lies. We can then offer that service and sell capacity time rather than a flat production cost.

"With more resource available, we can offer greater capacity to customers alongside our existing capabilities. Investing in 5G gives us the ability to win more contracts, and in turn, create more jobs.

"AE Aerospace has achieved more than 25% Annual Compound Growth Rate (ACGR) for the past seven years but with 5G, we believe that we can drive that growth further, thereby increasing the number of high value jobs in the West Midlands and across the UK."

About WM5G

West Midlands 5G (WM5G) is the UK's first region-wide 5G innovation company established by the West Midlands Combined Authority (WMCA) and forms part of the Department for Digital, Culture, Media and Sports, 5G Tests and Trials programme.

WM5G manages a number of high-profile projects across a variety of sectors to speed up the launch of 5G networks and test, prove and scale up new 5G products and services. WM5G work in partnership with public and private sector organisations to deliver these projects to serve local people, public services and businesses.

Learn more

If you've identified an operational issue and have a desire to explore new technology, we'd love to hear from you. Contact us to begin your 5G journey:

wm5g.org.uk/contact

WM 5G
West Midlands Combined Authority
Department for Digital, Culture, Media & Sport
EUROPEAN UNION
MIDLANDS ENGINE
HM Government
Supported by the Getting Building Fund (GBF)