

Digitization of India - Impact on the BOP Sector

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ABSTRACT

India is the fastest growing economy in the world. It is also the seventh largest economy in the world by GDP measure and the second largest in terms of Purchasing Power Parity (PPP). The digital Indian plan was a major step by the government in India to bring all segments into purview. It has a three pronged agenda of providing infrastructure, governance and digital empowerment to every citizen. This initiative will transform the economy of the nation and make it among the top seven countries globally to go completely digital. But, inherently this exercise was a critical need to get the vast population and the informal sector into the folds of accountability and get statistics on the informal economy in India. Although, there is no accurate figure defined as BOP for the Indian sector by the government statistical organizations, the below poverty line statistics published by the government look at people living on even less than \$ 0.45 per day. Such being the socio economic situation with the thrust on a lot of developmental measures and poverty alleviation methods, there has been a significant improvement in employment opportunities and as per some statistics we have seen a large number of households moving out of dire poverty. The importance of these digitization efforts is planned economic and societal growth triggered by a massive adoption of digital technologies. This paper studies the various action plans in digitization and their impact on the BOP sector in India.

Keywords: BOP, Digital India, BOP sector, Unorganized sector.

1. INTRODUCTION:

Digitization has been defined as “the economic and social transformation triggered by the massive adoption of digital technologies to generate, process, share and transact information” (Katz, Koutroumpis, & Callorda, 2014) [1]. It has been seen in several countries that digitization has become one of the key economic driver’s in recent times as it provides economic growth and in the creation of ample job opportunities. Some years back when the world economy was sluggish, propelled by digitization it was able to produce an output of \$193 billion and create 6 million jobs across the globe [1]. The World Economic Forum has mentioned in its report that 10% increase in digitization score of any country would bring 0.75% growth in its GDP per capita. Other

recent studies also confirm that its impact is 4.7 times more than the average impact of 0.16% on the per capita GDP for broadband deployment. We have seen that India has been on a growth trajectory since the last two decades. ‘The Digital India’ program, an initiative by honourable Prime Minister Mr. Narendra Modi emerged with the idea to build a transparent, participative and responsive system of governance. It looks at a three tiered agenda-one, creating requisite infrastructure, corporate governance and digital empowerment to every citizen. It was dream to remodel India into digitally empowered society and knowledge economy. It tries to bring about public accountability by making information accessible digitally which would further lead to transparency and public accountability. In India, the informal economy is very vast in size as in

many developing countries, the businesses here are in the unorganized sector and the statistics are not available for major economic decisions. The digital India campaign would also lead to proactive steps in getting this informal economy into the folds of the organized sector and network it to further benefit by infusing various government programs and services which would mobilize the capability of every sphere of the economy.

2. BACKGROUND:

Digital India program comprises of several initiatives targeted to prepare India for becoming a knowledge economy and for bringing good governance to citizens through synchronized and co-ordinated engagement of the entire Government. Nine major projects have been undertaken [5]. These are as follows:

1. All highways to have broadband services: The Government has initiated steps to lay national optical fibre network in all 2.5 lakh gram panchayats. Broadband has been laid for rural India and it will be made mandatory to provide communication infrastructure in new urban development and buildings. By March 2017, the government has completed the task of providing nationwide information infrastructure.
2. Easy access to mobile connectivity: massive step have been taken to ensure that by 2018 all villages are covered through mobile connectivity. The aim is to increase network penetration and cover gaps in all 44,000 villages.
3. IT Training for Jobs: Government to focus on training 10 million people in towns and villages for IT sector jobs in five years and train an additional 0.3 million agents to run viable businesses delivering IT services. Additionally, the project involves training of 0.5 million rural IT workforce in five years and setting up of BPOs in each North-eastern state.
4. Manufacturing of electronics: The government is focusing on zero imports of electronics by 2020. To achieve this, the government has planned to put up smart energy meters, micro ATMs, mobile, consumer and medical electronics.
5. Provide public access to internet: The government has aimed to provide internet

services to 2.5 lakh villages which comprises of one in every panchayat by 2017 and 1.5 lakh post offices in the next two years. Further, it is aimed to make these post offices Multi-Service centres for the people.

6. E-Governance: The process and delivery of various services of the government has been aimed to make digital through e-Governance with UIDAI, payment gateway, EDI and mobile platforms. School certificates, voter ID cards would be provided online. This would enable a faster examination of data and for the BOP segment they could look at availing benefit services of the government using these identity proofs that are mandatory for all government schemes,

7. E-Kranti: e-kranti would make it necessary for every citizen to go digital by aiming to deliver electronic services to people which deals with health, education, farmers, justice, security and financial inclusion.

8. Global Information: Engaging social media in a big way to host data online and use these social media platforms for governance is the aim of the government. Making information available by ensuring that even simple information like train schedules etc are available easily to citizens at the click of a button.

9. MyGov.in is a website launched by the government for a 2-way communication between citizens and the government. People are free to send in their suggestions and comment on various issues raised by the government, like net neutrality.

10. Early harvest programs: Government plans to set up Wi-Fi facilities in all universities across the country. Email will be made the primary mode of communication. Aadhar Enabled Biometric Attendance System to be deployed in all central government offices where recording of attendance will be made online.

3. KEY SECTORS PROGRAM HIGHLIGHTS:

India's current Gross Domestic Product (GDP) is currently at US \$ 2.73 billion. As per the McKinsey report, with the digitization program it is estimated to touch US \$ 6 trillion [1,12].

The digital India program has generated employment opportunities for 17 million people directly and indirectly. In the next five years India will emerge a leader using IT in almost all sectors of business and governance. By digitizing India’s predominantly ‘cash based economy’ and reforming the tax system India has the potential to amplify its expansion had make it one of the fastest growing economies over the next ten years. According to the Morgan Stanley research, India’s economy is poised to leapfrog from its current seventh place to the third largest economy by 2027 with \$ 6 trillion gross domestic product. The equity market now, tenth in the world, is estimated to jump to fifth, with financial services and consumer discretionary stocks leading the way.

1. Banking Sector –

The initial spurt for digitization can be credited with the launch of the Aadhar initiative in 2010, a biometric identification program with more than 1.3 billion Indians registered in the government’s digital database [1,8,11]. The ‘Jan Dhan’ paved the way to ensure that every household in India has a bank account and ease of access to these accounts. Since this initiative more than 295.2 million bank accounts have been opened as on August 2017. Prior to the launch of Jan Dhan more than 35% of Indian households did not have access to a bank account. By slowing moving Indians from cash based transactions to digital transactions there has been a major boost to the economic growth. In unorganized sectors and BOP segments where there is major cash transactions, firstly, it they are not accounted for, to that extent the taxes are evaded. Secondly, it becomes near impossible for government to get an accurate estimate of the size and volume of business. Also, in some cases, consumers and small enterprises are not possible to avail the benefit if credit transactions.

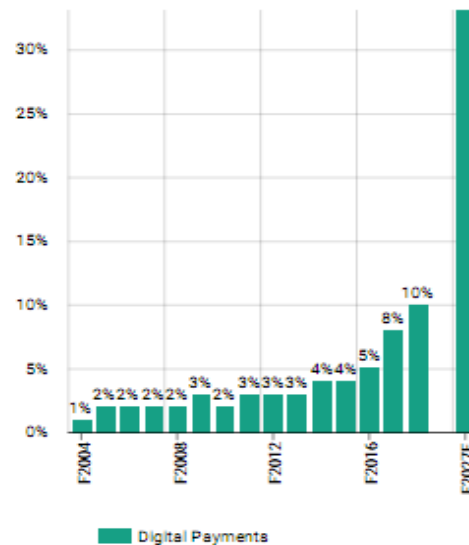
Certain milestones since digitization -

(i) The Government has been able to successfully open 3.8 million bank accounts for workers in the unorganized sector ensuring some accountability and digital movement among the unorganized sectors and the base of pyramid segments.

(ii) About 2,00,000 point of sale (PoS) machines have been provided in 1,00,000 villages and RuPay cards have been distributed to over 34 million farmers across India.

(iii) Recently, the government also lowered the Merchant Discount Rate (MDR) fees to be paid by merchant establishments to banks for the PoS machines reducing to try and reduce the losses of the banks.

Definitely, there is a going to boost to the banks and payment gateway companies through digitizing of payments. As a proportion of total personal consumption expenditures, digital transactions in India were recently just 8%, given the increase in digital payments, this is expected to go up to 36% by 2027.



Source: RBI, NPCI, CEIC, Morgan Stanley Research (E) estimates

Figure 1- Digital payments in India estimated figures in 2027 [22] [India’s Digital Leap, Morgan Stanley Report, 2017]

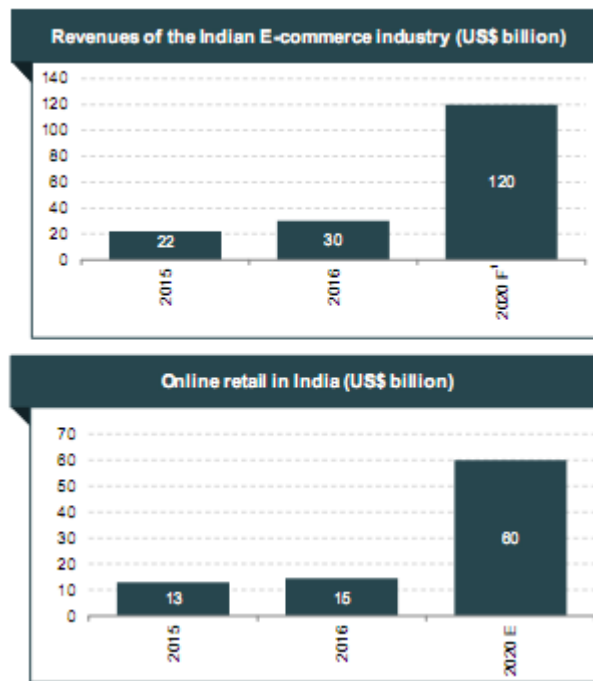
Many banks are exploring the option to launch contactless credit and debit cards which would use near field communication (NFC) mechanism allowing customers to transact without having to insert or swipe the card. It is estimated that India will move rapidly to a digital payments economy in as little as seven years.

2. Retail Sector –

Retail sector is emerging as one of the largest sectors in the economy. The total market size is estimated to be around US \$ 672 billion in 2016,

expected to grow to US \$ 1.3 trillion by 2020. The organized retail penetration is low at 8-10 percent as compared with 80 per cent in the US. This indicates a very strong growth potential. While the penetration is low in this organized retail segment, the sector is growing at a CAGR of 20-25 percent. In 2020, it is estimated that organized retail segment penetration would be at 18-20 per cent and unorganized retail penetration would go up to 80-82 per cent. As of now, organized retailers and consumers are keen and willing to use digital payments and use the online platform for transactions, there is a huge untapped potential among the unorganized sector which has to be addressed through the penetration of digital media and consumer and retailer awareness. Government has taken a lot

of steps to address these issues. At the first glance, retail will be affected in a big way by youngsters' with access to smart phones at their fingertips and internet. There has already been a lot of research on online shopping habits of consumers, payment gateways being used and so on [2-7]. Availability of big data, the speed of the social media, new avenues of advertising and promotion and retail polarization will help in the exponential growth of the industry. FMCG and retail players are taking on enhanced strategies for digital marketing and are using advanced tools to understand consumer behaviour patterns and shopping habits. Revenue of e-commerce companies is expected to US \$ 120 billion by 2020. Government has run lot of initiatives to educate e-commerce and encourage it.



Source: BCG Retail 2020, Ernst and Young, Deloitte, Indiaretailing.com, Economist Intelligence Unit, Euro monitor.

Figure 2 – Online Retail and e-commerce statistics in India [9]

With the ease of internet access and increasing spending capacities, young India is spending money online in a big way.

Certain trends & milestones -

(i) The mobile wallet industry is expected to maintain its current pace of expansion and the value of its transaction is expected to reach Rs 32 trillion (US\$ 480 billion) by 2022, growing at

a rate of 126 per cent.

(ii) Government to allow 100 percent FDI in e-commerce with the condition that the products have to be manufactured in India.

(iii) India's largest online retailer, Flipkart, has raised at least US\$ 2.5 billion from SoftBank Vision Fund to maintain its dominance in the Indian e-commerce market and to fight against

its arch rival Amazon India.

(iv) Google plans to set up its first data centre in India in the city of Mumbai by end of 2017, to improve its services to local customers wanting to host their applications on the internet and to compete effectively with the likes of Amazon and Microsoft.

(v) SAP SE, in partnership with the Associated Chambers of Commerce of India (ASSOCHAM), has rolled out a knowledge sharing resource centre which will serve as a one-stop portal for businesses looking to adopt or migrate to technology that will make them future ready. Every business owner wants to go digital and a lot of firms are mushrooming to provide this knowledge and expertise.

This boom in retail has been enabled largely also by multinationals trying to capture rural BOP markets using innovative strategies and tying up with social entrepreneurs at rural and semi urban levels who have enabled driving the success of the business forward.

3. Technology Sector –

The global sourcing market in India continues to grow at a higher pace compared to the IT-BPM industry. The global IT & ITeS market (excluding hardware) is pegged at US\$ 1.2 trillion in 2016-17, while the global sourcing market increased by 1.7 times to reach US\$ 173-178 billion. India remained the world's top sourcing destination in 2016-17 with a share of 55 per cent. Indian IT & ITeS companies have set up over 1,000 global delivery centers in over 200 cities around the world.

Software is like the central nervous system of technologies driving digitalization. As far as talent is concerned, in 2013, United States led the world in software developers; it had about 3.6 million software developers in the labour force. India, meanwhile had 2.75 million, but by the end of 2017, India will have 5.2 million developers, an almost 90 percent increase, as against 4.5 million in the US, which is a 25 percent increase [5,10]. Digitization has ensured a new layer of connected intelligence.

Every company is today trying to strategize ways to get its employees and customers into the digital loop by creating a simple interface medium. Be it the most recent ITC asking

consumers to click a selfie with the Sunfeast biscuit packets and send it using whatsapp (a simple to use communication and sharing medium) to the elaborate offering of simple cost effective handsets with ERP packages to empower its Shakthi Ammas by Hindustan Lever, HUL has time and again leaped to create such powerful sustainable and loyalty driving strategies for success [13,16]. Today almost every company is using the applications, software as means to cater to customers and remain in the top of mind recall.

The internet industry is likely to double to reach US \$ 250 billion by 2020. The number of internet users in India is expected to reach 730 million by 2020. While at the top end of the technology platform we have the seamless integration of interactive technology such as Virtual Reality, Artificial Intelligence, wearable, live streaming, drones etc at the bottom end are simple handsets for the rural poor with low literacy levels or even the urban ageing people. Companies offering technology and solutions will have a huge leap in business growth boosted by the digital revolution. Every company via media outsourcing digital bandwidth will ensure digital space and movement.

Certain milestones and trends-

(i) The Government of India has allocated Rs 10,000 crore (US\$ 1.5 billion) for BharatNet project under which it aims to provide high speed broadband to more than 150,000 gram panchayats by 2017-18.

(ii) The Bharat Interface for Money (BHIM) app, an Aadhaar-based mobile payment application launched by the government that will allow users to make digital payments without having to use a credit or debit card. The app has already reached the mark of 13 million downloads.

(iii) Wifi facility is being set up for around 5.5 lakh villages by March 2019 with an estimated investment of Rs 3,700 crores (US\$ 555 million) and the government expects to start broadband services with about 1,000 megabit per second (1 gbps) across 1 lakh gram panchayats by the end of this year.

(iv) A free Doordarshan DTH channel called DigiShala has been set up, that will help people

in the rural and semi urban segments and with low literacy also to understand the use of unified payments interface (UPI), USSD, aadhaar-enabled payments system, electronic wallets, debit and credit cards, thereby promoting various modes of digital payments.

(v) The Telecom Regulatory Authority of India (TRAI) shall release consultation papers ahead of framing regulations and standards for the rollout of fifth-generation (5G) networks and Internet of Things (IoT) in India.

(vi) Digital commerce market in India is set to grow at 30.4 per cent year on year to US \$ 34.11 billion by December 2017.

(vii) Indian technology companies expect India's digital e commerce to have the potential to reach US \$ 4 trillion by 2022 as against the GOI estimates of US \$ 1 trillion.

(viii) Employees from 12 Indian start ups like Flipkart, Snapdeal, Ola etc have gone on to form 700 startups on their own.

Most of the programs in IT are India is the topmost off shoring destination for IT companies from across the world. Having proven its capabilities in delivering both on-shore and off-shore services to global clients, emerging technologies will now offer an entire new gamut of opportunities for top IT firms in India. US\$ 150 billion Indian IT industry's export revenue to grow at 7-8% and domestic market revenue is projected to grow at 10-11 per cent in 2017-18.

4. Healthcare Sector –

Healthcare has become one of India's largest sectors in terms of revenue and employment. India's healthcare sector is growing at a 15 percent CAGR to reach US \$ 158.2 billion by 2017. Healthcare comprises hospitals, medical devices, clinical trials, outsourcing, telemedicine, medical tourism, health insurance and medical equipment. Deloitte has predicted that with increased digital adoption and cost efficiency being the biggest advantage, the Indian healthcare market, which is worth US \$ 110 billion, will grow to US \$ 320 billion by 2020. Rural India which accounts for 70 percent of the population will emerge as the potential demand source [18,20]. Economic prosperity would improve affordability for generic drugs in

the market. With digitization, there will be more demand for and need of medical services among the lower segment of the population. As of now, they have limited access to well equipped services.

Online pharmacy and healthcare service companies are slowly realising the transition. Many buyers in urban locations are moving to purchase medical supplies on a monthly or fortnightly basis from onliners such as Netmeds and Medplus.

The country has also become one of the leading destinations for high end diagnostic services with tremendous capital investment for advanced diagnostic facilities. India's healthcare sector is vast and full of opportunities, as of now only tip of the iceberg has been touched by the digitization movement but the challenges and opportunities are high in this sector. Most healthcare related companies are yet to awaken to tap the digital avenues.

5. Education Sector –

India has an important place in the global education industry. We have more than 1.5 million schools with over 260 million students enrolled and around 751 universities and 35,539 colleges. We have one of the largest higher education systems in the world. India has become the second largest market for e-learning after US. The sector is pegged at US \$ 2 billion and is expected to reach US \$ 5.7 billion by 2020. The distance education market is estimated to grow at a CAGR of 11 per cent during 2016-2020.

Certain milestones & trends –

(i) The ministry of Skill development and entrepreneurship has launched the Pradhana Mantri Yuva Yojana is expected to provide entrepreneurship education across India targeting 700,000 students.

(ii) Various government initiatives have been adopted to boost the growth of distance education market besides focussing on new education techniques such as E-learning and M-learning.

(iii) The Pradhan Mantri Grameen Digital Saksharatha Abiyan has been given a target to make 60 million rural households digitally literate. Which will be a huge transformation for

the knowledge economy, this would enable a lot of people in the BOP segment to get digitally literate and improve their technological expertise. Many corporations looking at partnering with NGO members in their rural and BOP segment initiatives would largely benefit from this program.

(iv) The Digi Dhan Abiyan (digital financial literacy program) to educate over 10 million people on e-payments in rural India. Microsoft Co-founder Mr, Bill Gates expects this to be the biggest game changer which can make India the world's largest digital payments economy in seven years time.

(v) The government along with the United States Agency for International Development to create awareness about digital payments across 60 million traders and merchants across the country.

(vi) Certain companies in partnership with educational institutes have launched initiatives called 'Smart Campus', where more than one million students through digital and other e-learning techniques will be trained in the field of IT and Banking by 2020 [4,5].

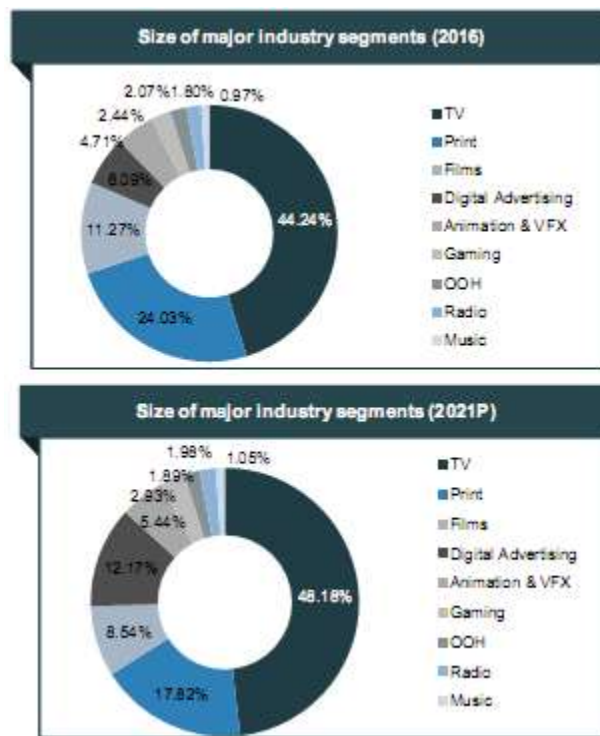
6. Media and Entertainment Industry –

This industry has been largely driven by increasing digitization and high internet usage over the last ten years. Internet has almost become a mainstream media for entertainment for most people. The fact that India has more than 50 per cent of the population below the age of 25 years and today most of the youth are equipped with mobile phones and internet, media and entertainment has grown in a big way. Digitization has given the biggest growth spurt in this industry. Radio, television, and music entertainment modes can be had anywhere anytime. The advertising industry is the second largest growing industry in the Asian region after China. This industry is expected to grow at a CAGR of 13.9 per cent against a

global average of 4.2 per cent. The Indian television market is expected to grow at CAGR of 15.5 per cent to reach US\$ 15.2 billion in 2019. The entertainment industry is dominated by the television segment itself, with this segment grossing 44.24 per cent of revenue share in 2016, which is expected to grow further to 48.18 per cent by 2021. Television, print, and films together account for 79.54 per cent of market share in 2016 as can be seen from the figure below. Print media is the next largest sector in the overall entertainment industry in India, followed by sectors of Out of Home (OOH) and Radio which are expected to contribute almost 2 per cent each to the entire industry by 2021. Indian print media industry generated revenues worth US\$ 4.51 billion in FY2017.

The Indian media & entertainment sector is expected to grow at a Compound Annual Growth Rate (CAGR) of 13.9 per cent, to reach US\$ 37.55 billion by 2021 from a figure of US\$ 19.59 billion in 2016, which outshines the global average of 4.2 per cent. Over FY 2016-21, radio is likely growing at a CAGR of 16.1 per cent, while digital advertising will grow at 30.8 per cent. The largest segment, India's television industry, is expected to grow at a CAGR of 14.7 per cent, while print media is expected to grow at a CAGR of 7.3 per cent. Though the growth compared globally is quite impressive, the penetration within India is very deep. The digitization of the cable network has also helped the government to get exact numbers and data on television penetration and reach.

India, as per statistics and one of the highest spending and fastest growing advertising market globally. The country's expenditure on advertising is expected to grow at 12 per cent to US\$ 9.47 billion in the year 2017. Mobile advertisement spending in India is estimated to grow to US\$ 1.55 billion by 2018.



Source: KPMG – PwC Report 2017.

Figure 3- Size of major industry segments in Media & Entertainment industry [9]

While estimates show that television is going to be still the largest component in the M & E industry, followed by print and films, they are all transgressing to digital platforms. Lot of firms such as Voot, Hotstar (a Star TV venture) have been successful at capturing the Out of Home (OOH) consumers for visual and audio content with live streaming options etc.

Certain trends & milestones –

(i) Government of India has taken up various initiatives such as digitizing the cable distribution sector to attract greater institutional funding, increasing the foreign direct investment limit from 74 per cent to 100 per cent in cable and DTH satellite platforms, and granting industry status to the film industry for easy access to institutional finance. This has pushed further the new entrants and employment opportunities.

(ii) Growing internet penetration and data consumption is definitely going to increase digital advertisement spend in India at a compounded rate of 30.8 per cent between 2016 and 2021.

(iii) Given the growth possibilities backed by digital technology and government initiatives, the media & entertainment industry will be able to create immense employment opportunities.

With increasing penetration of internet and digital mediums, the digital segment is expected to outperform other segments of the M & E industry.

4. IMPACT OF DIGITIZATION ON ECONOMY AND BOP SEGMENT:

BOP definition in India – Information and Communications technology (ICT) technologies today are far more pervasive than they have been in the past. More people, especially at the lower end of the income pyramid have access to a mobile phone than to electricity. This has created a need and an opportunity for policymakers to include all segments through a digital revolution in India. The base of the pyramid is by far the largest percentage of the population and market in India. The McKinsey report states that as of 2005, 1.05 billion people (5 out of 6 Indians) were BOP, which is on average they were living on an annual household

income of less than INR 200,000 per year or 16,667 per month. In urban India, where the cost of living is considerably higher, BOP is considered to have an annual household income of less than INR 3,00,000. This is equivalent to less than INR 25,000 monthly household income. In rural India, an annual household income of less than INR 1,60,000 or monthly household income of INR 13,333 is considered as BOP. There has been significant economic growth in the last few years that has fuelled improvements and a fast growing middle class, the report, however, states that BOP still stands at 78% of India's population or 997 million people in 2015. The Rangarajan Committee after re-examining the issue of poverty in India proposed to the government of India to adjust for urban and rural differences by creating two poverty line thresholds – one, less than INR 47 (\$0.69) per capita expenditure per day in urban areas and INR 32 (\$0.47) per capita expenditure per day in rural areas. This again is the upper layer of the poor as defined by the Rangarajan committee. As per the McKinsey report, in 1985, 93 percent of the population had an annual household income of less than INR 90,000 or less than \$ 1,970 per year, this income bracket was categorized by McKinsey as 'deprived'. By 2005, this had dropped to 54 percent of the population, which means that more than 103 million people in India had moved out of desperate poverty. This definition of poverty of less than INR 90,000 household income is also the measure used by NCAER. The forecast shows that the deprived segment will further drop from the 54 percent in 2005 to 22 percent in 2025. 'Aspirers', are categorized as people who have an annual household income of INR

90,000 (\$1,970) to INR 2,00,000 (\$ 4,376), although they cannot be termed as deprived, nonetheless, they struggle to live comfortably, typically spending more than half their income on necessities. As people move out of desperate poverty India's income pyramid will also undergo a change and India will have a significant sizeable and large middle class. They have classified the middle class to comprise of two economic segments- 'seekers' with real household income of INR 2,00,000 (\$ 4,376) to INR 5,00,000 (\$ 10,941) at PPP terms. Further on in the classification are 'Strivers', people with an annual household income of INR 5,00,000 (\$ 10,941) to INR 1,00,00,000 (\$ 21,882) and 'Global Indians', having an annual household income of more than INR 1,00,00,000 (\$ 21,882). While urban centres are the fastest growing market in India, rural areas account for 70 percent of the country's population and have accounted for more than half of India's consumption. As per the survey, even with continued urbanisation, it is expected that 63 percent of the population will be in rural areas in 2025 [11,12]. As of today, more than 600,000 villages of varying sizes are home to close to 800 million Indians.

Digitization effects – we are looking at digitization from a three pronged view of certain determinants which we consider to be the pillars or the basic needs of a vast majority of the population and the indicators of momentum in the economy –

1. Economic
2. Social
3. Capital Resources

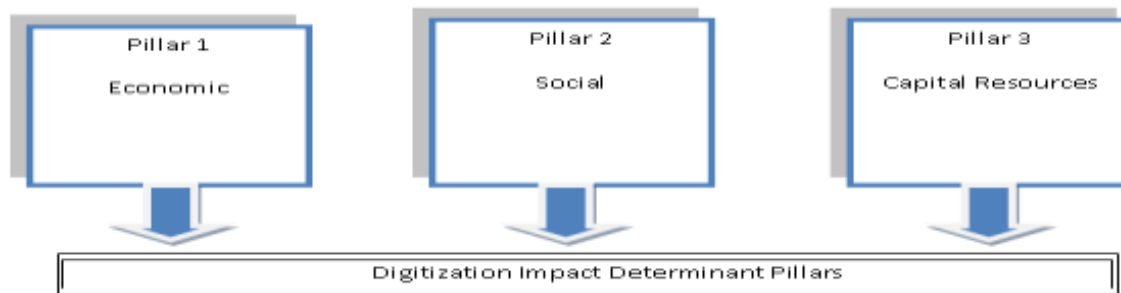


Figure 4 - Digitization Impact determinant pillars

1. Economic - The prime factors in the digitization program have been the universal biometric identification system (Aadhar), measures to boost financial inclusion (JanDhan), move to a fully online value added goods and services tax system and impetus on the implementation of real time payment systems. As per the Mckinsey report, the Indian economy coupled with a fast paced smart phone and internet penetration is expected to grow to be the third largest economy in the world with a GDP of US \$ 6 trillion, we can expect a growth to take India to be among the top five equity markets in the world with a market capitalization of US \$ 6.1 trillion by 2027. India is also expected to be the third largest listed financial services sector in the world with a market capitalization of US \$1.8 trillion by 2027 [11]. From an economic perspective the main aspects that will depict growth and momentum are –

- i. GDP growth
- ii. Job creation
- iii. Rising levels of income

Job Creation & Income enhancement capabilities- In any economy some of the deciding factors for measuring the implication of a digitization program is the adoption and usage of digital technology, reliability, pricing of the digital interface initiatives and ease of use being predominant, these, in turn, are said to determine the impact on employment, infrastructure facilities available, quality of life, access to public services and so on. As per the Price Water House Coopers survey amongst 150 nations, it is seen that an increase in digitization of ten percentage points triggers 0.50 to 0.62 per cent gain in per capita GDP. In the case of the digital India program, the government has put in motion machineries right at the grass root level to ensure that the lives of the people living in even the remotest low income segments with poor or limited access to digital technologies are driven to adapt at an economical pace to digitization. It is going to be an exercise that has strategic long term benefits to raise the socio economic levels of the society. Across the world, both developed and developing economies are reaping benefits for digitization. Researchers have analysed that the developed

countries are getting higher economic benefits from digitization; this could be because the basic infrastructure and other job facilities are already in place. But it has been seen that the peak of the effects more or less stables out and the effects of growth for digitization are measurable as they depend on domestic consumption and in most cases these countries outsource lower skilled work to other cheaper labour countries in the emerging markets. Thus, for them gains come from the effect of digitization on employment rather than from its influence on growth (World Economic Forum). Digitization also has a significant impact on job creation in the overall economy: an increase of 10 per cent in digitization is found to reduce the nation's unemployment rate by 0.84 per cent (PWC Report). The 6 million jobs that were created by the digitization effects were found to be 94% from emerging economies and 6% from North America and Western Europe. According to the World Economic Forum, a country which gains 10 digitization score, reduces unemployment by 1.02 per cent [7, 12].

The effects of digital technologies in future days are unknown, but challenges related to digital technologies have shown the magnitude of the shifts in employment. While we positively look at and pre-empt employment opportunities, job losses are going to be a reality as technology transforms manufacturing and services in the coming years, this further raises questions about how quickly new jobs will be created and about the future of economic development models based on exporting labour-intensive manufacturing products. The technology frontier is expanding quickly, with recent breakthroughs in self-learning artificial intelligence propelled by the rising amounts of data being generated by mobile phones and sensors on machinery and equipment. With this spurt of digital industries, the demand for digital skills has increased. There is an increasing demand for coders, web developers, product managers and data scientists who would be steering the business to growth. There would also be requirement of online marketing managers, product developers and user-experience experts also. Internet has been able to create 3.6 million jobs in the United

States. This is substantially more than the workforce engaged in agriculture and construction combined in the country. As per a European Commission press release, which mentions that 5 lakh jobs were created in the US in the last 5 years for the development of mobile application and IT related. The digital space is creating more jobs because of the thriving digital ecosystem. In addition to this, it has been forecasted that digital employment would grow by 5.4% by 2020. An extensive study in France showed that 2.6 jobs are created on every job destroyed by internet. Analyzing 15 years, the report found that 1.2 million jobs were created by the internet and there was a loss of 5, 00,000 jobs [1,11-18]. Essentially, digitization, also calls for re-skilling and new skills development, the Skill India initiative is aimed at re skilling India in the new direction so that the upscale of necessary skills can take place to complement job losses and new technology job opportunities. Continuous innovation and creative thinking would be required for facing the challenges of the digital business world. For creating a thriving presence in the increasingly digitalized globe, India needs to be a digital market maker. To unlock the potential of internet in the Indian economy, in broader sense, accessibility, awareness and regulatory framework for internet have to be improved. This throws a challenge to the policy makers for designing sector digitization plans, building capabilities and enablers, and jump-start and monitoring ecosystem.

2. Social – Any progress in society should bring with it sustainable development to the population. Economic barometers could take the form of GDP, National Income etc., but the human development index, societal value creation form the basis of determining successful transformations of masses to higher levels of sustainable socio economic development. At a social level, we are looking at the following aspects –

- (i) Access to basic services – Health, education, sanitation, financial services etc
- (ii) Improvement in quality of life
- (iii) Innovation

The world economic forum and its global

competitiveness report talks about human centric economic progress that has become the need of the current decade. The goal of this human centric progress is sustainable and equitable welfare of a country's population. Economic growth is a precursor to human development and well being. Digitization is one gigantic step in the movement towards socio economic growth as the global competitiveness report suggests for policymakers across the world, sustainable growth is possible only need reforms that build up human and physical capital and which leverages new technologies, this program is leveraging digital technology to penetrate accessibility across every person and using this path to create extreme innovation capabilities in the emerging markets by developing countries. Be is initiatives that focus primarily on providing basic education, providing higher levels skills and re skilling needs to match emerging employment needs, using digital modes to create overall human wellbeing, encouraging, private partnership to fulfil needs of basic sanitation, healthcare, education etc. The digital communication technologies have enabled widespread acceptance of sanitation and healthcare needs and benefits in India. Government and corporate bodies have used media and communication provided and spread awareness and usage of these basic facilities. Total factor Productivity has shown a declining trend in both developing and emerging economies probably due to the infusion of today's technologies which do not have the same productivity enhancing potential as past inventions, additionally, the rise in the number of services available to consumers which are not priced at the value they create to the consumer, hence making it difficult to measure their productivity in the traditional GDP measurement methods.

The pace at which technological changes are taking place has been creating unprecedented opportunities and challenges and these amplified by the convergence of digital, physical, and biological technologies. The world economic forum terms this as the characteristics' of the emerging 'Fourth Industrial Revolution' [10]. These emerging technologies have immense

potential to be a source of growth, but their truth cannot be underplayed that their evolution is uncertain. Innovation is going to be a key determinant in future success and growth amongst economies. It has been seen that a 10 point increase in digitization leads to a 6 point increase in the country's score on the global Innovation Index – a correlation suggesting that as countries progress in their digitization stages there is more innovation. A key challenge would be in unlocking their potential in a way that benefits society because they can reshape the national and global distributions of income and opportunities immensely and lead to significant structural transformations. Digitization has been that one unifying and multiplying force in the financial sector. Increasing digitization supports better access to basic services as measured by UNDP's HDI which tracks global access to health and education as well as overall living standards. The three steps of Jan Dhan (financial inclusion), Aadhar (universal biometric identification system, mobile penetration and the online goods and services tax have changed the way India is doing business. It is rapidly moving India towards financial access and formalisation of the economy. The big growth ingredient is going to be the better credit delivery. By means of the mechanism of Aadhar, JanDhan and digital revolution of banking business credit delivery will be easier. Especially, the base of the pyramid consumers will benefit largely by participating in this financial inclusion exercise and mobilisation of credit. When everyone has access to basic banking facilities and credit facilities, the dependence on orthodox systems of money market prevalent in the unorganized sector such as borrowing money from money lenders at illogical interest rates is diminished to a large extent. Financial inclusion also brings with it the need for financial literacy. Financial education is "the process by which financial consumers/investors improve their understanding of financial products and concepts and, through information, instruction and/or advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to

know where to go for help, and to take other effective actions to improve their financial well-being." According to the report of Standard & Poor's, over 76% Indian adults lack basic finance literacy and they don't understand the most basic and key financial concepts. Digitalization has revolutionized the way we use banking services and technological advancement and interconnectivity of the various services and digitization of various banking related services there was an urgent need to ramp up the nation's financial literacy also. The 'DigiShala', which is a free to air channel in Doordarshan has been set up, that will help people in the rural and semi urban segments and with low literacy to understand the use of unified payments interface (UPI), USSD, aadhaar-enabled payments system, electronic wallets, debit and credit cards, thereby promoting various modes of digital payments and giving seamless financial literacy to the masses. The problem of the lack of data availability for banks and financial institutions will be a thing of the past. Digital transactions and GST will leave a data footprint which lending institutions can access and use. Flow based lending will increase especially with the small consumer and the small and medium enterprises (SME) sector benefitting. Households will benefit with improved credit access. With increase in consumer lending and credit penetration, households will have a smooth consumption pattern which will thereby boost discretionary spending. GST will be a mechanism to get a formal structure to the taxation issue and do away with dual taxation system, it will also net tax compliance amongst every business class from a small trader in the informal economy to a large corporate leading to increased tax revenues for the economy. The government's implementation of schemes such as Direct Benefit Transfer (DBT), which is a social welfare scheme enabling transfer of subsidy benefits directly to the beneficiary's account apart from saving the exchequer transaction costs, will further boost compliance of citizens at every level for financial inclusion. Overlooking the predicted growth in GDP to reach trillions of dollars, even on a simple per capita basis, the annual incomes are expected to

reach \$ 4,135 by 2027, which translates that India would move to a majority proportion population belonging to a upper middle class income status. A major positive financial move translates to significantly more Foreign Direct Investment (FDI) opportunities especially in the financial and infrastructure sectors.

3. Capital – Both human and technical capital form the backbone of the nations. Be it physical and capital in the form of infrastructure i.e., roads, electricity, digital infrastructure or even intangible capital such as knowledge and easy access to information, these aspects build a nation's economy. The initiative to lay national optical fibre network in all 2.5 lakh gram panchayats, broadband for the rural and broad banding for all urban will mandate communication infrastructure in the whole of the country. The government has completed the task of providing nationwide information infrastructure. The second important step of providing easy mobile connectivity has also been in progress and all villages are covered through mobile connectivity. The aim is to increase network penetration and cover gaps in all villages. Over the last decade, the productivity in the construction industry in India had stagnated and gone over budget by 80 per cent, primarily because of the stakeholders reluctance to adapt to digital tools and platforms. With the push by government bodies and the positive influence of manufacturing sector has reduced costs and improved productivities by pursuing digital solutions, the construction sector has also started adopting digital tools and platforms. Advanced analytics, automation, robotics, 5-D building information modelling (BIM) and online document- management and data collection systems are in wide use today. This has enabled higher productivities, reduction in costs and on time completion of projects rarely going over budget. This cost and productivity benefits are too large to ignore and these digital tools are amply available, making it easy to adopt and use. Even government highway infrastructure projects have greatly benefitted by their usage, the short sight in this could be the myriad options available and the failure to identify a portfolio of digital solutions

that address major issues. Construction has been at the forefront of innovation but, they have the leverage of learning from other industries in the course of the last five years. As per the McKinsey Global Institute report, over the last 20 years, the industry has fallen behind in innovation, in an analysis of 22 industries, construction was second to last for overall digitization rates, ranking only above hunting and agriculture. However, several large Engineering & Construction (E&C) companies have begun to digitize in the recent years and they will be leading in innovative digital platforms practices.

5. CONCLUSION:

Many exploratory and quantitative research studies have shown that the impact of digitization on a nation's economic growth is phenomenal. The PWC research covering 150 countries in various stages of development, which divided economies on the basis of their level of digitization showed that the impact can be felt relative to their digitization scores, and countries such as Germany, United states which are high on the score and in the advanced or nature stage of digitization have made significant strides in addressing ICT usability and also developing a talent base to take advantage of available technologies', products, and services while at the same time working on improving the speed and quality of digital services. India can now take advantage of the trail set by the developed countries by learning from their best practices, mature technologies, and markets. This could bring in the much needed acceleration also in the digitization programs. The challenge now lies in taking the movement forward with the same speed, developing appropriate econometric methodologies to determine the impact that mass adoption of digital technologies can have on economies and societies and government effectiveness. India's digital initiatives have already had far reaching impacts on the socio economic lives of people in the base of the pyramid segment and will only increase in the days to come.

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