The Homepage Design for the Elderly People

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Abstract— Most homepage design is made primarily for young users at present time. It focuses on the complex operations, fancy linkages and drastic acousto-optic effects which young users like very much. Instead, due to degeneration of body functions, the complex operations and the drastic effects form become a barrier of difficulty in use for elderly people. This study, made through the elderly people's view point, tries to find out the suitability of homepage design model and its content for elderly people, Furthermore, this study trends to construct an experimental website so that the page layout, word size, background color and the multimedia elements can be made together in optimum design for elderly people. Their specific demand can then be better understood.

I. INTRODUCTION

THE internet has a lot to offer for elderly people in terms of autonomy support and quality of life improvement (Slegers et al., 2005). The use of internet helps individuals to keep in touch with the outside world and maintain social contacts (Czaja, 1996; Mead et al., 1999; Morrell et al., 2000). It also helps access relevant information, provides many facilitate instrumental activities of daily living (Czaja et al., 2003). Additionally, Web is becoming more of a mass medium and elderly people are one of the fastest growing groups of new Web users (Eastman & lyer, 2004; Schofield, 1999). It is noticeable that nowadays, elderly people typically have more disposable income and buying power than other segments of population. Thus, marketers and web owners need to consider elderly people's preference and web design should also focus on age-related functional limitations.

According to Slegers et al. (2005), in order to improve internet performance of elderly people, it is vital important to take into account age-related limitations when designing web interfaces. The cognitive functions, such as visual acuity, contrast sensitivity, memory, and movement, will eventually diminish because of aging, which causes a decreased ability to discern small details and color hues of visual objects, as well as less accurate for elderly people. Furthermore, it is important to consider user's preferences when developing interface design guidelines- a website that is designed to meet its user's abilities but not their preferences may be less attractive to its intended users.

The purpose of this study is to investigate the homepage design preferences and easy of use in elderly people by manipulating a series of design aspects within a context of a fixed interface design. We made through the elderly people's view point, is to find out the suitability of the homepage design model and its content for elderly people,

Grid

Freeform

Racetrack

Fig. 1. The three virtual layout pattern.

and to construct an experimental website so that the page layout, word size, background color and the multimedia elements can be made together in optimum design for them..

II. METHODS

This study selected laboratory experiment to manipulate homepage design elements because we intended to establish cause-and-effect relationships between web design and elderly people's preference. Since laboratory experiment can eliminate competing explanations for observed findings, it is considered the best methodology to achieve our research goal at current time.

In research design aspect, this study adopted design of experiment (DOE) to investigate website satisfactory of the elderly. There are four factor of DOE: Page layout, Word size, Background color, and Multimedia. Those DOE factors can be defined as below:

(a) Page layout: according to Vrechopoulos et al. (2004), there are three virtual layout patterns: Grid, Freeform, and Racetrack. Grid layout navigates customers through a hierarchical structure (i.e., product category < - > product subcategory < - > end-product) to reach their desired products. Freeform layout can reach customers desired products at once, either through the use of a search engine or by selecting any of the items permanently displayed on every page of this very same version. Racetrack layout forces customers to navigate through specific paths in order to reach their desired products. This practice is achieved by placing two "corridors" on every web page; each time customers need to choose one of the displayed corridors to continue their navigation within the website. Fig. 1 shows the three virtual layout patterns.

(b) Word size: there are two word sizes: large and small. Large size is 18pt MS Word format. Small size is 12pt MS Word format.

(c) Background color: there are two background colors: warm color and cold color. Yellow is for warm color. Blue is for cold color.

(d) Multimedia: two types picture were selected: picture with dynamic effect and still picture.

This study used factor design. The factors consist in homepage design are: page layout 3 (Grid, Freeform, Racetrack) x word size 2 (large, small) x background color 2 (warm color, cold color) x multimedia 2 (dynamic effect, static picture). There are 24 homepage choices in total.

Experimental setting and Sampling

Researchers created the experimental website to manipulate four DOE factors. The twenty four different versions of the same website were tested against elderly people in a within-groups experiment. All versions were designed using a common template that contains four homepage design elements: layout, text, background color, and multimedia.

Thirty participants with age 45 to 65 from island (Taiwan) wide are involved in this study. Participants were free from serious medical conditions and were not taking medications that impaired memory or concentration. All of them have experiences with computers, WWW, mouse and keyboard. Table 1 shows the demographic variables of the participants.

Questionnaires were used as data collection instruments, while participants completing them by browsing the experimental website.

Finally, it should be noted that most tasks of the experiment were completed by using a personal computer (Intel Pentium 4 processor with 512MB of RAM and shown on a 17 inch monitor set at a resolution of 1024 × 768 pixels). Participants used a standard keyboard and optical wheel mouse to take responses.

Statistical Analyses

ANOVAs were conducted to analyze participants' preferences and easy of use regarding homepage design features. If the ANOVA showed a significant effect, Tukey post-hoc tests were done to make pair-wise comparisons.

III. RESULTS

The results of our study on the demographic characteristics of participants are presented in Table 1. Approximately 43 percent of the participants were male and 57 percent were female. Their education level was spread as: high school (47 percent), university (50 percent), and elementary school (3 percent); among which, 53.33 percent of the participants age were 50-54. The other ranges of age were age 55-59 (23.33 percent), 60-64 (20 percent), and above 65 (3.33 percent).

Table 1. The demographic characteristics of participants

Variables	Group	N	Percentage
Gender	Male	13	43.33%
	Female	17	56.67%
Age range	50-54	16	53.33%
	55-59	7	23.33%
	60-64	6	20%
	65 above	1	3.33%
Education	Elementary school	1	3%
	High school	14	47%
	University	15	50%

Homepage design preference and easy of use

Different aspects of homepage design were analyzed to investigate the effect of age on participants' preferences (Table 2) and easy of use (Table 3).

Table 2. ANOVA parametric tests for the Preferences

Aspect of homepage design	F	Sig.	Tukey post-hoc comparisons (order of effects)
Layout*3	7.23	0.0008 ***	Grid > racetrack Freeform>racetrack
Word size*2	2.78	0.0962	not significant
Background color*2	0.15	0.7008	not significant

Multimedia*2	1.13	0.2872	not significant

Table 3. ANOVA parametric tests for the Easy of use

Aspect of homepage design	F	Sig.	Tukey post-hoc comparisons (order of effects)
Layout*3	5.75	0.0033 ***	Grid > racetrack Freeform>racetrack
Word size*2	0.16	0.688	not significant
Background color*2	6.457 E-0.0 3	0.936	not significant
Multimedia*2	0.035	0.8513	not significant

Interpreting the ANOVA, there was apparent that the layout significantly affects preference (P <.005) and easy of use (P < .005). The other design elements, such as word size, background color, and multimedia were not significant in participants' preference and easy of use. More specifically:

Preference: Subjects perceived the grid layout as significantly more satisfy than racetrack layout. Also, freeform layout was more satisfy than racetrack layout.
Ease of use: Subjects perceived the grid layout as significantly easier to use than racetrack layout. Also, freeform layout was more satisfy than racetrack layout.

IV. CONCLUSION

The result shows that the Grid pattern of page layout has high receptivity. The Freeform pattern in sole window becomes disorderly and confused if simultaneously presenting the necessary information content with the commercials together. The Racetrack pattern simply lets the elderly people feel hard to make clicks due to its complexity. The elderly people prefer larger word size and clear font. In multimedia applications, this study finds that the elderly people are fully aware of the homepage supposed to provide useful and versatile information. The colorful smart design, animations and pictures are not necessarily their consideration. The background color of the home page has not difference in their preference.

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