DEMONSTRATION OF AND EXPERIENCES FROM AN INTERACTIVE DIGITAL QUESTIONNAIRE

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In 2001-2004, a survey on long range bus travel in Sweden was carried out. An interactive digital questionnaire (IDQ) was used, and its potential to elicit survey results with a higher quality than traditional questionnaires was evaluated. The purpose of this paper is to demonstrate the IDQ and describe the experiences from using it in practice. IDQs do have the potential to elicit data with less measurement errors, but they are also delicate tools which need to be used consciously. If used in the wrong way, the multimedia content might have a negative effect on the survey quality.

Survey research, User studies

1 Introduction

The success of a survey depends highly on how closely the answers people give to the questions match reality (Polland, 1998). The lack of face-to-face contact between the researcher and the respondents in questionnaire studies makes the quality of the answers hard to judge (Trochim, 2006). Furthermore, the lack of personal contact also makes it harder for the researcher to make sure that the respondent has understood the question correctly (Trochim, 2006). The answers given by respondents are influenced by what information they can retrieve from memory. This factor is important in many other types of user studies, not only for questionnaires. Data from users with a lot of use experience of a product usually has a higher quality, i.e. less measurement error, than the data from users with less product experience (Engelbrektsson, 2004). Motivation and interest are two other important issues when discussing respondent behaviour. A motivated and committed respondent who actually thinks the questions over and wants to give accurate answers is more likely to do so than someone who is not (Couper, 2000; Groves 1989).

In the last decades, electronic surveys by e-mail and Internet have become frequently used in survey research (Plaisent et al., 2005). Their advantages include lower costs and higher speed (Couper, 2000) and a less difficult process when storing and analysing data (Dillman et al., 1999). The disadvantages are generally connected to nonobservation (sampling, coverage and nonresponse errors) (Couper 2000). The electronic mode gives researchers the possibility to increase interactivity and add multimedia content to a questionnaire. Studies which focus on the mode's possibilities to help elicit higher quality answers through affecting the respondents' interpretations, memory, judgements, estimates, honesty and motivation are rare (Couper, 2000).

2 Purpose

This paper demonstrates the functionality of an interactive digital questionnaire (IDQ) which was used in a large survey on long range bus travelling. The purpose is also to describe the potential of using IDQ´s in user studies, based on experiences from the project. In particular, the possibility to add multimedia content in electronic questionnaires is to be discussed.

3 Method

3.1 The project

In 2003, the largest bus operator and the largest bus manufacturer in Sweden were interested in peoples' requirements on future long-range bus travel. Together with researchers from Chalmers University of Technology, an IDQ (see "The IDQ" for a detailed description) was created and a survey carried out. The IDQ was distributed via advertisement in Swedish newspapers, flyers on travel agencies and gas stations as well as hyperlinks on Travel services on the Internet. The questionnaire was completed by 975 persons aged 16 and up, of which 65 % were men.

3.2 Complementary studies

Also three focus group interviews were carried out with altogether 19 participants (aged 18-62, 7 men and 12 women) in order to assess the respondents' impressions of the IDQ. The participants first answered both the IDQ and a traditional paper version of it which included the same questions although no consequence analyses accompanied them at all. Then the focus group discussions took place, exploring the contenders' experiences when completing the different questionnaires.

3.3 The IDQ

The questionnaire was stored on a cd-rom as an interactive multimedia application and was compiled as a journey by bus from Gothenburg to Stockholm. The respondents were to answer questions and choose between different alternatives in order to progress through the application. Depending on the choices made by the respondents, the ticket price changed accordingly (figure 1). If somebody for instance wanted a newspaper on their seat in the bus, the ticket price would immediately increase slightly. This way the economical consequences of the answers were shown to the respondents. The prices were calculated as realistic as possible with support from both the bus manufacturer and the bus operator. In some questions, the consequences of the respondents' choices were then not only shown by variations in the ticket price, but also graphically, i.e. when chosen a certain functions/service it immediately became visible in a picture describing the situation (figure 1). Some of the questions were followed by video sequences which were compiled according to the choices the respondent had made, i.e. if the respondents choose to check in their luggage, a video showed the course of events when checking in the luggage. These videos were usually followed by a question if the respondent would like to go back and change his/her answers if they were not happy with what they had seen. If they chose to do so, a different movie clip was compiled and played and then the possibility to go back and alter the answer was repeated.

Towards the end of the questionnaire, all the earlier answered questions were gathered for an improved overview (figure 2). Here the respondents had the option to adjust their answers once more as they observed the effect on the ticket price. Finally the

respondents had to answer one last question before the data were sent to the database. The question was: “Your journey’s price was xx.xx Swedish crowns. Was it worth this price?”

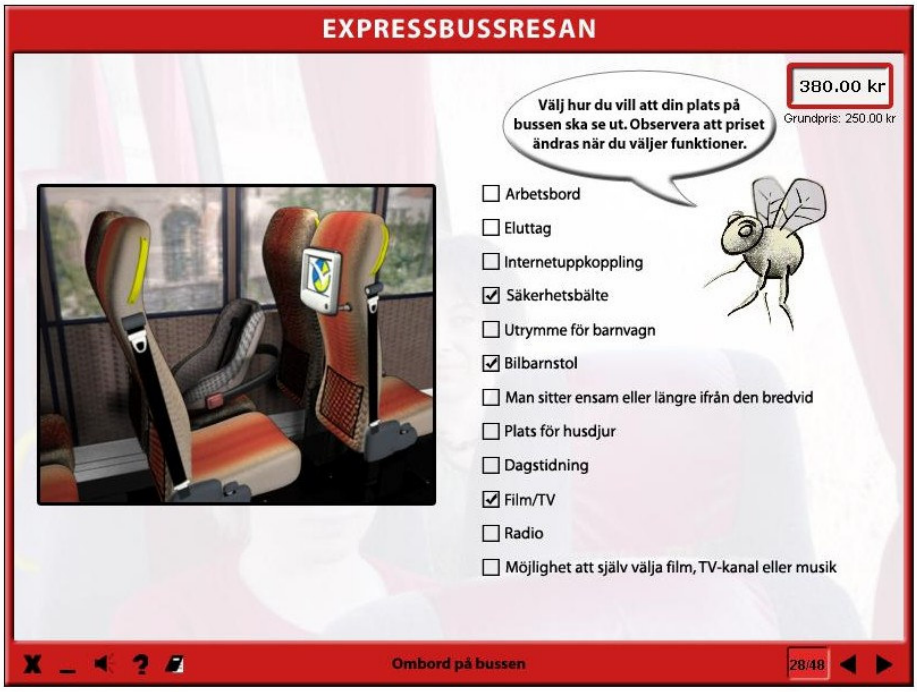

Figure 1: Example of a question with checkmark alternatives. When a square is checked the correspondent piece of equipment (such as the TV-screen and the safety seat) is immediately added to the picture on the left, and the ticket price in the top right corner is updated. The major part of the instructions and many of the questions were communicated to the respondent via an interactive agent, an animated mosquito.

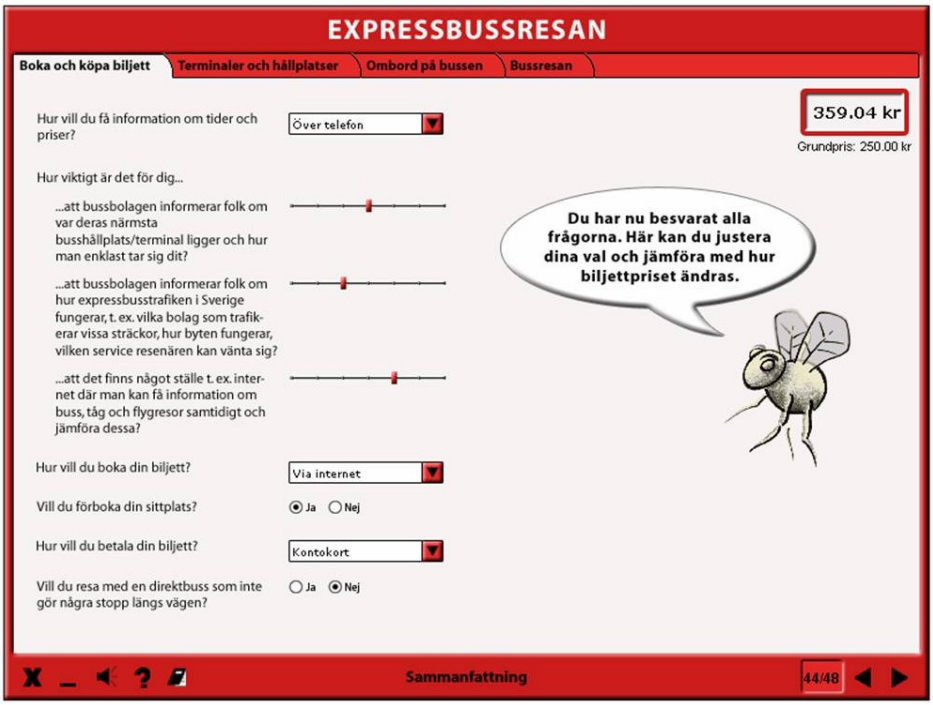

Figure 2: In the end of the questionnaire the respondent had the chance to modify all the answers given.

4 Results and discussion

4.1 Overall impressions

The participants in the focus groups were asked to write down 3-5 adjectives which they thought described the IDQ compared to its traditional counterpart (table 1). The IDQ was generally considered more fun, inspiring and aesthetically pleasing. Most of the negative adjectives were connected to the time consuming process of completing it. It seems like an IDQ can have a positive impact on respondents' motivation, at least if they already are committed to complete it (as the participant in the focus groups were).

Table 1: Adjectives from the focus groups. The numbers indicate how many participants that chose each word.

Compared to the paper questionnaire, the IDQ is more:		
Experience/emotions	***Interaction***	***Design/impression***
Amusing/Entertaining 10	Time consuming 7	Aesthetically pleasing 5
Engaging 5	Fast 2	Lively 3
Interesting 2	Complicated 2	Interactive 2
Inspiring	Easy (to fill out) 2	Ingenious
Elevating	Easy (to understand)	Believable
Frustrating	Demanding	Sexy
	Foreseeable	Childish
		Informative
		Flexible
		Dynamic
		Modern

4.2 Using Multimedia

One of the aims with the IDQ was to get higher quality answers by specifying the questions with the use of multimedia and continuously updated ticket prices. This did not work out very well. The respondent' had different views on what role the multimedia had in relation to the questions. Some considered the pictures and movie clips to be essential to the questions while others considered them to be more illustrative only. This had an effect on how they answered, and the researchers could not know under what considerations the respondents had given their answers. A number of pitfalls when including visual consequences into a questionnaire were identified in the study:

- The multimedia must match the question, otherwise the respondents will not know if they should answer the question or 'answer the multimedia'.
- The multimedia must match reality, otherwise the respondents will not know if they should base their answers on the multimedia or on 'real life'.
- The respondent (and the researchers) must understand what role the multimedia have in relation to the questions, otherwise they will not know if the multimedia

should be viewed as essential or as illustrative only.

4.3 Implications for user studies

The IDQ in this project took a lot of time to design and it was a very expensive way to carry out a survey. Besides that, the surveys quality when it comes to non-response related errors is rather poor. There is however some findings in this experiment that can be useful in the field of user studies and in the design process. The use of multimedia can surely be very efficient in surveys were the respondents is to judge certain products or situations. The multimedia can specify exactly what is to be judged, and respondent with little or no use experience could also answer. This can be useful in the design process especially, since the type of product under development may not exist yet. How users assess products is also very dependent on how much they cost. Here the inclusion of costs in a questionnaire may be of great help, and compared to directing and recording movie clips it does not have to be so expensive. Prices can quite easily be included in a web survey, for instance. Furthermore, the presentation of a continuously updated total ticket gives the IDQ another advantage compared to traditional questionnaires. It helps the respondents to assess the product more holistically. The total price serves as a 'boundary' which they can compare with competing products, unlike many Stated Preferences studies which only focuses the costs of specific details.

5 References

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Kommentarer på artikeln

Hej!

1) En mycket intressant artikel där jag har några kommentarer:
Generellt: Saknar metod och resultat, språket kan förbättras

2) *Abstract,* Försök få bättre flyt i texten och utnyttja de 100 orden som är tillåtna. Kolla årtal samt grammatik. Kommer ni fram till att ni fick mindre mätfel?
3) *Introduction,* Saknar här en definition på vad IDQ är samt en förklaring hur eller motivation till att använda detta för att förbättra mätfelen.
4) *The expressbussresan projekt,* Saknar avsnittet metod, är kanske expressbussresan och fokus-grupperna underavsnitt till metod? Saknar information om de 975 samt de 19 deltagande ålder, kön? Skulle också vara intressant att mer specifikt få vilken information om intryck man samlade in i fokus grupperna.
5) *The IDQ,* är detta resultat? Saknar avsnittet resultat. Det förefaller mig som att det första avsnittet i diskussionen 5.1 Using Multimedia, är resultat från fokusgrupperna?? Samt även de två första meningarna av 5.2? Mycket informativt och bra med figure 1 och 2.