



SUSTAINABILITY OF UNION DIGITAL CENTRE IN BANGLADESH: HAS IT GOT INSTITUTIONAL ROOTS?

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Abstract:

In Bangladesh, Union Digital Center (UDC), an ICT (Information & Communication Technology) based telecenter, began its operations in 2009 in only 30 Union Parishads through partnership between Local Government Division and the Access to Information (A2I) program under the Prime Minister's Office, presently operating at all 4,547 Union Parishads of the country. It is a one-stop service outlet operating under the Public-Private-People's Partnership modality, run by local entrepreneurs, hosted by Union Parishad and supported by Central Administration. But stakeholders and observers frequently question the sustainability of these UDCs especially those in rural areas where telecommunications and electricity are problematic. The purpose of the study is to examine the sustainability whether the UDCs got institutional roots or not. It also attempts to find out the factors having influence on the sustainability of UDCs and also the challenges and the possible remedies for ensuring sustainability. The study used both quantitative and qualitative methods of research. It has been found that having high potentiality UDC's sustainability is affected by various factors like Entrepreneur's Qualification such as professionalism and technical skill, Infrastructure such as electricity and internet, Location such as accessibility and availability of needed services and Government Intervention such as governmental support and political will.

Keywords: Union Digital Center, sustainability, institutional roots, viability, e-service

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1. Introduction

The Union Digital Centers (UDCs) are publicly owned privately run one-stop information and service delivery centers which are catering huge number of information and government services to rural communities. These are serving dramatically by delivering services to citizen's doorsteps and performing as a landmark towards achieving the goals of 'Digital Bangladesh'. The UDCs have enabled rural people to access needed information and essential services in rapid, cost effective and simple ways. Simply these are playing important roles in bridging the digital divide and giving the benefits of ICTs at the hand of rural communities. As the final source of information and service delivery, the scenario of UDCs to perform as the facilitating contrivance for ensuring sustainable development would be unparalleled (Rahman, 2016). However, question arises to what extent UDCs are institutionalized for long term sustainability? A good number of researches have already been conducted about the effectiveness of UDCs in Bangladesh for serving rural countryman to minimize digital divide. But there is not much study conducted about the sustainability issues of UDCs or the factors having influence on the sustainability of UDCs. The objective of the study is to find out the factors influencing the sustainability of UDCs, the challenges of UDCs to be sustainable for a long run and finally to locate possible remedies for ensuring sustainability. In order to fulfil the research objectives, the study has developed three research questions: 1. What are the factors that influence the sustainability of UDCs? 2. What are its challenges and what may be the way forward to ensure the sustainability of UDCs? 3. Have UDCs got institutional roots to ensure its sustainability?

2. Literature Review

2.1 Global Scenario

Mahmood (2005) mentioned that in order to supply information to the marginalized and rural disadvantaged and to decrease the digital divide between urban and rural areas, a number of information and knowledge centers popularly known as telecenters have already been established in the rural areas of many developing countries. According to Jauernig (2003), telecenters as a kind of ICT projects are providing the benefits of new communication technologies to the rural poor. But the lack of sustainability as a common problem for many telecenters hinder them from staying operational in a successful way for long run and becoming independent from subsidies and external supports. Particularly, location of the telecenter, facilities such as computers, power, photocopiers, scanners, laminators and printers, lack of enough chairs and space, unreliable internet, electricity affect the use of ICT in the telecenters to a great extent. Qualified staff and managers, leader's competency and capacity to manage telecentres are also essential for the development of telecenters and integrating ICT into the programs (Badsar et al., 2011). Training in ICT related skills, development strategies, staff roles, production of content, marketing, evaluation, human resource

management are important components in ensuring the sustainability of the telecenters (Norizan, Zaharah and Rosseni, 2010).

In contrast, there are several factors such as quality of services and delivery, appropriate staffing, and effective promotions of telecenters which are crucial in achieving social sustainability of telecenters (Zahurin et al., 2009). In most cases, the discussion of telecenter's sustainability refers to financial self-sustainability, which is often regarded as a condition for continued existence of the centre. However, experience from telecenter experiments suggests four types of sustainability exist for telecentres: Sustaining financial viability (Hudson, 1999), Sustaining staff capability (Baark and Heeks, 1998), Sustaining community acceptance (Whyte, 1999), and Sustaining service delivery (Colle and Roman, 2001). According to Hudson (1999), financial viability refers to the capacity that a telecenter has for generating sufficient income to cover its costs of operation, and/or the establishing cost. Baark and Heeks (1998) added that projects that introduce new skills also need to maintain the sustainability of the capabilities that are created. This will be ensured only to the extent that trained people, or their trained replacements, continue to work in the same area and that their capabilities are maintained and utilized. According to Whyte (1999), telecenter's sustainability is determined by the degree of acceptance by the community that it is able to generate. Again sustaining service delivery relates to the continuation of flows of information of a telecenter in terms of adapting to evolving community needs, proactively seeking new sources of useful information and alerting the community to the value of information (Colle and Roman, 2001).

2.2 Bangladesh Scenario

Akbar (2004) mentioned that Information and Communication Technologies (ICT) greatly facilitates the flow of information and knowledge offering the socially-marginalized and unaware community unprecedented opportunities to attain their own entitlements. Comparing with telecenter, Asad (2011) illustrated that UDCs are ICT enabled one-stop service outlets located at Union Parishad level similar to the 'telecenter' concept by different private organizations. It is unique in the sense that it builds on the concept of Public Private People's Partnership (PPPP) instead of donation dependent models. Faroqi (2014) has conducted a research on assessment of Union Information and Service Centers (UISC) in Bangladesh from beneficiary's perspective. He argued, despite some limitations the UISC has the potential to reduce time, distance and cost in service delivery. Its delivery mode is hassle free, immune from the reign of intermediaries and it does not ask for extra documents or coerce with bribes. Similarly, Ekram (2015) expressed his opinion as the establishment of UISCs at union level creates an opportunity for greater access to the information system and educational facilities for the underprivileged population of rural Bangladesh. Sarker (2013) added that as a one-stop delivery point, the UDC is placed with the potentials to eradicate all these problems since it is located in UP, a nearer place to them. Zaman (2015) explained that today, a farmer in a remote location can learn about appropriate fertilizer and pesticide, and receive prompt feedback from relevant public-sector experts; a villager can apply

for land records, birth certificates and other services without having to undertake multiple visits; and a migrant worker can now participate in Government-to-Government (G2G) migration opportunities without having to visit Dhaka. In case of UDCs, to impart all information and services, however, there must be an effective back-end support to supply them with appropriate contents (Hanna, 2010; Bhatnagar, 2004) which is yet to be developed for UDCs. Along with this, the capability of it to connect the rural citizenry can be questioned for a number of other reasons like limitations in infrastructure, human resource and support from Local Administration and the UP. It is also challenging to involve disadvantaged people like women, poor, and illiterate, given the difficulty to make them aware, for leveraging the benefits (Siddiquee and Faroqi, 2013).

Although different literatures showed the importance, effectiveness and acceptance of UDCs in Bangladesh, there is limited literature on telecenter sustainability or institutional roots of UDCs. However, many works have been conducted on telecenter sustainability issues which are beyond the Bangladeshi borders and cannot be generalized in the context of Bangladesh. Although Government is committed to ICT investments in the country and the UDCs have huge potentiality to fulfill this commitment, there is no or limited work on the sustainability issues of UDCs.

3. UDC (Union Digital Center) at a Glance

UDCs are one-stop service outlets operating at all 4,547 UPs of the country. Through use of ICT, UDC 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 Service Providers and users to save time, cost and has made operations hassle free. Operating under PPPP modality, these centers are run by local entrepreneurs, hosted by UPs and supported by Central Administration (A2I, 2015b).

3.1 Establishment of UDC

UDCs began operations in 2009 in 30 UPs through partnership between Local Government Division and the Access to Information (A2I) under the Prime Minister's Office. The Quick Win Initiativeⁱⁱ by A2I expanded rapidly culminating in a launch in all 4,501 UPs of the country on November 11, 2010 by the Prime Minister of Bangladesh and UNDP Administrator. These access points were known as the Union Information and Service Centers (UISCs) and currently renamed as the Union Digital Centers (UDCs) (A2I, 2015b).

3.2 Objectives of UDC

UDCs are ICT enabled one-stop centers where rural people can get various information and services of multiple provider agencies including Government, Local Government and private enterprises. It is equipped with computer, laptop, modem, mobile phone,

ⁱⁱ ICT based short term initiatives adopted by various ministries and agencies of the Government of Bangladesh. It is aimed at improving public service delivery techniques.

webcam, photocopier, scanner, printer, multimedia projector, digital camera, solar panel, etc. It was created for making changes among the overall scenario of the country as well as having a great impact in the socio-cultural context of Bangladesh, especially in the rural areas.

By analyzing the activities, the objectives of the UDCs can be summarized as (Asad, 2012)

- To ensure easy access of common people to ICT based services.
- To create ICT infrastructure at rural level and increase efficiency of UPs.
- To provide a supportive environment for creation of local entrepreneurs.
- To provide a supportive environment for empowering rural community.

3.3 Operations of UDC

Each UDC is operated by two young local entrepreneurs, a male and a female, who are self-employed and motivated under supervision of a local advisory headed by UP Chairman. They do not receive any remuneration from the government. There are some guidelines of appointing entrepreneurs from the Deputy Commissioner's Office regarding adequate computer skills so that they are able to operate the technology. They invest financially in the center and get proper profit share as per the contract made between the respective UP and entrepreneurs. Local Government Division coordinates with Cabinet Division and BCC to provide the basic ICT setup including computers, laptops, printers, multimedia projector, digital camera, webcam and solar panel. The entrepreneurs are free to install additional facilities to support business growth, at the same time, ensuring that the social sustainability of the centre is achieved by delivering government information and services (A2I, 2015a). People go to the centers according to their necessity and the operators provide the services by using ICT.

4. Clarifying Terms

4.1 Access to Information (A2I) Program

The Access to Information (A2I) Program at the Prime Minister's Office, with support from UNDP (United Nations Development Program) and USAID (United States Agency for International Development), was started in 2007 with the objectives of increasing transparency, improving governance and public services, and reducing inefficiencies in their deliverance in terms of 'TCV' – the time (T), cost (C) and number of visits (V) associated with obtaining government services for underserved communities in Bangladesh (A2I, 2016a).

4.2 Sustainability of UDCs

Sustainability of UDCs means a condition for continued existence of these centers. Here financial sustainability and social sustainability are the main concerns. The UDCs have been planned to be self-sustained. The entrepreneurs whatsoever they earn from the customers would be expending for day to day management of UDC functions and they

will get guarantee of the serviceability of all apparatus and will also do continuation of the apparatus from the revenue he creates from the customers.

4.3 Telecenter

Telecenter is a public place where people can access computers, internet, and other digital technologies that enable them to gather information, create, learn, and communicate with others while they develop essential digital skills (Caspary, 2002).

5. Research Methodology

The research is basically explorative using both quantitative and qualitative methods of research. Qualitative approach gives opportunities for discussions with managerial-staff like ADC (ICT), UNOⁱⁱⁱ, AC (ICT)^{iv} and UP Chairman^v and with entrepreneurs which allows capturing insights view of the respondents and quantitative study allows for taking catchy information from Service Receivers and from Service Providers. Primary data for the study has been collected from primary source through questionnaire survey, interview and observation methods. Secondary data has been gathered from different books, journals, research articles, dissertation reports, policy documents, and reports of Government of Bangladesh. Total sample in this research is 58. Out of this 58, Service Receivers were 20, Service Providers were 20 and Managerial Staffs were 18. Service Receivers were covered under questionnaire survey; Managerial Staffs were covered under in depth interview and Service Providers under both questionnaire survey and in depth interview. Data has been processed and analyzed statistically with the tools of MS Excel 2007 and SPSS.

The researcher collected field data by using different research instrument. Most of the data were collected by visiting different UDCs at different districts of the country. During the research, out of total 09 UDCs, 03 UDCs namely Gorol UDC of Kaliganj Upazilla of Lalmonirhat District, Mohakali UDC of Sadar Upazilla of Munshiganj District and Aminbazar UDC of Savar Upazilla of Dhaka District are falling in worse category according to the respective district's annual report and researcher's observation of the national digital centre management system at <http://www.dcms.e-service.gov.bd/>. Accordingly, three UDCs namely Kakina UDC from Kaliganj Upazilla of Lalmonirhat District, Rampal UDC from Sadar Upazilla of Munshiganj District and Savar UDC from Savar Upazilla of Dhaka District are in medium category. Finally Modati UDC from Kaliganj Upazilla of Lalmonirhat District, Panchashar UDC from Sadar Upazilla of Munshiganj District and Tetuljhora UDC from Savar Upazilla of Dhaka District are falling in the best category.

ⁱⁱⁱ Upazila Nirbahi Officer often abbreviated as UNO is the chief executive of an Upazila (sub-district) and a Senior Assistant Secretary to the Government of Bangladesh.

^{iv} Assistant Commissioner, appointed in the Deputy Commissioner's office, work on ICT related activities.

^v Union Parishad Chairman, directly elected by the voters of the Union under the Local Government (Union Parishads) Act, 2009.

6. Theoretical Concept: Four Capital Model of Sustainability

Ekins (1992) put forward a 'Four-Capital Model' relating manufactured, human, social and natural capital to the process of production and the generation of human welfare. Financial capital, and the financial system through which it acts, may better be seen as a type of social capital, a conventional way of allocating and representing the power to mobilize the other four kinds of capital, which have the real inherent power to deliver benefits. According to Four Capital Model of Sustainability, these capitals cannot be considered as complimentary. Sustainable development is simply related to the four-capital. Meeting human needs and increasing quality of life (through consumption, satisfying work, good health, rewarding personal relationships and well-functioning social institutions, and the full range of environmental goods and services) may be regarded as resulting from the flows delivered by the capital stocks. Doing so sustainability requires that these capital stocks are maintained or increased over time. A useful diagram of this Four Capital Model is shown in Figure 1 below.

Figure 1: Four Capital Model of Sustainability (Ekins, 2000)

Social Sustainability	Financial Sustainability	Environmental Sustainability	
<u>Human Capital</u> <ul style="list-style-type: none"> • Labor & Skill • Social Network • Political System • Trust & Reputation 	<u>Financial Capital</u> <ul style="list-style-type: none"> • Cash • Debt • Investment • Monetary Instruments 	<u>Natural Capital</u> <ul style="list-style-type: none"> • Resources • Living Systems • Ecosystem Services 	<u>Manufactured Capital</u> <ul style="list-style-type: none"> • Infrastructure • Machines & Tools

A. Manufactured capital

Manufactured (or human-made) capital is produced assets that are used to produce other goods and services. Some examples are machines, tools, buildings and infrastructure (Ekins, 2000).

B. Natural capital

Natural capital can be considered as the components of nature that can be linked directly or indirectly with human welfare (Ekins, 2000).

C. Financial capital

This type of capital is related to money and its related policies and instruments. Examples of financial capital include cash, debt, and other monetary policies which maintaining balance among them in the society creates the financial sustainability (Ekins, 2000).

D. Human capital

Human capital generally refers to the labor and skills, intelligence, social networks, political systems, trust and reputation, and influence and Power, health, well-being and

productive potential of individual people. Types of human capital include mental and physical health, education, motivation and work skills (Ekins, 2000).

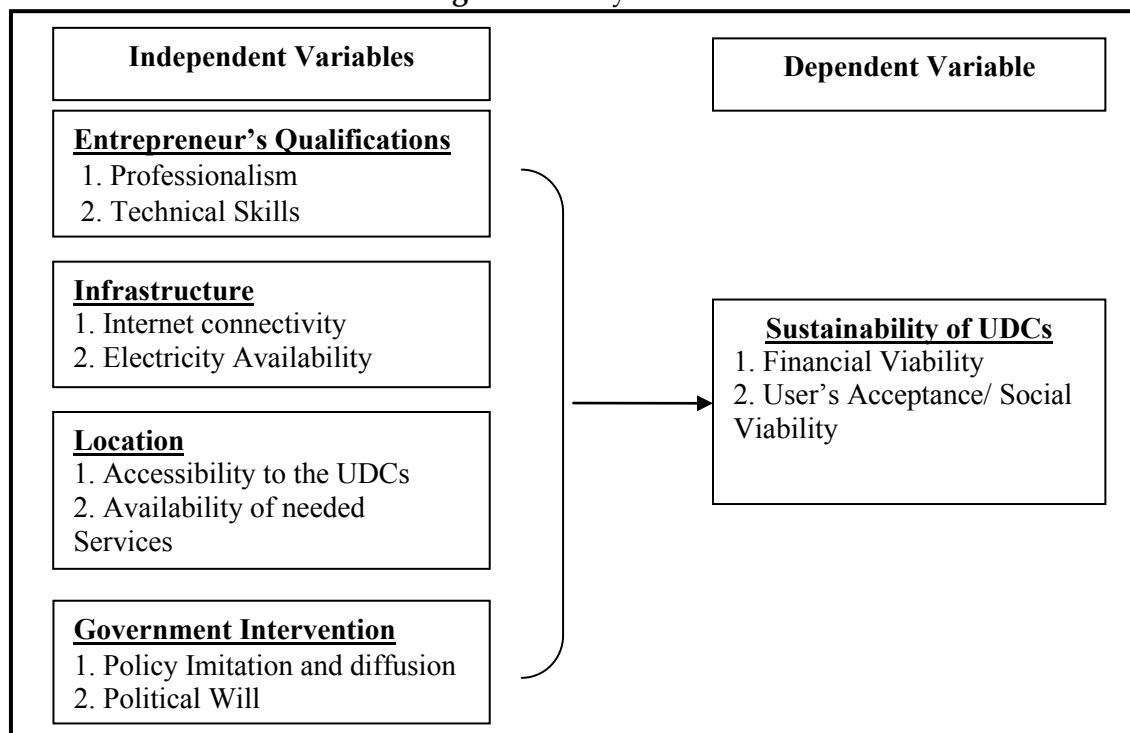
In order to maintain the sustainability, four capitals must be kept in equilibrium in any society. Giving too much concentration to any one of the capitals may affect the other capitals. This model put these four capitals subsequently to each other. According to this model, sustainability is not possible to build without maintaining the balance among these four capitals (Ekins, 2000).

6.1 Analytical Framework

Four Capital Model of Sustainability has been used in this research work. It seems to be a useful way to understand the sustainability condition of the UDCs in providing services. It may also indicate where managerial authorities need to apply their experiences and knowledge to make UDCs more sustainable in their area of interest.

As sustainability of UDCs is a key issue, it is considered as the dependent variable which has been derived by the financial viability and user’s acceptance or social viability. On the other hand, having influence of the other variables on the sustainability Entrepreneur’s Qualifications, Infrastructure, Location and Government Intervention are considered as independent variables according to existing literature and theory.

Figure 2: Analytical Framework



7. Findings and Discussions

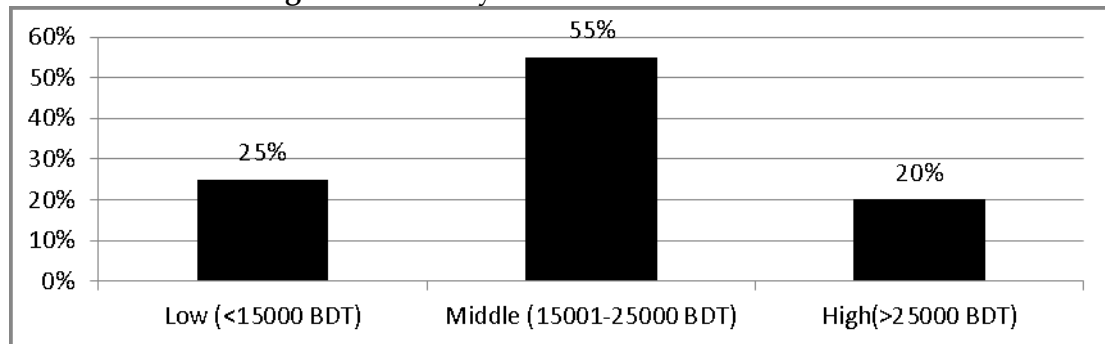
7.1 Sustainability of UDCs

Sustainability of UDCs is considered as dependent variable in this study. For this purpose two indicators namely financial viability and user's acceptance or social viability have been used. This means sustainability has been derived from financial viability and user's acceptance or social viability.

7.1.1 Financial Viability

Income is one of the important indicator of UDC's success. More income refers to more effective and more efficient UDC having possibility to be sustained.

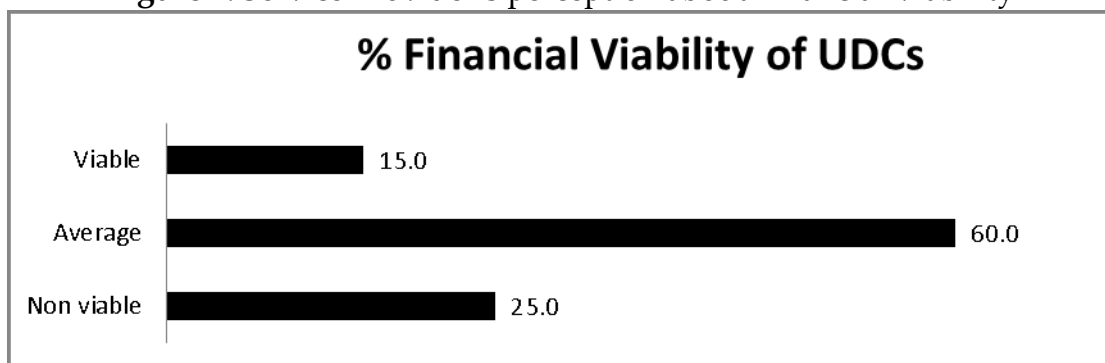
Figure 3: Monthly Income of Service Providers



With this income level, 40% respondents are not satisfied and 25% are moderately satisfied. Only 35% are satisfied with their income. It means maximum Service Providers are not satisfied with their income which indicates that maximum of the considered UDCs are not financially viable at present.

Data shows that the financial viability of maximum UDCs is not satisfactory. 25% respondents said that the UDCs are financially non-viable, 60% said UDCs are in average financial viability. Only 15% respondents agreed that UDCs are financially viable.

Figure 4: Service Provider's perception about Financial Viability



Majority of the Service Providers are at distressed situation with non-viability or average financial viability of the UDCs. Service Providers who have high level of

income and who are satisfied with their income are in favor of financial viability or average financial viability. Maximum middle incomers are in favor of average financial viability.

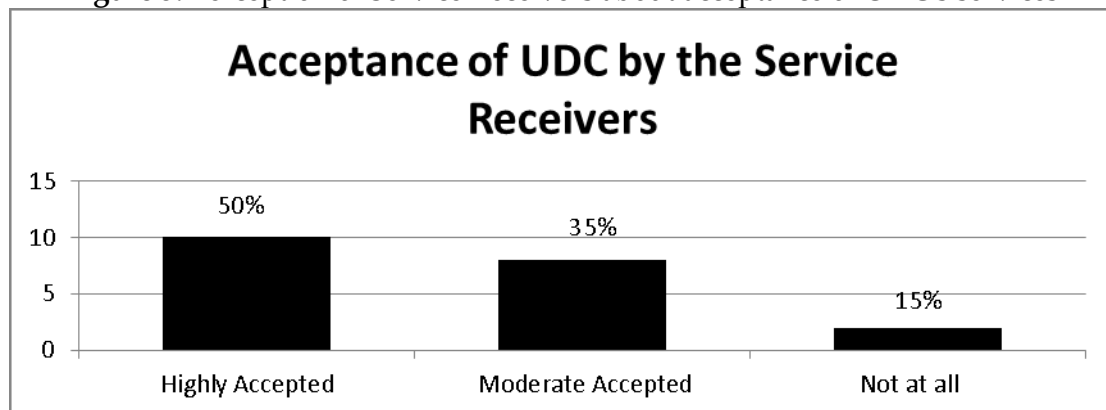
7.1.2 User's Acceptance or Social Viability

Sustainability issue is closely linked with user's acceptance or social viability. As Service Providers and Service Receivers both are the users of UDCs, user's acceptance has been derived from satisfaction of both Service Receivers and Service Providers in various aspects.

7.1.2.1 Service Receiver's Acceptance

Citizens are the final stakeholders of the UDCs and their acceptance is very much crucial for UDC's sustainability. It is seen that majority of the Service Receivers are frequently visiting the centers for different services. Some of them are visiting occasionally.

Figure 5: Perception of Service Receivers about acceptance of UDC's services

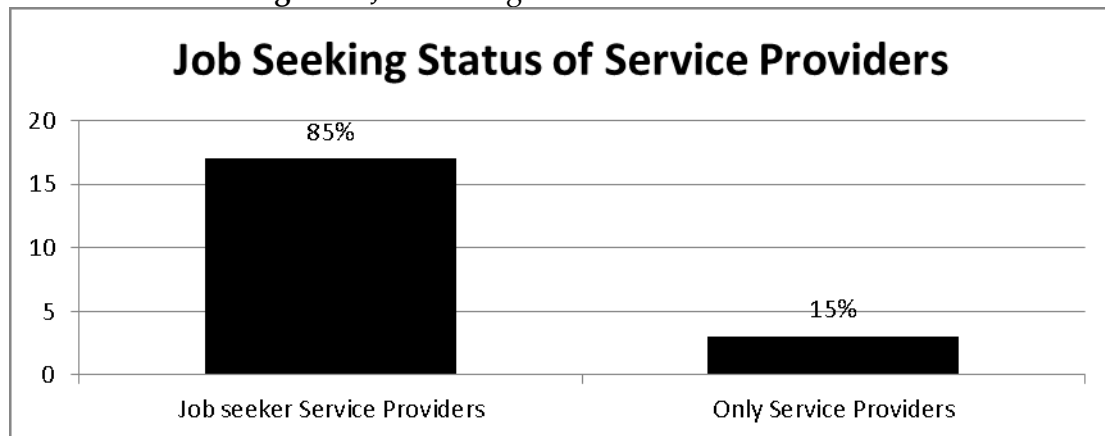


Around 50% of the respondents agreed that the UDCs have been highly accepted by the society, some said moderately accepted and a few said that UDCs are not accepted at all. Those who visit hardly are in support of non-acceptability of UDCs.

7.1.2.2 Service Provider's Acceptance

All of the entrepreneurs of UDCs said that they want to work in these enterprises but as they do not know whether they will get next contract or not, they are searching alternative source of income. Quantitatively it is seen that, 85% of the surveyed Service Providers are seeking other job. Here all the job seekers are student and others are either out of government service age range or some have no opportunity to continue education after completing secondary level education because of family burden.

Figure 6: Job Seeking Status of Service Providers



Qualitative data shows as the entrepreneurship is on contractual basis and assumed uncertain to the Service Providers. They also have to face some political challenge or illegal pressure from UP Chairman and/or UP Secretary. They feel insecure to stay and so they search alternative way of income.

7.2 Factors Having Influence on UDC's Sustainability

The study considers four independent variables: Entrepreneur's Qualifications, Infrastructure, Location and Government Intervention having influence on UDC's sustainability.

7.2.1 Entrepreneur's Qualifications

In the study, two indicators of entrepreneur's qualifications have been considered. Those are Professionalism and Technical Skills. For these, two measuring indicators are:

1. Promptness, regularity and cordial service delivery
2. ICT skills and training

7.2.1.1 Promptness, Regularity and Cordial Service Delivery

The study shows that maximum of the Service Providers (70%) are regular, some are average (5%) or irregular (25%). Male Service Providers are almost regular but the regularity of female Service Providers is not satisfactory. This is because the fact that majority of female Service Providers are housewives and they take the entrepreneurship as part time work to support family. After completing all the duties of family, it becomes tough for them to be regular in the center. The irregularity is more frequently seen in the rural area than the urban area where majority of them are student or are waiting for job.

7.2.1.2 Technical Skills and Training

It is seen that maximum Service Providers are good in technical skill and all of them received training of different categories. 60% of the surveyed Service Providers received advanced training (web page design, free launcher, graphics design, internet browsing, Microsoft office works etc.), 25% of them received moderate training (internet browsing, Microsoft office work) and 25 % received basic training (Microsoft office work).

7.2.2 Infrastructure

ICT infrastructure is very important to carry on the UDCs. In this case two indicators, internet connectivity and electric supply have been considered. For these the two measuring indicators were considered; High speed internet connection and Uninterrupted power supply.

7.2.2.1 Internet Connectivity

Whether the entrepreneurs and service receivers are satisfied or not with the speed of internet connection are also crucial for UDC's sustainability. It is observed that only 30% Service Providers and 45% Service Receivers are satisfied with internet speed; 35% Service Providers and 25% Service Receivers are moderately satisfied; and 35% Service Providers and 30% Service Receivers are dissatisfied with internet speed. That means most of the users are not satisfied or somehow satisfied with recent internet speed. Here, Service Receivers are more satisfied than the Service Providers.

7.2.2.2 Uninterrupted Power Supply

To make the UDCs effective, electricity supply is very important. Uninterrupted power supply plays a vital role for smooth functioning of UDCs. Almost all UDCs (95%) face load shedding during service delivery. 35% Service Providers are dissatisfied with power supply, 35% are moderate and only 30% are satisfied. On the other hand, only 15% Service Receivers are dissatisfied with electric supply, 25% are moderate and 60% are satisfied. The variation of satisfaction between Service Providers and Service Receivers are probably due to the presence of alternative power supply.

7.2.3 Location

Location is a very important tool to make UDCs sustainable. Two indicators namely accessibility to the service point and availability of needed services are considering in this study and for this purpose two measuring indicators are ease of access to the UDCs and availability of needed services.

7.2.3.1 Ease of Access to the UDCs

Citizen's access to the UDCs for getting e-services is one of the principal attributes for measuring of the acceptance of UDCs. If the beneficiaries of UDCs can enter easily into the UDCs for their necessary e-services, then it can be said that rural citizens have sufficient access to the UDCs which also means that the UDCs have social sustainability.

7.2.3.2 Availability of Needed Services in the UDCs

Most of the beneficiaries in the rural areas usually come to the UDCs for Birth Registration Certificate, Citizenship Certificate, Collection of Examination Result, Application for Admission at University, Application for job and Download of Government Forms. In some UDCs, Service Receivers come for some special services which are announced by the Union Parishad itself like Application for Certified Copy of Land Records, Application for Rural Electricity Connection, Application for Passport, Visa Application, and Health and Agriculture related Information. The availability of needed service delivery is one of the important criteria for sustainability of UDCs which ensures citizen's satisfaction. As the community people are the receivers of e-

services, their satisfaction is very much necessary. From the study, it is clear that the accessibility and availability of needed services in the UDCs are good because 95% respondents agreed that the UDCs have good accessibility and 70% respondents agreed that the needed services are available in the UDCs.

7.2.4 Government Intervention

It is an action taken by Government in an effort to impact the effectiveness of UDC beyond the basic regulation and provision. Two measuring indicators frequently used in this research are Policy Imitation and diffusion/Government Support and Political Will of the Government.

7.2.4.1 Policy Imitation and Diffusion/Government Support

It is seen that UDCs are run over by A2I Project Document I and II, UDC related circular and circular on attachment of different services in the UDCs to increase the income of UDCs. According to the circular, these one-stop service centers are essentially micro-enterprises run by 'citizen entrepreneurs', 1 male and 1 female. Except these there are no rules or regulation rather than the A2I program's decision to take any decision upon UDCs.

According to circular, these centers are physically hosted in Local Government offices and 1% of their annual budget is directed towards these enterprises. Meanwhile everyday expenses like service charges, internet bills, computer preservation costs, etc. are put up with by the entrepreneurs who must create revenues by providing certain public and private services (A2I, 2016e).

According to A2I project document the collaborative organizations or authorities are:

- Access to Information Program (A2I);
- Bangladesh Computer Council (BCC);
- Deputy Commissioner (DC);
- Additional Deputy Commissioner (ICT);
- Upazilla Nirbahi Officer (UNO) ;
- Union Parishad Chairman (UP-Chairman).

According to Service Providers opinions, it's not possible to run business without project support or government intervention. One of the Service Providers said:

"Government support needs for UDC's existence. If UDC exists, then we can continue our business which will ultimately confirm the financial viability and social viability."

7.2.4.2 Political Will of the Government

Vision 2021 is the political proposal of the present ruling party, Bangladesh Awami League, before winning the National Election of 2008. The Government of the People's Republic of Bangladesh declared a vision of 'Digital Bangladesh' by 2021 to ensure services at people's doorsteps. A total number of 4,547 UDCs covering all unions of Bangladesh is the major outcome of the A2I program which is a leading approach to fulfill the dream of 'Digital Bangladesh' into reality. It is the present government's

commitment to alter UDCs in the store house of information and through the application of ICT, to confirm easy access to any information with a lowest cost so that rural people need not to come to various government agencies (Rakib, et al., 2015). It expresses the political will of the ruling party converting into the Government's commitment. So, the UDCs have strong political will to exist in all over the country and the UDCs are getting apex precedence from the government also.

7.3 Critical Analysis between Dependent and Independent Variables

7.3.1 Sustainability and Entrepreneur's Qualifications

In this research, sustainability of UDCs means the UDCs having financial and social sustainability. Data shows that financial viability varies with Service Provider's qualifications like technical skills and professionalism. UDC is viable or averagely viable when Service Providers are qualified. Here professional Service Providers earn more with good, average or poor technical skill. Some respondents said that it is not a matter of high technical skilled Service Providers rather matter of sincerity or professionalism. It is due to the fact that the services provided to citizen from UDCs do not require high technical skill but professionalism. Pearson's correlation value also shows that professionalism and financial viability are positively significantly correlated at .01 levels (2-tailed) where correlation value is .681.

In case of social sustainability, it is noticeable that acceptance of UDC is high to the Service Receivers when Service Providers are more qualified. Sometimes, having good professionalism and good technical skill does not mean Service Receiver's high acceptance. This is due to other reason like availability of needed services and/or infrastructure. On the other hand, although the Service Providers accepted the entrepreneurship as a dignified profession and they feel comfort to deliver services from UDCs; their acceptance varies with the business security. As the business is on contractual basis for 5 years duration and as there is a provision to change Service Providers if they have any problems as per recommendation of UP Chairman, the Service Providers do not feel secure in this business and search for other jobs.

7.3.2 Sustainability and Infrastructure

To fulfil the desire of 'Digital Bangladesh' into reality and so to continue the services to the common people by the UDCs, it is essential to ensure continual supply of internet and electricity. Data shows that financial viability varies with satisfaction for internet speed of both Service Providers and Service Receivers. Here, Service Receivers are more satisfied with internet speed than Service Providers. This may be because of the fact that Service Receivers do not need much more speedy internet for their desired services or they are not concern about or experienced with the speedy internet. Service Receiver's satisfaction for internet speed has also more impact on financial viability. It is positively significantly correlated with financial viability with Pearson correlation value of .477 at .05 levels (two tailed). Service Provider's monthly income is also positively significantly correlated with Service Receiver's satisfaction for network speed having Pearson correlation value of .541 at .05 (two tailed) levels. In some cases, it is also observed that

UDCs are financially non-viable with satisfaction of both Service Providers and Service Receivers. It may be for other reasons like non-qualified Service Provider, or for distress access in the centre.

In case of electricity availability, it is seen that Service Provider's monthly income is high with both Service Provider's and Service Receiver's satisfaction for electricity supply but it may also be low or average in some cases. Service Receivers are more satisfied with electricity than that of Service Providers. The reason is that alternate to electricity in the form of solar energy or generator is present in almost all UDCs. Service Receiver's satisfaction for electricity has also more impact on financial viability. It shows positively significant relation with financial viability having Pearson correlation value of .549 at .05 levels (two tailed).

7.3.3 Sustainability and Location

It is assumed that the financial viability is closely correlated with the ease of access by the citizen in the centres and the availability of needed services to them. Ease of access in the UDCs is good, agreed by almost all of the respondents. Data shows that whether the UDCs are good, moderate or bad and whether the Service Receivers are satisfied, dissatisfied or averagely satisfied with delivered services from UDCs the accessibility is good. Only a few respondents agreed that the accessibility is somehow good who is also dissatisfied with delivered services. There is no direct relation between financial viability and accessibility but SPSS shows significant relation between accessibility and Service Receiver's satisfaction for delivered services from UDCs with .454 Pearson correlation value at .05 levels (two tailed). Service Receiver's satisfaction ultimately affects the financial viability of UDCs. In case of availability of needed services, financially viable UDCs have more availability of needed services. This is because more Service Receivers go the center where they get their demanded services. The Pearson correlation value of the relation between availability of needed services and financial viability is .462 which is significant at .05 levels (two tailed). So, the financial viability directly connected with availability of needed services but indirectly with accessibility having influence on Service Receiver's satisfaction for delivered services.

7.3.4 Sustainability and Government Intervention

UDCs are running over by UDC circulars and supports from different government organizations and authorities. Quantitative and qualitative data show that the surveyed UDCs will not survive without government support. As UDCs are directly controlled by A2I program which is the present government's top most priority given program, it is easy to control the system by the Central and Local administration. Structurally the decisions are also in 'Top to down' approach with strong political will. With giving apex precedence, maximum reviewed UDCs are not financially viable or they are not getting much acceptance from Service Providers or Service Receivers living far-off from the UDCs.

Qualitative data demonstrate that the UDCs are running by getting support from different governmental organizations and authorities. Service Providers will not be able

to carry business without project support or government intervention because of the political pressure especially from UP Chairman or interference of UP Secretary. Without government support, the system will be collapsed. Either the UDCs will have to maintain the present PPPP modality or have to internalize the UDCs into UPs where Service Providers will be under UP Chairman's direct supervision and control or have to nationalize entrepreneur's job so that they can carry their business with any condition.

8. Challenges of e-service Delivery through UDC

A. Antagonistic relationship of entrepreneurs with UP Chairman and UP Secretary

Service Provider's clash with UP Chairman or UP Secretary is common in almost all UDCs which need UNO or ADC level officer's interference to be settled. It's a common tendency of Chairman or Secretary to dominate Service Providers, to use them for their personal work, to change them according to their own will whether they are expert or not. Although UNO is the main person to change Service Providers, the power is given to the Chairman to recommend UNO by consulting with UP members which may be used illegally. UP Secretary sometimes wants to deprive the Service Providers by taking service fee, which are the right of Service Providers. One of the statements about this relation is given below.

B. Lack of Publicity about UDC services

Most of the citizen living far-off from the UDCs does not know about services delivered from UDCs because of the lack of publicity. One of the service receivers mentioned:

"That (UDC) is a room of UP where government certificate is delivered by one young boy (Male Service Provider), we do not know about other services, there was no announcement about the UDC"

C. Irregularity and drop out of Service Providers, mainly female Service Providers

Male Service Providers are almost regular but the regularity of female Service Providers is not satisfactory. Maximum of them are housewives and they consider the entrepreneurship as part time job. After completing all household activities they rarely come to the centers.

D. Service Provider's reluctance for personal investment

Service Providers feel insecure to invest in the UDCs as they are not the permanent employee in the centers. That's why only government or project given apparatus are present in the UDCs which become more competitive in this competitive era of ICT.

E. Service Provider's unwillingness or money crisis for hardware maintenance

Maximum machines mainly laptop or photocopier availed by the A2I project are out of service. Service Providers are not curious to repair those as the maintenance is costly. Their negligence is also prominent as they are not permanent employee.

F. Job seeking tendency of Service Providers

Majority of the Service Providers are seeking job as they are on contractual basis for specific period and the next contract is uncertain.

G. Power and Network Crisis

Power crisis is prominent in rural areas for which uninterrupted service delivery is hampered. Speedy network is another problem in rural areas and so online services are not delivering promptly.

9. Possible Remedies to Ensure Sustainability

Through the UDCs, modern technologies have reached to the root level of our country due to the initiative of government. The study found some possible remedies towards institutional roots so that the UDCs can serve people for long time. These are:

- UDC's own complex need to be established to avoid unnecessary interference of the UP Chairman or Secretary.
- More government and mandatory services need to attach for ensuring mandatory income to gear up Service Providers to carry their business.
- Time demanded training should be provided to the Service Providers so that Service Providers can provide more digital services and training to the citizens.
- A fix amount should be provided to the UDC from Union Parishad's fund to maintain the machines of the UDCs.
- More publicity of the services provided by the UDCs to aware citizen.
- Monitoring by the District and Upazilla Administration should be increased.
- To ensure reliable and continuous electricity, and high speed internet.
- The Service Providers and Officials may be offered some sorts of incentive packages for additional contribution in e-service implementation.
- Special provision needed for the appointment of female Service Provider.
- Age more than 30/32 years should be given priority for appointment as maximum Service Providers have tendency to seek other job.

10. Conclusion

The findings reflect the current reality regarding the institutional roots or sustainability of UDCs in Bangladesh. The majority of the respondents feel that the sustainability of UDCs will be vulnerable in coming days. Different types of factors are affecting its existence and UDCs are really facing some big challenges. Policy makers and implementers need to think of innovative planning about UDC in order to provide possible remedies as well as overcome the challenges on the way to sustainability.

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