
Addressing Challenges in Bridging the Digital Divide and User-Centered Design Initiatives: A Malaysia Perspective

Chui Yin Wong

Interface Design Department,
Faculty of Creative Multimedia,
Multimedia University,
Cyberjaya, 63100 Malaysia.
cywong@mmu.edu.my

Abstract

This paper will identify the underprivileged groups in Malaysia who are not properly represented in mainstream society to gain information access via Information and Communication Technology (ICT). The author will also share some experiences and challenges faced in User-Centered Design and Universal Design initiatives in Malaysia.

Keywords

Digital divide, user-centered design, universal design, mobile for deaf, Malaysia.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous. H.5.2. User Interfaces.

Introduction

In recent years, there are growing community development projects in bridging the digital divide in individual nation and cross-nation. In a developing nation like Malaysia, the government has started to work on a national plan in bridging the digital divide by

providing the necessary infrastructure for universal access to the Internet. The initiative is implemented via the National Strategic Framework for Bridging the Digital Divide. However, the policy-making process is still in the process being defined.

Nevertheless, there are several barriers for the underprivileged groups being marginalized from mainstream society to gain information access using Information and Technology Communication (ICT). The barriers are as follows:-

- limited technical infrastructure in rural areas
- social factors (i.e. employment, social perception)
- economy factors
- educational barriers (semi-literacy and illiteracy level)

The privileged groups stated here are as follows:-

- Body-disabled groups (hearing and visually impaired, cognitive disability and physical disability community);
- Elderly or senior citizens (age 55 and above);
- Aborigines in East Malaysia and residents in rural areas in West Malaysia;
- Low income social class such as farmers, fishermen, villagers, rubber tapers, blue collar labors and so forth.

Sharing Experiences in User-Centered Design and Universal Design Initiatives

As a usability and user experience professional, my mission is to bridge the digital divide for the

underprivileged community along nation-building strategies. My interest to UCD and universal design were based on personal mission to reduce user frustration and bridging the digital gap using ICT. I am privileged to be selected as a Fellow from a developing nation to share user opinions in a workshop at the Conference of Universal Usability in 2000. In addition, my formal training and project involvement in HUSAT (now as ESRI) in the United Kingdom also gave me the motivation to do some strategic work back home for the nation.

I have started to work on identifying some initial work to help bridge user-centered design (UCD) activities and community development projects in the country. Currently, I am looking for 2 ways of approaching digital divide by the following stages:

(i) Creating Awareness via Interface Design Education
 Firstly, I have been imparting knowledge and creating awareness of *early focus on users* in the design process via Interface Design education in Multimedia University. So far the Interface Design department is the only one design institution in the South-East Asian regions embracing UCD philosophy in design education.

Generally, in Asian culture, most of the ICT companies or manufacturing industries are either technical-oriented or product-centered instead of user-centered design in the business model. User needs and end-user involvement are seldom taken into consideration during the development process. Thus, the Interface Design Department has taken the lead in such effort by creating the awareness of user-centered design philosophy and highlighting accessibility issues in the design process to the young interface designers.

Hopefully there will be gradual changes in the ICT spectrum and design industry development process in Malaysia. In addition, future work will also involve projects and creating awareness campaign to local industries, especially in community projects.

(ii) Universal Design Research

Secondly, in order to gauge the initiatives, several research studies are being carried out to address the digital inclusive manner. In general, South East Asian countries like Malaysia are characterized as low broadband and PC penetration; on the other hand, high growth rate in mobile penetration.

The launch of Malaysian's Multimedia-Super Corridor (MSC) Project in the last decade had much focus in spearheading the intelligent city like Cyberjaya and also proven ICT growth in urban areas. However, there are very limited research studies being conducted locally of how ICT or mobile technologies play an important role to underprivileged community in their daily lives.

As a result, two preliminary studies have been conducted to investigate how local hearing impaired community and elderly users perceive the usage of mobile technologies in their daily lives. Due to limited length of the paper, below is one of the initial researches I have started to look at under the *Universal Design Research* action plan.

A Case Study on Mobile Technologies for Hearing Impaired Users

Mobile for Deaf in Malaysian context

There are approximate 31,000 hearing impaired people in Malaysia out of an estimation of 23 million populations [2]. Although the number may seem small,

the needs and demand using ICT such as mobile technology are essential to improve the quality of lives in their daily lives.

The initial approach is to conduct a survey to investigate user perception among the local hearing impaired community. A questionnaire was designed and modified based on the Technology Acceptance Model (TAM) [1].

The deaf community basically lives separately in different states in Malaysia. The diverse geographical area creates challenges in collecting survey data from the representative sample. Moreover, having considered the communication gap, the project team had decided to conduct face-to-face interviews at a Deaf Festival. The festival was considered to congregate a larger group of deaf population from different states. We received around 84 respondents during the survey at the first stage. The findings of the survey were reported in [3].

Challenges in User Engagement

We experienced several challenges during the study. Generally, due to inadequate understanding of Deaf Culture, there is a severe communication gap between the hearing and hearing impairment groups in Malaysia. For instance, there are 3 researchers conducting the interview session. One is an interface designer who suffers hearing loss. During the survey, the hearing persons experienced difficulties in building rapport with the deaf community. Basically, they face communication challenges in conducting the interviews without the knowledge of Sign Language. In a nutshell, the deaf communities feel much more welcoming if the survey was to be approached by their own peer

members who are part of the deaf community; or hearing people who know some Sign Language.

Multi-racial and Multi-lingual Society

Malaysia is a multi-racial society with three main ethnic groups – Malay, Chinese and India. Bahasa Malaysia is the national language for the nation while we also encourage mother tongues to be taught in the educational system. The local deaf community generally receives education in Bahasa Malaysia after Bahasa Malaysia Sign Language being introduced in the special education system in 1978. The level of English language for deaf community may not be on the same par as other hearing persons in normal education system except those receive special training from family and peer supports.

Originally, the questionnaire was mainly designed in English. The structure of questions was referred to TAM model with changes tailored to the study. A pilot study was conducted to gather user feedback from the deaf community. Due to inadequate understanding of English language, majority do not comprehend the

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Citations

[1] Davis, F.D. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly* (1989), 319-339.

questions in English. As a result, the questions were to translate into Bahasa Malaysia and also rephrase them into simpler sentence structure. Although the second study was designed in Bahasa Malaysia version, majority still prefer to have a hearing impaired person or interpreter using Sign Language for better communication. Nonetheless, English is still remained the most popular language on the Internet. There are rooms to improve the quality and content of special educational system for the deaf community in Malaysia.

In Closing

There are still very limited research interest and resources being explored to study the UCD and community projects in the context of Malaysia. International development from developed nation is highly encouraged for a developing country like Malaysia. For instance, the uptake of technologies in urban areas compared to rural areas is distinct. Hopefully, this workshop will be the first initiative to open up opportunities and form international partnership to reduce the ICT disparity between the developed countries and developing nations.

[2] Social Welfare Department (2005). <http://www.jkm.gov.my/>

[3] Wong, C.Y. Constructing a UTAUT Model for Mobile Phones for Hearing Impaired Users. (To be appeared) In Proc. of 12th International Conference on Human-Computer Interaction, Springer, Lecture Notes in Computer Science Series, Beijing (2007).