Requirement analysis and evaluation of interactive systems: approaches involving people with disabilities – Keynote Speech

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ABSTRACT

In User-centered design and participatory approaches, the requirements analysis and the evaluation of proposals and solutions are essential. Many methods can be used at different times in projects. It is possible to use them in the early stages, when the vision of the system is not yet clear; it may then be necessary to encourage and support ideation. Different types of methods can also be used on the basis of diagrams, mockups or prototypes. This can be the case for example in iterative approaches and agile projects. In addition, at the beginning of a project, it is possible to study one or more existing systems: this study will serve as a support for the analysis of the needs to move towards a new system or a new version. At the end of the project, the product can be evaluated in a usability (or UX) lab and/or in real contexts, before being used internally or marketed. There are therefore many situations requiring the use of various methods. The keynote will give an overview of the main categories of methods. More and more projects require the involvement of people with disabilities. A categorization of disabilities will be presented. The characteristics and needs of the people involved may require an adaptation of the methods used for requirements analysis and evaluation of interactive systems. The presentation will provide illustrations from different projects with various disabilities.

Author Keywords

Human-Centered-Design, requirement analysis, evaluation, people with disabilities, ecosystem, adaptation of methods, categorization of disabilities, disability awareness.

CCS CONCEPTS

• Human-centered computing → HCI design and evaluation methods • Accessibility

INTRODUCTION

In parallel with software engineering lifecycles, which allow different types of approach, from the most sequential to the most agile, user-centered design approaches are becoming increasingly important when an interactive system is targeted. The best-known approach is that proposed by ISO standard 9241-210 [2]. It can be based on several categories of methods that contribute particularly to requirement analysis and evaluation, allowing participatory approaches. Some of these categories have been proposed over the last thirty or forty years. They are gradually evolving, while taking into account the evolution of interactive technologies.

At the same time, the aim of more and more researchers and practitioners is to make it easier for everyone to use systems, access and contribute to information, services and knowledge. In relation to these different objectives, a range of human characteristics need to be taken into account, with particular reference to the different categories of disability [10], and the resulting needs. The links between disability and employment are also currently the subject of various studies and proposals.

FROM HUMAN-CENTERED DESIGN TO DISABLED USER & ECOSYSTEM CENTERED DESIGN

In the case of communication disorders arising from certain types of disability, conventional user-centered approaches prove insufficient, making it difficult for the disabled user to participate. In such cases, the involvement of the ecosystem or social environment of the disabled user is considered as very useful and even essential for the human-centered design of assistive technologies [5]. In [6], the authors explain that "the ecosystem actors involved in human-centered design processes are most often relatives (family and professional caregivers), associated therapists depending on the impairment (speech therapist, physiotherapist, occupational therapist, etc.) and people with professional expertise (doctor, specialized educators, teacher, etc.) depending on the assistive technology designed.". Examples from different projects, including different disabilities such as cerebral palsy, will be provided. New interest in ecosystem modeling stems from such work [6].

ADAPTING PROCESSES AND METHODS

The adaptation of methods for projects involving people with disabilities has been the subject of numerous studies. For example, in [1], the authors classify twelve methods into several categories (appropriate, needs modifications and adjustments, not recommended), according to four types of

disability, and also according to the age of the participants (children, elderly). User-centered design processes and adapted methods used for needs analysis and evaluation will be presented and discussed. These come from different projects involving different disabilities [3] [4] [8].

DISABILITY AWARENESS WITHIN COMPANIES

A current major challenge is to support integration, prevention of professional disintegration and job retention of people with disabilities. Sensitivity to disability in the workplace can be facilitated through various activities. For example, in [9], eight disability awareness activities are suggested, including: (1) organizing an inclusion day, (2) offering employees the opportunity to share their experiences, (3) providing key resources, (4) creating an accessibility map, (5) running workshops and training days, (6) organizing charity fundraising events, (7) offering staff workplace needs assessments, and (8) providing mental health awareness training sessions. We focus on activity number five by proposing a new approach. A serious game developed on an interactive RFID tabletop associated with tangible objects will be presented [7].

CONCLUSION

New methodological needs are emerging for projects involving people with disabilities. Their characteristics may require the direct involvement of actors from their ecosystem. This involvement may vary according to the stages of the user-centered approach used. Generally speaking, there is a wide range of methods that can be used in user-centered design approaches. However, they may be adapted to a greater or lesser extent depending on the category of disability targeted by the project (e.g. people with intellectual disabilities). Another major challenge is to raise awareness of disability issues within companies. New types of interactive systems can help in this respect.

This talk intends to discuss and exemplify such research ways. Research perspectives will also be considered.

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