

Disruptive Technologies and its Impact on Business Environment: A case of Automobile and Financial service sectors

T. Mohanasundaram
SC Vetrivel

Associate Professor, Department of Management Studies, M S Ramaiah Institute of Technology, Bangalore,
Associate Professor, Kongu Business School, Kongu Engineering College, Erode, TamilNadu,

Abstract: This chapter deliberates the emergence of two most disruptive technologies – 5G and Internet of Things (IoT)– and their effect on Automobile and Financial Service sectors. Almost all business sectors are driven by latest technologies. However, 5G -the 5th generation mobile network and Internet of Things are bringing paradigm shift, as the entire business outlook is disrupted. This study explores the ‘blue ocean’ of innovative practices and applications carried out in the automobile and financial services sectors. The 5G features like enhanced mobile broadband (eMBB), Lower latency and robust security aspects have already brought a phenomenal transformation in Financial Services industry. The applications of IoT in automobile sector and financial sector is massive and imposes see-saw changes for the benefit of these sectors. IoT provides smart monitoring and control environment thereby reducing wastages and frauds in automobile and finance sectors. Thus, 5G and IoT are the most recent technologies that brought noteworthy technological advancements in the business environment.

1. Introduction

The world has experienced an extensive change in almost every domain. The technological developments played a prominent role in those enormous revolutions. We are witnessing many novel technologies that have a huge bearing on the business and economy. Some prominent technologies are; artificial intelligence, 5G, machine learning, edge computing, internet of behaviour, internet of technology, Smart Grid, quantum computing, block chain, cyber security, human augmentation, cloud technology, augmented reality and virtual reality. Among these, this chapter focus on two prominent technologies – 5G and IoT and their impact on two vibrant sectors viz., Automobile and Financial Services. 5G technology enables the new industrial revolution, industry 4.0. The introduction of 5th generation (5G) telecommunication technology is expected to create new ecosystems of Fintech and digital banking by offering new features and tools. 5G technology is creating new business models in the financial industry and expected to change financial landscape, especially in FinTech. There is a growing attention from the international tech firms to make a way into financial industry. 5G features and its potential applications include: (i). Enhanced Mobile Broadband (eMBB) for virtual reality and improve video conferencing with extreme network speed and processing capability. (ii). Highly reliable and low latency in processing a very large volume of data. (iii) Massive Machine to Machine Communication enabling Internet of Things (IoT) etc., and, (iv). Robust security aspects leading to high reliability. Innovation is the need of any business which is all about novel thoughts that produce great value. We are living in the age of digitalization and we are constantly moving in that direction by adopting pioneering technology to ensure more effective and prolific way of life.

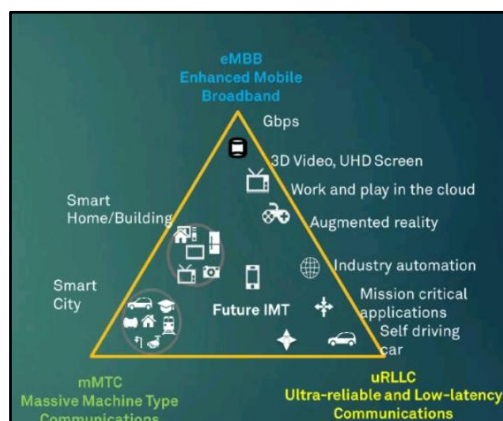


Figure.1: 5G Features and Applications

The automobile industry is already using the advanced technologies enormously. Smart parking, Vehicle-to-Vehicle communication etc are happening now with 5G and IoT. In the area of Finance too, consistent upgrading in the products, services, methodology and system with new technologies is going on. The financial sector is one of the largest users of digital technologies. Such an innovation and

upgradation in Finance through technology is known as FinTech (Financial Technology). FinTech is the combination of 'Financial Services' and 'Technology'. The adoption of technology in the field of financial services viz., Banking, Share market, Insurance sector, Mortgage loans etc. with database management, analytical tools, and innovative approach. Since 2016, India is actively engaged with FinTech after the demonetization of high denominated currency notes. From then, Unified Payments Interface (UPI) payment technique is highly engrossed by the Government of India. Many start-ups started using the innovative technology to make easy and cashless payments. FinTech will play an important role in achieving the cashless economy. Internet of Things (IoT) permits automation in almost all the process of business function and it also brings functional efficiency in all industries — supply chain and logistics, manufacturing, energy, banking and financial services, telecommunications, automobile, retail, hospitality etc. The magical word 'Internet of Things' signifies an assembly of unified, internet-enabled objects that are capable to collect, organize and transfer data through a wireless network without involving manpower. Now-a-days, business establishments are enthused by IoT as there are potentials of better revenue, low operational costs and improved efficiencies. IoT devices offers the data and acumens that are crucial to streamline and modernize the work flow, forecast usage patterns, process automation, accomplish compliance necessities, and effectually compete in a dynamic business environment. Thus, both 5G and IoT are contributing massively to the growth of automobile and financial services industries.

2. 5G in Automobile sector

5G is being deployed everywhere on the planet with the promise of bringing fast internet. Experts agree on the fact that 5G will benefit businesses more than consumers. And as a matter of fact, 5G is already being deployed in industry, specifically in the automotive sector. The application of 5G in automobile and automotive industry is vast, as its progress not only creates economic benefit but also has immense social value. Vehicular communications and networking are worth of billion-dollar business. The growing adoption of 5G will change the focus from comfort to technology when designing automobiles. Road accidents have remained the leading cause of accidents in most parts of the world. The inability to detect blind spots and delayed braking response times are among the top causes of accidents. The increasing number of accidents has led to a greater emphasis on road safety. The inclusion of 5G technology in the automotive industry will unlock opportunities for connected cars, connected bus-stops, smart metros, and autonomous vehicles. Such facilities will translate into ecosystem scalability, navigation and augmented reality, fleet monitoring, safety, and sustainability. 5G technology will bring more life to the IoT to connect a large number of sensors and actuators with a zoomed-in focus on energy efficiency. The future trends in automotive sector are; Automated, Connected, Electric and Shared Vehicles (ACES).

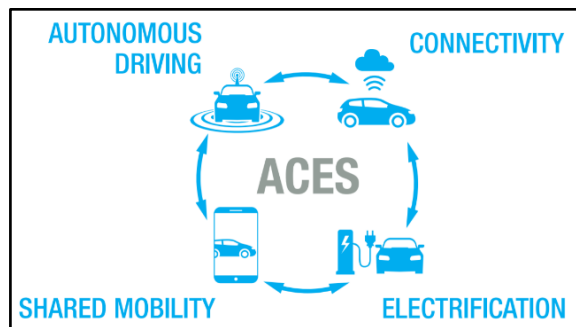


Figure 2: Trends in Automotive industry

Source: IEEE young professionals

If there's one thing to say, it's that automotive manufacturers should broaden their scope beyond comfort to On-board entertainment opportunities, cooperative maneuver, autonomous navigation, cooperative perception, and remote driving. 5G has the potential to make the long-discussed topic of autonomous vehicle a reality. Autonomous vehicles are using machine learning-based method – more the cars are driven, the more patterns can be understandable better that in-turn helps them shape the suitable driving responses. But all this absorption of information is only possible if the data are collected and stored, and for this, the higher level of network connections are required, a level that only 5G can enable. With the 5G cellular standard, an increase in flexibility of production is possible because it delivers fast data transfer rates in the gigabit range, extremely short latency times and high reliability. The use of state-of-the-art 5G network technology makes it possible to optimize existing production processes with new features. This includes, for example, linking data or locating products on the assembly line. The key areas in which 5G can play a role include applications of virtual or augmented reality, large-scale interconnections of equipment such as autonomous material

transporters and flexible network design. In all such applications, a private 5G network can provide tangible benefits in terms of speed of implementation, security and reliability. There are plans for in-car 5G applications. 5G technology will be critical for the automotive industry particularly when higher levels of autonomous vehicles penetrate the roads. The current 4G network is simply not fast enough to give autonomous vehicles human-like reflexes and cooperative driving capabilities in the future. Driverless cars are just one of the many incredible technologies that are likely to be ushered in with 5G. 5G will also present exciting possibilities for Vehicle-to-vehicle (V2V) and Vehicle-to-everything (V2X) connectivity. Furthermore, the technology’s low latency will make future autonomous vehicles extraordinarily safe and reliable on roads. A new generation telematics component with 5G technology is being developed. The first vehicle with 5G will be the BMW iNEXT, which is due to go on sale in 2021. The leading global air plane manufacturing firm, Boeing is already created a tech-based ecosystem for their commercial planes.

3. 5G in Financial Services industry

Change in any form is not easy to deal with, particularly when it happens in banking and financial services, as the process involved and the number of stakeholders is very high. In a digital era, the speed and ability of data transfer along with compatibility of data are vital for FinTech to prosper. The 5G technology just offers those features to enable FinTech companies to bring massive change in banking industry. Rapid internet speed has become imperative for improved financial transactions. 5G also has an edge at handling heavy load compared to the previous technologies. 5G will certainly help the FinTech players to bridge the gap between the existing reality and customer expectation by offering safer and faster service to end-users. 5G mobile technology services also support FinTech companies to provide affordable loans by refining the lenders assessment of borrowers based on financial soundness. 5G is expected to disturb information security, machine learning, IoT, data management system etc. which are used extensively by financial service companies. In Banking and Financial Services industry (BFSI), 5G will be mainly useful in making communications more secured, processing real time information and improving customer experience. 5G services has potential to connect numerous devices, minimize power consumption, reduce latency, offer higher security, and better support for augmented/virtual reality experience. It enables to manage millions of IOT devices. 5G mobile technology will empower extensive implementation of blockchain, artificial intelligence, machine learning and quantum computing. The Organization for Economic Cooperation and Development (OCED) predicts an upsurge in world GDP, higher employment and digitalization with quick 5G penetration.

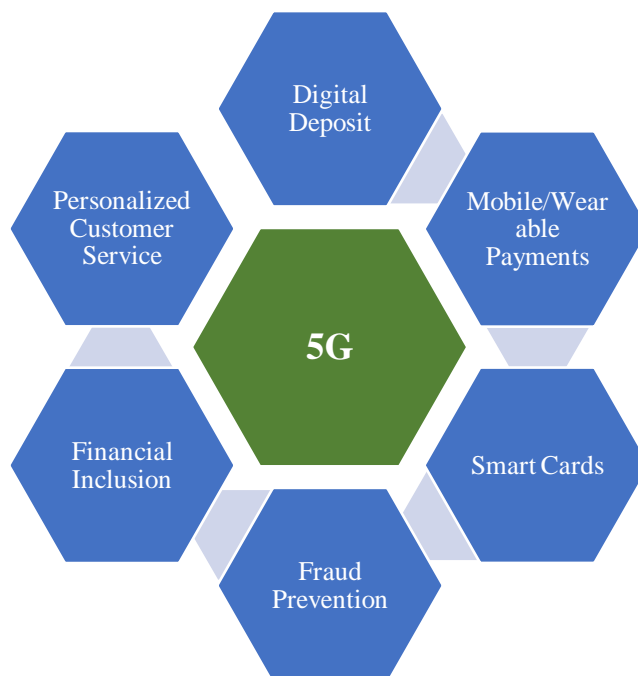


Figure 3: 5G – the enabler of Financial Services

India is having a good 4G connectivity which leads to highest mobile data consumption in the world, offers a great potential for 5G technology implementation. According to Ericsson, India has the world’s highest data usage per smartphone at an average of 9.8GB per month and this is expected to double to 18GB by 2024. The benefits of 5G in banking include; enriched ATM facility with features like virtual reality in order to directly interact with bank, enables richer customer experience with lower

cost, Risk prevention, complying with regulatory norms. 5G technology along with block chain and other revolutions will affect different areas in finance like capital markets, cross-border payments, automated payments, mobile banking etc. 5G provides an extensive platform for Fintech firms to innovate. Australian telecommunication providers have realized speeds up to 1200 mbps (1.2 gbps) in 5G testing which is significantly higher than 20 mbps to 50mbps in 4G technology. No doubt, if implemented, 5G will immensely improve the user experience and real-time delivery of services. As Fintech firms move towards 5G service, the likelihoods of forming truly universal financial services turn-out to be greater reality. International firms view 5G as a disruptive technology of this era. Many international banks like JPMorgan Chase, Bank of America, Citigroup and leading FinTech companies like, Ant Financial, Paypal, Qudian, etc. are actively penetrating 5G technology in their ecosystem to reap the benefit out of it.

5G primarily functions in three bands – low, mid and high frequency spectrum – each having their own advantages and limitations mainly on account of speed and coverage. In 2018, India had intended to start 5G technology at the earliest possible. The major telephone players in India have urged Department of Telecommunication (DoT) to roll out a detailed future plan on 5G frequency bands and spectrum allocation. However, Reliance Jio planned to unveil its own 5G network. The major challenges of 5G in India are; inadequacy of spectrum and TRAI's higher reserve price for spectrum auction. 5G has ability to augment the day-to-day use of banking products and services. The financial institutions that embrace 5G technology are effectively poised far ahead of its rivals as they enjoy offering data backed personal services for the customers of Gen Z. Moreover, 5G can overcome the major shortcoming of earlier technologies - inefficient handling of increased financial transactions.

4. IoT in Automobile industry

IoT supports to unlock competences and productivity in a business sphere. There are abundant uses of IoT for business entities viz., reduces operating costs, provides valuable understandings in decision areas, diminishes downtime by permitting predictive maintenance for capital goods and equipment etc. The surge of pioneer and smart devices along with the readiness of enormous data has already influenced majority of businesses. Similarly, the application of IoT and Smart Grid in the Automobile industry is extensive. IoT created a different way people interact with their vehicles, which the industry could see through the automobile revolution. IoT paves way for GPS system in cars and self-driven automation cars. It also helps the automobile firms to update the software system and respond to real-time maintenance issues by enabling a data communication system. It plays a massive role in preventing accidents. Internet of Things in the Automobile sector has become an important hot spot with multipurpose applications to fulfil the need of the day. The application of this IoT started from connected cars to fully automated transport system. The concept of connected cars is no more novel as there are already millions of cars are connected through wireless network. Cellular vehicle to everything (CV2X) is the IoT network used to connect these cars.



Figure 4: IoT Technology - Connected Cars

IoT enabled networks are Vehicle to Network (V2N), Vehicle to Vehicle (V2V), Vehicle to Infrastructure (V2I) and Vehicle to Pedestrians (V2P). IoT also helps immensely in fleet management by offering benefits like better route management, vehicle tracking, monitoring driver activity etc. In logistics, a real-time challenge to operators is to measure the weight of the Truck. The introduction of IoT came with a solution to this issue. By installing sensors on the axle of the Truck real-time weight data is made available and it can be accessed through mobile application also.

5. IoT in Financial Services industry

Among the industries, financial services are one of the active areas where technology and automation in process improvement and security management etc. have been implemented. One of the core benefits of IoT is that it can be remotely monitored and controlled. IoT applications in financial services and banking are well spread across various operations. The major benefits of IoT in financial services are; enhanced transparency in financial transactions, computing real-time depreciation, assessing multiple loan documents, speedy and reliable fund transfers and online payments, smart card reader, personalized customer service and relationship management, instantaneous data collection, fraud prevention, legal compliance, fast-track mobile point of sale (mPOS), enriching digital banking services and wide spreading micro insurance. IoT may enable bankers to forecast the sum of cash necessity at diverse places of automated teller machine (ATM). Moreover, IoT may help in making better decisions in the area of loan sanctions, lease financing etc.

6. Conclusion

5G and IoT potential in Indian Automobile and Financial services domain are boundless as the arrival of 5G coincides with rise in Internet of Things (IoT) inventions, including smartphones and wearables. This will help in making autonomous vehicle a reality and offers financial firms to make seamless financial transactions, innovate and to provide secure services to their customers. 5G and IoT could also enable in high frequency trading and effective diversification of bank's portfolio. 5G and IoT services may be effective on capturing how sentiment analysis can be used to gain more customer understandings across different domains. Overall, the technologies like 5G and IoT would be a highly beneficial in various fields for the world to adapt to as they will certainly improve efficiency and remove the biases that sneak apart from bringing revolutions by offering innovative products and services.

References:

1. Fuster, A., Plosser, M., Schnabl, P. and Vickery, J. (2019). The role of technology in mortgage lending, *The Review of Financial Studies*, Vol. 32, No.5, pp. 1854–1899. <https://doi.org/10.1093/rfs/hhz018>.
2. Leong, K., and Sung, A. (2018). FinTech: What is it and How to Use Technologies to create business value in FinTech way?, *International Journal of Innovation, Management and Technology*, Vol. 9, No. 2, pp.74 – 78.
3. [www.https://www.neosofttech.com/blogs/disruptive-technologies-to-watch-out-for-in-2021#:~:text=With%20the%20proliferation%20of%205G,to%20eagerly%20adopt%20this%20technology](https://www.neosofttech.com/blogs/disruptive-technologies-to-watch-out-for-in-2021#:~:text=With%20the%20proliferation%20of%205G,to%20eagerly%20adopt%20this%20technology).
4. <https://www.forbes.com/sites/forbestechcouncil/2020/12/08/12-disruptive-technologies-that-will-change-the-world-in-2021-and-beyond/?sh=13e443432170>
5. Automotive IoT – Next Generation connected cars, www.quectel.com/automotive