

Riding the Business 4.0™ wave through transformative capabilities of 5G

Abstract

Network technologies drive digital transformation journeys. However, ensuring a robust network environment has become a challenge, given the proliferation of devices, demanding users, and their evolving needs. The good news is that fifth generation wireless or 5G can address these challenges adequately, and trials for its commercial deployment have already begun across the world since the first 5G New Radio specs were approved in December 2017.

5G can enable fast data transmission and reception, and uninterrupted connectivity. Data is the crucial thread that flows through digital technologies such as cloud, analytics, artificial intelligence (AI), and robotic automation. This paper outlines 5G features in terms of end-user experience, and its impact on various industries.

Service providers have varied technical approaches for 5G services, all aimed at maximizing the satisfaction of the end users. These include user-centric computing, crowded area services, virtual reality (VR) and augmented reality (AR), telepresence, massive content streaming, and mobile edge computing with small cell base stations.

Introduction

The business environment has to be more agile and intelligent in the Business 4.0™ era, as emerging technologies constantly push enterprises to undergo transformations to stay relevant and ahead of the competition.

While there has been significant progress in the areas of computing and storage, current networks are not robust enough to take their full advantage. With the shift from third-generation, voice-centric services to the fourth-generation, data-centric mobile telecommunications, the services that used to be available only with wired networks are now accessible in wireless network environments as well. The rapid improvement of data transmission bandwidth has allowed mobile service providers to offer a range of improved end-user experiences.

With its improved bandwidth, 5G promises to accelerate customers' digital transformation journeys powered by TCS' Business 4.0™ thought leadership framework.

Understanding 5G in terms of end-user experience

Service providers have varied technical approaches for 5G services, all aimed at maximizing the satisfaction of the end users. These include user-centric computing, crowded area services, virtual reality (VR) and augmented reality (AR), telepresence, massive content streaming, and mobile edge computing with small cell base stations. These new application areas, in addition to customer demand for enhanced performance, ultra-high reliability, and seamless user experience, will require enhanced mobile broadband.

Growth and transformation opportunities across industries

5G services will enable noticeable growth and transformation opportunities in every industry. Those likely to see the most dramatic impact are discussed below.

High tech and services industry

The high-tech industry will see a tremendous acceleration in the face of continuous disruption. 5G will enable businesses to usher in new capabilities in terms of product and software capabilities. It will influence software providers to embed AI

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Automotive industry

To deal with increasingly complex road and traffic situations, vehicles—including driverless and connected cars—will have to rely on Vehicle-to-Everything (V2X) communication through sensors. Such machine-to-machine communication requires broad bandwidth. AI, the key technology behind autonomous vehicles, when combined with 5G will allow complete automation that can facilitate optimal route selection, smart parking, and even integration with smart cities and smart homes.

Transport

5G, combined with IoT and AI algorithms, can be the key enabler of smart transportation systems with real-time tracking options. Smart transportation will enable improved safety, higher productivity, and greater efficiency with the help of a 5G network infrastructure.

5G-supported connected cars and roadside units will have 'situational awareness' and route optimization features driven by a cloud-enabled dedicated transport network. Integrated public transport services, dynamic traffic management, smart parking meters, and smart road infrastructure will pave the way for autonomous vehicles and evolution of smart cities.

Healthcare

Wearable technologies and sensor-based devices have made their presence felt in the healthcare industry. 5G's fast, reliable and secure data transmission will allow accelerated data integration across the care continuum. E-health and m-health technologies will provide ubiquitous access to health care as patients connect remotely with doctors and other relevant parties. Improved connectivity will not only transform predictive care, but also make robot-assisted telesurgery a feasible option.

Manufacturing

Advances in the manufacturing industry have paved the way for connected machines, warehouses, and facilities to create cyber-physical systems (CPS). The combination of 5G and CPS will enable monitoring, connected operational intelligence,

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remote diagnosis, remote control, remote services, and tracking. Together, robotics, AI, and 5G networks will allow rapid automation for superior levels of accuracy and productivity. 5G-enabled video surveillance and AI-based video recognition algorithms will enable threat detection.

Media and entertainment

Customer expectations and habits of media consumption are changing, and content streaming is on the rise. VR and AR combined with 5G will enhance storytelling. Apart from high-fidelity media experience for the viewers, 5G will enable service providers to offer on-demand high upload bandwidth and streaming on various devices, personalized content, and pre-attached metadata for repurposing the content for different requirements such as second screens, interactive game, etc.

Retail

With increasing access to consumer information, delivering personalized experiences is the imperative for retailers. Immersive technologies (VR and AR) can support it, provided the necessary infrastructure is 5G enabled. 5G, combined with AI, can help retailers understand how consumers move through the store and derive actionable intelligence from security footage. 5G-supported wearables can automatically connect with the in-store beacon devices for push notifications with personalized deals, boosting sales and store visits.

5G impact on digital forces

5G will have a multiplier effect on all the key digital levers and themes, including cloud computing, cyber security, blockchain, AI and automation, business analytics, and mobile and social.

Cloud computing

5G will transform the design and reference architecture of cloud computing, to drive a strategic advantage. Enterprises will be able to innovate faster by leveraging the strengths of cloud, software, and data players.

Cyber security

5G will transform the cyber security industry, by providing them with quicker means to tackle vulnerabilities. Further, the ability of cyber security providers to strike back and neutralize threats will improve tremendously.

Translating the opportunity of 5G into reality will require active collaboration among society, industry, and governments. 5G business benefits and value creation should be shared across all stakeholders to ensure sustained adoption.

Artificial intelligence and automation

5G will enable users to leverage AI on the edge in a hybrid data network, while training them to control privacy settings. Multiple data sources can be correlated in real time by algorithms without latency issues that currently restrict the pace of innovation in AI.

Blockchain

Blockchain's true promise of a distributed peer-to-peer computing paradigm can be realized as the current latency and performance issues are resolved with 5G bandwidth. The transaction commits and related communications will be fast and uninterrupted.

Analytics and insights

5G will enable users to leverage current platforms to manage data with granular insights as the new standards will influence key aspects of the data pipeline and orchestration.

Mobile and social

The mobile industry will see a new avatar of the initial transformative values of mobility and social. The mobile industry will offer new gadgets with the next-gen Mixed Reality that will blur the lines of physical and digital.

Conclusion

Translating the opportunity of 5G into reality will require active collaboration among society, industry, and governments. 5G business benefits and value creation should be shared across all stakeholders to ensure sustained adoption. Establishment of 5G physical implementation in continuity will lead to multi-fold and multi-faceted advantages across industries and technologies.

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