

# Digitalization: Glitter and Jitter With Reference To India

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## **Abstract:**

*The digitalization has brought change in economy and society by reducing unemployment, improving quality of life, and boosting access to knowledge and other public services. The process of digitalization facilitates to preserve, access, and share an original document to the people worldwide that may only be available earlier to those who visit its physical location. Following this capacity building requirement are explained along with the role of the government and private sectors. Finally importance of execution and monitoring of digital growth has also been discussed. The research paper study the changes taking place in employment, job creation, economy, gross domestic product & per capita income, output productivity, Hospitality due to digitalization. Various examples of food processing industry with online platform are discussed to display change of digitalisation. Various online money processing technique tools are discussed. This is a conceptual research work at last we conclude that we study change of digitalisation on India by comparing various sectors which contribute & Effect Indian economy.*

**Key words:** Digitalization, Economy, Employment, job creation, GDP (Gross Domestic Product).

## **Introduction:**

The waves of adoption and usage of ICTs (Information and Communication Technologies) have revolutionized our world by introducing distinct technology-enabled services in every sphere of

our lives. There are various applications of ICT, Digitalization is one of them. Digitalization is different from digitization. Through digitalization, a company's digitized resources (such as online channels, machines equipped with digital sensors, cloud-based software) are transformed into new sources of revenue and operational gains. **Digitization** is defined as the social transformation triggered by the massive adoption of digital technologies to generate, process, share and transact information. At the most basic level, Digitization is the process of converting analog information into a digital format. Technology is changing the world of work and reshaping every sector in the economy. This paper focuses specifically on the effect of ICT-enabled smart machines, smart devices, and smart techniques which is having a greater change on economy of the nation. Emergence of Digitalization followed by proliferation of e-commerce has profound change on the productivity and socio economic standard of the society. Evolution of technology and associated information and knowledge help establish society's production capacity and standard of living which are decisive to the economic growth of the nation.

Increasing internet penetration, rapid technology adoption and high sale of technical gadgets like smart phones, tablets, etc, have led to an attractive online customer base. Digitalization has brought social transformation in the life of common Indians. The present government has taken up an initiative called "Digital India" for modernization of the society that will connect every corner of the country. However the effect of Digitalization at macro level in Indian economy is yet to be revealed. With the enormous benefits of Digitalization come political challenges for the policymakers to set the stage for seamless Digitalization. Studies reveal that use of internet by Indian SMEs would fetch 32% more revenue and 37% higher employment (FICCI & Nathan Associates Inc, 2013).

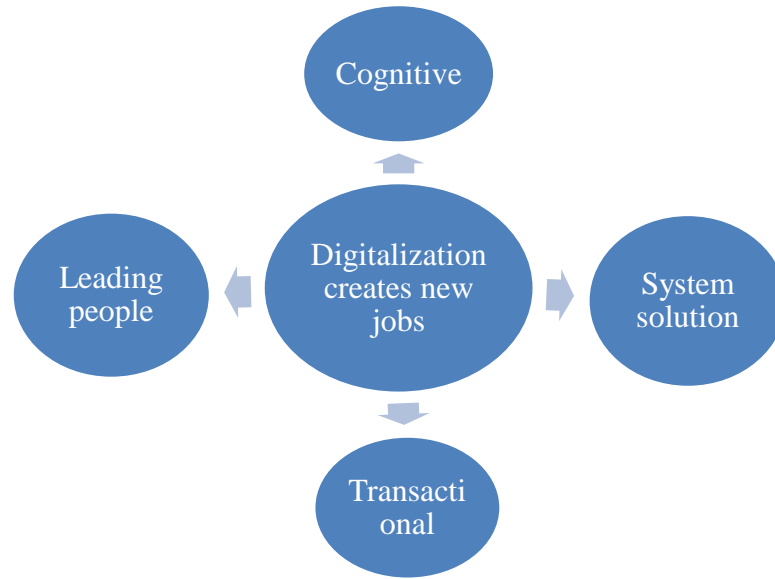
The introduction and advancement in Information and Communication Technology has a greater impact on employment, as it creates more jobs in the IT sector, which may be related to software development, Outsourcing, hardware manufacturing and other IT related businesses. In addition, the impact of these technologies has been realized on other service sectors, like in trade, industry, financial and health care services. Digitalisation has the possibility to create jobs by generating new business models, new products (e.g. the app technology), new machines (3-D printing) and reducing the cost of production. The gains vary per sector, depending on the interaction of the production costs, organisation and potential market reach of each sector.

As per the Economic Survey 2011-2012, Software accounts for 41.7% of the total services exports from India. As per the estimates of NASSCOM, India's IT and BPO sector (excluding hardware) revenues were US\$ 87.6 billion in 2011-12, generating direct employment for nearly 2.8 million persons and indirect employment of around 8.9 million. As a proportion of national GDP, IT and ITeS sector revenues have grown from 1.2 per cent in 1997-8 to an estimated 7.5 per cent in 2011-12. Software exports in 2011-12 were estimated at US\$69 billion compared to US\$59 billion in 2010-11. While exports continue to dominate the IT-ITeS industry and constitute about 78.4 per cent of total industry revenue, the CAGR of the domestic sector has also been high at 12.8 per cent compared to the 14.2 per cent for exports during the Eleventh Five Year Plan period.

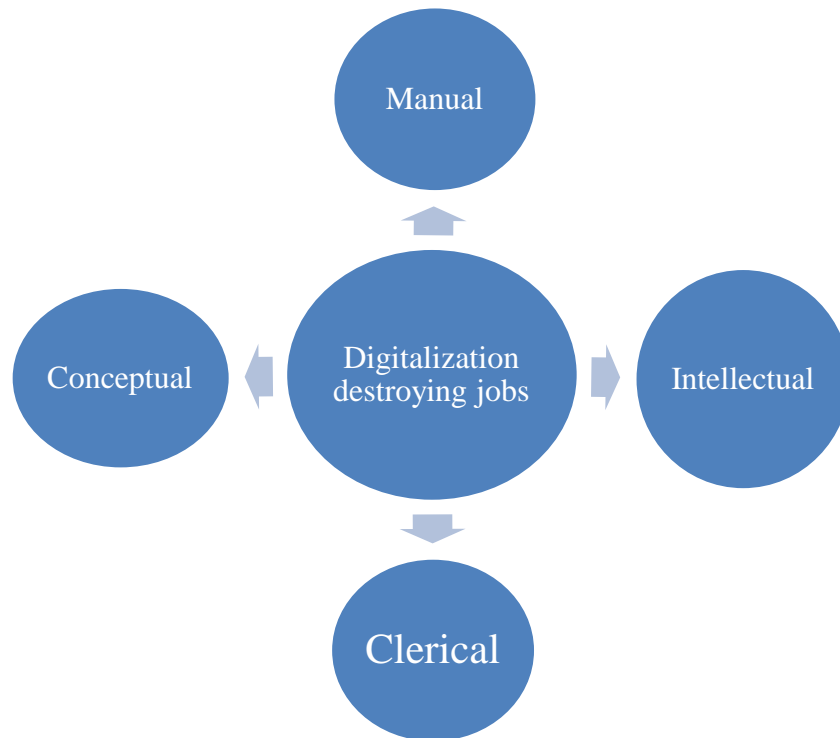
The IT-BPM sector has demonstrated flexibility and as per the Economic Survey is expected to touch an estimated share of 9.5% of GDP and more than 45% in total services export in 2015-16. E-commerce is expected to grow at 21.4% in 2015-16 to reach 17 billion US\$. India home to a new breed of young start ups has clearly evolved to become the third largest base of technology start ups in the world. Within one year the number of start ups has grown by 40% creating 80,000-85,000 jobs in 2015. This emerging sector is set to get up a fillip with the Start-up India programme.

### **Effect of digitalization through different models in different sectors of Job Creation/Employment.**

#### **Job creation/ Employment: -**

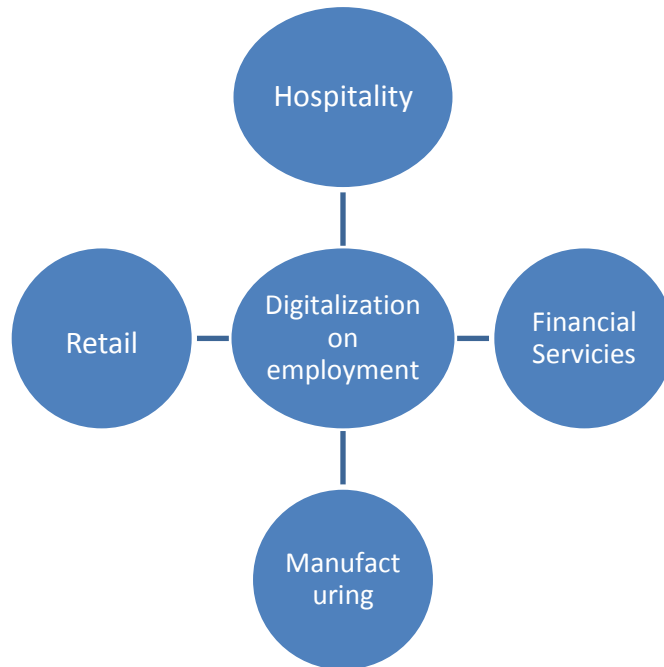


**Job Creator**



**Job Destroyer**

**Employment**



Sector	Industry output (% growth)	Industry productivity (% growth)	Industry employment (implied)	
Financial Services	1.98	2.82	↓	data structures
Manufacturing	1.19	1.79	↓	
Retail	1.34	0.71	↑	
Hospitality	1.52	0.41	↑	

and boundaries are more fluid.

#### Review of Employment/Job Creation

#### Employment

The introduction and advancement in Information and Communication Technology has a greater impact on employment, as it creates more jobs in the IT sector, which may be related to software development, Outsourcing, hardware manufacturing and other IT related businesses. In addition, the impact of these technologies has been realized on other service sectors, like in trade, industry, financial and health care services. **El-Darwiche, Singh & Ganediwalla, (2012)** presented a Booz & Company's econometric that analyzed a reduction in nation's unemployment rate by 0.84 % due to 10% increase in digital activities. By the advancement in digitization related

activities, there an estimated 19 million jobs were added to the global economy from 2009 to 2010. During 2007 to 2008, a more five % increase is seen in estimated 18 million jobs.

In another study of Booz & Company's, it is observed that digitization in 2011, produced a US\$193 billion boost to world economic production and generated 6 million new jobs in 2011. In the same year in the Middle East and North Africa alone, digitization resulted in an extra \$16.5 billion in output and nearly 380,000 new jobs (El-Darwiche & Singh, 2013). This global creation of hundreds of millions of jobs in the last few years has brought a great boom in the society that can highly contribute to the economy of the country. Thus, digitization accelerates economic growth and prosperity of the country by facilitating job opportunities to the peoples.

### **Job creation**

The ICT industry has directly created millions of jobs in the advanced and the emerging economies. In the OECD countries, for example, the ICT sector employment was 5.74 percent of total business sector employment. For the G20 member countries among this, the range was between 4.66 and 6.45 percent. Some emerging economies have also benefited. Brazil's IT industry was responsible for 16 percent of jobs created between 2010 and 2013, and had employed over 1.3 million people by 2014. India's IT-BPO industry has over 3.5 million workers; a third is women. The spillover effects of the industry are also significant. Various studies show that digital jobs generate between two and four times the employment in other sectors of the economy. These jobs also often pay higher-than-average wages and see them grow faster than other sectors. Indicative data from 2004-2005 for a set of G20 countries suggests that on average, computer programmers earn gross wages that are about a third higher than the national averages. As businesses and government begin to integrate technologies even further in their processes and activities, and individuals adopt these technologies across various spheres of their lives, there is expected to be a growing demand for digital workers. Workers who have these (high-level) skills and are able to access these jobs will benefit from the opportunity. However, many countries are facing a shortfall in the

number of qualified professionals even as they might have people who are unemployed. Hence, having more people working in digital jobs will need both the appropriate enabling environment for businesses and individuals to adopt technology, innovate, and grow, and the appropriate workforce development strategies in place. Digital tools The proliferation of cheaper and more capable technology globally has allowed more people to gain access to digital tools that allow

them to connect better to resources and markets including labor markets. Three categories of these digital tools have emerged as important enablers of labor markets.

**Transactional tools-** A range of digital tools enable buyers and sellers of various goods and services to transact their business with greater efficiency and transparency. This includes the mobile telephone, which is well documented as allowing various workers to find information on prices better (e.g. farmers or fisher folk). This also includes electronic payment services, for example, that improves the reliability of financial transactions irrespective of location of the buyer or seller. E-Commerce has also begun to have significant impact. In China, village economies have changed and begun to create jobs outside of agriculture because SMEs could sell other products such as furniture or handicrafts through Taobao, the consumer-to-consumer arm of Alibaba. eBay, an online marketplace originally started in the U.S., now has over 25 million sellers—many of them SMEs—and 155 million buyers, and works in 190 countries. Now, 90 percent of commercial sellers on eBay export to other countries; the share is less than 25 percent among traditional small businesses. And in India, these marketplaces have created thousands of jobs for delivery personnel.

**Complementary tools-** These tools include the various software and hardware that many organizations and workers now use, including business software, factory robots, personal computers, and smart phones. The McKinsey Global Institute finds that “companies that have fully integrated [the Internet] and use it extensively create more than twice as many jobs as the average, while the Internet has a neutral to slightly negative effect on companies using it only sparingly or not at all.” And it is likely that the sophistication of these technologies is set to exponentially grow. Advanced robots or artificial intelligence-based computers are able to do many tasks today that were previously considered impossible to automate. Robots are beginning to complement surgeons and could be used to perform remote surgeries. As 3D printing becomes cheaper and less complex, it is possible it could transform manufacturing, reducing the need for factory workers but increasing jobs for designers and 3D print managers.

#### **How Digitalization Affects Jobs**

However today, flexible manufacturing (the ability to create different models from the same production line) has shifted employment again. Premium manufacturers like BMW are experts at this, producing vastly larger ranges than before and creating new categories of vehicle. This has an impact on jobs in design, procurement, and sales and marketing, and means these areas now

have to become more expert at selling to niche markets. This approach has created new categories of employment and changed the shape of the industry.

So tech-enabled flexible manufacturing transformed car manufacturing, which was once limited by volume and long production runs. At the same time it has shifted the nature of jobs rather than destroying them.

In television, technology has also brought about change rather than destruction. On-demand viewing, in the shape of streaming provider Netflix, made it possible for the makers distributors of US series House of Cards to capitalize on the growing trend for marathon viewing sessions or “binge-watching” of high-quality TV shows. They financed and filmed an entire series, and then released all the episodes simultaneously. These new possibilities of digital distribution unblocked bottlenecks in the industry and cleared a path to new business models.

The pharmaceutical/life sciences sector is also in rapid flux as it seeks new routes to profitability now that the “blockbuster drug” business model has largely expired. Clinical trials – expensive, time-consuming and fraught with risk – are a major bottleneck to the development of new drugs and therapies, especially without the prospect of guaranteed future riches. Technology has the potential to transform this industry too, by mining data like medical records and health insurance data to augment and simplify the trials process and make it more cost-effective

E-commerce provides opportunity for direct and indirect employment on one hand and on other it is also responsible for job losses. ICT related jobs would be boosted as demands for computers and information system managers, computer system analysts, computer engineers, computer support specialists, database administrators, computer scientists and computer programmers would increase. With the growth of digital industries, the demand for digital skills would also increase. Companies would be looking out for coders, web developers, product managers and data scientists who would be steering the business to grow. There would also be requirement of online marketing managers, product developers and user-experience experts also. Digitization of the economy is the future. There is no looking back on that. In order to make the economic growth move through an upward trajectory, it is important for the government, business fraternity, education system and the people to realize that embracing the changing technology would help the country and its people to grow and remain competitive.

**GDP (Gross Domestic Product)**





- Private consumption: Online purchase of goods and services by individuals
- Private Investment: Investment regarding internet related technologies
- Public Expenditure: Internet spending by the government for consumption and investment
- Trade Balance: Exports - Imports of goods, services, internet equipment, B2B & B2C

### **Economy and GDP (Booz & Company)**

Booz & Company's econometric analysis estimates that, despite the unfavorable global economic climate, digitization provided a US\$193 billion boost to world economic output and created 6 million jobs globally in 2011. However, the impact of digitization by country and by sector is uneven. Developed economies enjoy higher economic growth benefits by a factor of almost 25 percent, although they tend to lag behind emerging economies in job creation by a similar margin. The main reason for the differing effects of digitization is the economic structures of developed and emerging economies.

Digitization has the potential to boost productivity, create new jobs, and enhance the quality of life for society at large. For example, if emerging markets could double the Digitization Index score for their poorest citizens over the next 10 years, the result would be a global US\$4.4 trillion gain in nominal GDP, an extra US\$930 billion in the cumulative household income for the poorest, and 64 million new jobs for today's socially and economically most marginal groups. This would enable 580 million people to climb above the poverty line.<sup>9</sup> If policymakers want to capture these rich returns, then they need to go back to the drawing board and figure out

how they can build their digital markets—the markets where the bulk of the world’s information and goods will be bought and sold in the upcoming decade of digitization.

### **The internet’s contribution to GDP**

Although there are three different methods for calculating the contribution a sectors makes to GDP, none take in account the total value contributed by the internet to the overall economy of a country or a society. These are the three common methods:

**Production method** measures the value added by companies producing goods and services.

**Revenue method** measures the gross revenues of institutional sectors, including employee pay.

**Expenditure method** measures the total spending by consumers and government on goods and services.

The contribution a sector makes to GDP is usually measured by calculating production. However to quantify the internet’s contribution in detail using this method following factors have been considered which identifies the proportion of revenue attributable to the internet with the associated margins for all companies in all sectors. This method looks at four factors: private consumption, public expenditure, private investment, and trade balance. The contribution of each of these factors all categories of goods and services enabled by the internet and attributed an underlying portion of this to the internet.

**Private consumption:** this is the total consumption of goods and services by consumers via the internet or needed to obtain the internet access, including electronic equipment, e- commerce broadband turnover of telecoms operators on the retail market, mobile internet market, hardware and software consumption, and smart phone consumption.

**Public expenses:** Public expenditure accounts for 15 percent of total Internet weight in GDP and includes Internet spending for consumption and investment by the government (software, hardware, services, and telecoms) at pro rata of Internet.

**Trade balance.** This is exports of goods, services, and Internet equipment, plus B2C and B2B e-commerce, from which were deducted all associated imports.

### **Internet Supply Leadership Index**

**Importance index,** measuring the country’s overall contribution to the global ecosystem

**Performance index,**

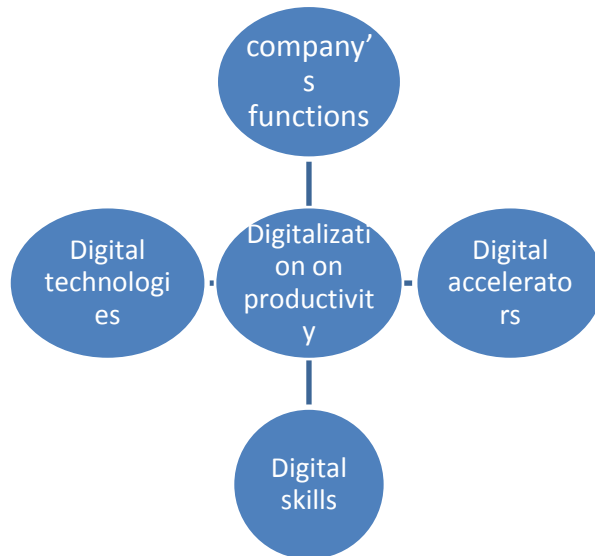
Measuring the profitability of a country in the Internet ecosystem

**Growth index,**

Measuring the growth of the country in the Internet ecosystem

**Preparation for the future,**

Measuring how well a country prepares for the future

**Productivity****Digital skills**

Information communication and technology expertise Use of digital media to facilitate remote working.

**Digital technologies**

Mobile connectivity economic facilities to make use of industrial internet.

**Digital accelerators**

How to set up digital net work prioritize digital investment based on value opportunities compete using an industry specific digital strategy create the right environment for digital transformation

**Productivity factors of digitalization**

To understand the marked differences in impact that digitization has in terms of productivity across emerging and developed economies, we first need to understand how digitization affects the functioning of any enterprise. A typical company's functions can be broken down into four

areas: business, go-to-market, production, and operations. Digitization has a profound and accelerating impact across these strategies.

**Business:** Digitization is fundamentally reshaping business models. It is lowering barriers to entry and expanding market reach for enterprises. For example, it is possible for Skype to provide telephony to more than 500 million user's globally using voice over Internet protocol (VoIP) technology, fundamentally disrupting business models for operators worldwide and forcing many to launch their own VoIP business models in response.

**Go-to-market:** Digitization is changing how companies build brands and products, communicate, and provide services to their customers. Companies are increasingly relying on social media to build brands. More and more, subscribers are forming their purchase opinions online, even for items that they then buy offline. Close to 40 percent of those online actually use the Web to research items that they buy in physical outlets. Digitization is also enabling companies to create products tailored to customers' tastes.

**Production:** Digitization is also changing the way companies manage their production assets. It has enabled companies to move labor-intensive tasks to emerging economies while competing to develop the best design and user interface. For example, Samsung acts as a supplier to Apple for its iPhone products, but both compete aggressively in the consumer market by trying to differentiate themselves in their design and user interface. Digitization is also leading to the emergence of new manufacturing technologies, with the advent of 3-D printing creating a new way to manufacture complex products and leading to the import of jobs back to developed economies.

**Operations:** Finally, digitization has had the greatest impact on the way companies organize and operate to generate competitive advantage. Digitization has created more global entities, seamlessly in touch across continents, and has redefined the concept of office space. One in four American workers regularly telecommutes, a fact that has a profound impact on how companies organize and manage resources. Digitization is also allowing companies to outsource or completely automate a number of their back-end functions, enabling them to become more efficient.

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level in Indian economy is yet to be revealed. With the enormous benefits of digitization come political challenges for the policymakers to set the stage for seamless digitization. Studies reveal that use of internet by Indian SMEs would fetch 32% more revenue and 37% higher employment (FICCI & Nathan Associates Inc, 2013).

Figure 1: Trend in production and growth of the Hardware and Computer Software Sector

Year	Production (Rs. Billion)		Growth electronic hardware computer software	
	Electronic hardware	Computer software	Total	(% increase over previous year)
2003-04	438.0	744.9	1182.9	21.9
2004-05	505.0	1019.2	1524.2	28.9
2005-06	565.6	1337.0	1903.0	24.9
2006-07	660.0	1780.0	2440.0	28.3
2007-08	844.1	2114.1	2958.2	21.2

## Productivity

Interest in the “productivity paradox”, as it has become known, has engendered a significant amount of research. Although researchers analyzed statistics extensively, they found little evidence that information technology significantly increased productivity in the 1970s and 1980s. The results were aptly characterized by Robert Solow’s quip that “you can see the computer age everywhere but in the productivity statistics,” and Bakos and Kemerer’s [1992] summation that, “These studies have fueled a controversial debate, primarily because they have failed to document substantial productivity improvements attributable to information technology investments.” Now, after researchers such as Brynjolfsson and Hitt [1993, 1995], and Lichtenberg [1995] found firm-level evidence that IT investments earned substantial returns, the media pendulum has swung in the opposite direction. Businessweek’s proclamation of “the productivity surge” due to “information technology” and Fortune magazine’s headline heralding the arrival of “technology payoff” represent the latest trend. ICTs affect growth and productivity both directly and indirectly. First, ICT are part of currently produced goods or services (think of computers and Internet) and technological improvement and productivity growth in ICT-

producing sectors have a direct effect on aggregate productivity that is proportional to the size of the ICT sector (see Jorgenson, Ho and Stiroh, 2002 and 2008, Gordon, 2000 and 2012 and van Ark, O'Mahony and Timmer, 2008). But, as they play a substantive role in the generation, storage and transmission of information and in the reduction of market failures related to information asymmetries, ICT are also affecting productivity in sectors that use them. In particular, ICT are enablers of product, process and organizational innovation in ICT-using sectors, and this, according to Bresnahan and Trajtenberg (1995), qualifies them as General Purpose Technologies (GPT):

16 technologies that are pervasive –i.e. Can be applied to several production processes - allow continuous improvements and experimentation and facilitates innovation in using sectors (through co-inventions).

### **Conclusion:**

An influential umbrella project of the government and blessings for the citizens to bring India to a global platform with participation from people and businesses. This initiative will ensure that all government services and information are available anywhere, anytime, on any device that are user friendly and secured. This transformation will make into reality when every citizen of India will participate in this transformative impact. Digital India initiative could help in achieving the objectives of: • Education for all. • Information for all. • Broadband for all. • Leadership structure. • Globally industry participation and many more, Increase in GDP.

Make in India: Boost for the Economy the Digital India vision aims to transform India into a digital economy with participation from citizens, businesses and promises to make India an important investment destination. Sectors like financial, edification, healthcare, automobiles and many more all over the world is ready to contribute in this mega project. New potentials will arise to change this development model. Villages will turn into smart economic centers that connect farmers directly to emarkets to know the price and make them less vulnerable to the whims of weather. During the Prime Minister recent visit to United States and meeting with Sundar Pichai, CEO Google, he has shown interest in providing free public WiFi in hundreds of Indian railroad stations, which are major transit and social hubs for their communities. This rebellion will open affordability of products and services in better ways. We Indians and others, have worked together to shape the knowledge economy. Our contribution to sustainable development of one-sixth of humanity will be a foremost force of noble for our world and our

planet . In this digital age, every civilian has a bright prospect to transform the lives in many ways that were hard to envision just a couple of years ago. With the imminent of “Digital India” campaign, India will have a stout and powerful digital infrastructure. All educational institutions and government services will soon be able to provide I-ways round the clock. Tech giants from all over the world are willing to actively participate in this dream campaign. More employment prospects will open for the youth that will boost the nation’s economy. It also increase our GDP and Productivity , the successful implementation for the brighter and prosperous India and hope India will again called a Golden Sparrow.

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