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EXPLORING NOVICE USER CONSIDERATIONS FOR A MOBILE DEVICE APPLICATION THROUGH CARD SORTING

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Mobile technologies applied through a variation of devices ranging from smart phones, netbooks and tablets, are developing quite fast and are expanding continuously. Users and media consumers interact increasingly nowadays which such devices, whose inbuilt functions and services are continuously developing and advancing. Based on this fact, this paper deals with the process, analysis, results and implications of a card-sorting usability study. The study has been conducted in order to investigate user-behavior during the design of a mobile tablet application for inexperienced users, focused on the topic of "first aid". Card sorting is a participant-based knowledge elicitation technique for grouping information into categorical domains. Through our study we have identified nine categories of cards and three cards were used by a small percentage of users. The categories presented indications of grouping by shared words and task. Differences in grouping were probably due to various mental representations on the part of users. Novices tend to group cards in one level without sub-groupings. Participants made many suggestions regarding possible new content.

Keywords: mobile devices; mobile interaction; novice user ; cart sorting; information architecture; human factors.

1. Introduction

The rapid growth of mobile and wireless technologies combined with contextual computing has contributed to the advance of new mobile applications and services. The adoption of sophisticated mobile devices and applications has created new social tools for people to connect and interact, therefore changing the ways people communicate. One of

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the main goals of a mobile interface is to relate function and operation to the elements of interaction that are performed well [Gatsou *et al.* (2011)]. The challenge is to structure these elements in such a way that the product and system is useful, meaningful and easy to understand and to use.

With the increase in the use of new technologies and of use of the Internet at home, the numbers of novice users, that is, of ordinary people who lack skills in computer science and who are drawn from a wide range of backgrounds, has grown exponentially. Such persons face difficulties in operating computers. Ordinary people, however, are now the main target of the market, which produces new applications very rapidly [Gatsou *et al.* (2012)]. Thus applications can be easy to use when the application conforms to the users' mental models. A good tool that enables one to see and understand this process is card sorting. Sorting is a natural method of classification and is an everyday activity for software, mobile applications and website content. The results that arise can lead to suggestions regarding navigation, the design of menus and taxonomies and ideas for interface design for specific target audiences [Courage and Baxter (2005)];[Spencer (2009a)]. Content categorization is significant for many reasons. The main advantage is that the method provides maximum information with minimal cognitive effort [Coxon (1999)]. Card sorting may have a fruitful impact on either the overall structure of the software or on specific components of the organization of the design. As a method, card sorting is a knowledge elicitation technique designed to reveal the conceptual structures or categorizations applied by targeted individuals [Cooke (1994)].

"The world is not a desktop", as Weiser (1994) distinctively described. The potential of computing and information technology goes beyond desktop or personal computers. As such, card sorting is a user-centered design tool capable of increasing the usability of a system and of improving the design of interactive systems. Users sort cards that describe their image, understanding and their mental image of concepts, workflows and information knowledge . The term 'card sorting' applies to a wide range of activities involving the naming of objects or concepts and their grouping [Hudson (2005)]. It is a methodology that can be used to capture users' mental models of how information is organized in a software interface structure. According to Morville and Rosenfeld, card sorting "can provide insight into users' mental models, illuminating the way that they often tacitly group, sort and label tasks and content within their own heads" [Morville and Rosenfeld (2006)].

The goal of this study is to investigate ways for novice user to find and interact with the information content of a tablet mobile application. Thus, in order to improve the effectiveness of interaction on the part of novices users in a mobile tablet application oriented around the topic of first aid, we performed a card sorting session to gather information with the following aims in mind:

- To generate categories for a mobile tablet application with specific content
- To identify how novices structure information and
- To gain ideas regarding potential information architecture for novices.

To present the results of this study, this paper opens with a literature review which establishes the theoretical background for our study. It then describes the research methodology employed. It analyses the data and offers results, which are discussed, before offering some conclusions.

2. Background

2.1 Mobile interactivity

The importance of interactivity has grown in mobile environments. Interactivity has been variously defined, whereas most of definitions highlight the significance of interaction between user and system. Williams *et al.* (1988) define interactivity "*as the degree to which participants in a communication process have control over, and can exchange roles in, their mutual discourse*". Rafaeli (1989) identifies satisfaction as one of the most obvious outcomes of increased interactivity.

In HCI, the increasing interest in designing mobile devices that could respond to changing environments of use provoked the design of user interfaces that included emotions and pleasure as design issues. Blythe and Wright (2003) explained that the increasing connection of home tasks with information devices and computers challenges HCI, as traditional usability approaches are limited to whether the product does or does not frustrate the user. Knowing and understanding users' needs is an important step that needs to be taken, in order to accomplish users requirements to design mobile tablets applications.

In the view of Fragopanagos and Taylor (2005), as computers and other electronic devices become increasingly involved in our everyday life, whether in a professional, personal or social capacity, the ability to interact with them physically becomes more and more important, so reflecting the way humans interact with each other. One way of improving the usability and interactivity of mobile devices is to make sure the users interfaces are familiar and easy to use.

2.2 Mental models

The term "mental model" has been used in many contexts and for many purposes. It was first mentioned by Craik in his book from1943, *The Nature of Explanation* [Craik (1943)]. Leiser argues that a mental model of a user interface consists of a set of representations of the relationship between user actions and system responses [Leiser (1992)]. This view rests on Johnson-Laird's view of mental models as a form of knowledge representation and their manipulation as a form of reasoning, in which a mental model is regarded as the set of possible representations of the available information [Johnson-Laird (1983)]. Mental models have been used in human-computer interaction and in increasing usability. Staggers and Norcio (1993) propose definitions of users' mental models that base the users' models of a system on their experience of it. Users may not always have optimal mental models [Nielsen ; Sano (1994)]. Designing a system based on defective user mental models can clearly hamper user performance.

Norman suggests that the usability, functionality and learnability of the conceptualized model of the designer depend on the degree of alignment between the conceptualized model of the designer and the mental models of the user. He argues that "*Mental models are naturally evolving models. That is, through interaction with a target system, people formulate mental models of that system. These models need not be technically accurate,* *but they must be functional"* [Norman (1983)]. Usability is strongly tied to the extent to which a user's mental model matches and predicts the action of a system [Davidson et al. (1999)]. However, sometimes it happens that the features of a system display no similarity to objects in the world. Nielsen argues that user interfaces should *"speak the user's language"*, which includes the presence of good mappings between the user's mental model of the system and the computer's interface for it [Nielsen (2003)]. Knowing the representative users' mental model with respect to the structure of a software is obviously very important, because it allows designers to construct the content according to users' expectations, thus making the resulting design as intuitive as possible for the users [Bernard (2000)].

2.3 From usability to user experience

Usability is a key concept in HCI (human computer interaction) - additionally is an integral part of mobile devices and its applications by its nature. It concerns, for instance, making systems safe, easy to learn and easy to use [Preece *et al* (2002)]. Preece *et al.* describe usability and user experience in the context of goals (see Figure1). Usability reflects the easiness and efficiency of use, and is a significant part of the user experience and therefore user satisfaction. A formal definition of usability is presented in the ISO standard 9241–11 (ISO, 1998):
"…the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction, in a specified context of use". In the same publication, usability attributes are defined as follows: "Effectiveness: *The accuracy and completeness with which users achieve specified goals.* Efficiency: *The resources expended in relation to the accuracy and completeness with which users achieve goals.* Satisfaction*: Freedom from discomfort, and positive attitude to the use of the product.* Context of use*: Users, tasks, equipment and the physical and social environments in which a product is used".*

Fig. 1 Usability goals and user experience goals (outer circle) adapted from Preece et al. (2002).

Blandford and Buchanan (2003) note the range of things that are*"usable"* can mean: How efficiently and effectively users can achieve their goals with a system; how easily users can learn to use the system; how well the system helps the user avoid making errors, or recover from errors; how much users enjoy working with the system.
Conventional usability research has generally focused on the evaluation of usability of artefacts and systems at the final stage of a system development. Latest studies have revealed that usability research in HCI is increasingly concerned with the study of user behavior and user's individual needs. This has urged the appearance of various methods that aim to better understand and represent the prospective user, and engage designers with users' experience.
In the view of Forlizzi and Battarbee (2004), user experience is an approach in product development that focuses on the physical, cognitive, sensual, aesthetic and emotional experience of product use. The International Organization for Standardization (ISO DIS 9241-210) defines user experience as *"a person's perceptions and responses that result from the use or anticipated use of a product, system or service"*. User experience is thus subjective and focuses on the use.

Hassenzahl *et al.* (2006) emphasize three main aspects of user experience (UX) as follow:

- Holistic: whereas UX takes a more holistic view, including emotions, affect, aesthetics.
- Subjective: UX is interested in the way users judge the products they use.
- Positive: UX is more concerned about the positive aspects of products use.

Users who have used mobile phones for a year will apply their knowledge to their use of mobile computing. However, frequent use of mobile phones does not guarantee that users are ready for mobile computing. In regard to user performance when he or she is using a device, previous studies have shown that novices users usually face greater difficulties than experienced users in handling a computer device or in the acquisition of computer skills [Goodman *et al.* (2004)]. Buxton (2007) considers the user experience to be made up from a combination of visual and experiential aesthetics and usability. The purpose of physical objects is to *"engage us in an experience – an experience that is largely shaped by affordances and character embedded in the product itself"*. Latest mobile technology products, like handheld personal computers, personal digital assistants, tablets and smart phones, are designed by teams with individuals from a variety of disciplines, but very few of them are trained in defining the overall user experience. Their knowledge of the influence of user experience and their ability to estimate ease of use is limited.
Traditional usability is about how well a user's task can be supported whereas the emerging focus on user experience is reaching far beyond this. User experience is a part of every interaction between user and system. When designing interactive systems it is important to understand what creates a particular experience. This will result in products being not merely utilitarian but enhancing the quality of experiences. A shift in the design activity that aimed to include the user in the design process prompted the need to understand the user through methods that allow access to the user's experiential world.

2.4 The importance of information architecture

The organization of information is one of the most powerful factors that influence the way in which users think about and intact with interfaces [Lidwell *et al.* (2003)]. In the view of the Institute of Information, architecture is the art and science of organizing and labeling websites, intranets, online communities and software to support usability [Information Architecture institute.org]. In the 1970s, Richard Soul Wurman created and gave the term "Information Architecture" wide circulation. Wurman was trained as an architect, but was also a skilled graphic designer. His definition of information architects emphasizes the organization and presentation of information.

"information architect. (1) the individual who organizes the patterns inherent in data, making the complex clear. (2) a person who creates the structure or map of information which allows others to find their personal paths to knowledge. (3) the emerging 21st century professional occupation addressing the needs of the age focused upon clarity, human understanding, and the science of the organization of information" [Wurman, (1989)].

In the view of Ding and Lin, information architecture involves a number of activities. It concerns organizing and simplifying information, designing, integrating and aggregating information spaces/systems; creating ways for people to find, understand, exchange and manage information, thus staying on top of it and making the right decisions [Ding and Lin (2009)]. Information architecture design is a set of specialized skills that allows one to interpret information and express distinctions between signs and systems of signs. More concretely, it involves the categorization of information into a coherent structure, preferably one that the intended audience can understand quickly, if not inherently, so that they can then easily locate the information for which they are searching [Morville and Rosenfeld (2006)].

Card sorting methods

There are two card sorting methods: open and closed (Fig.2). They produce different types of data regarding the organization of content. In an open card sorting procedure, participants create their own names for the categories and have the freedom to classify information according to their domain knowledge and experience, without external influences. This helps reveal both how they mentally classify the cards and what terms they use for the categories. In addition, open sorting is generative. It is typically used to reveal patterns in how participants classify, which in turn helps generate ideas for organizing information.

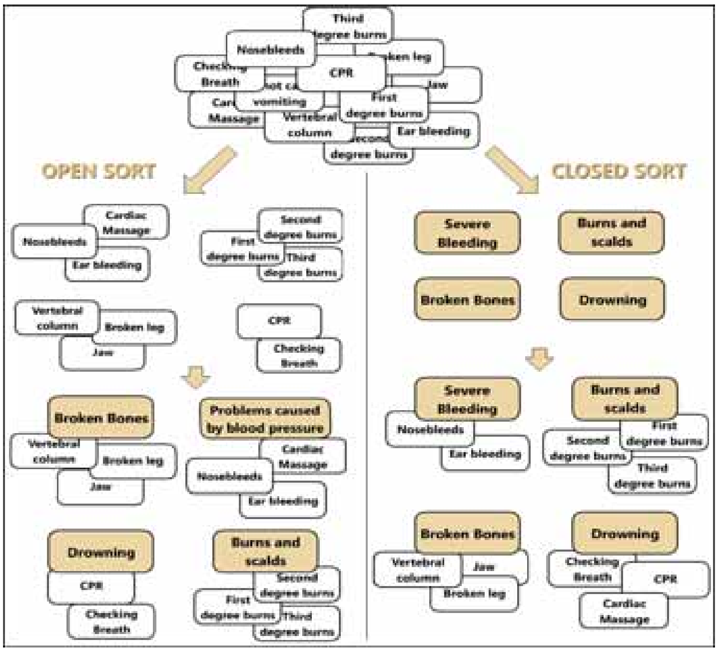

Fig. 2 Open and closed card sorting

In a closed card sort, participants are provided with a predetermined set of category names. They then assign the index cards to these fixed categories. This helps reveal the degree to which the participants agree on which cards belong to each category.

3. Research methodology.

To examine how novice users conceptualize a mobile tablet application, we decided to create a card sorting session (Fig. 3). This study used the open card sorting in order to assess the participants' initial categorical structure. Since we are interested in categorization by non-experts, we chose to use paper cards to implement our card sorting method. Before the study the subjects were required to perform, by way of practice, a pilot test involving fourteen cards which they were required to classify in four categories (names of towns, names of individuals, animals, birds), the aim of this being to familiarize the participant with the process.

Fig. 3. During the card sort session.

3.1 Participants

The optimum number of participants to be employed in such a card sorting experiment is unclear. According to Robertson, four to six participants are enough [Robertson, (2001)]. Mower and Warfel suggest 10 to14 participants [Maurer and Warfel (2004)]. Tullis and Wood propose a number of 20-30 participants [Tullis and Wood (2004)]. Kaufman recommends “at least ten participants” for a card sort exercise, but cites no data for this recommendation and even goes so far as to state that “you can achieve reasonable results with fewer” [Kaufman (2006)]. There is thus no agreement on the appropriate number of participants in such an experiment. However, as Nielsen points out, the value of card sorting experiments lies in listening to the subjects comment as they sort the cards. This procedure offers a deeper insight into the mental model that they employ, than does examination of the mere fact that they sorted certain cards into the same pile [Nielsen (2004)]. Ross adds that “Having several people sort the cards together allows you to hear their discussions and the reasoning around how they group the cards” [Ross (2011)]. Our session was designed specifically to include a representative pool of the potential users of the mobile application that was being tested. Twelve participants (N=12) aged between 18 -76 (mean age = 41.6, SD = 20.9, years), seven of whom were males and five females, participated in the card sorting session. All participants were novices in computing. They did not suffer from any visual or cognitive impairment and were educated to at least high school level. Participants were told that the study was being done to help organize the information for a mobile tablet application dealing with the topic of “first aid”.

3.2 Materials

Thirty six cards were used in the open card sorting session and their subjects were drawn from information pertaining to "first aid ". Items were carefully selected to be of interest to our participant population. The titles were framed so as to be of a uniform level of complexity. An information sheet with detailed definitions of 36 terms was given to the

Fig. 4. (a) The cards , (b) Participant during the card sort session.

participants. In our study we used self adhesive cards for better user performance (Fig.4 a,b).

3.2 Procedure

Each participant was given a set of thirty six (36) randomly ordered paper cards (see appendix A). Group observation was used to test the participants, who were asked to sort the cards into logically ordered groupings. The participants were requested:

- To sort the cards by placing similar cards on the same pile.
- To create as many or as few piles as they like.

They were told to bear in mind:

- That the piles did not need to contain the same number of cards and that it was permissible for some piles to be very large and others to contain only one or two cards, if, in the view of the participants, the subjects of such cards were not sufficiently similar to others.

The subjects were also permitted to change their mind as much as they wanted, to move cards around and to split piles as much as they saw fit. They were also allowed to place a post-it note on top of each of their piles, with the name of the name of category that they had created.

In addition, the participants were requested to:

- Use blank index cards to create new cards for anything the participant felt was missing or to create duplicate cards where the participant felt that a card belonged in multiple categories,
- To set aside cards that they considered to have no meaning or to place them in a pile of discards and

- To use a category called “other” or “general” for cards that seemed not to fit into any category but which they felt should still be retained [Hennig (2001)].

The subjects were encouraged to ask questions or to request further clarification whenever they desired of the concepts employed. Subjects were free to assemble as many groups of items as they wanted and to put as many items into one group as they saw fit. Each card was unique to the whole set. During the session participant P4, requested more information about the card “cardiac massage” as he was unable to find anything on the information sheet of detailed definitions that the participants were provided with. Another participant P9, asked if she could create a new pile containing all “symptoms” together. She was told that she could group the topics as she saw fit.

When the participants were satisfied with their final classification, they were asked to record their card groupings on paper. They were then requested to fix the self-adhesive card to the final position. Participants were given 45 minutes to complete the card sorting procedure. Only two of the 12 participants failed to finish in the set time, with most participants completing the sort in 30-40 minutes. When the classification was over, the participants were asked a set of open–ended questions to throw light on the process and describe their experience during the sorting process. To aid our understanding of the concepts that the participants employed in grouping the information, they were also asked to write down group names and descriptions of why they had grouped the items in this way.

4. Results analysis.

All participants gave their permission for the test to be recorded on video. Although it was useful to look at the various cards to discover how users organized the information Fig. 4(b), it proved to be more convenient to assign a score to each of the cards, so that a statistical analysis could be run. On the basis of our review of the literature, we can choose a number of approaches, namely visual analysis, simply looking at the grouping categories, cluster analysis and a spreadsheet template. We did not, however, employ cluster analysis, since, in the view of Hudson, dendrograms (the graphic result of cluster analysis) are of use only when there is a single location for each card and a few of our participants used two locations for one card. We employed the spreadsheet template created by Spencer (2009b). Card numbers were entered on the spreadsheet to be analyzed and determine which cards were placed in each category.

Fig.6 shows the relationship between cards, categories and participants. Each percentage shows how often a card was placed into a category by the participants. At the bottom of each column there are statistics regarding to:

- cards in this category , a count of how many participants cards were placed in this category
- cards with high agreement, a count of cards with a correlation of 75% of participants or more used this category for the card.
- cards with medium agreement, a count of cards with a correlation of 25%-50%
- cards with low agreement, a count of cards with a correlation of 25% or less.

Agreement: is a measure of how much agreement there was between participant results for that category [Spencer (2009b)] and calculated as follow:
Agreement = total Number of cards in category / Total Number of cards
Total Number of cards = (Number of participants)x(Number of unique cards).

The essential criterion for the formulation of categories was the presence of a "similarity of meaning" in the semantics of the language. This does not imply that the "same" meaning is to be sought, which would "reduce the semantic task to finding synonyms" [Coxon (1999)]. No significant differences have been found between manual and electronic card sorts in terms of accuracy, test-retest reliability, and number of categories generated by participants [Harper and Van Duyne (2002)]. It is very easy to organize online sorts, even those involving hundreds of participants, with the aim of discovering how far large numbers of individuals have understood the meaning of categories and concepts [Fincher and Tenenberg (2005)]. Although results offered by a card sorting session are mainly qualitative, those derived from large-scale online studies are mostly quantitative. According to Fincher and Tenenberg (2005), "Traditional analyses of card sort data use semantic methods, those methods that rely upon interpretative judgments by individual researchers on the meanings of the respondents' utterances". Thus it is obvious that, in order to construct workable information architecture for the project, it is important to listen, as it were, to the users, to feel their experience and to observe their difficulties over the meaning of the labels. Analysis of the card sorting task revealed that one of the older participants did not arrange the cards in a hierarchical structure. Instead, she arranged the cards in groups of four, in such a way that there was no interconnection among the groups. One other participant displayed no clear organizing principle at all in their arrangement of the cards. The younger novice participants adopted a hierarchical menu structure. The subjects created a total of 16 categories, but, because some employed different names for the same category, we identified nine categories in all. These nine are: heart attack, poisoning, burns and scalds, severe bleeding, car accident, broken bones, drowning, electrocution and hypothermia (see Figure 5).

Standardised category	Participants who used this	Total cards in this category	Unique cards	Agreement Weight
Heart attack	12	46	12	0,32
Burns	12	38	4	0,79
Broken bones	9	34	5	0,76
Bleeding	12	29	8	0,30
Poisoning	6	15	7	0,36
Electrocution	12	53	7	0,63
Car accident	12	61	13	0,39
Drowning	12	50	11	0,38
Hypothermia	8	20	6	0,42

Fig. 5. Interpretation of category results.

In Appendix B we present the category structure of the application we were intending to proceed before the session and in Appendix C the specified categories by participants.

Card No.	Card Name	heart attack	burns	broken bones	bleeding	poisoning	electrocution	car accident	drowning	hypothermia
1	Symptoms	55%				36%				
2	Critical the first hour	42%			25%					
3	Precious time	17%			8%			50%	17%	
4	Ask for an ambulance	50%					17%			
5	Give them a 300 mg tablet of Aspirin	100%								
6	First degree burns		100%							
7	Second degree burns		100%							
8	Third degree burns		100%							
9	First aids	20%	20%		30%			30%		
10	Broken leg			75%				25%		
11	Broken arm			75%				25%		
12	Vertebral column			75%				25%		
13	Jaw			33%				67%		
14	Cranium			27%				73%		
15	Severe bleeding				50%			42%		
16	Nosebleeds				83%					
17	Get medical help if necessary					50%				50%
18	Victim with senses							42%	42%	
19	Victim with loss of senses							25%	33%	17%
20	Do not cause vomiting	50%				25%				
21	Disconnect casualty from power source						100%			
22	Pushing away whatever						100%			
23	Don't touch casualty						100%			
24	Important help					17%	83%			
25	Look out for any continuing danger							100%		
26	Look out for the victims	17%				17%		67%		
27	Make a first assessment of the casualties					17%	25%	25%	17%	
28	Checking breath				8%				67%	
29	CPR (Cardiopulmonary resuscitation)								92%	
30	Checking pulse	17%							50%	
31	Cardiac massage	18%							36%	18%
32	Important details					100%				
33	Uncontrollable shivering				25%				17%	50%
34	Slow, shallow breathing	56%							44%	
35	Cold, pale, dry skin				20%					60%
36	Irregular pulse	22%					22%		22%	33%
	Cards in this category	12	4	5	8	7	7	13	11	6
	Cards with high agreement (>75%)	1	3	3	1	1	4	1	1	0
	Cards with medium agreement	5	0	2	2	2	0	7	6	4
	Cards with low agreement (<25%)	6	1	0	5	4	3	5	4	2

Fig.6 Participants agreement on classification.

As illustrated in Fig. 6 every participant created a group called "*burns*" and included the cards "*first degree burns*", "*second degree burns*" and "*third degree burns*". In this case participants may group similar names together. But in other cases superficial similarities in the names used can produce unhelpful results [Hudson (2005]. Furthermore every participant created a group called "electrocution" and used the cards "*disconnect casualty from power source* " "*don't touch casualty*", "pushing away whatever". The "car accident" group was diverse. The cards were put in that group least frequently were all ones that didn't fit strongly to one group. The card sort results were not used directly to create the information architecture. Instead, they were combined with results derived from other activities and an understanding of the users' behavior. According to Fling (2009) "*The secret is that mobile information architecture isn't all that different from how you might architect software or website; it just has a few added challenges*".

5. Discussion – Conclusion

The study reports our initial exploration of the difference between the mental models of novice users regarding the information architecture of a mobile tablet application.

We derived nine categories (Fig.6) from the 16 that participants had created, but, as we have mentioned, participants used various words to describe the same category. A small percentage of cards weren't labeled well which indicates either that the participants did not understand the meaning intended to be conveyed by these cards or that there is simply no need for these cards.

The differences we observed in the way the participants classified these cards suggests that one of the reasons for differences in grouping lies in the use of different mental representations. Novices tend to create groups on one level alone (appendix C), without any sub-groupings (appendix B) or with at most only one sub-grouping. Furthermore, our observations suggest that novice users interpret the concepts they are dealing with on the basis of their personal experience and are unable to create a hierarchical structure.

As stated above, we held a discussion with our participants after the test, the aim of the conversation being to discover any organizational principles that they may have employed [Cooper (2007)]. This helped us to decide on the final structure of the interface design of the prototype. One way of minimizing misunderstanding and delay in the conduct of the test is to provide a definition on the rear face of the card. We feel that this is more convenient for the participants than having to search for the relevant definition in a list of 36 definitions. We employed the procedure involving adhesive cards, whose aim was to allow changes to be made easily, as some of the participants used the wall to sort the cards, Fig. 3(b).

Since the amount of digitally delivered information provided through interactive devices in our lives continues to increase, information designers must design solutions that match users' requirements as much as possible. The proper selection of information structure is one way to optimize communication with users, but requires designers to be aware of user's mental models and how users structure information in an interactive application.

The results of our study, which applies a user-centered design process to the construction of novice-oriented information architecture for a mobile tablet application centered around the topic of 'first aid', make clear the benefits of involving novice users in the process. Involving prospective users in the design can capture their underlying perception of the different components of the information architecture, thus leading to the design of, among other things, a hierarchy and navigation structure that reflects the mental model employed by the user, to the naming of groups that likewise reflects this structure that efficiently categorize content.

We found card sorting to be a useful technique for task specification and for verifying task credibility. Moreover, the simple satisfaction of incorporating the user's point of view had a tremendous impact on the generation of ideas during the design of the prototype.

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Appendix A. Card labels

1	Symptoms
2	Critical the first hour
3	Precious time
4	Ask for an ambulance and say you suspect a heart attack
5	Give them a 300 mg tablet of Aspirin to chew
6	First degree burns
7	Second degree burns
8	Third degree burns
9	First aids
10	Broken leg
11	Broken arm
12	Vertebral column
13	Jaw
14	Cranium
15	Severe bleeding
16	Nosebleeds
17	Get medical help if necessary
18	Victim with senses
19	Victim with loss of senses
20	Do not cause vomiting
21	Disconnect casualty from power source
22	Pushing away whatever is conducting the current using an insulating material
23	Don't touch casualty because they may be 'live'
24	Important help
25	Look out for any continuing danger, to yourself and others
26	Look out for the victims
27	Make a first assessment of the casualties - is anybody in immediate danger?
28	Checking breath
29	CPR (Cardiopulmonary resuscitation)
30	Checking pulse
31	Cardiac massage
32	Important details
33	Uncontrollable shivering
34	Slow, shallow breathing
35	Cold, pale, dry skin
36	Irregular pulse

Appendix B. The intended structure before session**. Appendix C.** The specified structure by the participants