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Public Access ICT: A South-South comparative analysis of libraries, telecentres and cybercafés in South Africa and Brazil

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ABSTRACT

Over the past decade, many developing countries have initiated programs that provide public access to information and communication technologies (ICTs) as key components of their strategies for social and economic development. However different countries have had varying levels of success. In this paper we present a comparative analysis of public access ICT in South Africa and Brazil. The two countries are the most developed in their respective regions. Drawing on results of a larger qualitative study of 25 countries, we seek to explain differences in the levels of success in public access ICT programs in South Africa and Brazil. We focus on issues of Access, Capacity and Environment, and seek to explain why Brazil ranks consistently higher than South Africa in all key variables of our analysis. This analysis helps to understand the relative strengths and weaknesses of the public access initiatives in both countries, and validates the analytical framework developed for this study.

Keywords

Information and Communications Technology; ICT4D; Brazil; South Africa; Telecentres; Libraries; Cybercafés; Public access

INTRODUCTION

Over the past decade, developing countries, spurred by events at WSIS, have included information and communication technologies (ICTs) as key components of their arsenal in the war against socio-economic ills. The notion of *ICT for Development* (ICT4D) is now firmly ensconced in the lingua franca of the development community. Substantial resources are being directed by governments across to world to ensure that digital communications infrastructure is extended to all. Underserved communities are especially the targets of initiatives to enable public access to ICT, through free or reduced fees for computers in libraries, public schools and community telecentres.

However despite the massive strides made globally in telecommunications, and electronic networking the International telecommunication Union (ITU) reports that in 2009 only 25.9% of the world's population have access to the internet and 27.3% of the world have access to a computer at home (ITU 2009) . The same figures, when examined regionally, paint a very bleak picture especially across developing nations. For example, in Africa in 2008 there are on average 4.2% internet users per 100 inhabitants, with the lowest rate of 0.2 in Sierra Leone (ITU 2009). It is in this context that strategies for providing public access to ICTs are critically important, and will remain so for at least the next two decades. Without government, NGO and private sector intervention, the masses of socio-economically deprived communities may remain outside of the Information Society.

Since the 1990s, and the advent of the internet, public access computing has been studied from a number of perspectives. There have been numerous studies about ICT offerings in public libraries (Walkinshaw 2007; Rutkauskiene 2008), and especially in the US led by John Carlo Bertot and colleagues (Bertot et al. 2006; Bertot et al. 2007; Bertot, McClure, and Jaeger 2005). In the same way, in the last decade there have been important studies about telecentres for community development (Best and Kumar 2008; Etta and Parvyn-Wamahiu 2003; Kuriyan and Toyama 2007; Proenza, Bastidas-Buch,

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and Montero 2002; Gomez and Hunt 1999). Telecentres in Brazil and South Africa have been studied in some depth by different scholars (Benjamin 2001; Jensen and Esterhuysen 2001; Parkinson 2005; Bossio 2004; Saldanha and Hajji 2006; Selaimen 2004). To a lesser degree, there have been a few studies looking at cybercafés and their contribution to social and digital inclusion (Gurol and Sevindik 2007; Haseloff 2005; Finquelievich and Prince 2007; Robinson 2004), we found no previous studies that have done a systematic comparison of the different types of venues and across multiple countries.

This paper draws on a subset of qualitative data collected in an international study on the *Landscape of Public Access to ICT* in 25 countries. The purpose of the study was to explore opportunities to strengthen public access computing in developing countries (as defined by the World Bank) by having a better understanding of the landscape across different types of public access venues in different developing countries in the world. The study focused on public libraries (open to all, funded by government), telecentres (offering computers and internet, open to all, not for profit, intended to support community development, with or without fees) and cybercafés (offering computers and internet, open to all, for profit, with or without fees). We analyzed 75 variables grouped under the dimensions of Access, Capacity and Environment (ACE Frameworks) across libraries, telecentres and cybercafés in all 25 countries. In this paper we focus on South Africa and Brazil for a detailed comparison of their respective public access landscape. These two are the largest and richest countries in their respective regions, and they are quite similar in terms of development indices. Nonetheless, in our analysis Brazil was consistently ranked higher than South Africa in almost all indicators studied. We attempt to explain the differences by offering a detailed analysis of different aspects related to access, capacity and environment of public access computing in both countries.

The remainder of this paper is organized as follows: we first present an overview of literature about ICT and public access in each of the two countries, followed by a description of the research methodology we used in the study. We then present a discussion of the findings and explanations for the salient differences between South Africa and Brazil, and offer some concluding remarks and implications for future research.

OVERVIEW OF PUBLIC ACCESS TO ICT IN SOUTH AFRICA & BRAZIL

We present a short overview of public access to ICT in both Brazil and South Africa, drawing from published statistical information, results of our international study, and other literature.

Brazil is a very large and diverse country (area, population), which creates unique challenges with regard to public access to information and communication technology. Its regional, political, and demographic context influences the ICT landscape in several ways. The country's size and other geographical barriers like the Amazon Rainforest make it difficult to reach underserved people. By contrast, Brazil's high urbanization rate, which is over 90 percent in some regions, hinders physical access to government resources and initiatives, including ICT infrastructure. Regional diversity also reduces the effectiveness of generalized policies and initiatives. Access to ICTs in Brazil is being supported and enhanced through public policies, private initiatives, and telecommunication industry agreements with the government. Brazil has also embraced NGO-driven social movements and continues to look to telecentres to improve ICT access and capacity. Currently, most programs with the resources to create telecentres originate mainly in NGOs or grassroots organizations. NGOs have increased in quantity and quality and meet many social needs, although these projects have serious sustainability and funding problems. The emergence of cybercafés run by small entrepreneurs in low-income communities has increased dramatically (Gomez 2009; Voelcker 2008).

South Africa currently faces a legacy of apartheid which was abolished in 1994. The underlying objective of government policy and its programmes is to address the gross inequities created by the apartheid system. This is apparent across a range of efforts from building infrastructure for schools, clinics, roads and electrification projects in rural and underserved areas to the drive toward broad-based black economic empowerment initiatives designed to create wealth among the previously disadvantaged. As a key response to the inequities, South Africa is working diligently to expand and improve access to information and ICTs. Despite significant successes in areas such as economic growth, inflation control, fiscal control and revenue collection, other sectors have been slow to meet certain stated national objectives. This is particularly evident given the national power crisis, the delays in improving the education system, and the approach to the HIV/AIDS pandemic (Gomez 2009; James 2008)

In both South Africa and Brazil a variety of initiatives to provide the public access to ICTs were identified.   In Brazil there is evidence of a national mobilization towards "digital inclusion" in both government and civil society. This movement includes initiatives to promote ICT access in underserved communities, tax deductions to reduce computer prices, and investment in telecentres via national policies. In addition, an entrepreneur-driven boom in cybercafés, mostly located in low income neighborhoods, has altered the internet access landscape in the country.   South Africa also demonstrates a strong policy framework which supports various initiatives to implement a cabinet approved Information Society and Development plan. Public access facilities in South Africa include Telecentres, Libraries, self-assisted ICT access points or kiosks, and phone

shops. Unlike Brazil cybercafés, which do exist, do not appear to be dominant in the public access landscape of South Africa, especially in poorer areas.

Figure 1 below provides a comparison of development indicators, ACE Framework scores and Information Society indicators. With regards to development indicators, both countries present similar traits in respect of gross national income per capita, incomes which are held by the lowest 20% of the population, literacy and gross domestic product figures. The differences in population density and poverty are factors which may have a bearing on the uptake of ICTs in public venues.

COUNTRY PROFILE AT A GLANCE	source	Brazil	South Africa
Total population (million)	1	192	49.7
Total surface area (million sq km)	1	8.51	1.22
Population density (people per sq km)	1	22.7	40.7
Literacy rate (%)	1	88.6	86.4
Gini coefficient	1	0.57	0.65
ACE Framework Scores			
Access Interpretive Score	2	3.46	2.88
Capacity Interpretive Score	2	3.09	2.76
Environment Interpretive Score	2	3.25	2.77
Libraries ACE Interpretive Score	2	2.75	2.44
Telecentres ACE Interpretive Score	2	3.73	3.03
Cybercafés ACE Interpretive Score	2	3.32	3.32
Other Development Indicators			
Gross national income per capita (2008) in USD	3	$ 7350 (ranking =82nd)	$ 5820 (ranking = 93)
Poverty (% of population below national poverty line) (Brazil 2005; South Africa 2000)	3	31	50
Poverty headcount ratio at $1.25 a day (PPP) (% of population) (2000)	3	11	26
Income share held by lowest 20% (Brazil 2005; South Africa 2000)	3	2.9	3.1
GDP Annual growth % (2007)	3	5.7	5.1
Time required to start a new business (days)	3	152	22
Information Society Indicators			
Fixed telephone lines per 100 hab. (2008)	4	21.43	8.91
Mobile cellular subscriptions per 100 inhabitants.	4	89.79	92.2
Internet users per 100 inhabitants. (2008)	4	37.52	8.43
Broadband Internet subscribers per 100 inhabitants. (2008)	4	5.26	0.86
% population covered by mobile signal (2007)	4	90.64	99.79
International internet bandwidth (bits per internet user)	4	2 955	852
Proportion of households with computer (2007)	4	20.8	14.8
Proportion of households with Internet (2007)	4	15.4	4.8
Fixed broadband Internet subscribers per 100 inhabitants. (2008)	4	5.2	0.8

Figure 1: Country profile at a glance, Brazil and South Africa

Sources: 1=Wolfram Alpha 2010 curated data (www.wolframalpha.com Feb 2010); 2= *Landscape Study* interpretive scores; 3=World Development Indicators database (Sept 2009); 4=ITU Information Society Statistical Profiles (Africa, Americas), 2009.

Given the above, Brazil and South Africa presented themselves as suitable cases for further comparative analysis in the global Landscape Study. South Africa and Brazil currently have strongly established agreements in terms of the India-Brazil-South Africa (IBSA) Trilateral. The findings of this paper provide a basis on which to entrench the South-South partnership in respect of knowledge sharing within the framework of ICT4D. This paper therefore identifies factors in each of the public access ICT landscapes of both countries so as to explain the differences in results in the Landscape Study and the Information Society ratings.

Notwithstanding similarities in development indicators, the Information Society indicators present different trends. Besides mobile infrastructure and penetration, Brazil demonstrates higher uptake of computers and internet usage. Likewise, in the Landscape study, the findings indicate that that Brazil has consistently higher ranking across all venues (telecentres, libraries and cybercafés), as well as across the three categories of analyses: Access, Capacity, and Environment, which will be described at the end of the next section.

RESEARCH DESIGN

This paper draws data collected for a larger global study, viz. *Landscape of Public Access to ICT*. In this section, we briefly describe the country selection, data collection methods and research framework, followed by the methods for data analysis,

with particular attention to the cases of South Africa and Brazil. Note that the complexity of the global study cannot be fully accounted for in this short description. For a detailed description of the research methodology see Gomez (2010).

The 25 countries studied (Algeria, Argentina, Bangladesh, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt, Georgia, Honduras, Indonesia, Kazakhstan, Kyrgyzstan, Malaysia, Moldova, Mongolia, Namibia, Nepal, Peru, The Philippines, South Africa, Sri Lanka, Turkey, Uganda) were selected based on a careful process that used four successive sets of criteria to focus on a sample of developing countries with a mid-size geography and population, and with existing public library systems. The criteria for country selection were based on size, population and other demographic data[i], degree of freedom of expression[ii] and political unrest[iii], a measure of "needs and readiness" criteria[iv], regional representation, and availability of country research teams.

The research framework was based on Real Access/Real Impact, a framework developed in South Africa by Bridges.org[v]. We adapted and refined Real Access, and subsequently naming the resulting framework the Access, Capacity and Environment (ACE) Framework. The primary focus of these three dimensions was to understand the range of economic, political, educational, infrastructure, cultural, organizational, and other factors that affect the way people use ICT in public access venues. The three pillars of this framework are: **equitable access**: physical access, suitability, and affordability of the venue, technology access; **human capacity**: human capacity and training (users and staff), meeting local needs, social appropriation; and **enabling environment**: socio-cultural factors, political will and legal and regulatory framework, popular support.

Local research teams were retained following an international call for proposals. Lead researchers from each team were brought together twice to discuss the purpose, methodology, and emerging findings of the study. Each team conducted local research in local languages using the following data collection methods:

- Document review: Identify and review salient literature in the country, including existing statistical information about population, ICT penetration, public access venues, government policies and previous studies relevant to the study. About 40 documents per country were reviewed.

- Expert Interviews: Identify at least ten specialists in the areas of interest of the project and conduct in-depth interviews with them. Interview guides were prepared in each country depending on the local needs and context. About 10 to 15 interviews with experts were conducted per country.

- Site visits: Identify, visit and observe six or more venues of each type (library, telecentre, cybercafé, or other). Site visits were undertaken for a minimum of a half day, making sure to include both urban and non-urban sites (ideally three of each). In selecting sites, research teams identified typical case samples of each type of venue, including both urban and non-urban sites. On average there were 20 visits per country, about 500 sites visited in total.

- User Surveys: User information was collected via a survey. A common survey instrument was used to administer a questionnaire. Each country team was allowed to add questions that they felt were relevant to the local context to enrich the overall body of evidence. At each site every second or third user exiting the venue was surveyed. Teams surveyed between 40-50 users at each venue. Total users surveyed: around 1000 per country. Given limited time and resources, user surveys were not intended to provide statistically significant samples of the population or of the venues studied, but an exploratory indication of trends and patterns for comparison and further research.

- Operator Interviews: Identify at least one operator in each site visited and hold a structured interview to provide a more in-depth understanding of the venue, users and environment. Total operators interviewed: around 20 per country.

Detailed country reports were prepared by each local research team using a data-collection template designed to help teams organize their local fieldwork in order to answer detailed questions about Access, Capacity and Environment issues in each type of venue studied. The use of a shared research design and methodology helped make data more comparable, even though the specific ways in which data was collected varied from one country to another in order to make it more locally relevant.

In South Africa and Brazil local researchers followed the guidelines stated above. In addition to interviews with experts and operators, they surveyed users from the following venues (note that in South Africa no users of cybercafés were surveyed. According to the South African research team, there are very few cyber cafes outside of the major urban centres, and based on anecdotal evidence, very few in the previously disadvantaged areas [and] there are no official figures available on the number of cybercafes (James 2008). Instead users of HIV/AIDS centers, were surveyed which were found to present a unique opportunity to extend public access to ICTs in this country):

	LIBRARIES		TELECENTRES		CYBERCAFÉS	
	BRAZIL	SOUTH AFRICA	BRAZIL	SOUTH AFRICA	BRAZIL	SOUTH AFRICA
Number of sites surveyed	14	3	13	7	16	0
Number of respondents	445	331	395	160	444	0

Figure 1: Public access user surveys in Brazil and South Africa

Detailed country Reports for South Africa (178 pgs) (James 2008) and Brazil (145 pgs) (Voelcker 2008) were presented by the local research teams; those reports constitute the primary source of data for our comparative analysis.

Data Analysis

After careful reading of all reports, we conducted a detailed annotation of the different aspects that influence public access ICT, based on the three broad dimensions of access, capacity and environment as defined above. These three broad dimensions was further broken down into 75 variables and country reports analyzed to assign an interpretive score between 1 and 5 (where 1=low and 5=high), using pre-defined criteria for scores for each variable. This score is not statistical but interpretive in nature. It was validated through selective double blind scoring and spot checks for consistency and to rule out coding bias. In addition, Atlas TI was used to code 20 of the 75 variables in all country reports. The authors' numerical analysis of the interpretive scores using Excel (Meyer and Avery 2009) and review of Atlas TI coding results was used to elicit patterns, trends and themes emerging in the data. In addition, detailed reading of the reports and in-depth discussions allowed us to combine multiple visions and readings of the rich data collected in the study, and resulted in higher-level analysis of the trends that goes beyond published statistical figures, as it is grounded in the data and the context of each country and venue studied.

This study is the first in terms of its breadth and scope; no other studies have systematically looked at different types of public access venues across multiple countries. Nonetheless, it is limited by the fact that both countries are large and difficult to fully cover in a qualitative study; in both countries the local teams focused on a smaller region, including both urban and non-urban venues. Furthermore, the analysis we present is based on secondary data in the form of country reports as part of our larger study, and the interpretive codes are limited in that they do not provide a statistically significant picture of the venues of the phenomena studied: they do however provide an informed interpretation of the available data, and have yielded a set of useful themes with which to understand similarities and differences.

ANALYSIS OF FINDINGS

The Landscape Study focused on three types of public access venues: Libraries, Telecentres and Cybercafés. Each of these venue types is examined using the dimensions of the ACE framework: Access, Capacity and Environment.

In all three analytical dimensions, Brazil's assessments resulted in a higher than average of all 25 countries in the study (Figure 1), while South Africa's assessment is below the average. This assessment is consistent with the ITU's Information Society indicators as wells as the ICT Development Index (IDI), in which South Africa was ranked 87 (IDI = 2.8) out of 154 countries worldwide and Brazil ranked 60 (IDI = 3.48) i.e. 27 higher than South Africa.

This *overall assessment* suggests that there are factors in the Brazil situation which mitigate positively for uptake and use of public access sites. In the following sub-sections we analyze other components of the evidence so as to explain this situation. The discussion is presented per venue type i.e. libraries, telecentres, and cybercafés, which represent the three main types of public access venues which were the focus of the Landscape Study.

Public Access by Venue Type

Libraries

In **Brazil**, although public libraries are regulated and supported by government (federal and municipal), the government does not adequately invest in new libraries or ICT development. Based on data gathered through interviews and surveys, it is estimated that less than 15% of Brazilian Public Libraries offer ICT Services. The quantity and quality of libraries are concentrated in Southeastern Brazil. Furthermore, most libraries are located in city centers or near government buildings and do not necessarily serve underserved groups. Although most libraries have computers for internal use, most libraries do not

offer ICT services to their users, not even to search the digitally catalogued library collections. Most users affirmed that access to the internet would help them with school work and enhance the services already offered by the library.

The focus thus in Brazilian libraries is on books rather than ICT infrastructure. There is a lack of effort by public library directors and the government to invest in such technologies. According to interviews with experts, some government officials are working to change the perception of libraries from a book repository to a more dynamic space which would host exhibitions, cafes, and internet access facilities. However no evidence exists in respect of government allocation of funds for the implementation of such ideas.

In **South Africa t**he need for ICTs is regarded as much a priority by the appropriate authorities as the need to increase the number of books and other library resources e.g. in 2007 a national budget of 1 billion ZAR (approx. 125 million USD) was allocated for upgrading and expansion over 3 years. This demand is increasing not only for internal administration e.g. electronic cataloguing and book loans, but also for internet searching. This has been confirmed through the results of the Department of Arts and Culture audit as well as through interviews conducted in three provinces. Like Brazil, most public libraries do not have computer facilities for public use, although some of the larger metropolitan areas do provide access and do have internet connections. The purchase of ICTs is seen as the domain of provincial (tier 2) government and the expenditure on ICT equipment has however been very low and is not seen as significant in terms of future budgets.

There are instances however where libraries have been successfully harnessed as public access points in non-urban areas e.g. Cape Access project[vi] is one example. Access to Libraries were found to be limited due to restricted operating hours, membership being unaffordable to the poorest people, and a lack of books in local languages. This is in contrast to Brazil where libraries offer free unrestricted access to their facilities. The surveys indicate that there is a demand for ICTs in libraries in South Africa, with ICT skills training identified as a strong need. Access to Libraries in South Africa is restrictive as transport costs to reach venues with ICTs are a significant factor in determining use. For example, in the case of many libraries being set up in previously demarcated black or colored townships, the facilities are not as good as in major urban areas or in the CBD, but taxi costs are too high to allow for regular trips to the better equipped libraries. Users tend to be young in the libraries surveyed. Lack of ICT training was seen as a barrier by about 24% of users, which is much lower than the survey results from users in telecentres and the HIV/AIDS support centers.

Telecentres

In both countries telecentres serve the same general purpose i.e. a venue for public access to ICT, usually consisting of a room, usually as a component of a larger establishment, and open to the general public with computers connected to the internet.

In **Brazil** telecentres are usually located in NGOs or grassroots organizations inside low income communities. These organizations fundraise or solicit partners to create telecentres as a social benefit to the community. The majority of telecentres in Brazil are hosted by nonprofit organizations.

While the majority of Brazilian telecentres offer free access to the internet, they limit users to a certain amount of time. Often times, educational activities are given priority over others e.g. people using the telecentre for school research are generally given more leeway than those going to chat online. For example, GESAC is a federal government initiative that offers free internet access to NGOs and schools. CDI and Fundaçao Pensamento Digital are examples of NGOs that refurbish computers and donate them to other NGOs to create telecentres, while also offering continuous training and/or professional development for telecentre staff.

In **South Africa**, the establishment of telecentres is a legislated mandate of the Universal Service and Access Agency of South Africa (USAASA). The funding for USAASA's mandate is obtained from the Universal Service and Access Fund to which all telecommunications operators contribute a percentage of their turnover. Additionally some centers have also been established by big business e.g. Microsoft South Africa, in partnership with community based organizations. USAASA initiated telecentres are found in the government multipurpose community centers (now called the Thusong Service Centers), prisons, as stand-alone telecentres, in containers, women's organizations, churches, community radio stations, health care centers, homes for the disabled, youth centers, HIV/AIDs centers, ex-combatant centers, rural development centers, etc. Originally targeting a deployment of about 4000 telecentres, USAASA has to date rolled out only 154 telecentres. Currently (2009/10) the Agency is embarking on a different strategy in which telecentres are being handed over to entrepreneurs, and future deployment will take place in partnership with entrepreneurs and other local organizations.

The geo-demographics of public service provision in South Africa, is affected by the ongoing impact of urban/rural development under the Apartheid regime, along with the employment dynamics created by the concentration of labor intensive mineral exploitation in particular locations. In addition apartheid policies also concentrated the poor in separate

high-density settlements, away from the richer 'white' residential and commercial areas. These factors resulted in a high proportion of migrant laborers, millions of displaced families with little or no connection to the land they were removed to, and thus no tradition of local agriculture and stable social systems. So, in contrast to most other African and developing countries, there are a high proportion of the public who lack access despite being in what would be considered an 'urban' area

Many users identified the Thusong Centres as places where government services are offered and social grants can be collected. The telecentres in the Thusong Centers are not always visible or well-marketed as people-friendly places, nor are their services well-advertised. The low levels of service delivery, erratic hours and non-functional equipment contribute to the perception that many of these centers are not able to offer sufficient services. An evaluation of Thusong centers points to several factors that limit access e.g. long distances to walk / travel to reach centers, unfriendly operating hours for those who are employed, facilities not always in good repair, low levels of awareness of services that are offered by telecentres and poor service delivery often related to poor management. The youth in particular commented that their needs were not being addressed. The survey also found that demand for most ICT services is extremely low, particularly in rural areas. Usage of ICT and related services among residents is limited to photocopying and prepaid telephone services.

Cybercafés

Cybercafés are private centers created by small entrepreneurs. The **South African** component of the Landscape Study did not focus on cybercafés given the low rate of occurrence.   Cybercafés in the South African environment tend to be small, stand-alone, semi-formal businesses, set up along high-traffic routes that include daily commuters or tourist destinations. Sometimes the cybercafés are co-located with other businesses, such as second-hand bookshops, coffee shops, hotels, etc. It is estimated that there are 200 to 300 cybercafés in South Africa, in mainly major urban areas, but no actual data exists to confirm this figure or the depth of penetration.

The **Brazil** study indicates that cybercafés in this country are located in medium and low income communities, and are often not legally registered. Typically, they offer access to newer, high quality computers and are sustainable due to the fees they charge for access to their equipment. Cybercafés are often open day and night, and weekdays and weekends, making them especially available to users. However, in some cases, the cybercafé environment is not ideal for children, as centers might be integrated with restaurants or bars that sell liquor. Cybercafés also do not offer courses, though operators usually offer help, albeit limited, to non experienced users. As a result, the environment is far less tutored than telecentres in community based associations (places that offer daycare, afterschool activities, adult education, etc). The Brazil study indicates that cybercafés have become the most used places to access the Internet in the country, mainly among the young and the low income individuals. Among all internet users in Brazil, 49% of them access the internet cybercafés, also known as paid access centers. Further, most cybercafé users belong to underserved communities.

In light of the foregoing, the uptake of public access computing at cybercafés appears to be one of the key aspects which differentiate the landscape in Brazil from South Africa.

SUCCESS FACTORS IN THE PUBLIC ACCESS TO ICT LANDSCAPE

The analysis of the reports from Brazil and South Africa identify a diverse number of issues which affect the ICT public access landscapes in both countries.   Generally the issues that were identified were similar. However we were able to identify certain factors which can be attributed to the differences in assessment ratings between the two countries. These were related to capacity in respect of skills; affordability; the attractiveness of cybercafés to users and the role of NGO's as partners in the deployment of telecentres.

Limited capacity

In South Africa the lack of human managerial and technical capacity in the centers was identified as one of the inhibitors of success. Skills' training has been minimal and has not prepared telecentre managers for the challenging task of promoting their services, or sustaining a viable operation, usually under difficult circumstances. The lack of financial literacy of telecentre managers in South Africa was found to have led to the demise of a number of the existing telecentres. In Brazil centre operators have also found to lack capacity to manage public access venues as well as offer assistance to users. However most programs which initiated telecentres also offered training to operators with a focus on developing their ICT skills.

South Africa and Brazil share a common problem in respect of literacy of the users of public access venues. Although literacy figures are 86% and 88% (see Figure 1) for each of the countries respectively, this figure is not representative of full literacy. For example the national Functional Literacy Index in Brazil indicates a 65% partial literacy rate. Consequently

users in both countries do not understand how effectively integrate ICT into their lives or their work. The level of literacy thus is a contributory factor to the types of uses at public access venues. For the most part, users typically accessed ICTs for either communication or recreational purposes. However the positive return from this trend is that users generally would engage in a combination of self- and peer-led learning and thus develop their literacy levels through increased usage. Consequently, we infer that as long as users are able to get basis support they would be in a better position to develop digital literacy.

In Brazil although cybercafés did not typically offer training or formal educational support, they did offer some informal help for inexperienced users. Most learning occurs individually, or with peers. Entrepreneurs running the centers are typically technologically-savvy, and thus are in a better position to offer informal support to users. Furthermore, both studies identified the advantage of entrepreneur run public access venues which appear to be more sustainable that those run by NGOs. This was an advantage in the Brazilian public access landscape, given the higher number of entrepreneur run cyber cafes in non-urban areas as compared to South Africa.

Cybercafés are considered *cool*

The proliferation of cybercafés in Brazil across urban and the non urban environment has also given this country and unexpected advantage over South Africa in terms of improved uptake and usage of the venues. The survey of users in Brazil found that cybercafés were considered to be the "*coolest*" venue at which to use ICTs. Given that the typical user of public access venues in both South Africa and Brazil are youth this is an important factor. The surveys did not specifically elicit reasons as to why this was the case, but possible reasons could be related to: the lack of usage restrictions at these sites; the tendency to couple cybercafés with other services such as the sale of food; entrepreneurs being more business oriented, and therefore paying more attention to the aesthetics of the venue. The other key difference with regards to better uptake and use of ICTs at cybercafés in Brazil as compared to South Africa is the lower costs of access and the presence of these venues in non-urban areas.

Affordability factors

In developing countries the cost of accessing ICTs at public access venues is thought to be one of the most significant barriers. In Brazil however, costs were not identified by telecentre users as the most significant barrier. Instead hours of operation (24.1%) and lack of training (15.9%) were most common. Costs were only indicated as a barrier by 8.7% of the respondents in Brazil as compared to 32% in South Africa. In general Brazilian telecentres offers public access to information, free of charge, but may charge small fees for some services, like printing. Costs are also not an issue in libraries where access to computers where they are available is free. Although cybercafés, which are privately run, charge for internet access their fees are affordable, as they are mostly located in low income communities and are sustainable.

In South Africa costs are clearly one of the most inhibiting factors which have stifled growth and the uptake of public access ICT venues. Of the total basket of costs that a consumer pays for Internet access, most of these go directly to the incumbent fixed line operator, Telkom, in the form of access charges. The lack of competition is thus a key contributor to the cost barrier. However the telecommunications market is being deregulated, with a license already issued to a second national operator. Fortunately there is increasing competition in the broadband sector and national and international fiber links are already being rolled out, which should substantially reduce costs and increase penetration over the short-to-medium term. Costs of ICT access in both libraries and telecentres vary widely. This ranges from free, with limited internet time use in some libraries to about US$4 per hour in smaller libraries. Costs for internet access in cybercafés are estimated to be approximately US$2 per hour as compared to Brazil where Internet access range from US$0.60 to USA$1.58 per hour.

Harnessing stakeholders and partnerships

The key role of entrepreneur run cybercafés in enhancing uptake of public access ICTs has been pointed out in the previous sub-section. However this does not negate the continued role and dominance of government facilitated telecentres, which are more easily able to provide subsidized and hence cheaper access to users. In this regard a notable difference in the Brazilian landscape lies in the implicit role of non government stakeholders. Since the early 1990s nonprofit, community-based organizations have been growing in quantity and in quality, creating a vibrant third sector in Brazil. The government has thus placed great trust in these organizations to promote ICT access in underserved populations, through various partnerships with NGOs to create telecentres for the poor. For example municipalities like Sao Paulo and Porto Alegre have their own telecentre programs in partnership with NGOs located in underserved communities. The municipality donates computers, supports internet connection fees, and pays small wages to local youth that work as instructors or educators inside the telecentres. The federal government has a variety of initiatives that creates networks of telecentres and follows the same

framework of partnerships and roles. This is in contrast to the strategy implemented in South Africa, where a single government created agency has attempted to deploy and manage telecentres across the country. The decentralized approach in Brazil, coupled with the role of community based stakeholders has led to a better alignment of telecentres to grassroots communities, and hence improved success. In South Africa, the National Department of Communications, has committed itself to work closely with key stakeholders to make ICT relevant to the people of South Africa. In this regard a Stakeholder Engagement Programme that seeks to institutionalize a structured programme of engagement with key stakeholders has been developed (Department of Communications 2010)

CONCLUSION

This paper underscores the importance of the public access ICT landscape which in the current era is more critical than ever as governments steer towards the achievement of the millennium goals and associated objectives.

Evidence which was collected from two developing countries was analyzed with a view to explain why one of them, in the context of the data we studied, has a larger measure of success than the other. In presenting the evidence there can be no argument that the creation of an enabling environment for effective uptake of ICTs via public access venues is compounded by multi-faceted and complex factors in a country's environment, with no single issue taking precedent over the other. The paper further demonstrates that the factors which influence adoption of ICTs in a public access context are not as easily understood as those in a defined organizational setting.

Factors pertaining to capacity in respect of skills; affordability; the attractiveness of cybercafés to users, the role of NGO's as partners in the deployment of telecentres; and the lack of competitiveness amongst both venues and providers of internet services were identified as contributing to the differing success levels between South Africa and Brazil. Based on these findings, the following are important considerations in order to nurture the public access landscape in developing countries, and improve conditions to create sustainable venues which are relevant for especially the lower economic groups:

- **Models of successful venues: Combined, each of the three** venue types has a role in public access ICT landscape. There is a need however to recognize the inherent strengths in each of these, and to model deployment strategies accordingly. For example libraries are associated with knowledge acquisition, and thus they present a more ideal environment to provide more formal types of training. However networks of libraries do not extend into the hearts of especially underserved communities. Telecentres and cyber cafes on the other hand are more successfully used for communication, entertainment, and access of government information and are more easily established in non-urban communities. Entrepreneur run venues appear to be more successful, and thus a model which combines public telecentres and entrepreneur style management appear to be more sustainable.

- **ICT skills**: In light of the foregoing more should be done to harness venues other than libraries to build capacity for ICT use. Programs to support the development of both basic and digital literacy are an important component of public ICT access strategies. Continuous marketing and public education on the role of ICTs must also be regarded as an important component of capacity building for users. The youth especially should be targeted as they represent a sector who are more inclined towards uptake and use of ICTs. In this regard it must be noted that training programmes on their own are not effective, without ongoing opportunities for social appropriation of ICTs and effective use thereof. In this regard, formal training programmes could, for example, be supplemented by the development of local content, deployed through portals which are designed to cater for local interests and needs. The combined effect will thus result in sustained interest in the use of ICTs. Likewise the deployment of government e-services are another avenue to catalyze uptake and use amongst the adult population. There are a number of novel approaches for capacity building which can be explored, such as the Meraka e-Skills Institute's plan in South Africa to harness the local interest in soccer to promote e-literacy via formal and informal community based sporting organizations; and the e-Cadre program, a multi-pronged approach that combines the delivery of ICT skills training and life orientation to youth.

- **Government influence of costs to the end-user: The South African environment especially will benefit from the** adoption of policies which promote competition in the telecom sector. Even though the process of liberalizing the market has commenced it may take many more years for the full effect to be felt. Thus the concept of a Universal Service fund to subsidize the provision of access to ICTs must continue to perpetuate until such time that market forces bring access costs to more reasonable levels.

- **Funding models need to also account for capacity building:** Sustainable public access ICT venues must incorporate programs to skill venue operators with relevant management skills. In both South Africa and Brazil the lack of financial and general business acumen were highlighted as deficiencies across public access venues. An integral problem was that

once public access venues were established, there was no concern for ongoing development of staff and venue operators. as well as succession plans.

- **The successful uptake of ICTs in public venues requires a bottom up approach:** Implementation strategies are more successful from the bottom up with the involvement of grassroots stakeholders, and when a context for uptake and use is interweaved into the deployment model. In this regard the creation of partnerships with organizations which exist within local communities are a key ingredient for sustainability, and to ensure a more systemic integration of ICTs which will lead to social appropriation.

Finally, we need to stress that the foregoing are not intended as an exhaustive set of success criteria. Rather they represent factors, which as a result of comparative analyses, were found to have provided an advantage in one environment over another. Thus these success factors need to be considered against the backdrop of an environment which is in a continual state of flux, due especially to rapid pace at which technology evolves and the constantly changing expectations of citizens. Thus policy makers and practitioners need to be aware that the public access landscape is amoebic like. As such we need to be mindful that monitoring and evaluation strategies will be crucial for ongoing assessment of these and other criteria which shape successful public access ICT landscapes.

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[i] Size (exclude largest and smallest), population (exclude countries with population less than 1 million, and exclude highest population (India, China)), per capita income (exclude countries with per capita income over $11,116), human development index (HDI below 0.5)

[ii] Based on Freedom House index: http://www.freedomhouse.org.

[iii] Based on U.S. Dept. of State travel advisories.

[iv] **Needs criteria**: Income inequality based upon Gini index (2006) from United Nations Development Program; ICT usage: based upon CIA World Factbook (2007); ICT cost: based upon International Telecommunications Union's World Information Society Report (2006). **Readiness criteria**: Politics: based upon World Economic Forum Global Information Technology Report (2006), Transparency International (2007), World Bank Worldwide Governance Indicators (2006); Skills: based upon International Telecommunication Union opportunity skills index (2007); ICT infrastructure: based upon International Telecommunication Union opportunity network index (2007).

[v] Non-profit organization based in South Africa, www.bridges.org.

[vi] http://www2.capeaccess.org.za/