

5G - REDEFINING MANUFACTURING FOR TOMORROW

Abstract

Technological transitions have always created huge impacts on the world. The awareness, acceptability, affordability & availability of 5G promises a massive shift in the way things operate around us. Among the entire range of industries set to gain from this change, Manufacturing sector in particular stands at an advantageous position to be at the fore & derive most benefit. This POV is a take on how that change will be navigated, how 5G is going to redefine the future of Manufacturing Industry.

5G – The Redefining Revolution

In the present world, Technology is our Go-To. The ease of availability of technology is making us very dependent on it. Speed and reliability are the driving force for adapting new technologies. And along with this driving force if there are new capabilities

coming in adaptability becomes easier to embrace. A new era where adaptability & embracing unprecedented change is the new normal, 5G brings in new capabilities to address the same.

An evolutionary transition from 4G to 5G is a massive undertaking for the industry. A much more improved infrastructure, sophisticated technology, algorithms are

essential to justify the investments of both money & effort and utilize the cost-effectiveness that 5G revolution brings in. 5G technology once standardized will drive embracement of connected cars and industrial automation. A hyper-connected society and socio-economic value addition will be the breakthrough of this technology.

- VR and AR with faster, more uniform data rates
- Lower latency
- Lower cost-per-bit

- Massive number of embedded sensors in virtually everything
- Ability to scale down in data rates, power, and mobility
- Extremely lean and low-cost connectivity solutions

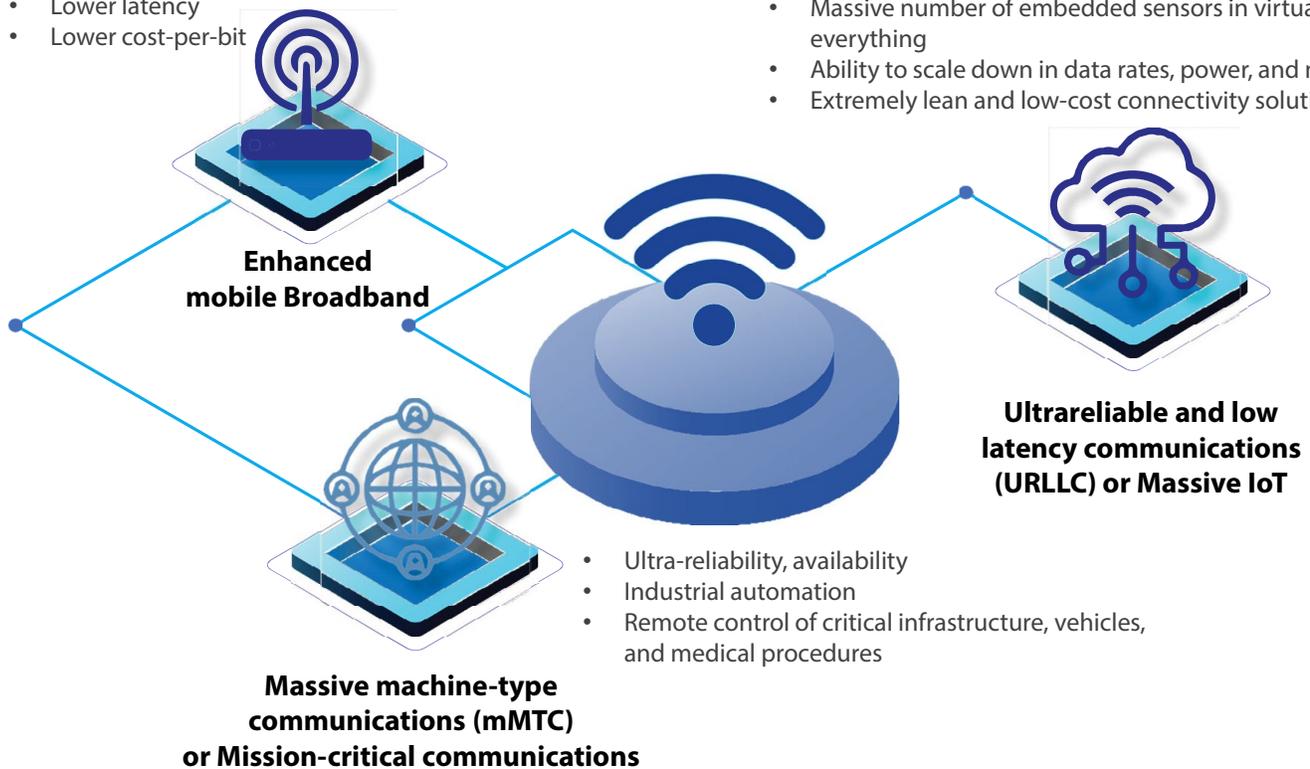


Fig.1. Unique 5G applications

5th generation wireless communication technology for telecom providers will help enable networks expansion of services under three main categories:

- **Enhanced mobile broadband (eMBB)**
New era of immersive experience such as Virtual & Augmented Reality with uniform data rates, faster response, and lesser cost-per-bit.
- **Massive machine-type communications (mMTC) or Mission-critical communications**
Enabling need of the hour services with

industry transformation capabilities like remote monitoring for critical infrastructure, automobiles & health & medicinal procedures with enhanced reliability, availability, and faster response times.

- **Ultrareliable and low latency communications (URLLC) or Massive IoT**
Achieving an "Everything Connected" environment through seamlessly connecting multiple sensors through

the ability to reduce data rates, power, and mobility—providing leaner and more affordable connectivity solutions.

Enhanced access to social services including education, employment, health services, conveyance, and utilities lead to better economic prospects through 5G technologies adoption.

5G Driving the Impact to the world around us

In this post pandemic era, it is the continuous improvement in technology that is helping the economy to recover faster from the unprecedented setbacks caused last year. 5G is one of these improvements. 5G is taking connectivity to the next level by connecting people to everything - be it people to people connectivity or people to information

connectivity in a unified manner.

5G: The growth driver

\$13.1 Trillion dollars of global economic output

- Even though the pandemic caused the global economic sluggishness expected sales growth enabled by 5G is approximately \$13.1T in 2035.

\$22.8 Million new jobs

- 5G-enabled job growth is forecasted to

be greater than previously expected - up from 22.3 to 22.8M by 2035.

10.8% Driving Global GDP growth

- In next 15 years on an annual basis about \$265B 5G CAPEX and R&D expenditure.

Socio-economic benefits of 5G

By 2030, it is predicted that 5G can enable the growth of global manufacturing Gross Domestic Product (GDP) by 4%.

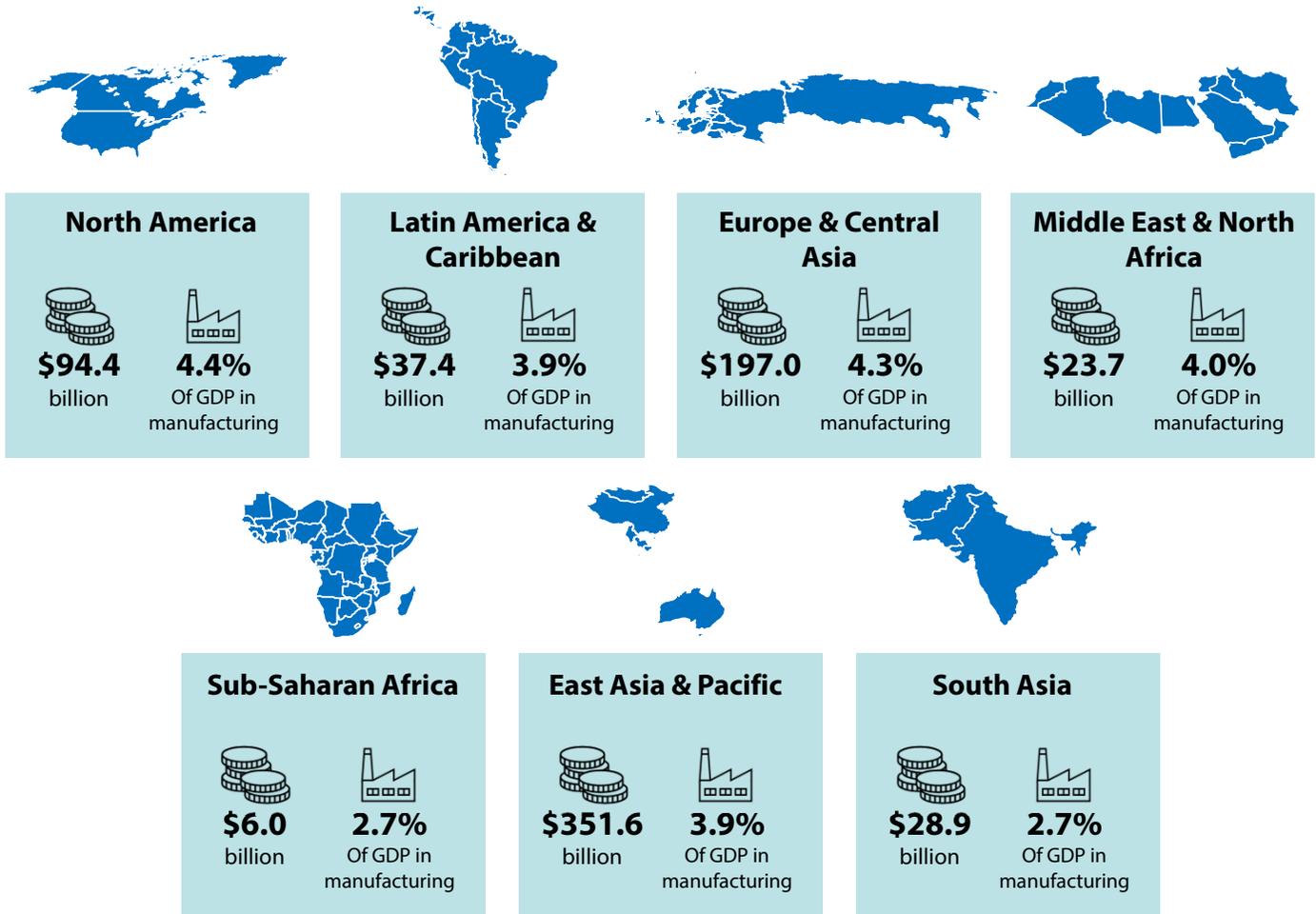


Fig 2. Regional impact of 5G on manufacturing sector

5G is not only Driving Economic Growth, Resiliency, but also enabling Sustainability to a large extent. 5G driven Sustainability benefits include - **Eliminates Emission**

- Reduction in carbon emissions from mobile networks by 50% over the

next 10 years due to network efficiencies

Reduces Pollution

- Intelligent Transportation System can lead to 15% less traffic and as a result pollution emitted by vehicles
- Upto 50% reduction in pesticide

and herbicide usage through 5G enabled drones using AI/ML

Increases Energy Efficiency

- 5G enabled mIoT devices are developed to have a longer battery and device lifetime compared to previous technology

5G: Redefined Manufacturing & Opportunities for Manufacturers

Omdia's study & forecast shows that by 2035 manufacturers stand to gain \$4.6tn from 5G adoption globally, which amounts to 5.4% of total sector output. When it

comes to launching the enterprise 5G, manufacturers are in the forefront. Omdia's research also indicates about 43% of projects that reach deployment stage are from manufacturing – and with inclusion of a larger sectors like transport, utility & associated areas this percentage jumps to around 80%.

According to research from KPMG, the manufacturing industry will be the first to significantly unlock the value of 5G, amounting to around 5% of a typical manufacturer's annual revenue. The impact on manufacturing GDP is predicted at approximately \$740 billion by 2030.

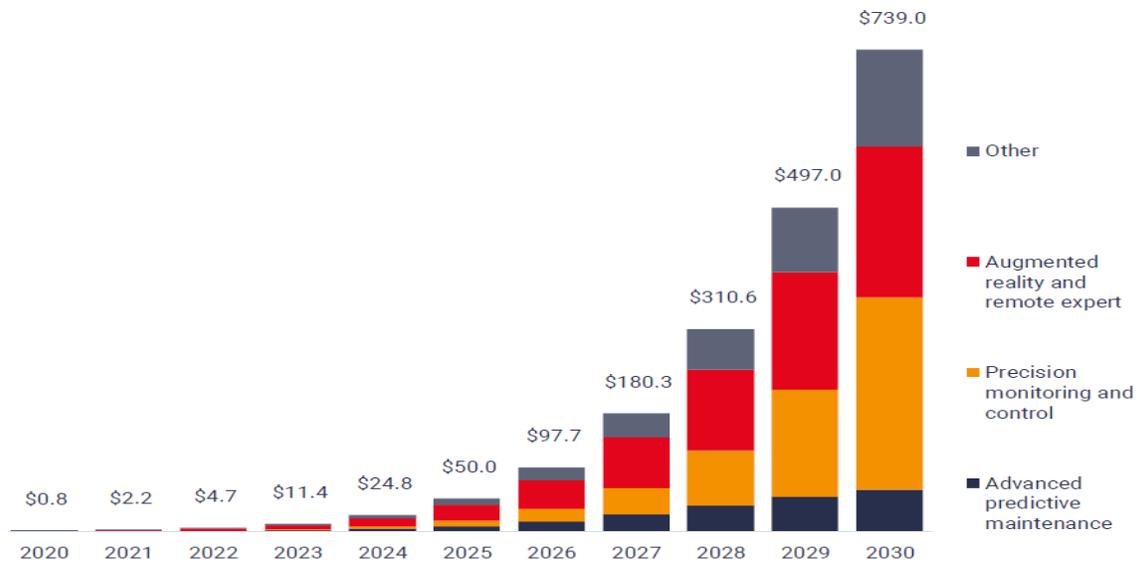


Fig 3. Benefits to industry attributable to 5G (USD trillions)

Expected to be driven by new use cases and improvements in existing applications unique to 5G and associated improvements impacting productivity. 5G enabled solutions are estimated to add \$1.4 trillion to global GDP in 2030.

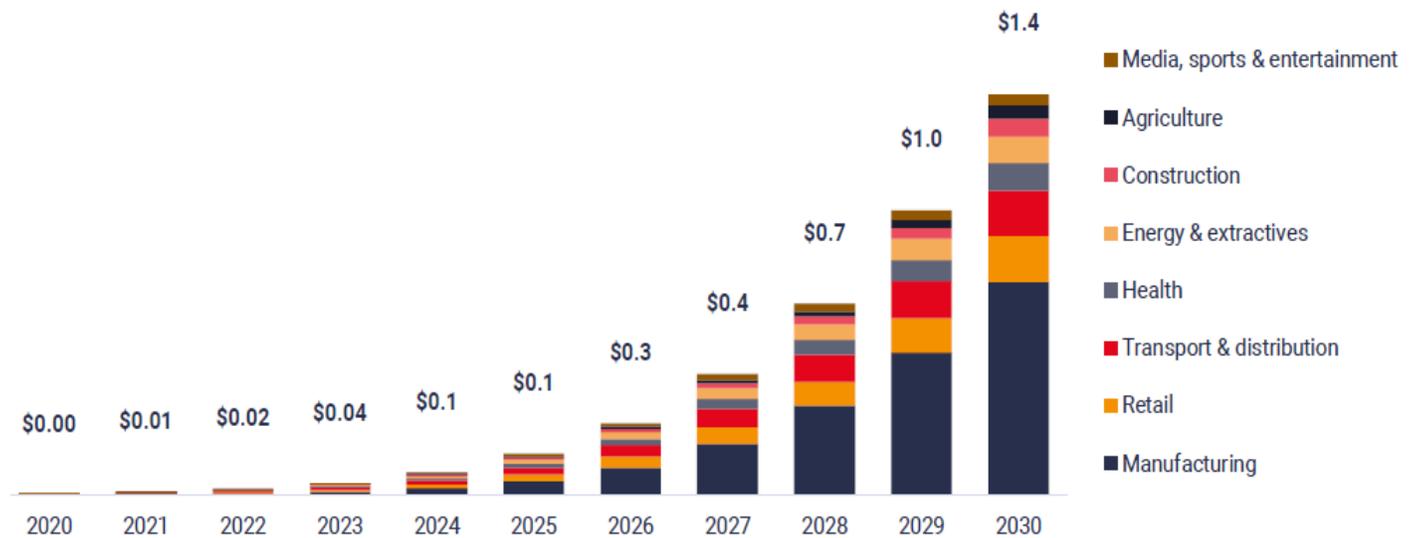


Fig 4. Impact of 5G on Manufacturing: 2030 would witness a gain of \$740BN



Implementing 5G: Partner Ecosystem, Challenges, ROI

Unprecedented disruption due to the pandemic combined with uncertainties in demand, supply chain and production lines posed new, unheard & unique challenges for the Manufacturing sector. Manufacturers with timely investments in Smart Factory initiatives & digital transformation were able to respond or adapt better to the situation. Post pandemic world will embrace 5G platform with hyper-automation capabilities & ability to incorporate new services into all kinds of products as indispensable.

Gearing up for the change: Create a partner ecosystem

- To fully comprehend the possibilities with 5G, an enabled ecosystem of stakeholders, comprising of partners, vendors, solution providers, etc. is needed.
- **Having the right stakeholders for the enabled ecosystem is the current challenge & perhaps the biggest one as well.**
- A minimalistic setup with, offering full capabilities with ease of usage, consumption and flexible for being paid on the go to address the involved costs & risks is preferred.

Challenges in implementing 5G

5G drives the future of Manufacturing

through Industry 4.0 and Smart Manufacturing hence making it the preferred choice for future communication platforms. The elephant in the room needs to be addressed for coping up with the increased bandwidth, requirements around latency, data processing required for big data from a large number of connected devices on the shop floor.

Financial Challenges

5G surely provides a boost in Productivity, the Integration with smart factories would minimize the downtime for maintenance. It also provides a Greater integration with supply chain. But **the financial cost of setting up a 5G is much higher that the Manufacturers are looking at answering the question** - Are the gains in productivity and efficiency offsetting the Cost?

Technological Challenges

- **Complexity of automation technology**
- Concerns regarding reliability and cyber security in case of an Open system implementation. A closed system provides the required security but the downside being a compromise on speed and flexibility.
- **Cybersecurity and 5G**
- Dependency on software-based functionalities and high speeds across the infrastructure imply faster cyber-attack leading to greater data being at potential risk. 5G is equipped with

substantial augmentations and features to eliminate known vulnerabilities, improve prevailing security protocols, and increase ability of the system to identify a risk or a breach and also avert problems because of these.

- **Longevity before something else takes over 5G**

It will take time for the benefits of 5G to be fully realized, both in terms of performance by the network and in terms of financial benefits for operators rolling it out.

Return on Investment (ROI)

In 2020, the return-on-investment market for 5G technology was valued at \$2.0 billion. By 2026, the same is projected to increase to \$320.1 billion. A CAGR of 132.8% from 2020-26.

Staff productivity improvement will enable the business to increase revenues and reduce costs due to the implementation of several technologies – autonomous vehicle, virtual office, massive IoT, AI and others – that will require 5G services and infrastructure.

Justifying huge investment in 5G services, downstream & associated revenue streams should be significantly higher. While eMBB enables improved service for an existing customer base to enhance competitiveness and raise ARPU (Average Revenue per User), mMTC and URLLC, target a new market segment that will likely increase customer base significantly.



5G

Conclusion

The Way Forward

Amongst all the sectors, Manufacturing sector seems to benefit maximum from the 5G revolution. Manufacturers testify this fact with their confidence of the benefits they will gain with the growing number of 5G enabled engagements. This is a positive sign amidst the pandemic and in fact it may serve as an additional push for the already in vogue trend.

There is a clear economic benefit of lower investment as it enables or builds on already available infrastructure setup which is a great motivator. 5G is promising many opportunities around IoT, that will be serving benefits equitably to the operators, companies, enterprises & customers. It will enable crucial manufacturing use cases like industrial control and automation systems, planning and design systems, and field devices. The time to act is now.

5G is here to take on the Manufacturing World by a storm. Are you ready to embrace it?



About the Author



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Algy helps Industrial Manufacturers and distributors to navigate their next with his 28+ years of experience in consulting and helping clients deliver business value through technology. In his current role, Algy builds a very strong ecosystem of partners and strong team of sales and delivery professionals to ensure success for his clients. He is currently based out of Indianapolis where US Infosys Education Center and Midwest Innovation Hub are located.

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