Accessible Electronic Services on Digital TV

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ABSTRACT

This paper addresses issues related to interaction design of services on digital TV. Services that are in focus are typically based on electronic forms. The paper presents the implementation of accessible design of electronic forms on digital, interactive TV.

Keywords

Electronic forms, interaction design, universal design, digital TV

1. BACKGROUND

This paper is based on research in the projects Universal Design in Norwegian OSIRIS and UNIMOD (www.unimod.no). Both projects aim at developing universally designed user interfaces for people with disabilities. Our main focus is on functional cognitive disabilities which include deficits or difficulties with memory, literacy skills, attention or problem solving. The type of cognitive impairment can vary widely, from severe disability to inability to remember, or to the absence or impairment of specific cognitive functions [1, 2].

In order to demonstrate how to assist users with cognitive disabilities, accessibility principles based on universal design [3] have been applied on the 'New Tax Deduction Card Demonstrator' of the Norwegian Tax Authorities [4]. This service makes ordering a new tax deduction card possible on mobile phones or digital TV. (This is a service which is currently provided to all tax payers on the internet).

Based on the principles for universal design and the underlying guidelines, we have developed a set design guidelines for the management of service content on mobile devices and digital. Our design guidelines are organized into ten general categories of advice/guidelines, each contributing to the accessibility of the service through the user interface (UI). The guideline categories are 1. Navigation and work flow, 2. Errors, 3. Search and queries, 4. Input/output-techniques, 5. Time, 6. Text and language, 7. Voice and sound, 8. Graphics, 9. Figures and numbers, and 10. Help and information. An 11th category has been developed for digital TV alone. This category includes advice concerning the design and use of the remote control.

2. ELECTRONIC FORMS

Interaction between citizens and the public authorities, or between customers and suppliers of products and services, is usually performed by using forms for structuring the information. Case handling in very different contexts is profoundly based on forms. This is also true in the case of interactive services on digital TV. No matter which interactive service, an electronic form of some kind pops up on the screen.

There are many types of forms: survey forms, procedure forms, application forms, registration forms, and report forms are some examples. The term 'electronic form' can apply to both specific services and to simple input forms in connection with the use of an electronic service. Electronic forms usually have a structure consisting of sections, subsections and individual fields, just like forms on paper. These sections and subsections are either all on the same "page", i.e. the whole form is visible on a screen, or they are divided over a number of screens. There are four main types of digital forms: the word processor file, the Portable Document Format (PDF) file, the Web (HTML and/or other scripting program) and stand-alone software [5] (Ross, 2000). Forms on the web are either "freely" available (open to use for anyone and no authentication required) or only available after authentication. Forms in the latter group are found on web-portals for different types of communities and organisations, and in pure form/reporting systems, such as the Norwegian Altinn [6]. Services based on electronic forms are rapidly developing to be offered to the users on new technology platform, such as the mobile phone and digital TV.

'The New Tax Deduction Card Demonstrator' is an electronic form. The demonstrator has been implemented both on a mobile phone and on digital TV. The interface solutions are rather identical. This is also one of the main findings of the project: User interfaces and accessibility solutions in the context of electronic forms on mobile phones and digital TV resemble each other to a very great extent as far as information intensity and navigation are concerned. The remote control resembles a mobile phone, which makes many design guidelines applicable for both platforms. Appropriate use situations, and the suitability of services for each of the two platforms introduce the genuine differences.

3. EXAMPLES

Below, the 'The New Tax Deduction Card Demonstrator' on digital, interactive TV is shown through a number of screen-shots.
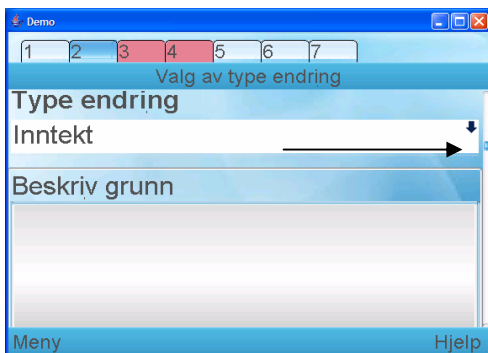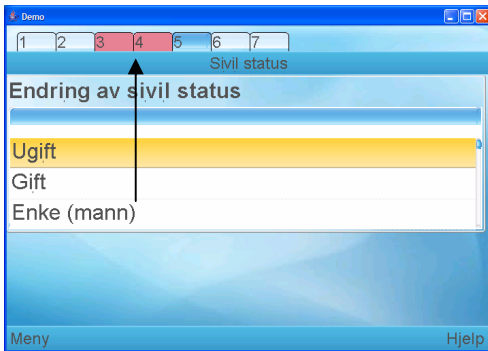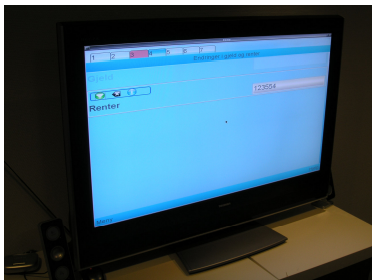

Fig. 1. Task cards and marking of the active card, i.e. the active task, in the task flow. Scroll bar showing the relative position.
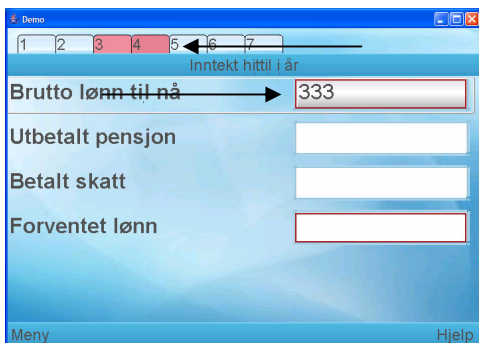

Fig. 2. Changes in the colour scheme indicate invalid input; input field containing '333' and cards number '3' and '4'.
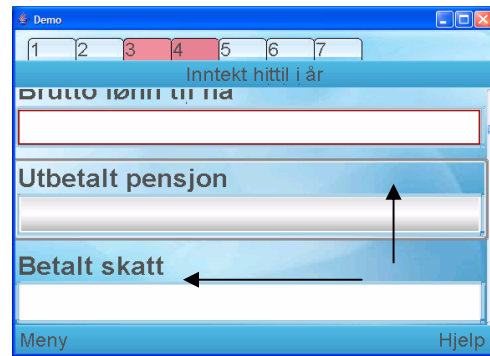

Fig. 4. Changes in the size of the font all over the user interface, or only in selected fields. Working area is accentuated by a frame.
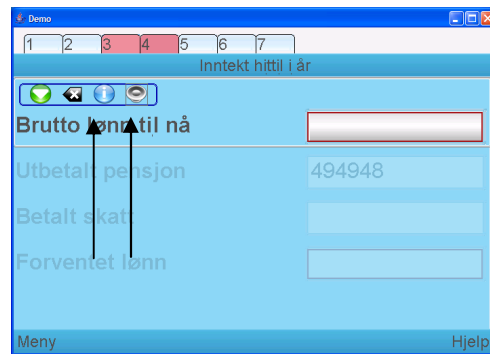

Fig. 4. Help texts can be read aloud. Menu and help functionality can be connected both to a physical key on the device, and to an easily operable screen button, as here.

4. CONCLUSION

The emerging self-service society is having a great impact on all citizens, customers and consumers. The self-service aspect is being enforced by societal reforms and national development programmes, helping for example disabled and elderly citizens to lead autonomous lives. Both groups of people are also becoming increasingly important users of digital media and digitised self services. Accessible design of electronic forms on digital TV is an important area of self-services.

REFERENCES

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