Design for appropriation of ubiquity in information systems

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Abstract. Computing and information systems have started to move out of the desktop and into the environment. Design requirements are no longer limited to the classical computer-user interface. Interactions are now expected to occur in a wider environment and in an invisible and more natural form. A large amount of research in various field of human – computer interaction has sought to address this evolution. Our research is aimed at helping this evolution by providing a comprehensive vision of the requirements for ubiquity. Once these requirements are more clearly defined, their diffusion and appropriation by researchers and professionals will be made easier. Providing user control is one of the fundamental requirements that we have identified. Computer-supported collaborative technologies are one of the tools available to offer user control, and therefore in the design of a ubiquitous user experience.

1 The search for Ubiquity

As computers become an integral part on most people's lives and provide support to an increased number of human activities, the computers and associated computing devices need to be tightly integrated into people's environment. Ubiquitous computing (Ubicomp), also known as pervasive computing, is the field of research interested in this relationship, seeking to bring a new vision to computers, networks and their applications (Weiser 1999).

Computing has reached a stage of maturity in terms of technology and therefore research should shift to improve the user experience associated to computing activities (Bellotti et al. 2002). This shift implies a complete reconsideration of the relationship between users and computing resources (Norman 1998). New practices and design principles needs to be defined to help the transition from the focus on pure technological improvements to an enhanced user experience of computing anywhere and anytime.

2 The parameters for ubiquity

This research has focused on three components of the ubiquity experience (privacy, context and adaptation) and identified general parameters supporting ubiquity in system and application design.

- **Choice and granularity**: users need to be provided with opportunity to make choices for themselves. The system or application should offer various levels of choices for opportunity to fine tune information disclosure, exchange and retrieval (Lederer 2003).
- **Memory:** users expect the system to remember about past, present and future interactions in an useful way (Salber et al. 1999)
- **Information filtering :** system should filter the information flow between the environment and the user as efficiently as possible (Herlocker et al. 2000)
- **Laws and norms (Kobsa 2001)**
- **User Control (Ackerman et al. 2001)**
- **Interactive learning:** the system will learn from users continuously and will provide users with learning opportunities as well. (Arnstein et al. 2002)

Computer-Supported Cooperative Work technologies have a big role to play in this evolution toward a ubiquitous user experience in information systems. Once the requirements to integrate successfully CSCW technologies in system are defined (Lemhachheche and Porter 2005) , these technologies could support the integration of all of these parameters in the design of successful information systems.

3 References

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