DELOS Research Activity Proposal

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Abstract

In relation to the student exchange activity promoted by the Delos Network of Excellence on Digital Libraries, the following document contains a proposal for research activity to carry out during my visit to CWI.

Proposal

My research proposal concerns the exploration of user-adapted interfaces for the provision of digital library information through mobile devices.

The large diffusion of digital content of various formats and the parallel advent of mobile information access devices, give us the opportunity to explore an interesting and challenging context in which users can query and browse large repositories of heterogeneous information anytime, anywhere. While many benefits stemming from the convergence of such powerful innovations can be envisioned, we are still at a very early and immature stage where the question of how to effectively and efficiently present information to end users plays a key role. The aspects concerning interaction with mobile devices and services, and the influence of contextual information on it (such as: user's properties, device's functionalities, the characteristics of the surrounding ambient, etc.) require a thorough investigation. We need to understand what are the new needs rising from this new context and accordingly produce novel methods and techniques capable to improve the user's experience.

My proposal is to inspect how automatic or semi-automatic adaptive techniques can be employed to overcome the limits we encounter when accessing large repositories of digital information with devices with poor capabilities (e.g. small screen). The main objective is to understand how information about the user can be exploited to tailor the service around him/her and reduce the amount of information to be inputted and presented. This is particularly relevant considering that the main limitations of mobile devices derive from small screen size and limited input capabilities.

Specifically, we want to acquire information by means of explicit provision of information, recording of past interactions, and inference on collected data to:

- **Limit the amount of information to be inputted** – carefully selecting the necessary input requests to present (e.g. form fields), filtering out or giving low priority to rarely used input elements, and trying to figure out reasonable defaults to limit the amount of input that must be explicitly provided.
- **Limit the amount of information to be presented** - selecting library objects that are more relevant, according to the specific user profile, and deciding upon what data attributes to present for each retrieved element.

There are a large number of aspects to take into account and inspect in details while making these choices.

- **User information** – what wind of information do we need to enact the envisioned adaptations? Since we mainly want to modify the presentation in order to save screen space and limit explicit input, we must understand what information about the user can be exploited to fulfil our needs.
- **Acquisition of a user model** – how do we acquire the information we need? Given a specification of the kind of information we want to obtain, we must find clever strategies to acquire this information. Both explicit and implicit strategies can be employed, respectively facilitating the acquisition of a short-term and a long-term user model. The advantages and disadvantages of these strategies and their applicability in our context must be explored and validated.
- **Adaptation** – what do we adapt and how? Given a user model, we have to decide what elements of the interface must be adapted and what kind of adaptation we want to perform. We must choose what data elements and input facilities are relevant for the end user and what kind of adaptation to perform. Adaptation can happen filtering out irrelevant items, giving priority to some elements with respect to others, pre-filling form elements with often used values, etc.
- **Level of details and format** – what is the level of detail we want to use to present some items and what format do we use (e.g. audio, video, text)?

Along with all these issues, usability must also be taken into account. Automatic or semi-automatic adaptations are well known to be the cause of user's frustration and general sense of disorientation, therefore the solutions proposed should take care of this, providing strategies that let the user feel in control of the application and performing adaptations that are safe, appropriate, and predictable. Our investigation will take this aspect into account, examining the impact of the proposed methods on usability and searching for solutions where tasks are appropriately allocated to the system and to the user.