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Abstract

This paper describes the role of infomediaries, a particular function of public access computing (PAC) services that extend the reach of information and communication technologies (ICT) in developing countries. Infomediaries help PAC users and other members of the community meet their information needs through formal or informal training, support and service activities that result in better direct or indirect use of ICT resources. Infomediaries help foster digital inclusion and bridge gaps such as illiteracy, limited physical access to a venue, insufficient technology-operation skills, and income constraints. We discuss findings of an in-depth study of PAC in Colombia, South America, conducted by University of Washington researchers and local partners. Combining qualitative and quantitative research methods, we analyze the role of infomediaries in three types of PAC venues: libraries, telecenters and cybercafés. Infomediaries in PAC venues contribute to human development by enabling easier access to (1) information on education, health, government services and other social needs in the community (Social Impact); (2) information about jobs, employment, business opportunities, and agricultural resources (Economic Impact); and (3) information and communication resources to strengthen personal relationships and sense of belonging to a local and global community (Community Impact). This research sheds new light on the importance of the role of formal and informal infomediaries to strengthen the contribution of PAC to human development.

Keywords

public access computing, infomediaries, public libraries, telecenters, cybercafés, Colombia

Public libraries, telecenters and cybercafés all play an important role in offering public access to computers and the Internet in Colombia.

Introduction

Between 2007 and 2009 a study of public access computing (PAC) in 25 selected developing countries across the world was conducted by the Technology & Social Change group (TASCHA) at the University of Washington. The study, which became known as the Global Landscape Study, compared issues of access, capacity and environment of PAC across different types of venues (public libraries, telecenters and cybercafés) and across multiple countries, in order to assess their potential contribution to human

development (Gomez 2011). Among other findings, the Landscape Study showed promising indication of the important role of information and technology brokers, commonly known as infomediaries, in

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delivering services of public access computing to underserved communities, and called for further research into this topic (Gould and Gomez 2010). Building on the comparative findings of the Landscape Study, in 2010 we conducted an in-depth study of PAC in Colombia, in order to probe more deeply into some of the issues identified in that global study. This paper offers an in-depth analysis of the role played by infomediaries in PAC venues in developing countries, based on the findings of our study of PAC in Colombia.

Our research explores two major questions in regards to infomediaries in PAC: (1) What specific infomediary behaviors can be identified in PAC venues in Colombia? and (2) How do these infomediaries impact social, economic and community development?

This work is based primarily on qualitative data collected across three types of venues that constitute the PAC ecosystem in Colombia: public libraries (government-funded venues that increasingly offer PAC services in addition to print collections for users), telecenters (not-for-profit centers that offer training and access to computers and the Internet, sponsored by government or non-governmental organizations as part of broader development initiatives), and cybercafés (for-profit businesses that offer computers and Internet among other products and services such as food, photocopies, phone calls, etc.). We use a model of infomediary behavior suggested by Theo Schilderman (2002) to analyze the specific types of infomediary behaviors we found among operators (the owners, employees or volunteers working to help computer users) in libraries, telecenters and cybercafés in Colombia. Our analysis offers insights into different ways in which infomediaries in libraries, telecenters and cybercafés help broker information and technology, and the effect of such intermediated interactions on the social, economic, and community needs of the populations they serve.

The remainder of the paper is organized as follows: In the next two sections we present a literature review and a description of the methodology used in this study. This is followed by findings and discussion of the role of infomediaries and their contribution to social, economic, and community development. The paper concludes with a discussion of the implications of the findings and issues for future research.

Literature review

Information and communication technologies (ICT) can contribute to social and economic development

(Warschauer 2003; Unwin 2009), and venues such as telecenters, libraries and cybercafés, which offer public access to computers and the Internet play an important role in extending the reach of ICT to underserved populations (Delgadillo, Gomez and Stoll 2002; Finkelievich and Prince 2007; Becker, Crandall et al. 2010).

Fifteen years ago there were very few PAC experiences in developing countries around the world. They were limited to a small number of international donor-funded 'multipurpose community telecenters (MCT),' for example in Uganda and Mali; a few 'civic telecenters' precariously operating in schools and libraries in different countries; a few 'basic telecenters' set up by local non-governmental organizations (NGO); a couple of 'telecenter franchise' experiences of centrally coordinated but locally owned telecenters, as in South Africa and Peru; and a handful of cybercafés in wealthy neighborhoods and shopping malls of many capital cities and tourist towns (Gomez, Hunt and Lamoureux 1999). In a decade and a half, these few, early PAC experiences have multiplied and spread around the developing world, sponsored by development agencies, governments, non-profit organizations. Privately owned cybercafés, which operate as for-profit businesses, have grown even faster. A 2010 study of 25 developing countries reported that over 30,500 telecenters and more than 182,000 cybercafés, in addition to about 14 percent of 27,783 public libraries in those countries, offer PAC (Gomez and Camacho 2011). According to this study, the ecosystem of public access computing is today an eclectic mix of about six cybercafés for every library or every telecenter in cities and towns in developing countries.

One of the key elements to extend the reach of ICT among underserved populations using public access computers is the role played by formal and informal infomediaries (Gould and Gomez 2010). Typically, three steps are required to serve a population's information needs: understand the population's culture; include someone in the decision-making process who understands the population; and receive direct input from the population from project inception. Gathering users' input enables and involves them in accessing information and solving their information needs in ways that are personally relevant (Bridges.org 2009). In order to succeed, PAC venues must be able to meet the information needs of a given population. Infomediaries play a critical role in understanding and meeting the information needs of the users of PAC.

Table 1. Three main functions of infomediaries (based on Schilderman 2002)

Functions	Infomediary characteristics
Share information	Capacity to provide information in an accessible format Willingness to share information rather than hold on to it Ability to get hold of information and adapt it to a local context
Help users	Experience, education, knowledge and reliability Accessibility, proximity and helpfulness
Build relationships	Social sensitivity and capacity to involve residents Leadership qualities, influence and moral authority Ability to foster trust in the relationship with residents

Infomediaries have been associated with the notion of ‘intermediaries’ in international development. Intermediaries play an important role in the diffusion of information, knowledge, technology, innovation, or practices such as how to operate a cell phone or a computer. They have been commonly referred to as ‘brokers’ (Provan and Human 1999) or ‘bridgers’ (Bessant and Rush 1995). In several cases intermediaries are considered liaisons that link other actors in organizational networks and communities. This view of intermediaries is rooted in social network analysis, most notably in the work of Granovetter (1973) on ‘weak ties’ or that of Burt (1982) on ‘structural holes’. Howells (2006) provides an extensive overview of the literature on intermediaries and their role in innovation and change. In the majority of studies intermediaries are found to transfer knowledge, technology and practices between unconnected members of social and organizational networks or between unconnected networks. How infomediaries in public access venues affect the transfer and diffusion of information, technology, and knowledge into the communities they serve, let alone how this gets used for social, economic, community development, seems to be less well understood.

In the information science literature, the notion of infomediary is closely linked to that of key informants (Schilderman 2002), gatekeepers (Metoyer-Duran 1993), lay-information mediaries or LIMBs (Abrahamson and Fisher 2007) and boundary spanners (Mason 2007). These authors use different terms to refer to the function or role of an infomediary in public access venues: an individual that serves as a broker or transferor of information, facilitating access to information for users in a culturally appropriate manner, by taking into account the norms of each group of people with whom the infomediaries connect (Gould and Gomez 2010).

Schilderman suggests eight characteristics of infomediaries (which he labels key informants) that are of

importance to the development role of public access venues; we group these characteristics into three main functions, as shown in Table 1.

These three infomediary functions, and the corresponding eight characteristics of infomediary behavior suggested by Schilderman, provide the structure for our investigation of infomediaries in different PAC venues in Colombia.

Research methods

Fieldwork was conducted in Colombia between January and June 2010 in collaboration with a local team of research assistants. By combining the breadth of a statistically representative survey, with the depth and insight of semi-structured interviews, and the context and interaction of focus group workshops in different communities, we offer a comprehensive understanding of PAC venues in Colombia and the role of infomediaries in them.

We examined public libraries, telecenters, and cybercafés in order to have a more complete picture of the public access computing ecosystem in the country. Under telecenters we include both community telecenters (supported by non-governmental organizations) and governmental telecenters (supported by the government’s Compartel program, among others); both types of telecenters have a mission to support community development. Cybercafés, on the other hand, are defined as commercial, for-profit businesses that offer access to computers connected to the Internet and other related services in towns and cities: Sometimes they offer food or beverages, connectivity services like telephone calls, scanning, printing, photocopying, and disc burning, or diverse services, such as hair salons, gym, or video games. A telecenter operator explains the difference between telecenters and cybercafés as follows:

“One of the differences between telecenters and cybercafés is where they are located. When I think of the cybercafés I think everyone around the schools, libraries, universities, shopping centers, mainly in urban areas. Telecenters typically have been identified with marginalized communities, rural areas, and low cost services, and also where there is no choice of Internet access. [Otherwise] there would be very little difference between a cybercafé and a telecenter, mostly because they would provide Internet services to whoever pays for it.”

This study did not consider non-users of ICT. Understanding the perspective of non-users can add valuable insight to the question of ICT for development, but studying non-users requires a very different methodological design than the one implemented in this study; given limited time and resources the study of non-users is not included in this research. It also did not include venues such as schools or specialized libraries, which are not open to the public.

This research used the Access, Capacity and Environment (ACE) Framework to offer a comprehensive understanding of the PAC ecosystem in the country. The ACE Framework addresses three pillars of PAC: (1) equitable access: physical access to the venue and to technology in it, suitability of the venue, and affordability of the services it provides; (2) human capacity and relevance: human capacity and training of both users and staff, meeting local needs, and social appropriation of the venue and services it offers; and (3) enabling environment: socio-cultural factors, political will and legal and regulatory framework, as well as popular support (Gomez 2010).

To better reflect the diversity of the population in the country, we adopted the regional distribution criteria used in the National Survey of Community Television (Angel 1998), which divided the country into five regions based on cultural and demographic characteristics: the Caribbean coast, Santanderes, Antioquia and coffee-growing region (Eje Cafetero), Central region, and Southwest region. This regional distribution model allowed us to have national coverage and to distribute the aggregate sample proportionally and statistically in the selected regions, based on the 2005 Census.¹ In each of the five regions we drew the sample from the capital city and a small town in order to reflect the diversity and variety of both urban and non-urban experiences in different cultural settings around the country. The data was collected using the following activities:²

User Surveys (n = 1,135): We surveyed 1,135 adult³ users of PAC venues across the country. The size of the sample was statistically representative of the country, adjusting to population distribution in urban and non-urban settings for each of the five regions.

Expert Interviews (10): Researchers with government, non-government and academic institutions, and opinion leaders in community communication activities in the country.

Operator Interviews (100): semi-structured interviews with owners, employees or volunteers working in libraries, telecenters and cybercafés around the country.

In-depth user interviews (10): conversational interviews with users identified in the research process as especially interesting because of the transformation, motivation, or vision of ICT for development they revealed.

Focus Group Workshops (6): workshops that used a blend of participatory rural appraisal techniques and focus group interview, including approximately twelve participants representing users, operators, and other stakeholders in the field of PAC (e.g. school teachers, ICT trainers, leaders of local community organization, etc.). All data was collected in Spanish with the help of local research assistants.

Survey responses were analyzed using SPSS and Excel software. In addition, all interview transcripts and focus group field notes were coded using ATLAS.ti, a software package for qualitative analysis, using key variables in the ACE Framework.

This paper in particular is based primarily on analysis of expert and operator interviews across all venues around the country. We focused on responses to questions pertaining to infomediary behaviors, grouping the responses by venue type, in order to identify operators' roles and propensity to serve as infomediaries. In particular, we looked at two subcategories related to the human capacity and relevance dimension of the ACE Framework: (1) Digital Literacy of Operator and (2) Operators' Attitude to Support Information Needs. Nonetheless, the use of Atlas.ti qualitative coding software afforded us the opportunity to analyze references to infomediary behavior throughout all the dataset, not just the abovementioned sections in the interview guides.

Due to limited Spanish language fluency of part of the team during the analysis phase, we employed two methods of translating transcripts from Spanish into English. First, we translated all interview transcripts using a mix of Google and Microsoft machine translation tools. These tools are not without limitations. Ambiguity, syntactic irregularity, and poorly articulated context were the core issues resulting from machine translation. To mitigate these issues, we used a two-column template, matching both the Spanish and English versions of the transcripts, and worked closely with members of the research team who are fluent in Spanish to provide context, disambiguation, and complete human translation in key areas. Any translated passages of questionable quality were either translated anew by a person or not included in our analysis.

Findings

We used Schilderman's eight key characteristics, grouped into three broad functions of infomediaries, to analyze the use of libraries, telecenters and cybercafés in Colombia. The key functions and their corresponding characteristics are:

Share information: (1) capacity to provide information in an accessible format; (2) willingness to share information rather than hold on to it; (3) ability to get hold of information and adapt it to a local context;

Help users: (4) experience, education, knowledge and reliability; (5) accessibility, proximity and helpfulness; and

Build relationships: (6) social sensitivity and capacity to involve residents; (7) leadership qualities, influence and moral authority; and (8) trust between key informants and residents.

We found the key functions to be similar across all types of PAC venues in Colombia, although their manifestations were qualitatively different for libraries, telecenters and cybercafés.

We will now describe the appearance of each of these infomediary functions for each type of PAC venue in Colombia, starting with public libraries, followed by telecenters and cybercafés.

Infomediaries in public libraries

Library staff and volunteers view themselves primarily as trainers and teachers for those that lack the skills

necessary to operate and afford ICTs. We found that infomediaries within library venues have a strong inclination to offer ICT access for all, including children and those members of society with disabilities. Libraries have a unique advantage over other public access venues in that they can integrate and provide linkage to other types of related learning resources (i.e. books, periodicals) into the overall ICT learning experiences. While there was not sufficient data that suggests public library infomediaries are particularly trusted within the community, there is no indication that community members distrust information acquired in public libraries or from their operators. Library staff tend to have the strongest self-perception of strong infomediaries for PAC services, although users don't necessarily share this perception. On the contrary, users tend to perceive library operators as unprepared to help with meaningful access and use of computers and the Internet.

Furthermore, there is an important difference in the capacity of library staff in urban areas as compared to non-urban areas: While the former tend to be better trained and equipped to offer quality service in the library, especially in the large, award-winning libraries of Bogotá and Medellín, libraries in small towns and municipalities tend to be ill-equipped, both in terms of infrastructure and training in digital skills, to serve the population. This gap between urban and non-urban is more noticeable in libraries than it is in telecenters or cybercafés.

Library infomediaries: (A) Share information. There is strong pride among library operators in their ability to understand user needs in order to better serve their information needs:

"We constantly think about our contact with the community. We try and understand who has the most frequent usage of the library and are always asking question like do you understand me. In the library we go out of our way to try and accommodate the space for many types of users."

Another respondent emphasizes that

"in addition to doing community outreach, we use surveys to find out the information needs of the people who use our facility. During the survey interview/discussion, we find out if he/she got what they were looking for, what they needed, why they couldn't find what they needed including the possibly that

they had a lack of information or some other required user needs.”

In addition, library operators pointed out how they exercised “more freedom in what the library offered including both a culturally appropriate service but also one which is very personalized.” This is important to them because “personalization allowed library staff members to not only help the users get specific ICT training but also help them with knowledge useful to their career.”

The library is also seen as an aggregator that brings together different services that benefit the community in an accessible way. For example, a neighborhood has “a cultural center which provides the community with a library service, newspaper, a playroom, and service workshops to mothers who require training. Our library is an institution which gives training to the community via the cultural center.” Library operators also point out that through the library and the Internet they can bridge global information and local needs. One library staff says how “the Internet provides history of the neighborhood which would not normally be available. The Internet also provides information about unique regional and local products such as beans, cassava, or local foods.”

The free nature of library services is unique in relation to other types of public access venues: telecenters tend to charge a small (subsidized) fee, and cybercafés tend to charge higher fees for the use of PAC. This gives library operators a good point of entry to emphasize their willingness to share information, especially at no cost to users. They felt that “one of their biggest advantages over cybercafés and telecenters was that ICT services are offered without cost to the community.” Most library operators in Colombia perceived themselves as being a part of “public institutions that were required to be open and available for use to their constituency, regardless of social and economic status.” Libraries “have the opportunity and desire to introduce their users to different usage programs and activities on the computer without incurring further charges or fees, (like in a cybercafé or some telecenters).”

Library infomediaries: (B) Help users. Another advantage of a library is that “based on our teaching background, we know how to link activities in the library with the Internet. For example, when libraries promote reading and writing, they can provide a direct link to activities and social projects that serve as a

hook to a user’s personal growth, which causes them to really love the experience and want more”. Sometimes, in a group setting focusing on an information seeking activity, the operators “found that all of the group participants contribute to the query and the investigation, thus promoting a stronger group learning experience. Neither of these linkages is typically available in a cybercafé nor as prominent in the telecenter environment.”

But the knowledge of library operators is also limited by other factors. One operator discusses some disadvantages for infomediaries in public libraries: “. . . we are subject to the funding variances of government and related support.” Another one mentions “there is considerable pressure to be current on new technologies. This has been very difficult as libraries have had to try to keep up with the constant rapid advance of technology without the supporting budget, and has become a factor when a one of the library users knows as much or sometimes more than we the library staff do.” At the same time, library operators are challenged by users who may be more digitally literate than them: “users are very near to us, they are in the room and they ask, or we go and ask them what they are doing, what they need, and we can suggest things and we learn what their expectations as users are, because we are constantly learning too. It can happen as well that the users know more [about computers] than we do, so we have to be constantly learning.”

Library operators point out that “It’s easy to tell when a person arrives on site if they know the management of computers or not, and if they need your help/guidance.” Reaching out, especially to children, in order to help them make better use of computer resources is a particular strength of library operators. For example, one informant talks about how on a number of occasions “users come to the library to ‘kill time’, as operation staff I tell users that this is a place to learn, not to ‘kill time’. In these cases, sometimes we show them an interactive learning page then helps them learning faster to get them through the idea of just killing time. Typically, children would rather play games but we would like them to use the tool. Usage in the library is very diverse and varies by individual, each user has their own concerns, needs and we try deal with the concerns and meet their needs.”

Moreover, library operators explicitly look for ways to involve users not just in other library services beyond computers, but in other community activities

as well. “We want people not just participating in other reading and writing activities, but we use computers as a hook to get them involved in other social projects we have, things that they end up liking because it contributes to their personal growth.”

A library staff member notes how their (infomediary) services help the users go much further than they would on their own:

“Sometimes you get recurring queries about a book or a story or the research a particular user is doing. When the library has the answer to these queries, it can orient the user not only to right physical location but also to the right ICT. For example, the university did not know of a university network that already existed and we helped them with that. Also, university students may need to do some research on a city so we can provide them with the architectural history and connect them with some local historians with whom we already have contact, and this provided a richer information experience.”

But this level of support is not systematic. As another informant points out, “the level of assistance and type of assistance we provide varies each day and is very sporadic. In most cases we don’t follow the guidelines or our standard protocol. Some days we’ll help someone to open an email and others we’ll help a user not lose certain types of information. As library staff technology can be very hard for me. I have a lot writing skills and am concerned that technology will pigeonhole me in a specific format or job.”

Library infomediaries: (C) Build relationships. One of the strategies implemented by Colombian libraries has been to include collections, exhibits and other contents that are locally relevant and important. For example, one of the large libraries in Medellín is hosting a photo exhibit of local architecture, and another one shows old family portraits of traditional families from the region. The director of the library tells us this is not a random coincidence:

“How do we make the library be so loved? We keep the [population’s] memories and we make them protagonists of what is going on. It is different to go to a library where there is a picture of your dad or your grandfather . . . So we first work to make our library system include the local memory . . . in all the small libraries we have a local collection, the collection of the neighborhood, the picture of your mom, the special dish of that region. And when you have that you

start to have something called identity, something called patrimony, something called memory. And we have all that here in the library.”

Library operators point out that they “train a number of underserved individuals including homeless, sex workers, and those who use the pages of the Internet to get help. For example, they can go to the government ministry sites, family welfare sites, and even apply for benefits.” Another one indicates that “we even serve those who are retired and others whose lives are low, and dirty. We also develop partnerships with specific institutions and agencies who work with specific underserved populations to help take their programs forward.” This sense of social inclusion is strongest among library operators.

Library operators also explicitly seek ways to include disabled populations: “I think one of the most important communities to understand is the disability community, and unfortunately I think this community is a little forgotten. Our library contacted Fundación [X], to create a contact for the main disability community members, we worked with adults but still have to remember children with disabilities.” Another respondent indicates that “the Colombian Ministry of Culture and [a private foundation] have trainers for the people with disabilities, and have listening to our input where we help with creation of training materials. We do have one computer that is Braille enabled and offer it to children in area glaucoma who have learned the location of the computer keys. We also have a JAWS program that we found worked well. Unfortunately, it’s only on one individual computer, which limits its availability, but we need to have it adaptable to any computer that we offer.”

Better serving senior citizens is also a specific target of libraries. One library informant describes how “our library has been training a lot of grandparents. We are currently training 10–15 who are learning the basics including Microsoft Office, and tasks such as sending an email, and chat (with someone from another country). Since we have free Internet access we’d like to understand their basic tasks required to do this as well as some in practice the skills we are teaching them. This group is very interested in learning operation and learning about ICT.”

Finally, library staff tends to have a strong image of the way they help users so that they can, in turn, help others: “There are people in the library who help others and do social work. Mostly, in our educational institutions girls are the ones who provide support,

we collaborate with them because they in turn will help older people.” This double layer of infomediary behavior, i.e. helping meet the needs of those who will in turn help others, is of particular importance in public libraries.

Infomediaries in telecenters

We found that telecenter operators often work in rural settings where access to computers and the Internet had not existed before. Although telecenters generally charge for Internet access, their fees are less than most cybercafés. Telecenters tend to have more structured and comprehensive training strategies that go beyond introductory use of computers and basic applications, as most libraries do; telecenters also offer training in both information strategies and information literacy. Like libraries, infomediaries in telecenters have a strong inclination to bringing ICT access for all, including minorities, children and people with disabilities.

Telecenter staff viewed themselves primarily as problem solvers, mediators, and connectors. We found that telecenters often actively work in different social and community development areas, and the local population expects telecenters to help resolve a variety of issues and problems in the community. Telecenters are also the PAC venues where there is the highest awareness of the importance of the operators, and their role as infomediaries, for the success of its mission. As succinctly described by a local expert:

“For us at [X] and for me personally, I am convinced that the success of a telecenter depends on who is leading it, and as long as this person is better trained, committed, that they have an income that gives them the quality of life they want to live, well, that telecenter will prosper. Another [key item] . . . is the analysis of community needs. If a telecenter understands the needs of its community (and the needs are not just Internet access or to chat online, those are just uses; needs are education, health, employment, etc.), if a telecenter knows how ICT helps meet those needs, then it will be successful.”

Another one of the experts consulted expressed a clear vision of the way telecenter operators are “not limited to selling minutes [for computer access] but had a more complex profile.” In other words, telecenter operators are effective infomediaries when they realize that:

“The telecenter becomes a supporter of the community in that it facilitates use by different social organizations in the community, they can participate in

local development processes; they help provide assistance to social organizations, and they can offer assistance to public institutions . . . they can provide access to information and knowledge to the community in general, and how that information and that knowledge contributes to community development. This means that the profile of the [telecenter operator] was a critical component in the success of the telecenter . . . to ensure that all the investment in infrastructure resulted in a positive impact for the development of the community.”

Telecenter infomediary: (A) Share information. Telecenters serve communities that are traditionally poor, marginalized and excluded from mainstream society. They frequently work hard to make sure their services are accessible to the local populations in ways that are appropriate and meaningful, sometimes going beyond just sharing information but helping users turn it into actions that help them improve their lives. In the words shared with us by a telecenter operator:

“We are serving a diverse audience of people who are vulnerable, who live in rural areas, and people, communities, organized groups, municipalities who want Internet access capabilities. In public access venues like public libraries [they] have the possibility of using the Internet and deliver Internet services to the community. In most cases, public libraries usually assist people to find information, and typically have more tools so that can provide wider services and access to knowledge. However, in a telecenter we emphasize more than just increasing access to knowledge like a public library, we also provide training on how information can be rebuilt as well as how restate and use knowledge.”

Telecenter infomediary: (B) Help users. Telecenters tend to offer the most comprehensive and systematic training programs, especially targeted to underserved populations in their communities. They frequently describe training programs in telecenters as “more than just learning the tools.” For example, one telecenter describes its recent track record in community training on the use of ICT: “We have trained around 700 users, and we now have more than 300 registered for our courses starting in 2010. We do not really offer public access to the Internet, we focus more on training on ICT uses, and we give priority to people affiliated with community organizations such as [women, youth and peasants organizations].”

Another telecenter operator emphasizes “the importance of working with those who would not otherwise use ICT, so they can at least learn and then decide if they can do something with them. So in the training we offer we teach them to use a word processor and how they can use it for this or that . . . and we also try to work a lot with women, and we want all types of [marginalized] populations to come to the telecenter.”

Telecenters are frequently places where kids go to do their school homework, frequently with the help of telecenter operators. Like libraries, telecenters offer information and help with homework and other education activities as part of their services. Unlike cybercafés, telecenter operators consistently talked of *helping kids with homework*, rather than *doing it for them*. “Many kids come do their homework, and we help them look for it, and help them take their completed homework to their home.” “We offer free access to the Internet, we print documents and burn CDs, and we also save to a memory stick the kids’ homework.” In more rural or remote areas, they also reach out to include school teachers in order to help them with information resources. “I want to have a center that supports the entire rural neighborhood (*vereda*), we are getting together with the school teacher and other parents to set up this group.” Another telecenter in a small town offers training to school teachers from the rural areas around it, “so they can take advantage of it and offer a good service to the community, with access to the Internet.”

Telecenter operators have a high regard for their infomediary role in being accessible and helping the local communities, placing it at the level of a company policy (for government-run telecenters):

“It is company policy that we collaborate with the user in every way possible . . . they sometimes come to create an email, and we guide them step by step in the creation of the email, we tell them what servers they can use, what information they need to enter, all that is needed, all the basics. If they need something more specific and if we know how to do it, we collaborate with them in all we can.”

But such policy is not always realized. Sometimes, “those in charge of training have little training, and they frequently only know how to use Microsoft Word.” This is frequently the result of lack of continuity and high staff turnover, especially in government-run telecenters. This problem is especially significant when users come with a higher level of technical

knowledge than the operators themselves, which is not a rare occurrence. One of the telecenter operators interviewed notes that “many telecenter users are people who know what the purpose of the telecenter is and how it is used. In cybercafés, and sometimes in telecenters too, there are a number of premium users who know, and who have a natural skill in using the venue.”

Nonetheless, telecenter operators frequently see themselves as “a helping hand” for users who need things done on the computer. “Users ask us many questions, they want us to help them with obtaining a judicial past [police record] or other documents, and we help them in whatever transactions we can.”

Telecenter infomediary: (C) Build relationships. Telecenter operators are committed to serving all sectors of the population and provide information and services in ways that are useful to them. They explicitly target underserved minorities such as gays and lesbians, indigenous populations, senior citizens, and people with disabilities, offering special training programs for them. For example, a telecenter operator points out: “I offer training every day from 8 to 10 am, explicitly for seniors, for single moms, for kids with autism.” In the same way, in Southern Colombia, where there is an important proportion of an indigenous population, one telecenter operator emphasizes how they serve “the Guambiano Indians, who are fighting to be recognized by their original name of Nasa Paez,” and another telecenter points out “we worked with the Nasa community, we worked on a dictionary for the Quichuas and we had the Otavalo dictionary installed in the computer, so they can consult diverse sources and also learn.”

In other cases, the telecenter acts as a meeting place that pulls the community together: “people with disabilities meet here . . . they come for training and they establish social relations and ties, they want to continue together in the next level. [The telecenter] becomes an important meeting place.” Telecenters are frequently used as spaces to meet and discuss problems with government institutions, which “can cause some opposition to the existence and use of telecenters.” There is also a perception that some users are more interested only in using the computers and the Internet, others are interested in helping run the telecenter and manage it in a way that meets local needs more effectively, realizing that “technologies, computers, and the Internet are just tools and channels through which information is accessed, but may be useful for making decisions.”

Telecenters also tend to build longer-lasting relations with their users, and to cultivate these relations with the intent to help them improve. For example, one telecenter started a database of users and asked them what they needed to learn. “Through that survey we learned what they can do and where they are weak, what software they need to learn, or how to educate them about their online safety. That database has helped us regulate and be in better contact and relationship with users.”

Telecenter operators are most frequently seen as community leaders with the ability to reach out to the community and help solve its problems with the services offered by the telecenter. For example, workshop participants speak of one of the telecenter operators in their community as someone who “reaches out to all the community, organized as an NGO [non-profit organization], to offer training services to other NGOs, so that they can also flourish. Up to now this has been well received in the community . . . even though there are few resources because the community is very poor.” The blurred boundary between infomediary and community leader is clearly described by a telecenter operator who tells us:

“The community usually comes here to the telecenter and talks to me directly and I am often told that a problem is occurring in their area. . . . Some have asked me to help them formulate solutions and projects, give advice, guidance, because many of them have the initiative and the idea but don’t know what do to or how take their idea into reality. I often function at a personal level to help people who have an immediate need and can usually help them meet that need. I am the connector, often between people who come here and need job and those who have jobs. Sometimes people come in and say, I need someone to work on something and I now happen to know the person with the skill set and then I become the connection between these two and meet both of their needs.”

At the same time, people notice when such leadership is absent: “there is a great lack of training to the leaders who drive those processes [in telecenters] . . . sometimes the infrastructure exists, but there is no training and there is no awareness of the importance of learning, it is not seen.”

Infomediaries in cybercafés

Cybercafés are far more numerous than telecenters and public libraries; given the volume of cybercafés in Colombia, it is important to understand how

cybercafé operators help meet the information needs of their customers. While there is an emerging body of literature that looks at cybercafés and their provision of ICT, the discourse has largely remained isolated from their relationship to public libraries and telecenters. Cybercafé operators suggest that their physical space is more inclusive, since they are more systematically embedded in their communities. Yet evidence suggests that while operators exhibit strong infomediary behaviors as a means to providing good customer service, questions remain whether or not cybercafé operators adequately equip customers with the tools necessary to navigate the digital space.

Cybercafé operators provide a diverse array of services beyond access to computers and the Internet. Operating in a for-profit business, cybercafé operators are compelled to provide good customer service in addition to basic computing access. One operator highlights cybercafés’ unique services in the following manner:

“Cybercafé operators have an advantage over library operators in that cybercafés provide a broader range of services (such as coffee, food). They also have the flexibility to have tables etc. so that those who have laptops can come in and have [wired or wireless] Internet access vs. a fixed computer kiosk in the library. Another advantage is that cybercafé operators also have accessories available such as cables, memory sticks, and printers which [other public access venues] typically don’t have.”

Cybercafé infomediary: (A) Share information. We found that cybercafé operators in Colombia tend to be less likely than library or telecenter operators to provide and share information with customers. While there is no doubt that cybercafé operators *facilitate* the flow of information, there is little evidence that suggests they provide, share or adapt information to their users.

In cybercafés, operators are tasked with providing reliable access to the Internet and other services, such as printing, scanning, food, and drink. They also recognize the importance of ensuring a positive experience for their customers. This is evidenced in the fact that the maintenance and upkeep of cybercafé resources and equipment is generally better than in telecenters or public libraries.

Cybercafé infomediary: (B) Help users. Cybercafé operators tend to offer assistance to users in order to use their equipment and resources, in order to have

satisfied, returning customers. Operators view themselves as an intermediary between the customer and the effective use of the cybercafé's resources and tools. Cybercafés generally do not offer formal training programs, but offer ad hoc training, as requested by users to carry out specific tasks. There is no evidence to suggest that cybercafé operators are incapable of serving as brokers of information; rather, it is a result of the business model of customer service to attract clients and increase revenues, and of the needs expressed by the customers and users. Many cybercafé operators recounted experiences similar the following, coming from two different regions of the country:

“There are people coming who do not know how to turn on a computer, then I tell them ‘come and I teach you,’ it is practical and economic, sometimes they take longer but I help them and charge them the same, the important thing is to have the client.”

“For example, people who try, seniors who come [to the business] asking for help, to teach them how to use email, or how to create an email account, how to personalize their accounts, how to download files, how to modify them or print them, this is what allows us to inform and guide them, and I train my employees so they can offer the users this service as well.”

Operators indicated that customers frequently request assistance in building job resumés and completing applications for employment, and in other online transactions such as obtaining a police record (*pasado judicial*). While they recognize that sharing information with customers is not their primary role, many expressed that if they were asked for help finding information on the Internet, they would be more than willing to assist customers in doing it. Helping children with homework assignments was a particular topic of interest. Operators tend encourage children to do their homework at the cybercafé: some offer ‘free days’ for children, and several others said they would actually do the homework for them (copying and pasting from Wikipedia was mentioned several times) while the kids play games on another computer. Only very few cybercafé operators commented on whether or not their efforts in teaching basic computer use led to a more empowered, informed, and engaged customer-base.

On the other hand, some cybercafé operators posit that they serve a particular customer base that does not need or expect any additional support or help,

since they already know what they need and how to get it, and all they want is access to the machines and the Internet. They view users as people for whom “access to the Internet is a necessity” and they are there to provide it. No training is necessary for their users:

“The truth is I have not thought about that (training) because I don’t think it is needed. I think many people know how to use the Internet and a computer, and those who come here already know how to use it so I have not seen the need to provide training.”

Cybercafé infomediary: (C) Build relationships. Maintaining a customer base is the cornerstone of cybercafé operations in Colombia. Unlike libraries and telecenters, cybercafés are for-profit businesses. Attracting customers and establishing unique value amid a high number of competitors, cybercafé operators in Colombia display the desire to provide a high level of service and attract repeat customers. Cybercafé operators recognize the need to create a welcoming, positive atmosphere for their customers. Many operators recognized that offering a welcoming space and treating customers with respect was essential for the health of the cybercafé. As one operator points out,

“It also highlights that in an Internet cafe is very important that the operator is really nice compared to the expressed needs of users, as this is what helps you keep your customers and capture a new one.”

A recent study looked at infomediary behavior in cybercafés in developing countries (Gould and Gomez 2010) and concluded that cybercafé operators are less successful infomediaries than those in libraries and telecenters. The findings in Colombia suggest that infomediaries in Colombian cybercafés tend to show no overt desire to connect customers to their community, but nevertheless place a strong emphasis on fostering a positive relationship between customer and operator. This highlights an important distinction between cybercafés and other public access computing venues: Cybercafés rely on strong relationships with a *diverse pool* of customers to sustain the business.

Another unique challenge faced by cybercafé owners is the high volume and concentration of other cybercafés. Public libraries, by comparison, are fewer in number. Telecenters are slightly more numerous than libraries; however, they generally

Table 2. Comparative chart of infomediary functions for public access venues in Colombia

		Libraries information service	Telecenters community service	Cybercafés customer service
Infomediary functions	Share information	Offer access to multiple information resources Information is free	Offer locally relevant information Information helps solve community specific problems	Facilitate access to info cus- tomers seek Information and technology are commodities that can be sold
	Help users	Help find information Basic training in infor- mation and technol- ogy use.	Help solve community problems Basic training and training on strategic uses of ICT	Help to do specific tasks (cre- ate account, do homework) Ad Hoc training as needed
	Build relationships	Service to all Support government initiatives	Include marginalized populations Foster community empowerment	Maintain satisfied, returning customers Meeting place for community
Funding		funded by government	funded or subsidized by government or non-government organizations	for-profit business

meet specific information needs of a specific target population. A social mission or the directive of a larger organization seldom binds cybercafés. They provide an Internet connection and often sell goods such as office supplies and snacks. What distinguishes one cybercafé from another is their ability to connect and serve their immediate community and customer-base.

Cybercafés build relationships in several ways. First, operators are generally willing to train unskilled users to perform key instrumental tasks. This includes using the mouse and keyboard, creating and using email accounts, accessing documents, web browsers, and sending files to the printer. These ad hoc trainings lower a technological barrier that may have previously prevented users from accessing information. Equipped with the knowledge to perform basic tasks, these users are more likely to frequent the cybercafé. Second, operators recognize that cybercafés are integrated within the local culture. Many cybercafés are family-owned businesses, and operators are often family members or people who hold ties to the community. This enhanced approachability is a powerful tool in building relationships with customers. In the words of a cybercafé operator from Antioquia:

“The thing is I have always lived in this neighborhood, I grew up here. So we all know each other, as if we were all from a single family. So I get along well with everyone, with kids and with youth, with

adults, with the priest [...] with everybody. So everything concentrates here, we talk, they come to buy something and stay for a while, they come to use the Internet and stay for a while and we chat.”

Discussion

The findings suggest that across all three types of PAC venues (libraries, telecenters and cybercafés) there are formal infomediaries that affect the way users access and use the information services provided in each venue. Operators in each type of venue were essential in enabling patrons to access and use information technologies to solve problems, and in some cases, gain a sense of personal and community empowerment; but in each type of venue the infomediary roles take different forms. Table 2 summarizes the key differences in the infomediary roles across different PAC venues in Colombia:

Sharing information is a key function in libraries and in telecenters. While libraries tend to focus on offering free access to multiple information resources (not just computers but also books and other printer materials), telecenters tend to focus on offering access to specific types of information to meet local community needs. For example, rural telecenters sponsored by an agricultural research center offers lots of information on agricultural practices, and tend to have operators who are more knowledgeable about these

topics. Cybercafés, on the other hand, provide access to computers and the Internet as their primary service, and they tend to focus on facilitating users' access to the information resources they are needing (this frequently includes porn, for example, which is generally blocked in libraries and in telecenters).

Helping users is an important function in all PAC venue types: Infomediaries in libraries tend to help users find information they need, and they tend to offer basic training lessons on computer and Internet use. In telecenters, infomediaries tend to be focused on helping users solve local community problems, including access to information resources. Telecenters tended to offer the most comprehensive and systematic training programs on computer and Internet use, and also on strategic uses of the information and technology resources to help people and organizations solve their local needs. This type of training is absent in most cybercafés, where operators tend to focus on helping users accomplish specific tasks and offer on-the-spot training to do so. Helping users is taken one step further in cybercafés, where we found operators eager not just to help kids with homework but to actually do it for them while the kids play games, as a way to encourage kids to use the cybercafés.

Infomediaries in PAC venues contribute to building relationships in the community in different ways. While in libraries the focus tends to be on offering a public service to all, and on supporting local or national government initiatives, in telecenters there tends to be a stronger emphasis on including underserved and marginalized populations, and on promoting community development and empowerment of the users to solve their problems and transform their realities. In cybercafés, on the other hand, relationship-building is primarily focused on customer satisfaction to promote returning (paying) customers, and on offering a comfortable place for users to visit (and return to).

Telecenters tend to offer training that is oriented not just to help users use information and technology but to apply it to solving local community needs; they frequently include not just email but one-to-many communication tools such as blogs, Facebook and other social media. Focusing on these types of applications is consistent with our observation that one of the primary infomediary roles within telecenters is *community service*. In their community service infomediary role, telecenters were used as an organizing function for creating community awareness, change, activism, and community development. Several study

participants noted that telecenters were sometimes used for community change initiatives that even opposed the government entity that provided the funding for the existence of the community telecenter itself.

Only about 16 percent of Colombian public libraries offer public access to computers or the Internet; the rest rely on the traditional collections of books and periodicals. The libraries that do offer PAC tend to find themselves trying to extend the reach of their print collections, but most users want only the computers: "we have 10,000 books available, but all people want is the two computers," laments one library staff member. Library staff are frequently ill prepared to help patrons with their computer use, and even less to deal with technical problems, virus, and other malfunctions in the equipment. In contrast, we found that cybercafé owners and operators strove to keep all computers in working order, as a way of providing good customer service and in order to maximize revenues.

Contrary to a commonly-felt prejudice that regards cybercafé staff as clerks that just collect payment, we found that cybercafés offer effective infomediary services that meet user needs. They are more consistently motivated to offer quality service that drives higher customer satisfaction, including aspects of service that libraries and telecenters would not consider appropriate. Some libraries discourage or block games, webmail, blog or social networking sites with the argument that they are not appropriate for homework or community development needs; almost all libraries and telecenters block porn from their computers. Games, social networking, and, especially porn, are huge drivers of users in cybercafés, and some go as far as offering enclosed booths for users to use computers in complete privacy.

Each type of PAC venue in Colombia exhibited its own flavor, a slightly different set of characteristics and qualities, even though they all offer public access to computers and the Internet. We observed that though each PAC venue had different operating methods, training, set of service offerings, and qualities within their infomediary roles, they all contributed to empowerment of the individual and the community and to economic, social, and educational development. Each type of venue has operators that exhibit effective infomediary behavior in different ways. Libraries, telecenters and cybercafés all have infomediaries that promote information sharing, help users and build relationships. While libraries tend to focus

on 'information service,' telecenters tend to focus on 'community service' and cybercafés on 'customer service.'

Conclusion

Few studies have compared the PAC ecosystem of cybercafés, telecenters, and public libraries, even though it is today clear that all three venue types play an important role in offering public access to computers and the Internet for underserved communities in developing countries. The role of infomediaries, those who help users get the information, training and services they need, is a critical component of the success of PAC venues. While infomediaries can be both formal and informal, we studied formal infomediaries and their behavior among operators (owners, staff and volunteers) of PAC venues in Colombia. Drawing from Schilderman's description of key characteristics of infomediaries, we studied how infomediaries share information, help users and build relations in libraries, telecenters and cybercafés. While infomediaries in all three venue types exhibit each infomediary function, they all do it in a different way: libraries emphasize 'information service,' telecenters emphasize 'community service' and cybercafés emphasize 'customer service.'

These findings are important because they can help shape decisions about recruiting, training and retention of effective infomediaries in each type of venue. Especially in libraries and telecenters, which share a non-profit orientation to support community development and meeting local information needs, the choice and training of effective infomediaries play a critical role. Libraries and telecenters need to explicitly address the need for effective information sharing, helping users meet their needs, and building strong, durable relationships with the communities they intend to serve.

Good customer service is important. But left to the whim of the forces of the market, infomediaries tend to focus on customer service that regards information as a commodity, training as an ad hoc, task-oriented activity, and users as consumers of goods and services. Effective infomediaries focused on quality information service and community service offer access to multiple sources of locally-relevant information that helps solve local problems and needs, help users find information and learn how to strategically use the ICT tools at their disposal, and foster relationships with all, including marginalized and

underserved sectors of the population. Effective infomediaries concerned with community development would know the difference between, for example, helping users do their homework, and doing the homework for them; between giving someone a fish, and teaching them to fish. This is the kind of infomediaries that libraries and telecenters need to recruit, train and retain.

Notes

1. The National Administrative Department of Statistics (DANE in Spanish) is the entity responsible for planning, processing, analysis, and distribution of official statistics in Colombia. [Cited 26 May 2010. Available at http://www.dane.gov.co/daneweb_V09/index.php?option=com_content&view=article&id=175&Itemid=28].
2. Data collection instruments are available at <http://faculty.washington.edu/rgomez/projects/colombia/>.
3. Sample was limited to adults even though a high proportion of PAC users are kids; nonetheless, it was practically impossible to get informed consent from parents or guardians of minors to participate in the survey.

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