



# Telecom Services Industry – Technological Evolution And Future Opportunities

There have been innumerable technological shifts over the centuries that have impacted humanity greatly. Innovation of the telephone in the 1800s made it possible to talk to people remotely. And about 100 or so years later, the first portable handsets appeared. Initially functionality was limited to sending and receiving calls and text SMSs.

Evolution of handsets and telecom networks took place with the first dramatic change, with the 3G network rollout, and common mobile phone conversion to smart phone – enabling phone users to access the internet.

With the 4G network rollout, mobile internet speeds became up to 500 times faster than 3G. This supported HD mobile TV, high-quality video calls, and 3D television.

4G is now common throughout the world. And now the talk of its successor, the 5G network is on. We are discussing and planning to rollout the 5G network in India in the next 1/2 year period. This will be a network with much faster speed, reduced latency, and much higher bandwidth. 5G would support a plethora of applications. 5G would help enabling digitization of vertical markets and enhancing and building new service capabilities across sectors. Business across industry verticals needs to plan and gear up on leveraging on this technology disruption for new service innovation. It is going to bring a revolution in our life style. Some examples where this can be seen are:

*Alarm clock* – having remote programs and custom tones, turns on the coffee maker. *Coffee maker* – has custom settings for each coffee type, starts when the alarm goes off. *Electric tooth brush* – automatically reorders brush heads, shares brushing habits with your dentist. *Smart scales* – measure and send weight info for progress tracking. *Refrigerator* – RFID tags reorder groceries as needed and suggest menu/recipes. *Oven* – allows settings to be changed from a computer or phone remotely. *Automobiles/cars* – Maps traffic in real time, allows others to track your location. *Cell phones* – securely perform identification and verification for payments/financial transactions. *HVAC* – controls temperature and lights for maximum efficiency. *Computers* – offer centralized control for remote interfacing to any other device. *Printers* – Automatically reorder toner, papers as may be needed. *Vending machines* – automatically

reorder supplies before they are exhausted. *Building security* – security cameras interact with a facial recognition database. *Exercise equipment* – recognizes individual users and tracks workout schedules. More and more devices that people look for as required in services like fleet tracking, emergency call/navigation, public transport, industry telemetry, smart metering for electricity, water, gas, remote medical treatment facilities, and anything and everything we can think of.

The 5G network is going to give a *huge opportunity* for everyone. It is going to support the *IoT* (internet of things). Earlier it was individual vertical networks, viz. education, transport, home, energy, earth, and agriculture. IoT goes beyond the individual vertical networks, and aims at interconnecting all networks, that is a network of networks. The related technology trends are – *field domain* – sensor technologies – long endless battery life, self-healing, secure, and adaptive. *Infra domain* – evolving – has to change significantly in order to cater to the huge explosion in IoT. *Head end* – cloud, big data, and new age analytics.

This requires convergence of all technologies viz. nanotechnologies, biotechnologies, material technology, and information and communication technology (ICT) – leading to intelligent technology. Near field communication sensors, smart surveillance and security applications, and smart robots are also required.

Developments needed for *device makers* – sensors – 50 billion devices by 2020. *Network providers* – data collection, communication/management. *Developers* – actionable analytics, applications. *Service providers* – security and surveillance, (1) maintenance crew, (2) asset monitoring and control, (3) health services.

To achieve this government's, the public at large, and industry participation is must.

The 5G and IoT era give a big opportunity for all the industries and service providers. All need to be ready to take up the challenges and tap the opportunities for their own benefit and benefit of the society and mankind as a whole. ●

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