

# **Digital Divide in India: An Analysis of India's Performance with special reference to Digital India Initiative**

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## **ABSTRACT**

*The rapid spread of advanced digital technology is transforming several socio-economic activities. At the same time this has contributed to widening digital divide leaving the developing countries, especially least developed countries, even further behind. This study tries to examine the India's digital growth in the context of Digital India initiative and as well as the digital divide that exist between India and selected countries of the world using selected variables.*

*Keywords: Digital India, Digital Divide, Information Communication Technology, Digital Adoption Index*

## **INTRODUCTION**

The digital revolution has altered human life and influenced the society with unimaginable speed and magnitude, providing enormous opportunities as well as several challenges. New technologies can make noteworthy achievements in realising the social and economic potential and also contribute to accomplish the various developmental goals. Digital progress can also lead to rising inequality through wealth generation and its concentration in the hands of few. Expanding digital divide between countries can eventually affect the least developed countries the most as digital development is the least in such countries due to the inadequate digital infrastructure and services available. Widening digital divide among countries should be reduced by improving the digital access in areas where the internet access is limited or nil. India being a developing country should make use of its advantage as a global knowledge based global to enhance its capabilities to achieve a faster and more equitable growth.

## **STATEMENT OF THE PROBLEM**

Growth of digitalization across countries happens in an inequitable manner contributing to a digital divide across countries. This digital divide otherwise referred as the gap in access and use of digital infrastructure and services by individuals, businesses etc. remains significantly wide for developing economies. Moreover this gap is significant in the case of certain sections of population like the rural ones who do not have adequate access, affordability and skills to digital technology. The digital disparities between countries and sections of population act as a deterrent factor in harnessing growth and prevents from channelling the benefits accrued from ICTs. Efforts should be taken to reduce the digital divide by providing adequate, affordable digital infrastructure at par with the advanced economies so as to reap the benefits from it. This in turn can boost innovation and economic growth of the developing countries and bring about a more equitable growth.

The purpose of this study is to understand the extent of digital divide which exist among selected countries with special reference to India taking into account certain selected variables and the measures to be taken to tackle this digital divide with in India. This study also aims to look into the Digital India campaign initiated by the Govt. of India to stimulate digitalization through developing the ICT sector.

## **OBJECTIVES OF THE STUDY**

1. To identify the digital divide that exists in India
2. To understand the role of Digital India initiative in the progress of digital technology in India.
3. To identify the level of diffusion of digital technology in India using the Digital Adoption Index

4. To analyse the role of Digital India initiative in reducing the digital divide within the country.

Digital development can act as a catalyst in achieving better growth and development of an economy. Developed countries with higher growth have better digital infrastructure and these countries share of ICT to GDP is much higher than the rest of the countries of the world.

## REVIEW OF LITERATURE

NTIA (1999) define the digital divide as the disparity between those with access to ICTs and without. The digital divide is not restricted to access to the technical infrastructure, but also to the social infrastructure that supports ICT (Rooksby, Weckert & Lucas, 2002). Helbig et al. (2009) explained that there are multiple dimensions like socio-economic status, skills, geography and education which result in the digital divide. In short studies on digital divide had a common viewpoint that the digital divide is not just about access to technology, but rather that it has socio-economic and institutional components.

Spiezia (2013) suggests that increased GDP growth and country-specific global competitiveness can be primarily attributed to growth rates in ICT investment.

Gunasekaran & Harmantzis, (2007) focussed on the diffusion of technology in developing countries and found out that the deployment of wireless services can contribute to advanced digital inclusion due to its characteristics like accessibility, availability and affordability of service and application.

Midha (2016) concluded that digital India is a great plan to develop India for knowledge future but its improper implementation due to inaccessibility and inflexibility to requisite can lead to its failure. But, if properly implemented it can be highly useful to the citizens of our country.

In short, several studies have looked into the aspect of digital divide and identified different aspects of the digital gaps as well as the influence of ICT on economic growth. . But specific studies relating to India was very limited. In this context, the present study has tried to look into the digital divide / digital progress of India in comparison to some selected countries as well as the role of Digital India initiative initiated by the Govt. of India to stimulate digitalization through developing the ICT sector.

## RESEARCH METHODOLOGY

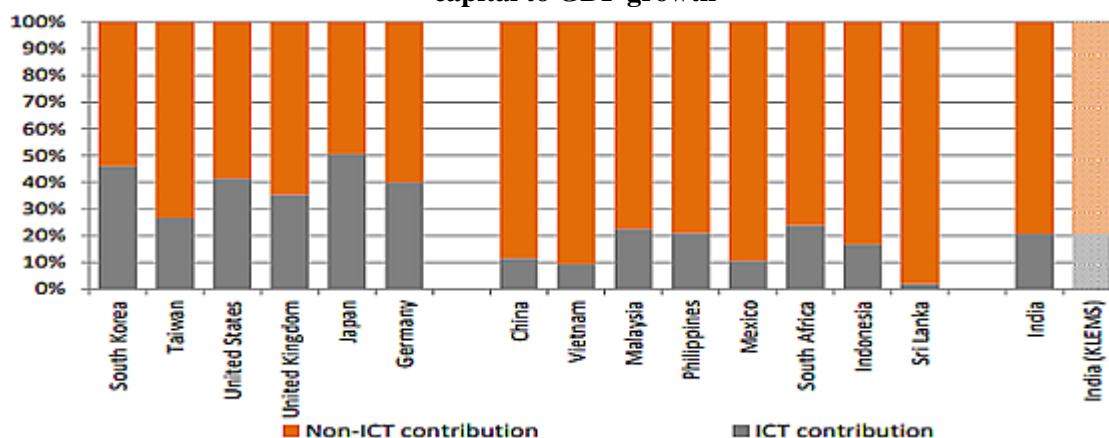
The study uses various secondary data to arrive at the conclusion. Digital Adoption Index, overall internet connectivity speed, percentage method etc. were used to arrive at the conclusion. Digital Adoption Index developed by World Bank is a better method that other existing methods available. Digital divide between urban and rural section has been shown in terms of the change in the number of internet users and internet access and growth in the two areas.

## ICT AND ECONOMIC GROWTH

The role of information and communication technologies (ICT) in enhancing economic growth has been well corroborated in various studies (see Inklaar et al., 2008; Jorgenson and Vu, 2005; van Ark et al, 2003). ICT helps firms improve their productivity and growth, through reducing communication and transaction costs, and improving the quality of capital.

Figure: 1 clearly shows the contribution of ICT and Non-ICT to economic growth (GDP). The ICT contribution to economic growth is much higher in developed countries compared to those of the developing economies, indirectly pointing out at the digital divide that exist between these two groups of countries. This confirms that ICT act as a catalyst in promoting economic growth through improved productivity and reduction in cost.

Figure-1: Contribution of ICT (hardware, software and communication equipment) and non-ICT capital to GDP growth

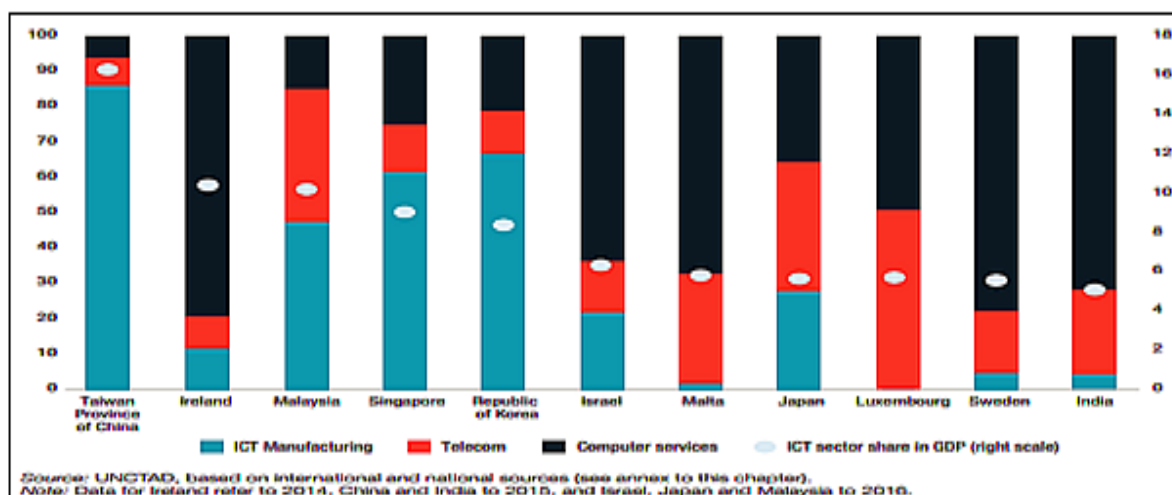


Source: The Conference Board Total Economy Database, May 2016 & Erumban, Das, 2018

**VALUE ADDITION BY ICT TO GDP**

Developed countries with higher GDP have greater availability and access to digital technology which confirms the fact that improvement in digital technology act as a stimulus in bringing about growth in the country. Value addition made by ICT and its subsectors of a country indirectly shows the growth of digital technology and thereby its contribution towards economic progress. (See Figure: 2)

Figure-2: Share of the ICT sector’s value added in GDP and the distribution by subsectors: Top ten economies, 2017



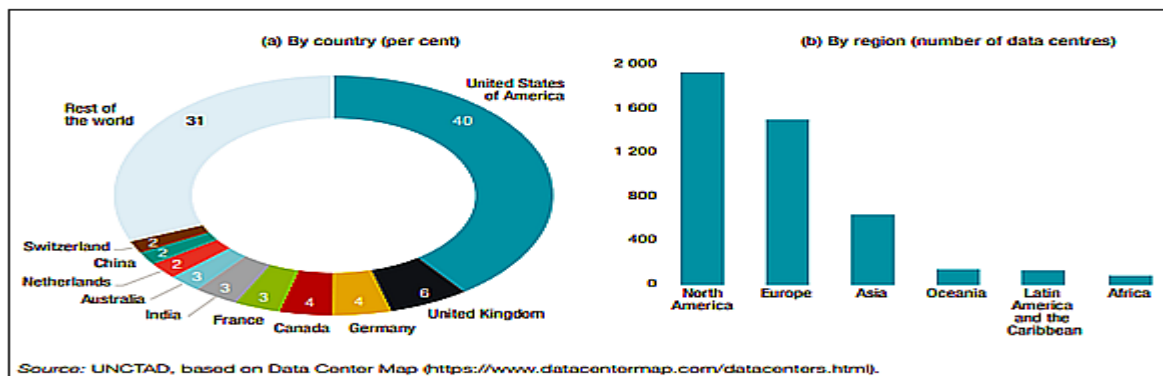
Source: UNCTAD, based on international and national sources (see annex to this chapter). Note: Data for Ireland refer to 2014, China and India to 2015, and Israel, Japan and Malaysia to 2016.

The ICT sector’s value added in GDP and its distribution by subsector shows that with Taiwan Province of China at the top followed by Ireland accounting for 10 per cent of GDP. India ranks tenth accounting for with approximately 5 per cent of ICT contribution to GDP, of which the computer services constitute more than 70 per cent of the ICT sector’s value added.

**DIGITAL INFRASTRUCTURE**

Development of digital economy requires exponential increased in data transmission infrastructures like fibre optic cables and about 99 per cent of total international data transmissions run through these cables (Bischof et al., 2018). The capacity for storage and processing of digital data infrastructure called as colocation data are majorly located in developed countries with the United States accounting for about 40 per cent of the total (Figure: 3). More data centres are being set up in developing countries to keep data closer to the user, reduce latency and lower the costs of broadband use.

Figure-3: Geographical distributions of colocation data centres, February 2019

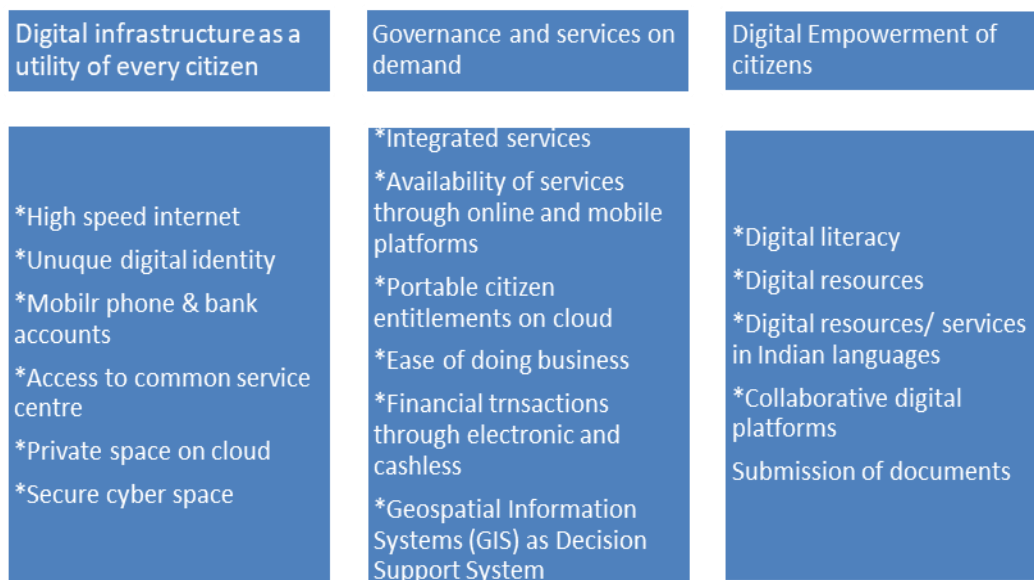


The influence of ICTs on our lives is much different from that on productivity and growth. It helps in social development and transformation through providing access to information, connectivity and new employment opportunities. The Government of India has adopted policy measures to promote ICT sector realizing its significance in the coming years. As a result, among several policy initiatives, the Government of India came up with the Digital India campaign to boost the digitalization process.

**DIGITAL INDIA**

Digital India is an initiative by the Govt. of India to help the country adopt digital initiatives and enable the citizens to get access to various government services electronically. This programme will benefit the Indian citizens by reducing the time taking bureaucratic procedures, accessing public services within a knock of time and reducing corruption. But this will be successful only when the country has adequate, quality online infrastructure and internet connectivity. Access to digital technology, services, knowledge and information can help to empower the citizens. Digital India has got three components- 1) creation of digital infrastructure 2) delivering services digitally and 3) digital literacy (Fig: 4).

Figure-4: Components of Digital India



Source: Ministry of Electronics & Information Technology, Govt. of India

**DIGITAL INFRASTRUCTURE- THE CURRENT SCENARIO**

Digital Economy includes the entire information and communications technologies (ICT) sector as well as the digital-enabling infrastructure needed for a computer network to exist and operate, the digital transactions and services that take place using that system and the content that digital economy users create and access.

Digital infrastructure includes a set of technological and human components, networks, systems and processes that influence the functioning of an information system. (Tilson et. al. 2010). Digital infrastructure mainly consists of a network of connected devices exchanging information with each other. With the advent of the Personal Computer, the number of active internet connected devices swelled into the millions including the smart phones, tablets, fitness bands, watches etc. The rapid growth is being driven by an increased access along with a steep decline in prices of broadband connections.

**DIGITAL SERVICES**

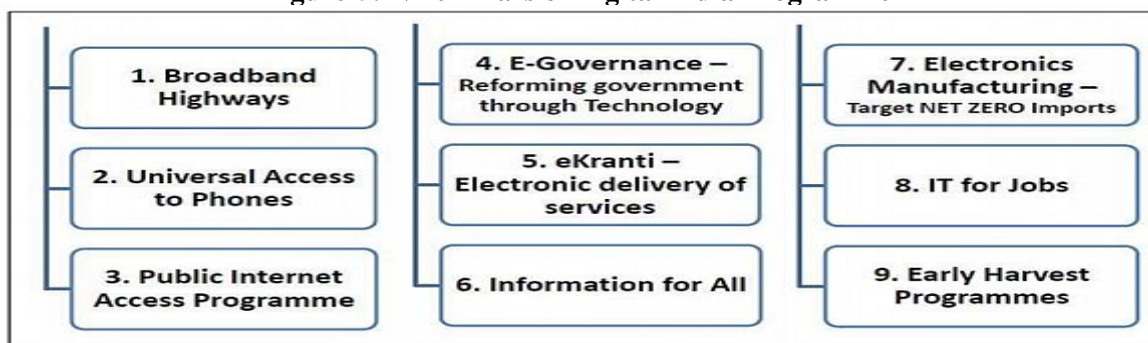
The programme aims to make the various Government services available to people digitally and enjoy the benefits of the newest information and technological innovations. It brings various schemes like, Digi-locker, National Scholarship portal, E-Health, E-Education etc. The program aims to provide equal benefit to the user and the service provider. The consumers will be benefitted by way of saving time and physical energy spent in lengthy government processes. The success of this depends upon proper implementation of these services making it accessible and available to the people easily and enables them to make use of the technology through making them digitally literate.

**DIGITAL EMPOWERMENT THROUGH E-LITERACY**

Digital Literacy is the ability of individuals and countries to understand and use digital technologies for meaningful actions within life situations. Digital illiteracy and inadequate digital access can result in a digital divide between countries and even sections of people widening the economic and developmental gap. Without digital literacy, people will not be able to make use of the digital resources as well as the digital services provided by the Government and other agencies. Those who are digitally literate are more likely to be economically secure.

Government has initiated the programmes like the Digital Saksharata Abhiyan (DISHA) or National Digital Literacy Mission (NDLM) Scheme to impart IT training to people, including Anganwadi, ASHA workers and authorised ration dealers all over India. (Ramaswamy, 2016). Through Digital India initiatives, the government of India aims to provide more Wi-Fi locations, creating job, universal phone connection, high speed internet, digital inclusion, e-services, e-governance, digitally motivated people, e-education and so on. The success of this initiative mainly rests on several factors of which most important among them are availability and access to adequate quality ICT infrastructure as well as e-literacy. The Digital India programme stresses on nine pillars (Fig: 5) to achieve universal digital literacy within India and to fulfil the objective of achieving a digital economy par with developed economies characterised by high end digital infrastructural access and availability.

**Figure-5: Nine Pillars of Digital India Programme**

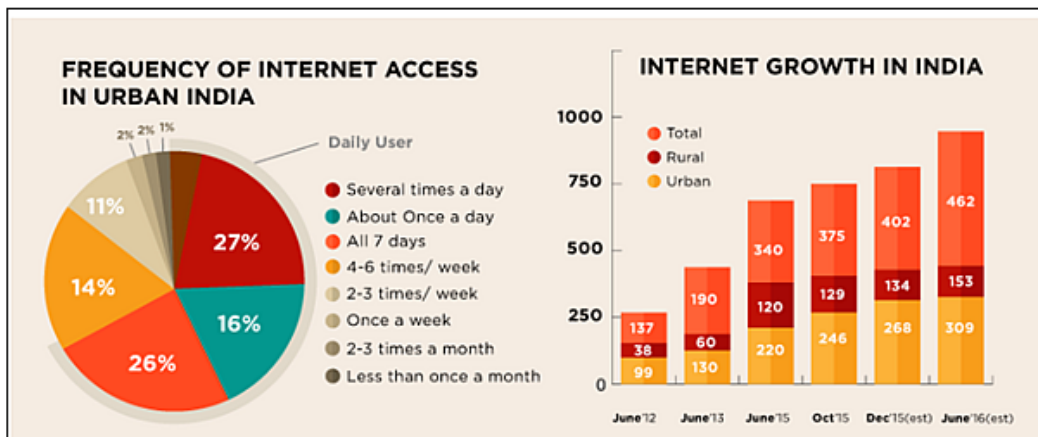


Source: Ministry of Electronics & Information Technology, Govt. of India

Through these pillars, this programme aims to increase the efficiency of the Government and Public sector but also to bring about huge democratisation of the economy. The main aim is to make technology central to enable change. But at the same time developing countries should progress in terms of cost effective digital infrastructure and make it available at reasonable rates to reduce the digital divide and to be at par with the developed economies.

The digital divide can exist within an economy in the form of creating inequality across urban and rural areas. Many of the interior rural areas still doesn't have adequate infrastructure like electricity supply, transport facilities and such areas devoid of internet connectivity is not an exaggerating fact. The rural urban divide in terms of internet access between rural and urban areas shows that India has to still cross hurdles to become a complete digital economy to make successful use of the various digital services provided by the Government of India. Over the years, even though the growth of internet as well as the use of mobile internet users has increased at a very fast rate in both urban and rural areas, still there exists disparity in these two areas. See the Figures: 6 & 7.

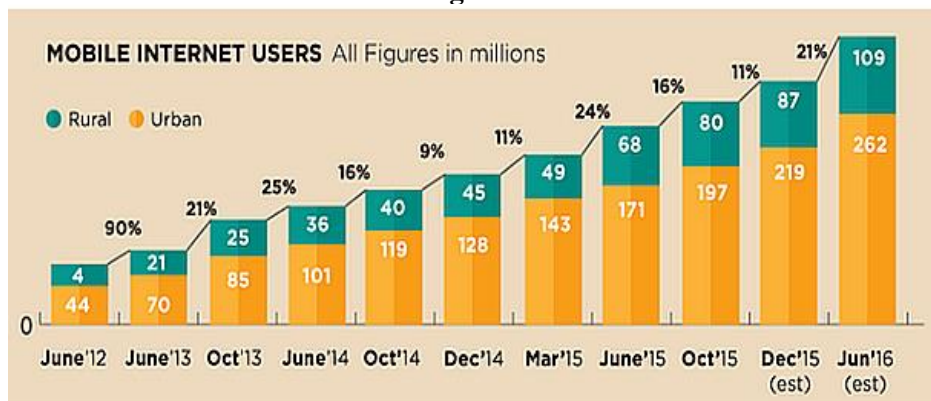
**Figure-6**



Source: Internet in India 2015 by the Internet and Mobile Association of India (IAMAI) and IMRB International

Approximately 43 per cent of the people use internet at least once daily, of which 27 per cent use it several times a day. Only 5 per cent of the people use internet once a week and less. The increase in frequency of internet usage over the years indirectly shows the availability and accessibility of people with respect to digital technology. This can be mainly due to the improvement in terms of the availability of digital infrastructure over the years.

**Figure-7**



Source: Internet in India 2015 by the Internet and Mobile Association of India (IAMAI) and IMRB International

Mobile internet users in urban India are more than double that of rural India as per June 2016. There has been a steep increase in the number of internet users since 2012, continuously both in urban and rural areas. But the gap between rural and urban areas still exists and it is declining at a very slow pace. This can be due to the large digital illiteracy which exist in rural areas, inadequate digital infrastructure as well as the non-availability of cost effective internet facilities.

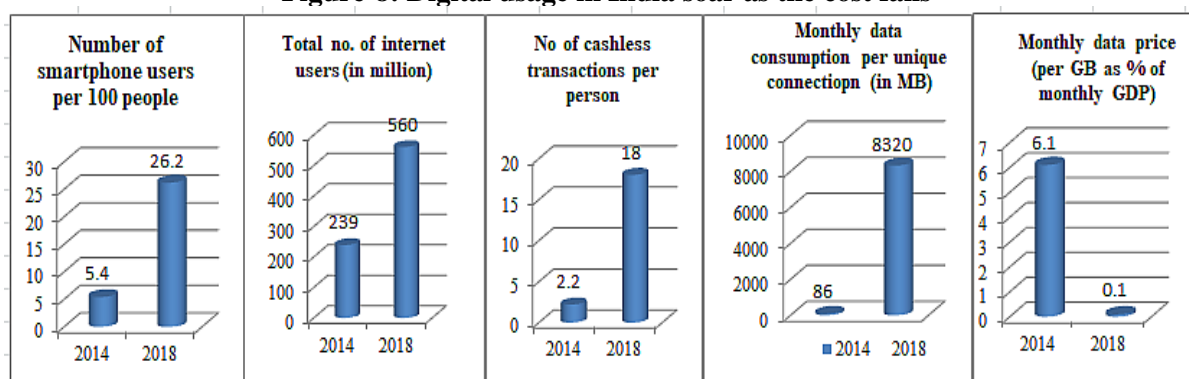
Moreover, the fourth industrial revolution- the digital era is altering the scope and complexity of opportunities and challenges which the country has to overcome. Growth and development should trickle down to all sections of people in an equitable manner so that inequality can be minimised. Digital empowerment should involve not only the elite urban sections but also the underprivileged rural masses.

Government has come up with various digital technology innovations and apps to bring about active participation of its citizens in the country’s governance and use the latest digital techniques in dealing with various issues and connecting with them through line conversations. In spite of the Digital India campaign to speed up the digitalization process across India, success to a large extent depends upon the dissemination of this technology and its adoption rate.

**ANALYSIS AND INTERPRETATION**

There is a close relation between IT adoption and the growth of Broadband Infrastructure. The use of mobile phones is widely spread throughout the country as a result of a supportive environment consisting of a combination of low cost devices, competitive tariff rates and a series of value added services available at affordable prices. Added to this, the policy measures undertaken by the Government to promote the growth and development of digital environment in India have brought about transformational changes within the country at various levels.

**Figure-8: Digital usage in India soar as the cost falls**



Source: Mckinsey Report

Fig: 8 show that the digital users and transactions have increased in India in 2018. One of the major reasons can be the fall in the monthly data price resulting in higher usage of data and its consumption. Further the competitive price of mobile phones and other digital equipment’s has led to increase in the number of users. The extent of spread of digital technology can be understood with the help of the Digital Adoption Index.

**Digital Adoption Index<sup>1</sup>**

The Digital Adoption Index (DAI) is a composite index measuring the degree of spread of digital technologies within and across countries. DAI reflects the extent to which digital technologies are available and adopted by all the key agents in an economy: people, businesses, and governments. Therefore it provides a more comprehensive picture of technology diffusion than the existing set of indices.

**Table-1: Digital Adoption Index of Selected Countries**

Country	Digital Adoption Index		DAI Business		DAI People		DAI Govt.	
	2014	2016	2014	2016	2014	2016	2014	2016
Japan	0.816	0.835	0.731	0.761	0.787	0.835	0.932	0.909
Norway	0.783	0.804	0.865	0.882	0.781	0.811	0.704	0.720
Singapore	0.868	0.871	0.836	0.852	0.805	0.803	0.964	0.957
UK	0.735	0.764	0.881	0.904	0.770	0.799	0.555	0.589

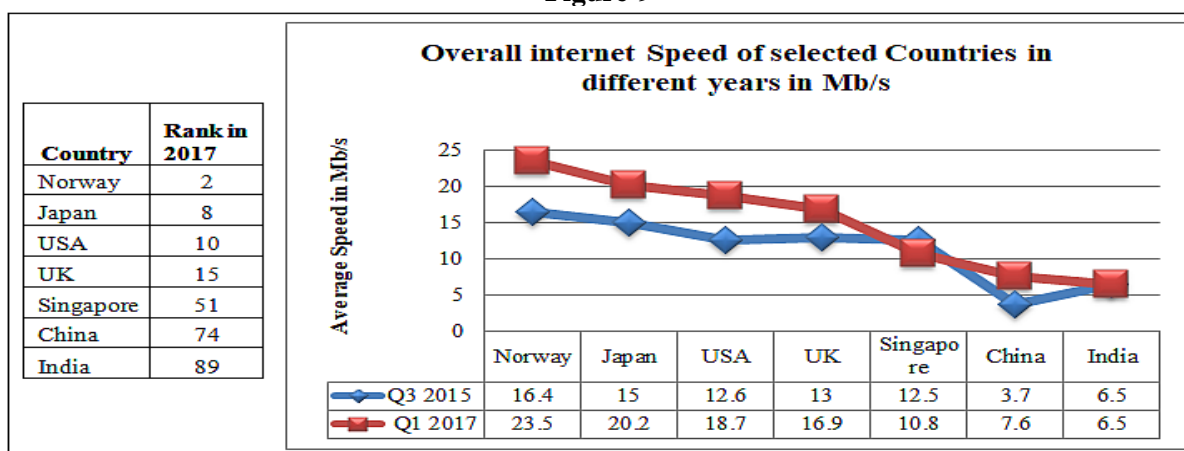
<sup>1</sup> The details of DAI is provided in the 2016 World Development Report, *Digital Dividends*

USA	0.720	0.747	0.760	0.781	0.665	0.731	0.735	0.730
China	0.501	0.586	0.471	0.548	0.400	0.525	0.632	0.686
India	0.442	0.511	0.430	0.501	0.430	0.501	0.737	0.804
Nepal	0.297	0.365	0.315	0.346	0.155	0.249	0.421	0.501

Source: World Bank (2016)

There exist a positive relationship between Digital Adoption index and economic growth. Developed countries have a higher digital adoption rate compared to the developing countries. (Table: 1). This can be due to the two way relationship that exists between economic growth and digital technology. The digital adoption rate also to a large extent depends upon the internet connectivity facilities available for which better digital infrastructural facilities area pre requisite. Figure 9 shows the overall internet speed across selected countries in two quarters of different years.

**Figure-9**



Source: Akamai Technologies

India ranked 89<sup>th</sup> whereas the developed countries like Norway, Japan, USA, UK and Singapore ranked 2, 8, 10, 15 and 51 respectively. China had a rank of 74 in terms of overall average internet speed.

The Government has a significant role to play in contributing to digital development by adopting and implementing relevant policy measures which in turn can harness the overall development of a nation. Providing affordable and reliable internet connectivity is one of the major challenges faced by many of the LDCs, especially in remote rural areas.

The digital progress in terms of internet speed and digital adoption index in the case of India compared to selected countries clearly indicates that developed countries are much ahead compared to the developing ones. The improvement in the Digital Adoption Index of India shows that the various agents within India are keen to accept the new changes and further the efforts on the part of Government has helped in a better diffusion of the digital technology within the country. For instance the Digital India Programme initiative was under taken by the Government of India to make the country digitally competitive.

However, the digital economy has resulted in the creation of several risks in the form of cyber security breaches to facilitate illegal economic activities, challenging the privacy of people etc. The Governments, Scientists, Academicians and Researchers should find ways to solve these problems and to make use of the digital technology in bringing about peace, harmony and sustainable development for all.

Corruption is one of the major problems faced by the developing countries and a parallel economy flourishes side by side to the main economy. A significant reason behind the existence of a parallel economy is the dependency on cash-based businesses which is high in developing countries including India. Digitalization and the use of online transactions can to some extent help to eliminate corruption and can bring more people within the tax net.

## SUGGESTIONS

Governments should focus on providing digital connectivity at low cost and at the same time should make the people especially women digitally literate. Measures should be taken to assimilate ICT skills development and to collaborate with the private sector to create awareness and training regarding the better use of digital platforms.

The digital economy will require a range of novel skills to meet the changing requirements as well as a set of internet safety usage policy measures. More investment in education meant to develop the new technical and digital skills as well as to instil a lifelong access to learning opportunities should be given priority in the process to move towards a digital economy and to be at par with the developed ones.

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