



SUSTAINABLE GROWTH AND DEVELOPMENT: WHY DO DIGITAL DISRUPTIONS MATTER?

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ABSTRACT

Purpose: In a developing country context, the following are important issues to achieve sustainable growth: innovation, transformation of society, sustainable goods governance (both national and local), etc. The major issue at present is the way changes are taking place, a transition to get rich. Some nations are on the verge of having relative prosperity, but unwarrantedly kept the issue of efficiency at bay in the era of digital revolution. In the era of economic globalisation, the efficiency issue has been certainly put in the back burner. This makes the wealth distribution unequal, and the efficiency issue has been kept out of the growth equation, in the sense that, let us allow the cake (Gross Domestic Product, GDP) to grow more and the share of the cake by the society (distribution of income) would take its course; it can look after itself in its own right. Unfortunately, this has not been found true, so far. This study investigates how and why the digital disruption makes an economy grow unsustainably.

Design/Methodology/Approach: Digital disruption has been investigated with secondary information recently published in a study of the Australian Productivity Commission (APC) of the Australian Government. This approach is relevant for any subsequent study conducted in the area.

Findings and Limitation: The paper identifies the major areas of disruption of digital technology, particularly from demand and supply side points of view of the computer hardware and software elements.

Original Value: The study will make an original contribution towards identifying the issues surrounding the digital disruption debate presently in place in both the developed and developing country context. The case examples of Bangladesh will present a picture of the government's commitment in approaching digital technology with the limited resources available, and collaboration with multilateral and bilateral agencies such as UNDP, USAID, respectively.

Keywords: Sustainable growth and development; digital disruption; Bangladesh; Australian Productivity Commission

INTRODUCTION

It is now universally accepted that sustainability is the game changer for both developing and more developed nations in the 21st century. Recently, a volume was published by the Princeton University Press entitled, *Pursuing Sustainability*, which presents some thought provoking issues on the subject of sustainability and growth.

This volume made it clear that it will help support teaching and research which “deals with sustainability in particular sectors such as energy, food, water, and cities, or in particular regions of the world” (Matson et al., 2016). Among other things, the volume helps “in working collaboratively in governance processes to influence how society takes actions to promote sustainability” (Matson et al., 2016). Two issues have been important in this respect: 1) unlocking the sustainable goods governance process of a nation for growth, and 2) society's actions towards promoting sustainability for growth. In view of the above, the interdisciplinary nature of sustainable development would play a major role in the prosperity or wealth creation of a nation.

In a developing country context, the following are the important issues for the achievement of sustainable growth: innovation, transformation of society, sustainable good governance (both national and local), etc. The major issue at present is the way changes are taking place, a transition to get rich. Some nations are on the verge of having relative prosperity, but unwarrantedly kept the issue of efficiency at bay in the era of digital revolution.

In the era of economic globalisation, the efficiency issue has been certainly put in the back burner. This makes the wealth distribution unequal, and the efficiency issue has been kept out of the growth equation, in the sense that, let us allow the cake (GDP) to grow more, and the share of the cake by the society (distribution of income) would take its course; it can look after itself in its own right. Unfortunately, this has not been found true, so far.

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Having said this, let us return to the subject of sustainable growth and digital disruption. Sustainable growth is important in the transition period of prosperity of a nation. What is transition? It means, leaving the past behind, enjoying a relative prosperity now, and looking forward to a prosperous future (McIntosh, 2013). All nations have been through such a process since the time of the industrial revolution. According to many development experts, China, India and other large nations of Asia and former states of the Soviet Union are in transition now and satisfy this process to prosperity.

All have been looking forward to attaining prosperity in this era of globalisation and digital revolution. One cannot deny the fact that sustainability becomes the major issue for all transition states, including Bangladesh. The most important issue under transition to prosperity is responsible governance, scientific innovations and effective use of these to create wealth within the shortest possible time. In Bangladesh, it is well known that between 1975 and 1990, in both political and economic terms, the nation lost direction; those were the lost years. However, over the last quarter of a century (1991-2016), political governments have ruled the nation except, between 2006 and 2008. There is no doubt that almost quarter of a century of democratic governance brought prosperity in several sectors of this nation, such as food, transport, health and sanitation, education, macroeconomic stability, etc. It is, however, hard to find many economic and political reforms that took place over this period with sustainability, or pursued sustainable growth and a development agenda.

Sustainable Development

In terms of the society's actions towards promoting sustainability and sustainable development, let us first define sustainable development. There are many ways sustainable development can be defined; the most commonly used was from the Report for World Commission on Environment & Development in 1987.

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

This early version of the definition contains two important concepts: first, the concept of needs, which underlines that the world should prioritise the needs of the poor; second, the idea of limitations, which reminds the world that it should use resources available in the environment with technology and social organisation in a responsible manner. As we all know, the United Nations introduced a global programme in January 2016 called *Sustainable Development Goals (SDGs)* to 2030.

Global higher education development in modern times is one of the most important elements of any society, not just to give or transfer knowledge; it is also a core centre for learning for all societies. It progresses the application of scientific knowledge to



new ventures, keeping in mind the costs and benefits to the society and the nation at large. Sciences, social sciences and other relevant disciplines play major roles in the estimation of both social and economic costs and benefits of new innovations and discoveries.

Bangladesh's specialised universities (agriculture, physical sciences and technologies), for example, immediately come to mind. Certainly, in agricultural sciences the achievements over the last three decades have been overwhelming, retaining sustainability in crops and horticultural production. The time is now right to catch up with sciences and technology-based institutions to make a breakthrough in attaining sustainable growth for prosperity.

Indeed, this nation has been making a major drive towards making the nation a middle income nation by the next decade. It is doing this by making the economy driven by digital innovation and revolution. In the next section, Bangladesh's achievement in this area has been analysed in more detail.

Digital Bangladesh

The present government of Bangladesh, with the support of the USAID and UNDP, has been making major steps towards introducing digital services in the day-to-day works of the government machineries. Similarly, the private sector has been taking similar initiatives to bring digital services to the door step of clients, with a view to achieving efficiency and higher productivity in all sectors of the economy, and to achieve the aims and objectives of good governance. The digital Bangladesh programme has been run by the Prime Minister's Office (PMO) with the support of the UNDP, Bangladesh under its technical support programme. With a digital strategy in place, government departments have been brought under the digital network to provide services to the people effectively and efficiently.

INTRODUCTION OF NATIONAL E-SERVICE SYSTEM (NESS)

A central coordinating e-service platform has been established to connect national government departments with their relevant officials located at district, sub-district and union level. This platform monitors all the services sought by clients and given by the respective government bodies in shortest possible time and with maximum effect. The major elements of NESS are e-filing, using e-forms, e-communications, e-service management, managing users' requests through the Internet, directory access service, e-directory, national e-service portal, citizen web account, e-notification and NESS web services. The objective is to gradually bring all the 16,000 government office facilities under the nation's e-services. In these facilities more than 60,000 officers and employees will provide digital services to the citizens. Some major e-service programmes are presented below.



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Union Information and E-service Centre (UIASS)

In order to provide services to local and rural people, the government has begun to establish the UIASS programme to all 4,501 Union Council Offices (the lowest tier of local government). These information centres have been providing services to the people since 2010, covering the major areas for economic and social development. These include agriculture, education, health, public and private commerce, business information, etc. Table 1 presents some statistics in this respect.

District Level E-service Centre

In order to provide services within the shortest possible time, in a cost effective and hassle free manner, on 14 November 2011, the government established district e-service centres. So far, this service has answered more than a million requests, and the issue of certified copies of documents has been increased by more than 40%. Currently, citizens can get services within 2-5 days of application instead of 2/3 weeks in the past; the time for making decisions on applications has been reduced by 80-90% (District e-service centre dashboard, 2012).

Table 1 E-services Statistics in Bangladesh, 2012

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- Out of 4,545 Union Council, 4,516 had been brought under UIASS;
 - Out of 9,032 initiatives, 4,615 were female;
 - Services have been provided to 40 million people;
 - 32 million birth certificates have been provided under this plan;
 - More than 10 billion Taka have been generated as revenue;
 - 1.5 million temporary migrants to Malaysia have been registered from rural areas;
 - There have been 2,773 mobile banking centre established where 56,000 had taken services with a transaction of more than Taka one billion;
 - The Life Insurance Corporation of Bangladesh has issued 599 policies to rural people, with more than Taka four million as premiums;
 - More than 35,000 young students have been provided with computer training;
 - 32,000 patients have been given a telemedicine service, and hundreds of thousands of health camps (temporary) have given health services to 750,000 patients.
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Source: www.a2i@a2i.pmo.gov.bd

Digitised land records

Under the digital recording system, citizens now can withdraw SA/CS/BRS certified copies from District Commissioners' offices. All land records are being brought under digitisation, and 45 million records can soon be brought under this system in 64 districts of the country. This is indeed a revolutionary achievement of the Digital Bangladesh strategy.

Education sector

The achievements have been even greater in the education sector. In order to provide Information Technology (IT) services effectively under a2i programme, there were two models introduced: the Establishment of a Multimedia Classroom (EMC) and Teachers Training on the Creation of Digital Contents (TTCDC). Under the EMC programme, each classroom of primary to secondary schools will be provided with the following services as a package: one laptop, one multimedia projector, and Internet facilities. Under the TTCDC, teachers trained in IT will be engaged in making contents of courses for the subjects at primary and secondary levels. The contents are available under a Blog created for this purpose.

At the last count, 500 secondary and 503 primary classrooms have been given multimedia facilities. By 2017, it is expected that multimedia classrooms would be established in all higher secondary, secondary and primary school and college multimedia classrooms. In addition, more than 12,000 teacher trainers and 6,000 master trainers have been provided with training in making digital content. Under the Teachers Content Blog, so far 13,146 trained teachers contributed 14,279 blog posts and 8,000 contents (www.ictinedubd.ning.com).

In addition the following programmes are in operation: e-book (www.ebook.gov.bd), online publications of results of public exams, online application forms for admissions, and learning and earning facilities established by online outsourcing posts.

Health sector

With the introduction of e-health services covering the whole nation, clients and patients are now able to seek advice from all public health complexes free of cost. For this purpose, a mobile set has been provided to all health complexes at district and sub-district levels of the nation (482 hospitals). There is a link established for all the mobile numbers (http://app.dghs.gov.bd/inst_info/mobile_search.php). In addition, a telemedicine plan has been introduced to provide specialist consultancy for clients in remote places via Skype. So far, Skype connections have been established with 8 remote hospitals and 22 union *parishads*. In addition, mobile numbers are put on the notice board in all hospitals in order to make any complaints about the quality of service, or if any other problems exist.

Other facilities

The following facilities are also in place: National e-information centre, National portal framework, Electronic money transfer, Utility bill e-payment, Registration of joint stock companies online, etc.

Table 2 presents in brief the impact of e-services on the joint stock company registration process in Bangladesh (2014).



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Table 2 E-services in a Nutshell and their Impacts to 2012

Type	Past Performance	Present Performance
Name Registration	Needed 7 days	30 minutes
Registration of Firms	30 days (minimum)	4 hours
Payment of Fees	via standing in line from morning	Bank deposit
Visit SE Office for registration	At least for 6 times	Nil
Transparency	No transparency	Online monitoring
Accountability	None	Accountable

Source: Registrar of Joint Stock Companies

Digital Disruption: Possible Impacts on Sustainable Growth

This part is mainly based on the outcome of a recent study conducted by the Australian Productivity Commission (APC) of the Australian Government located in Canberra, *Digital Disruption: What do governments need to do?* June 2016. It is well known that the world went through four major revolutions in technological development over the last two centuries: the first industrial revolution with the introduction of the steam engine, the second of electrification, the third of information technology (both hard and software development). According to Schwab (2016), the world is now going through a fourth industrial revolution, driven by the continued development of digital technologies.

The APC is of the view that many of the changes associated with these ‘revolutions’ are incremental, adopted over time as capital is replaced, new skills are acquired, and consumer preferences change (Australian Productivity Commission, 2016). According to APC (2016):

“however, some technologies are adopted at a pace or scale that means they are ‘disruptive’ – fundamentally changing the way the economy and society operates, sometimes in a relatively short space of time. This report focuses on the role of government in the face of potentially disruptive technological change. Governments establish the legal and regulatory systems that govern the operation of the economy. They provide key inputs into the economy by educating the labour force and providing public infrastructure and services as mentioned earlier for Bangladesh in the developing country context. They also negotiate (through democratic processes) and maintain (through social expenditure and justice) an underpinning social compact with the community. Disruptive technologies have implications for each of these roles (p. 14)”.

Digital disruption

What exactly the meaning of digital disruption? It is now recognised that the vast majority of modern disruptive technologies are of a digital nature. How? For example, the rapid advances in computing power, connectivity, mobility and data storage capacity; it is not necessarily true that all these developments are smooth in nature and operation in the market and society from both demand and supply side points of view (Christensen, 1997; Christensen and Raynor, 2003; Christensen et al., 2015).

In general terms the APC (2016) found the following very interesting with respect to disruption:

- while the technological development, for instance, in the IT industry often requires substantial upfront investment to develop, they generally allow replication at very low additional cost
- many have 'network' features in that their value to each user increases as they become more widely used
- they add value by enhancing the gathering, processing, storage and transmission of data and provide the delivery of information in digital form
- along with communication technologies, they affect the way individuals interact with each other and with businesses and government, changing how households consume, engage with civil society, and supply their labour.

There are several technologies, known as enabling technologies, that are fundamental to digital disruption because they enable subsequent technological innovation (potentially of further enabling technologies):

- The internet and its supporting infrastructure, such as broadband, software and associated hardware (computers, tablets, smartphones and routers). The internet enables the collection and distribution of information at low marginal cost, which allows people and businesses to be connected at all times.
- Cloud computing – which utilises internet connectivity to provide on-demand computing power and more efficient use of distributed computing infrastructure. Cloud computing can provide the data storage and computing power for the processing and analysis of large-scale, complex and rapidly collected data (known as big data) (Hashem et al., 2015).
- Sensor technologies – which when sufficiently low in cost and high in quality can be used in a wide variety of digital applications. The IoT refers to the networks created through the embedding of sensors and internet connectivity hardware into consumer goods, public infrastructure and production machinery. The IoT enables the collection of data, the automation and improvement of production processes and infrastructure management, and the development of new consumer goods and services (p. 18).

How the digital technologies affect the economy?

There are several ways an economy may be affected both positively and negatively by digital technologies (Figure 1). The major disruptions are:



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- By reducing the costs of information transmission, digital technologies have driven the emergence of products that feature both a good and a service component. For example, Rolls-Royce has moved from selling commercial aeroplane engines to supplying a fixed-term rental service that features monitoring and maintenance facilitated by the transmission of real-time data to Rolls-Royce's service centres (*The Economist*, 2009). Digitally-driven online shopping can substitute for functions provided at higher cost by brick-and-mortar stores. Many products purchased online can now be customised, and detailed order information (such as delivery time estimates and automatic email and SMS updates) is frequently provided.
- The digitally-enabled collection, processing and application of data has created a new and valuable resource – one where almost boundless accumulation is possible and where use by one party does not reduce availability to others (often referred to as non-rivalrous in consumption). Data is collected as a by-product of digitisation, but much of it remains underutilised. For example, less than 1 per cent of the data generated by the 30 000 sensors on an offshore oil rig is used – and this is primarily to find irregularities in production rather than for improving prediction and optimisation decisions (Manyika et al., 2015, 2013). While big investments are required to build a data resource and analytical capacities, the marginal cost of using them to produce new products (information) is generally low. Once the initial investment in collecting and managing data is made, the introduction of new data-based products can be rapid.
- Digital technologies allow for the increasing automation of tasks and the replacement of workers with capital. This trend (and the anxiety it generates within the commu-

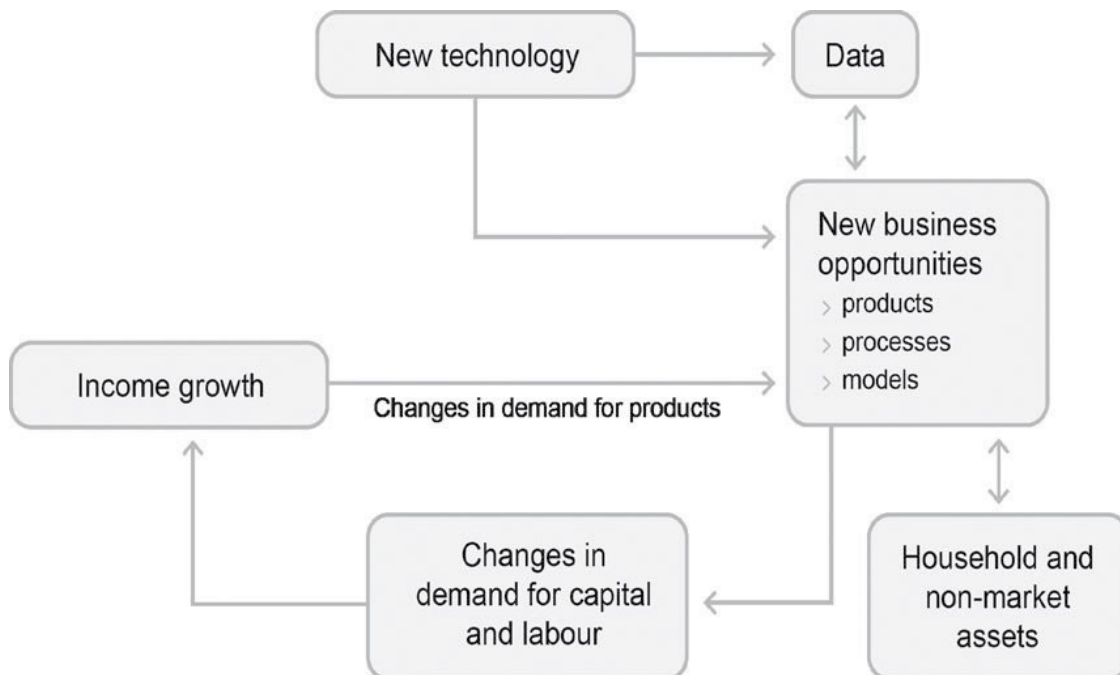


Figure 1 How New Technologies Drive Growth - A Stylised Framework

Source: APC (2016), p. 28

nity) has long been a feature of technological change. For example, 19th century textile workers (the Luddites) smashed labour-saving textile-weaving technologies out of fear that they would leave them without work. Presently, the replacement is of lower-level cognitive tasks, such as administrative tasks, but this could expand to more advanced but routine cognitive tasks (Frey and Osborne, 2013).

- New, digitally-enabled business models are now emerging across many sectors. Digital platforms and improvements in communication technologies are reducing transactions costs and information asymmetries. For example, software businesses have traditionally relied on large and efficient sales and distribution teams to gain market penetration. But Atlassian, a business solutions firm, invests in product development and operates at lower cost by listing all sales-related information online (Macmillan, 2014).
- Digital technologies offer greater scope for the market use of household assets, including labour. Digital intermediaries allow more, as well as a broader variety, of people to engage in paid work, and to use underutilised assets in market activities (p. 19).

Managing the Adverse Impacts of Digital Technologies

The APC (2016) analysed the role of governments in balancing and managing any adverse impacts of disruptive technologies with any foregone social and economic benefits from the delayed or averted adoption of new technologies. This section picks up some broader areas where potential adverse impacts need government attention; these include consumer protection, social concerns arising from new technologies, privacy protection and cyber security. Due to the limitation of space not all are analysed here.

Consumer protection

New technologies can pose new risks, and the task of governments and their regulators is to assess these risks and set regulatory requirements that are proportionate to the risk posed (Figure 2). Consumers may be protected from:

- Deceptive conduct;
- From unsafe and or defective goods and services;
- Providing consumers with remedies when they suffer loss from such conduct or products, and assisting consumers in making better purchasing decisions by providing product information.

Social concerns

New technologies can raise community concerns that go beyond the issues of consumer and community protection. These include:

- questions about the moral or ethical acceptability of products supported by new technologies. Governments' role when it comes to all new technologies is to set the bar based on well-informed community preferences;

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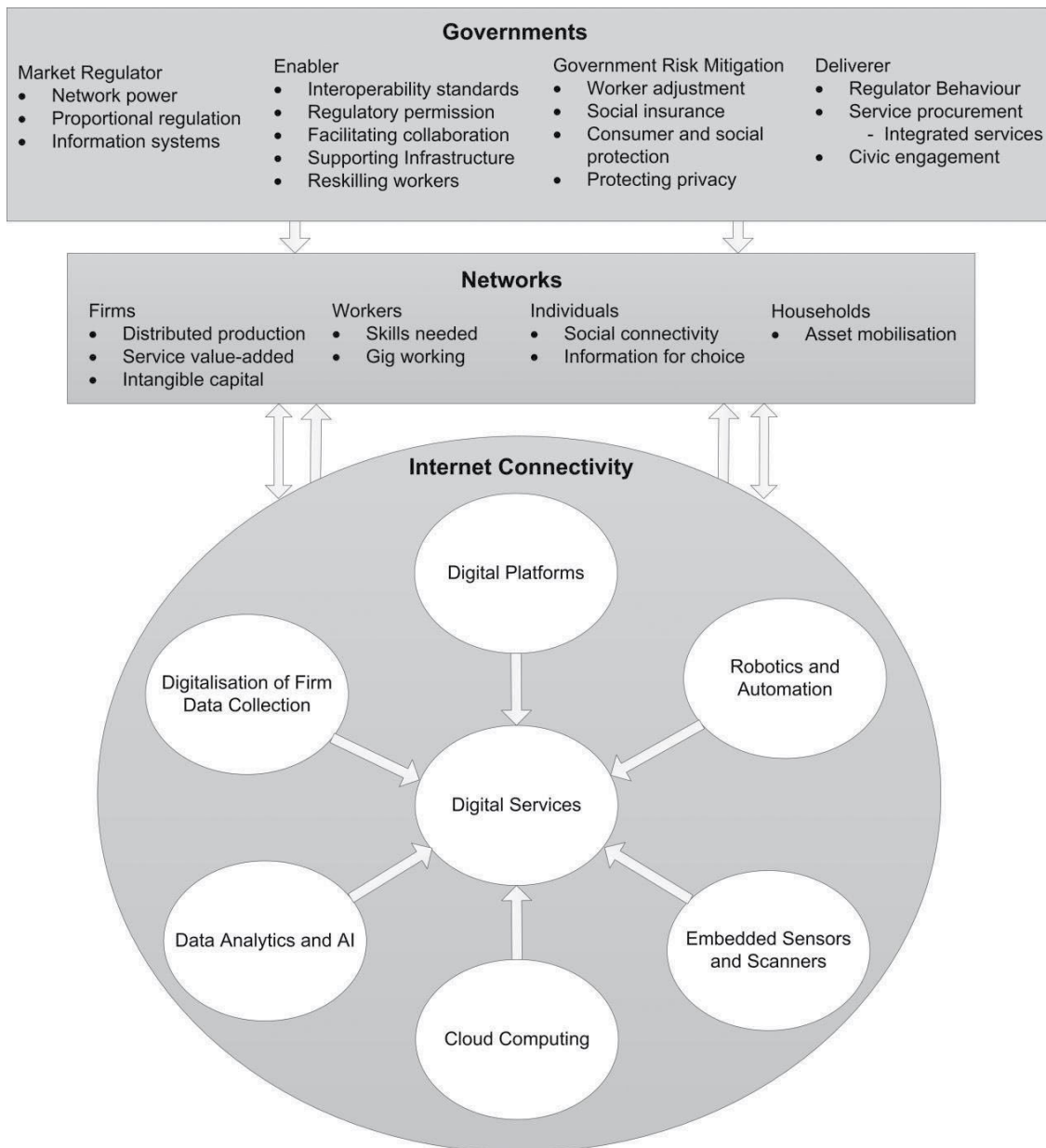


Figure 2 Digital Technologies and the Roles of Governments

Source: APC (2016)

- an ethical dimension also arises with the ability of insurance firms to use digital technologies to much more accurately assess, and hence price, individual risk;
- moral and ethical considerations: regulatory restrictions on activity for moral or ethical considerations are a complex area;
- some restrictions, such as those on human cloning, initially appear straightforward, but can also affect all the (more broadly beneficial) steps towards a technology that would make this possible (such as stem cell research). Some restrictions may be pre-

cautionary in the absence of data on the risk posed by new technologies, but they may also be based on fear, rather than a rational assessment of the potential risks posed.

CONCLUSIONS

In this study, we have demonstrated how digital technologies have made their way to developing countries such as Bangladesh in recent years. The governments of the developing nations have been investing more to catch up with the developed nations to reduce the gap in digital technology, the so called digital divide. It has been found that while the economies of both sides are making progress and attaining prosperity, there are also concerns. While the new technologies drive substantial changes across the economy, this can leave labour and/or capital underutilised for long periods. It has been observed that:

- The current wave of disruptive technologies are mostly digital in nature, enabled by technologies such as the internet, cloud computing and sensors. These technologies affect firms, households and the economy by:
 - reducing transactions costs for information exchange
 - generating and maintaining data as a valuable resource
 - increasing the automation of tasks
 - allowing new business models facilitated by digital platforms, cloud computing and sensor technology
 - bringing household and other assets into the market economy . . . (p. 13)
- By some measures, technologies are developed and adopted more quickly now than in previous eras. In part, this may be because digital technologies often costs little to replicate and have been able to use existing infrastructure.
- Major advances in technology can take some time to deliver higher productivity growth, but the gains were considerable through the 1930s to the 1970s. While computers and communication improvements have boosted productivity growth in the last three decades, further advances in digital technologies have yet to yield measurable productivity gains.

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