

## INDICATORS AND IMPACTS OF DIGITALIZATION

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### Abstract

Digitalization transforms how individuals interacting personally and socially at a larger scale and also the changes taken place in basic structure and business models of the economy. In this paper, I have tried to analyses how digitalization raised important policy changes; including privacy, security, consumer policy, competition, innovation, jobs and skills, among others. Not addressing the above said issues can lead to major economic inefficiencies, reactionary policies, increasing inequality and worse effect in the form of erosion of social fabric, as well as slower growth. Main indicators of digitalization are digital infrastructure, access to and use of digital technologies and services, innovation in the digital economy, skill needed to participate in the digital economy, trust in the digital economy etc. I have used secondary data available from various sources like relevant journals, research papers and some websites etc. It is recommended that, for digitalization, it is necessary to ensure more access to digital technology and services, to setup supportive digital infrastructure by developing high speed networks and services, financing new and innovative business models resulting from digital technology adoption, develop standards for a digital world, regulatory approaches for the ICT sector that are adopted to a converged environment. Digital security, special skills for digital economy, start ups, consumer rights and legal framework are also very important aspects to be taken care of.

**Keywords:-** skills, infrastructure, ICT, technology

### INTRODUCTION

Digitalization transforms how individuals interact with one another and with society more broadly and changes the structure and business models of the economy. In doing so, digitalization raises important policy challenges; including privacy, security, consumer policy, competition, innovation, jobs and skills, among others. Failure to adequately address these issues could lead to economic inefficiency, reactionary policies, a worsening of inequalities and a further erosion of social fabric, as well as slower growth. Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities. Digitization is a complete process that broadly includes: selection, assessment, prioritization, project management and tracking, preparation of originals for digitization, metadata collection and creation, digitizing, quality management, data collection and management, submission of digital resources to delivery systems and into a repository environment, and assessment and evaluation of the digitization effort.

### OBJECTIVES OF THE PAPER

This research paper is basically focuses on three main aspects;

- 1 To find out the main indicators of Digitalisation prevailing in the economy.
- 2 To analysis the long term and short term impacts of Digitalisation to be seen.

3 To be aware to the challenges of Digitalisation etc.

### **METHODOLOGY OF THE STUDY**

The study focuses on extensive study of Secondary data collected from various books, National and international Journals, publications, News editions, Publications from various websites and News papers which focuses on various aspects of Digitalization.

### **DEFINITION**

Digitization is the creation of digital objects from physical, analogue originals by means of a scanner, camera or other electronic device. It is undertaken as part of a process that includes:

- Selection
- Assessment, including of needs
- Prioritization
- preparation of originals for digitization
- metadata collection and creation
- digitization and creation of data collections
- submission of digital resources to delivery systems and repositories.

This process is accompanied along the way by management, including intellectual property rights management and quality control, and evaluation at the end. These steps are essential to ensure that the digital object remains accessible in the long-term.

### **INDICATORS OF DIGITALIZATION**

The indicators are grouped into five broad categories: digital infrastructure, access to and use of digital technologies, innovation in the digital economy, the skills needed to participate effectively in the digital economy, and metrics around trust.

#### **1 Digital Infrastructure**

Efficient and reliable communication networks and services are the foundation on which the digital economy is based. It is critical that governments promote investment and competition in the provision of high-speed networks and services, ensuring that key enablers are in place (e.g. sufficient spectrum and increasing uptake of IPv6 Internet addresses), as well as encourage investments data itself to realise the full potential of the digital economy. Broadband is an essential digital infrastructure. The demands for faster broadband are increasing due to the use of the Internet in providing a range of communication services, rapidly increasing volumes of Internet video traffic, increasing numbers of smartphone and other mobile devices, the connection of billions of smart objects through the IoT, and access to applications and data stored remotely. Broadband infrastructure needs to keep pace with these growing demands for broadband Internet access. This applies to both terrestrial (e.g. fibre) and wireless or mobile broadband which are closely interrelated as terrestrial networks provide essential “back haul” that link the edges to the main (backbone) network.

#### **2 Access to and use of Digital Technologies and Services**

Individuals and businesses, including SMEs, need reliable and widespread access to digital networks and services to benefit from digital opportunities and boost growth and well-being. This is also important for ensuring that the global digital divide does not grow wider, and would help people in low- and middle-income countries, those in rural areas and other disadvantaged groups, to benefit from the education, employment and health opportunities that are enabled by the Internet.

### 3 Innovation in the Digital Economy

Technologies, smart applications and other innovations in the digital economy can improve services and help address policy challenges in a wide range of areas, including health, agriculture, public governance, tax, transport, education, and the environment, among others. ICTs contribute not just to innovation in products, but also to innovation in processes and organisational arrangements. Digital innovations also facilitate cooperation within and among countries. Investment in ICT goods and services is an important driver of growth in the long-term, with two-thirds of ICT investment devoted to computer software and databases. Since 2004, ICT investment has declined in almost all of the G20 economies for which data are available.

### 4 Skills needed to participate in the Digital Economy

New approaches to education, training, re-skilling, skills use throughout the economy, and adjustment assistance to meet the fast-changing demand for new skills, will be key to maximising the benefits of a digital and inclusive economy and society today and in the future. Basic skills will be important, as will digital and science, technology, engineering and mathematics (STEM) skills and variants such as data analytics, programming and network deployment and maintenance, and softer skills associated with content creation, design, organisational change and entrepreneurial creativity.

### 5 Trust in the Digital Economy

To realise the potential of the digital transformation for growth and well-being, greater co-operation in developing coherent strategies for digital privacy and security, and implementing privacy and security risk management frameworks, are essential, as is the protection of consumers engaged in the digital economy through e-commerce and other activities. Issues around access to data, use and ownership of data, as well as safety, are particularly relevant as the IoT, and with it billions of interconnected devices, becomes a reality. Denial-of-service (DoS) attacks are a well-publicised and relatively common form of cyber-attack. These attacks aim to make machines or network resources unavailable by interrupting or suspending the services of a host connected to the Internet by flooding the host site using multiple machines, often remotely controlled via malware. In general, large firms are more prone to DoS attacks. At the global level and in absolute terms, China, the United States and the Russian Federation lead both in terms of DoS attacks originating from or targeting each geographical area. These measures are highly correlated, suggesting to some extent the domestic nature of many attacks. Exceptions include Canada, Italy, and Spain, which receive many more attacks than they originate.

## **IMPACTS OF DIGITALIZATION ON ECONOMY**

Despite the rapid spread and uptake of digital technologies, adoption and use vary among economies, demographics, industries and by firm size, raising concerns about the inclusiveness of the digital transformation.

As economies vary, barriers to the access and effective use of digital technologies typically include some combination of a lack of high-quality and affordable infrastructure; a lack of trust in digital technologies and activities; a shortage of the skills needed to succeed in the digital economy; a more reactive than proactive approach to the openness of the Internet; services trade barriers; high costs and poor access to

financing for smaller firms; barriers to the reallocation of resources across firms and sectors; and a lack of interoperability of standards.

Key barriers to the deployment of high-speed networks and services include the nature of the infrastructure itself (monopolies, duopolies), which can give rise to high barriers to entry. In addition, geography, administrative barriers, regulatory uncertainty, and high capital expenditure, access to spectrum, and in some countries, a lack of basic infrastructure (e.g. electricity) particularly in rural areas, can be stumbling blocks.

An important area for policy action involves establishing national broadband plans with well-defined targets and reviewing them regularly. These plans should ideally address all of the key barriers to the deployment of high-speed networks and services identified in the chapter, and include measurable targets to address the policy challenges associated with ensuring competition and investment and that the important technical enablers, such as access to Internet exchange points, spectrum, and take-up of IPv6, are in place. Financing hurdles related to digital infrastructure investment include high capital costs, susceptibility to changes in market conditions, low rates of return in rural and remote areas, and a lack of accurate data for making informed investment decisions.

Encouraging investments in and sharing of data – itself an important 21st-century infrastructure – is also needed. Challenges to doing so include issues related to data curation and investment incentives, trust (privacy and digital security risk management), data evaluation, pricing, data ownership and intellectual property rights (IPRs).

Access to finance is also a key challenge for innovative enterprises that are seeking to implement new business models based on digital technologies. There are a number of areas in which the G20 could play a role to help address some of these concerns, including by strengthening infrastructure deployment through public and private financing and improving framework policies to foster financing of digital infrastructures and new business models.

Open, voluntary standards, grounded in bottom-up and market-led approaches, are an important tool especially when dealing with fast developing technologies and shifts in markets. Such standards and related guidelines are needed to maintain current levels of safety, ensure trust based on enhanced levels of digital security and privacy, improve energy and resource efficiency, and address emerging social and organisational challenges brought on by the digital transformation.

The development of standards and standards-based interoperability is critical for the development of Industrie 4.0 and the IoT, including smart cities and smart mobility. The key to success lies in inclusive standards development, built on collaboration and co-operation among the many players that make up the standards ecosystem. G20 leaders could support the adoption of best practices and policies that enable groups/actors, including SMEs, to more effectively work together within the variety of processes used to develop standards.

Advanced governance frameworks □ building upon both existing public- and private-sector-led processes □ and new multi-stakeholder initiatives for the benefit of all, as well as improved or new policy and implementation tools, are necessary to effectively address the complexity of today's interlinked issues in successful Industrie 4.0 development and deployment. The G20 could play a role in creating an architectural framework for Industrie 4.0.

Ensuring a 21st-century approach to the ICT sector may involve removing regulation where it is no longer necessary or extending the scope of regulation to new service providers. It may also entail creating converged regulators and /or adjusting regulatory powers so they can oversee all elements of bundled services and ensure consistent consumer protection.

Promoting competition in the converged communications environment is another important challenge. In mobile network markets, solutions may include blocking mergers between mobile operators that would harm competition, introducing conditions to facilitate market entry of new providers, facilitating consumer switching, and enabling network sharing as an alternative to consolidation. With respect to fixed network markets, one solution may be to facilitate efficient access to passive infrastructure to increase the number of providers able to offer high-speed services.

### **CHALLENGES OF DIGITALIZATION**

The explosive growth of ICT services is presenting policymakers with three key challenges. The first challenge is to establish standard performance indicators to measure the extent to which ICT is being assimilated in societies. During most of the sector's development, ICT stakeholders focused primarily on access, building the networks that today connect much of the planet; they devised metrics accordingly. In a world of near ubiquity in terms of access, policymakers need a new way to look at the ICT sector.

The second challenge concerns the lack of tools to determine the impact that the mass adoption of connected digital technologies and applications is having on societies and economies. With practical, reliable tools to measure the benefits of digitization, governments could potentially be more ambitious in developing and investing in the ICT sector.

The third challenge is for policymakers to adopt new policy tools to accelerate digitization and reap its accompanying benefits. Over the past two decades, policymakers established rules to enhance access to communication services — setting policies that introduce competition and promote infrastructure sharing, for example. Now they need to gain a similar understanding of the ways in which they can encourage adoption and boost the usage of digital applications by consumers, businesses, and public institutions.

Digital technologies are one of the most important sources of growth for national economies. They enable economies to create more jobs, improve people's lives and build better and greener societies. Citizens, enterprises, universities and governments become increasingly connected in the digital world. Digital is changing people's lives: the way they work, shop, socialise, communicate and educate.

It also reshapes traditional industries and transforms the business environment, from fashion to automotive, from transport and logistics to energy distribution. New technological developments speed up and improve the way new innovative products and services are conceived, developed, produced and accessed. They are enabling businesses to faster develop and bring to market innovative products and services that it was impossible to think about before.

Digital technologies help to totally re-shape value chains, sharpen market intelligence, improve efficiency, reduce time-to-market and increase customer satisfaction. In addition, with the aid of technology, SMEs can now go global from day one, reaching overseas markets and talent pools instantly. Not surprisingly, European SMEs grow two to three times faster when they are empowered by digital technologies.

Modern collaboration technologies not only put a much larger and more diverse talent pool within reach of any entrepreneur starting or scaling a business; they allow talented individuals to work together in a seamless, global operation, despite being separated by time zones and geography.

However, the huge potential of digital evolution still remains untapped in Europe. There is a need to stimulate a more innovative and entrepreneurial mind-set and accelerate smarter use of 'digital' technology in various sectors of the European economy.

### **ELEVATING DIGITIZATION ON THE NATIONAL AGENDA**

To reach the advanced stage of digitization and realize the wide-ranging benefits it offers, countries need support from the highest levels of government. National leaders must formulate and commit to a national digitization policy, with oversight at the executive branch level. Governments need to play a leading role in setting the agenda for digitization because many participants are seeking to stake a claim in this fast-growing arena. As a result, without a coherent strategy and oversight, the sector may devolve into a “tragedy of commons” in which too many competitive stakeholders impede progress.

Governments also need to recognize the importance of the ICT sector for overall economic growth and treat it accordingly, rather than focusing on the direct tax revenues it can offer. Many developing countries still struggle to make the transition from viewing the sector as a source of tax revenue to understanding it as an enabler of socioeconomic development. But countries that have made that transition have been rewarded. For example, in recognition of the sector’s role as a vital economic enabler, Qatar has reduced the royalties paid by the telecommunications sector and as a result has incentivized investments, growing the ICT sector’s contribution to Qatar’s GDP by approximately 16 percent for the last five years and doubling Qatar’s share of total ICT activity in the+ Middle East region.

Another essential element of elevating digitization to the national level is to create an effective system that measures, tracks, and demonstrates conclusively the significant impact of every dollar that is invested in it. First, policymakers need to create a detailed national- and sector-level digitization plan, clearly identifying goals, milestones, and corresponding metrics. Second, policymakers need to institutionalize systems to measure and monitor digitization progress against those plans, while creating accountability for the targets defined.

Irrespective of their stage of digitization development, most economies are still in the process of establishing the relevant metrics. Some developed countries have revised and refined their plans; for example, the United States has laid out its National Broadband Plan. Its six goals (ensuring high-speed Internet in 100 million homes, providing leadership in mobile innovation, developing a ubiquitous and robust broadband network, ensuring affordable broadband service, establishing wireless nationwide access for first responders, and enabling a clean energy economy) are intended to bring “the power and promise of broadband to us all.”

## **CONCLUSION**

Digitalization transforms how individuals interacting personally and socially at a larger scale and also the changes taken place in basic structure and business models of the economy. Digitalization raised important policy changes; including privacy, security, consumer policy, competition, innovation, jobs and skills, among others. Not addressing the above said issues can lead to major economic inefficiencies, reactionary policies, increasing inequality and worse effect in the form of erosion of social fabric, as well as slower growth. Main indicators of digitalization are digital infrastructure, access to and use of digital technologies and services, innovation in the digital economy, skill needed to participate in the digital economy, trust in the digital economy etc. The recommendations are, for digitalization, it is necessary to ensure more access to digital technology and services, to setup supportive digital infrastructure by developing high speed networks and services, financing new and innovative business models resulting from digital technology adoption, develop standards for a digital world, regulatory approaches for the ICT sector that are adopted to a converged environment. Digital security, special skills for digital economy, start ups, consumer rights and legal framework are also very important aspects to be taken care of.

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