

Economic effects of digitalization

الآثار الاقتصادية للرقمنة

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Abstract

Among the terms most commonly used today between government officials, academics and the public alike is the "new economy", which refers to the economy that is emerging in the midst of the ongoing IT revolution. The IT revolution points to a sharp decline in costs due to low cost due to converging ICT levels. The Internet is one of the most important technological innovations achieved by capitalism, and has a wide range of influences in different domains and economic worlds. It has been said that this revolution has created a new economy where the old rules of the economy no longer apply. This paper discusses the economic impact of the new economy and its ability to create jobs and achieve development

Keywords ; digitalisation ; information and communication technologies(ICT), digital economy

ملخص:

من بين المصطلحات الأكثر استخدامًا هذه الأيام بين المسؤولين الحكوميين والأكاديميين والجمهور على حد سواء هو "الاقتصاد الجديد"، الذي يشير إلى الاقتصاد الذي بدأ يظهر في خضم ثورة تكنولوجيا المعلومات المستمرة. تشير ثورة تكنولوجيا المعلومات إلى الانخفاض الحاد في التكاليف نتيجة انخفاض التكلفة بسبب تقارب المستويات في تكنولوجيا المعلومات والاتصالات. تعد الإنترنت واحدة من أهم الابتكارات التكنولوجية التي حققتها الرأسمالية، ولها مجموعة واسعة من التأثيرات في

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مختلف النطاقات و العوالم الاقتصادية. لقد قيل إن هذه الثورة خلقت اقتصاداً جديداً لم تعد فيه القواعد القديمة للاقتصاد تنطبق. تناقش هذه الورقة الأثر الاقتصادي للاقتصاد الجديد وقدرته على خلق فرص عمل وتحقيق التنمية.

INTRODUCTION

The past decade has witnessed technological advances that fundamentally changed how our markets and economy are organised, and promise great leaps in productivity and economic growth.

Digitalization is now an irreversible fact that has changed the world as we know it and affects all aspects of our lives: economic, cultural, social and political. It is only now we are starting to see the extent of its impact, which has not been entirely without controversy.

Established technologies such as the internet and smartphones, as well as emerging technologies such as cloud computing and social media continuously push the frontiers of our 'old economy', redefining businesses, jobs and the way we interact with our economy. The global diffusion of digital technologies as general use tools has also spurred arguments that it may increase knowledge diffusion through improved communication efficiency, improve consumer engagement, and allow countries to leapfrog traditional methods of increasing productivity.

Foundation skills, digital literacies as well as social and emotional skills are crucial to enable effective use of digital technologies by all individuals in their daily lives.

The digital economy is experiencing high growth, rapid innovation, and broad application to other economic sectors. It is an increasingly important driver of global economic growth and plays a significant role in accelerating economic development, enhancing productivity of existing industries, cultivating new markets and industries, and achieving inclusive, sustainable growth.

To address this goal we have split our research into three main areas:

1. Clarification of concepts and their importance;
2. Analyzing the available tools to do that.
3. Defining their characteristics and their causes.

The research covers the impact of ICTs, the concepts of access and the digital divide and the need to foster digital development

1. Is there any evidence that access to ICTs has had a positive or negative impact on the economy of a country?
2. Is it worth beneficial to foster digital development to accelerate the positive impacts of access to ICTs?

The guiding research question is ‘what are the economic effects of digitalisation?’ Based on this guiding question, it is hoped that this study will answer the following questions:

- What is digitalisation ? What are the characteristics of the digital era ?
- What are the necessary infrastructure needed to apply it?
- What are the characteristics of a digitalized economic activities ?
- How Digitalisation affects the new economy and under what condition it does that?

The objective of the paper is to study the effects digitalisation on economic activities and Whether or not, the digitalisation is important for different countries economies ?

We target to maximize the economic growth through:

- Enlarging the using of new technologies
- Increasing the efficiency of exploiting resources through decreasing the costs.
- Exploit opportunities offered by digital technology.

We are not focused on a particular new technology but we take internet as the most important technology and the innovative way that influences the economic businesses in nowadays to expand access and encourage the efforts to reach that targeted goals.

1. Concepts of digitalization

The term “digital” in this context is used to refer to those activities that involve internet or web-based technologies. This includes digital infrastructure (fibre, wireless etc.), digital platforms (websites, mobile etc.) and digital content (information, entertainment etc.).⁽¹⁾

According to Gartner, Inc., is the process of employing digital technologies and information to transform business operations.

1.1 :digitalization is defined as the economic and social transformation triggered by the massive adoption of digital technologies to generate, process, share and transact information⁽²⁾. Digitalisation should not be confused with **digitisation**, which refers to the process of encoding information into binary digits (i.e. bits) so it can be processed by computers. Digitalisation in contrast refers to the transformation of the economy and society as induced by the use of information and communication technologies (ICTs)⁽³⁾.

1.1.1 Advantages of digitalization

Digitalization reduces costs for setting up a business and finding employment. It also creates opportunities for small companies to innovate and grow faster:

(1) Scotland’s Digital Future Supporting the Transition to a World-leading Digital Economy: Emerging Findings: April 2013 ; p4

(2) Raul Katz, Pantelis Koutroumpis and Fernando Martin Callorda ; Using a digitization index to measure the economic and social impact of digital agendas ; VOL. 16 NO. 1 2014, pp. 32-44, Q Emerald Group Publishing Limited, ISSN 1463-6697,2013

(3) OECD ; Stimulating digital innovation for growth and inclusiveness ;the role of policies for the successful diffusion of ICT ?2016.P7

1. It has a great importance for job creation opportunities by successful start-ups
2. It also impacts traditional companies, which can reduce their marginal cost of production
3. It also enables the creation of markets which are entirely new, even outside the ICT domain
4. Many of these businesses will require people to complement their rational and rules-based digital hardware and software skills with emotional intelligence and social interaction skills
5. Digitisation also improves labour market demand and supply by helping workers to find employment across a much wider variety of job offers on different recruitment platforms
6. Digitisation enables new ways of working
7. facilitate flexible work for both men and women
8. digital transformation leads to higher levels of income, which will be spent on many kinds of products and services, whether digital or not⁽¹⁾. Digitisation creates many well-paid new jobs for ICT specialists, and even more jobs in other fields of the economy

1.2 : The characteristics of the digital Era

The “Digital Era” refers to a time in which there is widespread, ready and easy access to, sharing of, and use of information (knowledge) in electronically accessible digitized form in economic activities.

The “Digital Era” is characterized by the information and communication technology (ICT) revolution and its rapid international diffusion, which has led to:

(1) European Commission : A concept paper on digitisation, employability and inclusiveness ; The role of Europe, may 2017, p4

1. huge declines in the costs of computation and information storage coupled with the huge increases in the speed of computation;
2. huge declines in the cost of communication coupled with the huge increases in both speed and through put volume—greatly enhancing the capacity for accurate analysis and real time response;
3. huge increases in the degree of precision of the information due to digitization but without a corresponding increase in costs.
4. The retrieval and transmission of information is greatly facilitated by the “Internet”
5. The communication, transmission and distribution of information are no longer limited by space and time, and in particular, are not limited by national boundaries.
6. Information can be accessed, analyzed and transmitted in real time and at low marginal cost.
7. Much information has become a public good.
8. Over time, more and better information has become available faster and cheaper and to a vastly greater number of people.

1.3 : Themes of New Economy : The new economy is based on :

Knowledge : The key assets of the organization are intellectual assets and they focus on the knowledge worker.

Virtualization : As information shifts from analog to digital, physical things can become virtual ;changing the metabolism of the economy, the types of institutions and relationships possible, and the nature of economic activity itself.

Molecularization : The new economy is a molecular economy. It replaces mass media, mass production by molecular media production.

Integration/Internetworking : The new economy is a networked economy, integrating molecules into clusters that network with others for the creation of wealth. The new economy has rich interconnections within and between organizations and institutions.

Disintermediation : Middleman functions between producers and consumers are being eliminated through digital networks. Middle businesses, functions, and people need to move up the food chain to Create new value or they face being disintermediated.

Convergence :In the new economy the dominant economic sector is being created by three converging industries computing, communications and content that in turn provide the infrastructure for wealth creation by all sectors.

Innovation : The new economy is an innovation-based economy. It is the key driver of economic activity and business success, Rather than traditional drivers of success such as access to raw materials, production, and cost of labor human imagination becomes the main source of value.

Presumption : In the new economy the gap between consumers and producers blurs.

Immediacy : The new economy is a real-time economy. Commerce becomes electronic as business transactions and communications occur at the speed of light.

Globalization : The new economy is a global economy. As Peter Drucker says, “Knowledge knows no boundaries”. There is no domestic knowledge or no international knowledge. The office is no longer a place; it is a global system. The technology is eliminating the “place” in workplace.

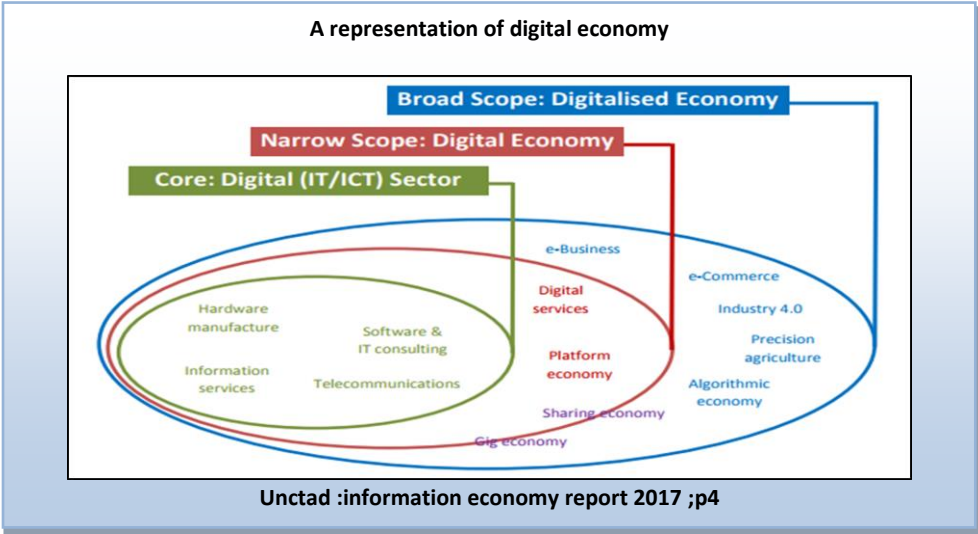
Digitization : The new economy is a digital economy⁽¹⁾.

1.4 The digital economy

(1) Nirmala Krishnan : E-Business in The New Economy ;

Digital economy refers to an economy that is based on digital computing technologies. The digital economy is also sometimes called the Internet Economy, the New Economy, or Web Economy. Increasingly, the "digital economy" is intertwined with the traditional economy making a clear delineation harder⁽¹⁾.

The “digital economy” is a term for all of those economic processes, transactions, interactions and activities that are based on digital technologies. The digital economy is different from the internet economy in that the internet economy is based on internet connectivity, whereas the digital economy is more broadly based on any of the many digital tools used in today's economic world⁽²⁾.



Digital economy deals with many contemporary issues, such as the assessment of the impact of ICTs upon primary economic variables, the investigation of the influence of new technologies on productivity and competitiveness, the measurement of the digital

(1) Wikipedia

(2) Techopedia

divide, the consequences of ICTs on the environment and the perspective of sustainable development⁽¹⁾.

Digital technologies can raise productivity, but the technologies are diverse and they are

Being adopted and diffused at different rates (Cardona, Kretschmer, & Strobel, 2013)⁽²⁾.

1.4.1: The pillars of digital economy

The digital economy refers to an economy that is based on digital technologies both the digital access of goods and services, and the use of digital technology to help businesses.

Generally speaking, you can identify four basic pillars that together create e-economy (Raisinghani, 2004) which are :

1. technical changes (the development of ICT),
2. social changes caused by the popularization of the use of ICT,
3. microeconomic level of changes,
4. macroeconomic level of changes⁽³⁾

The main elements of digital economy are digitisation and high level of ICT usage, conversion of information into market value and new ways of organising the economy, business processes, work and production. Growth of digital economy has an impact on the entire economy⁽⁴⁾

(1) <http://www.iseb.gr/e-m-Business-and-Digital-Economy>

(2) Organisation for Economic Co-operation and Development : Working Paper on Measurement and Analysis of the Digital Economy
Measuring Digital Maturity in Firms ; 2-3 November 2017, OECD Headquarters, Paris.

(3) Miroslaw MOROZ : The level of development of the digital economy in Poland and selected European countries: a comparative analysis, Foundation of management ; Vol. 9 ; 2017, p177

(4) Erik Brynjolfsson and Brian Kahin ; Understanding the Digital Economy Data, Tools, and Research ; The MIT Press, Cambridge, Massachusetts, and London, England : 2000 ; p14

Professor Walter Brenner of the University of St. Gallen in Switzerland states: “The aggressive use of data is transforming business models, facilitating new products and services, creating new processes, generating greater utility, and ushering in a new culture of management⁽¹⁾.”

1.4.2 : Digital infrastructure :

Digital infrastructures, including efficient, reliable and widely accessible broadband communication networks and services, data, software, and hardware, are the foundations on which the digital economy is based. Individuals, businesses and governments need reliable and widespread access to digital networks and services to benefit from digital opportunities⁽²⁾

Digital infrastructure is the basic physical materials and organizational arrangements that support the existence and use of computer networks, which are the foundation of the digital economy. This ; includes:

1. Computer hardware Software Telecommunications equipment and services Connected devices support services
2. Digital tools open up significant new opportunities for small- and medium-sized businesses (SMBs)
3. The use of digital technology enables businesses to increase accessibility, information availability and connectivity with their customers
4. Digital tools help SMBs export and diversify their customer base
5. Digitally-engaged SMBs create more jobs : Small and medium sized businesses (SMBs) are significant contributors to the economy, both in terms of the number of people they employ and their output

(1) http://msue.anr.msu.edu/news/the_evolution_of_the_new_economy;10/03/2018

(2) OECD Digital Economy Outlook 2017, p28

6. Revenue growth is a key benefit of SMB digital engagement : SMBs that move up the digital engagement ladder have better growth prospects, both in terms of experiencing increased revenue growth as well as having higher expectations for future revenue growth.
7. Digital tools drive innovation : Innovation is important to every sector of the economy – it keeps businesses competitive and relevant. The use of digital tools provides significant opportunities for SMBs to drive innovation within their business
8. SMBs with lower digital engagement need to be convinced of the value of digital tools : Adopting digital tools and a broader digital strategy can initially be perceived as costly for SMBs from both a time and money perspectives. The analysis presented in this report shows that digital tools can be effective for all SMBs in improving business performance on metrics such as revenue growth, employment and customer diversification
9. Developing the skills to use digital tools can improve SMB engagement : Digital skills and literacy are becoming increasingly important in today's workforce, with many employers across the economy seeking workers with both business-related and technical ICT capabilities.
10. SMBs should consider how to set up for digital success : Increased digital engagement has highlighted the significant digital dividend to be gained by SMBs that embrace the opportunities offered by digital tools, with respect to growing revenue, creating jobs and diversifying customers⁽¹⁾

Advances in digital technologies are embedded in all sectors of the economy and contribute to:

1. improving productivity

(1) Deloitte Access Economics : connected Small Businesses 2016

2. reaching new markets
3. reducing costs
4. changing business processes
5. creating new business opportunities and new jobs.

Digital technologies can raise productivity, but the technologies are diverse and they are being adopted and diffused at different rates (Cardona, Kretschmer, & Strobel, 2013)⁽¹⁾

1.4.3 : Skills needed for the digital economy

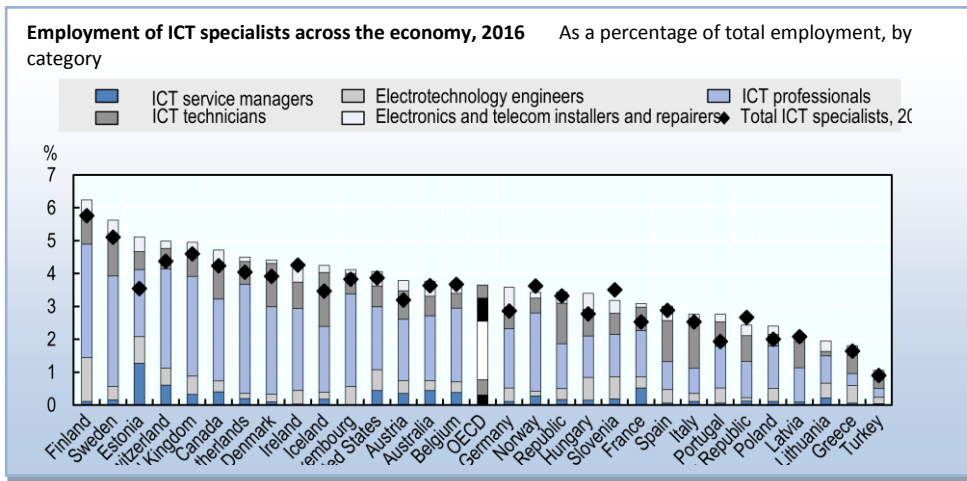
Ensuring that everyone has the right skills for an increasingly digital and globalised world is essential to promote inclusive labour markets and to spur innovation, productivity and growth. Several types of skills are needed :

1. **Innovative and adaptive thinking** : having the ability to think and come up with solutions beyond that which is routine
2. **Virtual Collaboration and social intelligence**: Ability to work virtually across boundaries as the internet becomes more pervasive in all parts of the world. This includes the ability to assemble a virtual team together to work on projects and harnessing the power of technology to develop deep collaborations.
3. **Ability to work across disciplines** : The world now needs systems which means that the ability to work across disciplines become important.
4. **Literacy in different types of media** : The ability to understand various media platforms, and how best to communicate effectively with them are valuable skills

(1) Directorate for science, technology and innovation committee on digital economic policy. Working Party on Measurement and Analysis of the Digital Economy/ Measuring Digital Maturity in Firms/2-3 November 2017, OECD Headquarters, Paris.

5. **Computational Thinking and Analytics** : computational thinking will be a highly demanded skill as big data and analytics become a reality in our everyday lives

Increasing use of digital technologies at work is raising the demand for :



1. Workers needed who acquire generic ICT skills to be able to use such technologies in their daily work.
2. The production of ICT products and services require ICT specialist skills to programme, develop applications and manage networks.
3. The use of ICTs is changing the way work is carried out and raising the demand for ICT-complementary skills.

1.4.4: The pervasiveness of the digital economy

The digital economy is becoming an ever more important part of the global economy.

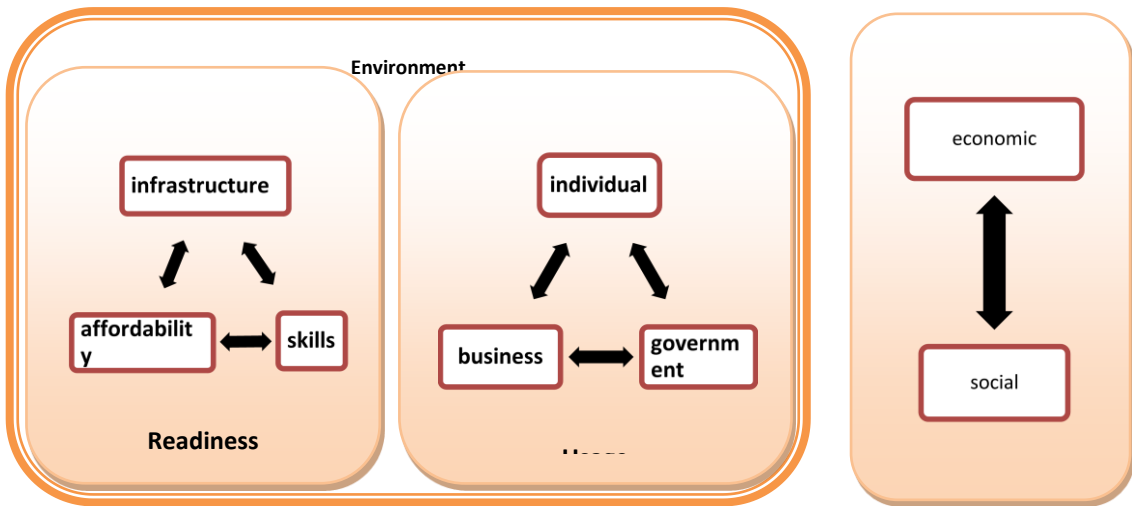
- It is affecting the lives of growing numbers of people.
- It is a growing part of people's economic lives.

- It is pervasive in doing business: business-to-business (B2B) transactions are worth a multiple of business-to-consumer (B2C) transactions.

- It is encompassing an ever greater part of the global economy.

- It is increasingly used by governments to interact with citizens and to deliver services.

The transition to a digital economy is a major policy priority for all countries. They can derive significant economic benefits from digital development. It can make overseas markets more accessible for exports, including by linking domestic companies and small and medium-sized enterprises (SMEs) to global value chains (GVCs)⁽¹⁾.



1.4.5 :Digital economy as a way towards development

Studies by Kaldor (1967) and Kuznets (1966) reveal that the advancement in the manufacturing sector leads to the growth of IT and ITES advancement. Chanda (2002) finds that technological development leads to more demand for manpower. Joshi (2009b)

(1) Unctad : world investment report 2017 ; investment and the digital economy, p156

suggests that due to ICT development many non-tradable services become tradable nowadays.⁽¹⁾

The economy related to the process of digitization is mainly realized through the ways that involves in creation, preservation, dissemination and use of digital information. Digital technologies have dramatically expanded the information base, lowered information costs, and created information goods. This has facilitated searching, sharing of information and contributed to greater organization and collaboration among economic agents. By overcoming information barriers, augmenting and transforming products, digital technologies can make development more inclusive, efficient, and innovative⁽²⁾

Researches show developing economies has more possibilities of gaining advantages of e-commerce than the developed economies as developing economies have wider scope of reducing inefficiencies and increase production⁽³⁾.

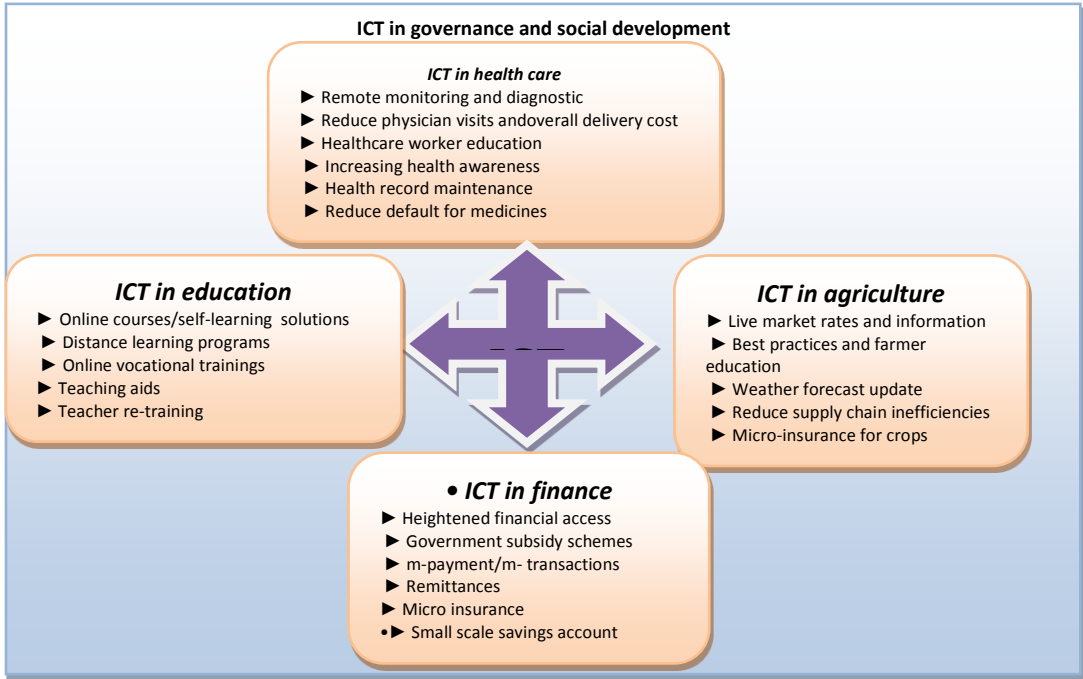
Digitization directly impacts on total trade volume of an economy as it helps in increasing the efficiency of any business. Due to the development of information and communications technology (ICT), the service sector has flourished. During 2014-15 service sector alone contributed to around 52 % of India's total GDP. The market share of Indian services sector in world trade is significantly large and also increasing year on year. In 2014-15, India's service sector amounted to the US \$783 billion with a compound annual growth rate of 9 percent, which is much higher than India's GDP growth rate.

(1) Asian economic and financial review, Digitalisation ; its impact on economic development and trade « with special reference to services and MSME sector in India ;2017 ; Vol 7.N°6,pp541-549

(2) International bank for Reconstruction and Development / The world bank/ World development report 2016,digital dividends ;2016..P8

(3)https://www.researchgate.net/publication/291349502_Role_of_Digitization_and_E-commerce_in_Indian_Economic_Growth_An_Employment_Generation_Perspective [accessed Apr 01 2018].

India's service sector has grown at a compound annual growth rate of 11.7 percent during 2011-12 to 2014-15⁽¹⁾.



2 : Characteristics of digital businesses : The digital economy is characterized by the digitization of

many products and services and by the use of the Internet and other networks to support economic activities.

Firms doing online business have considerable advantages by:

- attracting new customers;
- expanding local business markets at national or even global level;
- the emergence of new business opportunities globally;

(1) Asian economic and financial review, Digitalisation ; its impact on economic development and trade « with special reference to services and MSME sector in India ;2017 ; Vol 7.N°6,pp541-549

- improving customer satisfaction;
- acquiring customer loyalty;
- the better understanding of the behavior of the comparators;
- developing products targeted at the specific categories of clients.

Digital technology in a firm is a source of growth. It brings lower costs by facilitating interactions; and it helps match supply with demand by processing information. This advantage brings another source of efficiency owing to increased economies of scale or higher productivity: the more customers a company has, the more capable it is of offering them a service of better quality at the same price. Digital businesses induce economic environments that are often characterized by :

1. **High levels of connectivity between actors :** Digital technologies serve between different parties leading to a higher connectivity between businesses
2. **Low geographic limitations :** reduce the strength of physical boundaries.
3. **Low switching costs :** Customers can switch businesses at a relatively low cost due to low search costs through accessible and comparable information
4. **Transparency of customer behavior :** More customer interaction, better data collection and analysis tools lead to high information about customers.
5. **High transparency of firms :** Customers and partners have more information on the focal firm since activities can be traced and retrieved more efficiently through digital channels.
6. **Low transaction costs :** Transaction costs are lowered due to reduced coordination costs, low geographic barriers, and high information levels

7. **Opportunities for price discrimination :** Internet enables firms to collect better information about consumer characteristics.
8. **Low menu costs :** which incur when a price is changed. Digital media allow changing prices at almost no cost. Low menu costs make it more cost effective to dynamically change prices online⁽¹⁾

2 : Characteristics of successful ICT use :

MIT professor Erik Brynjolfsson (2005) has pinpointed the seven characteristics of successful ICT use in companies:

1. The IT system should be the core infrastructure of the company.
2. Information processing comprises 70 percent of the work done in major companies.
3. Information will only bring added value to the company if it is used in decisions. It does not have power if the ones who possess and use it have no power to make decisions.
4. Incentive systems must value accomplishments. Employees should be rewarded when they use information and make decisions.
5. The corporate culture must be invested in. Promoting cooperation between employees is as important as technology.
6. The right people must be recruited. The productivity benefit of technology is higher according to how competent its users are.
7. Intellectual capital must be invested in fulfilling these practices requires continuous training within the company⁽²⁾.

3 : Approaches to measuring the Internet economy

A roundtable took place in September 2011 and brought together

(1) Karl Täuscher : Business Models in the Digital Economy: An Empirical Study of Digital Marketplaces ; pp8-11

(2) Matti Pohjola : Digitalization and productivity in the financial sector ; 2014 ; p18

academics, policy makers, researchers and the business concluded that the term Internet economy refers to various types of quantifiable economic impacts of the Internet, and that this concept varies in scope and adopted several general approaches to measure the broad universe of the Internet Economy. These involved measuring the:

1. **Direct impact** : Value added generated by Internet-related activities expressed as a part of GDP.

The BCG (2010) report distinguishes four key elements of the direct economic impact of the Internet:

- ✓ The share of GDP attributed to the Internet, including consumption, investment, government Spending, and net exports.
 - ✓ Consumer and business economic impacts not captured by GDP including e-commerce, Online advertising, and consumer benefits.
 - ✓ Productivity impacts including gains from e-procurement in manufacturing and productivity gains through e-sales in wholesale and retail trade.
 - ✓ Broader social impacts including user-generated content, social networking, fraud and piracy⁽¹⁾.
2. **Dynamic impact** : Net GDP growth generated by all activities related to the Internet activities.
 3. **Indirect impact** : Consumer surplus and welfare gains generated by the Internet activities⁽²⁾.

3.1 : The impact of internet access on economic growth

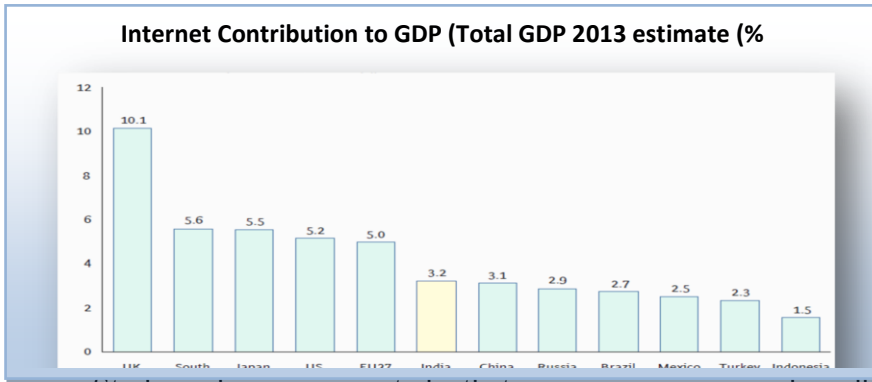
The internet offers unprecedented opportunities for economic growth in developing countries .By providing access to information, connecting people to businesses everywhere, and opening up new markets, the internet can transform the very nature of an economy and support economic development as shown bellow:

(1) OECD : Measuring the Internet Economy; a contibution to the research agenda;2013 ;p20

(2) OECD : opcit;2013 ;p10

Small and medium size enterprises (SMEs) in developing countries are amongst the biggest winners from receiving access to the internet. By reducing transaction costs and the constraints of distance, throughout the world the internet has reduced barriers to market entry and allowed SMEs to innovate and reach a broader market.

Deloitte estimates that the resulting economic activity could generate \$2.2 trillion in additional GDP, a 72% increase in the GDP growth rate, and more than 140 million new jobs⁽¹⁾.



Studies have suggested that an increase in broadband penetration of 10% reduces the unemployment rate by 0.28 percentage points.⁹⁶ Wider digitalisation also creates jobs: a recent paper published by the World Economic Forum⁹⁷ shows that, on average, increasing digitalisation by 10% leads to a reduction of 1.02 percentage points in the unemployment rate.

3.2: The benefits of internet openness

The largest impact has been on transactions that existed before the arrival of the internet but are now quicker, cheaper, or more convenient to carry out. This mechanism operates in two ways.

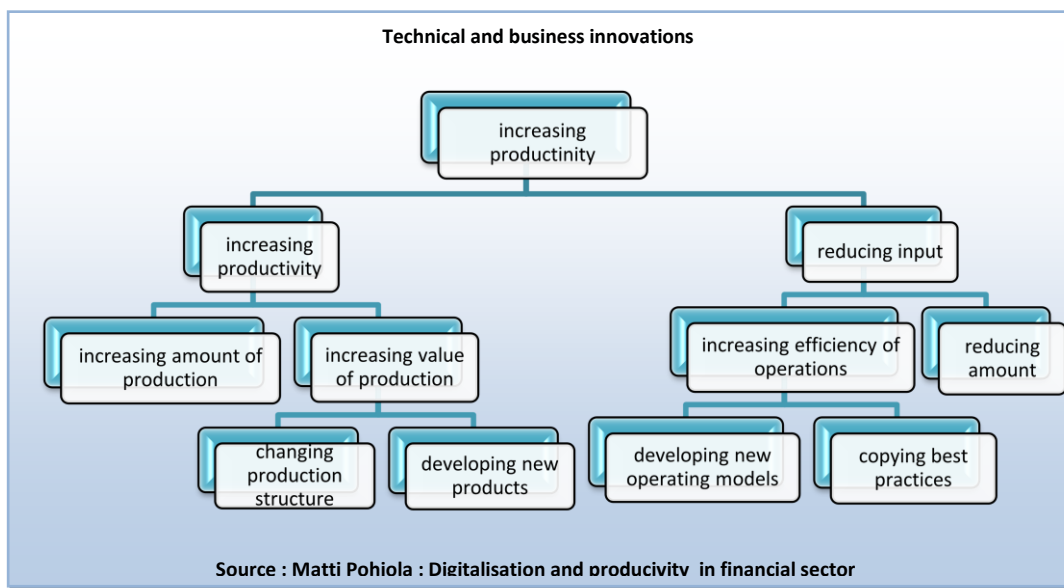
1. the dramatic decline in the price of digital technologies has led businesses and governments to replace existing factors with ICT capital and to automate some of their activities.

(1) Organisation for Economic Co-operation and Development : Measuring digital Maturity in Firms, 2-3 November 2017; p4

2. digital technologies augment the factors not substituted and make them more productive. They help managers to better supervise their workers, politicians to monitor the service providers, and workers to use technology to become more productive⁽¹⁾
3. Advances in digital technologies are embedded in all sectors of the economy and contribute to:

improving productivity ; reaching new markets ; reducing costs ; changing business processes ; creating new business opportunities and new jobs.

Digital technologies can raise productivity, but the technologies are diverse and they are being adopted and diffused at different rates (Cardona, Kretschmer, & Strobel, 2013)⁽²⁾.



4. Expanding trade : The internet enables more products to be

(1) International bank for Reconstruction and Development / The world bank/ World development report 2016, digital dividends ; 2016..P11

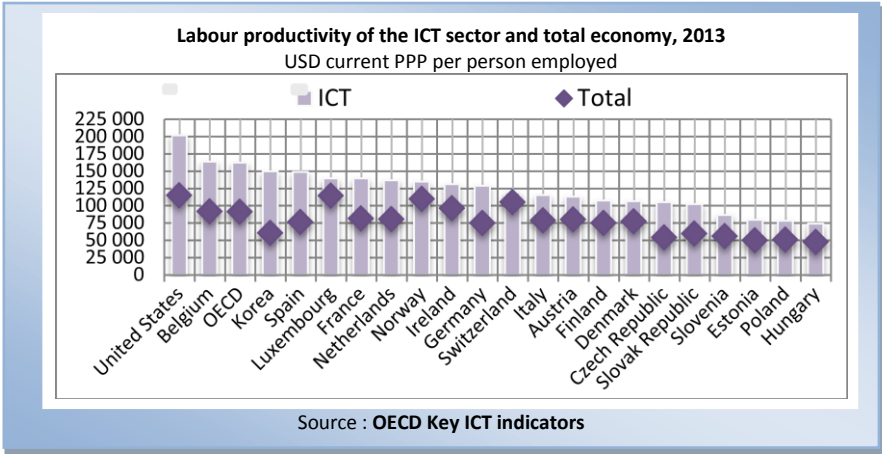
(2) Organisation for Economic Co-operation and Development : Measuring digital Maturity in Firms, 2-3 November 2017, OECD Headquarters, Paris.

exported to more markets, often by newer and younger firms. A 10-percent increase in internet use in the exporting country is found to increase the number of products traded between two countries by 0.4 percent. A similar increase in internet use of a country pair increases the average bilateral trade value per product by 0.6 percent⁽¹⁾

5. Improving capital utilization : Perhaps the greatest contribution to growth comes from the internet's lowering of costs and thus from raising efficiency and labor productivity in practically all economic sectors. Better information helps companies make better use of existing capacity, optimizes inventory and supply chain management, cuts downtime of capital equipment, and reduces risk

6. Increasing labor productivity : Productivity refers to the volume of production generated in relation to the input resources, and is typically calculated separately for each input. Labour productivity refers to the volume of production per labour input. Labour input is measured either

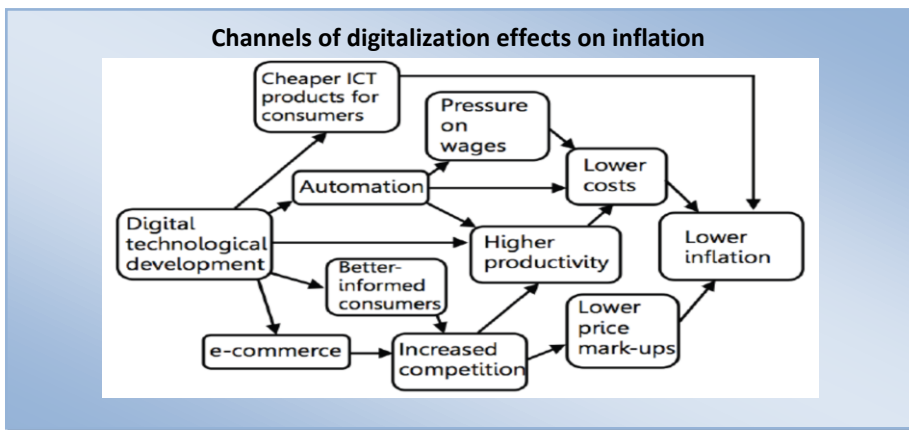
7. according to the number of working hours or employees. Capital productivity is calculated from the volume of production per capital input. Total factor productivity is a weighted average of labour and capital productivities and, consequently, captures the efficiency of all the inputs used⁽²⁾



(1) International Bank for Reconstruction and Development / The World Bank/ World development report ;digital dividends2016..P12 International bank for Reconstruction and development / The world bank/ World development report 2016,digital dividends ;2016..P12

(2) Matti Pohjola : Digitalization and productivity in the financial sector ; 2014 :p12

8. Accelerating growth : Digital technology creates opportunities to accelerate growth. It enables firms that face more competition to reduce their costs to outperform their competitors. The growth impact is largest when firms in traditional sectors use digital technologies to modernize their business
9. Improving public sector capability : The digital technologies can improve management by monitoring the performance of workers. The internet also provides real-time data for better planning and management of service facilities
10. Increasing international technology diffusion : The internet reduces geographic distances, which are the main predictor of international technology diffusion. Technology spillovers provide an indirect channel for digital technologies to boost efficiency and thus firm productivity growth beyond firms' measured ICT capital stocks
11. the Internet conveys mixed effects on inflation mainly via three main channels: the use of electronic commerce, the consequences on productivity and labour, and the direct effect on the prices index.



12. Extend digital finance : We define digital finance as financial services delivered over digital infrastructure—including mobile and internet—with low use of cash and traditional bank branches. Mobile phones, computers, or cards used over point-of-sale (POS)

devices connect individuals and businesses to a digitized national payments infrastructure, enabling seamless transactions across all parties. Digital payments have the potential to improve government finances in emerging economies and improve the effectiveness of government spending by helping to target it more accurately.

Payment cards are not just convenient but also play a crucial role in stimulating economic growth in countries around the world.

12.1 :Digital finance benefits : Our research takes a comprehensive approach to quantifying the potential economic and social benefits of digital finance. Individuals, businesses, financial-services providers, and governments all stand to gain. Collectively, the benefits can significantly boost GDP and job creation⁽¹⁾

Digital financial services contribute to progress towards meeting the UN’s Sustainable Development Goals Adopting digital payments and financial services can help countries achieve their 2030 Sustainable Development Goals.

Digital financial inclusion directly supports ten of the 17 UN Sustainable Development Goals

goal	mpact from digital financial inclusion
No poverty	1. Poor people and small businesses are able to invest in their future 2. More government aid reaches the poor as leakage is reduced
Zero hunger	1. Farmers are better able to invest during planting seasons and smooth consumption between harvests 2. More food aid reaches the poor as leakage is reduced
Good health and well-being	1. increased government health spending as leakage is reduced 2. Financial inclusion for women can increase spending on health care
Quality education	1. Digital payments to teachers reduce leakage and absenteeism 2. Micro tuition payments increase affordability 3. Financial inclusion for women can increase spending on education
Gender equality	1. Digital reduces women’s physical barriers to gaining an account 2. Women have more control over their finances and their businesses
Affordable and clean energy	1. Mobile pay-as-you-go schemes create access to clean energy 2. Better targeted subsidies increase use of renewable energy
Decent work and economic growth	1. Greater pool of savings increases lending capacity 2. Data history of poor and small businesses reduces lending risks

Digital finance can boost GDP through three principal channels⁽¹⁾:

1. digital payments increase productivity of financial and non-financial businesses and governments;
2. broader financial inclusion of people and businesses enables the formal financial system to capture more of the saving in the economy and in turn extend more credit, increasing investment;
3. digital finance saves time for individuals, enabling them to work more hours.

The impact of improved business and government productivity estimated to be from three sources :

1. businesses reap significant time and cost savings from moving to digital payments and reducing the number of manual processes and cash management activities.
2. governments benefit from more efficient operations, lower costs, and reduced leakage in expenditure and tax collection.
3. we estimate the impact of increased human capital in the economy as a result of more effective government spending on education and health care.

Widespread use of digital payments and other digital financial services offers major benefits to individuals, small businesses, governments, and providers of finance in emerging economies. Within the next decade, digital finance could enable 1.6 billion unbanked people to gain access to financial services; of this total, more than half would be women, and 45 percent would be in the bottom two quintiles of the income pyramid. An additional \$2.1 trillion in loans could be made to a wide range of businesses and individuals with digital payment histories.⁽²⁾

(1) McKinsey & Company :op cit 2016 ;p51

(2) McKinsey & Company 2016 ; Digitalfinance for all ; empowering inclusive growth in emerging economies, Sept 2016 ; pp 39 ; 55

Conclusion

The digital revolution is dramatically changing the business environment and the financial services industry is no exception. It creates totally novel opportunities for business activities and even breaks traditional business ecosystems and it is about to be a permanent change in the ways we act.

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.

Technology is fast becoming necessary to all kind of businesses. Even reports state that the demand for employees with enhanced digital skills is on a constant rise.

technology and the digital revolution can disrupt conventional models and bring benefits to the common man in many ways, for instance, by providing a platform that connects buyers and sellers across the globe and updates the status of transactions as they happen online

Recommendations

The fact is that we are not building technology to aid employees or humanity, but we are only trying to maximize our profits and to squeeze more out of everyone

A growing reliance on digital technology will change the way business is done. But, at the same time we have to change how we use IT. we suggest that we should make sure that technology is selected not only for the business's benefit but also for the benefit of people. While technology's benefits cannot be neglected, something has to be done about its negative aspects

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