E-Government for Women's Empowerment in Asia and the Pacific

E-government for Women's Empowerment: A state of art analysis of Bangladesh

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1. Historical overview

The digital era came to Bangladesh rather belatedly as regimes of the eighties and nineties had rejected the opportunity to connect to the South Asian information super highway for fear of free flow of information, citing the need to protect classified state information (Hasan, 2003). As a result, the e-government landscape in Bangladesh was still in its infancy in the early 2000s.

In 2001, the United Nations Division for Public Economics and Public Administration (UNDPEPA) and the American Society for Public Administration (ASPA) conducted a study on the e-government environment and sustainable development of UN member states. It found that 11 per cent of countries did not have e-government, 16.8 per cent had emerging e-government, 34.2 per cent had enhanced e-government, 29 per cent had interactive e-government and 9 per cent had transactional e-government. Bangladesh was placed among countries with deficient e-government[1] capacity where e-government registered as low priority in the policy agenda.[2]

However, by the October 2001 general elections, Information Communication Technologies (ICTs) had become a vital electoral issue. Both BNP and Awami League (AL) parties vied for votes promising to do anything and everything to bring about digital technologies. The BNP promised to build Internet villages with IT experts. The AL continued the IT agenda it had embarked on upon assuming power in 1996, including the launch of a Bangladesh Submarine Cable Network Project and waiving taxes on computers and computer accessories.

The BNP assumed power through the 2001 elections and delivered its IT pledges in 2005 when Bangladesh connected to the information super highway via a submarine cable costing US$ 35.2 million. It likewise formulated the country's first National ICT Policy in 2002. With this connection, it became possible to launch the first blog site Somewhereinblog.net in December 2005 with 68,000 registered bloggers (Haq, 2013). By the end of 2006, the Norwegian telecommunication company Telenor opened 500 community information centres. Internet cafes started to mushroom in urban areas.

The Roadmap for Digital Bangladesh. During the December 2008 elections, ICTs once again became a central issue, highlighting citizen demand for more digitalisation. Hence, when AL popularized the slogan "Digital Bangladesh", it resonated with young voters (who comprised one-third of the electorate at the time) as they saw digitisation as being synonymous with being modern and forward looking (Genilo, Islam & Akther, 2013). Subsequently, AL won the election by a landslide and the euphoria over ICTs spread to various sectors - the media, civil society, business, IT and academia – each of which developed their own interpretations of the buzzword. At first, the concept

1 The categories of e-government capacity in the research study included high (2.00 to 3.00), medium (1.60 to 1.99), minimal (1.00 to 1.59) and deficient (below 1.00). See Benchmarking E-Government: A Global Perspective. https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/English.pdf

2 Benchmarking E-Government: A Global Perspective. Available at: https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/English.pdf

of "Digital Bangladesh" was unclear. It came to mean anything and everything. It was also linked to the war against poverty. Later, the media played an important role in facilitating dialogues on 'Digital Bangladesh'; sponsoring multi-stakeholder forums until the concept was exhaustively discussed[3] (Genilo, Islam & Akther, 2013).

Picking up on these public debates, the government furthered the conceptual development of "Digital Bangladesh" and published three documents on building an information society - *Digital Bangladesh Strategy in Action 2010, National ICT Policy 2009, and Strategic Priorities of Digital Bangladesh 2010*. These documents set into motion the development of the roadmap for Bangladesh's ICT development. The government presented Digital Bangladesh as a new society, where technology could help ensure education and health, generate jobs and reduce poverty, and promote human rights.

However, the roadmap was not well-received by all sectors of society. Scholars such as Bhuiyan (2013) mused that it seemed like double speak. After doing a critical discourse analysis of the official documents describing 'Digital Bangladesh', Bhuiyan (2013) concluded that the national ICT strategy was pro-business, but with several pro-poor messages integrated (resulting in a tension between marketization and egalitarianism of ICT). The digital inclusion of all sectors in society was not guaranteed in the said documents.

Under both National ICT Policy 2002 and 2009, the Prime Minister chaired the National ICT Task Force (composed of government representatives) that spearheaded all matters relating to ICT policy in the country. Each ministry had to appoint a mid-level government official (at the level of Joint Secretary or Additional Secretary) as the ICT Focal Point to coordinate e-governance activities and priorities within the ministry (Raihan & Habib, 2006). Based on the roadmap, all government agencies and quasi-state bodies were tasked with looking at how ICTs can facilitate (in their respective areas): (1) social equity (2) productivity (3) integrity (4) education and research (5) employment (6) strengthening exports (7) healthcare (8) universal access (9) environment, climate and disaster management and (10) support to ICTs. The National ICT Task Force, meanwhile, were to monitor any deviation in implementing the policy; undertaking status checks, necessary reprioritizations and program changes.

To encourage ICT innovations, the government launched the annual Digital Innovations Awards in 2010. The award categories included e/m-business, e/m-culture, e/m-education, e/m-governance, e/m enterprise, e/m-health, e/m-inclusion, e/m-learning, e/m-localisation, e/m-news, e/m-science and environment and e/m-content.[4] Under the e/m inclusion category, the awardees for 2010 and 2011 may be classified into two groups. The first group consisted of academic institutions

3 From January until September 2009, journalists brought together stakeholders from different sectors to engage in dialogue about Digital Bangladesh. The journalists worked for various media houses such as Dainik Jugantor, South Asian Media Net, Financial Express, Bangladesh Observer and Daily Star.

4 http://www.thedailystar.net/news-detail-193623

and non-government organizations that have implemented specific interventions to address the digital exclusion of certain vulnerable groups (disabled, farmers, rural population and small entrepreneurs). The second group were government units that have made use of the digital to improve basic service delivery such as transportation, food and health (Genilo, 2012a). Some award-winning innovations included the RHD Central Management System (Ministry of Communication), Public Food Distribution System (Directorate General of Food) and Office Attendance Monitoring System (Directorate General of Health Services). Taking its cue from the government, non-government and development agencies became active in using ICTs for development. Genilo and Akhtar (2015), in mapping ICT4D projects, found at least 25 private sector and/or NGO-initiated projects that sought to make basic services available to poor and marginalised sections of the population (in sectors such as digital access, safe drinking water, health care, medicines, computer literacy, weather updates, flood forecast, online education, agricultural extension, nutrition information and life insurance).

Gender divide and Digital Bangladesh. Various initiatives in ICT4D put Bangladesh's journey into motion towards digitalization. However, as Bhuiyan (2013) has highlighted, 'Digital Bangladesh' does not guarantee digital inclusion. ICT policy documents overlook the digital exclusion of women, gender inequality in ICT education, as well as the under-representation of women in ICT professions.

The documents simply assume that women can freely participate and benefit from 'Digital Bangladesh'. Islam (2012) opined that "there are no reliable statistics on women's use of ICT in Bangladesh but it is clear that the numbers are small. Most women who use information technology use it at work. Except in upper income enclaves, access to a computer or the Internet at home is not a typical phenomenon." According to Islam, many factors affect the digital inclusion of women such as literacy and education, language, time, cost, geographical location of facilities, social and cultural norms, and women's computer literacy levels and information search and dissemination skills. The gender digital divide is reflected in other statistics on patterns of use, as well. For example, a 2015 survey of Facebook use in the country indicates that 79 per cent of users are male and only 21 per cent female.

The lack of attention to the issue of the inclusion of women in technology professions is also a matter of concern. In 2009, the Bangladesh Online Research Network flagged the need to address the gross under-representation of women in ICT-based occupations. In fact, corporate executives and computer professionals came together in 2010 to establish the Bangladesh Women in Technology (BWIT) Forum, in response to this challenge. BWIT aims to empower women with technology in order to build a critical mass of women ICT workers in Bangladesh. Its main goal is to enhance the reputation of women in the ICT sector through developing their capacity in this field. For example, in 2015, it conducted a series of workshops for integrating women ICT freelancers and entrepreneurs into the labour market.

Though National ICT policy is not informed by a gender perspective, the government has taken a strong pro-women stance in its traditional sectoral programming and has advanced the women's agenda. The Bangladesh government is a signatory to the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and the Beijing Platform for Action. It has also attempted to take concrete action to realize these international commitments. For example, between 2000 and 2014, the Ministry of Women and Children Affairs enacted robust legal and policy measures for the prevention of domestic violence and other forms of violence against women and girls; and curtailment of dowry and child marriage. As a result, the United Nations reported that Bangladesh had met several targets of the Millennium Development Goals (MDGs) including gender parity in primary and secondary education at the national level. The government undertook interventions such as stipends and exemption of tuition fees for girls in rural areas, and the stipend scheme for girls at the secondary level.

The government adopted the National Policy for Women's Advancement (2011)[5] and a series of programs for ensuring gender-inclusive sustainable development[6]. It should also be noted that at present, there has been a surge in the number of female parliament members (20 per cent of the total seats). The government has further recognised the contribution of women in societal development and accelerated efforts towards women's empowerment. In observance of "World Women Day 2017", State Minister for Women and Children's Affairs Meher Afroz Chumki explained the need for effective resistance against women's oppression in order to achieve Vision 2021, which is for Bangladesh to reach middle income status. She further indicated that women's equal rights and dignity should be upheld and respected as an intrinsic value, and not just because of their instrumentality in attaining development goals. Women's time use should also be appropriately valued; women should be given due value for their paid and unpaid work.

Gender Equality Strategy of a2i program. Whilst State ICT policy documents have overall been gender blind, one exception has been the Prime Minister Office's Access to Information (a2i) program, which has a specific strategy on gender equality. In general, the a2i program aims to increase transparency, improve governance, and reduce inefficiencies in public service delivery. The program is the facilitator for the government's innovation agenda, known as 'Digital Bangladesh'. According to a2i People's Perspective Specialist Naimuzzaman Mukta, "the objective [of the program] is increased-gender responsiveness in the project structure, leadership and interventions. Together, an inclusive Digital Bangladesh can be built – reducing the digital divide between men and women and ensuring an enabling environment for all sexes."

The a2i program has four gender strategy pillars - organization and staff; programmatic intervention; institutional behavioral

5 National Women Development Policy 2011. Available at: http://mowca.portal.gov.bd/sites/default/files/files/mowca.portal.gov.bd/policies/64238d39_0ecd_4a56_b00c_b834cc54f88d/National-Women-Policy-2011English.pdf

6 Ministry of Women and Children Affairs. http://www.mowca.gov.bd/site/page/72926d78-cf02-442f-bf19-99122b6b082d/Implementing-Programs

change; and partnerships. The first pillar deals with the a2i program itself. The program strives to become a women-friendly organization by ensuring equal opportunities for both male and female staff and promoting a gender sensitive work environment. The second pillar is about program intervention – whereby gender considerations are sought to be integrated in designing, implementing and reporting. A gender dashboard has been set up, to facilitate the results management team of the a2i program in tracking progress towards the gender inclusion strategy. The third pillar focuses on government organizations; building government officers' capacity and awareness to incorporate gender considerations in daily and strategic decision-making. As part of this strategy, all ministries need to appoint a gender focal point and ensure the involvement of women in their digital innovations. The last pillar looks at the partners of the a2i program in the private and NGO sectors, proactively exploring with them different strategies for promoting gender sensitivity and empowerment.

The a2i program began in 2007, with support from the United Nations Development Program (UNDP) and United States Agency for International Development (USAID). Instead of delegating Digital Bangladesh to certain ministries, the government opted for a whole-of-government approach through an innovation intermediary. In this approach, the responsibility for digital innovations rests with the entire government machinery - the a2i program being the focal point of digital innovations. In fact, the program spearheaded several e-government projects focused on women, particularly in the areas of commerce (Service Innovation Fund), livelihoods (Joyeeta.com), education (Teacher's Portal) and health (Government Hospital Service Delivery). It has also launched initiatives to provide ICT access to rural areas (Union Digital Centers) and increase public awareness about women's empowerment (through television commercials).

Alongside with the a2i program, the Ministry of Women and Children's Affairs pursues digital strategies to advance women's issues and welfare. In addition to a website, webmail and Facebook page, the ministry has internal and central e-services. The internal e-services include the Joy Mobile App (an ICT tool to fight violence against women). The central e-services include e-tax payment and an inheritance calculator. Such services are offered to improve women's economic empowerment; for women to be aware of their rights to inheritance and increase their capacity to understand the country's taxation system.

Given the presence of a gender focal point, which is part of the a2i program's third pillar, other ministries have formulated future plans regarding ICT and gender. The ICT Department under the Ministry of Posts, Telecommunications and IT has the "She Power Project", which aims to create an enabling environment for women's participation in the ICT sector and thereby develop their careers as entrepreneurs and generate employment opportunities for them. For example, in April 2013, the ministry signed a MOU with Dell to teach rural women about careers in ICT and absorb them as Dell service engineers.

The overall picture reflects shifting trends, with an explicit commitment to a gender responsive approach catalysed by the a2i programme. Although there was an initial a lack of a gender perspective, the a2i program has slowly moved some government ministries such as the Ministry of Posts, Telecommunications and IT towards greater gender inclusiveness through its four gender strategy pillars. However, there is still a need to incorporate gender inclusiveness in other ministries.

The following sections of this paper will discuss the digital initiatives in the country, including good practices in the area of e-government for women's empowerment. In examining e-government, it covers the aspects of service delivery, citizen uptake and connectivity.

2. Status of e-government?

This section provides an overview on the status of e-government in the country (covering the facets of service delivery, citizen uptake and connectivity architecture) using a gender lens.

2.1 Service Delivery

On the whole, the Bangladeshi government is guided by a gender-neutral vision of ICTs for improving the quality of public service delivery in its e-government efforts. It is this type of thinking that has informed the development of the Bangladesh National Web Portal together with a national forms portal and convergent service delivery platform. The national web portal (www.bangladesh.gov.bd) has been developed in a way wherein citizens can access information and services of all public offices in one platform and web address. Through this single gateway, citizens can access the websites of unions, upazillas (sub-districts), districts, divisions, directorates, departments and ministries. The national web portal contains more than 25,000 government websites, which have information on more than 43,000 government offices. It has uploaded more than 71,000 photographs of the country's natural beauty, archaeological, historical and traditional sites. Together with the national web portal, the government established Sebakunjo (all services platform) and forms portal. Sebakunjo (www.services.portal.gov.bd) is a web platform where citizens can browse and find

all types of public services. The forms portal (www.forms.gov.bd), on the other hand, makes it easy for citizens to search and download government forms. The forms are divided into types - law, job, education, land, agriculture, environment, health, bank, industry, information, post and telecommunication, local government, etc. There are around 1,400 forms; 1,200 are in pdf format. These can be downloaded and filled out. The website (plus the services of the Ministry of Women and Children's Affairs) is included in the national web portal.

During an interview for this study, Deputy Secretary of the Ministry of Posts, Telecommunications and IT, Mustain Billah, demonstrated how the national web portal works, showing all the inquiries made to his office during the day and how all his responses to these inquiries have been logged. In this manner, the government can monitor which offices respond immediately to citizen queries and which offices do not. He explains that this is part of the e-filing system, which has been introduced to provide prompt, transparent and efficient services. The system is in place at the Prime Minister's Office, 20 ministries, four directorates, 64 deputy commissioner's offices and seven divisional commission's offices. To keep the national web portal regularly updated, the government has designated more than 30,000 information providing officers and trained another 71,000 officers. It has around 550 master trainers countrywide and ensures that there is one trainer in every district and upazilla (sub-district).

While inquiries and responses logged under the national web portal by each officer are visible to the monitoring machinery at the government-end of the web portal, on the citizen-end, only the individual citizen who filed the enquiry can access the response. Data about promptness levels of different offices in addressing queries is also not published in the public domain. This makes a citizen-end audit of promptness of different offices in addressing queries quite challenging.

Apart from these initiatives, the government has set up a digital record room particular to matters concerning land. Khatian (land record) services started as a test case through the online system of the Deputy Commission's Office in Jessore District in 2010. In 2011, it was upgraded to the "Electronic Land Record Service" and piloted in three districts. With its success, the system has been replicated and replaced with the "Digital Record Room". As of July 2016, 1.95 million records have been digitized and 172,026 online applications have been received.

In the eyes of the government, both men and women are seen as benefiting from such digital innovations. A gender-neutral thinking prevails in the majority of governmental digital initiatives in the areas of service delivery, education, language tools, legal services, media, health, agriculture, business, transport and taxation. Most of these efforts assume a target group that is an homogenous mainstream user and does not take into account the differentiated needs of women.

The government likewise views its ICT initiatives as enforcing its Right to Information Act 2011; knowing fully well that "information is the cardinal source of power - those who possess information are powerful, and those who do not have access to information are powerless" (Mishbah:2013). According to Mishbah, access to information helps increase citizen confidence as decision-making becomes more transparent; assists public administration to become more efficient and effective as record keeping systems are organized and procedures are established; allows scarce resources to be properly applied and utilized; and can serve to increase foreign investment. It is a tool that provides the power to ensure that social services reach the most disadvantaged and marginalized people; supports true social accountability; and promotes political and economic empowerment and the protection of individual rights. As women are one of the most vulnerable and marginalized sectors in society (facing the double burden of generating income and caring for children), the Act provides them with meaningful access to information.

Some e-service delivery projects and programs have yielded benefits specifically for women and can be categorized along the following lines:

a. projects with a large proportion of women beneficiaries.
b. projects that possess design elements that ensure women's inclusion.
c. projects that are women-directed/exclusively targeted at women.

A. Projects with a large proportion of women beneficiaries.

In 2013, the government established the Teacher's Portal (www.teachers.gov.bd) with the objective of devising a modern, far-reaching supplementary tool for teacher training. Therefore, it designed and developed an online social platform for school and college teachers, which functions as an online repository of multimedia materials and an idea generating/problem solving platform regarding teaching pedagogy. In other words, the portal provides a peer-to-peer collaborative environment for lifelong learning support for teachers.

a2i Program Policy Advisor Anir Chowdhury, in a presentation to United Kingdom Trade and Investment (UKTI) on 30 January 2015, said that the Teacher's Portal is the most cost-effective way to conduct teacher training[7]. The country has more than 30 million students and nearly one million teachers in over 120,000 primary and secondary schools. Traditional face-to-face training entails so much resources that it takes five to six years to update the knowledge and skills of all teachers in the system. For this reason, the government has no option but to devise alternatives to traditional pedagogic training.

As of July 2016, more than 132,000 teachers from all over the country have registered in the portal, of whom 45.85 per cent are female. They can access around 100,000 pieces of content developed and uploaded by their fellow teachers relating to

7 https://www.youtube.com/watch?v=n3_bn2w31Cs

the teaching of languages, information technology, science, social studies, religious studies, mathematics and others. The a2i program also established 23,331 multimedia classrooms (i.e., one laptop with Internet connectivity and a projector) in schools so that teachers can access the portal and utilize the said technology as part of their teaching-learning methods. It must be noted here that over 39 per cent of the country's teachers are female, and hence the portal is an important initiative to assess, in the study of the gendered impacts of e-service delivery. In a survey undertaken amongst registered portal users, the a2i program discovered that the portal furthered gender equality as it reduced discrimination against female teachers. Table 1 illustrates the benefits that female teachers are perceived to obtain from the said portal.

Table 1
Perceived Benefits to Female Teachers of the Teacher's Portal

Perceived Benefits	Percentage
Won't need to travel far	80.7
Can receive training besides doing housework	80.7
No security concerns	33.1
TCV (Time, Cost and Visit) decrease	29.5
More active participation	23.5
Teacher skill development	22.9
Religious restriction is not a barrier	11.4
Gender gap in teacher-related knowledge would decrease	6.0
No need to spend night somewhere else	5.4
Pregnant teachers won't miss training	4.2
Teachers uncomfortable at big forums can take training at their own convenience	3.0
Disabled teachers can also receive training	0.6
Others	3.6

Source: https://www.youtube.com/watch?v=n3_bn2w31Cs

As illustrated by the table, the respondents indicated that females benefit from the portal since they do not have to travel far (80.7 per cent), can receive training while doing housework (80.7 per cent), and do not have security concerns (33.1 per cent). It should be noted that in Bangladesh, women have less mobility as compared to men due to reasons such as security, household chores and norms binding women to the home. Given this, many female teachers miss training opportunities, particularly if they need to travel to the regional or national capital. With the portal, female teachers need not worry about leaving their homes for training and for this reason, many of them registered to be members.

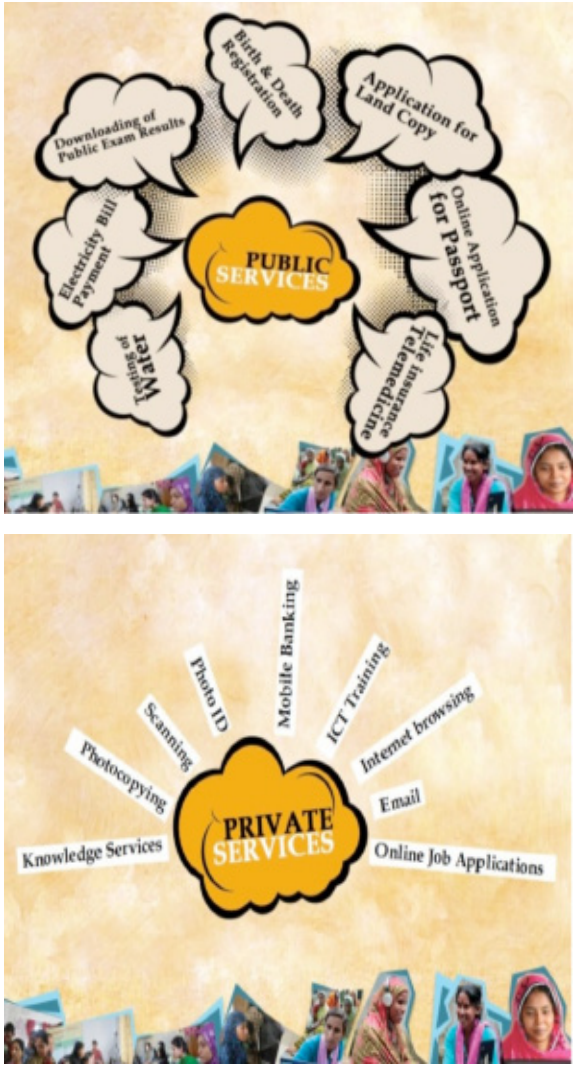
B. Projects whose design elements ensure women's inclusion.

Gender-responsive design is exemplified by the a2i program's flagship project, the Union Digital Centers (UDCs). The UDCs serves as an alternative to government front-offices for service provisioning. In the past, people needed to travel long distances to reach government offices located in urban and/or semi-urban areas. They thus had to spend a lot of time traveling back and forth; especially because of the lack of information regarding

the processes and requirements to obtain public documents. They also had to incur additional costs such as transportation, accommodation and food. UDCs decentralize the delivery of public services; bringing both public and private services to millions of underserved citizens. Asad-Uz-Zaman (2012) provides a list of public and private services offered by these digital centers. Public services include downloading of public exam results, application for land copy, online application for passport, electricity bill payment, birth and death registration, testing of water, life insurance, telemedicine, etc. Private services include email, Internet browsing, ICT training, mobile banking, photo ID, scanning, photocopying, knowledge services, online job applications, etc. UDCs provide a total of 102 public and private services. A snapshot is shown in Figure 1.

Nine years after declaring Digital Bangladesh, the government has established UDCs in all 4,547 union parishads (lowest level government service offices) of the country. The government, however, adopted a business model in operating the UDCs, bringing in local entrepreneurs to run the centers and entering into numerous agreements with corporate entities. Instead of going at it alone, the government sought market relevance and sensitivity to citizens' demand. With entrepreneurs, the UDCs would not be shutting down on weekends like government offices normally do. As a result, UDCs are believed to be citizen-centric and bottom-up in approach. They function as one-stop information and service delivery outlets.

Figure 1
Public and Private Services Offered in Union Digital Centers (UDCs)



According to Naimuzzaman Mukta, People's Perspective Specialist, a2i (Access to Information) Programme, the UDCs' design elements are very novel since it reaches out to the underserved, extending the service beyond usual office hours. A typical center is about four kilometers away from a person's home. A government sub-district office is about 20 kilometers away whereas a district office is more than 30 kilometers away. The UDC management model fuses together the mandate and infrastructure of the public sector and the entrepreneurial zeal and efficiency of the private sector. It also requires a male and a female entrepreneur for each UDC. In doing so, it ensures women's empowerment as women have the opportunity to become entrepreneurs and women citizens can be attended to by a person of the same sex, which is highly beneficial given that UDCs are seen as public spaces (and for those communities with conservative values, women are barred from entering such spaces occupied only by men).

As of July 2016, UDCs have provided 237 million services, undertaken 75 million birth registrations, processed the registration of 2 million prospective migrant workers, included more than 4 million citizens in m-banking and covered 0.29 million citizens for life insurance. The entrepreneurs, who laboured for such achievements, earned USD 28.15 million. With the policy of making women co-managers, UDCs have become more accessible to women and have made possible women-specific livelihood projects (which were done in partnership with corporations).

The a2i program has identified three challenges that are being faced by the UDCs, at present. First, the entrepreneurs need to find the right mix between financial and social sustainability. Citizens now trust UDCs as a decentralized government desk, as indicated by their popularity. However, the financial viability of UDCs remains a problem in many areas. Second, the quality of service differs from one UDC to the other. The a2i program admits that they have not ascertained or studied these differences in quality. Third, many female entrepreneurs simply allow their male counterpart to take the lead. Some have also stopped going to UDCs after getting married or after giving birth. As a result, the design for women's participation in UDCs has not effectively materialized. Given that UDCs are considered as public spaces, the absence of female entrepreneurs makes it harder for women users to enter the centers given social barriers and norms in relatively conservative communities.

C. Projects that are exclusively directed at women

In accordance with its gender strategy, the a2i program has embarked on several projects to empower women, which it does in collaboration with the Ministry of Women and Children's Affairs and/or Ministry of Posts, Telecommunications and IT. For example, it gives out Leadership Awards to women role models as part of celebrating International Women's Day. As part of the information portal/ content repository "Jatiyo e-tathyakosh (http://www.infokosh.gov.bd/)", a section containing content

on women's health and violence against women has been developed. The portal was established in 2011 with contributions from various organizations on topics such as health, education, agriculture, law and human rights, non-farm activities, disaster management, employment and commerce. It has, at present, 90,000 pages of content.

In March 2013, it opened the "Service Innovation Fund" to provide seed funds and incubate cost-effective, citizen-centered design innovations to improve public services for underserved communities. To date, the program has allocated one-third of its funds to support 13 women-oriented projects, incubated jointly by government, NGOs and the private sector. One of the more successful projects is called Joyeeta (or victorious in English; ejoyeeta.com) which enables more than 60,000 women producers and 5,000 micro-entrepreneurs to advertise and sell their products online. E-Joyeeta was set up as part of the a2i program service innovation fund with the involvement of the Ministry of Women and Children's Affairs, Union Digital Centres, private sector organisations and NGOs.

According to Deputy Secretary and Additional Director of the Women Affairs Department, Shahnowas Dilruba Khan, ejoyeeta.com e-business platform aims at supporting and facilitating grassroots women entrepreneurs showcase their arts, crafts, products and services. The products sold cater to men, women and children. There are also home decorative items. Consumers can easily log into the website and create their own account. If they wish to purchase products, they can either pay through a bank (Dutch Bangla Bank),the mobile financial service provider (bKash) and/or cash on delivery. The money goes into the bank accounts of the women entrepreneurs. The delivery can be made within 24 hours. In addition to the website, the Joyeeta project has established an independent sales center called Joyeeta Marketing Center at the fifth floor Rapa Plaza, Dhaka City. There are around 140 stalls in the center. Consumers can go here and purchase their desired goods. In interviews conducted for this research, the stall owners expressed confidence about the prospects of the Joyeeta project. They regularly brand their products through the online platform. As a result, the sales of their products increase, especially during cultural and religious festivals. With a steady income source, the project has helped them improve their quality of life.

The latest e-government innovation exclusive to women is the "Joy" mobile app, launched in August 2016, as part of the a2i programme in partnership with the Ministry for Women. The mobile app aims to provide instant support to women or children falling victim to any type of violence. When the emergency button is pressed in the app, a message is sent over to the national helpline center, police control room, nearest police station and friends or family members. The a2i program instructs that "any woman or child facing unfavorable or violent situations can quickly send a text message to 10921 via this app" to get help immediately. In case the user is not able to access the app in an emergency, the mobile's power button has to be pressed four times which will put the cellphone on vibrate mode, and with the fifth press of the power button, the message will be sent

to the respective authorities for help. A few reserved numbers can be set up along with the phone number of authorities that are already in the app, once they are contacted, they track the user based on GPS location to provide instantaneous support. Mobile operators have been asked to allow the use of the 'Joy' app free of charge. The app is on a trial run in a few cities such as Jessore, Keraniganj and Tongi. However, in order to analyse the effectiveness of the app, dedicated studies are needed.

2.2 Citizen Uptake

With an enabling environment, Bangladeshi citizens have embraced the digital age; participating and benefiting from various e-government initiatives. The Bangladesh Telecommunication Regulatory Commission (BTRC) shows an increasing trend in Internet use in the country. From only 0.07 per cent in 2000, it rose to 14.40 per cent in 2015. The astronomical increase was due to mobile Internet usage estimates. In 2013, BTRC estimated that the population of Facebook users in Bangladesh is 3.39 million.

With greater Internet access and use, more citizens participated in e-government initiatives. As of July 2016, the a2i program reported more than 90 million hits per month for the National Web Portal, which contains 25,000 plus government websites. The type of content visited may be broken down as follows:

Table 2
Percentage of Internet Users in Bangladesh (2000-2015)

Year	Population	Percentage
2000	131,280,739	0.07
2005	142,929,979	0.24
2010	151,616,777	3.70
2015	160,995,642	14.40[8]

Source: Bangladesh Telecommunication Regulatory Commission, 2016

Table 3
Type of Content Visited in National Web Portal (average per month)

Portal Type Visited	Number of Hits
e-Directory Users	7.65 million
e-Services Users	1 million
Government Forms Users	0.25 million
Hotels and Rest Houses	1,728
Tourist Users	1.5 million
Growth Centers/Markets	10,944
Religious Institutions	19,897
Public Representatives	26,000
Photographs of Important Places	71,000
Educational Institutions	65,000
Development Projects	65,538
Financial Institutions	1,386

Source: a2i Program, Prime Minister's Office

8 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.

There were a total number of active UDCs registered in July 2016. On the Teacher's Portal, there are 132,300 members; 120,000 teachers have been trained on operating multimedia classrooms; and there are 39,000 blog posts; 98,375 active users monthly; and nearly two million page views monthly. However, gender-disaggregated data of the uptake of the Teachers' Portal is not available.

Truly, Bangladesh may no longer be categorized as a country with deficient e-government capacity where e-government is low priority. Its e-government has come a long way since the 2001 UNDPEPA and ASPA study. The country has moved up significantly in the e-Government Development Index from a world ranking of 150 in 2010 to 124 in 2016.

Table 4
e-Government Development Index and World Ranking for Bangladesh

Year	e-Government Development Index	World Ranking
2010	0.3028	150
2012	0.2991	134
2014	0.2757	148
2016	0.3800	124

Source: UN e-Government Knowledge Database (2016)

Bangladesh' Telecommunication Infrastructure Index and Human Capital Index have shown improvement. According to the UN data, around 9.6 per cent of the population uses Internet[9]. There are 75.92 mobile telephone subscriptions per 100 inhabitants. Literacy rate has reached 61.55 per cent and gross enrolment ratio is 39.59 per cent. It should also be noted that the country has a world rank of 84 in the e-Participation Index. The UN believes that promoting participation of the citizenry is the cornerstone of socially inclusive governance. The e-participation index (EPI) focuses on the use of online services to facilitate the provision of information by governments to citizens ("e-information sharing"), interaction with stakeholders ("e-consultation"), and engagement in decision-making processes ("e-decision making"). The initiatives of the a2i program towards e-participation have improved the country's world ranking and since these are still in the early stages, e-participation is expected to grow further in the coming years.

9 The UN counts the aggregate number of Internet users by various platforms - wireless, telephone line, broadband and mobile. The national telecommunications regulator, BRTC, uses a different methodology to measure connectivity – that of counting the number of active Internet subscribers in the past 90 days – and hence, the estimates of the UN and BRTC are different.

Table 5
Telecom Penetration and e-Government Development Components for Bangladesh (2016)

Indicators	Figure
e-Government Development Index	
• Rank	124
• Index Value	0.3800
Online Service Index	
• Index value	0.6232
Telecommunication Infrastructure Index	
• Index Value	0.1193
• Percentage of Individuals using the Internet	9.60
• Fixed Telephone Subscriptions per 100 inhabitants	0.69
• Mobile Cellular Telephone Subscriptions per 100 inhabitants	75.92
• Fixed (wired)-broadband Subscriptions per 100 inhabitants	1.19
• Wireless Broadband Subscriptions per 100 inhabitants	0.50
Human Capital Index	
• Index Value	0.3973
• Adult Literacy (per cent)	61.55
• Gross Enrolment Ratio (per cent)	59.39
• Expected Years of Schooling	9.98
• Mean Years of Schooling	4.25
e-Participation Index	
• Rank	84

Source: UN e-Government Knowledge Database (2016)

For these reasons, it is hardly surprising that in 2016, for the third consecutive year, Bangladesh won the World Summit on the Information Society (WSIS) Award for initiatives under the a2i program. The innovations include Service Process Simplification (SPS) for Increased Transparency, Efficiency and Responsiveness (category 6: enabling environment), Development of the web-based Environmental Clearance Certificate (ECC) Application System of the Department of Environment (category 7: e-government), Teachers' Portal for Empowerment (category 9: e-learning), and Farmer's Window (category 13: e-agriculture).

Digital Divide in Bangladesh

Although citizen uptake of the Internet and e-government services has been expanding drastically, there exists a digital divide in the country.

It is important to examine the concept of the digital divide before discussing its specific manifestations in Bangladesh. Manicinelli (2007) explains that there are three types of digital divides: (1) access divide (those with and without access to ICT), (2) usage divide (those who use and do not use ICT), and (3) quality of use divide (difference in usage by users). To measure the digital divide, the Digital Divide Index (DDIX) may be utilized. Husing and Selhofer (2002), after measuring social inequalities in European ICT adoption, concluded that the following groups are at high risk of being impacted by the digital divide, along various socio-structural axes: gender (women), age (50 years and older), education (low education group) and income (low income group). The DDIX indicators consider the percentage of total computer users, percentage of computer users at home, percentage of total Internet users and percentage of Internet users at home. A low score in the DDIX may indicate a lower quality of life. Manicinelli (2007) asserts that the lack of access to digital technologies puts individuals at a disadvantage. They are excluded from benefits of changing social structures and relationships, new working methods, new ways of education

and training, and emerging communities of learners in the digital society.

In Bangladesh, those with lower education, those residing in rural areas and those who are female are at a higher risk of being unconnected, reflecting global patterns in digital divides. Table 6 shows that those who are pursuing/have completed bachelor's degree, master's degree and/or medical/engineering degree account for 58.32 per cent of the country's Internet users. Those who are pursuing/have completed technical/vocational education comprise 8.0 per cent while those who are pursuing/have completed lower and higher secondary education make up 9.6 per cent. In other words, the more educated one is, the more likely one is to have access to the Internet.

Table 6
Individuals Using Internet by Gender and Education

Aspects	Male	Female	Total
No education	0	0	0
Class I to V	0	0	0
Class VI to VIII	0.54	0.43	0.48
Class IX to X	4.25	2.95	3.6
Lower Secondary	4.27	2.83	3.65
Higher Secondary	6.74	4.62	5.95
Technical/Vocational	8.05	7.84	8.0
Bachelor's Degree	13.47	12.59	13.21
Master's Degree	18.19	16.57	17.76
Engineering/Medical	27.2	27.96	27.35

Source: The Bangladesh Literacy Survey, Bangladesh Bureau of Statistics (BBS), 2010

Table 7, meanwhile, indicates the divide between urban-rural and the male-female users. In 2013, only 6.6 per cent of the Bangladeshi population used the Internet. There were more urban dwellers (18.1 per cent) using the Internet as compared to rural residents (2.1 per cent). In addition, more men (8.2 per cent) were using the Internet as compared to women (5.1 per cent). In both urban and rural areas, there was a greater percentage of male users as compared to female users.

Table 7
Individuals Using Internet by Gender and Location (2013)

Aspects	Percentage
All Individuals	6.6
• Male	8.2
• Female	5.1
All Urban Individuals	18.1
• Male	21.8
• Female	14.6
All Rural Individuals	2.1
• Male	2.9
• Female	1.3

Source: ITU World Telecommunication/ICT Indicator Database

The following sections discuss the digital divide between men and women in the country. First, it looks at the case of affluent urban women and second, it investigates the digital exclusion of rural women.

The Case of Affluent Urban Women. Although there exists a digital divide between men and women in the country, the degree of inclusion/exclusion is not determined by gender alone. Genilo and Akther (2015) argue that the digital inclusion/exclusion of women is determined by both the individual's socio-demographic context (age, education, location, occupation and civil status) and the citizenship status of her local community in ethnic, religious and ideological terms. In this sense, it cannot be said the women per se are digitally excluded. With the right demographic and socio-economic characteristic, women have been shown to be digitally included. Several studies (Haque, 2013, Hossain & Sultana, 2014 and Haque & Bin Qader, 2014) have documented that urban, affluent and educated women who belong to liberal (secular) minded families are very much integrated into the digital world.

The divides in terms of women's access to STEM careers, however, stubbornly persist. The Managing Director of PlusOne, a cloud-based telemedicine platform, in an interview with the Dhaka Tribune on 27 April 2017, said that the man-woman ratio in the ICT sector is still "unacceptable". She felt that more women need to be enrolled in ICT courses; more women need to be recruited to fill in jobs in the sector; and strong mentorship should be provided to women so that they believe that can compete equally against men. At the moment, it is only the affluent women who have made some gains in penetrating the ICT sector. Genilo, Akther and Haque (2013), after in-depth interviews with 12 women students, professionals and entrepreneurs who have succeeded in the ICT sector, discovered that women who were successful had the following personal characteristics, they: expressed an inclination towards computers and technology; were exposed to computer education and Internet at an early age; owned a laptop, desktop or tablet and had Internet connection at home or in school; managed to navigate the Internet in English and in Bangla; possessed computer skills (high computer literacy); used computer and the Internet for a variety of purposes (relatively superior quality of ICT usage); and had social support for ICT use. These women belonged to families with liberal (secular) mindsets.

Digital Exclusion of Marginalized Rural Women. The scenario for women residing in rural areas, on the other hand, was very different. Unlike their urban counterparts, many women do not own or possess desktop and laptop computers or mobile phones with Internet access. Rather, most can only access the Internet from the Union Digital Centres (UDCs) and/or if their male relatives are willing to lend them their computers. Genilo and Akther (2015) visited two UDCs located in two differing types of villages - one with a more secular ideology (Kapasia, Gazipur, Dhaka Division) and one with a more Islamist belief (Sharsha, Jessore, Khulna Division). During the visit, around 30 male and female UDC users, UDC entrepreneurs and community leaders were interviewed in-depth. From the interviews, they constructed four levels of digital inclusion/exclusion of male and female respondents.

Matrix 1
Levels of Digital Inclusion/Exclusion of Male and Female Respondents

Tier	Gender and Occupational Groups	Description
1. (Most Included)	Males: Students, Professionals and Businessmen	• Access to computer and Internet at the telecenter, workplace and/or school. Unrestricted and very frequent visits to telecenter. • Access to ICT device at home and ownership of multiple ICT devices with Internet access such as desktop, laptops and mobile. • Moderate to high computer literacy and English proficiency. • Extensive usage of ICT devices. • Usage of ICT devices for entertainment, information, education, communication, business, bill payments, exam results and social networking.
2. (Relatively Included)	Females: Students in both villages	• Access to computer (mainly) and Internet (sometimes) at the telecenter and/or school. Frequent visits to telecenter for training purposes. • Access to ICT device at home if permitted by male family member. • Some own mobile phone and fewer with Internet access. • Moderate usage of mobile phones. • Moderate to high computer literacy and English proficiency. • ICT devices used mainly for education and communication. To a limited extent, for entertainment and information.
3. (Relatively Excluded)	Females: Professionals in both villages and Housewives in Kapasia	• Access to Internet at the telecenter and/or workplace. Moderate number of visits to telecenter. • Access to ICT device at home if permitted by male family member. • Some own mobile phone and most without Internet access. • Limited usage of mobile phones. • Poor to moderate computer literacy and English proficiency. • ICT devices used mainly for bill payments, exam results, social networking, online job applications and communication.
4. (Most Excluded)	Females: Housewives in Sharsha	• Access to Internet at the telecenter. Rare number of visits to telecenter. • Access to ICT device at home if permitted by male family member. • Few own mobile phones. • Poor computer literacy and English proficiency. • Very limited usage of mobile devices (for communication purposes only). • ICT devices used mainly for communicating with family members living abroad.

Source: Genilo and Akther (2015)

At the highest level of digital inclusion (most included), one finds male respondents – students, professionals and businessmen. They have complete freedom to access the Internet and own ICT devices. At the second level (relatively included), are female students. They are allowed to visit the UDCs and use their male relatives' gadgets, mainly for educational purposes. Also, they have relatively higher language skills and computer literacy. Basically, rural women's access to digital devices depends on the support of men. The male family member buys the SIM card and the mobile phones. Female members may use mobile phones but they are not the real owners. They need to seek permission from their husbands. At the third level (relatively excluded), one spots female professionals and housewives in the secular-minded village. They are allowed a few visits to the UDCs. They have moderate computer and English language proficiency. Since many Kapasia housewives have husbands working abroad, they need to access the Internet for various reasons. At the lowest level (most excluded), one finds the housewives in Sharsha - who rarely visit the UDCs. They are also digitally excluded due to weak English language skills and also, they are not really interested in knowing about digital technologies.

Matrix 2
Description of Individual Characteristics affecting Women's Digital Inclusion in the Select Villages

Characteristics	Description
Occupation	Students have a high level of digital inclusion in both communities. This is because it is socially accepted that students' main responsibility is learning and computers are part and parcel of the learning process. Professionals likewise have a moderate level of digital inclusion given their need to search for jobs, communicate with colleagues and look for work-related information.
Civil Status	Once married, the key responsibility of women is to look after the home and their children. The enormity of the responsibility affects their mobility (like going to the telecenter).
Presence/ Absence of husbands	When husbands are working abroad, housewives need to fill in their shoes in terms of becoming the head and main decision maker of the household. They need to be mobile and also search for information in order to make better decisions. Thus, housewives whose husbands are away tend to access the Internet more, when compared to their counterparts whose husbands are still residing with them.

Source: Genilo and Akther (2015)

Based on these, Genilo and Akther (2015) conclude that certain individual variables affect women's digital inclusion/exclusion in Digital Bangladesh - occupation, civil status, education and presence of the husband. Moreover, community ideology also affects women's digital inclusion/exclusion. Relatively secular-minded villages are more inclusive as wives participate in decision making and are able to pursue professions as long as they fulfil household work. They can also join community activities. In more conservative communities and villages, women

are discouraged from pursuing higher education and professional careers. They are mainly tied to the home; taking care of their husband and children. The roles imposed on them have a bearing on their access to UDCs.

Matrix 3
Description of Community Citizenship Characteristics affecting Women's Digital Inclusion the Select Villages

Characteristics	Description
Secular (Kapasia)	Women are mainly responsible for the children and home but can make decisions on certain matters such as education, health and family planning. They are allowed to pursue higher education and embark on a professional career as long as they fulfil their household duties. They are not prohibited from joining social clubs and organizing social events. Women with good qualifications are encouraged to hold political positions. The participatory role of women in household, community and politics warrants their access and use of ICTs.
Islamist (Sharsha)	Women are mainly responsible for the children and home. They cannot make decisions without the consent of their husbands but are allowed to voice their opinions. They are not encouraged to pursue higher studies or embark on professional careers. Rather, they are persuaded to marry early. They can participate in religious projects and foundations but dispirited to organize community events. Some are prevented from voting and engaging in political activities. As a norm, married women should not freely mix with men in public spaces. The passive role of women and restrictive cultural norms become hurdles in accessing and using ICTs.

Source: Genilo and Akther (2015)

2.3 Connectivity Structure

Bangladesh has great digital ambitions. It wants to become the next ICT hub after Silicon Valley, Seoul, Boston and Bangalore. It plans to earn USD 5 billion annually from the ICT industry and create one million jobs by 2021. To enable this, the government knows that it needs to drastically improve its connectivity structure. For this reason, the government entered into an agreement for a second submarine cable. A consortium of 15 telecommunication operators from 16 countries across three continents built the South-East Asia-Middle East-Western Europe 5 (SEA-ME-WE-5). The 20,000 kilometer cable from Marseille to Singapore would be offering 100gbps DWDM technology; having a capacity of 24Tbps on three fibre pairs. This would deal with the quadrupling of bandwidth demand between Europe and Asia. Bangladesh was connected to the second submarine cable via Kuakata landing station on 21 February 2017. Through this, the country is expected to get another 1500 Gbps bandwidth. Currently, it has nearly 300 Gbps bandwidth from the first submarine cable. At the time of writing this paper, the connection between Kuakata landing station and the mainland is yet to be established.

True enough, the demand for Internet connectivity has been expanding in the country and the second submarine cable comes at a very opportune time. The BTRC in July 2016 reported 63.91 million mobile Internet subscribers. In many respects, Bangladesh has come a long way since it awarded a license to its first telecommunication operator in 1989. UK-based Consulting

Company Deloitte (2015) stated that "the increase in mobile access has brought a wide range of benefits to the Bangladeshi economy and society, including increased productivity and economic growth." It likewise reported that over 90 per cent of people with access to the Internet use it via mobile connection over the 2G network, via feature-phones or low-end smartphones. Only 4.5 per cent of the population is connected to a 3G network. Given that fixed line penetration is less than one per cent, mobile phones could be the most cost-effective way to extend access to ICT and broadband Internet in the country.

The Next ICT Hub

Bangladesh appears all set to become the next ICT hub. In recent years, it has attracted global ICT companies such as Samsung and Advanced Micro Devices (AMD) – which have established their Research and Development (R&D) centers. Gartner, a technology research house, has included the country in the top 30 outsourcing destinations in a 2010 report (Mashroor, 2013). According to the Bangladesh Association for Software and Information Services (BASIS), the software market in the country has grown more than 50 per cent in the last two fiscal years. The export of software products may even exceed USD 100 million next year (Huda, 2013).

There are more than 150 registered companies in Bangladesh that export software products, mainly mobile application solutions and IT-enabled services (ITES). Moreover, there are an estimated 75 freelance software developers. Tandon (2006) had estimated the ICT industry in the country to be growing at an average of 20 per cent per annum for the previous seven years.

Apparently, the country is experiencing a third wave of IT outsourcing. The first wave was in consumer electronics while the second wave was in auto components, pharmaceutical and telecom equipment. The third wave of outsourcing consists of call centers, payroll processing, data entry, software engineering and research and development. BASIS has projected a tripling of current export performance in the near future if sufficient telecommunication infrastructure is provided. For BASIS, Bangladesh has comparative advantages to take a bigger slice of the global IT/ITES market. The country has abundant young and trainable labor, low IT/ITES labor costs, supportive government for digital initiatives and an active industry association.

In the eyes of the government of Bangladesh, ICT development is an engine for economic growth, particularly in the manufacturing and service industries (Tandon, 2006). In order to pursue its plans to establish high tech zones and a software technology park with dedicated data communication facilities, it set up in 2010 the Bangladesh hi-tech Park Authority (BHTPA) - an autonomous body to develop the ICT industry through the creation, management operation and development of hi-tech parks. In the parks, foreign investors are granted special privileges such as allowing 100 per cent foreign direct investment, provisioning of a single window agency, granting 10-year tax exemptions, building separate power plants, enabling duty-free import of capital machinery, providing fibre optic connectivity and ensuring direct

rail connectivity. In line with the government's vision to develop Digital Bangladesh, a total of twelve parks will be established in separate districts - Jamalpur, Natore, Thakurgaon, Comilla, Maymensing, Kareniganj (Dhaka), Barisal, Rangpur, Rajshahi, Sylhet, Khulna and Chittagong.

Women' participation in the ICT Sector. As a result of these developments, there is a growing demand for ICT workers in the country. According to Tandon (2006), the types of ICT jobs for which skilled labour is in desperate need in the country include ICT programming and applications, ICT platforms to support enterprises and ICT manufacture, service and repair.

In top leading newspapers, such as Prothom Alo (First Light) and Daily Star, there has been a shift in the types of ICT job vacancies and qualifications between 2004 and 2013. From being more technical/engineering oriented, jobs have shifted to ICT outsourcing such as data entry, call centers, etc. Keeping in line with this shift, the educational qualifications in demand have moved from technical/computer/engineering degrees to more general and diploma degrees. In both time periods, there is a demand for teachers for private and public universities offering computer, engineering and technical degrees. One major cause for concern regarding the fulfilment of this ICT hub aspiration relates to the country's work force. Tandon (2006) estimated that "the labour force is growing at almost twice the rate of the population growth, and this relationship is likely to remain unchanged for the next two decades or more as a direct result of the changing demographic dynamics." Furthermore, the deceleration of population growth could be offset by increased participation rates of women.

To increase women participation in the ICT sector, Tandon (2006) explained that the government needs to implement "effective, pro-active and deliberate policies that push for the social inclusion of women in all spheres of economic and social activity and decision-making." In addition, in a 27 April 2017 interview with Dhaka Tribune, Farhana Rahman, Vice President of Bangladesh Association of Software Information and Services stated that the flexibility in ICT jobs suit women. She noted that women traditionally have more responsibilities at home and people working in IT can have that flexibility if needed. "Women who want to give more time to their families, women who want to be entrepreneurs - should come into the IT industry. It has a huge potential."

It is also important to recognize that there is also a rural-urban divide when it comes to women's participation in the ICT sector. Currently, there is very little scope for rural girls to study ICT. Schools in major cities provide proper computer labs to facilitate ICT training. Moreover, urban families usually have a computer at home. For students in rural areas, the situation is completely different. Very few rural schools and colleges across the country have fully-fledged computer labs and trained teaching staff. The Barisal Teachers Association President Ashish Kumar Dashgupta informed Dhaka Tribune on 27 April 2017 that although ICT is a compulsory subject for all students, there are simply not enough teachers for the subject. Table 8 illustrates the state of ICT

infrastructure in primary and secondary schools across the country.

Table 8
ICT Infrastructure in Primary and Secondary Schools

Aspects	Primary	Secondary
Electricity	55%	71%
Telephone Facility	0%	93%
Computer Laboratories	1%	38%
Internet Access	3%	22%
With Website	0%	1%

Source: UNESCO, Institute of Statistics, 2014

As can be gleaned from the table, secondary schools have better ICT infrastructure as compared to primary schools. They have more computer laboratories and have greater Internet access. They also have more connection to electricity and have telephone facilities. However, it should be noted that schools in urban areas have better ICT infrastructure as compared to their rural counterparts. The government would need to exert more effort in this area if its ICT hub ambition has to work out.

Another track where government efforts are required to increase women's participation in the ICT sector is that of skill development initiatives. Both Shahnowas Dilruba Khan (Deputy Secretary and Additional Director, Department of Women Affairs, Ministry of Women and Children Affairs) and Mustain Billah (Deputy Secretary, ICT Department, ICT Division, Ministry of Posts, Telecommunication and IT), in separate interviews, revealed that several projects have been undertaken to bring women into mainstream development by initiating them in the ICT sector where they can get new job opportunities. The a2i program, for example, partnered with Bangladesh Women in Technology (BWIT) Forum to train around 3,000 rural women to freelance in the ICT sector. In collaboration with Microsoft Foundation, it provided training to 5,000 female UDC entrepreneurs on hardware and software development. Women with very low-incomes participated in self-employment and skill development programs, conducted as part of a project with UNDP. In Chittagong city, 140 women entrepreneurs participated in an innovation camp in November 2016. Among them, nine projects were approved for funding. The a2i program, as part of the fourth pillar of its gender strategy, engages in partnership with development and private organizations in the country to uplift women's status.

On 5 July 2017, the Ministry of Posts, Telecommunications and Information Technology along with the BWIT and Bangladesh Institute of ICT in Development (BIID) held the National Launch of the Women ICT Frontier Initiative (WIFI) in Dhaka City. The event had as its chief guest, Bangladesh Parliament Speaker Dr. Shirin Sharmin Chaudhury, and as special guest, Women and Children Affairs Minister Meher Afroze Chumki. WIFI is one of the flagship projects of the United Nations Asian and Pacific Training Center for Information and Communication Technology for Development (UNAPCICT-ESCAP). WIFI aims to promote women's entrepreneurship through enhancing capabilities of

women entrepreneurs in ICT and entrepreneurship so that they and their enterprises can become more productive. So far, there are five modules under WIFI covering business management, ICT skills and ICT-enabled women entrepreneurship, which have been translated into the Bangla language and piloted. The target of the initiative is to empower 25,000 female entrepreneurs in the ESCAP region by 2018.

3. Conclusion and recommendations

Bangladesh entered the digital era rather belatedly. Fulfilling its campaign promise, the government formulated three policy documents to forge ahead with digitization, Digital Bangladesh. However, these policies were mainly gender neutral, which in many respects deviated from the government's otherwise strong stance towards women's empowerment. The government pushed forward ICT/digitalisation projects that benefited society as a whole, with the assumption that these will automatically benefit women. For example, it constructed a national web portal to improve the efficiency and effectiveness of government service delivery. Through the portal, citizens could download forms and make queries to government officials, thereby fostering their capacities for participation. The portal likewise increased transparency as government call for tenders for different projects as well as achievements of different agencies are available online for all to see. This has helped in operationalising the right to information.

Through the Prime Minister's Office's a2i program, an internal transformation transpired. With the help of the USAID and UNDP, the program embarked on initiatives to transform itself into a gender-friendly environment. It created a forum where female staff could speak directly to top management; it ensured 60:40 staff representation in favour of women; and disseminated information to prevent sexual harassment in the

workplace. Apart from these, several of the staff were trained on how to formulate and monitor gender strategies. Such efforts facilitated the formulation of a gender strategy, which influenced program interventions; and collaborations with other government institutions and external partners. The a2i program, as the government's main digital innovator, pursued this strategy in several ways, compensating for the lack of a gender lens in national policy documents.

First, the program undertook projects that had special benefits to women. For example, it undertook two promising projects: the Joyeeta e-platform (where female entrepreneurs can advertise and sell their products) and Joy mobile app (where women can seek protection against violence and abuse). Second, the program aspired for greater digital inclusiveness. It established UDCs so that citizens would not have to travel far to access government services. As part of ensuring gender sensitivity in the design and functioning of the UDCs, it declared that the entrepreneurs handling the UDCs should consist of one male and one female. With a female entrepreneur, women would be able to enter and transact business in this public space.

There are several lessons to be learned from the a2i program concerning women and e-government. For one, the program formulated a gender dashboard to track the progress of the commitment to the gender strategy, collecting gender disaggregated data with a results management team regularly analyzing such data. Second, it ensured that women would avail of e-services through the UDC strategy, especially by appointing one male and one female entrepreneur in these centres. Then, the a2i program mandated that government offices should have a gender focal point; making it easier for them to collaborate on women-related issues. The program also established partnerships with development and private organizations in integrating women in the ICT sector and incubating women projects under the Social Innovation Fund.

Although the government has made great progress in inclusive e-government, there still exists a digital divide in the country. The citizens most at risk of social exclusion are those with lower income, lower education, older persons, and those residing in rural areas. Also, women are more likely to be excluded than men, and this gender divide is amplified along the socio-structural lines mentioned above. For example, affluent urban women find it easier to access the Internet than women from rural areas and conservative religious backgrounds, particularly if they are already married or are considered to be of marriageable age.

In light of these, firstly, it is recommended that, building on the learnings from the a2i program, the government may extend the gender strategy to cover other institutions with the aim of making them gender responsive. It may not be enough to simply assign a gender focal point in each institution. Instead, an internal transformation, similar to the a2i program, may be needed. With more gender responsive organizations, gender strategies will be drawn for an inclusive government service delivery system.

Second, as the government has grand ambitions to make the country an ICT hub, it would need to promote participation of women in the ICT sector to ensure success. At the moment, the a2i program has collaborated with government, private and development partners to enhance the entrepreneurial and ICT skills of women. In light of this, it is recommended that ICT training for women (in terms of knowledge, attitude and skill learning outcomes) be undertaken at the primary, secondary, tertiary and vocational/technical levels of education. The government may find it prudent to invest in building ICT infrastructure in schools all over the country; creating multimedia classrooms and building the capacity of female teachers along the way.

Third, scaling up from the successes of the Social Innovation Fund, where women's ICT-related livelihood initiatives were developed, the government may wish to consider creating ICT incubation centers throughout the country. In these centers, female entrepreneurs could be supported in coming up with new innovations/ideas relating to ICT and livelihood. In addition, the centers may serve as intensive training sites for women interested in pursuing ICT careers. These incubation centers may be linked to UDCs (as their infrastructure is already in place).

Fourth, on 19 June 2017, the Cabinet approved the "National Online Mass Media Policy 2017", which recommends the constitution of a National Broadcast Commission to facilitate the operations of online mass media in an organized manner. Earlier, on 22 August 2016, it approved the "Digital Security Act 2016", which tackles the problems of cyber-crime, fake news and defamation. Akin to the other national ICT policy documents, the new laws are gender neutral. They do not have provisions to safeguard women and do not define the types of cyber-crimes against women. In light of this, it is recommended that the government undertake measures to enhance gender awareness of leaders in the executive and legislative departments. Although 50 out of the 350 parliamentary seats are reserved for women, it should not be assumed that those who occupy these seats are mindful of women's rights and issues. Otherwise, the country will continue to have gender neutral laws and policies.

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