

## Economic and Business Implications of e-Government Lessons for Bangladesh

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**Abstract:** Governments all over the world are moving towards ICT integration. Benefits of such integration in national economy need to be quantified. This paper focuses on identifying macro level impacts of e-Government initiatives on economic and business growth of a country using panel data analysis. Using 50 country specific data for the year 2000 to 2005 in panel data analysis, it is observed that the effect of ICT expenditure on GDP growth rate, business and export growth was positive and statistically significant. A micro level analysis conducted by Qiang, C.Z et. al., to see whether ICT improves the performance of an enterprise suggests that ICT plays an important role in allowing business to grow faster and become more productive. It is also true that developed countries use ICT in a symbiotic relationship and now gradually moving towards connected government paradigm. Bangladesh cannot stay far beyond from this trend. Fifty-five e-Governance projects in 16 different sectors have been initiated under Support to ICT (SICT) Program. National ICT Policy allocates 2% of Annual Development Plan (ADP) expenditure for information technology. Government of Bangladesh should enhance the ICT expenditure in National Budget and should remove infrastructural and legal barrier in an appropriate way to reduce the digital divide. The paper emphasizes the facts that investment in ICT will make contribution in enhancing our economic growth rate and will be supportive to the Business entities of the country.

### 1.0 Introduction

Electronic Government or e-Government is broadly understood as the use of ICTs by government to enhance the range and quality of government information and services provided to clients in an efficient, cost-effective and convenient manner, while making government process more accountable, responsive and transparent (World Bank, 2005). e-Government shows a unique way of achieving good governance and resultant development. e-Government establishes effective communication and offer efficient services and thus build peoples confidence on government. It also offers access to strategic data and data

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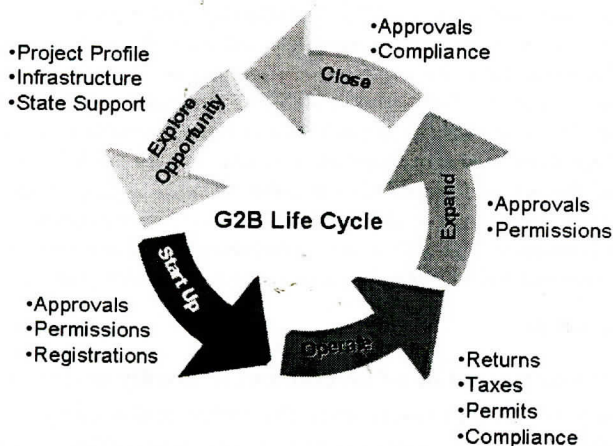
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exchange facility and thus contribute in effective decision-making. Developed country embraced technology in their governance system and thus secured high-income with a leading position in knowledge-based economy. So, technology adoption and efficient service delivery through business process reengineering in government system can be seen as a mechanism of economic growth of a country.

## 2.0 G2B Life Cycle: Multiple Interactions with the Government

e-Government provides with efficient, convenient and transparent services to the business in all interactions of G2B lifecycles and thus enhances the value of the customer, improve business ecosystem, and increase velocity of business and ease of doing business. Transparency gained through e-Government initiatives leads to higher investment and saves time, money & effort.

**Figure-1: G2B Life Cycle: Multiple interactions with the Government**



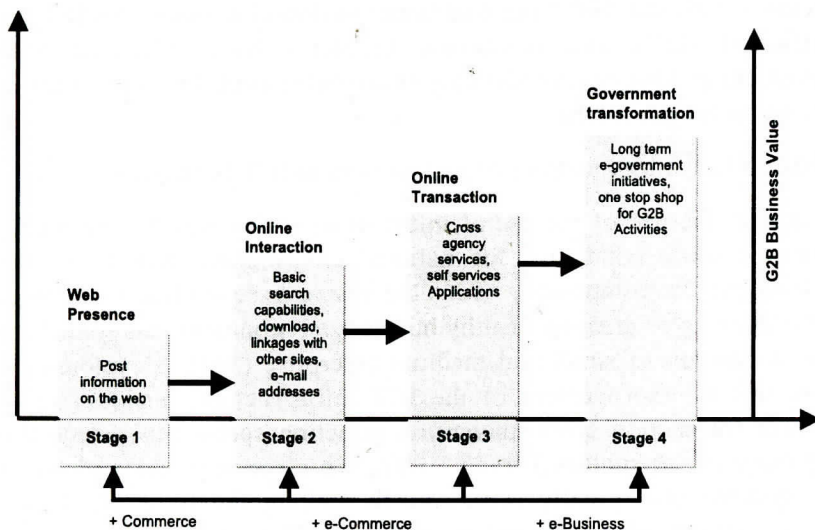
Source: Satyanarayana, J (Case Studies in G2B: transforming business environment)

ICT adoption by the government eliminates distance and other divides for business creation, simplify reporting requirements, help business understand what regulations apply to them and how to comply with them. G2B also provides a business case to initiate change, reduce unnecessary bureaucracy, coordinate inter agency information needs, organize the sites by needs and identify the needs of customer group.

### 3.0 e-Government Maturity Model with Implications for Business

Gartner, an international e-Business research consultancy firm has formulated a four-phase e-Governance model (Backus, M. 2001). These phases have been defined based on experience with e-Commerce and e-Governance in Europe and other Western regions. Most government start by delivering online information, but demand from citizen and business and internal efficiency soon require more complex services. Thus advanced phases are characterized with increasing value to citizen and business (Figure-2). These four phases are Information delivery through Web presence (offer business information, opening hours, employee, telephone numbers, laws, rules and regulations), Online Interactions (offer facilities for downloading forms on websites, submitting forms online, e-mail notification, online help with filling in forms), Online Transactions (license applications and renewal via websites, Payment of taxes, and online procurement) and Government Transformation Phase (personalized website with integrated business account for all services).

**Figure-2: e-Government Maturity Model with implications for business**



Source: Jim Hanna and Ana Carrasco Martin (e-Government services for SME).



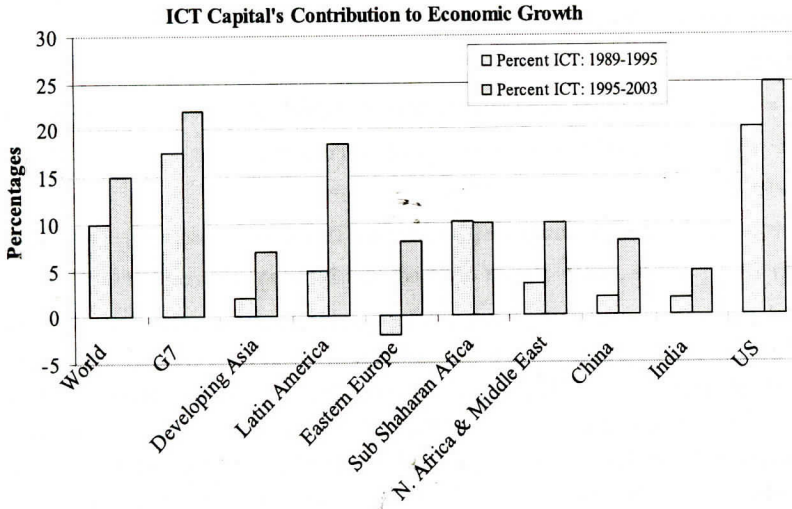
#### 4.0 Closer Interaction with the Business: Public Private Partnership

In developing e-Government projects, developing partnership with the private sectors is commonly seen both as beneficiary and as providers of e-Government solutions. This has both way impact. First, there is the possibility of cost-sharing projects, with a possible return on investment for the private sector. Second, the private sector has invaluable expertise that can be tapped by government in the areas of customer satisfaction, work productivity gains, and personal efficiency. Third is the possibility of technology transfer from the private to the public sector. Thus, involving the private sector in Public Private Partnerships is often seen as a key success factor for e-Government initiatives. A successful investment in e-Government is Ghana's GC-Net - a PPP that has already brought a positive return on investment. The GCNet was established to develop and operate a customized electronic system for processing trade and customs documents - the portal has generated a 49% increase in customs revenues within 18 months. However, a major challenge is creating and retaining government capacity to manage the relationship with the private partner in PPP projects as well as to manage the changes associated with the shift from traditional to digital systems. Aside from insufficient skills and resources, problems have occurred with government institutions not showing sufficient respect for e-Government PPP contracts (gtz, 2008).

#### 5.0 Macro Level Implications of e-Government/ICT Initiatives

The greater the use of the use of information technology by the public sector, the more conducive the national environment will be to the development of e-competency within the business sector (Habil, 2005). e-Competency helps creating healthy business environment that contribute to the expansion of small and medium enterprise (SME) development. Again, due to improvement of the ICT infrastructure, business firms minimize transaction costs, increase transaction speed and reduce the complexity of international trade. Effective electronic and automated trade systems also greatly contribute to making the trade regulatory system more transparent and predictable. These issues are major considerations in establishing investor confidence. Thus, e-Government initiatives of the government contribute to increased foreign direct investment and as well as domestic investment. International Telecommunication Union (ITU) in their Annual Report 2006 substantiated the position that the world are benefiting from the impact of ICTs on their economy (ITU, 2006).

**Figure-3: The contribution of ICTs to economic growth**



Source: ICT Development Report 2006: Measuring ICT for Social and Economic Development, ITU.

The report also emphasized that ICT, or some or all of its components, could expand economic development and accelerate growth in low-income countries. However, along with direct or indirect impacts on a country's GDP growth, ICTs could help by increasing information flow leading to more open societies. In developing countries, the diffusion of ICTs "provides new opportunities for insertion into the global value chains and for diversifying production activities and exports" (UNCTAD, 2007-2008).

### 5.1 Empirical analysis-1

Taking the hypothesis that Investment on ICT enhances GDP growth rate, enhances contribution of business in GDP and enhance the contribution from Export in GDP of a country, panel data analysis techniques was used for analyzing 50 country specific data for the year 2000 to 2005. The following three models were used:

**Model 1:**

$GDPGR = \alpha + \beta_1(\text{ICT expenditure}) + \beta_2(\text{FDI}) + \beta_3(\text{Telephone Subscriber}) + \beta_4(\text{Internet User}) + \text{Error}$ , Where  $GDPGR = \text{GDP Growth Rate}$

**Model 2:**

$BGR = \alpha + \beta_1(\text{ICT expenditure}) + \beta_2(\text{FDI}) + \beta_3(\text{Telephone Subscriber}) + \beta_4(\text{Internet User}) + \text{Error}$ , Where  $BGR = \text{Business Growth as Percent of GDP}$

**Model 3:**

$XGS = \alpha + \beta_1(\text{ICT expenditure}) + \beta_2(\text{FDI}) + \beta_3(\text{Telephone Subscriber}) + \beta_4(\text{Internet User}) + \text{Error}$ , Where  $XGS = \text{Export of Goods and Services as Percent of GDP}$

World Development Indicators (WDI) was used for major data source. The countries were the first 50 countries in e-Government Readiness Survey Report, 2008. These countries were upper and middle income group. Lower income countries were not included due to not having sufficient macro data in WDI report. It was expected that the variable ICT will be significant and positive in every equation. The result was shown below:

**Table-1: Effect of ICT expenditure on GDP growth rate, Business and Export**

Effect of Information and Communication Technology (ICT) Expenditure (% of GDP) on			
Indicator	GDP growth rate (annual %)	Business (% of GDP)	Exports of Goods and Services (% of GDP)
Observations <sup>a</sup>	220	230	230
Number of groups	39	40	40
ICT Expenditure (% of GDP)	2.1128* (5.35)	7.2559* (6.41)	4.4373* (7.18)
Foreign Direct Investment (% of GDP)	0.0517	0.1719	0.0670
Telephone Subscriber (per 1000 People)	0.0030	0.0110	0.0064
Internet User (Per 1000 people)	-1.91e-08	-2.61e-08	-1.15e-08
Constant	-14.4459	31.7390	9.9837
R <sup>2</sup>	Within 0.1722	Within 0.2406	Within 0.2596

Note: The numbers in the parentheses are *t*-statistics

\* denotes statistical significance at 5 percent.

Source: Authors estimation using STATA.

It was found that the effect of ICT expenditure in a country on GDP growth rate, business and export was positive and statistically significant. i.e., ICT expenditure has substantial impact on increasing GDP growth rate, flourishing business and enhancing exports. However, due to having



sufficient data it is easier to derive economic impact of ICTs focusing on a limited number of industrialized countries but there are some exceptions. Based on data mainly from Bangalore it was found that ICTs sector has made a significant contribution to the Indian economy (ITU, 2006).

## 5.2 Empirical analysis-2

In a study of 27 high-income countries and 66 developing countries by Clarke and Wallsten, found that a 1 percentage point increase in the number of Internet users boosts total exports by 4.3 percentage points, and increases exports from low-income countries to high-income countries by 3.8 percentage points (Clarke, 2004). Another study conducted by Freund and Weinhold that included 56 developed and developing countries, found a significant link between access to the Internet and trade growth for the period 1997-99. Specifically, they found that developing countries with the fewest established trade links benefit the most from using the Internet (Freund, 2004). However, ICT use is highly correlated with income level. Countries with high ICT usage (that is countries where between 60 and 90 percent of firms use e-mail or web sites) have an average per capita GDP of \$12000. Several low income countries, such as Bangladesh, Kenya, Moldova, and Tanzania, have an average rate of e-mail and website use of between 50 and 60 percent, suggesting that ICT use is not a luxury (Qiang, 2006).

## 6.0 Micro Level Implications of ICT use in Business Firms

A good communication and information infrastructure is an essential part of overall infrastructure; it improve the connectivity between firms, suppliers, and clients as well as provide business opportunities, especially for companies that are physically distant from urban centers. Entrepreneurs with wider, more diverse contacts have more productive enterprises and are more likely to have access to supplier credit (Barr, 2000). Thus, a network of entrepreneurs can accelerate endogenous firm growth. On the other hand, the internalization of ICT applications affects business operations directly. The ability to transfer information seamlessly through shared electronic files and networked computers improves the efficiency of business processes such as documentation, data processing, and other back-office functions (for example, organizing incoming orders and preparing invoices). These improvements reduce inefficiencies in the use of capital and labor and lower operational and transaction costs among economic agents, thus improving the productivity and profitability of firms.

## 6.1 Empirical/Firm level analysis

Using data derived from Investment Climate Surveys (ICS) conducted by the Private Sector Development Network and Development Economics Research Group at the World Bank in collaboration with local partners in the countries involved (56 countries including Bangladesh), an analysis was conducted by Qiang, C.Z *et. al.*, to see whether ICT improves the performance of an enterprise. These surveys were conducted through face-to-face interviews between 1999 and 2003, covering 20,000 firms from 26 sectors in 56 low and middle income countries. ICS had the following three indicators for ICT use:

- Percentage of a firm's workforce regularly using computers in their jobs;
- Whether a firm uses e-mail to interact with its clients and suppliers;
- Whether a firm uses a Web site to interact with its clients and suppliers.

This study gave focus on several measures of enterprise performance, including sales and employment growth, labor productivity, total factor productivity, and investment. The findings are presented in table- 2.

**Table-2: Effect of ICT Use on Enterprise Performance in Developing Countries**

Performance Indicator	Enterprises that do not use ICT	Enterprises that use ICT	Improvement
Enterprise growth			
Sales Growth (percent)	0.4	3.8	3.4
Employment growth (percent)	4.5	5.6	1.2
Profitability (percent)	4.2	9.3	5.1
Investment			
Investment rate (percent)	n.a	n.a	2.5
Re-investment rate (percent)	n.a	n.a	6.0
Productivity			
Labor productivity (value added /worker, \$)	\$5,288	\$8,712	\$3,423
Total factor productivity (percent)	78.2	79.2	1.0

Source: Qiang, C.Z *et. al.*, 's analysis based on data from World Bank Investment Climate Surveys 2000-2003

i.e., The firms those used ICT had acquired a leading edge over the enterprises those did not use ICT. Actually, Government enhances the possibility of ICT access by the business enterprise and finally, this access improves the performance of business entities.



## 7.0 E-Government/ICT Initiatives of Government of Bangladesh

Bangladesh started her journey towards e-Governance in 1980's with some computer-aided applications in some public sector organizations. However, e-Governance issue is a recent discussion point in our policy level. The major initiatives are mentioned as follows:

Ministry of Science and ICT (MoSICT) has included e-Governance in National ICT Policy, 2002. ICT Act has already been enacted in 2006. To help the ICT sector flourish in the country and to create an enabling environment, the amendments to the Copyright Act 2000 incorporating issues related to ICT/software has been published by gazette notification. Some other legal frameworks are in progress. In 2003, Ministry of Planning launched a "Support to ICT (SICT) Program" with the objective of ensuring access to information by every citizen to facilitate empowerment of people and enhanced democratic values and norms for sustainable economic development by using the infrastructure for human resources development, e-Governance, public utility services and all sorts of on-line ICT enabled services. SICT has taken up 55 e-Governance projects in 16 different sectors:

In order to develop software industry in the country an ICT incubator has been set up in Dhaka. Presently, 48 software and IT enabled service companies invested Taka 378 crore and 1700 software professional are employed for export of software in the global ICT market. To provide a range of modern infrastructure and administrative support services and to create an efficient working environment for the development of information technology, electronics, telecommunications, engineering, biotechnology and other knowledge based industries, the government has planned to establish a Hi-Tech Park in the country at a cost of Taka 25 crore.

MoSICT has started a project to provide computers, IT human resources, and broadband to 38 Ministries. Some government institutions have taken e-Government initiatives to automate process and workflows.

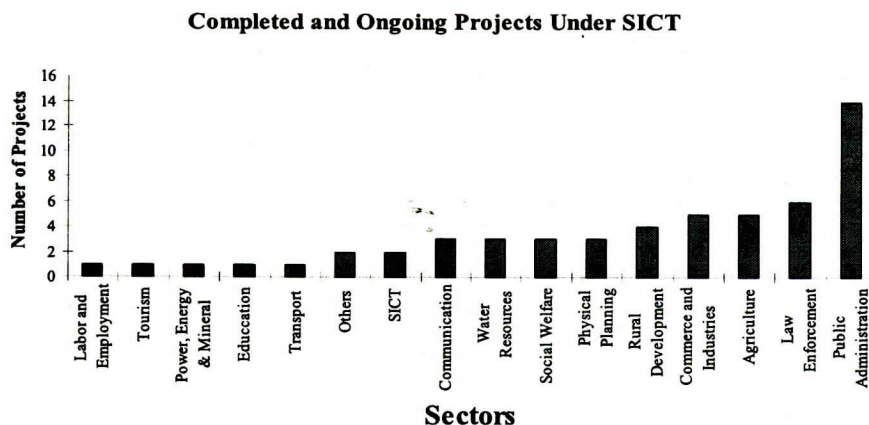
Ministry of Finance has customized software for budget planning, sensitivity analysis, impact analysis, and financial projections. National Board of Revenue is computerizing the revenue budget procedures. Stock Exchange both in Dhaka and Chittagong are computerized and networked, allowing citizens to trade with much more ease than before. MoSICT is creating a website containing information about various

ministries. Ministry of Communication is providing online searchable database of contractors, tenders and have also developed a Project Monitoring System for tracking progress of projects. Bangladesh Planning Commission has developed software for interfacing between development and revenue budget, file-sharing facilities through LAN, electronic notice board, ADP database facilities, software for tracking movement of files. Board of Investment (BoI) has developed a tracking system for international and national investors. There are also more noteworthy initiatives in Roads & Highway Department, Ministry of Religious Affairs, Bangladesh Bureau of Education Information System (BANBEIS), Rajshahi City Corporation (i.e., Electronic Birth Registration System), and in Bangladesh Bank.

Submarine cable connection has been done in mid 2006. All analogue telephone systems have been converted to digital system. Voice over Internet Protocol (VoIP) has been legalized in principle. VSAT license fee has been reduced. Cyber cafes are available in all major towns. Deregulation has widened the coverage of telecom in Bangladesh. Fixed line telephone has been opened up for private investment. Within the region, Bangladesh has become pioneer to start privatization of telecommunication sector when it awarded license as early as 1989 to a private mobile telephone company. Government has liberalized telecommunication regulations in recent years under the 'Bangladesh Telecommunication Act 2001' and established an autonomous Bangladesh Telecommunications Regulatory Commission (BTRC) in 2002 for overall supervision and management of the area. Upgrading the tele-communication and data-communication infrastructure, i.e., ensuring an effective ICT infrastructure in the country is one of the major tasks of BTRC.

National ICT Policy allocates 2% of Annual Development Planning expenditure for information technology. Moreover, the government has exempted ICT related equipment from VAT and taxes and has been providing tax holidays to ICT related ventures and creating an equity fund for financing investment in this sector. Bangladesh Computer Council (BCC) is entrusted with training/awareness creation/motivation of government officials through training, offering advisory services and organizing sessions on awareness building.

**Figure-4: Sector-wise number of projects under SICT**



Source: SASM Taifur, July 2006

**Table-3: Allocation of Expenditure for e-Government Projects**

Total number of Implementing Organization	Total Number of Projects	Project Expenditure (million taka)	Development Partners	Foreign fund (million taka)
38	55	77631	China, IDB, Supplier Fund, UDCF, South Korea, KOIKA, UNDP, EU, IDA, JICA, DRGA, Australia, UNFPA, FAO Canadian CIDA, Denmark, DFID, Netherlands	40097.9

This allocation was made in ADP during the period of 2004-2005 to 2006-2007

Source: Horizon Scan Report, 2007

## 8.0 e-Governance/ICT Access Scenario of the People of Bangladesh

### 8.1 Telephone Access Scenario

Presently fixed phones are available to slightly more than one million people in Bangladesh. However, with a rapid growth of mobile phones, total (fixed and mobile) telephone subscribers stand at 34.37 million (December 2007). With this estimate, teledensity of fixed phones only, per 100 persons stands at 0.79 and teledensity of total (fixed and mobile) phones stand at 23 per 100 persons. Fixed telephones are mostly urban oriented. A newspaper report on May 2003 shows that out of 8,95,000 fixed telephones installed by Bangladesh Telephone and Telegraph Board (BTTB)( now BTCL), 7,70,000 lines are in urban areas where Dhaka



alone had 4,56,000 lines (The Daily Star, 2003) BTRC has an interim direction on tariff and marketing promotion. According to the directives the maximum airtime charge can never be fixed more than Tk. 2.00 per minute and less than Tk. 0.25 per minute. This circuit applies to all voice services and packages offered by the operators.

## 8.2 Computer Access Scenario

Sales of PCs climbed up rapidly from 1998 because of exemption of taxes on computers and accessories. Everyday, on an average, 250 computers are sold in Bangladesh (BCS, 2000). The Bangladesh Computer Council (BCC) and Bangladesh Bureau of Statistics (BBS) survey result shows that Dhaka division has the highest concentration (72.76%) of IT involvement, followed by Chittagong (11.14%), Rajshahi (7.39%), Khulna (4%), Sylhet (2.8%) and Barisal (1.3%) (GoB Survey). These indicate an existing digital divide within the country.

## 8.3 Internet Access Scenario

According to ITU (International Telecommunication Union), Bangladesh had 4,50,000 Internet users as of September 2007, which gave 0.3 percent penetration. Currently approximately 500 cyber café are running all over Bangladesh (BTRC). Presently total Internet subscriber stands at nearly one million and multiplying by the users of cyber cafes, academic institutions, libraries, mobile Internet user etc. total number of users assumed to reach nearly doubled. With this estimate, Internet users per 100 population can be calculated as 0.13 (considering the estimated population of 150 million by 2007). Presently in Bangladesh, speed of Internet connection is not satisfactory; individual bandwidth of ISPs varies from 128 Kbps to 8 Mbps (GoB, 2005). Cost for Internet access at individual level varies from Taka 15 to 30 per hour and for unlimited use Taka 1000 to 3000 per month. Currently, a company needing 1 MB monthly bandwidth incurs cost of taka 80,000 to 100,000 per month without VSAT back up and it goes up to taka 1.8 -2.0 lakh with at least 50 percent backup (Ahmed, 2008). Though bandwidth price is decreasing due to increasing the number of users, still it is higher than our neighboring countries.

So, a divide between Bangladesh and other countries (even with the neighboring and competing ones) is evident. Within the country, there are further divides between various sections of people and between geographic regions too.

#### 8.4 Telecentres in Bangladesh: Potential Access Point of Government Initiatives

Telecenter is a poverty alleviation objective oriented ICT based micro-enterprise that integrates ICT with the development process through creating job opportunity, strengthening the role of the commons in the market and filling the gap between citizen and the state. It is revealed that telecentre operation in rural Bangladesh is highly supportive to economic growth, reduce the countrywide existing digital divide and take the government at the doorstep of every citizen. Presence of telecentre is seen in Bangladesh with diversified names, such as Community Multimedia Centre, Community Information Centre, Rural Knowledge Centre, Gonokendra, Pallitathya Kendra, and such based on telecentre operator's choice.

NGOs in Bangladesh introduced micro-enterprises like telecentres during 80s with a view to facilitate sharing of knowledge and information among community members. However, those centres were relying on traditional tools. ICT-based centres were introduced around 2005. Relief International-School Online and Young Power in Social Action (YPSA) launched such telecentres in 2005. Since then Dhaka Ahsania Mission, D.Net, KATALYST, Digital Equity Network (DEN), Grameen Phone and some other NGOs launched telecentres with varying models. The Government also setup telecentres in collaboration with international organisations like UNESCAP. Currently 2165 telecentres are operating in the country. However, realising the importance of connecting people through electronic channel the Government has taken steps to establish 1000 telecentre-like centres within 2010.

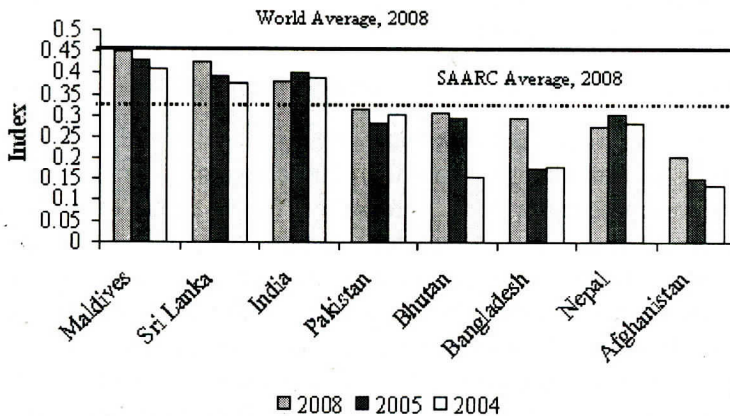
#### 8.5 IT Companies and e-Commerce Scenario in Bangladesh

Currently there are more than 1000 hardware showrooms and nearly 8000 IT institutions in Bangladesh. More than 100 companies are involved in software development. Sixteen percent of these firms export their products, ten percent are completely export oriented. Bangladeshi business persons have already introduced e-Commerce in a limited scale and more are on the pipeline. Wireless Application Protocol service is available in Bangladesh allowing for use of Internet through mobile phones. This has introduced e-Commerce to a wide area in Bangladesh. Cell Bazaar is an online market place working in Bangladesh now, where items are listed and bought and sold by simply using a mobile phone. Currently there are roughly 10000 items listed in over 60 different locations around the country in Cell Bazaar (Nader, 2008).

### 9.0. e-Readiness Ranking and Bangladesh

The e-Government readiness index is based on a weighted average composite figures calculated from Web Measure Index, Telecommunication Infrastructure Index, and Human Capital Index. This index gives an indication of the relative position of a country's e-readiness in the region and the world. Bangladesh holds 142nd position among 192 countries surveyed in UN e-Government Readiness Report 2008, which is clearly better from previous year's position (Figure-4). Within SAARC, the Maldives continues to dominate with an index close to the world average followed by Sri Lanka. The position of India is much better than other SAARC countries. In 2004 and 2005, Bangladesh was shown falling behind SAARC countries, but significant improvement is visible in 2008 report. Bangladesh's improvement was attributed to its progress in web measurement index, where the country's various government web sites made presence in large number in last few years. Though this presence is characterized by mainly emerging and enhanced with a very limited scale of interactive sites (mainly Education Boards, DESA, PDB, and BTTB). More advanced transactional and connected stages of e-Government service delivery require more compatible administrative reforms, enactment of necessary cyber and electronic transaction law and capable private sector. However, it is expected that using the infrastructure of mobile communication it is possible to achieve transactional stage within short time in some cases.

**Figure-5: e-Government Readiness for Southern Asia**



Source: UN e-Government Survey, 2008 and UN Global e-Governance Readiness Report, 2004



## 10.0 Lessons for Bangladesh

e-Government is a form of e-business in governance and refers to the processes and structures needed to deliver electronic services to the citizen and businesses, collaborate with business partners and to conduct electronic transaction within an organizational entity (Backus, 2001). Developed Countries use ICT in a symbiotic relationship and now gradually moving towards connected government paradigm. Bangladesh can not stay far beyond from the current development trend. In the UN global e-Government Readiness Index of 2008, Bangladesh holds 142nd position with 0.2936 index value (UN, 2008). Bangladesh needs to raise its position with an index value of at least 0.5 or above in next 10 years. It is expected that with that value Bangladesh will be a middle-income country. So, Government should enhance the ICT expenditure in its National Budget and remove infrastructural and legal barrier in an appropriate way to be more supportive to the Business sector. Bangladesh also needs to develop a strong partnership with the private sector in implementing e-Government initiatives.

Along with developing formulating strategies and policies government should look on the legal issues with same importance. Moreover, government needs to consider interoperability framework in all initiatives for smooth knowledge sharing as well as adoption of free and open source technologies for e-Government solutions. Government should continually rethink on incorporating trained human resource as a part of capacity development before investing large amount of money on ICT projects.

## 11.0 Conclusion

e-Government is one of the most flexible government systems that allow strong public-private partnership, privatization and outsourcing. It is a more client focused government system that depends on people's decision and thus more democratic. So in time all the government systems will be e-Government and the letter e will be redundant. Empirical analysis and firm level survey data analysis suggest that ICT is playing an important role in enhancing economic growth allowing business to grow faster and become more productive. With this backdrop government of Bangladesh should take more initiatives to allow affordable access to network infrastructure, provide a supportive legal and regulatory framework for e-business, and overcome market failures in areas of demand aggregation and skill formation.

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