
Designing bridges to the digitally divided

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Abstract

This paper presents the issue of digital divide from a interaction design perspective. It introduces the current views and a definition of the problem and discusses attempts that have been made to overcome it. From the perspective of specialists such as Mark Warschauer, and the examples portrayed, there is a trend towards an increase of humanistic approach and participation to an area that has been initially viewed as purely technological. Finally it discusses the role that interaction design could play in these humanistic multidisciplinary groups that are being created to deal with the digital divide problem all over the world. Specially how the User Centered approach can add a missing piece towards a democratic knowledge society.

Keywords

User Centered Design, Digital Divide, Interaction Design, Knowledge Society.

Introduction

The idea for this paper came from the research phase of NOKIA's Only Planet project. I became interested in those people still "unconnected" when comparing communities in the developing countries with the multimedia-full time-connected society in Scandinavia. In my research, I found that there is a great debate over the digital exclusion issue. Most texts criticize the approach of merely providing the technology, insisting that providers and developers must look at the bigger picture. This means to create meaningful and complete experiences for the communities, by providing technology access with context relevant content. Surprisingly, terms such as "interaction design" or "interaction designer" were never mentioned, once we are so interested and able in designing meaningful experiences. There was only one reference to Human-Computer Interaction helping the introduction of technology to people who might have literacy problems.

In so, this paper aims at introducing the issue of digital exclusion, giving different examples of projects aiming at help certain groups. Finally then, it explores the contributions that Interaction Design as a discipline can offer to the problem of digital exclusion/inclusion and its social consequences.

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Internet access comparison						
	Internet		Users		Broadband Subscribers	
	Subscribers (000s)	Subscribers per 100 inhab.	Users (000s)	Users per 100 inhab.	Total (000s)	Per 100 inhab.
	2006	2006	2006	2006	2006	2006
Brazil	16'525.0	8.87	42'600.0	22.55	5'921.9	3.14
Canada	7'997.0	24.68	22'000.0	67.89	7'675.5	23.57
Americas	99'604	11.40	336'231.9	37.33	80'387	8.93
World	427'163	6.67	1'136'593.2	17.47	282'661	4.33

Table 1. Totals and averages per 100 inhab. figures from two major countries in the american continent. (source: Internacional Telecommunication Union [5])

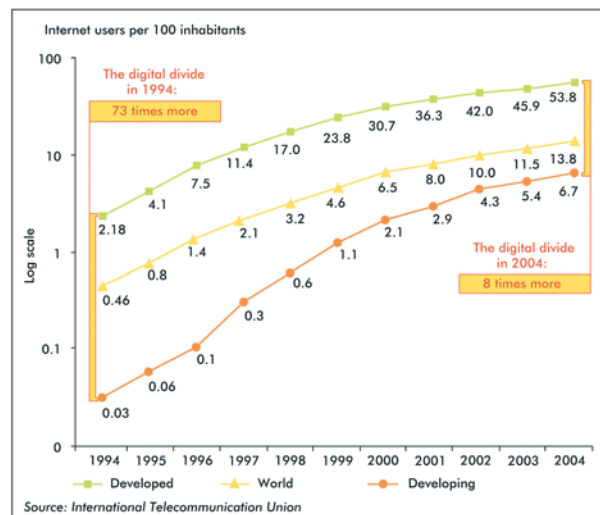


Figure 1. The 'digital divide' in numbers. (source: International Telecommunications Union [6].)

The problem: Digital Exclusion

With the growing presence of digital artifacts in our daily lives grows the discussion on the role of the internet and communication technology (ICT). First vs. second lives issues come along the amount of time people spend in

front of computers and also surveillance and control, with the spread and popularization of location based technologies such as GPS. Changing the focus of the discussion a little bit and placing it in wider perspective, bigger issues such as the very access to ICT and its social importance come forward.

Reports from the International Telecommunications Union, show the amount of people in the world that have any kind of access to ICT (figure 1). For example, in a comparison of internet access between Canada and Brazil, (table 01) notice the difference in the total quantity (42.6 million in Brazil - 22 million in Canada) versus the percentage of internet users in these two countries (22% in Brazil - 68% in Canada) compared to the world averages (1.13 billion - 17.5%). From these abstract figures it's possible to only start to understand the gap called "digital divide". They do not translate all the subtleties and shades of the issue itself or among the different cultures. There are several factors that influence this asymmetry, and they usually combine to compose the real picture in different parts of the world. [4]. Among these factors we find economic resources, age, countryside versus metropolitan location, disabilities, employment, language, gender and education and social background.

Mark Warschauer, a researcher from the University of California works focusing on the integration of information and communication technologies (ICT) in schools and community centers and the relationship of ICT to institutional reform, democracy, and social development. He argues that it is wrong to relate to these facts in black and white terms, or binary divisions. [2]

Instead, there are gradations of access in each of these aspects and also in their compositions. A hard contrast view

of the facts can cause distortions and mislead the efforts by portraying a wrong scenario. Also, to label minority social groups as 'digitally disconnected' or 'divided' can actually increase the distance in social integration, marginalizing them even more. In addition to that, he points out the whole framework and terminology are not satisfactory because they place technology ahead of other factors: "Finally, the digital divide framework provides a poor road map for using technology to promote social development since it overemphasizes the importance of the physical presence of computers and connectivity to the exclusion of other factors that allow people to use ICT for meaningful ends." [2]

Such ideas are supported by Rob Kling, director of the Center for Social Informatics at Indiana University and another researcher in the field of social computing. In personal correspondence with Warschauer he explains that: "[The] big problem with "the digital divide" framing is that it tends to connote "digital solutions," i.e., computers and telecommunications, without engaging the important set of complementary resources and complex interventions to support social inclusion, of which informational technology applications may be enabling elements, but are certainly insufficient when simply added to the status quo mix of resources and relationships".[2]

These arguments and the coming examples show that there is a shift in the way the problem is being handled. It started with technicians and informatics staff granting the equipment supply and its access. Now it moves towards a broader view, bringing into the discussion social scientists who add cultural and historic points of view to the problem.

First attempts: providing equipment

The first attempts to bridge the gap, after 1995 when the term was first used by the US government, tried to simply

provide access to those groups that had previously no contact with any form of ICT. Several projects and programs all over the world have then collected successes and failures and it's possible to point out countries as India and Brazil as recipients of these initiatives. It's important to state that the "first and second attempts" do not follow each other in time. The second attempt does not extinguish the first, but they overlap and coexist. The division merely highlights different approaches to the problem.

One example is The Fund for Universalization of Telecommunications Services (FUST), a program started in 2001 by the Brazilian government.[8] Its final goal was to connect some 13,000 schools (with 7 million students), 10,000 cultural centers and NGOs, and 30,000 health centers to the internet. But FUST resources did not take into consideration teaching, training or concerns towards the content of the equipment. Already in 2003, it was criticized for not incorporating the training of professionals to guide the use of the technology and estimates were made that it would take an additional 15 years after the implementation of the structure until the teaching was developed [2].

Silvio Meira, a pioneer in Information Technology in Brazil, published in his blog entry "aos poucos lá vai o FUST" (*bit by bit there goes the FUST*) of October 26th, 2006 that the fund resources had not been applied so far. [6] Bureaucratic problems aside, the program is an example of the mentality in which overcoming the gap is a matter of just providing access to the technology.

New Perspectives: Context Awareness

Other ways have evolved from the first movement of bringing ICT access to those without it. Some groups have been looking for a more holistic approach, doing a careful study of the context and the community in which the

technology will be brought into. The project produces a relevant context of use, and the edited content, now familiar to the users own daily experiences brings them into the hardware seamlessly.

One example of this new perspective is the Gyandoot (which translates to “purveyor of knowledge”) project, developed in 2000 in the southwest corner of one of India’s poorest rural states: Madhya Pradesh, (figure 2) where two thirds of the population is illiterate. The core objective of the project was to bring more economic and political power to the rural villages. A network of connected kiosks in the villages was created and local people were hired to service the machines and run the kiosks. The differential however is in the team that created an intranet, with content based on the villagers social and economic needs.

This content includes official application forms, a place to hold village auctions and to air public grievances. It also includes updated crop prices at the district, regional and national markets, so that small farmers can decide whether to harvest their crop and where to sell it without wasting a day traveling to the district capital for price checks. A complaint service lets villagers report local problems, such as malfunctioning hand pumps or teachers failing to show up at schools. With villagers quickly able to voice such concerns digitally, government services have started to improve. However, computers, are not operated by the population, but by the kiosk managers. These same managers offer training – that cost a small fee, used to keep the service running and to maintenance – to the village children, empowering future generations.

The main success of the project is the low cost of implementation – only one computer per village. The



Figure 2. The Gyandoot project kiosk with villagers and a kiosk manager. (photo: Pablo Bartholomew Netphotograph.com/ Scientific American August 2003)

benefits of the system start with small amount of people but gets rippled to other members of the community. The local oriented content creates demand and interest, plus educational activity for future users.

One other attempt has recently been in the media: the One Laptop per Child project brings together big players in trying to reach a global audience. Although its founder, Nicholas Negroponte says it’s an educational project and not a laptop project, it is directly criticized for its centralized top-down “imperialistic” design and distribution. [9]

Adding the Interaction Design perspective

The “mere access supply” mentality fails completely to provide a meaningful experience in the population’s contact with technology. On the other hand, it is a first step from which other programs could take inspiration and develop other approaches. But even this second wave still falls short, in the sense that the content, as in the

Gyandoot example, must be accessed by the managers, keeping the villagers away from directly controlling their interaction experience. Information is twice mediated, first by the computer and second by the manager. That is where interaction designers could join in, by making the carefully edited content equally carefully designed, fitting the cognitive and interactive abilities of local population and empowering them in acquiring knowledge and also in acquiring the knowledge by themselves.

Mark Warschauer suggests a framework of technology for social inclusion that puts the people in the focus and technology as a means for higher goals. [2] This discourse is very similar to that of User Centered Design, although it is not evident that there has been a deeper contact from Warschauer with the classic authors of User Centered Design. For one side, this is a confirmation of the multidisciplinary qualities of the User Centered approach and for another, it urges that those disciplines come together.

In the examples mentioned, as much as in the literature found, there are no references to Interaction Design, User Centered Design or interaction designers. The rare exception is a Brazilian researcher, Carvalho, who talks about the importance of Human Computer Interaction in the digital exclusion issue. [3]

Carvalho's paper, in spite of being the closest reference to what we practise as designers, still holds the point of view of computer science when talking about HCI. It is restricted to discussing functional interface usability issues and does not explore the wider aspects of the global experience of the service, incorporating the emotional aspects of use, in either the moment of use or its evolution over time. Borders between the concepts of

usability and experience design are not precise and clear, but this is subject to another discussion.

Interaction Design can be applied in projects aiming to bridge the digital gap in several ways and in multiple degrees of involvement. In a first and more auxiliary position, designers could be used as information managers, serving as a communication link over the usual abyss that separates the research and implementation phases of product or service development. This is crucial to keep a consistent vision in long term projects or among large groups. Careful and well designed documentation ensure that everyone involved in the project moves together. In this sense, team members can make contributions because they understand where the project is and where it is going. This importance has been identified in many design companies and as a result, more and more emphasis has been given to the aspects of design (project) communication, storytelling and creative information management in design education.

In a deeper level of participation, the designer can join the social science group and get involved in ethnographic observations to help understand the social needs and opportunities, and unlike most of the social scientists whose work ends with the research phase, the designer migrates to the development phase of both content and interface, improving noticeably the flow and continuity of projects.

At the specific level, interaction designers can act on the design of interfaces, with heuristic evaluations and doing the graphic design and information architecture project, bringing together form and content, always keeping sight of the big picture: the whole service experience.

As an example, the social context research conducted to create the intranet content for the Gyandoot project could have been enhanced by participatory events and carried on to the visual aspects of the interface, so that the illiterate population could have a more active participation in finding their information and acquiring knowledge. Aspects of how those individuals communicate inside the community and visual cues would be used consistently at the interface, making the familiar and relevant content also familiar in form and interaction, being also tailored to the user group.

By incorporating interaction design methods and techniques it would be also easier to communicate the findings of the social sciences' research to the developers and technical staff. At IDEO, one of the biggest and most successful design consultancy companies, and a pioneer in the use and development of Interaction Design techniques, designers are considered specialists in bringing specialists together, because of their ability to "speak" different professional languages, they are valuable members in any multidisciplinary team.

Conclusion

It is possible to claim, then, that interaction design, through User Centered approach, offers many contributions to the group attacking the problem of the digital division. Analyzing the evolution of attempts to overcome it, and at the same time interaction design techniques and methods, it's clear that both are converging to a more humane approach. There is more and more concern towards people and their contexts for one side and a perception of products and service use as experience of use from the other.

The collaboration with social sciences in both areas, with the adoption of some techniques, as in the case of the ethnographic observations, is a clear example of this convergence. There is no evident reference of use or participation of designers in the process of developing solutions for ICT implementation. However, we can see by the discussed examples how those contributions could improve and enhance these solutions in different levels.

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