Bridging the digital divide: Understanding information access practices in an Indian village community

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ABSTRACT

For digital library and information retrieval technologies to provide solutions for bridging the digital divide in developing countries, we need to understand the information access practices of remote and often poor communities in these countries. We must understand the information needs of these communities, and the best means to provide them access to relevant information. To this end, we investigated the current information access practices in an Indian village.

Categories and Subject Descriptors

H.3 [**Information Storage and Retrieval**]: H.3.7: Digital Libraries – *User issues*.

General Terms

Human Factors, Design

Keywords

Digital Divide, Information Need, Information Access

1. INTRODUCTION

Digital Library (DL) and Information Retrieval (IR) technologies are believed to be powerful tools to bridge the digital divide, as they can allow communities in developing countries to have access to timely and relevant information. However, this can only be realized if we understand the current information access practices of these communities [1]. Only then can we design information access technologies that will enable these communities to bridge the digital divide.

2. UNDERSTANDING THE CONTEXT

It is now widely agreed in IR and DL research that successful information access technologies must consider time, place, history of interaction, task, device, and a range of other factors that are not given explicitly but are implicit in the interaction and ambient environment, namely the context [2].

Imagine a village like Budikote, situated 100km – or a 3hr bumpy drive - east of Bangalore, India; with unreliable power-supply, low-literacy levels and challenging health problems. Considering the context, both in terms of users and infrastructures, is even more important to design information access solutions appropriate to a community like Budikote.

SIGIR '07 July 23-27, Amsterdam, The Netherlands.
ACM 978-1-59593-597-7/07/0007.

Budikote, home to approximately 3,000 people, is typical of a rural Indian village. The primary form of employment is agriculture, selling crops at the local market. There is a primary and secondary school and healthcare facilities. Like many such communities, Budikote has televisions, DVD-players and radio sets. The village has an ICT resource centre with several computers with limited access to the Internet. A mobile telephone company is currently installing a transmitter to provide mobile phone access in the village. Technology is present in Budikote, the question is how to best exploit it to bridge the digital divide.

A study in 1999 revealed that none of the available (private and governmental) media catered to the specific information needs of the community, mirroring the massive information gap existing in the country[1]. As a result, Voices[2], with funding from UNESCO, established a community radio station called Namma Dhwani ("Our voices") in 2000, to provide timely and relevant information to the people in the community through audio, a medium they were comfortable with. Programmes are made at the ICT centre, and range from audio-only, audio with synchronized powerpoint style slides, to full audio-video presentations. A content analysis of 84 programmes showed that they range from public service announcements, interviews, plays, reports, panel discussions to songs, and can be categorized into the following topics: health (e.g. hygiene, HIV/AIDS), women and children, legal issues (e.g. property rights), and awareness related programs (e.g. self-help groups).

Because of the high level of poverty (65% below Indian poverty-level) and the low textual literacy (50% for women and 55% for men) in Budikote, these programmes are distributed in several ways to be inclusive: via cable to people's televisions and specially adapted radios; and, on tape to be played to 'self-help' groups (where the interests range from micro-finance to health). There is a Dalit community (the lowest caste members) on the outskirts of the village, with limited access to technology. Its members receive programmes via loudspeakers placed in trees.

Using a variety of methods, we investigated the information needs (Section 3) and the current information access practices (Section 4) of the Budikote community.

3. INFORMATION NEEDS

We conducted a combination of individual and group interviews with members of the village to identify information

[1] http://portal.unesco.org/ci/en/ev.php-URL_ID=14615&URL_DO=DO_TOPIC&URL_SECTION=201.html

[2] http://voicesindia.org/

practices and needs. These included three focus group discussions with the village governors (Panchayat), a women's self-help group, and a mixed villager group. They also included interviews with 15 regular Namma Dhwani listeners covering a cross section of the community.

The needs in terms of information were mainly in the areas of environmental issues, more in-depth legal information, education options for children, career options, spoken English, social sciences and mathematics, help for senior citizens, general knowledge, religious rites and rituals, festivals, agriculture, profiles of local achievers and celebrities, preventive health information, disabilities, sports, hygiene and cleanliness. These topics are well covered by Namma Dhwani.

However, one difference was that an increasing number of younger people wished for programmes about spoken English, and more programmes on their existing government school or college syllabi.

Overall, there is a strong need to have access to relevant and timely information by all members of the community, and an even stronger need by the younger members of the community on education matters. This supports the idea of using DL technology. Storing programmes in DLs – with appropriate access methods – would allow the members of the community to access information useful to them, and would be a good step towards bridging the digital divide.

Another aspect we looked at with interviewees is their sources of information. We could distinguish two main sources: community and individual. The former source includes neighbors, self-help group members, television news reports, newspaper reports, radio news, and local news from Namma Dhwani. The latter source includes key people in Budikote and surrounding villages, such as lawyers, doctors, government officials, and persons helping the village community members to fill out application forms (for a small fee) and knowing (or pretending to know) the latest developments and news. We identified a clear concern regarding the detail of the information provided. In particular, with individual source, the information was often superficial and sometimes inaccurate. DLs can remedy to this problem, as they can provide more independent access to in-depth information and ensure greater levels of accuracy.

Finally, we observed that while information needs may be expressed articulately by a few, there were many needs that could not be expressed in words. We believe that it is this aspect that makes the deployment of DL and IR technologies as a means to bridge the digital divide particularly challenging. DLs seem the perfect technology to bridge the digital divide, but only with appropriate access methods. It is also obvious that accessing relevant information cannot be done by entering a text query via the standard search box. Some sort of navigation-based access seems necessary, and one that fits the information access practices of the community.

4. INFORMATION ACCESS

To bridge the digital divide, information access solutions must benefit the whole community, in particular its most disadvantaged members. In Budikote, some people have access to information mostly by listening to radio programmes. We therefore investigated listening patterns to get insights on the best ways for these people to access relevant information, if it were to be stored in a DL. We observed two sessions, where a group of 15 to 20 persons gathered to listen to radio programmes, one on governance and the other on consumer rights. In both sessions, a volunteer acted as a facilitator between the programmes and the listeners.

Organizing such sessions is time consuming and expensive. To be worthwhile, a session requires 15 to 20 persons listening to 30mn of audio without a break. Holding the attention of the listeners for the full half hour with an audio-based medium was definitely a challenge. Some listeners gave their full attention to the first 15mn, but got distracted during the latter 15mn. Others were clearly not interested in the programme when it started, but as the topic became clearer, they gave their full attention to it.

Some listeners felt that some of the terms used were difficult, and believe that these could have been presented in a simpler language. The role of the volunteer was very critical to help the listeners understand the programme in the way it was meant to be. There was however an issue regarding the objectivity of the facilitators who could steer the discussion in the way they deemed fit due to personal bias.

These findings emphasize the need to put in place technology that will supplement the above process to provide information relevant to the Budikote community. It is obvious that providing information in text-only format is not appropriate. It seems that a combination of audio and image media will best address the literacy problem and keep people interested.

As our users are very familiar and comfortable with the radio medium, we are currently experimenting with the radio metaphor as a means for users to access information [3]. Our proposed DL comes with a physical knob and a touch-screen. As the user turns the knob, a snippet of each programme is played on the screen. In the current prototype, developed using the Greenstone software [4], the programmes are organized along a so-called tuner-bar according to categories (education, health etc). Alternatively, the touch-screen allows access to information based on visual representation of categories. The metadata created at production times is used to manually assign programmes to categories. We are in the process of automating the categorization process using e.g. K-NN approach, where the main challenge is the sparseness of the metadata.

Obviously, the current ordered presentation of programmes will not scale with any large increase of stored programmes in the DL. For this reason, we are experimenting with other orderings such as popularity and recency, used for example in blog retrieval. This is the aim of our future work.

5. ACKNOWLEDGEMENTS

This work is funded by EPSRC (EP/E006396/1). The team includes the authors and Eran Edirisinghe, Will Harwood, Paul Palmer, Dorothy Rachovides, Roger Tucker, Dhamikke Wickramanayake, Arthur Williams.

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