SOME ASPECTS OF DESIGNING ACCESSIBLE ONLINE FORMS FOR THE YOUNG ELDERLY

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Abstract: This short paper reports on two key aspects for designing accessible online forms for the young elderly: (i) distinguishing between required and optional fields and (ii) usability of checkboxes, radio-buttons and list-boxes. Two hypotheses are tested with seven young elderly people in the course of desiging a website for an old-age pensioner association. Separating required and optional fields into two sections is easier for the young elderly to understand and use than the current "asterisk" strategy which is invisible to them. Checkboxes and radio-buttons are easier for the young elderly to use than list-boxes because the latter requires a larger number of clicks in selection tasks. The results initially confirm both hypotheses, which should become requirements for designing accessible online forms for the older population.

1 INTRODUCTION

Online forms are often used in a wide range of web applications. Nevertheless, in spite of population aging ((Edwards, 2002); (Larra, 2004)) and a serious lack of web accessibility for the elderly, little research has been carried out on designing accessible online forms for them.

This short paper aims to report on two key aspects for designing accessible online forms for the young elderly: (i) distinguishing between required and optional information; (ii) usability evaluation of checkboxes, radio-buttons and list-boxes.

Aging is a dynamic process where the individual, social and environmental context often play a determining part in it. Three "types" of elderly adults are generally distinguished in the literature on The Psychology of Aging in order to group phenomena: the oldest-old (85 and over), old-old (75-84) and young-old (65-74). The young-old outnumber the oldest-old and the old-old, and this outnumbering is expected to become larger in the near future (Larra, 2004).

1.1 Required and Optional Information

During the course of designing a simple website for an old-age pensioner association in Molins de Rei, a little town near Barcelona (Spain), we found that young elderly adults had difficulties filling in online forms, as they had a number of problems to distinguish between required and optional fields by means of the usual asterisks, which appeared invisible to them. This is a noteworthy accessibility barrier.

Despite the general tendency of using asterisks, there are other design strategies which were thought to help elderly people to fill in online forms. Namely, (Shneiderman, 1997) proposes separating required and optional fields into two independent sections. Nevertheless, online forms have largely been overlooked by those web guidelines and patterns which have specifically been aimed at the elderly (e.g.; (Hodes and Lindberg, 2002, Holt, 2000, Echt, 2002, Holt and Morrell, 2002, Morrell et al., 2003, Zajicek, 2004)).

1.2 Checkboxes, Radio-buttons and List-boxes

Checkboxes, radio-buttons and list-boxes are widely used in online forms. Nevertheless, clicking on them requires precision and difficulties using the mouse are one of the documented problems faced by elderly people interacting with computers (e.g.; (Fisk et al., 2004)).

At the old-age pensioner association, we found out that selecting options from list-boxes was one of

the most important difficulties experienced by our users (apart from dealing with required and optional fields) because unfolding the list of options and selecting one required the users to be very precise in using the mouse.

Assuming that elderly people only use the mouse to deal with list-boxes and other widgets in online forms, we thought that checkboxes and radio-buttons would be easier to use than list-boxes. Two clicks are at least required in order to select an option from a list-box, when the same task can be conducted with one click in either checkboxes or radio-buttons.

1.3 Hypotheses

The study described in this short paper aimed to test the following hypotheses:
- Separating required and optional fields into two sections is easier for the young elderly to understand and use than the current "asterisk" strategy because they see clearly which fields have to be filled.
- Checkboxes and radio-buttons are easier for the young elderly to use than list-boxes because the latter requires a greater number of clicks in selection tasks.

2 METHOD

2.1 Users

Seven elderly Spanish adults ranging in age from 65 to 74 took part in this study. All participants had minor age-related declines in vision (e.g.; myopia and astigmatism) and manual dexterity (e.g.; arthritis). Two elderly people were skilled at using computers. They write documents and seek information on the Web on a daily basis. The rest of the participants had little experience with computers.

2.2 Materials and Evaluation Procedure

Four prototypes were designed, two for each hypothesis, respectively. The prototypes are described in the following sections.

The traditional usability test ((Nielsen, 1993); (Rubin, 1994)) was carried out in the usability evaluations of the four prototypes.

Prior to the tests, semi-structured interviews were carried out in order to gather the difficulties experienced by the participants in filling our online forms.

During the tests, the users were asked to fill in the prototypes as if they were truly surfing the Web. With the aim of simulating real use, the prototypes aimed to look like real online forms (e.g.; user's registration forms) as much as possible. The participants were also required to think-aloud while they were accomplishing the test tasks.

After the evaluations, participants were informally interviewed in group (focus group) to know which version had been the easiest to use and why.

3 SCENARIO 1: REQUIRED AND OPTIONAL INFORMATION

3.1 Objective

The aim of this scenario was to test the hypothesis that separating required and optional fields into two sections is easier for the young elderly to use than the current strategy with asterisks.

Two prototypes were evaluated. Both of them intended to look like typical online forms (e.g.; registration forms) as much as possible. The same number and type of fields were used in both prototypes.

3.2 Description of the Two Prototypes

Figure 1 shows the "asterisk online form". Asterisks are used in order to distinguish between required (name and country) and optional (first and second surname, e-mail) fields.

Formulario de registro

Para registrarse, necesitamos alguna información de usted.

Por favor, introduzca la información que necesitamos en el siguiente formulario.

Al lado derecho, podría encontrar un ejemplo que sugiere la manera de introducir la información.

Nombre (*)		(Ejemplo: Sergio)
Primer Apellido		(Ejemplo: Sayago)
Segundo Apellido		(Ejemplo: Barrantes)
País (*)	España	
Correo electrónico	correo electrónico	(Ejemplo: sergio.sayago@upf.edu)

(*) Esta información es obligatoria

[Enviar datos] [Borrar formulario]

Figure 1: Asterisk online form.

Formulario de registro

Para registrarse, necesitamos alguna información de usted.

Por favor, introduzca la información que necesitamos en el siguiente formulario.

Al lado derecho, podría encontrar un ejemplo que sugiere la manera de introducir la información.

Información obligatoria

Nombre		(Ejemplo: Sergio)
País	España ▼	

Información opcional

Primer Apellido		(Ejemplo: Sayago)
Segundo Apellido		(Ejemplo: Barrantes)
Correo electrónico	correo electrónico	(Ejemplo: sergio.sayago@upf.edu)

[Enviar datos] [Borrar formulario]

Figure 2: Divided online form.

Figure 2 shows the "divided online form". Unlike the previous prototype, the required and optional fields are divided into two separated sections, respectively.

It is worth remarking that both prototypes use the same default values. Default values are suggested by some guidelines (Shneiderman, 1997) as a valuable mechanism to guide users through the process of filling in online forms.

3.3 Results

Independently of previous experience with computers, all the participants expressed a strong preference towards the "divided online form".

Asterisks were overlooked by all the users because they assumed that all fields had to be filled. Nevertheless, when they were informed about the possibility of leaving some of them in blank, all the participants had difficulties in getting to understand the intended meaning of the asterisks. Although these difficulties were overcome when they read the legend, none of them started looking for it prior to filling in the prototype. It seemed as if the asterisks were 'invisible' or did not help the elderly to filter/select information. This fact seems to contradict other findings which point out that elderly people are very cautious and "spend more time reading information before clicking and even pondering the pros and cons of clicking before attempting to click a link" (Chadwick-Dias et al., 2003).

By contrast, none of the users experienced difficulties distinguishing between required and optional information in the "divided online form". According to our analysis, the main reasons are two:

− The "divided online form" was much clearer than the "asterisk online form" because of having two separated sections, which guided the users in the process of distinguishing between required and optional fields.

− The "divided online form" was easier to use than the "asterisk online form" since our users did not have to read any instructions (e.g.; the legend) to fill in it.

It is also worth mentioning that default values were very useful in order for all the participants to know how to fill each field.

4 SCENARIO 2: CHECKBOXES, RADIO-BUTTONS AND LIST-BOXES

4.1 Objective

The aim of this scenario was to test the hypothesis that checkboxes and radio-buttons are easier for the young elderly to use than list-boxes because the latter requires a greater number of clicks in selection tasks.

Two prototypes were evaluated. Both of them intended to simulate online forms which typically use these elements, such as online forms in electronic polls. Our prototypes allowed the users to select options from three categories, which were found to appeal to our users: food (pasta, vegetables and stew), traveling (Spain, Morocco, Brazil and London) and sports (soccer, basketball and ballroom dancing). The same number and type of fields were used in both prototypes.

4.2 Description of the Two Prototypes

Figure 3 shows the prototype with radio-buttons and checkboxes. Radio-buttons were used to allow users to select a dish and a place to visit. Checkboxes were used to allow users to select none, one or more types of sport.

It should be noted that there is a small lack of consistency between the two prototypes. The prototype with list-boxes only allowed users to select one type of sport, unlike the prototype with checkboxes and radio-buttons. Due to the fact that our aim was to compare the usability of these widgets, it was assumed that this difference would not be relevant for the purposes of our study.

Formulario de preferencias

A continuación se muestran una serie de opciones.

Para cada una de ellas, seleccione su preferida.

Comida
○ Macarrones
○ Verdura
○ Pasta
○ Cocido

Lugares a visitar
○ España
○ Marruecos
○ Brasil
○ Reino Unido

Deportes
○ Futbol
○ Baile de salón
○ Baloncesto

[Enviar datos] [Borrar datos]

Figure 3: Online form with checkboxes and radio-buttons.

Formulario de preferencias

A continuación se muestran una serie de opciones.

Para cada una de ellas, seleccione su preferida.

Comida   Macarrones ▼
Deportes   Futbol ▼
Lugares a visitar España ▼

[Enviar datos] [Borrar datos]

Figure 4: Shows the prototype with list-boxes.

4.3 Results

Independently of experience with computers, all the participants had difficulties using list-boxes. According to our analysis, the main problems were brought about by the need of clicking precision and the larger number of clicks. The participants had to click on the arrow of list-boxes in order to see the list of available options. This task turned out to be quite complicated on account of the small size of the arrows. Afterwards, they had to select an option by clicking on it.

These difficulties were overcome in the prototype with checkboxes and radio-buttons. These elements allowed the users to select options by clicking directly on them. In addition to this, no "extra" click was required to show the list of available options because all of them were displayed by default.

It is also worth noting that all the participants, with the exception of those with previous experience with computers, understood the main difference between radio-buttons and checkboxes after the tests. Before the session, they thought that the same type of selection tasks could be carried out with both widgets.

5 SUMMARY OF FINDINGS

This short paper has aimed to report on two key aspects for designing accessible online forms for the young elderly. Two hypotheses have been tested during the course of designing a website for a Spanish old-age pensioner association:

– Separating required and optional fields into two sections is easier for the young elderly to understand and use than the current "asterisk" strategy because they distinguish clearly which fields have to be filled.

– Checkboxes and radio-buttons are easier for the young elderly to use than list-boxes because the latter requires a greater number of clicks in selection tasks, which involve a precision they might lack.

The results initially confirm these hypotheses. Elderly people have difficulties both identifying and understanding the meaning of asterisks. These difficulties are overcome by separating required and optional fields into two sections, respectively. Checkboxes and radio-buttons are easier to use than list-boxes. Selecting options from a list-box involves more clicks and greater precision using the mouse than doing the same task with either checkboxes or radio-buttons.

Even though older people with previous experience with computer overcome difficulties faster than those without experience, it has been found that the previous two findings seem to be independent of the experience variable.

5.1 Some Implications

Current online forms do not meet the needs of the elderly and the two strategies described should become requirements for designing accessible online forms for the elderly. In addition, as these requirements deal with basic and common aspects of

computer-based forms, they are not necessarily limited to online/web forms.

Difficulties interacting with list-boxes give rise to several design concerns. If checkboxes and radio-buttons are to be used with elderly people rather than list-boxes, a larger number of options will be rendered visible. As a consequence, the size of online forms might grow considerably (e.g.; the "country" field would demand the display of a huge number of options, the countries). This might lead to other accessibility issues, such as visual clustering, a larger number of pages and scroll.

The results presented in this paper might also contribute to current web guidelines or patterns for the elderly, which have briefly been reviewed in the first section of the paper, in addition to being used in recent developments aiming at automatic personalization of online forms for the elderly, such as the DIADEM EU funded project (Lines et al., 2006).

5.2 Limitations and Outlook

Web Accessibility with the elderly is a new and growing research area and there are many unanswered questions.

Our results are based on a small number of young elderly people. Nevertheless, due to the fact that aging is a very complex and heterogeneous process, a larger number of elderly people with different profiles and nationalities should be contemplated in future studies. Working towards inclusive design, comparisons with young and disabled people; more complex online forms and quantitative analysis (e.g.; time to carry out tasks) are worthy of attention in order to pinpoint the effects of age and disabilities on designing accessible online forms.

This study has focused on the mouse as the only input device used by elderly people. However, they might interact with online forms through alternative input devices or assistive technologies, which could be used together. Future studies might consider the impact of input devices on the design of online forms for the elderly.

Further studies are also needed in order to evaluate the usability of more widgets with older people, such as multiple list-boxes,.

We expect to address all these issues within the context of our ongoing PhD research, which is focused on ICT-based communication tools and usability methods with the young elderly.

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