Effective ICT Use for Social Inclusion

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ABSTRACT

Access to information and communications technology (ICT) is considered important for individuals to fully achieve educational and economic development goals. In fact, ICT access has become so important that the lack of it has been termed the digital divide. To combat the digital divide, community-based computing centers were created as a vital first step to provide physical access to ICT. Commonly known as Community Technology Centers (CTCs) or Telecentres, these publicly accessible labs are providing a valuable means for the diffusion of technology in underserved communities. The meaningful digital divide, however, is whether individuals can fully participate in society. Access to tools like computers and the Internet are only the first step toward effective social inclusion. Furthermore, if the tools become the focus, and we look exclusively at diffusion of technology to address the digital divide, then we make compromises in implementation that never address other, equally important, issues.

If public computing facilities such as CTCs are to make the transition from facilities fostering diffusion of technology to community centers empowering citizens through effective use of ICT as citizen professionals such as citizen scientists, citizen planners, and citizen journalists, it is necessary to revisit implementations of technology within these spaces; this may mean creating a new framework for how computers and other ICTs are set up for use in CTCs and Telecentres. Techniques used by African-American marketing agencies as well as successful non-profit organizations that implement grassroots campaigns can teach us a lot about designing compelling experiences that attract audiences.

General Terms

Management, Design, Experimentation, Human Factors

Keywords

"Community Technology Center (CTC)," "Community Informatics," "Citizen Professional," "Mass Amateurization," "Public Computing Space Design Aesthetics."

1. INTRODUCTION

Information and communications technologies (ICT) have become an important tool helping individuals fully achieve their educational and economic development goals. The digital divide is the inability of underserved populations to access and use ICT, furthering social, economic, and educational inequities [16, 17, 18, 19]. To combat the digital divide, community-based computing centers have been used as a vital first step to provide physical access to ICT. Commonly known as Community Technology Centers (CTCs) or Telecentres, these publicly accessible labs are providing a valuable means for the diffusion of technology in underserved communities.

The meaningful divide, however, is whether individuals can fully participate in society. Gurstein [9] points out that achieving educational and economic development goals in an information society requires more than simple physical access to ICT; access to tools like computers and the Internet are only the first step toward effective social inclusion. Furthermore, if the tools become the focus, and we look exclusively at the issue of diffusion of technology to address the digital divide, then we make compromises in implementation that never address other, equally important, issues. According to Fuchs [11], while diffusion of technology is often the initial impetus for creating CTCs, this need is reduced over time as more access is available in private residences. At that point CTCs either must transform to meet other "back of the market" needs, or dissolve. Examples of such transformations can be found in countries like South Korea where even though the percentage of residents with home computers and broadband Internet access is very high, public computing facilities such as cyber-cafes still thrive as social hubs. Further, public physical spaces can foster behaviors and activities that may lead to greater civic participation by hosting a complex range of interactions with ICT, including some activities that also take place in private computing spaces [29].

While it may be necessary to start with an emphasis on diffusion, as rapidly as possible we need to emphasize effective use for social inclusion. To make this shift, we need to consider what roles and activities technologies need to support. While the diffusion focus often results in technological implementations that help meet basic educational needs and prepare youth and adults for entry-level positions (with few options for advancement), the effective use for social inclusion model results in technology

implementations that help prepare residents to be leaders in building stronger communities and shapers of the workplace as opposed to being employed by those shaping the workplace.

The question then is, how do we implement technology in a way that ultimately prepares residents to be leaders? A framework of effective use is needed, defined by Gurstein as "[t]he capacity and opportunity to successfully integrate ICTs into the accomplishment of self or collaboratively identified goals." [9] In order to create this framework for underserved populations, we must first understand the roles and activities that lead towards a stronger civil society, the role of a citizen professional, as well as the ICTs that a community member needs to assume that role. Secondly, we must also understand the current trends in the design of public computing spaces in order to project how technology may function in the future and how ICT will affect communities. By understanding the various roles of the citizen professional, the current trends in technology, and the design of public computing spaces, we will be able to amplify community voices through ICT.

2. THE CITIZEN PROFESSIONAL

According to Vaughan [28], "[t]he priority of the scientific community and government should be empowering citizens, developing the tools and approaches to bridge the gap between civil society and decision-makers." This is exactly the idea behind the citizen professional, a community member who plays the role of an amateur scientist, urban planner, or journalist within the community and whose efforts allow the community to be a part of major decision making processes that affect the community.

In physically bringing together community members, each with different backgrounds, insights, and skills, community technology centers can serve as places where knowledge acquired by one can be shared with others, an important aspect of any sustainable CTC. These centers thus allow community members to participate in citizen professional roles and become gathering places for "communities of practice" [34], that is, groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly. CTCs can also serve to foster communities of inquiry, groups united by shared interests who work together to investigate and act to address common problems [25]. Based on the early-twentieth-century theories and practices of Charles Peirce, John Dewey, and Jane Addams, a number of researchers have proposed that the inquiry cycle, especially as applied to communities of inquiry, provides a rich environment for achieving educational and community development goals [5, 4, 6, 26, 25, 33]. Indeed, these examples illustrate the importance of creating centers that first and foremost emphasize community collaboration in a physical space while providing the necessary ICT to support such activities.

Indeed, the desire to build social capital is something many CTCs (or Telecentres) have in common. Ceballos [7] suggests that "the best Telecentres are local gathering places; places where people come together to talk, tell stories and share knowledge." As stated earlier, public and private physical spaces can foster behaviors and activities that may lead to greater civic participation. Depending on the setting, members of the community may enter into conversations with each other to determine what is needed to improve the local quality of life. Thus, not only do they become actively engaged in adapting tools to their own local needs, but also they become more connected with each other, possibly further strengthening the community. CTCs serve as both hubs where people join communities of inquiry to determine what is needed to improve their quality of life and centers where the tools necessary to implement some of those changes are available for community use. New technologies enable self-determined media production that multiplies the voices in communities. Sharing local stories may forge civic bonds. In this way, communities are better able to define their own future.

Berry, et. al. [1] points out that participation in the political process is best fostered through regular face-to-face interactions. The strongest local governments are the ones that create mechanisms to encourage the formation and bi-directional flow of information with healthy neighborhood-based associations. Such associations help balance power between the elite and non-elite within the community and are shown to decrease tensions between those advocating for neighborhood or business interests. As local information hubs and gathering places, CTCs clearly have the potential to move beyond serving as merely a channel for the delivery of government services to being a platform that helps provide communities with skills needed for a new type of citizenship. They become places to negotiate the future of governments creatively and inventively [7]. This new type of citizenship and the negotiation of future government are facilitated by the presence of citizen professionals in the community.

We see examples of this trend in high-functioning communities. They are finding ways to take advantage of the mass amateurization brought about by emerging technologies, such as low-cost ultra mobile personal computers, smartphones, cloud computing, geographic/neighborhood information systems, and personal webs, to engage community members in community development goals. According to the 2009 Horizon Report, newly emerged and emerging technologies such as mobile and cloud computing are leading to a collective intelligence and mass amateurization that are redefining how we think about virtual and physical spaces. Cloud computing, networked computers that distribute processing power, applications, and large systems among many machines [10], provide a unifying technological base for grassroots video and collaborative webs that are empowering citizen professionals at many levels. The Horizon Report also reviews a number of ways in which the growing availability of Geographic Information Systems (GIS) targeted at the consumer market is being used by citizens to enhance storytelling, health, and learning objectives. Already considered as another component of the network on many campuses, mobile devices continue to evolve rapidly. New interfaces, the ability to run third-party applications, and location-awareness have all come to the mobile device in the past year, making it an ever more versatile tool that can be easily adapted to a host of tasks for learning, productivity, and social networking [10]. These technologies enhance the overall quality of outcomes by using a diversity of input, but equally important to these virtual collaborations are the physical spaces of CTCs where some collaborations take place. The challenge remains to empower more communities, especially in underserved areas, through access to, and training with, citizen professional ICTs, as well as through a design of space that is welcoming and engaging to draw in community interest and participation.

A training or educational component of promoting citizen professional ICTs is also very important to meet the needs of the clientele of the CTC or Telecentre, some of whom may have had little previous exposure to technology. Communities of practice may share information and help each other learn to perform tasks better through interaction with others in the community, but this assumes a basic level of skills that some or all members possess in order to be able to teach them to one another. Fuchs [11] points out that the best way to do technology training in CTCs for less experienced and first-time users is often through "individual training or small group sessions." But where do the people who have these skills to be able to pass along come from? In many cases, the Telecentre or CTC staff members are the first in a community to possess the technological skills needed. According to Fuchs, Telecentres create a capacity for technological prowess that "becomes self-generating" [11] as staff pass along their skills and empower community members. These community members may then pass their newfound skills on to still more community members through interaction and collaboration, often becoming innovators and early adopters as a result of the skills and confidence learned in the Telecentre.

3. DESIGN OF LOCAL INFORMATION HUBS AND GATHERING PLACES

The design of spaces in low-income neighborhoods is understudied but important for understanding the psychographic traits and needs of underserved communities. The ways in which spaces regulate social experiences and constrain individual and social relations is an important topic in the development of public computing centers. CTCs must support the ways ICTs will be used to encourage citizen professional activities. While numerous professionals find mobile devices the platforms of choice for their daily work lives, many CTCs are still built in closed rooms and restricted to mass implementation of non-flexible technology directed only at basic bridging of the digital divide.

If public computing facilities such as CTCs are to make the transition from facilities fostering diffusion of technology to community centers empowering citizens through effective use of ICT as citizen professionals such as citizen scientists, citizen planners, and citizen journalists, it is necessary to revisit implementations of technology within these spaces; this may mean creating a new framework for how computers and other ICTs are set up for use in CTCs and Telecentres. Techniques used by African-American marketing agencies as well as successful non-profit organizations that implement grassroots campaigns can teach us a lot about designing compelling experiences that attract audiences. Design matters because it directly impacts our real and perceived quality of life and experience, and the design of public computing spaces will be an important contribution to the implementation and approach of community informatics.

Design and aesthetics that resonate with the aspirations of African-Americans, for example, are of critical importance when cultivating ongoing relationships. Companies are increasingly using experiential marketing companies to cultivate emotional relationships with brands and products that rely heavily upon beautiful spaces and intriguing environments. Social spaces meet a variety of instrumental and emotional needs, and the public computing center can be evaluated with this in mind. People use public computing spaces to check email, apply for a job or work on a computer to accomplish a variety of tasks. These are the instrumental aspects of this public space. But there are also the non-instrumental or emotional aspects of the social experience in public computing spaces. Human-computer interaction literature focuses on the experience of users with technology but neglects the study of the environment in which human-computer interactions take place. Interface design happens at the level of individual interaction with the machine. But spatial design occurs at the individual and social level. Spatial design impacts the types of interactions that are allowable, both with machines and with other users in the public computing center. The intersections between current designs of public computing space with what we can learn from experiential marketing efforts targeted at African-Americans provide some insights into the crucial intersections of virtual and physical spaces.

4. CONCLUSION

CTCs are often seen as bridges between basic ICT services and the superior but more expensive access to ICTs in places of residence. However, there is a range of examples that exist in which CTCs are transforming. They are being used not only by those who do not have access elsewhere, but also by those who have access but value the social interactions found at these community centers. In short, they are shifting from places of technology diffusion to places that promote social inclusion, and encourage communities of practice and inquiry to form. High functioning neighborhoods and organizations find ways to bring together citizen professionals in communities of inquiry/practice to help build civil society. Today, this also means finding ways to equip people with, and inform them about, emerging technologies that support mass amateurization.

Such trends show us that as we build CTCs for underserved areas, we must create them in a way that encourages similar citizen professional activities if we are to truly foster social inclusion. We must also examine trends in the ICTs currently used by various types of citizen professionals, communities of practice and communities of inquiry, and study the impact of experiential marketing targeted to urban consumers and community members to improve both the public and social computing experience in CTCs. Only then can ICTs that are most appealing to these community members in CTC settings be combined with the design of physical spaces in ways that will encourage residents to take an active role in shaping and leading their own communities.

5. REFERENCES

[1] AGARWAL, A., AND MEYER, A. 2009. Beyond usability: evaluating emotional response as an integral part of the user experience. In Proceedings of the 27th International Conference on Human Factors in Computing Systems, Boston, MA, Apr. 2009, ACM Press, New York, NY, 2919-2930.

[2] ALLEN, M.W. 2008. A dual-process model of the influence of human values on consumer choice. A revista Psicologia: Organizações e Trabalho (rPOT) 6, 1, 15-49.

[3] BERRY, J. M., K. E. PORTNEY, AND K. THOMSON 1993. The Rebirth of Urban Democracy. Brookings Institution, Washington DC.

[4] BISHOP, A., AND BRUCE, B.C. 2008. Liberating Voices! A Pattern Language for Communication Revolution: Community Inquiry [Online]. Available: http://www.publicsphereproject.org/patterns/print-pattern.php?begin=122.

[5] BRUCE, B.C., AND BISHOP, A.P. 2008. New literacies and community inquiry. In Handbook of Research on New Literacies, J. COIRO, M. KNOBEL, C. LANKSHEAR AND D.J. LEU, Eds. Routledge, New York, NY.

[6] BRUCE, B.C., AND BISHOP, A.P. 2002. Using the Web to support inquiry-based literacy development. Journal of Adolescent & Adult Literacy 45, 8, 706.

[7] CEBALLOS, F. ET AL. 2006. From the ground up: the evolution of the telecentre movement. Ottawa, ON, CA: Telecenter.org / IDRC, accessed July 2009 at http://idl-bnc.idrc.ca/dspace/handle/123456789/27550

[8] COCKTON, G. 2008. Designing worth - connecting preferred means to desired ends. Interactions 15, 4, 54-57.

[9] GURSTEIN, M. 2003. Effective Use: A community informatics strategy beyond the Digital Divide. First Monday, 8, 12, 1 December 2003.

[10] JOHNSON, L., LEVINE, A., AND SMITH, R. 2009. The 2009 Horizon Report. The New Media Consortium, Austin, Texas.

[11] FUCHS, R.P. 1998. Little Engines That Did--Case Histories from the Global Telecentre Movement. Ottawa, ON, CA: Telecenter.org/IDRC, http://www.idrc.ca/fr/ev-10630-201-1-DO_TOPIC.html.

[12] HASSENZAHL, M. 2006. User experience (UX): towards an experiential perspective on product quality. In Proceedings of the 20th French-speaking Conference on Human Computer Interaction (Conférence Francophone sur I'Interaction Homme-Machine) IHM '08. Metz, France, September 2008, ACM Press, New York, NY, 11-15.

[13] HASSENZAHL, M., AND TRACTINSKY, N. 2006. User experience – a research agenda. Behaviour and Information Technology 25, 2, 91-97.

[14] MITTAL, B. 1988. The role of affective choice mode in the consumer purchase of expressive products. Journal of Economic Psychology 9, 499-524.

[15] NAFUS, D. 2009. From multitasking to plastic time: the busyness (or not) of technology use. Seminar presented January 23, 2009, Abstract accessed July 2009 at https://apps.lis.illinois.edu/wiki/display/sp09lis590ul/Schedule

[16] National Telecommunications and Information Administration (NTIA), US Department of Commerce 2002. A nation online: how Americans are expanding their use of the internet. Washington, DC: NTIA.

[17] ———. (2000a) Falling through the net, toward digital inclusion. Washington, DC: NTIA.

[18] ———. (2000b) National telecommunications and information administration annual report.

[19] ———. (1999) Falling through the net: Defining the digital divide. Washington, DC: NTIA.

[20] NORMAN, D. A. 2002. The design of everyday things. MIT Press, New York, NY.

[21] PHOTOVOICE, Cameroon, November 2004 - January 2005, Photography by disabled people in the UK, Bangladesh and Cameroon, [Online] Available: http://www.photovoice.org/html/exhibitionsandevents/upcoming/bangladeshexhib.html.

[22] RAINIE, L., AND ANDERSON, J. (2008). The future of the internet III.[Online].Available: http://www.pewinternet.org/Reports/2008/The-Future-of-the-Internet-III.aspx

[23] SADUN, E. (2009). Consumers, not providers, ready for ubiquitous cellular data.[Online]. Available: http://arstechnica.com/telecom/news/2009/03/going-ubiquitous-with-cellular data.ars

[24] SAWHNEY, N (2009). Voices beyond walls: the role of digital storytelling for empowering marginalized youth in refugee camps. In Proceedings of the 8th International Conference on Interaction Design and Children. New York: ACM Press, 302-305

[25] SHIELDS, P. (1999, Mar.). The Community of Inquiry: Insights for Public Administration from Jane Addams, John Dewey and Charles S. Peirce. Public Administration Theory Network. [Online]. Available: http://ecommons.txstate.edu/polsfacp/3.

[26] SHORT, K.G., SCHROEDER, J., LAIRD, J., KAUFFMAN, G., FERGUSON, M.J., AND CRAWFORD, K.M. 1996. Learning together through inquiry: from Columbus to integrated curriculum, Stenhouse, Portland, ME.

[27] STOECKER, Randy (2005). Research methods for community change: a project-based approach. Sage Publications, Thousand Oaks, CA.

[28] VAUGHAN, HAGUE 2007. Citizen science as a catalyst in bridging the gap between science and decision-makers. In the Proceedings of the Citizen Science Toolkit Conference, Ithaca, NY, Jun. 2007, Cornell Lab of Ornithology, Ithaca, NY.

[29] VISEU, A., CLEMENT, A., ASPINALL, J., AND KENNEDY, T.M. 2006. The interplay of public and private spaces in Internet access. Information, Communication & Society 9, 5, 633–656

[30] WANG, C., AND BURRIS, G., M.A. 1997. Photovoice: concept, methodology, and use for participatory needs. Health Education & Behavior, 24, 3, 369-387.

[31] WANG, C., ET. AL. (1998). Photovoice as a participator health promotion strategy. [Online]. Available: http://heapro.oxfordjournals.org/cgi/reprint/13/1/75.pdf

[32] WEISER, M. 1991. The computer for the 21st century. Scientific American 265, 3, 94 –104

[33] WELLS, G. 2001. Dialogic Inquiry. Cambridge University Press, New York, NY.

[34] WENGER, E. C., AND SNYDER, W. M. 2000. Communities of practice: the organizational frontier. Harvard Business Review, Jan./Feb.,139-145.

[35] WILDERMAN, C. (2007). Models of community science: design lessons from the field. [Online]. Available: http://www.birds.cornell.edu/citscitoolkit/conference/proceeding-pdfs/Wilderman%202007%20CS%20Conference.pdf