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Structure and Flexibility in Global Research Design:

Methodological Choices in Landscape Study of Public Access in 25 Countries

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CIS Working Paper No. 8

Revision 3, Oct 2009

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This is a work in progress and the authors appreciate your comments.
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ABSTRACT

This paper presents the research methodology for the global study "Landscape of Public Access to ICT in 25 Countries" (referred to as the Landscape Study), a study conducted in 2007-2009 by the University of Washington's Center for Information & Society, with a grant from the Bill & Melinda Gates Foundation. The study looked at public access venues (public libraries, telecentres, cybercafés, other) that offer public access to information, especially through information and communication technologies (ICT), in 25 countries around the world. We describe here the criteria for the country selection, selection of local research partners in each country, research design considerations, data analysis, and limitations of the study.

Keywords: ICT, public access, public libraries, telecentres, cybercafés, Landscape Study

Introduction

This paper presents the research methodology for the global study "Landscape of Public Access to ICT in 25 Countries" (referred to as the Landscape Study), a study conducted in 2007-2009 by the University of Washington's Center for Information & Society, with a grant from the Bill & Melinda Gates Foundation. While other papers describe findings and lessons, we limit this one to a detailed description of the methodological choices, research design and sampling rationale developed for this research.

The study looked at public access venues – public libraries, telecentres, cybercafés, other—venues that offer public access to information, especially through information and communication technologies (ICT), in 25 countries around the world. We describe here the criteria for the country selection, selection of local research partners in each country, research design considerations, data analysis, and limitations of the study.

Country Selection

This international study aimed to understand the landscape of public access to ICT in a variety of contexts around the world, focused on "middle of the pyramid" countries, and especially on countries with existing public library

systems. The country selection went through a series of filters based on demographic data, feasibility criteria, and ranking criteria[1], as described in the following figure:

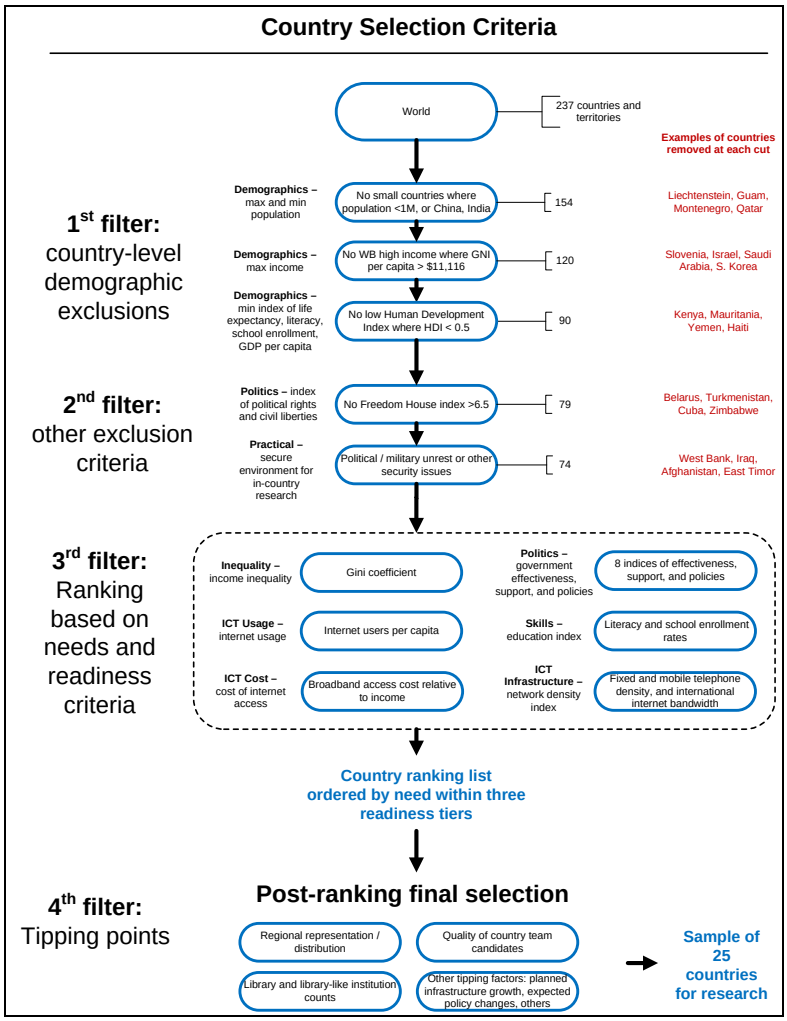

Figure 1: Country Selection Criteria

The first filter used publicly available demographic data to reduce the total 237 countries and territories around the world to a subset of 90 countries:

- Remove all small countries with populations under 1 million, as well as countries with most population (China and India).
- Remove all countries with highest per capita income (over $11,116).
- Remove all countries with lowest human development index (HDI below 0.5).

The second filter used publicly available data to exclude countries where freedom of expression or political unrest could undermine conducting independent research, bringing the subset of countries to research down to 74:

[1] Early stages of the country selection criteria, including needs and readiness rankings, were developed by Chris Rothschild and Chris Coward at CIS, University of Washington.

- Remove countries limited freedom of expression (Freedom House[2] index over 6.5).
- Remove countries with political unrest or security issues (US Department of State travel advisories).

The third filter used publicly available data to rank countries according to needs and readiness criteria. This involved creating two composite indices using available data as proxies to help measure what we called information needs and readiness in each country, particularly in relation to ICT use.

- Needs criteria:
  Inequality: Income inequality was used as a proxy indicator for measures such as geography, ethnicity and gender inequalities, where greater inequality suggested greater potential need for public ICT access. Gini index (2006) from United Nations Development Program.

  ICT usage: Internet users per capita was used as a proxy indicator for ICT use within a country, where lower ICT usage indicated greater potential need for public ICT access. Data from CIA World Factbook (2007).

  ICT cost: Lowest broadband cost as a percentage of monthly income was used as a proxy indicator for ICT cost, where higher ICT cost suggested greater potential need for public ICT access. Data from International Telecommunications Union's World Information Society Report (2006).

- Readiness criteria:
  Politics: Eight expert-survey-based indices were used, including: government prioritization of ICT; importance of ICT to government's vision of the future; government success in ICT promotion; intensity of local market competition; freedom of the press; corruption perceptions; government effectiveness; and regulatory qualities, where each index served as a proxy indicator to evaluate multiple dimensions of political support and policies, while also suggesting greater potential readiness for public ICT access. Listed in order, data from: World Economic Forum Global Information Technology Report (2006), Transparency International (2007), World Bank Worldwide Governance Indicators (2006).

  Skills: Adult literacy and school enrollment was employed as a proxy indicator for skills, where high literacy and enrollment rates indicated a greater potential readiness for public ICT access. Data from International Telecommunication Union opportunity skills index (2007).

  ICT infrastructure: Fixed phone density, mobile phone density and international Internet bandwidth was used as a proxy indicator for ICT infrastructure, where higher teledensities and Internet bandwidth indicated greater potential readiness for public ICT access. Data from International Telecommunication Union opportunity network index (2007).

- Ranking of needs and readiness:
  After combining the data into needs and readiness scores for each country, we used a three-tier ranking system representing high, medium and low readiness, with each tier ranked according to need. This placed 25 countries in Tier 1 (high readiness, high to low need), 25 countries in Tier 2 (medium readiness, high to low need), and 24 countries in Tier 3 (low readiness, high to low need). We then applied a filter based on distribution, to arrive at a sample of 30 countries where 25% of them would be in the top and

[2] http://www.freedomhouse.org

bottom tiers of needs and readiness respectively (Tier 1 and Tier 3), and 50% would be in the middle tier (Tier 2). In the selection of countries within each tier an element of geographic distribution was introduced, to make sure there would be representation of countries from all regions of the world. This resulted in 8 countries from Tier 1, 14 countries in Tier 2, and 8 countries in Tier 3 for a total of 30 countries. This distribution was chosen in order to capture more countries in the middle tier of need and readiness, along with a sample of countries that could represent higher and lower needs and readiness based on the defined criteria.

Needs & Readiness		Needs	
		Higher and Medium	Lower
Readiness	Higher and Medium	Algeria Brazil Colombia Dominican Republic Georgia Kazakhstan Peru Philippines South Africa Sri Lanka	Argentina Costa Rica Egypt Malaysia Moldova Mongolia Turkey
	Lower	Bangladesh Ecuador Honduras Namibia Nepal Uganda	Indonesia Kyrgyzstan

Figure 2: Needs and Readiness Ranking

The fourth and last filter in the country selection process to bring the sample size from 30 to 25 countries (figure above) was based on tipping points such as regional representation, quality of country team candidates to conduct the field research, perceived strength of national library system or importance of other library-like institutions, and anticipation of planned infrastructure growth or policy changes in particular countries. In the end, the most important tipping point was the availability of a qualified local research team to conduct the fieldwork, as described below.

This detailed and careful country selection process enhanced the credibility and trustworthiness of the research results, as well as their utility to help understand commonalities and differences between the countries studied and in relation to other countries not included in the sample.

Local Research Teams Selection

This study was led by University of Washington researchers in collaboration with teams of local researchers in each of the 25 countries in the sample. Selection of research partners was critical to the success of the project[3], given the exploratory, collaborative, qualitative, and comparative nature of the global study. To select the research partners an initial call for expressions of interest was issued in October 2007, widely distributed through specialized mailing lists and web sites. This resulted in 220 responses from research and consulting teams around the world. The responses were assessed for relevance, experience and references, and a subset of them was invited to submit a statement of qualifications for this research project. From over 50 proposals received a final

[3] Criteria for research teams selection were developed by Chris Coward, Chris Rothschild, Rebecca Sears and Ricardo Gomez at CIS, University of Washington.

group of 19 qualified local research teams (some researchers representing more than one country) was retained to conduct the country studies, coordinated by the team at University of Washington. The final selection was based on nine criteria (completeness of proposal, research team qualifications, organizational strength, relevant research experience, knowledge of public access ICT environment, complicating factors, costs, reference, and overall assessment), and on perceived fit with the collaborative nature of the international study.

Lead members of all local research teams were then invited to participate in one of two design workshops (Seattle, Kuala Lumpur) in which the key objectives and proposed methods for the research project were shared and improved. This early involvement by local research teams in the design process helped to strengthen research design and promoted collective ownership of the larger research process beyond the sheer contractual relation of each team to the University of Washington. This collective ownership was further emphasized by ongoing online communications and a second workshop halfway through the project in which all teams came together to share progress, early insight and priorities for next steps.

The reliance on local expertise to conduct fieldwork (as opposed to outside experts), and the use of a collectively agreed upon research framework and rationale (as opposed to different approaches and frameworks) greatly contributed to the trustworthiness of the research, and enhanced the comparability of results. The open process for local team selection, the participatory nature of the research design, and the open and ongoing discussion of early insights emerging from the in-country research teams were all critical factors that contributed to the success of this ambitious research project. Nonetheless, the tight timeline to conduct country studies (roughly 9 months in most cases), and the need to prepare all country reports in English (as opposed to local language reports) might have been factors that hindered the quality of the in-country research results.

Research Design

Research Question

The study was designed following an integrated, iterative approach[4] that builds on the collective strengths of the research teams and on emerging lessons from the research process. The guiding research question for this study was: **What are the information needs and opportunities to strengthen institutions that offer public access to information and communication, especially to underserved communities, and especially through the use of digital ICT?**

Research Framework

To answer this question, we explored different frameworks that could help structure the research process (Bridges.org, 2005; Camacho, 2004; DFID, 1999; Earl, Carden, & Smutylo, 2002; Gomez & Reilly, 2002; Heeks, 2009; Whyte, 2000) and chose one of them, the Real Access framework, as a starting point. The Real Access framework was developed by Bridges.org in South Africa in 2005, as a framework to understand the range of economic, political, educational, infrastructure, cultural, organizational and other factors that affect whether someone truly has 'access' to ICT. In other words, it is based on the assumption that providing computers alone will not solve the access challenge, an assertion that has been validated by the numerous public access initiatives of the past decade (Alampay, 2006; Bossio, 2004; Colle & Roman, 2001; Dagron, 2001; Delgadillo et al., 2002; Etta & Parvyn-Wamahiu, 2003; Gomez & Ospina, 2001; Gomez & Reilly, 2002; Jensen & Esterhuysen, 2001; Maeso &

[4] Research design was led by Ricardo Gomez, in collaboration with Chris Coward, Rebecca Sears and Rucha Ambikar from CIS, University of Washington. We acknowledge the strong contributions of Kemly Camacho from Sula Batsu, Costa Rica in development of the ACE Framework.

Hilbert, 2006; Parkinson, 2005; Proenza, 2001; Simpson, Daws, & Pini, 2004; United Nations, 2007). Compared to other frameworks, the Real Access framework has been tested on the ground in several countries. For the purpose of this study, it provided enough structure and flexibility to adapt to the research needs and local context of each country in the sample. In brief, we chose the Real Access framework for its simplicity, flexibility, appropriateness, and applicability in diverse contexts around the world.

Early involvement of different stakeholders and local research partners helped us refine the Real Access framework and adapt it to the needs of this research, making sure all key categories and dimensions of analysis were addressed. At the same time, multiple iterations and revisions in the process of research design, data collection and analysis helped make sure that the most meaningful questions were being asked in the most meaningful way, which would result in interpretations and findings that are useful, credible, dependable and trustworthy (Denzin & Lincoln, 2005; Lincoln, 1995; Villiers, 2005). These are the key design features of our Integrated, Iterative Approach (IIA), also called Integrated Contextual Iterative (ICI) approach (Barzilai-Nahon, Gomez, & Ambikar, 2009), rooted in the interpretivist tradition of social inquiry (Walsham, 1995; Schwandt, 1998; Denzin & Lincoln, 2005).

The original Real Access framework by Bridges.org suggests twelve themes to analyze ICT use[5]. We used these as a starting point, grouping them into three categories (equitable access, human capacity, and enabling environment). As part of the modifications resulting from research design workshops with country teams early in the study we expanded some of the categories to address the situation of venues that do not currently offer ICT as part of their services (public libraries in some countries, in particular), and added a notion of change over time (past trends and future directions), to compensate for the relatively static nature of the original framework. In addition, two new themes were added to the framework (social appropriation of technologies[6], and international policy and regulatory framework), making the research framework more complete and robust.

As a result of the research findings, the research framework was further modified, with clearly defined categories and indicators for analysis of the public access landscape. We have called the resulting framework the ACE Framework (for Access, Capacity and Environment). In a nutshell, the ACE Framework is based on the idea that three key dimensions are required to understand public access venues: Access, Capacity and Environment. The three dimensions are interrelated, and together they contribute to a robust public access landscape in a particular location. A detailed description of each one of these dimensions and the variables that influence them is described below. This approach is contrary to early thinking in the ICT for development field, which assumed that setting up more connectivity infrastructure was enough to bridge the digital divide, and convergent with other critiques that regard connectivity as only one of the key elements for digital inclusion (Gomez and Ospina, 2001; Norris, 2001; Warschauer, 2003; Wilson, 2004). As Warschauer acutely notes,

> *"a digital divide is marked not only by physical access to computers and connectivity, but also by access to the additional resources that allow people to use technology well. However, the original sense of the digital divide term -*

[5] The twelve original themes in the Real Access framework are physical access, appropriateness, affordability, human capacity and training, locally relevant content, integration into daily routine, socio-cultural factors, local and macro-economic environment, political will and public support, and legal and regulatory framework. www.bridges.org.

[6] The label "Social Appropriation" is derived from the Spanish concept of *apropiación*, which implies taking ownership and transforming the use for purposes not necessarily intended by the original designers of the project or technology. See (Camacho, 2002; Echeverria, 2008) for a more in depth discussion of the concept of social appropriation.

which attached overriding importance to the physical availability of computers and connectivity, rather than to issues of content, language, education, literacy, or community and social resources - is difficult to overcome in people's minds."

The ACE Framework further develops each of the key dimensions to offer a comprehensive picture of public access venues and their potential contribution to social and economic development, as schematically represented in the following figure. Further development of the variables and indicators in the ACE framework will contribute a valuable addition to the research on ICT in public access venues.

Schematic Representation of ACE Framework

1. Access	**2. Capacity**	**3. Environment**
1.1 Physical Access to venue • Location of venue • Venue distribution (urban/non-urban) • Basic infrastructure (space) • Hours of operation	*2.1 Human capacity and training* 2.1.1 Staff • Level of librarian/operator training (libraries only) • Digital literacy • Operators' attitude to support information needs 2.1.2 Users • Perception of venue • Venue offers training in skills to use services (libraries only) • Venue offers ICT training • Digital literacy of users (independent of training in venues) • Programs for underserved populations • Trust in the venue	*3.1 Socio-cultural factors* • Gender discrimination • Age discrimination • Education discrimination • Religion discrimination • Socioeconomic discrimination • Ethnicity discrimination
1.2 Suitability of venue • Universal access (differences between venues serving rich and poor) • Venue meets local needs and conditions • Physical safety of venue, people, and materials • Venue as a place people want to go	*2.2 Meeting local needs: relevant content and services* 2.2.1 Local needs • Local needs are met (resources, skills, & operator capacity) • Locally relevant content (meeting local needs) • Produced in local languages 2.2.2 Local services • Sharing between venues • Sharing between venues • Urban/non-urban distribution	*3.2 Political will, legal and regulatory framework* • National and regional economic policies support of venues • Political will for venues • Long term government strategies to support the venue • Coordination of national and local policies • International policies to support venue networks • Use/censorship of materials (including ICT) in venues • Legal and regulatory framework particular to ICT
1.3 Affordability of venue • Cost in relation to daily needs • Financial Sustainability of venue • Sustainability for ICT • Competent services (including ICTs)	*2.3 Social appropriation* • 2.3.1 Venues • Space for collaboration • Integration into culture • Adapt venue to suit local needs (including ICTs) • 2.3.2 Technology in venue • Space for collaboration • Integration into culture	*3.3 Popular support* • Popular support to improve venues (including ICT) • Involved stakeholders (including NGOs, civil society, community organizations, etc.) • Champion for the cause
1.4 Technology access 1.4.1 Infrastructure • Availability of technology (hardware, software, telecommunications networks, internet services) • Basic infrastructure (electricity) • Appropriateness of technology • Physical access to technology 1.4.2 Affordability of technology & technology use • Cost in relation to daily needs • Financial Sustainability of technology		

Figure 3: Schematic Representation of ACE Framework

Key Definitions

As a complement to the analytical framework we established common definitions and criteria for data collection across all countries, starting with a clarification of what is meant by Public Access Venue:

Public Access Venue is an institutional venue with a mission to offer public access to information tools and resources, with services that are available to all and not directed to one group in the community to the exclusion of others.[7]

Based on this definition, we identified three main types of public access venue of importance in most countries, and grouped them under the generic headings "public library", "telecentre" and "cybercafé", with room for "other" venues of interest and importance in a particular country. We suggested the following common definitions for each one of the three main types of venues included in this study:

Public Library A **public library** is a library which is accessible by the public and is generally funded from public sources (such as tax monies) and may be operated by civil servants. Taxing bodies for public libraries may be at the municipal, district covering several municipalities, county, state, or federal level. Public libraries exist in most nations of the world and are often considered an essential part of having an educated and literate population. Public libraries are distinct from research libraries, school libraries, or other special libraries in that their mandate is to serve the public's information needs generally (rather than serve a particular school, institution, or research population). Public libraries typically are lending libraries, allowing users to take books and other materials off the premises; they also have non-circulating reference collections. Public libraries typically focus on popular materials such as popular fiction and movies, as well as educational and nonfiction materials of interest to the general public; Internet access is also often offered. (based on Wikipedia.org)

Cybercafé An **internet café** or **cybercafé** is a place where one can use a computer with Internet access, most for a fee, usually per hour or minute; sometimes one can have unmetered access with a pass for a day or month, etc. It may serve as a regular café as well, with food and drinks being served. Internet cafés are located world-wide, and many people use them when traveling to access webmail and instant messaging services to keep in touch with family and friends. Apart from travelers, in many developing countries Internet cafés are the primary form of Internet access for citizens as a shared-access model is more affordable than personal ownership of equipment. (based on Wikipedia.org)

Telecentre A **telecentre** is a public place where people can access computers, the Internet, and other digital technologies that enable people to gather information, create, learn, and communicate with others while they develop essential 21st-century digital skills. While each telecentre is different, their common focus is on the use of digital technologies to support community, economic, educational, and social development—reducing isolation, bridging the digital divide, promoting health issues, creating economic opportunities, and reaching out to youth for example. Telecentres exist in almost every country, although they sometimes go by different names (e.g.,

[7] Adapted from: International Federation of Library Associations and Institutions (2001). The Public library service: IFLA/UNESCO guidelines for development. In P. Gill et. al. (Eds.), *The Section of Public Libraries*. The Hague: K. G. Saur Verlag GmbH München. Retrieved December 4, 2007, from http://www.ifla.org/VII/s8/proj/publ97.pdf.

village knowledge centers, infocenters, community technology centers (CTCs), community multimedia centers (CMCs) (based on Wikipedia.org)

Some countries adapted the definitions to fit the particular situation of their country (for example, Cabinas Publicas in Peru are considered cybercafés, as are Warintek and Warmasif in Indonesia; but telecentres are called NGO Information Service Centers in Algeria, and Community Technology Centers in Dominican Republic). The exact contextualized definition, when one was suggested, is included in each detailed country report. In few cases the local researchers excluded venues where fees were charged (i.e., cybercafés in Turkey), when it would have been better to include them for consistency with the global study, and in other cases they included venues that are not fully open to the public but cater to a specific population (Schoolnet in Namibia, studied as "other venue"), resulting in data that is of interest to the country but not quite comparable with findings in other countries.

Each country identified other public access venues of local relevance. In some cases other venues were studied in detail, in others they are just acknowledged but not studied in depth. For example, community libraries in Argentina, or Mosque libraries in Algeria were studied as "other venues", but WiFi plazas, phone booths or use of mobile phones were not studied as they are not quite "venues" or don't have the same institutional nature of the other venues we were focusing on. These other spaces and services are undoubtedly important in information flows in most countries, but they are not covered in our study and further research about their interaction with public access venues is needed.

In addition to the generic definitions of each type of public access venue, we identified five key inequity variables that the research in all countries would focus on understanding: income, age, education level, gender and geographic location (urban/non-urban). Other common inequity variables such as caste, ethnicity, language, religion or other were left to the discretion of local researchers to explore, if relevant. Data about these other variables is of great local importance, but it is less consistently available across all countries; its analysis is not included in this paper.

Data Collection

Primary data for this study was collected in two successive phases by local research teams in each country, under the guidance of the UW team[8]. We then conducted several iterations of comparative analyses based on the country reports prepared by each country team. The comparative analyses use detailed country reports prepared by local teams as primary sources. This section describes these two levels of data collection in more detail.

Using the ACE Framework as an organizing principle we prepared a data collection template for each country to follow in the preparation of their respective reports. This template was discussed and enriched after the initial workshop with all researchers (Dec 2007), and it was used by each local team to prepare an interim report (for Phase 1, March 2008)) and a final, detailed country report (after Phase 2, Sept 2008) with all the key findings and interpretation for each country. In addition to the full country report, each local team produced and/or reviewed a country profile with key statistical data from different sources for the country, a short summary of findings, and a narrative report that could be edited into a book chapter. All these primary documents are publicly available for

[8] Data collection strategy was designed by Ricardo Gomez, in collaboration with Rucha Ambikar and Rebecca Sears of CIS, University of Washington.

consultation and reference[9], including the blank data collection template, all country reports, and a summary of all findings in an easy to read format (Gomez, 2009).

The data collection template was designed to help each country research team organize their local fieldwork to answer detailed questions about Access, Capacity and Environment issues in each type of venue studied, as well as national environment, history and trends in relation to public access initiatives. Rather than provide them with ready-made interview guides and questionnaires to apply, we preferred to build a collaborative research practice that took advantage of local expertise and talent, emphasizing the requirement to conduct research based on commonly accepted research standards[10] and research principles[11]. This approach allowed sufficient structure to have common elements of design, purpose and approach, and sufficient flexibility to allow for adaptation to local needs and realities of each research team in each country.

The high level structure of the data collection template used in each country is summarized in the next figure[12].

[9] The project has maintained a public web site with all reports and publications at www.cis.washington.edu/landscape.

[10] Research Standards of the American Evaluation Association (Joint Committee on Standards for Educational Evlauation, 1994):

> **Utility** (ensure that research will serve the practical information needs of intended users)
> **Feasibility** (ensure that research will be realistic, prudent, diplomatic and frugal)
> **Propriety** (ensure that research will be conducted legally, ethically, and with due regard for the welfare of those involved in the research, as well as those affected by its results)
> **Accuracy** (ensure that research will reveal and convey technically adequate information about the features that determine worth or merit of the program being studied

[11] Research Principles of the American Evaluation Association (Joint Committee on Standards for Educational Evlauation, 1994)

> **Systematic inquiry** – evaluators conduct systematic, data-based inquiries about what is being evaluated
> **Competence** – evaluators provide competent performance to stakeholders
> **Integrity/honesty** – evaluators ensure the honesty and integrity of the entire evaluation process
> **Respect for people** – evaluators respect the security, dignity and self-worth of the respondents, program participants, clients and other stakeholders with whom they interact
> **Respect for general public welfare** – evaluators articulate and take into account the diversity of interests and values that they may be related to in the general and public welfare

[12] The complete template (blank) as well as all country reports built on this template are available online at http://cis.washington.edu/landscape/library/working-documents/.

Contents of the Country Report Template

Figure 4: Final Country Report Template

Each local team conducted the necessary data collection and analysis needed to complete the report template, with some degree of variation across countries. In addition to obvious differences in the complexity and maturity of the public access landscape across all countries studied, some of the local teams had more experience with one particular type of venue and not the others[13], and they generally needed more work to study the venues they knew less about. In some cases the size and diversity of the country (i.e., Brazil, Indonesia) was such that researchers concentrated on a particular region. Some research teams had more active discussion and collaboration with other country teams as the research unfolded. All country teams worked with local students, contractors or consultants to gather the required information, and all were led by a reputable researcher affiliated with a university, non-profit organization or consulting firm. All in-country research was conducted in the local language, and all the reports were prepared in English.

Even though each local team was given much freedom to carry out in-country research in the most locally-appropriate way (and bound by research standards and principles, as described above), all teams agreed to use *at least* the following data collection methods in each country:

- **Document review** – identify and review salient literature (published or unpublished) in each country in relation to the project's area of focus. Total documents reviewed: 30-50 per country.
- **Expert Interviews** – identify at least ten specialists in the areas of interest of the project and hold in-depth interviews with them. Total expert interviews: 10-15 per country.

[13] The fields of Information and Communication Technologies for Development (ICTD) and Library Information Sciences (LIS) have generally operated apart from each other; this collaborative research project has helped to bring researchers from these fields closer together in each country, learn from each other and confirm that they have much common ground in their interest for information, technology and human development.

- **Site visits** – identify, visit and observe six or more venues of each type of venue studied (library, telecentre, cybercafé, other) for a half day, with special attention to include both urban and non-urban sites (ideally three of each). Sampling rationale: seek typical case samples of each type of venue, including both urban and non-urban sites. Total site visits: 18-22 per country, total 450-550 sites visited.
- **User Surveys** – collect user information from sites visited using a survey instrument template (some set questions provided, with opportunity to add other questions in each country). Sample rationale: based on same sample of sites visited, survey every second or third user exiting the venue, target 40-50 users in each venue. Total users surveyed: 720-1100 per country. Note that the user surveys are not intended to provide statistically significant sample of the population or of the venues studied.
- **Operator Interviews**: identify at least one operator in each site visited and hold a structured interview for more in-depth understanding of the venue, users and environment. Total operators interviewed: 18-22 per country.
- Additional optional data gathering: focus groups with users, operators or experts; additional visits and interviews; peer consultation and review.

It is important to note that this study focused primarily on qualitative data gathering and interpretation, to assess the current state and future opportunities in public access to ICT across different types of venues and across a sample of 25 countries. The numerical data that was gathered, particularly through user surveys, interviews and document review, must be used and interpreted with care as it cannot explain particular behaviors in specific contexts, nor can it be used as statistical data for generalizations about the venues or the population. User surveys were adapted in each country and varying numbers of respondents were included, in some cases more and in some cases less than what we originally designed; combined with data obtained from interviews with operators and with other research results available in the country, they constitute the primary source for information about users in the different types of venues, including gender, age, education and income variables, analyzed in more detail in other work in progress. Other numerical data such as counts of venues, proportion of them with ICT, and proportion of them in urban or non-urban settings generally come from secondary sources consulted by local researchers.

The data about public libraries is generally more reliable, as there are public records in most countries and international bodies that work with libraries (i.e., IFLA, UNESCO); when available these official sources were used. Nonetheless, information about telecentres is more disperse among international agencies and local non-profit organizations that sponsor them, and information about cybercafés is generally sketchier or not available at all. Information such as estimated number, characteristics and locations of cybercafés, and to a lesser degree, telecentres, tends to be an informed estimate, sometimes the result of "educated guesses" on the part of the researchers, based on what they learned about those particular venues and the context in the country. In most cases, detailed country reports by local researchers indicate the sources for the numerical data about each type of venue in the country.

On the other hand, there is much variability in available estimates about the number of venues, especially cybercafés. While in our study there are numbers that may be exaggerated (the number of cybercafés in Uganda, for example, is estimated at 20,000, a figure corroborated by the local research team), they are missing in others (no estimated numbers for cybercafés in Malaysia, Georgia or South Africa, for example, and we could not find independent and credible estimates elsewhere). This means that while the numerical details discussed here may not be an exact reflection of any single country, and estimates about cybercafés in particular may be the most

variable, they are based on locally-informed estimates and analysis which, when combined across all 25 countries, represents a meaningful source of trends and patterns.

Data Validation

The field research in each country was based on multiple methods for data gathering, conducted in local languages by a qualified team of local researchers. Furthermore, the CIS team cross checked the consistency of the data within and across different reports (summary, detailed report, narrative report, statistical profile), and in some cases, verified the accuracy of data regarding counts of public libraries in different countries. This allowed for various triangulation options, multiple data sources, multiple methods, multiple perspectives and multiple investigators, all of which add to the validity and confidence of the findings (Patton, 2002).

Based on these common research design elements, each local team designed and conducted field research to best respond to local context and needs, and in a way that capitalized on the team's expertise and networks. Each team identified and researched key public access venues to study in their country, and in consultation with the UW team they produced a preliminary report over a period of two months. Preliminary reports were then analyzed across countries to look for early indications of gaps, similarities, trends and opportunities, and to inform the direction of the next iteration of the research in what we called Phase II. Phase II lasted about six months, and was launched by bringing together all researchers again in a workshop to discuss the research process, emerging findings, and next steps. We revisited the original research framework, and identified and incorporated additional themes emerging in the findings that were not part of the Real Access framework. We also discussed and refined a final country report template which was used by all country teams to produce their reports in a standard and consistent format. This combination of clear overall structure and flexibility for local adaptations, together with a collaborative approach that facilitated and promoted communication and cooperation among the different researchers proved to greatly enhance the robustness of the design and the utility of the findings (Shulha & Wilson, 2002).

Furthermore, the two-phase design, which is part of the Integrated Iterative Approach used in this research, allowed a finer focus in the data collection and analysis. By using this iterative design, early results, preliminary comparative analysis and peer review helped to identify emerging trends and gaps in the research, and helped to strengthen the utility, credibility and comparability of the final results (Creswell, Clark, Gutmann, & Hanson, 2002)

Data Analysis

With the massive volume of qualitative data gathered from all 25 countries in both Phase 1 and Phase 2, we conducted several iterations of comparative analysis to inform the findings in the Landscape Study. Special attention was dedicated to data reduction, data display and data management (Miles & Huberman, 1994). We explored the early use of qualitative analysis software (Atlas TI) but postponed it due to software limitations to handle the volume and different sources of data and the collaborative nature of the research team. We chose a more traditional approach to coding the data, finding patterns, labeling themes and developing category systems as part of the analysis (Patton, 2002). For this we developed a detailed coding grid[14] based on the ACE framework, in which we coded each dimension of Access, Capacity and Environment for each type of public access venue in each country, using a scale of one to five, where one is lowest and five is highest. See detailed coding grid and definitions in Appendix 1.

[14] Data coding grid was developed by Kemly Camacho, Elizabeth Gould and Rucha Ambikar, in collaboration with Ricardo Gomez and CIS team at University of Washington.

All the coding was performed by the research team at the University of Washington, following agreed upon criteria and with regular conversation to discuss borderline cases or outliers that were difficult to code. Furthermore, spot checks and double-blind coding was done for several venues and/or several countries to look for salient discrepancies. Very few were found and in only one case an assigned code was changed following the verification. This highlights the utility of the coding as a tool to seek patterns, themes, regularities or divergences. Furthermore, the systematic coding allowed us to work with "what if" scenarios, as well as offer an analytical tool that can assign different weights to different measures, an important feature of the Integrated, Iterative Approach in measuring digital divide/s (Barzilai-Nahon, Gomez, & Ambikar, 2009). This interpretive coding is not intended to provide statistical data about public access venues, but a sense of ranking and relative weight of each one of the variables in consideration.

In addition to detailed data coding, we conducted SWOT analysis (strengths, weaknesses, opportunities, threats) on parts of the data, we facilitated several analytical workshops on particular themes emerging in the data, and we held numerous research conversations, discussion groups and team debriefings, to illuminate the findings and assist the interpretation of the rich data gathered in this study. In a nutshell, we dedicated over a year of the skills, training, insight, capabilities, energy and enthusiasm of a small and interdisciplinary team of researchers, assisted by a network of research partners in the University and around the world, to do what interpretation of findings does best: *making the obvious obvious, making the obvious dubious, or making the hidden obvious* (Patton, 2002).

Numerous products result from this research, including academic papers, technical reports and other publications, in addition to teaching and learning opportunities for graduate students at the University. This paper is one of these research results.

Limitations of the Study

This study is groundbreaking in its breadth and scope: no other studies have systematically looked at different types of public access venues and across multiple countries around the world. Nonetheless, breadth comes at a price: this study does not provide an in-depth analysis of a particular venue, country or experience, and findings are not easily generalizable without a clear understanding of the specific context and the analytic framework in use. Furthermore, despite the different mechanisms to enhance the credibility and integrity of the data, research was particularly challenging in some countries over others for intrinsic or external reasons (country size and diversity, as in Brazil, Indonesia or South Africa; or unexpected political turmoil, as in Georgia; or very tight timeline for most researchers, especially those with turnover in the research teams).

The tension between structure and flexibility in research design generally helped to strengthen the research results. We purposefully did not enforce a centrally-defined interview guide for fieldwork research, leaving that level of definition to the local researchers in each country, depending on the context and expertise of both interviewers and interviewees. Nonetheless, we did include a short survey instrument that was localized by the teams, and in many cases, complemented with additional questions. We knew the survey sample would not be statistically representative, but we wanted a credible indication of possible trends. Survey results were mostly shared as percentages, not absolute numbers, and in some cases the scales for the answers were changed (for example, the age brackets to distinguish youth from adult), thus diminishing the utility of the survey results.

It has been mentioned before, but worth repeating here: numerical data needs to be handled with special care, as it is not the result of census or statistically significant sample, collection or analysis. The user surveys were not statistically representative and had country-by-country variations that limit their generalizability. Venue counts and distribution, especially cybercafés, are sketchy and mostly represent "educated guesses" on the part of local

researchers. Numerical data presented in this study is mostly useful to uncover general trends and point to interesting areas for further research to be conducted.

Lessons Learned

Conducting a global study of the magnitude of this one carries its unique challenges, and allowed us to learn valuable lessons. First and foremost, the balance between structure and flexibility is a delicate equation that needs to take into consideration the needs and requirements of the different stakeholders. While pure research with no strings attached to funding would allow for a design that privileges theoretical and methodological considerations, our applied research was constrained by specific requirements and needs of the different parts involved, including funders. Tighter structure allows for more centralized control and could increase the comparability of results, while higher flexibility allows for more adaptation to meet local needs and possibilities. If we were to do this over again, we would either drop the user surveys altogether, or do them with a strong, centrally-defined instrument and statistically significant samples of the population.

Collaborative nature of the research process also had its advantages and disadvantages. A relation that is handled as a consultant contract or a data-collection exercise in which the local teams have no say in research design might be easier to implement, but would likely have less meaningful buy-in and engagement, and would miss out on opportunities to strengthen the research activities, as we saw in our research. Through facilitated dialogue the research teams could gain a direct understanding of the intent and scope of the study, and contribute their insight to make it stronger from the outset. Nonetheless, we were not able to set up useful online interaction and dialogue early on, which resulted in lower ongoing collaboration except in cases where researchers already had existing relations between them. If we were to do this again we would start immediately with an online collaboration tool, even if it is a simple mailing list, and focus more energy on the facilitation of the ongoing interaction and sharing between research teams, both during the data collection and the analysis phases of the study.

The scope of the research we undertook meant sacrificing some depth in exchange for breadth. The result is a broad blanket of understanding over a variety of topics in relation to ICT in public access venues, but not enough depth to really understand their intricacies, causes or effects. In future steps we will explore ways to adapt the research framework to apply it to in-depth studies of a particular country or context.

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Appendix 1

Detailed coding grid with definitions, for interpretive scores used in data analysis:

		Definition of variable	*Criteria for ranking 1-3-5*
1	1. ACCESS	**Composite**	**2, 7, 12, 17**
2	1.1 Physical Access to venue	**Composite**	**3, 4, 5, 6**
3	Location of venue	*How easy is it to go to the venue? Is it centrally located? Connected by public transport/convenient to get to?*	1 difficult to get to, even if centrally located 3 centrally located, but limited public transportation 5 easily accessible via public transportation, walking, bicycling…
4	Venue distribution (urban/non-urban)	*Is there an equitable distribution of venues between urban and non-urban areas?*	1 services only urban, easily-accessible areas, very centralized 3 some non-urban locations serviced 5 wide geographic distribution – urban/non-urban, decentralized, hard to reach areas serviced
5	Basic infrastructure (space)	*Is venue space sufficient to offer the necessary services?*	1 very limited physical infrastructure 3 moderate infrastructure 5 well-developed physical infrastructure
6	Hours of operation	*Are the hours of operation of the venue convenient for the users? Or does it preclude certain users from accessing the venue?*	1 hours are convenient for none/very little of the population 3 hours are convenient for some of the population 5 hours are convenient for most of the population
7	1.2 Suitability of venue	**Composite**	**8, 9 10, 11**
8	Universal access (differences between venues serving rich and poor)	*By its very nature, does the venue appear more suited for the general population or does it cater specifically to the rich or poor?*	1 The venue is accessible to select populations or individuals 3 The venue is accessible but not "inviting" to all people 5 The venue is open for all people to use
9	Venue meets local needs and conditions	*Does the venue meet basic local information needs and services?*	1 information needs are not being served 3 people are content but see deficiencies in access to information needs 5 people are satisfied with their information needs being met
10	Physical safety of venue, people, and materials	*Do people feel safe at the venue? Are materials, including hardware, ever stolen?*	1 people do not feel safe in this venue, vandalism and theft is a major concern 3 Not all people feel safe in this environment, some steps need to be taken to keep the venue secure 5 People feel safe, vandalism and theft are not an issue
11	Venue as a place people want to go	*Do people perceive the venue as a place they want to go? Is the venue welcoming?*	1 people prefer to go to other venues to meet their information needs 3 Some people see this venue as a place to go to satisfy their information needs, but this is not the belief of most people 5 People feel that this venue is the place to go to satisfy their information needs
12	1.3 Affordability of venue	**Composite**	**13, 14, 15, 16**
13	Cost in relation to daily needs	*Given the average income, etc. of the people, is the cost of using the venue proportionately affordable?*	1 ICTs are not affordable for a majority of the population 3 ICTs services are barely sustainable through charge for services, which is not affordable to all 5 ICTs are free for anyone to use
14	Financial Sustainability of venue	*Does the venue have sufficient funds (beyond ICT charges) for long term sustainability?*	1 The venue is not financially sustainable (with our without support by ICT costs) 3 The venue is has some financial support beyond ICT costs, but long term sustainability is questionable 5 The venue has sufficient financial support to continue functioning in the long term
15	Sustainability for ICT	*Does the venue have sufficient funds for continued ICT service?*	1 staying open is a constant struggle 3 start-up costs covered, but continuous revenue source is unreliable 5 supported by a reliable revenue source
16	Competent services	*Does the venue offer basic services to meet information needs that function*	1 This venue does not offer services nor resources that function well 3 Some services and resources function well, but many do not

	(including ICTs)	*well?*	5 This venue offers services and resources that function well and are easy to use
17	1.4 Technology Access	**Composite**	**18, 23**
18	1.4.1 Infrsastructure	**Composite**	**19, 20, 21, 22**
19	Availability of technology (hardware, software, telecommunications networks, internet services)	*What technology is available to meet local needs?*	1 no access to ICTs 3 limited access to ICT services, little or no internet access 5 multiple ICT services, good internet service
20	Basic infrastructure (electricity)	*Is there sufficient electricity/alternate power source for the venue to continuously function?*	1 very limited to no electricity, connectivity not even a consideration 3 moderate infrastructure, limited electricity with developed alternatives 5 well-developed physical infrastructure including connectivity
21	Appropriateness of technology	*Is the available technology suitable to meet local needs?*	1 There is frustration with and unequal access to ICTs 2 People are unaware that ICTs exist to meet their information needs 4 People are content but see deficiencies in access to ICTs 5 People are satisfied with their ICT needs being met
22	Physical access to technology	*Are the technology resources within the venue easy to access?*	1 The technology resources within the venue are difficult to get to and/or have very restrictive user regulations 3 The technology resources within the venue have restrited access 5 The technology resources within the venue are easily accessed by everyone and available for anyone to use
23	1.4.2 Affordability of technology & technology use	**Composite**	**24, 25**
24	Cost in relation to daily needs	*Is the comparative cost of using ICT high or low for a majority of the population?*	1 ICTs are not affordable for a majority of the population 3 ICTs cost a minimal amount 5 ICTs are free for anyone to use
25	Financial Sustainability of technology	*Is the available technology sustainable financially, or does the high cost jeopardize its future use?*	1 ICTs are sustainable 3 ICT services are barely sustainable through charge for services, which is not affordable to all 5 ICTs are not sustainable
26	2. CAPACITY	**Composite**	**27, 39, 48**
27	2.1 HUMAN CAPACITY AND TRAINING	**Composite**	**28, 32**
28	2.1.1 STAFF	**Composite**	**29, 30, 31**
29	Level of librarian/operator training (only libraries)	*Is the staff trained formally (e.g. with degree in library sciences)?*	1 none of the staff members have had library training 3 at least one member of the staff has some type of library training (not a formal degree) 5 at least one member of the staff has Library degree
30	Digital literacy of operator	*The ability to use digital technology, communication tools, or networks to locate, evaluate, use and create information*	1 Staff has little exposure and does not use ICT 3 Staff has some knowledge and proficiency in the use of ICT 5 Staff is proficient in the use of ICTs
31	Operators' attitude to support information needs	*il the venue operator willing to help users find what they need?*	1 staff is not interested and involved in supporting user's needs 3 staff will assist patrons if asked 5 staff is interested and involved in supporting user's needs
32	2.1.2 USERS	-	**33, 34, 35, 36, 37, 38**
33	Perception of venue	*How is the venue perceived by its users?*	1 population perceives no value in this venue 3 population perceives venue as providing services for “others,” or useful to limited populations 5 population perceives venue as valuable places for access to information and/or a “cool” place to go
34	Venue offers training in skills to use services	*Does the venue offer training to meet information needs?*	1 users are not offered any training programs nor help by staff for library usage 3 users are offered few training programs and very little help by

	(libraries only)		staff for library usage 5 users are offered multiple training programs and help by staff for library usage
35	Venue offers ICT training	*What level of ICT training is offered to users?*	1. Users are not offered any training programs/any help by staff in the use of ICTs 3 Users are offered few training programs/very little help by staff in the use of ICTs 5 Users are offered multiple training programs/help by staff in the use of ICTs
36	Digital literacy of users (indep. of training in venues)	*The ability to use digital technology, communication tools, or networks to locate, evaluate, use and create information*	1 very few users are digitally literate and are unable to use ICTs 3 some users are digitally literate and are somewhat able to use ICTs 5 most users are digitally literate and are able to use ICTs
37	Offers programs for underserved populations	*Are there any special programs/trainings/facilities for populations that are traditionally underserved?*	1 no accommodations or programs exist for underserved populations 3 there is some accommodation and programs for underserved populations 5 the venue services all populations with special programs for underserved communities
38	Trust information in the venue	*Do people trust the information gathered from the venue?*	1 information gathered from this venue is not considered trustworthy 3 information gathered from this venue is perceived as somewhat trustworthy 5 information gathered from this venue is perceived as trustworthy
39	2.2 MEETING LOCAL NEEDS: RELEVANT CONTENT AND SERVICES	**Composite**	**40, 44**
40	2.2.1 Meet Local Needs	**Composite**	**41, 32, 43**
41	Local needs are met (resources, skills, & librarian capacity)	*Does the venue meet local needs in terms of resources available, skills and staff capacity?*	1 This venue does not have enough resources to meet local needs 3 This venue has enough resources to somewhat meet local needs 5 This venue has enough resources to fully meet local needs
42	Locally relevant content (meeting local needs)	*Is the content offered in the library locally relevant?*	1 no locally relevant content can be found 3 some/little locally relevant content is available 5 locally relevant content is available
43	Info available in local languages	*Is content produced in local languages available in the venue?*	1 very little/no content in local languages available 3 some content in local language is available 5 content can be found in local languages
44	2.2.2 Relevant Local Services	**Composite**	**45, 46, 47**
45	Sharing between venues	*Do different venues collaborate with each other on resources, training, etc. (libraries, cybercafes and telecentres)?*	1 Venues do not network nor share resources 3 Some venues are networked with resource sharing 5 Networking and resource sharing occurs throughout the country
46	Sharing between libraries	*Do different libraries collaborate with each other?*	1 libraries do not network nor share resources 3 some libraries are networked with resource sharing 5 library networking and resource sharing occurs throughout the country
47	Urban/non-urban balance	*What is the distribution of venues and services offered in terms of urban/non-urban locations?*	1 Content and services are vastly different between urban and non-urban areas, or are non-existent in non-urban areas 3 Content and services are superior in urban areas 5 Content and services are similar in both urban and non-urban areas
48	2.3 SOCIAL APPROPRIATION	**Composite**	**49, 53**
49	2.3.1 VENUES	**Composite**	**50, 51, 52**
50	Venue as space for collaboration	*Does the venue itself encourage or discourage collaboration among patrons?*	1 this venue discourages community building in their space 3 this venue offers potential for community building (but is not necessarily used for this activity right now) 5 this venue discourages community building in their space

51	Venue integration into culture	*How easy or difficult is it for people to integrate libraries into their daily lives?*	1 People are unaware of information provided through ICTs at this venue and do not integrate this in their decision making/activities 3 People are somewhat aware of information provided through ICTs at this venue and sometimes integrate this in their decision making/activities 5 People are aware of information provided through ICTs at this venue and routinely integrate this in their decision making/activities
52	Adapt venue to suit local needs (including ICTs)	*Is the venue able to adapt to local needs?*	1 this venue does not change according to local needs 3 this venue is sometimes able to change according to local needs 5 this venue is able to change according to local needs
53	2.3.2 TECHNOLOGY IN VENUE	**Composite**	**54, 55**
54	Technology as space for collaboration	*Does the technology provided in the venue encourage or discourage collaboration among its patrons?*	1 ICTs in this venue discourage community building 3 ICTs in this venue offer potential for community building (but is not necessarily used for this activity right now) 5 ICTs in this venue are places where community building occurs
55	Technology integration into culture	*Is the venue easily integrated into the daily culture of the people. Eg. Is looking up information in the library a usual part of people's information culture?*	1 People are unaware of information provided through ICTs at this venue and do not integrate this in their decision making/activities 3 People are somewhat aware of information provided through ICTs at this venue and sometimes integrate this in their decision making/activities 5 People are aware of information provided through ICTs at this venue and routinely integrate this in their decision making/activities
56	3. ENVIRONMENT	**Composite**	**57, 64, 72**
57	3.1 SOCIO-CULTURAL FACTORS	**Composite**	**58, 59, 60, 61, 62, 63**
58	Gender discrimination		
59	Age discrimination		
60	Education discrimination	Are there biases against anyone in the following six categories based upon the listed factors	1 No discrimination for this factor 3 No discrimination is mentioned 5 There is discrimination for this factor
61	Religion discrimination		
62	Socioeconomic discrimination		
63	Ethnicity discrimination		
64	3.2 POLITICAL WILL, LEGAL AND REGULATORY FRAMEWORK	**Composite**	**65, 66, 67, 68, 69, 70, 71**
65	National and regional economic policies support of venues	*Are there any current policies at the national or regional level that support the venues?*	1 These venues were never supported by national/regional funding 3 These venues were sometimes supported by national/regional funding 5 These venues are supported by national/regional funding
66	Political will for venues	*Is there support among policy makers for the venue?*	1 there are no policies that support local endorsement for these venues 3 there are minimal policies that support local endorsement for these venues 5 policies support local endorsement for these venues
67	Long term government strategies to support the venue	*Does the government prioritize the sustained existence of the venue?*	1 long-term strategies do not exist to support these venues 3 the government finances long-term strategies to support this venue, although it is not highly prioritized 5 the government finances and gives priority to policies that support this venue
68	Coordination of national and local policies	*Is there coordination between national and local policies that support the venue?*	1 government policies do not support these venues nor their information needs 3 government policies may support these venues, but do not take local needs into account 5 government policies for these venues support local needs
69	International policies to support venue networks	*Do international policies support the venue and/or networks of venues*	1 There are no international policies that support the venue nor venue networks 3 There are minimal international policies that support the venue

		(financially or otherwise)?	and/or venue networks (directly or indirectly) 5 There are international policies that help to support the venue and/or venue networks
70	Use/censorship of materials (including ICT) in venues	*Are there any explicit censorship rules that prohibit use of certain materials/services (excluding the social and popular norms that govern information behaviour)?*	1 information is severely restricted because of government mandates 3 some information is censored through government mandates 5 information is not censored through government mandates
71	Legal and regulatory framework particular to ICT	*Do government policies explicitly support the use/provision of ICTs?*	1 ICTs in these venues are not considered important by the government 3 ICTs in these venues may be considered in government policies, but are not given high priority 5 ICTs in these venues are an important consideration for government policies
72	3.3 POPULAR SUPPORT	-	**73, 74, 75**
73	Popular support to improve venues (including ICT)	*Do the venues (including the ICT they provide) enjoy popular support?*	1 there is no popular support for these venues, it is not a priority 3 there is popular support for these venues but there is not much effort put into improvement 5 there is popular support for these venues that encourages changes for their improvement
74	Involved stakeholders including NGOs, civil society, community organizations, etc.)	*Are there any other stakeholders such as NGOs, civil society organizations, etc. that are involved with the venues?*	1 stakeholders do not help to support these venues 3 stakeholders are not actively involved in supporting these venues 5 stakeholders actively support these venues
75	Champion for the cause	*Is there a particular champion for the cause of any of the venues? E.g. first lady in Egypt is a champion of libraries*	1 this country does not have a champion who supports public access to these venues 3 this country has a champion who supports public access to these venues, whose support is somewhat effective 5 this country does not have a champion who supports public access to these venues