

5G Impact: Traffic To Teaching, Factories To Farming

Why high-speed data services can transform how Indians work, learn and live

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The government has announced the rollout of the transformational 5G services, which will bring about a revolutionary change in communication with benefits spanning various sectors. Besides spurring economic growth, 5G is essential for industry 4.0, enabling rapid digitalisation in India.

A fillip for education and healthcare

The pandemic underscored the enabling nature of digitalisation in most sectors, but more so in education and skilling. With the enhanced mobile broadband (eMBB) feature of 5G, the full potential of digital education can be unleashed. Expanding on PM eVidya, it can deliver high-quality educational content through mobile applications to every student in the country. 5G will also provide a major impetus to digital universities. Vocational training programmes, delivered in the 'phygital' mode, can improve the employability of youth and women by providing hands-on experience and reducing on-job training time.

In healthcare, the ultra-reliable low-latency communication (URLLC) feature of 5G will enable user-friendly point-of-care diagnostics and the creation of much-needed connected ambulances. Along with m-Health, 5G will also significantly improve access to world-class medical advice, resulting in better follow-up care. A hospital-run private 5G network will enable even a handful of doctors and nursing staff to provide quality care to hundreds by monitoring their vitals while simultaneously maintaining electronic health records.

NextGen banking and transportation

For financial inclusion and the banking sector, both eMBB and URLLC features will play significant roles. India has already become a world leader with the Unified Payment Interface (UPI). With the help of Geospatial Information Systems, we can reach the next level of



Unlocking the future

simple, seamless and secure payments such as 'one-tap payment' and 'cashierless store' models. Similarly, the payments bank model can be expanded through incremental steps towards a completely mobile formal banking system. This will enable citizens to securely access various bank facilities through a virtual branch experience, thereby enhancing the banking population of India.

In transportation and mobility, the massive machine-type communication (mMTC) feature of 5G can prove to be a game-changer. A network of EVs and charging stations can be created, optimising the availability of the charging infrastructure, and thereby enhancing the cost-effectiveness of EVs' ecosystem. Integrating initiatives across transit systems, like FASTag for toll and entry tax, can not only improve efficiency within the transportation sector but also reduce our carbon footprints. Alongside the launch of the drones-as-a-service ecosystem in India, the URLLC feature will be crucial for navigation and drone traffic control.

Meanwhile, ports across the globe struggle with long waiting times and inventory congestion. Using the mMTC and URLLC features we can turn these challenges into opportunities. The deployment of machine vision

with software-enabled automatic-guided vehicles can help in better port-space management.

Friend of farmers, bedrock of industry 4.0

In agriculture and renewable energy, farms can be equipped with a diverse range of sensors to continuously monitor the factors impacting the health of crops. Even small farmers with little virtual training can improve irrigation efficiency as well as crop yields through 5G. Renewable energy farms (especially wind and solar) already deploy numerous sensors, but because they are in remote regions, there is a delay in response. With 5G, their response time and efficiency can be radically improved.

In manufacturing and industry, the impact of 5G will be most visible and tangible. Here, 5G private networks will be the cornerstone of industry 4.0. These networks connect an array of IoT (Internet of Things) sensors and devices, and automate the scheduling of various processes based on intelligent algorithms. In manufacturing factories, such networks can improve efficiency by an estimated 2-4 times while reducing carbon emissions. However, these gains are not limited to manufacturing sector alone. Any industry that is able to digitise and schedule processes will be able to leverage many benefits of 5G.

Efficient service delivery, safer public spaces

In governance and public safety, service delivery and citizen-engagement efforts can be improved with faster and safer digital identity verification. This will in turn enable faster implementation of direct benefit transfers and other such schemes. Real-time automated monitoring of public spaces and traffic using city-owned private 5G networks will improve public safety and congestion in India's metro cities. Deployment of IoT-based systems on similar networks, using the network function virtualisation feature of 5G, will improve the efficiency of projects under the Smart Cities Mission.

Thus, every feature of 5G has numerous use cases across key developmental sectors. We need to embrace and leverage 5G to realise the vision of a technologically savvy India.

The writer is CEO, Niti Aayog. Views are personal