Perceptions on Interaction Design in Malaysia

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Abstract. Even though researchers have introduced Human Computer Interaction (HCI) methodologies, since 1980's, Malaysia's user interface is still considered inadequate. Despite being aware of the importance of usable design, several non-technical issues have more significant influence towards poorly designed user interfaces in Malaysia. This paper reports the findings of a study of interaction design and/or any HCI methodologies in practice among Malaysian companies for software design and computer-related design development. The research involved senior Information Communication Technology (ICT) managers and focused on the application developers, whose job descriptions and responsibilities vary. The study used semi-structured interviews and a focus group study to uncover the current perceptions of people involved in ICT project development. The findings serve as a pointer to the Malaysian government and stakeholders towards the improvement of user interface design.

Keywords: HCI, usable design, interaction design, practices, Malaysia.

1 Introduction

The term *interaction design* is widely used in Human Computer Interaction (HCI); however, the definition varies [4]. Among many other areas, HCI aims to identify and understand usability problems in task-oriented computer systems [1]. Usability is the key to HCI [5][8] but many researchers in HCI have explored more advanced features; for instance, emotional design [13]. Emotional design is an important dimension in interaction design, in addition to usability, ease-of-use and fitness-for-purpose. Interaction design, HCI and usability design have pragmatically been the focus of researchers and practitioners in developed countries. However, there have been few studies on design of interaction between human and computer in developing countries [7].

Since 1996, Malaysia has been among developing countries with the highest ICT investment [2] as Malaysians are widely exposed to information technology, from the entertainment arcade to wireless connection available in shopping malls and restaurants. The need for appropriate usability and correct interaction design are critically important to ensure excellent information usability. Unfortunately, there is no clear distinction between software design or computer-related design and the adoption of interaction design in Malaysia. This study is among the first attempt to learn about the current status of interface or interaction design among practitioners in Malaysia. In

this paper, we will report the results of two data collection procedures: semi-structured interviews and focus groups. Most of the participants described themselves as application developers.

2 Related Work

The literature indicates that designing interfaces has been studied for more than twenty years [5]. The fact that there is lack of such studies in the Malaysian context may suggest opportunities for more attention to be paid to the subject in Malaysia. Understanding interaction design in developing countries may have a significant impact on the usage of computer interfaces.

Most designers in developed countries are trying to support and address the needs of users by nurturing, serving and caring for them [4]. In contrary, designers in developing countries are competing with users, struggling to fulfill their project's due date [12], trying to satisfy clients [19], project leaders and/or system analysts and finding the best words to describe their design [14].

Design practices may cover graphics design, product design, artistic design, industrial design and the film industry [12]. How to create a useful design, to meet the diversity of users' needs and requirements, must be clearly understood by designers [7][16]. However, designers' perception and behavior will be influenced by the design community and organizational culture in which they are working [21]. Organizational cultures are patterns of basic assumptions that are considered valid and that are taught to new members as the way to perceive, think, and feel in an organization [4]. In software project development, risks were not often from the designing team but from the other issues such as the organization's policy [20].

In Malaysia, designing usable interfaces has been applied, although few studies and results have been published or made accessible to the public [2]. On the whole, these user interface designs have rarely been studied, and few comparisons have been made. As suggested, lessons learned in one project are not transmitted to others. Additionally, appropriate technologies are rarely evaluated; and financial sustainability, scalability and cost recovery are seldom addressed [6]. Such situations create many possibilities to learn from the diverse issues of human and computer interaction design in Malaysian design experience.

2.1 Proposed Framework

The study aims to find out the general perceptions of the application developers involved in interaction design processes. The study were conducted directly with the people involved in the design; i.e. a few organized groups of practitioners in Malaysia. Our primary aims are to (i) learn about the status of interaction design and HCI methodologies used in IT and IT-related projects among practitioners in Malaysia; and (ii) identify the influencing factors that contribute to design decisions.

Figure 1 shows the proposed framework of the relationship between applications developers and their final product. The products that are designed by application developers are influenced by several factors which include user requirements, functionality, decision making and creativity.

Influencing factors

user needs and requirements
functionality
decision making
creativity

Application Developer → → Product
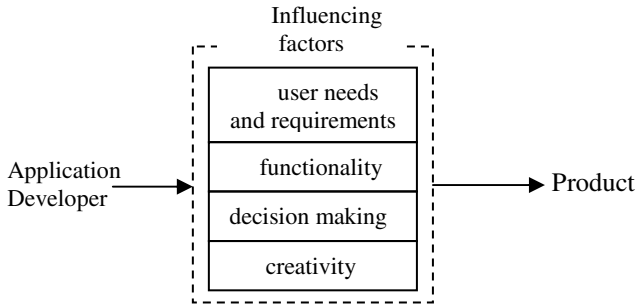
Fig. 1. Non-technical issues that influence design amongst application developers

Application developers, especially those who are involved in the design phase, will design according to users' goals [18], motivation [12], and task domain [5]. As the designers interact with their designed product (including software, systems and services), they form interpretations that influence how they think, feel and behave. Such interpretations are based on forms and functionalities [3]. At the same time the interpretations are actually more complex responses which may include assessment of the values of the products. The judgment may be associated with cultural values [7]. Crilly [3] asserted that people attach such meanings to products; designers may form intentions that the products they design will be interpreted in particular ways, and these intentions shape the product's result.

3   Methodology

This study used two methods of data collection. First, eight semi-structured interviews were conducted with application developers in four different companies based in Kuala Lumpur, Malaysia. These companies are located in urban areas where software and computer-related projects are actively conducted and managed. Secondly, one focus group was held among selected application developers to study perceptions and collaboration among different task practitioners in design reasoning, methods and values of design development.

3.1   Participants

The study's participants were IT Manager, Information Architect, Head of Creative Design, Head of Enterprise Portal, Assistant Manager, Graphic Designer, Application Developer and Programmer. The participants did not receive any compensation. They were willing to share their experience and concerns in interaction design which are part of their daily work and practices. Table 1 shows the list of participants' type of work and their previous job title.

Table 1. Participants' current and previous job titles

Participant	Current Job Title	Previous Job Title
P1	IT Manager	System Analyst, Programmer
P2	Assistant Manager	Application Developer
P3	Head Creative Designer	Website, Courseware Development
P4	Head Enterprise Portal	Lecturer, Broadcasting, Director, Scriptwriter
P5	Information Architect	Application Developer
P6	Graphic Designer	Artist
P7	Application Developer	Programmer
P8	Programmer	-

3.2 Questionnaire

The main aim of this study was to collect data on the perception of participants towards design in system development (i.e. interfaces that they have designed and developed). The questionnaire consisted of demographic information and questions about interaction design. Closed-ended questions were to find out ethnic group and level of design experience, which is part of their work responsibilities. Participants were also asked to describe their job responsibilities, people or users that they dealt with during design development and how they acquire design knowledge and learn about different design methods. The latter part was asked in open-ended format.

We explored participants' perceptions and beliefs with open-ended questions which aimed to engage the participants' perception of the importance of design, description of design, sensitive issues in designing for different ethnic groups, and what they think important in design. The participants were also asked to give a rating on a 1 to 5 scale on each perception question (1 for the Least Important and 5 for the Most Important influence or factor to consider in design). Each reply has been categorised into common terminology which includes perceptions, training in design, cultural element perceptions and design guidelines used in the development process.

3.3 Focus Group

Focus groups brought together the SKALI [15] design team who shared interests in the design of software and computer-related development. The focus group provided opportunities to explore shared beliefs and experiences with respect to SKALI's culture and way of work (i.e. design process and procedure). Table 2 summarises demographic information of the focus group participants. During the focus group session, the participants were given a questionnaire about their design practices according to its importance (Likert scale 1 to 5).

Table 2. Focus Group Participants' current job title and years of experiences

Current Job title	Years of Experience
Project Manager	More than 3 years
Assistant Manager	4 years
Creative Designer	8 years
Information Architecture	More than 3 years

4   Results

4.1   Demographic

The results are divided into three main sections: demographics, perceptions and focus group. Four male and four female subjects participated in the interview sessions. Their ages ranged from 25 to 34 years. All participants had a bachelor's degree or higher. Of the eight application developers participating in the study, four judged themselves proficient with design interface or interaction and four somewhat intermediate. Questions regarding ethnicity were asked and there was one anomaly to the standard replies:

> *Q1: Which ethnic group you belong to?*
> *P8: Mixed Chinese and Malay*

4.2   Perceptions

Generally the perceptions are identified by three terminologies: HCI, usability and interaction design. These perspectives directly reflect the importance of HCI by the participants.

Table 3. Awareness of common HCI terminologies

Users were asked questions on	Yes	No
1) Terminology		
• HCI	6	2
• Usability	7	1
• Interaction Design	3	5
2) Have had training in design	4	4
3) Is there any ethnic issue regarding design	5	3

Table 3 shows the perception of participants of HCI terminology. Most were aware of the important terminology and had heard about HCI and usability. However, five participants never heard of interaction design. Half had attended formal training in design. Five participants indicated that they were aware of the sensitivity of ethnic issues, for example use of colour.

Participants were also asked about important factors or issues in design for interaction. Their feedback varied, and included creativity, design feedback (e.g. graphics, text, colour), grabbing people's attention [18], usability [8], impression [13] and brand, passion [6], functionality and getting it right the first time [14]. As for application developers, the participants perceived their design as satisfactory but need more information to ensure their users' satisfaction. Participants also described their design output as based on experience and the users' needs and requirements. They also reflected on the meaningfulness of design, which must be relevant to its usage.

Considering the different ethnicity and religions in Malaysia, the implementation of design should be according to ethnic groups. Although all the participants have different job functionality, they all agreed on the usefulness of design guidelines.

They normally referred to their project leader, systems analyst, senior colleagues and the decision maker. Additionally, they mentioned website that has common design guidelines or government authority, such as MAMPU [10]. MAMPU is a government agency that handles the functions of administrative modernisation and human resource planning.

During the interview and focus group sessions, participants were asked which they considered the most important perceived factors in design development. The result, adjusted by Net Positive Value (NPV) [17] has proven that the highest rank of perceived importance in design is the user's requirements. The lowest rank is the superior's or manager's satisfaction on design.

Table 4. Net Positive Value (NPV) of perceived importance in design development

	NPV
Aesthetic design	+1
Functional design	+3
User requirements	+7
Due date of Completion	-1
Superior's or Manager's satisfaction	-5
User's satisfaction	+5

The results in Table 4 indicate that participants (i.e. application developers or practitioners) do not always agree with their managers (NPV=-5) because they are not necessarily the person who will interact most with the user interfaces. Due date completion (NPV=-1) is the second lower rank in perceived importance in the interview results. This research suggests that the application developers think that they must meet end users' requirements of the system rather than management's requirements. Aesthetic design (NPV=+1) occupies the third lowest rank. Most application developers believed that no matter how aesthetic the application is, failure to achieve users' needs and requirements will cause users to abandon the product. Functional design therefore scores +3 in the NPV ranking.

When it comes to a project where the client is both the decision maker and the user, application developers may have to agree to certain design issues against the basic principles, for example, the client's desire for animated unrealistic graphics and/or dynamic text for important messages on the website. According to ISO 14915 [9] still images and text should be used for all important information other than time critical warnings. However, not many decision makers were aware of or understood this standard. Practitioners also did not know of the ISO details, so many of the principles were ignored. The result of the NPV analysis shows that user satisfaction (+5) is considered more important than aesthetic design or even the function of the application. Application developers perceived that the user's requirement (NPV=+7) is the most important phase in design development.

4.3   Focus Group

Four of the subjects who answered the questionnaire and participated in the in-depth interviews were also involved in the focus group discussion. The outcomes of the focus group highlight several issues and influencing factors in interface design.

Data Requirements Gathering from the Right Users. The results of the NPV analysis showed that user requirements is the most important consideration in design. The focus group, however, identified user requirements as the most difficult phase in the design process. The waterfall model [2] is one of the common system development methodologies used by Malaysian practices, and it is also used for website development. Since data requirements are always identified by the information architect and systems analyst, the designer has no first-hand contact with the potential users. Unfortunately, the information gathering does not always cover all stakeholders, which should include end users and decision makers. Difficulties arise when the end users and decision makers cannot agree on a single solution for the application developers. For example, end users require items which would help them perform better in their jobs. On the other hand, decision makers will always consider the costs involved to provide such requirements.

   All application developers agreed that the decision makers always get what they want throughout design decision. However, in the case of the SKALI (the only company in this study which has a usability team), project managers will meet the decision makers of the project and educate those decision makers in the design consequences, based on their own experience and scientific principles underlying their decisions.

> *P8 [translated]: There was the time that an elderly client complained that the font was too small. We could not do anything because the space was limited. However, because of his authority, we had to change the font size even though many people disagreed.*
>
> *P5: The most difficult part is to get agreement on who is the user, and who is the decision maker. We had many experiences where the people we interviewed happened to be the end user but not the decision maker. Decision makers decide on cost, timeline and context. Most of the time, these people do not use the system or interface.*

   According to Zhang [21], it is time to focus on making top management realize and incorporate the HCI perspective into corporate strategic planning and management. HCI issues and concerns in the business, managerial and organizational context should be integrated. It is assumed that in this structure, the designer's role is isolated from the organization or from the development team itself [14][19]. For example, in the user requirement information gathering, in most projects, the role will be done by an Information Architect (IA) [2] and/or systems analyst [8][17].

Importance of HCI Studies. A knowledge of HCI can be used to justify design, for example in convincing the users of the selection of certain design elements, for instance using certain colors is not appropriate because of how our eye processes the information.

P6: I do design for web but I never heard of the term usability… [laugh]…What is it actually?

The research discovered that 25% of the participants had never heard of HCI. This is a critical issue since these participants were the IT Manager who had been working for more than 5 years, and a graphic designer who has been designing for more than 2 years.

Designers are rarely involved in fieldwork; they are the people who usually sit in front of the computer monitor with pencils, colours and blank paper in their hands. However, Stolterman [16] has argued that designers, even in the most demanding situations, are able to deliver a design that is practical and has good design outcomes. He also named several researchers who have provided fundamental understanding of design, which is a unique human activity deserving its own intellectual treatment.

These research findings have supported those of Stolterman [16]; an in-depth approach has showed that, due to the lack of knowledge of psychological studies related to design, designers are unable to justify their own inventive designs during presentation. When clients disagree about a proposed design, the designers will more often than not justify their creation based on comparison with competitors' products. Therefore, the intention is to give designers a tool which is based on the understanding that designers should be supported by a "being prepared-for-action" tool [14]; another tool for "guided-in action" is required to support communication between designers and stakeholders.

All of these methodologies and theories will only be found in an HCI curriculum [1]. Therefore, HCI must be introduced to the practitioners through short courses or other educational approaches.

Design Guidelines for Interface. The result of this focus group has uncovered the fact that practitioners in Malaysia have their own guidelines, compile guidelines from websites, refer to their own experience and to MAMPU [10]. There is no current in-depth study to compare the guidelines used by practitioners in this region and current research into design guidelines produced by specialists. This research contributes to a promising and challenging future in research for design guidelines used in practice by Malaysian industries.

Although designers' inventive designs are usually based on their personal intuitions and motivations [16], they sometimes ignore the fact that users do not possess the same cognition, levels of expertise or intention of use [3]. Furthermore, with only a little time allocated for user testing, designers often grab the most convenient users available – themselves – to test their own design [12].

Multiracial Influences. According to the research results, use of colour is a recurring issue in design. Government websites normally avoid using green because the opposition's official colour is green. However, critical websites like the Ministry of Natural Resources and Environment [11] used a different green colour.

> *P1: [translated]*: *If the clients are Chinese, the application focuses more on business; Malay will be more on information display, organisation chart and so on.*
>
> *P2: Government websites must have an organisation chart. Certain colours should not be used because they may reflect personal belief…*
>
> *P3: Cultural differences could have different aspects; they want the product to be delivered, for example, must be sharp on time for Chinese clients. Malays have a lot of bureaucracy. A lot of people need to sign the paper work. I don't know why they cannot use the electronic medium to communicate efficiently. Colour, yes, government projects normally avoid using green. Well, just in case..*

5   Discussions

This study has been significant as it is perhaps the first to investigate the issues of interaction design among website and systems programmers in Malaysia. Many programmer-designers are working in the industry, and interaction design has received insufficient attention. Our work on the effectiveness and importance of HCI should be followed–up, and re-look. Some work has been done in this area but the results are yet to be published [6]. While the Malaysian government portal has received awards and recognition, the issue of updated information needs to be addressed [10][11], and maintenance of the portal has been a concern. Human factors have been discussed in many conferences, but the specific issue of interaction design has not received full attention by the designers. Few local companies focus on interaction design [6][7], and more seminars, workshops and awareness programmes have to be established in order to increase knowledge of the importance of applying interaction design skills.

This research has revealed that design failures in Malaysia are not mainly because of technical issues, but rather because non-technical managers [20] have a significant impact on design as a whole. Such non-technical issues include decision making in design teams, organisational policy towards design issues, and lack of awareness of cognitive psychology related to design among designers themselves [18].

Finally, the main factor contributing to the design delay and failures in Malaysia is that designers do not have authority in decision making. Organisational policy may aim to impress the client company in general, rather than the specific user [20], and the designer's creativity will be wasted. In the Malaysian context, too little information is being addressed to the designer's dilemma in ICT project developments. This study is urgently needed as Malaysia is aiming to engage seriously in the knowledge-based economy.

References

1. ACM SIGCHI: Curriculum for Human-Computer Interaction,
    http://sigchi.org/cdg/
2. Alvin, W.Y.: Are Usability Assessment Technique Reliable in Non-Western Cultures?. The Electronic Journal on Information Systems in Developing Country (2000),
    http://www.ejisdc.org

 3. Crilly, N.: Product Aesthetics Represents Designer Intent and Consumer Response, Doctoral of Philosophy theses, University of Cambridge (2006)
 4. Fallman, D.: The Pragmatics of Design Studio Culture: Our Story. In: Proceeding CHI 2007 (2007)
 5. Gould, J.D., Lewis, C.: Designing for Usability: Key Principles and What Designers Think. ACM 28(3), 300–311 (1985)
 6. Khalid, H.M.: Human Factor Engineering for Malaysia and Singapore, http://www.damai-services.com
 7. Halimahtun, M.K., Helander, M.G., Alvin, W.Y.: Work With Computing Systems. In Work With Computing Systems, Royal Institute of Technology (2004)
 8. Hammond, N., Jorgensen, A., MacLea, A., Barnard, P., Long, J.: Design Practice and Interface Usability: Evidence from Interviews with Designers. In: Proceedings CHI 1983, pp. 40–44. ACM, New York (1983)
 9. ISO: ISO 14915 Multimedia User Interface Design Software Ergonomics Requirements, Part 1: Introduction and Framework; Part 3: Media Combination and Selection in International Standard Organization (2000)
10. MAMPU: Electronic Government Information Technology Policy and Standards (EGIT), http://www.mampu.gov.my/mampu/
11. Ministry of Natural Resources and Environment, http://www.nre.gov.my
12. Mueller, J.: Getting Personal with Universal. In: Innovation Spring, IDSA (2004)
13. Norman, D.A.: Emotional Design: Why We Love (or Hate) Everyday Things. Basic Books, New York (2004)
14. Schön, D.A.: The Reflective Practitioner. Basic Books, New York (1983)
15. SKALI Official Website, http://www.skali.net/
16. Stolterman, E.: The Nature of Design Practice and Implications for Interaction Design Research. International Journal of Design, 55–65 (2008)
17. Sutcliffe, A.G.: Scenario-based Requirements Analysis. Requirements Engineering Journal 3(1), 48–65 (1998)
18. Sutcliffe, A.G., Kurniawan, S., Shin, J.: A Method and Advisor tool for Multimedia User Interface Design. International Journal of Human-Computer Studies, 375–392 (2007)
19. Weiss, A.: The Web Designer's Dilemma: When Standards and Practice Diverge. ACM, New York (2006)
20. Zaitun, A.B., Mashkuri, Y., Wood-Harper, A.T.: Systems Integration for a Developing Country: Failure or Success? A Malaysian Case Study. e-Journal of Informations Systems in Developing Countries 3(1), 1–10 (2000)
21. Zhang, P., Galletta, D.: Human-Computer Interaction and Management Information Systems: Foundations, pp. 1–18. Sharpe, Armonk, New York (2006)