

Unlocking the Real Potential of Digital Transformation Through 5G



Back in 2012, when the first ever 4G services were launched in India, it was touted as a monumental moment in the country's technology revolution, and it subsequently led to a host of advancements across sectors. The biggest benefactors of 4G were not necessarily the builders of network infrastructure, but rather the emerging technologies that leveraged it to make great strides in building forward-looking software and hardware. From application-based aggregators in the healthcare, transportation and e-commerce sectors to smart devices, these were just some of the areas that were transformed to offer users services at the click of a button. Owing to its high data speed and quality, customers could enjoy a completely online transactional experience freely and without any hindrances.

These interconnected applications and devices which make up the IoT sit at the centre of many of today's disruptive technologies, and while still in a nascent stage, can expect to be transformed completely with the imminent arrival of 5G. The use of robotics, smart home devices, AR/VR, industrial IoT are already gaining momentum as we speak.

In a world where 4G made on-demand vehicles-for-hire a reality, 5G will make self-driving cars come to life. As a network which is defined by ultra-high speeds as compared to 4G, latency will be the key differentiator in defining the use of 5G across applications. With 4G networks, we saw an average latency of around 50ms. In 5G, this could drop to 1ms. To put it into perspective, an image seen by the human eye takes about 10ms for the brain to process it. Under 5G run applications, this low latency will be crucial to the success of real-time reactions in automobiles and machines. As and when autonomous cars hit the roads, they are expected to produce up to 25GB of data per hour, and will require this to be processed in real-time. Current networks will not be able to handle such large volumes, and

here's where 5G will be crucial to facilitate real-time data processing and communication between vehicles, infrastructure, networks, and even pedestrians.

Furthermore, in today's Digital India, which has grown to become the second largest smartphone market in the world, the downside includes highly saturated, often congested networks. This is further fueled by the influx of IoT devices in both home as well as commercial setups, which are currently powered by 4G LTE networks which sit between 850-2500Mhz. Almost every internet user would have, at some point, experienced network congestion while being in a small area with a lot of people - like at a concert or stadium for example. Existing networks simply cannot cope with the large numbers of devices, leading to longer lag-times for downloads and slower speeds.

As a solution, the millimeter wave offered by 5G in bands of 24.75-27.25 GHz can allow for a greater number of devices to function seamlessly at the same time. MSMEs, and the manufacturing sector in particular, stand to gain from this, as automation which is already underway, will become an important part of their operations. As the driver of the digital revolution in the country, the transformation of MSMEs is particularly dependent on 5G to handle large volumes of data and requests in a precise manner. This next generation network, designed with 'service based' architecture to offer a grander class of service, is based on the 'slice' of network and will cater largely to IoT and low latency applications, to allow more customers and devices to be connected at the same time, ultimately ensuring greater enterprise possibilities.

Within the manufacturing sector, factories are becoming 'smarter' with the increased use of IoT sensors being installed across the floor to share real time updates. In order to achieve increased flexibility, smaller lead times for layout changes and lower costs, large organizations such as Siemens, Worchester Bosch and Ford Motors have begun deploying enterprise 5G networks to streamline their operations. What this does, is that it not only helps them to become more efficient, but at the same time, aids reducing operation and maintenance costs, along with refining security, meeting the needs of the hour within the sector.

While addressing the changes that 5G will bring about, it is important to note, that unlike its predecessor, the next-gen network allows for slicing. Arguably one of its most defining features, 5G network slicing will allow for a split in resources into logical or virtual networks that address use cases with distinct characteristics and service level agreement (SLA) requirements. Simply put, this will ensure that critical IoT devices, such as telemedicine applications (including remote surgery and remote patient monitoring) would enjoy lower latency and reliability requirements as compared to a 5G slice for a voice call, or mobile streaming services.

This is not to say that 4G will cease to exist or be rendered redundant with the arrival of 5G. 4G in its current avatar has helmed the digital revolution and paved the way for a more technologically powered future. The fact of the matter is, while 4G is good and can handle about 4,000 devices per square kilometer, 5G will be able to handle close to a million. The

two networks will coexist, work together, for accelerated growth and digitization across the country.

Sources:

<https://www.globalxetfs.com/what-4g-can-teach-us-about-5g/>

[https://www.datareign.com/4g-circles-in-india/#:~:text=If%20you%20are%20looking%20to,LTE%20TDD%20\(2500%20Mhz\).](https://www.datareign.com/4g-circles-in-india/#:~:text=If%20you%20are%20looking%20to,LTE%20TDD%20(2500%20Mhz).)

<https://edition.cnn.com/2020/01/17/tech/5g-technical-explainer/index.html>

<https://www.t-mobile.com/5g>

<https://www.raconteur.net/technology/4g-vs-5g-mobile-technology>