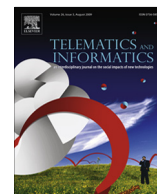




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Research in brief

## Job search website for illiterate users of Pakistan



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## ABSTRACT

Illiteracy is a major hurdle in socio-economic development of Pakistan. Research in the Information and Communication Technology (ICT) can help in tackling this issue by developing solutions tailored for illiterate population. The work presented within this paper proposes a job search website for illiterate population of KPK province of Pakistan. The designed website does not require any human assistance while searching a job. Moreover, the website uses culturally relevant graphical and audio content. The usability of the website is tested according to the ISO-9241-11 specification. Furthermore, we have studied the effect of the participants' characteristics, i.e., their age, computer and mobile usage experience on the usability of the website. The results show that the participants found the website usable. Specifically, they could search suitable jobs with a minimal number of clicks and in less time as compared to the usual task completion rates reported throughout the literature. None of the participants' characteristics were found to be affecting the usability of the website. These results suggest a promising potential of ICT solutions for providing services to illiterate population of Pakistan.

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## 1. Introduction

Information and Communication Technology (ICT) is providing remarkable services to various sectors like education, healthcare, agriculture and commerce etc. However, most of the services use text in their user interface (Findlater et al., 2009). Textual interfaces encode knowledge that requires decoding for comprehension and thus demands the decoder to be literate (Wagner and Kozma, 2005). Hence, most of the ICT solutions focus the educated users and ignore 774 million illiterate people throughout the world (Huebler and Lu, 2013; Wagner and Kozma, 2005).

Making the ICT services accessible to the illiterate users belonging to the developing world has numerous socio-economic benefits. Some of the notable examples include an ICT solution for helping rural farmers (Wirastuti et al., 2008), a phonebook for low literate users (Joshi et al., 2008) and a speech-based solution for entertainment and job search (Raza et al., 2013).

Searching a job is an important activity for people. This activity is particularly difficult for illiterate users because they do not have access to traditional job search facilities (e.g., newspapers, job search agencies). Moreover, existing ICT solutions for searching a job use text in the user interfaces, thereby making these interfaces unreadable for illiterate users (Huenerfauth, 2002). Therefore, an ICT solution is required for supporting job search by illiterate users.

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Medhi et al. (2007) proposed a solution to support job search for household workers belonging to the slums of Bangalore, India. The proposed job search solution uses graphical contents (icons), which are specially designed for visualizing household jobs like cooking and cleaning. Nevertheless, this solution cannot be scaled for a variety of jobs like gardener, security guard, barber, watchman and carpenter practiced by illiterate population in Pakistan. Also, the graphical content for job visualization and audio feedback is shown to be culturally relevant for female household workers of India. Since a solution must use culturally relevant content in order to be usable for illiterate users (Medhi et al., 2007), the content designed for slums of Bangalore cannot be directly used in an ICT solution for job search in the KPK province of Pakistan, where females do not usually do household jobs.

The work presented within this paper describes an exploratory research for designing a usable website to support job search for illiterate people of KPK, Pakistan. The website uses graphic contents, which are culturally relevant to the users of the target population. An ethnographic focused group study is conducted to test the usability of the contents before utilizing them to design the website. Since the objective of the website was to help illiterate people to search for an appropriate job without any human assistance, voice feedback is provided in the local language. Moreover, the website provides functionality to print the job address. The users can subsequently use this printed address for locating the job.

The rest of this paper is organized as follows: Section 2 discusses various ICT solutions proposed for illiterate users. Section 3 presents a job search website designed for the illiterate users of KPK, Pakistan. Section 4 describes the usability evaluation of the website. Finally, Section 5 summarizes the main contributions of this paper, identifies the limitations and points towards some directions of future research.

## 2. Related work

Traditional ICT solutions heavily rely on text for user interaction. However, numerous research studies report that text-only interfaces are not appropriate for illiterate users (see e.g., Findlater et al., 2009; Medhi et al., 2009). This led to a new research area of designing ICT solutions specifically for illiterate users. ICT solutions have been designed, which afford a variety of interface modalities to help illiterate users, e.g.; tangible, text-free interfaces with and without human assistance. Since the focus of this research is to design a job search solution for illiterate users, the discussion of the related literature is confined to the ICT solutions designed for providing services to illiterate users. The following paragraphs discuss the ICT solutions in terms of a) interface modality, b) human assistance requirement and c) ease of use.

There are many examples of ICT solutions providing communication opportunities for illiterate users: Friscira et al. (2012) designed a text-free interface for smartphones to help illiterate users in reading and writing short-messages. Visual phone-book (Joshi et al., 2008) used colors, icons and number cues to save and readily find the contacts. Another example is an email solution for illiterate users (Ishii and Ullmer, 1997). An email is composed as recorded video in this solution. Similarly, Deo et al. (2004) proposed a web-based digital library for providing access to information. The interface of the library consisted of text, images and audio support. Wirastuti et al. (2008) designed an agriculture information system using ubiquitous technologies to help illiterate farming community in learning new agriculture practices. Electronic screening tool was developed to identify alcohol consumption and depression of rural patients (Akan et al., 2006). The tool provided graphical user interface with audio support for computer illiterate users.

The term 'e-government' is coined for making the public information, documents and services available for citizens. However, illiterate users could not benefit from these services due to text-dominant interfaces. Taoufik et al. (2007) proposed an e-government portal for providing access to official documents and other government services for illiterate citizens. The designed interface used text along with audio and pictures. Similarly, Alam et al. (2008) designed an electronic system with a tangible user interface for illiterate users to cast their votes. Another application with similar interfaces is Personal Health Information System (Parmar et al., 2009) for rural women of India. The results from these studies showed that ICT based supportive solutions were effective, easy to use and the illiterate users wanted to use them again.

Directly relevant to our work is the study conducted by Medhi et al. (2007). Their ICT solution helped illiterate and semi-illiterate population of India in seeking appropriate jobs. The solution provided text-free user interface for searching a job and for locating this job on the city map. The solution used icons to describe job timing, nature of job, salary, etc. The authors believed that, their solution could help without any human assistance to search for a job. Similarly, Raza et al. designed a speech-based job search mobile application for illiterate users of Pakistan (Raza et al., 2013). The primary purpose of the application was to disseminate information and services such as advertisement list, message boards to promote social and political changes and awareness, mailing and journalism. The frequency of calls (more than 495,000) and number of users (more than 85,000) suggested that this application was successfully used by population, but it was not clear that how many of the users were illiterate users.

All the above-mentioned studies agreed that designing interfaces with images, icons and audio support in the users' local language can help illiterate users in accessing useful services. However, the rich interfaces may cause complexity and cognitive load (Medhi et al., 2009). Thus while designing such interfaces, one should follow the 'simple is the better' principle. Most of the discussed studies reported that illiterate users needed human assistance for using the proposed solution. A significant reason for this requirement is the interface complexity. Another important concern while designing text-free interfaces for illiterate users is the influence of culture on these interfaces. According to Pappachan and Ziefle (2008), icons have different meanings in distinctive cultures (Pappachan and Ziefle, 2008). Thus, it is evident that culturally relevant

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