CONCEPT OF INFORMATION ECONOMY AND ITS IMPLICATION FOR BANGLADESH

Tanveer Ahmad and Akhtar Jahan

ABSTRACT

Despite much discussion in recent years, there are many understandings of information economy. No dominant analytical framework has emerged on how to participate in this economy. To secure full benefits of the information economy a country needs to formulate appropriate strategies and plans based upon the analysis of currently available information, data and statistics. For a developing country like Bangladesh responding to this challenge requires awareness, time, financial resource allocation and political commitment to codify and execute necessary rules, laws and policies. At the same time Bangladesh must guard against the idea that information economy and information and communication technologies (ICTs) are the panacea to all of country's development problems.

1. INTRODUCTION

The world economy has been driven by a large-scale amalgamation of global markets and a dramatic growth of information and communication technologies (ICT). Two factors are thought to have contributed to this phenomenon. First, the blend of widening global markets and escalated international competition. Second, the delayed impact of a number of technological-innovation that have been developed over several decades. Agriculture and industrial production will continue as long as humans need food, housing, shelter, clothing, mobility etc. But a new world economy has emerged over the last decade as these two broad trends have converged. This new economy differs from the old economy, as information has replaced traditional productivity inputs, such as labour and natural resources, as the primary ingredient for economic growth.

Various catchwords have been used to name this emerging economy: "E-economy", "Internet economy", "virtual economy", "weightless economy", "immaterial economy", "new economy", "knowledge economy", and may be more familiar and appropriate "information economy". Although these terms express different characteristics of this phenomenon, we frequently use them as synonyms.

2. RATIONALE

Developing countries like Bangladesh are facing new challenges in the socio-economic development process as a result of the emergence of information economies worldwide. For Bangladesh, responding to the challenges of information-based economy requires awareness, time, financial resource allocation and political commitment to codify and execute necessary

rules, laws and policies. Most discussions in Bangladesh seem to focus on the application and use of ICT only. This trend of encouraging aggressive use of ICT without an equivalent recognition and development of the information economy sector might lead to trade deficit problem. To secure full benefits of the information economy it is important to balance the relationships between being an effective user and a capable producer. This article is a modest attempt to determine the appropriate nature and strategies of participation in information economy for Bangladesh based upon the analysis of currently available information, data and statistics. From this standpoint the study is considered as rational and useful.

3. OBJECTIVES AND RESEARCH METHODOLOGY

This paper attempts to examine the concept of information economy from different points of view, analyse its relevance for Bangladesh economy, determine the readiness of Bangladesh to take advantage of information economy and recommend measures to transform Bangladesh into an information economy. The study is exploratory in nature. It is mainly based on review of primary and secondary literature including journals, research articles, and books. Relevant literature was also amassed through Internet browsing.

4. LITERATURE REVIEW

Nair and Kuppusamy (2004) in their study of 14 selected countries find that countries that have invested heavily on information technology infrastructure and appropriate human capital development achieved higher level of productivity. Tripathi (2006) elaborates upon the current developments in the information and communication technology sector in India. He finds that a strong ICT infrastructure and right policies are crucial in transforming the country into information economy. Soete (2006) showed, those European Union (EU) member states that have performed best in terms of information investments, have succeed most in generating the public resources for the development of social welfare and capable of addressing rapid global changes of the 21st century. Ye and Ma (2009) argues that development of information-based economy is a requirement for upgrading industrial structure and strengthening international competition. Citing the economic reality of China they opined that a traditional agriculture and industry based country like China cannot leave aside traditional industry to unilaterally develop information economy. But it should combine traditional industry together with information economy, and integrate industrialization with information and knowledge. Mustapha, Yassin, Ishak and Abdullah (2001) emphasized the need to review education systems and human resources development (HRD) policies in Malaysia to prepare a future workforce suitable for the new information economy. Goh (2004) in his study provides evolutionary perspectives of Singapore's industrial policy-making in relation to how it has helped build the nation to its current state of economic development. He argues that industrial policy-making to be effective in transiting to an information economy, must address the pursuit of innovation as a prime mover in economic development.

5. THEORITICAL BACKGROUND

It is not a new idea that information plays an important role in economy. All economies, however simple, are based on information about how to do economic activities. What differentiates the present from the past is that the degree of incorporation of knowledge and information into economic activity is now so great that it is inducing quite profound structural and qualitative changes in the operation of the economy and transforming the basis of competitive advantage.

Machlup (1962) was the first academician to point out the emergence of an information economy, based on his analysis of aggregate economic data. Bell's (1973) notion of the "post-industrial society" was a step further towards the formalization of the idea. Bell identifies three general elements of the "post-industrial society" (which he later termed as "information society"). First, is the change from goods producing to a service economy. The second element is the centrality of the codification of theoretical knowledge as a driving force in society. The third element is the creation of "intellectual technology" as the key tool of production, which analogizes to machine technology of industrial society. What Bell refers to as intellectual technology, are in many way resembles today's information and communication technologies. Marc Porat has the distinction of first pointing out the presence of an information-based economy authoritatively. Borrowing some of Machlup's methodology and some of Bell's philosophy he declared the United States as an information economy in 1976. Porat writes that the economy was traditionally divided into three sectors: agriculture, industry and services. Viewing the revolutionary changes in the economy after Second World War he adds a fourth sector - information -which includes teachers, selected clerical workers, selected professionals (accountants, lawyers) and people who work at information machines (computer and telephone operators). The criterion for inclusion in this fourth sector is whether the information-handling aspect of the job overshadowed the non-information aspects. Porat (1978) classified the nature of U.S workforce from 1860 through 1980 into three stages. In stage I (1860-1906) agriculture dominated the U.S workforce. In stage II (1906-1954) the industrial workforce was pre-eminent, reaching a peak of 40 percent in 1946. This was the period we might call "industrial society". In stage III (1954-present) information workers became the largest sector of the economy. He shows that by 1978 the number of industrial workers had declined to only 25 percent of the U.S labour force, while information workers made up about 47 percent of the workforce. Manuel Castells' magnum opus "The Information Age - Economy, Society and Culture" (Vol. 1, 2 and 3 published in 1996, 1997, 1998 respectively) explores the attributes of contemporary information economy. He summarizes in the opening passages of the third volume: "In the last quarter of this fading century, a technological revolution, centred around information, has transformed the way we think, we live, we die, we make war and we make love. A dynamic, global economy has been constituted around the planet, linking up valuable people and activities from all over the world" (Castelles, 1998:1f).

6. DEFINITION

Despite much discussion in recent years, no dominant analytical framework has emerged on how to define and understand the overall structure of the information economy. Molla (2000:4) views information economy from two angles. "One as a metaphor to describe the

ongoing general economic and social transformation that follows the panoply of (information) technology developments and their innovative and pervasive applications in all sectors of the economy and two as an economic sector that has its own value-adding components and complete structure." Cogburn and Adeya (1999:6) argue that information economy "refers to a new global economic structure, wherein the production of information goods and services dominates wealth and job creation, and is underpinned by the use of information and communication technologies (ICTs) and a global information infrastructure". Piazolo (2001:3) describes this as "an economy where both final output and intermediate input predominantly consists of information and where the modern (digital) information and communication technologies provide worldwide access to almost any available information. These new technologies might have the potential to enable an increase in the productivity of conventional business practices, but also facilitate the establishment of new processes and products". Tapscott (1996) sees this as a new industrial sector comprised of computing (computers, software, services), communications (telephony, cable, satellite, wireless) and content (entertainment, publishing, information providers). For the U.S. Department of Commerce (1999) this economy includes e-commerce and information technology (IT)- producing and -using industries. IT-producing industries include computer-hardware, software/services, communications equipment and communication services industries. Through the synthesis of the various works Molla (2000) conceptualized the information economy to include the following: 1) design, production and distribution of information and communications technology (ICT) products, 2) the development and operation of network backbones and infrastructure and other telecommunications services, 3) the design, production and distribution of software programmes and application solutions, 4) the design and delivery of professional services, 5) the design, packaging and distribution of contents, 6) e-commerce related activities and 7) informatization of economy and society through the use of ICT.

In information economy, the ICT is the main technology that replaces mental labour and increases the mass production of systemized information, knowledge and technology. Freeman and Soete (1994:42) defined ICT as: "A new techno-economic paradigm affecting the design, management and control of production and service systems throughout the economy, based on an inter-connected set of radical innovations in electronic computers, software engineering, control systems, integrated circuits and telecommunications, which have drastically reduced the cost of storing, processing, communicating and disseminating information. It comprises a set of firms and industries supplying new equipment and software, but its developments and applications are not limited to this specialized IT sector".

7. BANGLADESH IN GLOBAL INFORMATION ECONOMY

In the Connectivity Scorecard 2010 commissioned by Nokia Siemens Networks Bangladesh stood 24th among 25 countries; identified as a resources and efficiency driven economy with a score of 1.69 (LECG, 2010). These economies are less well developed, sometimes face barriers to attaining a widespread connectivity infrastructure in geographical or policy form, often have a marketplace not suitable to foreign investors and a short-fall in the human capital needed to make use of the available infrastructure and thus increase connectivity.

Neighbouring India, Pakistan and Sri Lanka ranked 21, 25 and 16 with score of 1.82, 1.53 and 3.18 respectively. The indicators used to formulate the Connectivity Scorecard include ICT usage and penetration rates, level of education, government and individual spending for IT hardware and software, extent of e-government services. Nokia Siemens Networks terms Bangladesh as 'a poor performer, but with some rays of hope' (LECG, 2009).

In the last available Knowledge Economy Index (KEI) of 2009 Bangladesh was placed at 138 among 145 countries surveyed. This Index is calculated by using Knowledge Assessment Methodology (KAM), run by the Knowledge for Development (K4D) group at the World Bank. KAM uses structural and qualitative variables to describe a country's performance on four key aspects of a knowledge economy: economic incentive regime, education, innovation and ICTs. These variables help show how well an economy is using information and knowledge to fuel its socio-economic development (The World Bank Group, 2009).

Bangladesh ranked 118 out of 133 countries under survey in this year's (2009-2010) Networked Readiness Index (NRI). The Index examines how prepared countries are to use ICT effectively on three dimensions. These are (1) the general business, regulatory and infrastructure environment for ICT (2) the readiness of the three key stakeholder groups in a society - individual, businesses and governments - to use and benefit from ICT (3) the actual usage of the latest ICTs available. Among the South-Asian neighbours India is placed at 43, Sri Lanka 72 and Pakistan 87. Bangladesh was ranked 130 out of 133 countries in 2008-2009 Index (WEF 2010a).

Bangladesh secured 107th position in the Global Competitive Index (GCI) 2010-2011 among 132 countries, regressed one step from the previous year. The GCI is based on 12 pillars of competitiveness including (i) Institutions (ii) Infrastructure (iii) Macro economic stability (vi) Goods market efficiency (vii) Labour market efficiency (viii) Financial market sophistication (ix) Technological readiness (x) Market size (xi) Business sophistication and (xii) Innovation. India secured 51st, Sri Lanka 62nd and Pakistan 132nd Position (WEF 2010b).

8. INFORMATION ECONOMY IN BANGLADSH

Bangladesh is facing socio-economic challenges characterized by low growth rates, balance of payment difficulties, weak industrial structures, poor physical and communications infrastructural development and problems associated with heavy debt burdens and huge public and social expenditure budgets. These problems are likely to be compounded by the new challenges posed by globalization and the uneven distribution of ICT if steps are not taken to embrace policies aimed at addressing them.

8.1 ICT adoption

Bangladesh was an early adopter of ICT. An IBM 1620 series mainframe computer, installed at the then Pakistan Atomic Energy Commission was the first encounter with computer technology in this region. During 1980's mostly publishing companies started using computers. These companies also inspired the development of Bangla software. Government decision to cut down taxes on computer goods in the late 1990's made possible for general public to buy a computer for the personal use. Personal computer users per 100 people are now more than 2.3 (The World Bank Group, 2011a). In 1996 first Internet Service Provider (ISP) of the country started functioning. According to a recent newspaper report ISPs provide

Internet to 0.25 million people, 0.055 million people use Internet through Public Switched Telephone Network (PSTN) and five mobile phone operators (Grammenphone, Banglalink, Robi, Airtel, and Citycell) provide Internet service to 0.57 million users. Large majority of the population are still not connected to information highway (Daily Prothom Alo, 2010). Mobile phone subscription crossed the 50 million mark in 2009. The figure now stands at 66.6 million (Daily Prothom Alo, 2011). Bangladesh was connected with information super highway in 2006 through submarine cable network SEA-ME-WE-4. Bangladesh Telecommunication Regulatory Commission (BTRC) has taken a move to connect Bangladesh with two more submarine cables through private sector initiative.

8.2 Education

Adult literacy rate in Bangladesh is 55% (The World Bank Group, 2011b). But this data is based on minimal level of literacy and means very little considering the high skilled human resource an information economy requires. A focus on human resource development is essential for the growth of information economy in Bangladesh. Currently there are over 60 universities and 100 colleges and institutes offering ICT course at Bachelors, Masters and Doctoral levels. These universities, colleges and institutes yearly produce more than 5,500 graduates major in ICT- related fields. In addition there are about 300 commercial training centres offer training courses and certifications.

8.3 ICT industry

Software development and providing IT-enabled services (ITES) has become a growing industry over the last two decades. The Bangladesh government in its export and import policies, has formally declared it as one of the 'thrust sector'. Bangladesh's software industry will become a 500 million U.S. dollars export earning sector by 2013-2014, if all possibilities can be utilized properly.

Table 1: A decade of growth of software export

Export	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
US$ million	2.24	2.8	4.2	7.2	11.44	23.82	26.08	24	33	35

(BASIS : 2011)

Bangladesh's approximately 285 million U.S. Dollars software industry currently employs nearly 20000 skilled and semi-skilled professionals. There are over 500 companies of which more than 100 companies are exporting their products and services to over 30 countries of the world. The European Union (E.U) has officially declared Bangladesh as one of the best 20 outsourcing destination. Recent global market recession make Bangladesh's software industry even more attractive to Western and European companies for low-cost IT services. Call centres have emerged as a new foreign currency earning ICT sub-sector generating more than 30,000 jobs since its boom in mid-2009, with around 47 centres currently in operation.

8.4 Policy regime

Bangladesh adopted a national ICT policy in 2009, which incorporated requisite update necessitated by developments since the last ICT policy of 2002 was approved. The policy document is structured as a hierarchical pyramid with a vision to support the national goal of becoming a middle-income country by the year 2020. Its 10 broad objectives are: 1) social equity 2) productivity 3) integrity 4) education and research 5) employment 6) strengthening exports 7) health care 8) universal access 9) environment, climate and disaster management and 10) support to ICTs. There are 56 strategic themes and 306 action items .The action items meant to be executed either in the short term (18 months or less), medium term (5 years or less) or long term (10 years or less) (MoSICT, 2009).

ICT Act of 2006 was a much-needed legal impetus for the development of an information-driven economy in Bangladesh. Its provisions include eliminating barriers to e-commerce, promoting legal and business infrastructure to secure e-transactions, facilitate electronic filing in government offices, protection against defamatory content in electronic form, establishment of Cyber Appellate Tribunal.

The issue of copyright is a major area of concern for Bangladesh's emerging information economy. In Bangladesh, the Copyright Act (Amendment) came into effect in 2005. It provides sufficient legal protection for intellectual properties including computer-equipments like software, hardware and patent. But violations of the provisions provided by the act are very common.

Bangladesh Bank, the central bank of the country introduced e-commerce recently. Banks have been allowed to make online money transactions, payment of utilities bills through internet, transfer of funds (account to account), for trading goods and services, and facilitate online credit card payments in local currency.

'Digital Bangladesh' by 2021, an agenda set in present government's election manifesto became a milestone towards achieving an information economy in Bangladesh. Elements of Digital Bangladesh are seen as vital components of overall economic development strategies. Four pillars of Digital Bangladesh vision are (i) human resource development (ii) connecting citizens (iii) digital government and (iv) ICT in business. Its goal is to develop ICT infrastructure and human resource for strengthening vital developmental sectors including (1) agriculture (2) health (3) land administration (4) local government (5) social safely nets (6) disaster management (7) commerce and investment (8) law enforcement and judiciary (9) parliament and (10) civil service (Access to Information Programme, 2009).

9. TRANSITION TO AN INFORMATION ECONOMY: A CONCEPTUAL BLUE PRINT

Countries around the world regardless of their level of development, implementing comprehensive strategies, plans and policies specifically aimed at reaping the benefit of information economy. Bangladesh is no exception. In its ICT policy Bangladesh clearly states its objective to achieve the status of a middle-income country by the year 2020 through the planned use of information and communication technologies in every sector of the economy.

But inserting into the information-based economy favourably is a major challenge that developing countries facing worldwide. We have seen from the discussion of the previous chapters that despite having good potential, Bangladesh still stands far behind its target.

The Digital Opportunity Initiative (DOI) - a public-private partnership between the Markle Foundation, Accenture and United Nations Development Programme (UNDP) developed a strategic framework to help guide developing countries to reap benefits of ICT to expedite socio-economic development. The framework includes five interrelated areas for strategic intervention. (1) Infrastructure - building a reliable ICT network infrastructure, providing universal access for all. (2) Human capacity - developing an appropriately educated and skilled mass of knowledge workers, strengthening domestic managerial and entrepreneurial capabilities. (3) Policy - a clearly defined, articulated and transparent policy; institutional framework to execute the policy. (4) Enterprise - supporting access to domestic and international financial markets, enforcing appropriate taxation and property rights regime, stimulating local demand for ICT. (5) Content and Applications - providing locally relevant information to people. The real benefits lie not in the provision of technology directly, but rather in its application to create effective socio-economic networks (Tipson and Frittelli, 2003). In a similar attempt The World Bank suggested a Knowledge Economy (KE) framework that consists of four pillars: 1) economic and institutional regime 2) education and skills 3) information and communication infrastructures and 4) innovation system. The framework claims that investments in these four pillars will boost a country's likeliness to achieve economic success domestically and internationally by augmenting sustained creation, adoption and use of information in economic production (World Bank Institute, 2009).

Bangladesh's much talked about "Digital Bangladesh" project adapted all components of these two frameworks. But there are few points to keep in mind. Mere replication of these frameworks and following the experience of already successful developed countries may not prove fruitful to Bangladesh. Bangladesh has its own weaknesses and strengths that should be taken into account during the formulation of an appropriate and sustainable blueprint for transition to an information economy.

9.1 Role of government

Government has an important role to play in promoting and facilitating the adoption of ICT by different sectors in Bangladesh. In this stage of early growth, government can act as a leader by providing a vision, raising awareness and making ICT development a national priority. The government uses many channels to communicate people. Modern ICT might be used as an additional channel. These new technologies can streamline regular tasks. Using e-mail can accelerate internal communication. Much of the pile of paper files can be reduced to a few gigabytes of computer-data. Electronic voting systems can make the election process more transparent, error-free and credible. Websites can be used to communicate government policy, rules and regulation. All of these activities will beget local language contents to meet local needs, which may create even more demands for information services.

9.2 Human Resource Development

A common rhetoric of our politicians and policy makers is that our population is our greatest resource. This perspective is confusing. A population can only be regarded as resource if they have the capability to participate effectively in the process of value creation and consumption. The major segment of the population in Bangladesh are economically marginalized and educationally deprived. These people can make very little meaningful contribution to the development of an information economy where a highly educated, technologically skilled population is an essential pre-requisite. Neighbouring India is an example to Bangladesh in this context. The government of India started to underscore the building-up of engineering and computer skills in the 1950s and 1960s through Indian Institute of Technology. India's current position as a major global software exporter owes its foundation to those initiatives. Bangladesh can emulate this success within a relatively shorter span of time due to recent advances in educational technology.

9.3 Electronic-Commerce

Like other developing countries, incorporating ICTs in economic and commercial activities is a challenge for Bangladesh. Businesses using ICT concern about issues such as competition, interoperability, intellectual property, trust and security and a free market environment. In Bangladesh two major factors limiting the development of e-commerce are the issue of online security and the low level of credit card ownership. The government and the central bank have already taken steps to introduce e-payments, Internet banking, online trade finance and credit information and e-finance facilities relevant to SMEs.

9.4 Intellectual Property Rights (IPR) regime and innovation

Information economy embraces a growing emphasis on information-products in the economy. These include computer software and other digitally encoded services like news, film, music and data. IPR extends workable legal protection for information products, ensure due recognition and reasonable benefits to the creator/owner, offers incentive to share his information with the society. In Bangladesh there exists a cultural mindset to treat the intellectual property rights casually. Bangladesh already has a comprehensive copyright and patent protection legal framework. What we need to do is to translate these laws into action. But more importantly people should be aware of their roles and responsibilities to protect intellectual property.

10. RECOMMENDATIONS

1. Recognize the significance of information economy as an important sector of the economy in its own right.
2. Recognize the complementary role information economy sector can play to boost up the competitiveness of other economic sectors.
3. Integrate ICTs into national development strategies.
4. Create the appropriate economic, legal and institutional environment for ICT investment and use.
5. Create the appropriate business environment for effective use of ICTs.

6. Identify strengths/weaknesses of and opportunities/threats for our information economy sector. Set short-to-medium and long-term goals to overcome weakness and threats and utilize strengths and opportunities.
7. Encourage the development of the domestic information-based economy through government purchasing.
8. Safeguard locally produced software from counterfeiting and piracy by enacting strong IPR and copyright laws.
9. Introduce courses in information and communication technology into the general education curricula. Revise the curricula regularly.
10. Set up specialized educational institutions and centres to prepare young professionals for the information economy.
11.

12. CONCLUSION

Information economy offers a fresh occasion for Bangladesh to strive for the much needed economic development. But this economy poses new threats too. Continuous widening of digital divide both in terms of technology and technological capability will reduce the capacity of Bangladesh to develop. Responding to this situation the right policy choice for Bangladesh should be to participate in information economy and investing more in proper areas of ICT, either to achieve faster economic development or to avoid being left behind.

At the same time we must guard against the idea that information economy and ICTs are the panacea to all of our development problems. The worth of ICT rests largely on the prevailing level of economic development. These technologies can make existing physical capital (machines, roads), human capital (educated labour) and processes more effective and efficient; but cannot be a substitute for the lack of basic infrastructure. Traditional development concerns like education, health care, poverty and inequality as well as structural transition from agricultural to industry are equally important to gain the benefits of the information economy.

Distribution of benefits achieved through information economy ventures is another major concern for social planners. ICT using information enterprises mostly employ skilled and educated labour, depriving large mass of the Bangladeshi population. There is additional concern about displacement of labour by machines. Stimulating examples of villagers calling from their mobile phone sets mean little if such changes are not sustainable and other area of the economy continue to lag behind. Practical way forward for Bangladesh is to admit and foresee these difficulties and integrate them into information economy policies and strategies.

About Authors

Tanveer Ahmad, Associate Professor, Department of Mass Communication and Journalism,University of Rajshahi, Rajshahi-6205, Bangladesh. E-mail address: **taprobal@gmail.com**

Akter Jahan, Assistant Professor, Department of Mass Communication and Journalism,University of Rajshahi, Rajshahi-6205, Bangladesh

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