

# 5G Networks in Manufacturing Enterprises



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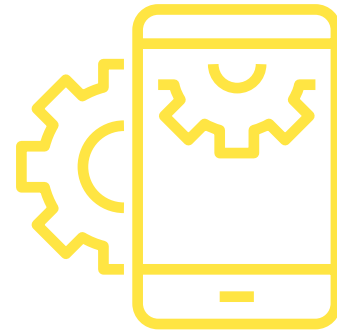
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# Introduction

A number of industries will be transformed by 5G networks. In the manufacturing sector, though, this new technology, will bring even further growth potential, from speed and efficiency, to new capabilities through data-driven processes. This is part of a larger conversation about the fourth Industrial Revolution, a new era of technology, including Internet of Things (IoT) devices, robotics and cloud, mobile broadband, edge and quantum computing, and artificial intelligence. The fourth industrial revolution and 5G networks, in particular, bring operational efficiency and data insights to the factory floor and supply chain. 5G networks are capable enough to transmit data 20 times faster than 4G, and as a result the factory floor will become more intelligent, 'hyperconnected enterprise', in a way that its operators and managers would be empowered to make intelligent decisions, based on automation and advanced analytics.

Machines need to work under optimum conditions in order to run production more effectively. One must calculate the key metrics of machines, such as vibration, temperature, throughput and other device-specific characteristics, in order to optimize the manufacturing process.



However, with a steady stream of metrics, monitoring applications will detect problems early on and warn for operational issues that need further attention. In addition to sensors, monitoring often includes the ability to transfer vast quantities of data from sensors to analysis devices. And that is where 5G networks allow for this quantity of data collection, which was not possible with previous technology. In order for the factory to follow a strategy for digital transformation, the network needs to be compatible, so it can keep pace with the technology that depends on it. Network Edge Computing (NEC) and Multi-access Edge Computing (MEC) offer the interim step to 5G and address Wi-Fi capacity limitations that inhibit manufacturers from enhancing operations, addressing workforce challenges, and providing more reliable service to customers and the supply chain.<sup>1</sup>

1. KPMG International. (2019). Converging 5G and IoT: A faster path to smart manufacturing.

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As manufacturers implement an intelligent infrastructure by using machine learning, prediction, interpretation, and self-correction practices, 5G can support smarter integration and analysis of the data, generated by the sensors. With so many interconnected technologies and endpoints (including robotics, mobility, and field-related applications), it is necessary to highly secure computer power to process massive amount of data. Added to this, the new technology is capable of ensuring data is well protected during transfer from various corporate silos, while also safeguarding it stays safe when it is located in premises. This exceeds expectations when rolling out IoT expansion. In smart integration projects and data analysis, generated by sensors and other multiple interconnected technologies that depend upon these and other endpoints, an increased level of reliability is required for large blocks of data that is transferred.

5G will ultimately set the grounds for the intelligent infrastructure and take a frog leap into the manufacturers' possibility to produce new products, services, and realize greater operational efficiencies.<sup>2</sup>

According to an extensive research conducted by STL Partners on 5G impact in manufacturing industry, it has been acknowledged its great potential in the future. It has been predicted that by 2030 5G could substantially contribute to the growth of global manufacturing Gross Domestic Product (GDP) by 4 percent, reaching a value just under USD 740 billion. This forecast is based on improvements in existing 5G case studies, compared to other technologies, and how these improvements impacted productivity levels.<sup>3</sup> In addition, this study's' assumptions have been extracted from interviews with manufacturing and telecom industry representatives, as well as by a survey of over 100 manufacturers worldwide, to validate the benefits of 5G.

2. GSM Association. (2019). 5G and Manufacturing: The dawn of 5G technology is here.

3. Adib, D., (2019, October). 5G's Impact on Manufacturing: \$740bn Of Benefits In 2030. STL Partners.

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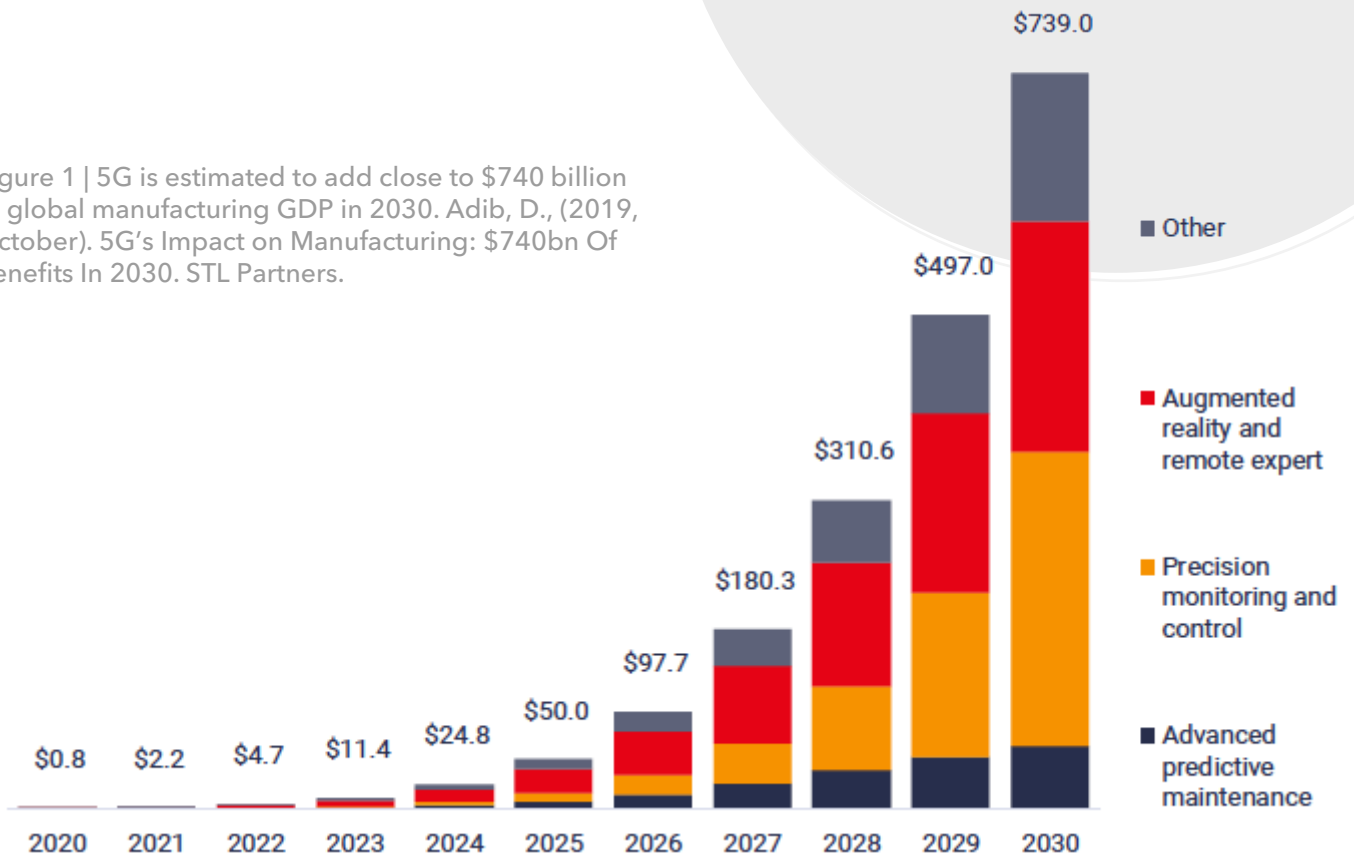
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Figure 1 | 5G is estimated to add close to \$740 billion to global manufacturing GDP in 2030. Adib, D., (2019, October). 5G's Impact on Manufacturing: \$740bn Of Benefits In 2030. STL Partners.



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**SECTION 1 |  
5G BENEFITS &  
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## Making the most of 5G in manufacturing industry

By managing and interpreting big data more effectively, manufacturers can make better decisions, particularly in relation to managing real-time operations. AI can significantly provide higher accuracy levels and minimise risks during production phase. *To be more precise, the new technology can actually transform the way manufacturers operate by:*

### 1. **Becoming more flexible and agile to meet customer needs**

Customer demands are increasingly evolving at rates businesses find hard to keep up. As a result, the output generated by the producer needs to be ready to be immediately modified to meet those demands. Flexibility for quicker production times can be achieved via connected systems that use cloud or cloud-like technology in-house. Business now have moved from the traditional IT procedures to Industry 4.0 capabilities thanks to Operational Technology (OT) domain to manage equipment and processes more effectively.

### 2. **Applying “shared models”**

When cloud is combined with data technology, manufacturers can mutually share plant space and physical infrastructure to reduce their capital costs by implementing shared “as-a-service” models. In this way, users can still manage the same assets and infrastructure even when unpairing the systems and processes from the physical objects they control.

### 3. **Developing service models**

Manufactures can now offer services by using insightful data stemming from in-life products. For instance, they can offer maintenance services during the after-sales journey services, or even by switching to the Rolls-Royce model to sell ‘hours of operation’ rather than ‘engines’.

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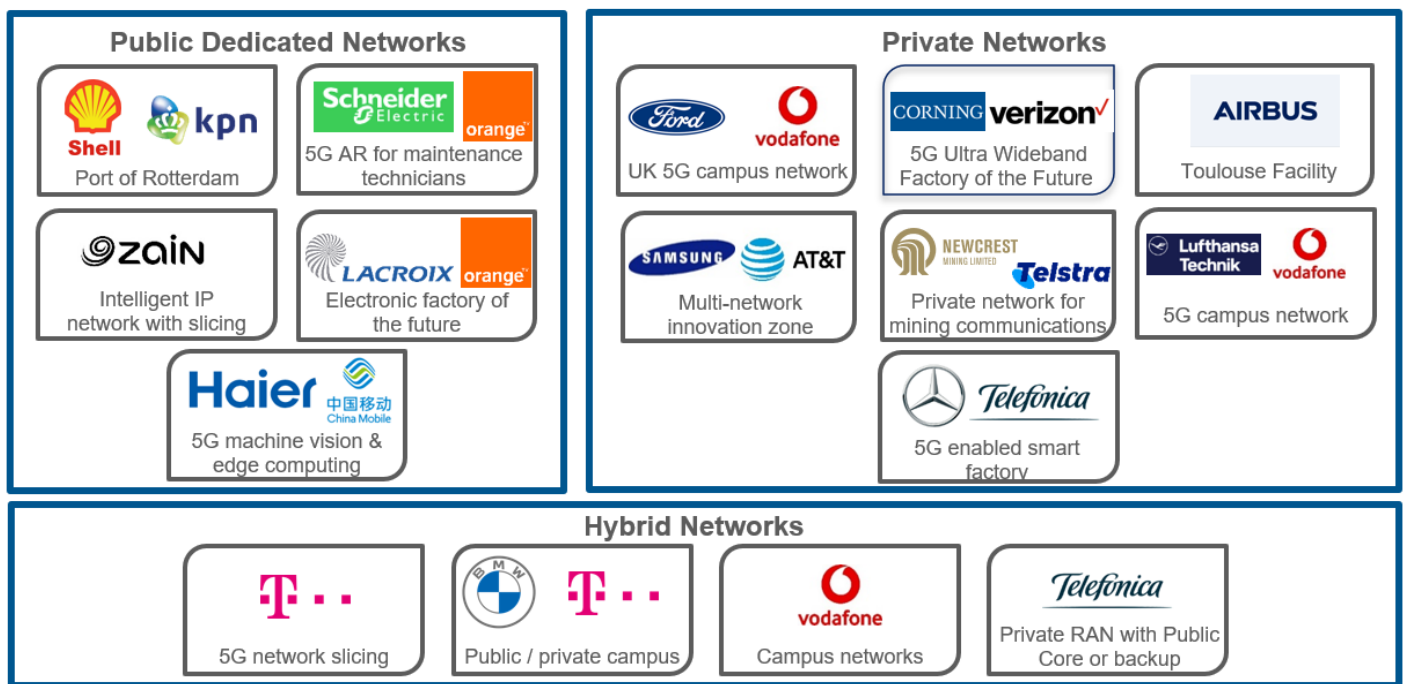
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Figure 12. Examples of different 5G / manufacturing deployment models. GSMA Association (2020, October). 5G IoT Private & Dedicated Networks for Industry 4.0



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