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DESIGNING E-COMMERCE SITES ACROSS CULTURAL BARRIERS: AN ELICITATION FOR INTERNET EGYPTIAN USERS

Ghada R. El-Said *Grefaat@aedegypt.org*
Kate S. Hone *Kate.Hone@brunel.ac.uk*
Department of Information System and Computing, Brunel University, Uxbridge, Middlesex UB8 3PH, UK

Abstract: Information security is now accepted as a major requirement to ensure consumers' trust on every E-Commerce and any other networked systems. Some people reduce the trust problem to one of security, suggesting that, if security issues are resolved, people will be happy to transact online. However, when the trust problem is broken down into its constituents, other factors are exposed to be as important to consumers as information security.

This paper employs a qualitative data elicitation technique to investigate factors that are affecting consumers' trust in the Egyptian context. It is concerned with identifying the attributes of E-Commerce web sites that most affect trust across culture. The paper is providing the basis for investigation of the effect of culture on trust and willingness to buy on line.

A card sorting technique was used with a sample of fifteen Egyptian computer users to elicit information about how E-Commerce sites are perceived within the Egyptian culture. In the first sorting task participants were given pictures of E-commerce home pages and asked to repeatedly sort these, generating their own sort categories as they did so. This was intended to provide an insight into which features of web sites are most salient to this group of users. The results indicated that the most salient features (indicated by frequency of use of the category) were language used on the web site and ways of searching for products. In a second (unexpected) sort, conducted a month later, the same participants were asked to perform a forced sort of the same materials according to the category: willing to buy from/not willing to buy from. This sort indicated that for the majority of participants, store

reputation and familiarity with the site can be the deciding factors in whether to buy from an E-Commerce site. A questionnaire was distributed with the sorting session to collect data around preference of shopping on line. The questionnaire highlighted the preferences of Egyptian users to shop from international on line store with English interface, confirming previous studies suggesting the extensive use of English on line for this group of Internet users. The implications of the results of this study and the relation between the elicited data and the international variables suggested by Hofstede (Hofstede, 1991) which characterize the Egyptian culture were discussed. The paper also discusses the role and applicability of the card sorting method within this cultural context. The paper makes a contribution to universal access by considering the attitudes and needs of users from the Arabic-speaking world.

Keywords: Cultural usability, Sorting techniques, Trust, Preferences elicitation.

1 INTRODUCTION

The proliferation of communication during the past few years has offered great opportunities to industry for globalization of their products and services via the World Wide Web. However, it also raises a number of questions about customers' trust. Numerous studies have singled out consumers' lack of trust as a major factor when examining barriers to the adoption of e-commerce, on one hand, security has been perceived to be a significant barrier to the emergence of a consumer mass market on the Internet (Kalakota and Whinston, 1996). However, on the other hand, what has been observed in user tests of E-commerce web sites is that the issue of transaction security is a short-term technological problem, and that the assessment of security typically happens very late in the trustworthiness evaluation process – namely, just before placing the order. Other factors, beside information security, are therefore suggested to have an effect on consumers' trust (Peterson, Balasubramanian and Bronnenberg, 1997; Egger and Abrazhevich, 2001; Jarvenpaa, Tractinsky and Vitale, 2000). This paper is aiming to investigate these factors by employing a qualitative technique for data elicitation.

The fact that the World Wide Web is connecting an ever growing population from all over the globe raises also a number of questions about cross-cultural usability. Designers need to consider whether interfaces designed in, and for, one culture (often the US), will work for other cultural groups. A number of researchers have therefore started to look at cultural issues in interface design. (Duncker, 2000; Day, 2000). Other researchers focused on the culture effect on consumers' on-line trust (Jarvenpaa and Tractinsky, 2000). While most of these researches looked at non-western versus western cultures; they rarely considered the Arabic-Speaker's culture. Alternatively, the number of Arab Internet users is expected to grow to some 15 million by the end of 2003. (Dabbagh Information Technology Group, 2000). The Internet was first introduced to Egypt in 1992. The Egyptian government is placing great emphasis on information and communication technologies, and Egypt is said to have one of the fastest growing ICT markets in the world. Initiatives to expand Internet access and use abound in the educational system, the business community, and the non-profit sector (Warschauer, El Said and Zohry, 2002). Yet, little is known about the attitude and perception of this culture toward Internet usage. This research investigates the way that Egyptian users perceive E-Commerce web sites. It aims to identify the most salient factors that affect the on-line purchase decision for this cultural group.

Having identified Arab culture as one for which on-line trust has not been extensively investigated, the following general research questions are proposed:

Q1: Which are the key interface features of an Internet store that affect the attitude of the Egyptian consumers toward that store?

Q2: Which are the key perceived factors of an Internet store that affect the Egyptian consumer buying behavior?

On the other hand, there has been a growing body of literature, which suggests methods for cultural data collection (Hofstede, 1991; Hoft, 1996). Yet, the validity of instruments used in cross-cultural and intra-cultural research still has its own share of challenges. (Tan and Hunter, 2001; Hurd, 2001). Further more, it was claimed that some of the well-known user evaluation methods are less applicable than others are for a culturally diverse user base. In cultural research, the use of qualitative techniques such as ethnography, focus group, card sorting, and the repertory grid is emerging as a tool for collecting wealthy amount of data. This paper investigates the use of qualitative techniques such as card sorting, as the primary method for elicitation of cultural-based perception of quality and design aspects in web pages.

The following section of this paper gives an overview about sorting techniques, and how they are implied in the current research. Section three of this research demonstrates the research's methodology and the research administration process, followed by data analysis in section four. Results discussion and conclusion are given in section five, section six evaluates the use of sorting technique. Difficulties found in the current research are given in section seven, while research limitations are cited in section eight.

2 USE OF SORTING TECHNIQUES

2.1 Personal Construct Psychology Theory

An in-depth investigation for culturally sensitive design elements used in E-Commerce interfaces, is emerging. Here, the use of the Personal Construct Psychology Theory (PCT) (Kelly, 1970) would be preferable. PCT is a theory of individual and group psychological and social practice that has been used widely in knowledge acquisition research to model the cognitive processes of human. PCT characterize human conceptual structures in obvious terms that could be translated directly to computational form. This theory would be suitable for this context and objective of this stage of research, as it emphasizes the use of human experts as the primary sources of information, and investigates the relationship between the psychology of the user –the performer- and the ontology of the system – the computational emulator- (Gaines and Shaw, 1993). Sorting techniques are considered as main knowledge elicitation tools based on Kelly's PCT. These tools facilitate the development of user's psychological model, through representations of data in a conceptual structure, easy to be developed later in an operational model for systems. Kelly's fundamental postulate was that:

"A person's processes are psychologically channelized by the way in which he anticipates events".

"A person anticipates events by construing their replications".

This postulate states that human's nature is defined by the way in which we interpret the world. Furthermore, it states that man makes sense of the world by categorizing and proposing theories, which may subsequently require revision. Based on these postulates, PCT provides tool that could bridge between human cognitive processes and computational knowledge representation.

2.2 Applicability of Sorting Techniques in Cultural Research

Sorting techniques are suggested to be the primary method chosen for elicitation of perceptions of quality and design aspects in web pages (Maiden and Rugg, 1996). Additionally, they are chosen to elicit cross-cultural perception of web pages quality, and more recently have been used successfully in eliciting perceptions of aspects of design in web pages (Hurd, 2001). As categories used by people represent an important part of their knowledge, sorting techniques became valuable in knowledge acquisition and requirements acquisition (Rugg and Mcgeorge, 1997). The sorting techniques are based one of Kelly's PCT corollary:

"To the extent that one person employs a construction of experience which is similar to that employed by another; their processes are psychologically similar to those of the other person". This corollary assumes that people make sense of the world by categorizing it, and that .It also refers to the similarities between individuals in the way they understand things and actions. The relevance to the sort method is that it aims to elicit such similarities of interpretation. It also has propositions for interpretation of cultural manners in that member of a cultural group may share similarities of construction. (Hurd, 2001).

2.3 Selection of Sorting Technique

The basic idea behind the sorting techniques is simply to ask participants to sort things into groups. The things may be Objects, or Pictures, or Cards.

Table 2.1: Types of Sorting Techniques

.	Objects Sort	Pictures Sort	Cards Sort
Description	sorting could be for different types of materials or goods such as screen or keyboards	sorting could be for screen shots from various main pages of web sites	Sorting could be for names of objects written on different cards
Advantaged	Participants use all their senses to investigate the object	Limited irrelevant object's feature, unconnected with research interest, could be trimmed	Card contains only relevant information about the object, which are needed to be examined
Challenges	Irrelevant object's feature, unconnected with research interest, could be distracted	Picture can not show all object's characteristics such as weight, but could be guessed	It requires participants to know about the objects from their names on the cards

In the current experiment, card sorting would not be practical as participants would probably not know enough information about a web site from its name. Object sorts would be impractical as well, on ground of resources and time, as participants would be asked to work with web sites on line, which requires for computer and Internet connection availability, and would not provide flexibility for session location choice. This left picture sorts are the best choice.

There are several varieties of sorting techniques, each has its pros and cons and context within which it is advisable to be applied in. Some of these sorting techniques could be cited as following:

Q Sorts: usually involve large number of cards. Participants are asked to fit cards under a scale, which is pre-defined criterion by the researchers, to fit cards under scale ranging from "strongly agree" to "strongly disagree", for example.

Hierarchical Sorts: usually involve cards representing entities from same semantic level. Participants are asked to sort cards according to descriptions of this level, to categorize animals' cards according to families, for example.

"All in One" Sorts: Participants are asked to sort entities into a matrix using one attribute for each axis of the matrix and a second attribute for the second matrix, to categorize cards holding names of illnesses according to seriousness and rarity, for example.

"Repeated Single Criterion" Sorts: In all the previously, individual attributes are not elicited systematically. Repeated single criterion sorts are flexible and easy to handle, it is used to find out which symptoms of a phenomenon are considered by user to be significant. Therefore, it is best used as an exploratory technique as part of the piloting work when deciding on the main technique (Rugg and Mcgeorge, 1997).

In the single criterion sorting technique, the participant sort cards carrying pictures into categories according to a criterion generated by the participant, and when each sort is completed, the participant announces the criterion. This approach permit to collect data around the nature and commonality of constructs generated, as well as highlights similarities in perception between participants. Therefore, this method could be used to investigate cultural differences in user perceptions.

3 METHOD

3.1 Sorting Session Design

In this study, two sorting tasks were conducted. The first sorting task concerned single criterion picture sorting, in which participants were requested to sort cards of screen shots of selected sites. In each sort, participants were asked to consider a single criterion in order to assess the cards and then place them in groups based on that criterion. Participants were asked to repeatedly sort the cards according to criteria that they produced, till they reach dry point. Participants' comments concerning evaluation of web site or the criterion used were noted.

A forced criterion picture sorting was conducted in the second sorting session. Same participants were asked to sort same materials according to the stated criterion: "Willing to buy from this site/ Not willing to buy from this site". The purpose of this follow up was to examine whether any of the interface features identified during the first card sorting study could be related to intention to buy.

Before the two sorting sessions, all participants filled a demographic questionnaire to gather data around their Internet experiences in general, and their perception and preferences for using E-commerce.

3.2 User Group

Fifteen young Egyptian professional Internet users volunteered in the study. The category of "young professionals" was chosen because it

represents the first generation of Internet users in Egypt (Warschauer et al, 2002).

"Young professionals" were defined for the purpose of the study as people between the ages of 24 and 36 years old, engaged in introductory or middle level professional and management positions. Gender was meant to be equally distributed, but with an odd number of participants, females represented 40% of the participants (6 out of 15) and males represented the 60% (9 out of 15). All participants have minimum university degree with minority (27%) having master degree. Areas of study ranged broadly and included engineering, economics, computer science, and medicine. IT Background was, some how, equally distributed having 47% of IT background including computer engineers, information technology specialists, system engineers, and managers. The other 53% were non –IT working for a variety of business and research industries and included an environmental researcher, librarians, statisticians, and doctors. They all have at least an intermediate level of English with the majority (80%) having an advanced level of English, as self-evaluated.

All participants had Internet years of experience varies from 3 to 10 years with the majority are early adopters of the Internet in Egypt, using the net for more than 10 years. 60% considered them selves as Internet expert users, while 40% as Intermediate. They are all Internet users, their use for the net ranges from 3 to 60 hours per week, with the majority working between 15 and 21 hours per week. 93% of participants use the Internet during working days and weekend. The biggest majority is connected to the Internet from home and work, while the longest period the majority stays on line is from work. The young professionals in this study were selected through personal contacts.

Table 3.1: Sample Characteristics

	%		%
Gender		English Level	
Male	60	Intermediate	20
Female	40	Advanced	80
Age Range		Internet Usage	
23-29	50	<3 Years	0
30-36	50	3-6 Years	30
		6-9 Years	37
		10 Years	33
Education		Internet Expertise	
University Graduate	73	Novice	0
Master Degree	27	Intermediate	40
		Expert	60
Education		Internet Connectivity	
IT Background	47	From Work Only	7
Non-IT Background	53	From Home only	0
		From Home and Work	93

3.3 Selection of Web Sites

In sorting technique, it is recommended to select entities from same level in hierarchy, comparing main pages of web sites for example. The higher up the hierarchy, site's main page, the more general the categories will be. The lower down the hierarchy, the more detailed the categories will be (Rugg and Mcgeorge, 1997).

In the current research, as more general data is acquired, higher level entities are considered, by including main (home) pages of Book Buying E-commerce sites. The sites were mainly selected randomly, within a large selection of sites, eleven are recommended to be allocated to this pilot experiment as they cover the following points:

Eleven sites were selected representing E-Commerce sites for selling books over the Internet. Books are the items which is mostly purchased by Arabs using B2C sites, representing 22% of what this population spent on the web in a year (ranging from 50 to 4000$) (Dabbagh Information Technology Group, 1998). The selected sites represent, local (Egyptian), Arabic, and international companies.

The selected sites included Arabic language, English Language, and a mix of the two languages sites. As big majority of Egyptians prefer to deal with the Internet in English language (El Said and Hone, 2001; Warschauer et al, 2002; Warschauer, El Said and Zohry, 2003). Following is the list of the proposed sites.

Card #1 http://www.e-kotob.com/

Card #2 http://www.amazon.com/

Card #3 http://www.barnesandnoble.com/

Card #4 http://www.borders.com/

Card #5 http://alkitab.com/originalsite/

Card #6 http://www.neelwafurat.com/

Card #7 http://www.almaktabah.com/BrowseSubjects.asp

Card #8 http://www.arabooks.net/

Card #9 http://www.boustanys.com/

Card #10 http://www.arabicworld.com/books.htm

Card #11 http://www.al-basheer.com/arabicBooks.asp

The decision was taken that the image representing each web site will be a screen capture of what the user would see when first opening the site without starting any scrolling. Although printing the first page of each site was an option, lay outing all site's features, but it was decided to use only the screen shot of the first page to provide more control to the interface elements of sites such as size and scrolling methods, which would not be adequately recreated on a paper print out.

3.4 Experiment Preparation

3.4.1. Pictures Preparation

Web Sites are located using Internet Explorer 6.0.; Main pages are all taken using screen capture features, pasted to PhotoShop painting tool, and cropped to be of same size, clarity and glossiness. Pictures are then printed on A4 white papers, using the same high quality DeskJet 950C HP, colored printer. Pictures are numbered for facilitating results recording; Numbers are clearly written on the right bottom of each picture. Printed pictures are then covers with hard plastic covers.

3.4.2. Location Preparation

A large empty desk was needed, for the participant, to be able to look at and work with all Web site pictures. Being busy professionals, most of the participants favored that the experimenter visits them at their work place and conduct the experiment during lunch hours, while providing a large meeting table in their work place meeting rooms. During the first four sessions,

participants were from same work place, accordingly the experiment use to take place in the participant work place meeting room. The thing which proved to be inadequate, especially in the case of participant four, since few participants find difficulties to detach themselves from their work responsibilities during the session, as they were located at their work place. In the nine sessions, the experiment take place in the experimenter's work place meeting room, providing the same large empty meeting table, and participants showed more concentration.

3.4.3. Instrument Preparation

An introductory session is designed to be conducted to all participants to train them on single criterion picture sorting technique. Examples used in the training sessions are from a completely different domain and they represent different types of cars. In the introductory session, instructions are written to be standards and clear. The instruction should include what the respondents could do, like the possibilities of using categories such as 'others" or "I do not know". And encourage them to look at all the pictures at the start before doing any sorting, to be aware of the range of categories they may use. A large clear desk is used in the experiment to enable participants to spread pictures in large.

As participants often change their mind during the categorization, it is recommended to ask them to cite the criterion based on which they sort pictures after and not before ending the sorting. It is highly recommended not to comment on the participants' categorization, to be able to find out their preferences. The only question which the experimenter could ask is to clarify what categories involved, to make sure that a single criterion was used in sorting. If the will be left over of pictures, participants could be reminded that a "don't know" or "not Applicable" category could be used. If after a while, participants reach the drying-up point, running out of ideas for criteria, it worth to record the point at which this happens, since it may reflects a change from explicit knowledge to semi-tacit or tacit knowledge of some sort. At that point, experimenter could try dyadic elicitation, which is to select two picture sin random and ask the participant to cite differences between them. Or Triadic elicitation, which involve selecting three pictures in random and ask the participant what two of the pictures includes and the third one doesn't (Rugg and Mcgeorge, 1997).

3.4.4. Experiment Piloting

The session was first pilot tested among one participant who was not in the final experiment, and then finalized and conducted for fifteen

participants. The participant grasped the idea of sorting techniques easily and quickly, and commented that the introductory session was important for him to be familiar with the sorting technique.

The participant commented that the picture presented to him doesn't layout all the features of the site that he can see when scrolling, like things located at the bottom of the first page of the site like contact and the affiliation of the site. He also commented that the card given to him doesn't allow him to use options given when mouse move on certain links of the site, the thing which will be only allowed while working on line. As previously mentioned, the decision was taken to include only screen shots of what the user would see when first looking at the web site, to provide more control and focus on design element of the web sites.

3.5 Study Administration Processes

3.5.1. The Questionnaire

A written questionnaire was developed that inquired about how Egyptian users perceive and use of the Internet and general and E-Commerce sites in specific, including investigation for preferences of shopping on line.

The questionnaire was originally developed in English language, translated into arabic language, and back translated into English. Both versions (arabic and English) were provided to participants to select from.

The survey included six questions about personal information (e.g., what is your profession?), seven general questions about Internet access and use (e.g., how long have you been using the Internet), seven questions about shopping online (e.g., do you have any objection(s) to use the Internet as means for shopping?), and seven questions about preferences of E-Commerce sites (e.g., what is the language(s) used in the site(s) you usually buy from?).

The survey was designed in English language and was first pilot tested among a small group of people who were not in the final survey, and then finalized and given to participants to fill after the sorting sessions.

3.5.2. Session Administrative Procedures

First, the author conducted the introduction and instructions in Arabic language, while participants were asked to use English language when specifying criteria and categories, which were recorded (verbatim) as cited by participants.

Introductory sessions were conducted with participants to train them on the picture sorting technique. Examples used in the training sessions were from a different domain, instructions were written to be standard and clear. The researcher emphasized that the participant can choose any criteria and any groups (including "don't know", "not sure" and "not applicable"). Participants were encouraged to use only one criterion in each sort and not two or more in together.

If participants reached a drying-up point, running out of ideas for criteria, the researcher tried Triadic elicitation, which is to select three picture in random and ask the participant what two of the pictures includes and the third one doesn't (Rugg and Mcgeorge, 1997).

The session was first pilot tested with one participant who was not in the final experiment, and then finalized and conducted for fifteen participants. The sorting session included the following six steps:

Step1: Introduction

The researcher gave an introductory letter to participant, including session objectives and steps, and answering any question concerning the purpose and the procedures of the session. Both Arabic and English versions of the letter were provided to participants.

Step2: Card Sorting Training

The researcher familiarized the participant with the card sorting technique, by using learning by example method with 10 pictures for different cars.

The researcher emphasized that the participant can choose any criteria and any groups (including "don't know", "not sure" and "not applicable"). The researcher highlighted that the main thing is to use only one criterion in each sort and not two or more in together.

The participant repeated the sorting until feeling comfortable with the technique. After that, the researcher started the experiment with the main set of E-commerce sites cards.

Step3: Card Sorting Session

The researcher showed to the participant the eleven colored high-quality printed cards for Book Buying E-commerce sites, previously selected for the session.

Each has a screen-shot of the opening or main page of the site – that means that it shows exactly what a user will see on the computer screen when

allocating a book to buy from the web-site. Fifteen participants contributed in the first sorting session.

The researcher showed the site cards to the participant asking to have the time to look at each of them. The researcher reminded the participant to think of a criterion as practiced in the training session and sort the cards into groups. When satisfied with the sort, the participant should tell the researcher the criterion and the categories. And to repeat the sorting process until feeling that all criteria one can think of were covered.

Step 4: Forced Sort Session:

As a follow-up to the first sorting session, a second sort session was conducted a month later. The intention of this follow up was to investigate whether any of the interface features identified during the first card sorting study could be related to intention to buy. Same participants were asked to perform a forced sort of the same materials according to the category: willing to buy from/not willing to buy from. Thirteen participants from those who attended the first sorting session, contributed in the second session. Having participated in a previous sorting session, no training was given this time. The researcher simply asked the participants to sort the eleven, same sites used in the previous sorting session, according to the criteria of "Willing to by from".

Step 5: Completing the Questionnaire

After the card sorting, the researcher gave either the Arabic or the English (as preferred by the participant) version of the questionnaire to the participant to fill, and return to the researcher.

Step 6: Session Recording:

Session could be paper, tape or video recorded, in the current research, paper-based recording is used to limit the time of transcription of data from tapes or videos. The following data are recorded during each session:

Respondent Name, Date of session, location.

Sort Number, Criterion used.

Category Names.

Code numbers of pictures in each category.

Drying-up point.

Any comment cited by participant during the session.

It is recommended to count the numbers of pictures in all categories and compare it wit the total number of pictures used in the session to make sure that no picture is missing.

4 RESULTS AND DISCUSSION

The type of analysis is dependent on the purpose of the sessions. As the main objective of this experiment, is to investigate elements in the interface design of web sites, which are of importance for Internet Egyptian users; therefore, type of grouping criteria, commonality and distribution of these criteria are the main points of data analysis.

4.1 Single Criterion Sorting Analysis

4.1.1 Criteria Count

The number of criteria used by participant in sorting session is informative about the amount of categorization knowledge elicited. If participants use large numbers of criteria, then there is considerable knowledge involved, for the participants' population (Rugg and Mcgeorge, 1997).

In the reported study, a total of 87 criteria were identified across the 15 participants. On the average, the participants used 6 criteria per session. Compared with other sorting elicitation experiments (Hurd, 2001) number of criteria used in the current experiment are relatively high, and suggest large number of information to be collected. When considering the participant's background and professionalism as a factor, it is considerably noticed that the participants with IT background engaged more criteria in their session, compared with participants with No- IT background. The thing, which might suggests that they simply know much and are more familiar and interested when working with web sites.

In some sessions, 8 out of 15, participants went to dry points, and the experimenter had to use triadic elicitation to assist participants in criteria generation. In general, most of the dry points happened after criteria number 3. No distinction was made here between IT and Non-IT Specialists. According to(Rugg and Mcgeorge, 1997), Dry Point implies some systematic change which may reflect the participants' tapping in to tacit knowledge. There for an analysis was done to look at criteria which were mentioned before and after drying up points, when looking at criteria communality.

4.1.2 Criteria Types

Criteria used by participants are divided into Observable/ Objective criteria, such as colors, languages and searching techniques in the site, and *Unobservable/Subjective* such as site good repetition, ease of use and site preference (Rugg and Mcgeorge, 1997).

In the reported study, the majority (59 out of 87 criteria, representing 68%) of criteria used by participants, were observable/objective; while fewer criteria (28 out of 87 criteria, representing 32%) mentioned were unobservable/subjective criteria. In general, the dominance of observable/objective criteria makes it easier for the researchers in data analysis. As it demonstrates that there is only one layer of knowledge needed to be investigated. While dominance of Unobservable/Subjective criteria needs further investigation on what makes such opinion for the participant on the first place (for example, what makes the participant consider a site user friendly. No significant difference could be noticed between the uses of IT Vs. Non-IT Specialists in using either type of criteria.

4.1.3 Categories Count

In the reported study, a total of 203 categories were identified across the 15 participants. On the average, the number of categories ranged from two to five per criterion, of average of 14 categories per participant.

In general, the majority of participant included only 2 categories in each criterion used. The frequency of using two categories per criterion within participants is dominant with a percentage of 74% while using three and four categories per criterion is used around participants with a percentage of 21% and 5% respectively. Accordingly, a tendency to sort sites into fewer categories is observed. In Addition, tendency to discrete sorting is observed (such as “Exit”, “Do not exist” for “Existence of command buttons” criterion). Very rarely, scalar sort is observed (such as “Excellent”, “Good”, “Bad”, “Very Bad” for “Interface Ranking criterion).

“Easy”, “Hard” categories for “Products are Easy to Buy” and “Yes”, “No” categories for friendliness and easiness criteria, suggest further investigation on what makes a site user friendly for targeted participant. In order to collect such data, the questionnaire filled by the participant at the end of the sorting session illustrated this point in more details as demonstrated in section 4.3.

The existence of Rag Bag categories is informal (Rugg and Mcgeorge, 1997), categories such as “not sure”, “don’t know” present how much

uncertainty there is in the sample. In the current experiment, the frequency of "not sure" category was 5. While the category "not clear" category appeared once. Therefore, we might find the frequency of Rag Bag categories relatively low (6 times within 203 categories), which suggests uncertainty of participant was relatively low. On the other hand the categories of the type "not applicable" appeared only 4 times in the experiments, which might suggest the absence of another layer of knowledge to be elicited (Rugg and Mcgeorge, 1997).

4.1.4 Criteria Commonality

Commonality of criteria is the main source for knowledge elicitation in the current experiment. High commonality in the sort results means that criteria with high commonality could be suggested to be the most salient interface elements for targeted group of participants, when evaluating a site. Some criteria appear to be the same (for example "Site Language", as generated by different participants).

Four verbatim criteria were generated by more than one participant and are shown in table3. It is noticed that site nationality criterion is only mentioned by Non-IT Specialists, while ways to find books criterion is only mentioned by IT Specialist. Most of participants who use ease of use criterion were Non-IT specialists, while site language criterion was equally distributed.

Table 4.1: Frequency of Verbatim Criteria

Criteria	Frequency by Participants with Non-IT Background	Frequency by Participants with IT Background	Total Frequency
Site Language	3	3	6
Ways to find Books	0	2	2
Site Nationality	2	0	2
Site Easy To Use	2	1	3

Other criteria do not appear typically the same like in table3, but they share similarities (for example "Language with which site is designed", "Language Used ", and "Interface Language"), all these could be safely grouped with confident under one criteria which is "Site Language".

In a deeper analysis, to avoid bias, it is recommended to ask an *Independent Judge* to carefully group criteria of same meaning into one same main category (Hurd, 2001). In this study, the judge, a fully qualified and experienced Egyptian English Language teacher, was selected on the basis of familiarity with web sites and was given the instructions to complete the task of criteria grouping. After grouping all criteria used by participants under main criteria, the independent judge reduced the total number of criteria to ten main criteria, which are as following:

- Site Language.
- Ways to Find Products.
- Type of Products.
- Content of Information Displayed.
- Familiarity with the Site.
- Ease of Use.
- Site Interface.
- Site Colors.
- Site Preference.
- Others.

4.1.5 Criteria Commonality Analysis

As shown in the previous section, the main criterion "Site Language" was used by all the participants as criterion for sorting web sites, with a frequency of 100%, followed by the main criterion "Ways to Find Products", used by 87% participants (13 out of 15). 8 out of 15 participants (53%) used the criterion "Type of Products", while all the other seven criteria were mentioned by 40% of participants or less. Figure1-Above demonstrates main sorting criteria, grouped by frequency of usage per participants.

Figure-Bellow demonstrates the main criteria, grouped by the number of sub-criteria included within. Accordingly, the main criterion "Ways to Find Products" includes the largest number of sub-criteria, equal to 26% of overall criteria used by all participants (23 out of 87 criteria). Followed by the main criterion "Site Language", which includes 18% of criteria used (16 out of 87 criteria). On the other hand, all the rest eight main criteria include less than 14% of the overall criteria used.

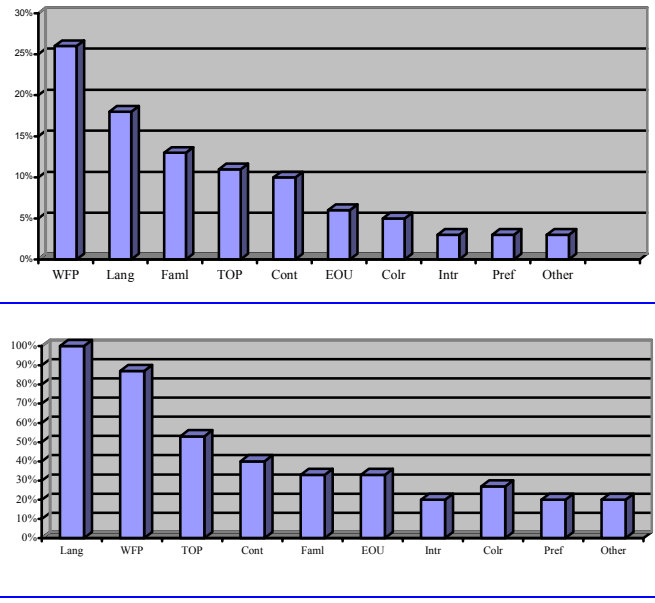

Figure 4.2.:Above: Main sorting criteria grouped by usage frequency

Bellow: Main sorting criteria grouped by number of sub-criteria

Lang: Site language — WFP: Ways to find products

TOP: Types of products — Cont: Site contents

Faml: Familiarity with the site — EOU: Ease of use

Intr: Site interface — Color: Site colors

Pref: Site preference

Table 4 demonstrates all the ten main criteria, with the number of participant using each one and with the number of sub-criteria included in each main criterion. The two main criteria having significantly high numbers of both participants' usage and sub-criteria included are "Site Language" and "Ways to Find Products". They could be suggested as the main criteria found as bases for web site sorting within the population who participated in the sorting sessions.

Table 4.3: Main criteria according to participants' usage and number of sub criteria

Main Criteria	Participant Use of Criterion	Number of Sub-Criteria Included
Site Language	**15**	**16**
Ways to Find Products	**13**	**23**
Type of Products	8	10
Content of Information	6	9
Familiarity with the Site	5	11
Ease of Use	4	5
Site Colors	4	4
Site Interface	3	3
Site Preference	3	3
Others	3	3

It is interesting to note that no significant differences were found between the usages of IT versus Non-IT Specialists for the two main sorting criteria, as the usage was equally distributed within the two groups of participants. The thing which suggests, that the recommended two main sorting criteria are shared within the overall population targeted by the sorting experiment.

It is also important to note that the main common criteria "Site Language", "Ways to Find Products" were mentioned in most of the time before the drying up point. The thing which suggests, that these two main criteria could be considered as main ones for the targeted population, when sorting book selling e-commerce web sites.

4.1.6 Distribution of Commonality

While, the two criteria concerning language and ways to find product were used by all the two participants, including IT and non-IT participants, and including those who used a few criteria, which implies, that this criterion is a main one, and not depending on tastes or experience; It is important to note that while there is a high level of commonality in criteria of Language and ways to find products, the commonality of categories within those criteria was variable. While one participant concerning language issue made reference to site's language support, another participant refers to interface language within same criterion. Similarly, while one participant concerning product allocation issue, made reference to existing of command buttons, another participant refers to browsing, searching, and scrolling navigation techniques within same criterion. It is interesting to note that all of the

participants who used the criterion ways to find book, used three categories for finding products, listing products, browsing category of products and searching for the products.

4.1.7 Significant Criteria Absence

It is important to look at Significant Absence (Rugg and Mcgeorge, 1997), where there are criteria which did not appear. In this case, "Site Security" and "Payment method" are two main elements which were expected to be mentioned especially in the context of E-Commerce. The absence of these criteria maybe is due to the fact that the pictures used in the sorting session, represent a screen shot from what the user will find of the site before any scrolling, and not the overall page. Security and payment issues are usually cited at the bottom of the first page of the site. Therefore, none of the used pictures include data about neither payment nor site security, which lead to the absence of these criteria in sorting. As explained in the limitation section, the decision was taken to include only screens shots of what can be seen by users of the sites initially because then elements could be more controlled, such as size of home page which would be variant on a paper print out.

4.2 Analysis of Second Sorting Session

Materials used in the second sorting session were the same printed cards used at the first session. Same participants were engaged, except two participants. The session took place at the same setting and location of the first one. No training session was given to the participants this time, but an introductory session was given to re-familiarize them with the technique and to introduce them to the objective of the second session. Participants were simply asked to sort cards according to a given criterion: "Sites I am willing to buy from/ Sites I am not willing to buy from". Participants were encouraged to give comments for reasons for their sorting.

In Summary, card 2 (www.amazon.com) ranked the highest in willingness to buy, being selected by all participants as a site they are willing to buy from, followed by card 4 (www.borders.com), and card 1 (www.e-kotob.com). Table 5 layouts the sites sorted by the participants and the percentage of responses. Figure2 demonstrates the distribution of participants responds.

Table 4.4 Percentage of willingness to buy for each site

Site Code	Willing to Buy From Frequency
2: Amazon	13 out of 13 – 100%
4: Borders	9 out 0f 13 – 69%
1: E-Kotob	8 out of 13 – 62%
3: Barners & Nobles	7 out of 13 – 54%
6: Neelwafurat	4 out of 13 – 31%
5: Alkitab	2 out of 13 – 15%
8: Arabooks	2 out of 13 – 15%
11: Al-Basheer	2 out of 13 – 15%
7: Almaktabah	1 out of 13 – 8%
9: Boustanys	1 out of 13 – 8%
10: ArabicWorld	1 out of 13 – 8%

When analyzing the comments provided by participants, site reputation scored the highest, for 77% of participants, for the reason why they willing to buy from a site. Familiarity with the site comes after, as a reason mentioned by 38 % of participants for willingness to buy from a site, followed by ease of use and site security as cited by 23% of participants. Table 6 layouts the reason for sites sorting and the percentage of responses.

Table 4.5 Percentage reasons for willingness to buy for each site

Reasons Given for Willing to Buy from a Site	Reason Frequency
Famous Site	10 out of 13 – 77%
Familiar Site	5 out of 13 – 38%
Secured Site	3 out 0f 13 – 23%
Ease of Use	3 out of 13 – 23%

4.2.1. Commonality of Criteria for Similar Willingness to Buy Sorting

A commonality of criteria, in the first sorting session, was found between all three sites rated highest for the willingness to buy. In the second sorting session, sites 1, 2, and 4 were selected by the majority of participants having high potential to buy from. On the other hand, these three sites were identified by participants of the first sorting session, as of web-standard look, of a famous repetition, friendly, easy to use, attractive, cheerful interface, and the most preferable when searching for books.

On the other hand, sites 7, 8, 9, 10, and 11 which were selected by the lowest percentage of participants for willingness to buy, same sites were

categorized on the first sorting session as not friendly, not easy to use, not famous and not attractive sites.

4.2.2. Matching Elicited Data International Variables

Data revealed concerning willingness to buy on line for Egyptian Internet users who participated in this study could be matched of some of the international variables suggested by Hoft, Hofstede (Hoft, 1996; Hofstede, 1991) and others. Some correlation might be suggested between the Uncertainty avoidance (Hofstede, 1991) variable and the willingness to buy from familiar, famous site.

Uncertainty avoidance international variable characterises cultures according to the extent to which people feel threatened by uncertain or unknown situations Egyptian culture was found to be one of strong uncertainty avoidance (Hofstede, 1991). In the context of web interaction uncertainty avoidance for the Egyptian users, might be expected to manifest itself as a tendency to rely on known and trusted web sites, rather than explore alternatives (El Said and Hone, 2001).

4.3 Questionnaire Analysis

The questionnaire collected participants demographic data, reported earlier in this document, as well as data around participants' perception of usefulness and attitude toward E-Commerce web sites.

Although almost all participants cited that the Internet provided them with information that helped them in purchasing products, a relatively high percentage 48% have objection for on-line shopping, mainly for security reasons as same percentage (48%) are unlikely or very unlikely reveal personnel information when requested on line. Same percentage (48%) never used the Internet in on line shopping, and mentioned that the main element that discourage them to buy through the Internet is mainly difficulty of payment, more specifically concerning credit card security. And they do not encourage on line shopping. It is important to note that the majority of people, who claimed their concern about credit card security, are the Internet intermediate users having the least experience on the web.

For the other 52% who do not have objection to shop on line and are ready to reveal personnel information on line, they did shopping on line during the past year from 1 to 10 times. And they do encourage on line shopping. This group of users reported that they spent between 45 and 5000 $ on line during the last year, and they mainly shopped from an International

secured sites. Very small percentage used either Egyptian site. In the later case users used the site for buying food while they used the international sites for software, hardware, books and cloths shopping. 75% of those who shopped on line bought books, while 50% got software.

100% of those who shopped on line used sites with an English interface. 48% used credit card and only 20% used pay when deliver method of payment, specifically with the Egyptian, food provider sites. It is interested to note that the majority of them are expert users; the thing which could suggest that users' experience with the Internet would encourage people to buy on line.

Other data revealed that half of the sample own credit card, while the other half do not. 87% are aware of some sites which provide on line shopping in the Arab world.

5 CONCLUSIONS AND FUTURE WORK

It is important to note that while some researches suggested information security to be the main factor affecting consumers' on-line trust, what has been observed during the current research is that the issue of transaction security would happen late in the trustworthiness evaluation process, while other factors could be suggested to have significant role in consumers' trust and willingness to buy from an Internet store.

Analysis of data collected from the two card sorting tasks reveals some interesting findings about the preference of Internet Egyptian users to shop on line. The first finding concerns the features of web sites that are most salient to Internet Egyptian users. Language used in a site was suggested to be the most salient feature of E-Commerce for the Internet Egyptian users. The majority of participants cited that they mainly shop from International secured sites. A very small percentage used Egyptian site, and in these cases they used Egyptian sites with an English Interface. The study indicates that, among the target group, English is used overwhelmingly in Web use, confirming the extensive use of English language for the Egyptian users on the Internet (El Said and Hone 2001).

The second finding concerns with willingness to buy from the Internet. The results suggest that for the majority of participants, store reputation and familiarity with the site, can be the deciding factors in whether to buy from an E-Commerce site. Analysis suggests that the key factor which distinguishes the sites from one another is their familiarity or fame as internet retailers. This finding fits with previous research which emphasises the role

of store reputation in internet purchase decisions across a number of cultures (Jarvenpaa and Tractinsky, 2000). At this point, the role of user's culture could be highlited, ase Egypt tends to be characterised as a high uncertainty avoidance culture (Hofstede, 1991), good store reputation reduces the uncertainty involved in an internet purchase.

In Egypt, Arabic is the native language and the main means of oral communication. While English is the principle foreign language of the general population, most of the science courses in Egyptian public universities are taught in English.

In the questionnaire distributed during sorting sessions, the majority of participants mentioned that they mainly shopped from International secured sites. This finding confirms the result of survey suggesting that 92% of the Arabs purchases from company that are not located in the Middle East (Dabbagh Information Technology Group, 1998). The study suggested that, among this group, English is used extensively in Web use, this finding fits with previous research which give emphasis to the extensive use of English language for the Internet Egyptian users (Warschauer et al, 2003; Warschauer et al, 2002; El Said and Hone, 2001).

On the other hand it contradicts with previous research suggesting that users from a specific culture group do prefer to use sites having symbols of same culture group (in this case Arabic Language) (Siala, 2001).

Further experimental work is planned to investigate whether these usability issues relate to culture. Where usability can be shown to relate to culture, we hope to show how better interfaces might be developed for Egyptian users.

6 EVALUATION OF CARD SORTING TECHNIQUE

The card sorting technique proved to be a very useful tool for knowledge elicitation. It is simple to learn and easy to use, and combine flexibility to use with formality and consistency of experiment, allowing participants to use their own categorization.

A problem which may occur with card sorts is that 'taken for granted' knowledge and implicit knowledge may not be elicited during the sorts (Maiden and Rugg, 1996). Taken for granted knowledge is fact which participants felt unnecessary to communicate, on the assumption that it will

be known by the researcher. This could cause a risk that important but simple constructs might have been rejected by the participants as too trivial.

In the current experiment, it was noticed that some of the participants considered some knowledge as "taken for granted" and did not mentioned it at the beginning. Site Language was a typical example for that. "*Of course I will not select the site language as it is obvious criterion*", was a common comment for participant when asked to find further sorting criterion:" When said, the researcher had to explain that nothing is right or wrong, nor taken for granted in that experiment, and encourage the participants to think of any "obvious" criteria. However, it is also arguable that some of the knowledge could not been said in this experiment as they may be missed, based upon the taken for granted factor.

7 DIFFICULTIES WITH THE TASK

The card sorting sessions did not generate any significant problems as the respondents were able to carry out the sorting process successfully and generate the required data, all participants stated that they understood what was required in the process.

Few of participants went to a dry point during the sorting sessions. This problem was tackled by providing Triadic elicitation, which enabled the participant later to continue with sorting task.

Few of participants engaged two or more criteria and/ or categories together during a single sorting task, especially in the first sort. This problem was solved by explaining that only a single criterion should be used at a time.

The sorting session take place in English, the participants' second language, while the researcher would switch to Arabic to give further explanation for any question asked by the participant. While all participants were asked to specify criteria and categories in English, for the researcher to write down and analyze later, very few of participants, namely two participants, having an lower ability of English language, showed anxiety when asked to specify knowledge in English, they spent long minutes searching for the right words in English and showed preference to mention them in Arabic. In many cases, the participants reformulated their constructs and categories several times using a variety of periphrases before settling upon the wording recorded. No attempt was made to correct incorrect English in verbatim constructs; however, on regular basis the researcher keep reminding these two participants to use very simple and plan English words to express their categories and criteria. In one case, the researcher had to

translate some of the criteria cited by the participant in Arabic, and make sure with him that the noted English word was matching with his choice.

8 LIMITATIONS

It is important to point out the limitations of this study. The sample size is relatively small and was selected through personal contacts of the researchers, and is thus non-random. The facts that the subjects were personally known by the researchers may have affected people's responses. The questionnaire was not formally tested for reliability. Notes captured during sorting sessions were examined for patterns and illustrative examples rather than systematically coded.

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