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Global ICT indicators' status in Bangladesh

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INTRODUCTION

Bangladesh, a developing country in the South Asia is focusing on Information and Communication Technology (ICT) with a view to realizing the vision of *Digital Bangladesh 2021*. Progress has been made over the past few years in terms of developing the ICT infrastructure in the country and delivering e-services at the doorsteps of the citizens. Government, in collaboration with different national and international agencies, is also training up people to make them capable of utilizing ICT facilities. This paper's contributions are as follows.

First, it highlights big data in the ICT sector. Second, it focuses on the existing online service providers. Third, it sheds light on trade opportunities in the ICT services. Fourth, it discusses about the telecommunication status of the country. Fifth, it finds country's household indicators to determine ICT progress. Finally, we provide an analysis of the future ICT goals and identify different merits and demerits.

2. ICT indicators

Accurate ICT indicators are critical to tracking the progress against the set ICT goals. In Bangladesh, several state-run agencies including Bangladesh Bureau of Statistics (BBS), Bangladesh Telecommunication Company Ltd. (BTCL) etc execute the task of formulating key ICT indicators to facilitate growth in this sector. BBS has an important strategic paper, National Strategy for the Development of Statistics (NSDS) to boost up statistical activities in a coordinated, participatory and scientific way. Statistics Act, 2013 has empowered BBS with a structured legal frame. BBS has recently deployed Computer Assisted Personal Interview (CAPI) technology to digitize the data collection method from field level.

2.1 Big data in the ICT sector

Some important and large-scale data in the field of ICT with respect to Bangladesh are furnished below.

- (a) 115 Million Services provided to citizens from Union Information and Service Centres (UISC).
- (b) BDT 1.38 Billion earnings from UISC Entrepreneurs.
- (c) 30,000 local youths got ICT training from UISCs.
- (d) More than 9000 leaders and entrepreneurs have been trained through leadership.
- (e) 4 Million Students Learning from Multimedia Content Developed by 20,000 Teachers.
- (f) 70 Million Results of Public Exams over Internet, 55 Million over SMS, 2.9 Million Admission Applications through SMS.

- (g) 300+ electronic versions of text books (e-books) available in primary and secondary levels including technical, vocational and Madrasha education. Millions Land Records Delivered Electronically in DC Offices.
- (h) 100 Million Birth Registered Electronically.
- (i) 10 Million Electronic Money Orders Sent through Post Offices.
- (j) 100 Million Birth Registered Electronically.
- (k) 2.6 Million Purchase Orders Sent for Sugarcanes over SMS.
- (l) 25 Million Utility Bills paid over Mobile Phones.
- (m) 1.2 Million Railway Tickets bought over Mobile Phones.
- (n) 300 Thousand Online tax calculations by citizens.
- (o) In Bangladesh, 112 million wireless subscribers now receive early warning info on natural disasters.
- (p) 1800 KM long optic fiber network under Bangladesh Railway is being utilized by the private Cellular Phone Operator.

2.2 Online Service Providers

To turn Bangladesh into a digital nation, initiatives have been taken to deliver e-services at people's doorsteps. To serve this purpose, a program titled "*Access to Information (a2i)*" has been commenced which is an UNDP and USAID supported project (program) having its office at the Prime Ministers' Office of Bangladesh. The overall objective of the project is to provide support in building a digital nation through delivering services at the citizen's doorsteps. The programme aims to improve quality, widen access, and decentralize delivery of public services to ensure responsiveness and transparency. Various initiatives taken by this a2i program are as follow.

(a) Union Information and Service Centres (UISC)

Union Information and Services Centres (UISC) are newly established one-stop service outlets operating at all 4,547 Union Parishads (UP, lowest tier of local government) of the country. Through use of ICT, UISC is able to bring various types of information related to government, livelihood and private services to the doorstep of citizens in rural areas. It ensures services providers and users to save time, cost and has made operations hassle free. Operating under the Public-Private-Peoples' Partnership (PPPP) modality, these centres are run by local entrepreneurs, hosted by UPs and supported by central administration.

KEY SERVICES:

- Public exam results
- Government forms download
- Birth and death registration
- Online university admission
- Data Entry
- VGD/VGF card database

- Livelihood information
- Employment information
- Visa processing /visa form printing
- E-mail and Internet browsing
- Computer Training
- Video conferencing
- Mobile Banking
- British Council's English Learning
- Photocopying/Scanning/Photo/Mobile phone services

(b) National Portal Framework (NPF)

The National web Portal Framework (NPF) is the single platform for accessing all public information from any government organization to ensure easy accessibility for citizens, easy updating of data by non-technical personnel and sharing of data amongst various organizations.

On June 23, 2014, Bangladesh formally launched the world's largest public web portal, Bangladesh Jatiya Tathya Batayon (National Portal) consisting of 25,043 websites of administrative levels including government agencies in one website titled www.bangladesh.gov.bd. A total Websites of 4550 unions, 14,640 upazila offices, 4,032 district offices, 455 divisional offices, 64 zila parishads, 488 upazila parishads, 55 ministries and divisions, 345 directorates as well as 414 pourasavas and city corporations are tied in one place through this National Portal (NP).

Counting all ministries, all directorates, all semi-government and all autonomous organizations, and all government offices at the division, district, upazila and union levels, there are about 27,000 government offices. Only a few hundred of these offices – mostly in Dhaka – have their own specific websites.

NPF ensures that all government organizations have online presence, and the existing officers and staffs of the organizations are able to update the sites without depending on technical personnel. In addition, NPF will allow the government to implement the Right to Information Act through proactive information disclosure.

The NPF is designed and developed by the Access to Information (a2i) Program of the Prime Minister's Office in consultation with government stakeholders in different tiers. The templates in NPF can be used as a guideline for website development of other affiliated organizations.

(c) District e-Service Centres

The District e-Service Centre (DESC) is an ICT facilitated one-stop service centre which provides an efficient electronic version of the century-old manual and heavily bureaucratic service

delivery system at every DC office. It is located in the Deputy Commissioner's (DC) office. DESC has been designed to improve the accessibility and transparency of public service delivery system at the district level to achieve the following.

Objectives:

- Ensure service delivery at the at the door steps of the people at the least possible time
- Uphold citizens' Rights to Information through extensive information flow
- Save time and labor in the processing period
- Increase the number of clients served everyday through the use of ICT
- Reduce corruption and increase accountability by ensuring enhanced flow of information and more transparent processes.

Services available at the DC office can be requested and received through the one stop service counters, online, by phone, by post, or by fax. The DESC was first piloted in Deputy Commissioner's Office of Jessore district and is currently operational in all the 64 districts of the country.

(d) Multimedia Class room

The education initiatives by Access to Information Project aim to make teaching and learning more effective and enjoyable for both students and teachers using ICT. a2i has followed a 3-pronged approach in its efforts to remodel education: establishing Multimedia Classrooms in secondary schools, training teachers on making ICT aided educational content on hard-to-grasp topics and make electronic versions of text books available in primary and secondary levels including technical, vocational and Madrasa institutions. As part of the education reform driven by the Ministry of Education, a2i through public private partnership has so far established 500 multimedia classrooms in secondary schools and trained about 4500 teachers through 400 trainers of public training institutes.

(e) Jatiyo e-Tathyakosh

In rural Bangladesh, information is vital for the betterment of lives and livelihood of the millions. However, availability of even the very basic information still remains a challenge for most citizens. Within this context and in the light of upholding the right to information, Access to Information (a2i) programme has taken the initiative to provide a one-stop solution for sharing livelihood-related information, through an online knowledge bank, the Jatiyo e-Tathyakosh (www.infokosh.gov.bd). This is a national e-Content repository having the largest pool of livelihood contents in Bangla delivered through audio-visual, text and animation formats.

(f) e-Purjee DIGITAL PURCHASE ORDERS FOR SUGARCANE FARMERS

An e-Purjee is a SMS-based purchase order that sugar mills all over the country send to sugarcane growers during crushing season. Formally known as Digital Sugarcane Procurement System, this new system promises timely delivery of purchase orders to farmers. This reduces

uncertainty of the previous paper-based system by enabling farmers with timely delivery of sugarcane to the mills benefiting farmers and sugar mills alike. With advisory and technical support from the Access to Information (a2i) Programme, Sugar and Food Industries Corporation is running the e-Purjee system in all 15 state owned sugar mills of Bangladesh since 2011-12 crushing season.

- ✓ Average 18,000 e-Purjees are being sent through SMS and published at the websites to cane farmers from 15 state-owned sugar mills.
- ✓ Approximately 2,00,000 sugar cane farmers around the country are benefiting from this service.

(g) NESS (National E-Service System)

The National e-Service System (NESS) is an initiative to consolidate all government e-Services within one framework. The NESS framework will accommodate all services offered by the government of Bangladesh to its citizens. An e-Service under NESS has capability to receive online or mobile-based applications, provide receipt numbers immediately for future tracking of status, and in most cases, completion of the service online. Any financial transaction associated with service application may be accommodated through a special e-Financial Inclusion platform. A forms engine to develop a digital version of any paper form is an integral part of NESS.

The major components of NESS are:

- e-Service delivery – a web service platform featuring initially 400+ e-Services and capability to integrate new e-Services from any service delivery organization of the government;
- e-Forms – an e-Forms engine that enables conversion of paper-based forms to paperless forms. Since many government services are initiated through a citizen's application using a form, e-Forms will allow integration of many services into the NESS platform;
- e-Filing – electronic management and archival of all files within and across government organizations;
- e-Communication – sending of SMS, email and other forms of electronic alerts for meetings, events, etc. to government officers. Also, sending of acknowledgment, progress and any other kind of notification to citizens waiting for service delivery.
- Government Directory Access Service (GDAS) – e-Directory service providing authentication and authorization of government users of the system. This also serves as a directory of government users with relevant organizational and contact information.
- Citizens' profile – usage profile of citizens in the NESS system so that citizens can access his or her own usage history;
- Dashboard – monitoring dashboard tracking all requests from citizens and all files generated from citizens' requests or internally within an office. A dashboard for a particular office will have personalized views containing all requests/files pertaining to that officer and all his/her subordinates.

Thus, an officer is able to view activities or lack thereof of all officers/staff under him/her. For example, a DC's dashboard will be able to monitor all e-service and e-file processing within the DC office and by all big UNOs under him/her, Cabinet Division's dashboard all Divisional Commissioner, DC and UNO offices, a DG's dashboard all divisional, district and upazila offices of the respective directorate.

(h) GIS Application

The GIS based interactive mapping tool, developed by BBS, has the capability of using the digital map of Bangladesh as well as census and survey results in order to prepare thematic maps and graphs for presenting different census and socio-demographic indicators.

(i) BDIInfo

It is a national, social and economic database system to store data generated from censuses, surveys, records of management information systems. BBS has developed this database as a step towards 'Digital Bangladesh' with technical and financial support from UNICEF. It can be used for evidence-based planning, budgeting and decision-making; and to monitor the achievements with equity towards the MDGs and other national goals in Bangladesh.

2.3 Trade in ICT services

IT and software businesses have been exempted from paying income taxes and VAT has also been exempted on imports and at the production level of software. A 'Research and Development Center' has been established in Bangladesh by South Korean tech giant company Samsung Electronics Co., and offices have been set up here by organizations like Google, Microsoft and Dell. Currently, the country earns around US \$250 million by exporting IT and IT enable services through firms or personal initiatives, which was only US \$5 million five years ago. "We aim to develop it to \$1 billion by 2018 and contribute 1 percent to the gross domestic product." Business opportunity exists in the field of e-governance, outsourcing, e-commerce, business software, mobile content and application, IT education, IT job fair, career counseling, multimedia and animation etc.

With the advent of ICT, conservative outlook about women in the country is diminishing gradually. As a result we find more women are employed in various knowledge based industries such as computer-aided designing, graphic designing, composing etc. Village Phones have increased income and savings accumulation among phone owners, mostly women. The women phone operators are generally poorer than the average villager is. However, the income that they earn is significant, generally accounting for 30-40% of household income and averaging US \$300 per year in a country where average per capita income is US \$286. The operators are likely to be married (90%), and half of them have no formal education. Another quarter has primary education and the remaining quarter, some secondary education. 36 % identify themselves as housewives, and only 6% have some kind of formal employment (in government or business). The women operate their phone businesses while doing household chores or operating another business. The phones are used primarily for calls relating to financial matters, particularly relating to remittances, which are a significant source of village income. Strikingly among poor villagers, 38% of phone users had one or more family member living abroad. Women phone operators have achieved economic and social empowerment within their households and communities.

2.4 Telecommunication status

2.4.1 Mobile Phone Subscribers in Bangladesh

The total number of Mobile Phone subscribers has reached 116.239 million at the end of May, 2014.

The Mobile Phone subscribers are shown below:

Operator	Subscriber (In Millions)
Grameen Phone Ltd. (GP)	49.088
Banglalink Digital Communications Limited	29.626
Robi Axiata Limited (Robi)	24.077
Airtel Bangladesh Limited (Airtel)	8.491
Pacific Bangladesh Telecom Limited (Citycell)	1.433
Teletalk Bangladesh Ltd. (Teletalk)	3.525
Total	116.239

* Subscribers in Millions

**The above subscribers' numbers are declared by the mobile operators

Source: Bangladesh Telecommunication Regulatory Commission (BTRC)

2.4.2 Internet Subscribers in Bangladesh May, 2014

The total number of Internet Subscribers has reached 38939.036 thousand at the end of May, 2014.

The Internet subscribers are shown below:

OPERATOR	SUBSCRIBER
Mobile Internet	37417.841
WiMAX	291.385
ISP + PSTN	1229.81

OPERATOR	SUBSCRIBER
Total	38939.036

* Subscribers in Thousands

**The above mentioned figure represents the number of Active subscribers only. A subscriber/ connection using the internet during the last Ninety (90) days is considered to be an Active subscriber.
Source: Bangladesh Telecommunication Regulatory Commission (BTRC)

2.4.3 PSTN Subscribers in Bangladesh May, 2014

The total number of Glossary Link PSTN Subscribers has reached 1,072.08 thousand at the end of May 2014.

The PSTN Phone subscribers are shown below:

OPERATOR	SUBSCRIBER
BTCL	845.00
Ranks Telecom Ltd	217.93
BanglaPhone Ltd	5.45
World Tel	3.70
Total	1,072.08

*Subscribers in Thousands

**The above subscribers' numbers are declared by the PSTN operators

Source: Bangladesh Telecommunication Regulatory Commission (BTRC)

Subscriber increase rate of Mobile & Fixed Phone and Tele-density till January-2014 are shown below.

SUBSCRIBER	Quantity
Mobile Subscribers (in Millions)	114.80
Fixed Phone Subscribers (in Millions)	1.10
Total Subscribers (in Millions)	115.90
Internet Users (in Millions)	35.50
Yearly Tele-density (%)	76.44

2.5 Household Indicators

Household Income and Expenditure Survey 2005 and 2010

Bangladesh Bureau of Statistics has conducted another survey Household Income and Expenditure Survey (HIES) 2005 & 2010. The questions focused on the use of fixed telephone, mobile phone, computer and email facilities. As is known HIES is a large survey with a long questionnaire. The inclusion of only four questions marks the beginning of a full effort in the future to conduct a survey especially on ICT.

As mentioned earlier, "Household Income and Expenditure Survey 2010" sought information on the use of ICT (use of computer, email, internet, telephone, mobile phone etc.) at the household and individual levels. The enumerators were provided with Laptop computers to collect and process field level data. The preliminary result of the survey has been published. However preliminary results show the following:

Table 01: Percentage of households having ICT facilities

Type of facilities	National		Rural		Urban	
	2010	2005	2010	2005	2010	2005
Telephone	2.07	2.87	0.70	0.33	5.79	10.36
Mobile Phone	63.74	11.29	56.77	6.05	82.74	26.73
Computer	3.01	1.36	0.97	0.17	8.58	4.88
email	1.39	0.20	0.39	-	4.10	0.81

Source: BBS, Household Income and Expenditure Survey 2005 & 2010

The table shows increasing tendency of use of computer facilities in Bangladesh especially in rural areas. The most notable information from the survey is that though mobile phone has been introduced in the country in

early nineties, there has been substantial growth of mobile phone use. The use of Internet has considerably increased both in urban and rural areas as focus by the recent survey. Understandably, the use of the ICT facilities is much higher in urban areas compared to rural areas.

There has been rapid growth of use of Mobile phones between 2005 and 2010. While only 11.29% of households used mobile phones in 2005, more than 63% of households were found to use them in 2010. Graph-1: Percentage of households having ICT facilities.

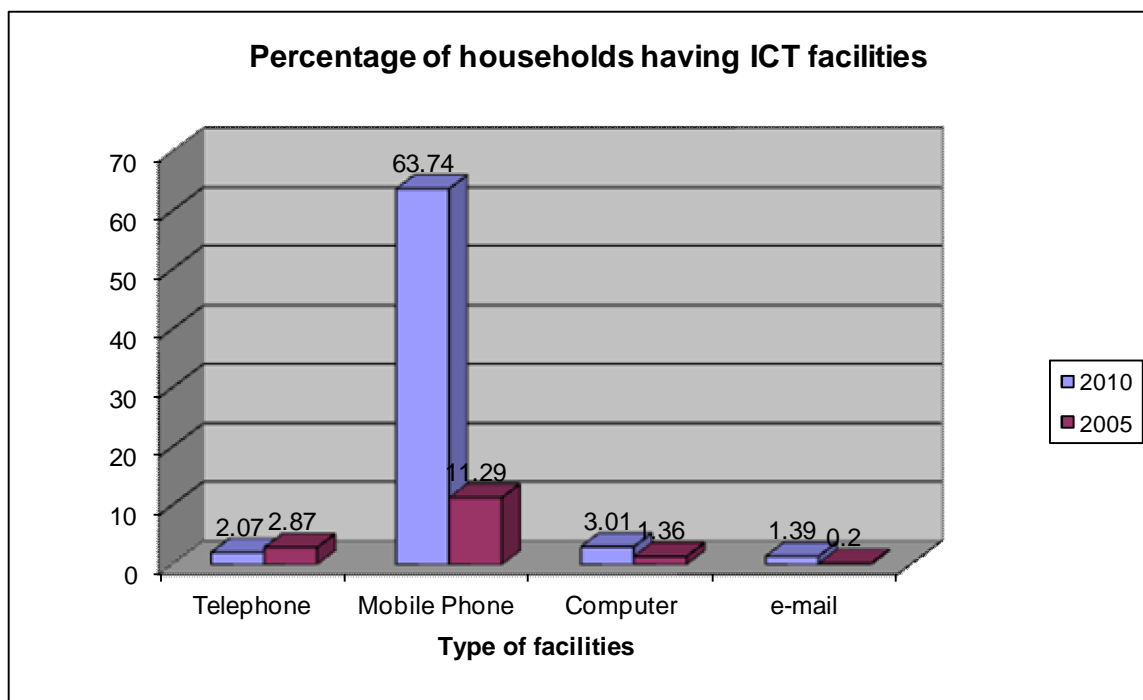


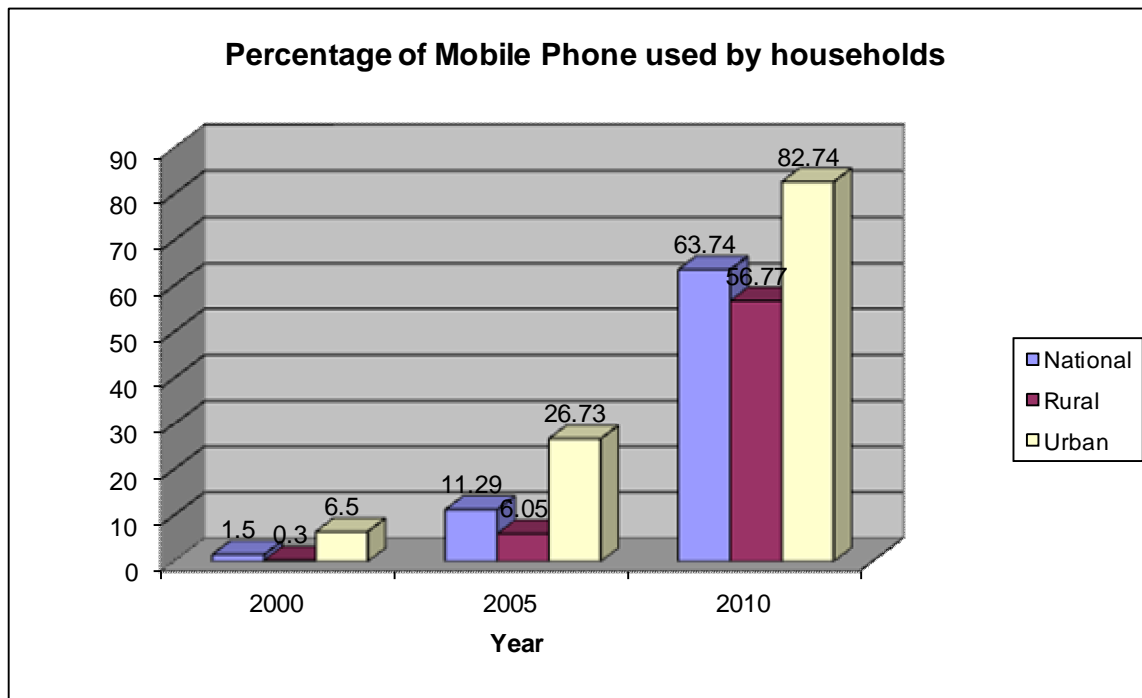
Table 02: Mobile phone used by households

Locality	2000	2005	2010
National	1.50	11.29	63.74
Rural	0.30	6.05	56.77
Urban	6.50	26.73	82.74

Source: BBS, HIES 2000 and HIES 2005 & 2010

It may be mentioned here that the government has been trying to popularize ICT in government offices to improve productivity and promote e-governance. The progress in this front has been captured in a recent survey which is discussed below.

Graph: Percentage of Mobile Phone used by households



In the more than 20000.00TK monthly income group the use of computer 51.27% and use of internet/e-mail is 82.5% in the year 2005. Whereas the percentage use regarding computer in the year 2010 is 67.17% and use of internet/e-mail is 72.78% in the year 2010. In this observation, it is shown that there has been an increment of 15.89% in the year 2010 compare to the year 2005. In case of the use regarding and use of internet/e-mail facilities there has been observed decreasing tendency of 9.77% in the year 2010 compare to the year 2005.

Table 03: Core indicators on access to, and use of, ICT by households and individuals, latest available data (Year 2013).

Country	Percentage of households with (Year 2013)	
Bangladesh	Radio	13.7
	TV	46.2
	Fixed Line Telephone	2.5
	Mobile-cellular telephone	86.6
	Computer	5.8
	Internet access	4.6

Country	Percentage of individuals using a (Year 2013)	
Bangladesh	Ever used Computer	4.7
	Ever used Mobile-cellular telephone	78.5

Country	Percentage of individuals using (Year 2013)	
Bangladesh	Ever use Internet?	6.5
	Where use Internet?	
	Home	49.49
	Work place	16.99
	Education Centre	13.37
	Another Person's home	6.86
	Cyber Cafe	6.42
	Other Places	6.86
	Frequency of internet use	
	At least once a day	25.08
	At least once a week but not everyday	45.69
	Once or more in 2 weeks	29.23

2.6 Future ICT Goals

The government will set up high-tech parks in every district in phases to develop the IT sector in every corner of the country in the areas of industry, health, employment generation, poverty alleviation, economic development and people's empowerment.

Digital Bangladesh Vision 2021 will need from both Public and Private sector an infusion of resources, leadership and ICT centered development if it is to be made meaningful. Over the last few decades, the world has been shifting from industrial to knowledge-based societies; the ability of a nation to use and create knowledge capital determines its capacity to empower and enable its citizens by increasing human capabilities. Easy access to knowledge, creation and preservation of knowledge systems, dissemination of knowledge and better knowledge services should be core concerns of the Digital Bangladesh Vision 2021. Bangladesh should be part of a well-crafted national strategy and "Digital Bangladesh", needs to be the cornerstone strategy for Bangladesh. We have to build a people-centered, development-oriented Information Society, where everyone would be able to access, utilize and share information and knowledge easily and efficiently. The concept of Digital Bangladesh should be centered on the creation of what is popularly termed as a "knowledge- based society," Information and communication technologies (ICTs) are a critical component for building this knowledge-society. Our ability in creating and disseminating knowledge will eventually drive the nation's growth in the coming days. A digital society ensures an ICT-driven knowledge-based society where information will be readily available online and where all possible tasks of the government, semi-government and also private spheres will be processed using state of the art technology. The first and foremost challenge to materialize the Digital Bangladesh Vision 2021 would be to ensure overall connectivity at an affordable cost. With the intent to enhance connectivity emphasis should be provided on the establishment of infrastructures to "Connect the Unconnected" and importance must be given on laying more optical fiber to reach the marginal people of the country. Digital Bangladesh Vision 2021 should establish technology-driven e-governance which includes e-administration, e-education, e-health, e-commerce, e- production, e-agriculture, etc. in the five focus areas of the knowledge paradigm:

(a) Access to Knowledge:

Providing access to knowledge is the most fundamental way of increasing the opportunities and reach of individuals and groups. Therefore, means must exist for individuals who have the ability to receive and comprehend knowledge to readily obtain it. This also includes making accurate knowledge of the state and its

activities available to the general public. Project, should be immediately initiated with an objective to facilitate the establishment of affirm presence of Bangladesh Government entities on the Web with two way communication capability or Web 2.0. The Programme requires provision of an entire spectrum of web services to the Government sector as well as running specialized Portals for the benefit of citizens and other stakeholders.

(b) Knowledge Concepts:

Knowledge concepts are organized, distributed and transmitted through the education system and that's why we need a *National Research & Education Network (NREN)* in Bangladesh. It is through education that an individual can make better informed decisions, keep abreast of important issues and trends around him or her and most importantly, question the socio-economic arrangements in a manner that can lead to change and development. In fact, a successful "Digital Bangladesh" would need amore literate population. A mass computer-literacy programme or even a government-sponsored computer course, offered perhaps as an incentive for every student who completes his or her secondary-school education, would benefit everyone. If there is will - backed by investment - there is a way.

(c) Creation of Knowledge:

A nation can develop in two ways – either it learns to use existing resources better, or it discovers new resources. Both activities involve creation of knowledge. This makes it important to consider all activities that lead to the creation of knowledge directly or help in protecting the knowledge that is created. To realize the aspirations of the 2021 vision, the country must be able to produce its own engineers, scientists and technological know-how.

(d) Knowledge Applications:

Knowledge can be productively applied to promote technological change and facilitate reliable and regular flow of information. This requires significant investment in goal-oriented research and development along with access models that can simplify market transactions and other processes within an industry. Initiatives in the areas of agriculture, small and medium enterprises (SMEs) and traditional knowledge can demonstrate that knowledge can be very effectively applied for the betterment of the rural poor.

(e) Delivery of Services:

Knowledge services have the potential to simplify many different points at which citizens interact with the State. Traditionally, these points of interaction have been vulnerable to unscrupulous activities and rent-seeking. We need to set the bureaucracy under an e-governance initiative, with a transparent file tracking system that the public can access. This will, right away, reduce corruption, because everyone involved in the process can be tracked down. Technology provides us with an opportunity to ensure accountability, transparency and efficiency in government services. E-governance is one of the ways in which citizens can be empowered to increase transparency of government functioning, leading to greater efficiency and productivity. E-Governance aims to place the government within the reach of all citizens increasing transparency and citizen's participation. Thus, the development of e-Governance should promote universal access to government's services, integrate administrative systems, networks, and databases, and make such information available to the citizen via Internet. In a nutshell, such e-Governance should transform the government into a citizen centric technological driven one.

3. Conclusion

Bangladesh has been advancing fast overcoming all the obstacles in the ICT sector under the auspicious leadership of the pro-ICT present government. If this pace is maintained, Digital Bangladesh 2021 vision can definitely be realized. The young generation of the country is highly tech-savvy and the members of the earlier generations are also adjusting themselves with the emerging ICT environment. Various public and private universities of the country have been producing ICT graduates who are capable of contributing to this sector. Adequate physical infrastructure is also being developed to track down the progress and hurdles in this arena.