Aiding Designers to Design for All: The IRIS Approach

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1. INTRODUCTION

Over the last few years, work on accessibility has created an increased awareness regarding the incorporation of requirements of people with special needs into systems designs. However the extent and impact of this work in Internet-based services has not yet been seen, for at least two reasons. Firstly, a large part of recommendations and guidelines regarding the accessibility of Internet-based services has been developed quite recently and thus has not been widely taken up in design and development. Secondly, most of this work has not been provided to designers and IT industry in a form that can enable them to easily include it to service designs.

IST-2000-26211 project IRIS (Incorporating Requirements of People with Special Needs or Impairments to Internet-based Systems and Services) is a recently started European project, which aims to design an architecture and develop and validate an environment which will aid designers to design for all. IRIS argues that design-for-all practical tools and methods need to be presented to designers, if possible as easily customisable software components, which will be, of course, generic in their design, in order to cover a wide range of requirements. This presentation overviews the basic concepts of the IRIS project.

2. IRIS OBJECTIVES

IRIS argues that design-for-all practical tools and methods need to be presented to designers, if possible as easily customisable software components, which will be, of course, generic in their design, in order to cover a wide range of requirements. The main objectives of the IRIS project are to:

- Encapsulate into a design aid environment, work on design-for-all tools and methods; user modelling theories and methods including users with special needs; guidelines, recommendations and results from work about hypermedia, enrolment and accessibility; and

- Use this environment to redesign and enhance existing services in the areas of teleworking / on-line learning and electronic commerce, guided by rigorous user testing and evaluation.

  More specifically, the operational goals of IRIS are to:

- Identify the suitability of a range of tools and methods, including metadata, for delivering media and alternating content formats relevant to multimodality in the service of accessibility;

- Elaborate models of user requirements, involving large and international groups of users with special needs, relevant to media and translate these models into technical characteristics of communication channels so that services may be configured to these characteristics;

- Specify, design and develop the information infrastructure (e.g. user models - profiles, content descriptions, alternating media capabilities, etc.) that is required to adapt delivering media and content to user preferences and characteristics, making use of relevant standards, based on state of the art directory services technologies, as part of the design aid environment;

- Specify, design and develop user centred techniques and mechanisms for adaptation of media and content to user preferences and characteristics, based on state of the art intelligent agent technologies, as part of the design aid environment;

- Further develop existing Internet services, based on the above findings and tools, in the selected areas of electronic commerce and teleworking / on-line learning, contributing to several Community Social Objectives

and Policies with focus and very specific impact on the social objective for "Employment" and improved "Quality of Life".

- Perform user evaluation and validation of the enhanced designs and services, involving large, international groups of users with special needs, which will enable IRIS to make the best use of their varying requirements and insight;

- Offer generic recommendations for enhancements of Internet-based services, addressing the IT professionals community, based on the above findings and experience;

- Disseminate the results of this work to appropriate fora, focusing on relevant standardisation activities including areas such as design-for-all, human factors, telecommunications and usability.

IRIS will focus on the enrolment and accessibility mechanisms of Internet-based services, especially in tools and methods for delivering media, content formats and metadata. User enrolment is key, since almost every commercial / interactive service available over the Internet, requires the user to go through a process of registering or enrolment and this process can be extremely complex in some applications, especially where the services provided are to be customised to the user abilities, preferences and constraints.

3. TECHNICAL APPROACH

The technical approach for the development of the design aid environment will be based on technologies and tools, which will be accessible from the WWW. This will enable all interested parties to directly access and use them. This section presents the basic clusters of the technical approach for the development of the IRIS components.

Specification of User Models taking into account Emerging Standards and Guidelines: A major issue in designing for all concerns the identification, modelling, specification and automated utilisation of user characteristics. Users are the most important entity of those that compose a computer-based information system, and their characteristics and activities should be the centre of system function and performance.

IRIS will take into account design for all methods, recommendations, results of relevant previous projects and insight provided by large groups of people with special needs to develop models of users (or deploy existing ones), which will incorporate the requirements related to human impairments. In parallel to employing recent advances in user modelling research, it is important to identify the suitability of relevant guidelines and standards, which can incorporate such research findings. In the areas of online, distance learning and electronic commerce, previous work involved the implementation, via directory services, of emerging specifications relative to personalised access to information and to the access to content in terms of ACTS GESTALT (Getting Education Systems Talking Across Leading Edge Technologies) project, and the implementation of intelligent software agents taking into account information filtering techniques in terms of ACTS GAIA (Generic Architecture for Information Availability) project. By studying correlations of advances of basic research to existing recommendations, IRIS will have formed a broad design space, where the aforementioned user models can be translated to a range of possible selections for the design of accessible services, which can pertain wide impact.

Generic Architecture for Active Design Aid and Implementation with State of the Art Technologies: The design support architecture will specify types of tasks for designers in order to ensure that they design for all; incorporate existing design-for-all methods and tools; introduce easily customisable and extensible tools to designers, e.g. for user modelling and user enrolment, to assist them design for accessibility of Internet services. The basic components of the design support architecture will be defined at the conceptual and functional levels within the duration of the project.

The technologies that will be used for the implementation of the design support architecture include Intelligent Software Agents and Directory Services regarding the management for active design support and the underlying metadata infrastructure respectively. Software agents will be employed in at least two distinct contexts: a) to dynamically manage multimodality and accessibility mechanisms during elicitation of user requirements for service usage and enrolment; and b) to assist designers in selecting appropriate recommendations for their service designs. Directory services platforms are robust and widely used in service designs where the underlying information infrastructure is key for the behaviour of systems.

Relevant previous work, carried out as part of the ESPRIT AMODEUS (Assaying Means Of Design Expression of Users and Systems) project, concerning the design and development of an active decision support system to assist designers in selecting appropriate methodologies and techniques for systems design will be also used for IRIS tool development.

Further Development of Existing Systems in the Sectors of Electronic Commerce and Telework / On-line Learning: IRIS will evaluate the work on user modelling and design support by applying this to Internet-based services in the selected areas of electronic commerce and telework / on-line learning. This will be achieved by further developing existing Internet services in these areas according to the above user modelling specifications and design support developments and evaluating the enhanced services. During the enhancement of existing services, IT designers will assess the support of the design aid environment and the extensibility and customisability of design for all tools. Designers will use those tools to assess the re-engineering effort for adding design for all properties to their software products, and to employ them directly to their developments.

5. CONCLUSIONS

Despite the fact that the principles of universal design and accessibility are well accepted, putting principles into practice is still problematic. For the efficient take up of this work it is important that research on design - for - all methods and tools is accommodated into a format that can be easily presented to and evaluated by the designers of electronic services.

The IRIS consortium will actively seek collaborators in the area of universal design and design for all in order to better accustom similar developments in the area, and ensure that IRIS results are validated by external experts.