HCI Practices in Malaysia: A Reflection of ICT Professionals' Perspective

Idyawati Hussein
School of Informatics Science
Universiti Malaysia Sabah
Labuan, F.T., Malaysia
idyawati@ums.edu.my

Murni Mahmud
Kulliyyah of Information Communication Technology
International Islamic University of Malaysia
Kuala Lumpur, Malaysia
murni@iiu.my

Alvin W. Yeo
Faculty of Computer Science and IT
Universiti Malaysia Sarawak
Kota Samarahan, Malaysia
alvin@fit.unimas.my

Abstract—***Although Human Computer Interaction (HCI) has been practised by Western countries over the last 40 years, very little is known about how HCI is being incorporated in Malaysian practices. We undertook a 12-week ethnographical study aimed at revealing HCI perceptions at different managerial levels in Information and Communication Technology (ICT) departments and agencies in Malaysia. We describe and discuss the factors that either drive or impede technology managers towards HCI awareness, based on the nature of ICT-related/software development in Malaysia. The result of the study indicates that the developers and corporations' overall perception of HCI is influenced by their national and organizational culture. The lack of emphasis on usable interface design and scarce information regarding user studies and evaluation are major concerns. Within this context of developing countries, the difficulty of creating HCI awareness and adopting usability may be due to the complexity of the government's bureaucracy systems. We suggest that stakeholders and policy makers such as the Malaysian Communications and Multimedia Commission (MCMC) and the Malaysian Administrative Modernization and Management Planning Unit (MAMPU) are more relevant in influencing and/or reinforcing the incorporation of HCI in the workplace and enhancing the usability of the products and software created in the organization at the managerial level.***

Keywords-HCI, practitioners, government, bureaucracy, Malaysia

I. INTRODUCTION

Information and Communication Technology (ICT) is one of the most important determinants of various industries' eventual success in Malaysia. According to the Malaysian Prime Minister, "ICT should be seen as not just an industry to be developed but also as an enabler for major economic sectors to increase productivity and efficiency" [7]. Efficiency means achieving a good fit among the users (who are the citizens), their tasks, and the technology within organizational, social and global contexts [23]. Max Weber noted that work, achievement, and striving for efficiency are important fundamental values. These values and putting them into practive, is key to the success of any society.

In particular, those who are involved in ICT development need to understand why and how people interact with computers in order to accomplish their work and personal goals [21]. Several issues that require attention include: what are the physical, cognitive, affective, and behavioral constraints on the user's side and what pleases or annoys them. It is important to know what makes human-computer interaction a satisfying experience or an experience that users do not want to repeat, and what makes the interaction efficient and effective [6]. This understanding lies in the foundation of Human Computer Interaction (HCI) practice. In order to do gain this understanding, academicians, practitioners, developers and corporations, policy maker in Malaysia need to have a good understanding of important factors that influence the success of HCI in practice.

HCI is a study of how humans interact with computers, with a focus on understanding how to make computers more useful and usable [21]. It is a discipline concerned with the design, implementation, and evaluation of interactive computing systems for human use. HCI has been around for about 40 years [9]. With such development, is it important to question: what is the current status of HCI in Malaysia? Have the human-computer interfaces been designed well enough to improve work, life and increase productivity? In other countries such as India, they are progressing to institutionalize HCI into their academic and business practices starting from the year 2000 [5]. In Korea, the beginning of HCI awareness is reflected by the first local HCI conference in 1992, which was affiliated to the ACM Local SIGCHI in Korea [15]. ACM is the Association for Computing Machinery, the oldest organization for professionals in computing.

Although indication on the local's perception and uptake of HCI practice and research can be achieved by looking at the number of HCI-project approved funds at the Ministry of Science level; this study attempt to focus on the current ICT practices. How well HCI is doing in Malaysia seems to be reflected in the awareness [1] of senior IT personnel of the term related to HCI and consider the number of ICT companies having a formal staff position in HCI. The aim of this study is to uncover what is the current status of awareness among practitioners regarding HCI in technology-based companies and agencies among different working sector and job level in Malaysia. This study could be among the first to investigate current HCI status as a beginning to comprehend HCI intend in the System Development Life Cycle (SDLC), thus promoting the utilization of HCI practices in the Malaysian ICT industry.

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II. RELATED WORK

Several Malaysian researchers attempted to address usability issues and have moved beyond usability [2][24][28] and focusing on emotional design [3][25]; however, the information of local HCI-related publications are scarce and scattered. Among the pioneer work on ergonomics and usability was done by Halimahtun Khalid at Damai Sciences [13]. The paper presented in the Fifth International Cyberspace Conference on Ergonomics was among the first which addressed issues on local HCI education [10]. The researchers sought to find HCI specialists in the Malaysian job market. Typing keywords "HCI in Malaysia" in Google returned no local centralized HCI research or HCI-related expertise in Malaysian companies. Therefore, in this research, three HCI-related job titles were asked to all participants which were "Usability Engineer", "HCI Expert" and "Interaction Designer". Although there are many other job titles related to HCI, these interview session was performed to uncover if these companies assigned the responsibility of HCI and usability projects to software engineers, software developers and software testers. According to participants' years of work, it was hypothesized that subjects should have at least have heard of HCI important terminologies such as usability, interaction design and ISO 9241 Part 11 (the guidelines which cover issues of usability).

III. THE STUDY

This research aimed at investigating what is the ICT personnel's awareness of HCI in the different sectors and working levels. Based on the participants' responses, the awareness of HCI can be subdivided into two categories i.e. have heard (1), have never heard of (2). Seven (7) questions were asked; these questions pertained to knowledge of terminologies used in the HCI field. The first three questions refered to HCI/usability-related professionals and job market in Malaysia. These participants were asked whether they have heard of Usability Engineers (1) or any other terms used which refer to the job responsibility, HCI Expert (2) or any other similar responsibility, and Interaction Designer (3) or any other similar job responsibility. Participants were then asked if they were familiar with the terminologies such as HCI (4), Usability (5), Interaction Design (6) and ISO 9241 part 11.

IV. RESEARCH METHODOLOGY

This research uses both quantitative and qualitative research methods. A combination of in-depth and semi-structured interview, questionnaires and observations was conducted to collect the data. Interviews with managers, information architects, designers/software developers was performed to investigate the actual issues and challenges at the working level. These participants were categorized as application developers. A survey was adopted to investigate the general understanding of the working sector in Table 1 about HCI awareness.

TABLE I. WORKING SECTORS SELECTED FOR THE STUDY

Working Sector	Department Name
Government	IT Department of Employee Proficient Fund (KWSP), IT Department Ministry of Defence Malaysia (MINDEF)
Government Link Companies	MARA, PETRONAS
Private	Forest Interactive Sdn. Bhd., Simer Sdn. Bhd.
Self-Employed	Marimuthu and Associates (IT-section of Insurance Company)

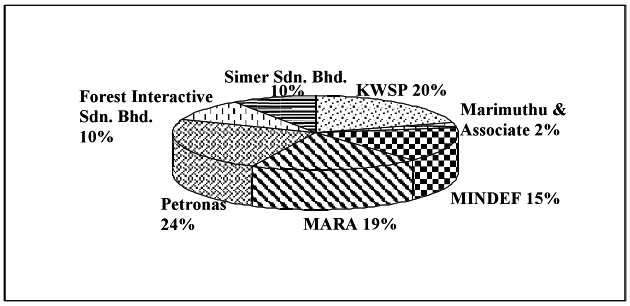


Figure 1. Pie Chart of Participants by Agencies

Fig. 1 shows the percentage of agencies that participated in the 12-week ethnography study. The majority of participants are from Petronas which is a government-link company.

V. RESULTS AND DISCUSSIONS

A. Profile of Participants

The study's participants were IT Managers, Information Architects, Senior Analysts, System Analysts, Project Managers, Assistant Managers, Graphic Designers, Application Developer and Programmer. The participants did not receive any compensation. They were willing to share their experience and concerns in interaction design which part of their daily work and practices.

TABLE II. PROFILE OF PARTICIPANTS

Characteristics	Item	Frequency	Percentage
Gender	Male	33	39.3
	Female	51	60.7
Age Group	20 – 29	26	31.0
	30 – 39	34	40.5
	Over 40	24	28.6
Education Level	Upper secondary education	1	1.2
	(MCE/SPM/GCE O level)	19	22.6
	Diploma/certificate/HSC/STPM	52	61.9
	Bachelor's degree	11	13.1
	Master's degree	1	1.2
	Others		
Working Sector	Government	30	35.7
	Government Link Companies	36	42.9
	Private	16	19.1
	Self-Employed	2	2.4
Job Level	Executive/top management	19	22.6
	Middle management	11	13.1
	Technical and operations/	28	33.3
	Professional	13	15.5
	Supervisory	13	15.5
	Administrative & Support		

Table II represents the participants' profile where 33 participants were male and 51 were female with percentage of 39.3 and 60.7 respectively. In terms of age group, 31.0% of the total participants were between the age of 20 – 29 and 40.5% in age group of 30 – 39 years old. The remaining 28.6% were in the 40 years and above group. The majority participants were in the middle age group between 30 – 39 years old and this alluded that most of the participants were generally experienced employees and can be considered skillful in their work.

In terms of education qualifications, most of the participants have got at least diploma, if not a degree or Master. Only one (1.2%) participant had upper secondary education and one (1.2%) participant held a postgraduate degree. This suggests that this group of participants is educated (who often use the computer and the internet. Majority of the participants are working with the government-link companies, that is 42.85% compared to those working in the government (35.7%), and in the private sector (19.1%) whereas 2.4% of them are self-employed.

The job level proportion was distributed quite evenly across the organizational hierarchy; 33.3% occupied technical and operations and/or Professional level, 22.6% occupied executive and/or top management, 15.5% occupied supervisory and administrative and/or support level. 11.1% of the participants were in the middle management level. Based on the predominant age group that is above 30 years of age, educational background and job level, it could be implied that the participants would be familiar with the organization's work culture and job opportunity process.

B. QUANTITATIVE DATA

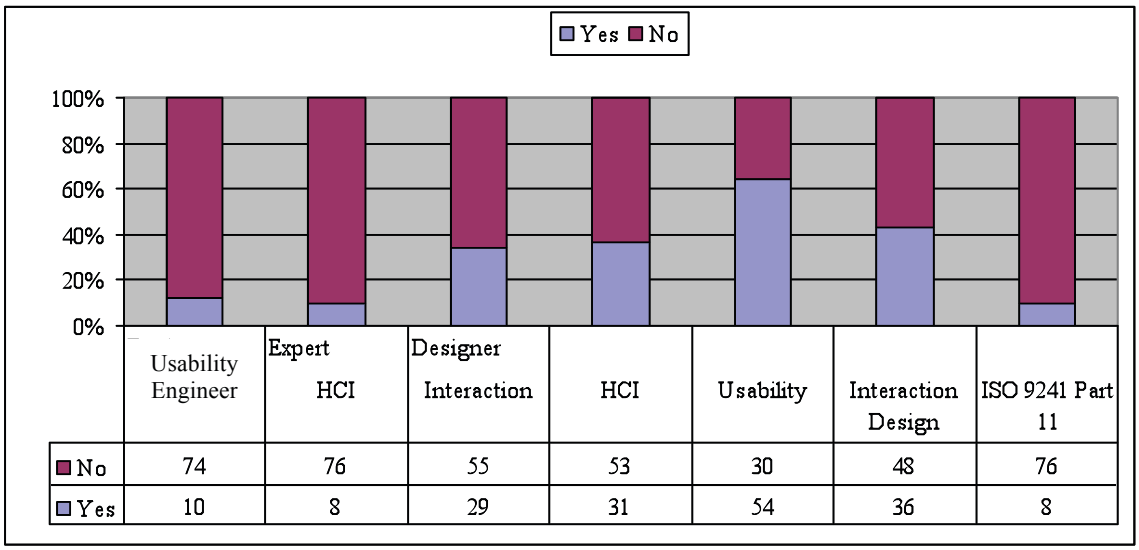
A total of 84 participants (N=84) participated in an in-depth interview, a semi-structured interview and filled-in questionnaire, or were observed during their working hours. Participants were asked to respond to seven (7) statements dealing with their awareness of HCI terminologies and formal HCI positions in the company. HCI awareness were represented by a categorical score of yes (have heard) or no (have never heard). For the job responsibilities, majority of the participants have never heard of Usability Engineer (88.1%) and HCI Expert (90.5%) in the company and the job market.

Those who claimed to have heard (11.9% and 9.5%) of these terms were the participants who were involved in either the research division, training division or came across them from computer magazines. Most participants assumed that the same job responsibility was held by the system analysts. About 65.5% of the participants have never heard of the "Interaction Designer" position in Malaysia. Participants (34.5%) who have heard of "Interaction Designer" mentioned that such job name was related to mobile content or mobile developers. A high percentage (63.1%) of participants have never heard of the term HCI itself.

Those who have heard of HCI (36.9%) claimed to have studied the subject during in college or university. They agreed of the importance of HCI, but current industrial practices fully implement SDLC with little or no HCI emphasis. On the other hand, 64.3% of the participants have heard of usability. However, 90.5% of the participants never heard about usability standards of user interface called ISO 9241 Part 11.

Upon further questioning, the remaining 9.5% participants who claimed to have heard of ISO 9241 Part 11 were those who misunderstood the term with the other ISO certification or standards in Malaysia such as ISO 9000. However, the percentage (57.1%) of participants who have heard of Interaction Design being practiced in Malaysia is slightly higher than those who have never heard of the term (42.9%). This finding may due to the tremendous increase of mobile use, gaming gadgets and entertainments appliances, which require human interaction in its use.

TABLE III THE FOLLOWING TABLE SHOWS THE FREQUENCY DISTRIBUTION OF PARTICIPANTS' AWARENESS TOWARDS HCI.



	Usability Engineer	Expert HCI	Designer Interaction	HCI	Usability	Interaction Design	ISO 9241 Part 11
No	74	76	55	53	30	48	76
Yes	10	8	29	31	54	36	8

C. QUALITATIVE DATA

Information gathered from interviews with the senior analyst claimed that:

> …[the] initiative for usable design seems to be the sole responsibility of the system analyst…you know, sometimes the programmer or graphics designer do not even care about the usefulness of each design. They rather focus on functionality – making sure it works as what it should. May be they are still lack of formal training on things that we called beyond functionality..erm..what was the term you said before? [Laughing]

He further added:

> ..if the boss provide financial support, we would go for HCI training… otherwise no thanks..*susah lah nak belajar... tak de masa banyak* deadline![translation: very difficult to learn by ourselves. We have so many deadlinesto meet!!]

Another interview with application developers whose job responsibilities was to gather user requirements stated:

> Requirements gathering is very hard. If you meet people who have no IT background, you will have a very difficult time arguing about their request which are absurd. Hence, delay our schedule. That's why we need marketing people to do the talking.

The majority of the interviewees were aware that the most critical issues in ICT projects concerned with the budget and cost. Project deployment will indirectly have impact towards overall budget and schedule. Twelve (12) interviewees commented that the lack of skills among systems developers is a major problem. Skills refers to programming skills, designing and human skills. One of the solutions to overcome this lack of skills is outsourcing [22]. Several system analysts noted that outsourcing may help in the programming but not aware of the need to outsource usability testing and user interface and interface design.

Most companies prefer to implement the SDLC because they believe that programmer can focus on developing the required function whilst system analysts design the system. In some organizations, marketing people will deal with products' selling and delivering to end-users. One programmer commenting:

> I prefer to sit in-front of the machine rather than meeting the user. I have so many deadlines and no time to deal with humans. Humans are complicated. When you met different people, they will request different things on the same item.

User requirements is another major problem to most of the participants. Eighteen participants agreed that users creates problems by making too many requests [12], keep changing the design and sending the wrong person for information gathering processes. The bureaucracy [17] in some agencies towards getting the firm requirements also becomes one of the major factors that lead to project delays. Therefore, user studies and task analysis were not conducted in many system developments. In addition to that, user evaluation was left out due to a lack of budget, time and enforcement.

When asked about initiatives should be taken towards human-centered design, most participants indicated that political factor is one of the most important issue to be taken into consideration [1][4]. Most participants commented that the government could be the most influential factor to promote the human-centered practices. Then related government agencies will become the transformation agents. For example, Malaysian Communication and Multimedia Commission (MCMC) and Malaysian Administrative Management Planning Unit (MAMPU) among the agencies that could influence other companies to consider the incorporation of HCI practices. .

Appropriate political strategies such as the ability to establish and maintain good relationships with influential people (decision makers in the upper management level) can ease the negotiation of acceptable solutions to ICT project problems [18]. It was important to many participants, if the organization incorporates HCI and usability; participants will find ways to improve their skills on HCI. The comments obtained from the participants' in-depth interview suggest that people who work in similar environments such as government-link agencies have similar difficulties in dealing with design solution and issues surrounding them.

Through observations, the availability of resources is one of the main factors that can contribute to the transformation of the personnel. Apart from costs, skills, and technological availabilities have become the main concern. It appears in the study that these agencies shared some common informal regulations or the unspoken rules such as to obey what the boss say. Some organizations value certain thing differently than other organizations [11]. For example some practitioners value experience with the systems rather than functionality and/or vise versa. Thus, researchers need to identify certain clusters for example whether the practitioners are dealing with government agencies or private companies in the design tasks. This is due to the fact that a group of workers tend to have similar perceptions towards working practice within the same working environment. According to sociologists, there are three basic issues that make various social groups different from others. The issues are: (1) the extent to which people are independent of or dependent on a groups; (2) their views on prosperity and profit, and finally (3) their views on whether it is appropriate to exploit, fit in, or submit to the outside world [17].

VI. CONCLUSIONS

From the study, we can conclude that there is no indication that ICT companies in Malaysia have incorporated HCI tools/techniques/processes in their ICT project development phase. Thus, we recommend that the government (e.g. MAMPU), commissions (such as MCMC) influence managers to incorporate HCI in the current ICT project development and enhance the usability of the products and software created in the organization. The introduction of HCI into Malaysian society was welcomed by the participants, they expected a plan that would convince management and decision makers in the introduction of HCI-related techniques into the software development process. Researchers have pointed out to the user studies as one of the main factors influencing ICT adoption [4][8][27]. Findings from the current study support that evaluation with real users needs to be done before a product, software and/or computer-related application is being released to the end users [6][12]. Ideally of course, that the real users are involved in the design at the very beginning.

The research findings also reveal that even though each stakeholder group has its own incentives, some of driving forces to incorporate HCI techniques in the development process are common for all or more than one group of stakeholders. The dominant driving force for all key ICT project stakeholders is educating those involved in the decision-making and development phase [17]. Political will, especially in the upper management is particularly important in the transformational process. The importance of convincing the higher ups is of greater significance especially in Malaysia where Malaysia is ranked as the country with the highest power distance. Power distance is the extent to which the members of a society accept that power in institutions and organizations is distributed unequally [20] [27]. Thus, the employees are more likely than not to listen to their employers. A key success factor here is to get the "buyin" from the upper management, and the employees will generally follow suit [16][17]. Social, organizational and cultural diversity are serious issues in implementing human-centered for practices [17][18]. Therefore, the role of HCI professional or specialist and decision makers should be distinct due to their interaction with other stakeholders' groups in the transformation process [1].

More research should be designed to discover whether reinforcement would be more beneficial than simply providing IT-related government agencies and/or companies with a practical and comprehensive HCI theories and methods. In some cases, the application of ergonomics standards which can be found in the field of HCI is enforced by law [19] for example the European Union (EU) published the directive 90/270/EWG concerning the minimum safety and health requirements for Visual Display Terminals (VDT) workers (EEC 1990). In order to create awareness of the importance of HCI, the national government should create or accelerate to a number of major strategies towards HCI awareness:

- Public awareness and education of the importance of HCI
- Cyber law enforcement – digital certificate on usability tested websites or digital applications
- Research & Development and Human-Centered Technology Innovations - encourage studies and public awareness activities regarding design, with the aim of achieving a better understanding of poorly designed things and the dangers they present, and thus being able to reduce the severity of accidents and human errors.

Based on the findings, we would propose that the future research should be focused on:

- Where do industries find qualified HCI practitioners? [10]
- The study of the role of decision maker in ICT project development [14]
- Exploration of how HCI can reform traditional SDLC within the contexts of bureaucracy system

We conclude that Malaysian ICT practitioners have a great reverence to the decision makers of any ICT project [26]. This is due to the essence of non-Western values that is respect of tradition, reverence to authority, and overall stability [20]. Hence, it can be considered that reinforcements by the national law would be more beneficial than simply educating designers/stakeholders with HCI theories, models, principles and standard for user interface design development. Though the result on this case was not a conclusive study, the exercise expressed reactions to the national and government enforcement towards the awareness of HCI practices in Malaysia.

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