

# Towards the Digital Transformation of Indian Telecom Sector: A Case Study in INDIA

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**Abstract - The fast growth of smartphone and increased demand for social media use has significantly changed customer expectation. Telecom sector companies are looking different aspect of technology to adopt, so that they can deliver better service to customers looking to their emerging needs. Digital transformation across each sector is bringing change around the corporate world. Computerized change is rising as a key driver of major development in our general surroundings. It can possibly essentially enhance shopper lives and make more extensive societal great, while giving organizations new open doors for esteem creation. This transformation is providing better consumer lives with more opportunities for revenue creation. The telecommunication industry is playing a vital role in this transformation as a key solution provider of worldwide digitization improvement. The broadcast communications industry is at the front line of this change, both as an industry seeing expansive scale change in its market condition and as a key driver of overall digitization. Speculation by the media communications industry in innovation and interoperability has supported a colossal move in data and capital moves through the worldwide economy, while giving the building squares to the development of altogether new plans of action crosswise over businesses. In parallel, access to a comprehensively associated organize has engaged a large number of individuals around the globe, by giving them access to ongoing data, commercial centers and social projects that will have long haul suggestions for personal satisfaction. Huge investment in telecom sector is providing base of building blocks for globally connected network which is empowering billions of people throughout the world in terms of real time solution. Again there are many obstacles such as risk for data security which need to overcome by telecom companies to sustain in the competitive market. Looking to this current context this chapter focus on recent status on Indian telecom sector & how digital transformation is going through cloud, IoT, machine learning and data analytics. This chapter also emphasis on current Standard of Procedure in Telecom Operation such as 4G & 5G network, Optic fiber, wifi and it's Quality Assertion and Management.**

**Key Words: Telecom sector, Digital Transformation, Telecom Operation, Network, Smart phone**

## I. INTRODUCTION

When we share information or communicate to distant or far away with the use of technology is called telecommunication. By this method transmission of signals, signs, messages, words, speech, pictures, data of any nature happens through wire, radio, optical, cables, physical media, electromagnetic radiation or other electromagnetic system. India is currently in second position in world telecommunication market due to its subscription base of 1.05 billion. A report by GSM Association (GSMA) in collaboration with the Boston Consulting Group (BCG) says that mobile industry is growing rapidly and will

contribute to GDP of India substantially as the app industry is in 4th position in world. By the year 2020, mobile industry is expecting to cross a total economic value of Rs.14 trillion. Now India is the second largest Smartphone market as shipments increased 23 percent in 3rd quarter of 2017 to reach more than 40 million units[1]. By rise in smart phone penetration and decline in data costs will increase 500 million internet users for over next five years. Data usage per Smartphone is expected to increase from 3.9 GB per month to 18 GB per month by year 2023. According to a report by Research Store, the estimation of Indian telecom market will reach USD 103.9 billion by 2020. A report by Microsoft says India is going to lead

virtual world by having 700 million internet users of 4.7 billion global users by 2025. As internet economy will reach USD 155 billion in 2018, it is going to contribute approx 5 percent to Gross Domestic Product of country. Due to Recent Government's favorable regulation policies for Smart cities & initiatives like to auction for 5G spectrum in bands like 3,300 MHz and 3400 MHz to promote Internet of Things, machine to machine communications, instant HD video transfer and 4G services expanding in the market at very high rate, Indian telecommunication sector will have a rapid growth in upcoming years [2].

Again as we know Integrating Digital technology into all areas of business results in fundamental change in standard of procedure in business operation.

So by Digital transformation business can provide better value to customers & better service delivery .Telecom sector is in stage of progress in digital transformation. Mainly Telecom Companies are focusing on robust consumer analytics, Digitization of order management, implementing simplified IT interfaces & customer self service portals; and business process automation to remain competitive in market[3]. Now they are giving importance on Cloud, Internet of things (IOT), mobile payments. Major Player in Telecom is surviving by intelligent system and innovative techniques for their operation & service side. Companies are increasing automation process with help of analytics in both customer and network part of operation which enable for a smooth end user experience with better time utilization.

## II. THEORETICAL BACKGROUNDS

As telecommunications industry is playing a important role in digital transformation for other industry such as healthcare , retail, hospitality , transport and many more. So telecom sector need to focus on more efforts to become digital. Again in today's competitive market companies need to grow and increase their revenue through digitization. Telecom companies are giving importance to Digitization, up-gradation of network, Advanced Data Analytics, Machine learning, Automation in process.

### 2.1 Digitization:

Nowadays all telecom companies are implementing digital technology both in their service and in the backend process. Data containing customer details and sales information are linked digitally so that it can be handled in single database. Due to this communication with customer are handled conveniently by use of apps and messaging system with minimal workforce intervention.

To reach this level of capabilities organization need expert skill in data analytics to store perfectly and receives maximum data from each and every customer. In current scenario many companies are recruiting chief digital officer

who are playing role of catalyst to implement digital efforts in all units of business. By Use of Digital Technology company can automate their all process as a result production costs go down. A research by Mckinsey found that providing service through digital system increases customer satisfaction and also leads to increase in revenue[4].Companies must have a clear vision of what they want to do in digital transformation looking to customer need and expectation with consideration of own strengths & weaknesses.

### 2.2 Up-gradation in Network:

To attract the customer and also to retain them, telecom companies are offering high network speed as because it the requirement of every customer. To go ahead in competitive environments and dynamic environment, companies are preferring fiber & 5G up gradation. As 4G network is spreading in both rural and urban areas, telecom companies are equipping themselves with state-of-the-art infrastructure and modern Network enhancements, so that they can manage in every flexible way to deal with all profitable opportunities[5]. Organization need to give importance to upgrade a network solution that meet their requirements and also they have to calculate impact of up gradation upon process and customer.

### 2.3 Data Analytics:

By use of analytics companies are able to know where capital investments in network can give most Return on Investments. Operators have exact data about usage pattern of subscribers such as where, when and how they use mobile handsets. By analyzing data through algorithms, operators are able to predict when network overloads is going to happen and which customers will get affected. With this information about network they are estimating for possible up gradation so that they can increase satisfaction of customer and also able to retain them [6]. Again by use of analytics they are able to withdraw investments where they are not getting maximum return in terms of both customer satisfaction and profit.

For example telecom operator can reduce the number of support calls by 90 percent by implementing sophisticated systems(self-service guides, automatic tips, instant-messaging chats with artificial intelligence ) to track and anticipate the problems and provide them solution to solve problem by their own.

### 2.4 Machine learning:

Currently network with small cells are less costly in comparison to large cell network, including flexibility. This flexibility enables network operators to reduce or increase each cell's capacity as per demand. By use of machine learning companies can adjust wireless networks automatically and usage it across network fluctuations. By analyzing subscriber data in machine learning models operator can know which offers customer are going to like or dislike, so that they can provide customized offer to them

accordingly[7]. As operators have large scale of data such as customer information, network performance data, data from social media etc. By using patterns in data companies are interpreting for different analysis. So many number of machine learning applications are used in this sector.

**2.5 Challenges of Customer Preference:**

In current scenario to sustain in market companies need to give priority to customer preference. Below are some point that are major demand from customer side which need to be looked.

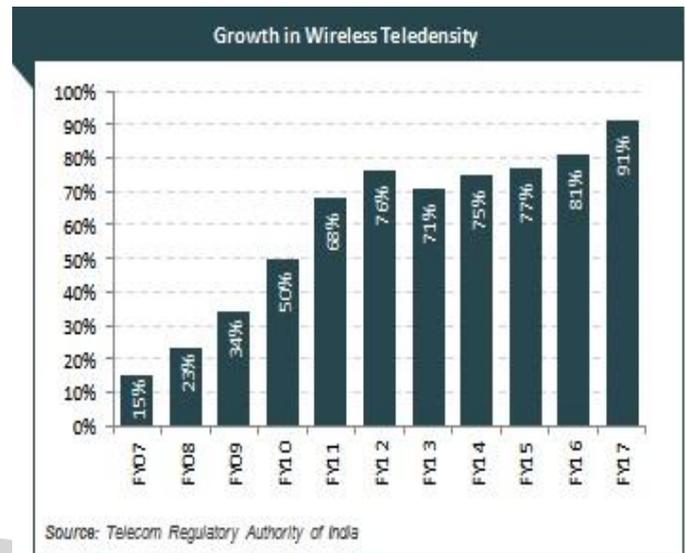
- Recently public demand for online shopping and social media has increased.
- Consumers are expecting more customized package according to their requirement. Telecom Operators must adopt & optimize their use in digital ecosystem [8].
- People choices vary from simple data pack to optimized data pack. Organizations are strengthening their relationship with customer by providing better service in all parts of sales and service time cycle.

**2.6 Opportunity Areas for Business Growth**

Nowadays Telecom company can use their infrastructure by combining with state of the art digital technology and position themselves as vital part of digital ecosystems in terms of Internet of things, digital security, industry 4.0. They can grow their business in the field of intelligent networks, solution provider in information and communication technology, cloud service provider, analytics for billing, customer relationship management, IOT service providers, digital security solution. Telcos can explore themselves as important player in smart city infrastructure ( such as smart gas pipes, intelligent street lights, traffic management, connectivity of gigabytes capacity, healthcare infrastructure, smart mobility system, cyber security , supply-chain infrastructure to navigation). Telcos can increase their revenue by offering service for smart homes, self marketing, digital entertainment and cloud service provider by working with their core competency along with digital technology opportunity.

**III. CURRENT PRACTICES IN TELCO**

According to report by TRAI out of total internet users in India 60% access through cell phone. More than 114 million users have access to 3G or 4G. According to survey by statist by January 2018 India is in first place in social media (face book ) users with approx 250 million users crossing United States which is in 2nd position with 230million users. Maximum user access social media through mobile phone and also the number of wearable devices is going to cross 4 million by 2020. Indian citizen are becoming ‘Netizen’ and using internet through phones for banking, online study material, entertainment, e-commerce and also for ease of work, user friendly, accessibility and affordable devices.



(Fig1-Teledensity in India, Source-TRAI)

**3.1 Digital penetration in Rural India –**

Currently 70% (approx.) are in middle class category out of which near to 40% are lower middle class. Many companies are focusing their operation at this rural market as rural internet users are increasing 40% each year approx, which they are saying as ‘profit at bottom of the pyramid(bop)’ .

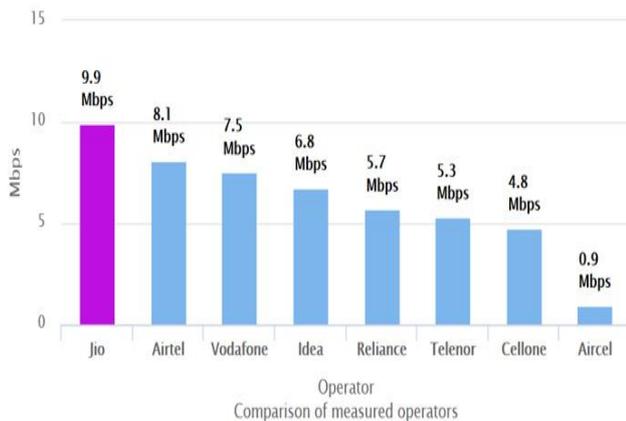
According to IAMAI (Internet and mobile association of India) in 2018, 54% of populations are under 25 years and around 50% are rural .The share of tech savvy persons or mobile users are near to 80 percent. Telecom regulatory Authority of India has proposed Public Private Partnership (PPP) model to BharatNet, which is a project of Central Government to set up broadband network in India [9]. Again considering the requirement of skill development in telecom sector , the Ministry of Skill Development and Entrepreneurship (MSDE) signed a MoU with Department of Telecommunication (DoT) to workout National Action Plan so that requirement of skilled manpower can be fulfilled.

**3.2 Wireless fidelity (Wi-Fi)-**

In the era of Wi-Fi the data package through mobile network still constitutes 50 percent source of total internet consumption. As we know Wi-Fi is a medium to connect local area networks through wireless. By this mode, internet can be accessed to mobile phones, personal computers, laptops; tablets and also it enable to provide hotspots for other external users. With smart city concept, Government have to install 8lakh Wi-Fi hotspots looking towards growth. The Railways ministry of India recently started providing many public Wi-Fi services across different railway station in India. Comparing the mobile data cost to Wi-Fi cost is 90% less as per Mb is costing around 23 paisa where as in Wi-Fi it is 2 paisa[10]. There is huge demand of Wi-Fi in cafes, cabs, metros, airport lounges, shopping malls, business house, etc.

### 3.3 4G status in India and Future Developments-

Airtel started 4G service in India. It has more than 2.5 million subscribers. Reliance Jio started operation with VoLTE which provides high-definition voice calls. Jio made investment in app system to offer music, video-on-demand, and digital payments solutions. Jio has a multi service operator license, which allows it to give service of live TV as well as television on demand through its network. Vodafone offers international roaming service for its 4G customers who travel to U.K, Spain, and Netherlands etc[11]. Reliance Jio entry as major player offering free voice call and free roaming across nation forced other players to offer attractive data packs and free voice call.



(Fig 2-Operator Comparison on Mbps, Source-TRAI)

#### 3.3.1 5G Network

Every day higher data speed is the normal demand of new generation in India. So the 5th generation systems, commonly known as 5G, is recent wireless network technologies started in 2018. This technology include Millimeter wave bands (26, 28, 38, and 60 GHz) which provide performance as high as 20 gigabits per second, Massive MIMO(Multiple Input Multiple Output - 64-256 antennas) which gives performance of ten times to 4G networks[12]. It is the radio system and architecture of network which provide high speed broadband, low latency connection and massive networking. Nokia and Ericsson have already started discussion with telecom operators for implementation of 5G.

#### 3.3.2 Optic Fiber Networks:

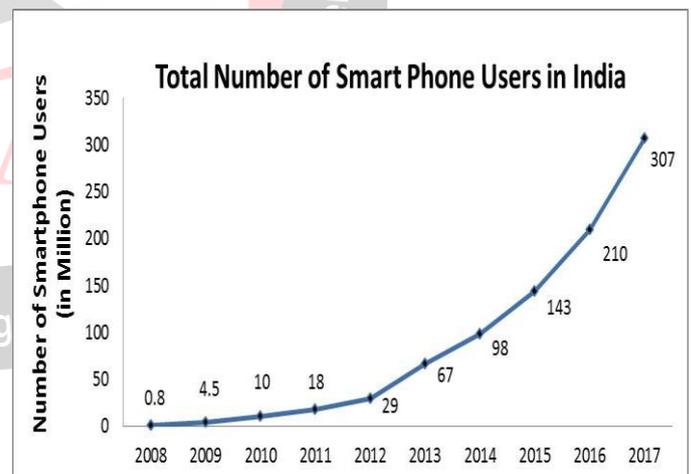
This is a method of transmitting information by light pulse through optics fiber. This network mainly used by telecommunication companies for transmission of voice signal, data signal, TV signal. Smart cities development In India, TV Digitalization, increasing demand for high speed data networks are creating the demand for Optic fiber networks. But there are some constraints present for implementing optic network like high investment amount required, poor infrastructure planning, non standardized regulation, and different policy for different state.

### 3.3.3 Internet of Things:

As the name indicates, it is network of physical objects in system with electronics, software, sensors, and network that help to collect and exchange data through physical device[13]. IoT as open connectivity helps to connect machines with machine to different application, and for people to take decision based on data. IoT is penetrating everywhere because of smart city concept, Make in India, Digital India Revolution. As digital technology is entering everyone life starting from fitness band to wearable's connecting home appliance, automation in office Some challenges in IoT are data security and privacy issue.

#### 3.3.4 Smart Phone:

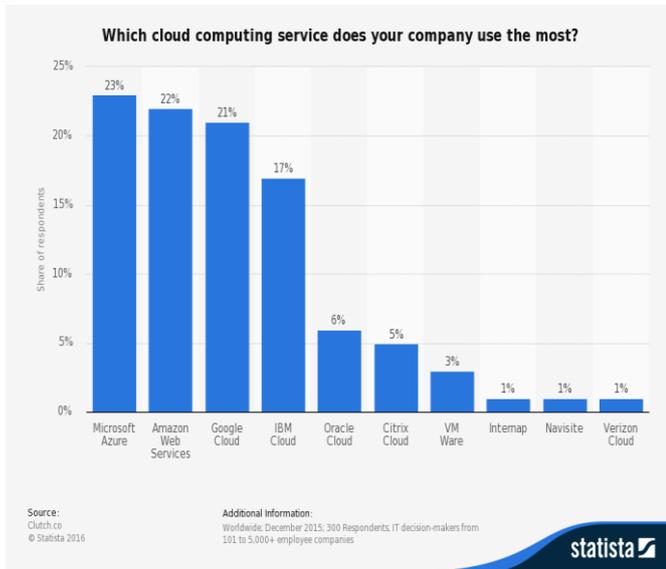
In 2015, 18% of population has smart phone whereas in 2018 it is around 28% of total population. It is estimated that by 2020 it will reach 32 % of country's population. Smart Phone makers from China such as oppo, vivo , Gionee have huge share in Indian market. According to statista Samsung has 22.6% share , Micromax has 9.9%, Lenovo has 9.2%, Xiomi has 6.4% and others hold the rest share in Indian smart phone market .Due to increase in digital uses through Mobile apps , the demand for smart phone has increased. India is in 4th position in world's app economy followed by china, US, and Brazil. This economy depends on the amount of time spent by users in app per day. Consumers are using mobile phone for activities like e-commerce to booking cabs. Indian government is giving importance to innovation with industry associations such as NASSCOM to setup incubation centre.



(Fig 3-Smart phone users, Source- Dart Consulting)

#### 3.3. 5 Cloud System:

Cloud is the required solution to provide storage plan for huge data. Netmagic, TCL, AWS, Azure and Software Layer are major cloud service providers[14] . Public sector Undertakings, Business Firms , Government, media houses, Hospitality , education sector and e-commerce are the huge contributors to cloud service providers. Manufacturing is the new emerging area .



(Fig 4-Cloud Providers , Source-Statista)

#### IV. STANDARD OF PROCEDURE IN TELECOM OPERATION

Telecom being the most dynamic among all the other industries works basically on two wheels. First one is the eye customized products and second is the service side that is back office completely by digital links and services interfaces. Currently the starting from the birth of a customer to its death (sim activation to sim churn) is completely digitalized to help in the smooth and automated functions. We have the support of a number of websites like CPOS that helps in the activation of numbers, BCL that helps in the postpaid end to end system functioning, UPSS that help in the Prepaid functioning and then comes to the CRM that is the whole and sole for the customer management services[15]. It has the complete interface supported by a number of backend data base like CPOS, UPSS , CAD, GAD, BCL/AMDOCS, OCG, OSS Unify CPOS, I-Reporting, waiver links ,DSTK services, Comverse and many more. Vodafone uses AMDOCS OSS(operation support system) to manage operations. Amdocs is a coordinated portfolio that causes the specialist co-ops to convey an ideal client involvement with each purpose of administration empowering world-driving specialist co-ops to convey an incorporated, creative and deliberate client encounter customized, participatory and opportune over any administration, area and gadget. [16]. The Amdocs portfolio holds Amdocs business process best practices in view of true situations, and rises above conventional business emotionally supportive networks (BSS), tasks emotionally supportive networks (OSS) and administration conveyance stages (SDPs) to empower specialist organizations to address both present and developing client encounter business forms. It has a special plan of action that spotlights on empowering its clients to make separation and construct mark, faithfulness, gainfulness and focused authority. Amdocs plays a vital

role in supporting Vodafone’s Internet Protocol / Multi-Protocol data switching (IP/MPLS) network deployment.

NICE-This system helps in managing and storing the biggest chunk of voice calls that helps in the process of Analysis. It is a digital linked up systems for managing customer calls and Outbound and Inbound call hearing services. All these systems are completely digital and form the backbone of telecom. Telecom having the biggest subscriber base in comparison to any other push and pull customer product and services product is now completely digital and these links support them in managing this large chunk efficiently. These digital links help in the activation of approximately 60 Lakh new customer generations total revenue of Rs.110 crores for a circle in a year. Hence to conclude Telecom in next to impossible without going digital and being most updated digitally always.

#### V. QUALITY ASSERTION AND MANAGEMENT

For the verge of attaining CXX (Customer Experience Excellence), quality is one of the most important effects of any company towards operation. High quality products bring out advantage to compete in market, enabling it to reduce cost and negative views. Vodafone is constantly striving hard and putting lot of effort in delivering quality service to its customer so it becomes very important in analyzing the process across its network and IT system. For successful result all data are being collected to analyze and inform IT and system staff[17].

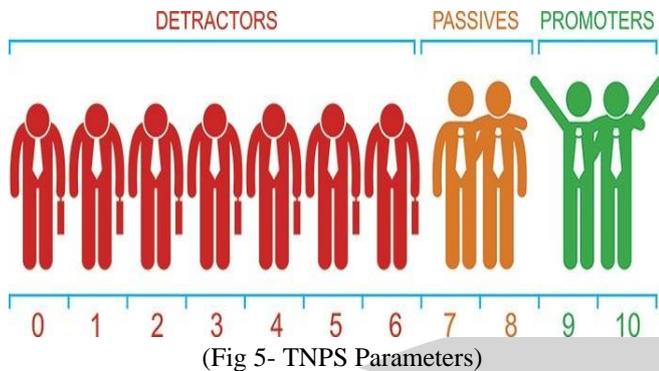
The major source of analyzing customers perception towards the company is through the Touch Point Net Promoter Score(TNPS) and ASAT (Agent Satisfaction).A digitalization process that helps analyzing or doing survey to determine whether the service provided is ‘transactional’ or ‘relationship’ focused. Touch Point Net Promoter Score is a customer loyalty metric that helps in analyzing the satisfaction level of a customer. It basically divides customer view into 3 groups i.e.:

a)Promoter-This type of customers are loyal and enthusiastic who have a tendency to repeatedly purchase from the company and they recommend others (friends and family) too for the same. Customers who give a rating(scoring) of 9 or 10 on a scale of 0 to 10 are considered Promoters.

b)Passive- This type of customers are happy but can easily be tempted to leave by an attractive competitor deal. Passive customers may become promoters by improving product, service or customer experience. Customers who give rating(scoring) of 7 or 8 are passive customers(inactive in nature, they are not dissatisfied), they do not factor into the TNPS score.

c)Detractor- This type of customers are unhappy, feel uncared and have negative impression or experience for the company. Detractor customers also have an increased

likelihood of switching to a competitor as well as warning potential customers to stay away from your company. Any customers who provides a rating(scoring) of 6 or lower are considered your detractors, these are the dissatisfied mass who in turn tend to unhappy with the company and spread bad word of mouth.



**Touch Point Net Promoter Score is calculated as stated below:**

$$TNPS = \left[ \frac{(Promoter - Detractor)}{(Promoter + Passive + Detractor)} \right] * 100$$

What exactly is send to the customers via digital media(phone, mail, messenger) after they receive a call from the Inbound or Outbound Team(service call) is as below:

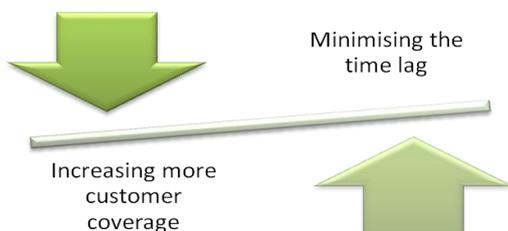
**1)First Question**

“On a scale of zero-to-ten, how likely is it that you would recommend us (or this product/service/brand) to a friend or colleague?”

**2)Second Question**

“On a scale of zero to ten, how satisfied are you with the agent who attended you???”

This provides with actionable items which can be targeted for effective process/people/product improvement and taking some corrective actions. This will also help to identify the core strengths and competencies of the company as viewed by its customers.



(Fig 6-Digitalization effect on Telecom operators)

**VI. MECHANISM OF INCREASING CALL QUALITY AND DECREASING ACHT(AVERAGE CALL HOLD AND HANDLING TIME) BY THE HELP OF DIGITALIZATION**

In order to reduce the Average Call Hold and Handling time Telecom sectors are conducting rigorous Audits and

refresher Sessions on Call Quality enhancement & Communication tips[18][19]. It’s a joint initiative from Quality, Operation & Training to reduce ACHT. This is only possible when the observers are regularly analyzing the calls(customer service calls only) stored or recorded in NICE portal. It becomes very essential on the part of the various telecom sectors to note what exactly their executives are conveying to the customers, starting from the greeting to the case(call) closure, whether the correct message has been provided or not, whether agent had listened to the customers query properly, whether agent has been empathetic to the customer, whether proper and appropriate resolution has been provide the customer, if call was disconnected by agent or customer, agent level disconnections(ALD) are marked down as because agents job is to make the customer satisfy and then it’s the customer who would disconnect the call when he/she finds a solution, exceptional call disconnections from agent end is not marked down in case of network connectivity and other issues[20][21]. The digitalized portal helps to note the average call hold and handling time and through regular screening tries to enhance the call quality by eradicating the unnecessary conversation and dead holds[22]. Thus we see how digitalization is adding values and boning our telecom operations.

Steps taken to enhance call operating quality by the help of digitalization:

- + ACHT reduction tips on call handling.
- + Refresher conducted on top call divers.
- + Call listening session conducted by training & quality team.
- + Convincing skills & soft skill has been imparted for better communication.
- + Call Monitoring by operation team.
- + Extraction of TNPS(Touch Point Net Promoter Score) dump(data) & Working Parameters Analysis
- + Providing TNIs(Training Needs Improvement) on controllable factors
- + Identifying process level failure
- + Working on ASAT(Agent Satisfaction) Parameter
- + Internal and External Calibration on calls to find out the exact drawbacks.

Thus digitalization can help to make more quality in operation and call quality in real time scenario [23].

**VII. CONCLUSION**

Universal changes in data connectivity speed and increased demand for e-commerce and service have changed customer demand. People are preferring for more customized demand according to their location and time. This type of development in telecom sector creates new challenges for telecom operators and vendors. To accelerate digital transformation in communication service companies have to give emphasis on next generation products and advanced digital platforms. There is no doubt that Digital

transformation is going to bring industrial revolutions. Also society at large and corporate need to face some undesired consequences of this digital revolution such as employment issue , security of data, privacy of information etc. The Indian vision of media communications in 2020 is a dream of data society based on a structure where IT and broadcast communications consolidate. Quick mechanical combination has just suggested a harmonious cover between the improvement procedures of IT and broadcast communications. Some portion of the present IT is 'telecom writ vast', it thrives on the telecom-arrange and thusly allows advanced media communications to utilize refined IT-programming. Equipment is a typical stage for both IT and telecom. There is a heritage vision got from trade accomplishment of India's product that has offered ascend to positive thinking with respect to India's developing pre-prominence in worldwide IT canvas. Such a dream expands on a significantly bigger vision of all round advancement of IT that overruns wide cross-segment of Indian economy and society. More profound examination demonstrates that there is requirement for a far reaching IT improvement technique to guarantee India's solid nearness in the worldwide programming market. To start with, it is to be valued that outside trade commitment of programming send out net of import of equipment is around half. Net outside trade commitment will increment if India can build up a solid base of equipment. Second, investigation of the structure of India's product trade opposite the developing elements of the worldwide market uncovers that India has negligible nearness in the quickest developing section of the worldwide IT advertise comprising of programming bundles and programming items. India's nearby rivals, then again, have made more noteworthy progress through enhancement of fares with programming bundles. There is, thusly, requirement for India to climb esteem chain with more inventive programming items in the global market. This is conceivable when India can wide base the advancement of IT with a solid and vast household showcase supporting development and its dispersion alongside the development of segment fabricating base. Suitable cooperative energy between the household and fare market will be vital to persisting achievement of Indian IT part in abroad market and advancement of best in class telecom framework is an essential to both.

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