

# Mosaics of Visualization: An Approach to Embedded Interaction Through Identification Process

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**Abstract.** New forms of interaction are arising closer to the users and embedded in the intelligent environments. In this work we present a context-aware application through Radiofrequency Identification (RFID) offering services to the users in an implicit way. The only required interaction with the system is to wear a little device called tag (smart label). Some of these services such as location, presence, access or inventory are implicit in this technology. Another, more important for us, is the visualization service, we call “Mosaic of Visualization”. Our main goal is to link the easy interaction by means of the identification process, through RFID technology, with the presentation of information.

## 1 Introduction

Ambient Intelligence (AmI) has the vision that technology should adapt to the user's needs, solving daily activities without any extra interaction [1]. New challenges of computing arise. The traditional computer is distributed to a whole set of devices placed around us providing users with an intelligent background. AmI is based on three key technologies: Ubiquitous Computing integrating microprocessors into everyday objects. Ubiquitous Communication allows these objects to communicate with each other and with users. Finally, natural interfaces interacting with the environment in an easier and more personalized way.

However, for this vision to become a reality it is necessary to handle the context-aware information. Brooks considers some aspects that we shall now mention as being important: [2]: “who” (identity awareness) managing the user's profiles and the way that context differentiates them in order to attain appropriate behavior; “where” (location awareness) as the knowledge of the location of people and the objects that will carry out the tasks; “when” (time awareness) referring to the acquisition and maintenance of information about time and date, static schedules and the dynamism of the user's calendar; “what” (task awareness), focusing on what the user is doing, the task he is carrying out and all that he or she wants to achieve. Others propose new forms of interaction which are more natural and closer to the user. Albrecht Schmidt

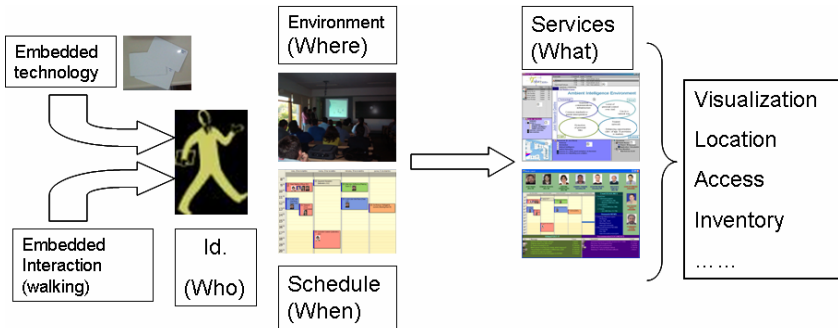
[3,4] proposes a definition of Implicit Human Interaction (iHCI): “*iHCI is the interaction of a human with the environment and with artefacts, which is aimed to accomplish a goal. Within this process the system acquires implicit input from the user and may present implicit output to the user*”. Schmidt also defines implicit input as user perceptions interacting with the physical environment. At this moment, the system can anticipate the user, offering services with explicit output. In addition this author defines embedded interaction in two terms. The first one embeds technologies into artefacts, devices and environments. The second one, on a conceptual level, is the embedding of interactions in user activities (tasks or actions) Schmidt et al [5].

In this work we propose the identification process as an implicit input. The system perceives the user identity, his profile and other kinds of dynamic data. This information complemented by the context in which the user is found, as well as the schedule and time, make it possible to anticipate the user’s actions. We try to solve the lack between implicit input by identification and the output through visualization of information

Under the next heading the “who model” by RFID is presented. In the section three a proposal for context-awareness by identification is studied. The next point presents our proposal of Context-Awareness Visualization-Based Services, called “Mosaics”. Then, two proposals putting into practice the visualization services is shown. Finally, conclusions are set out.

## 2 The “who” Model

People identification is a very good implicit input to the computer. The easy action of walking near an antenna allows the system to read and write information such as Id. Number, profile and other such items which are very useful, depending on the context where the users are. We have focused the context aspects mentioned before on the identification process [6, 7, 8]. We are therefore placing these concepts strategically in order to obtain visualization services for the users as seen in Figure 1.



**Fig. 1.** Context concepts through Identification

The user can also obtain typical identification services such as location, access, presence, inventory, phone call routing, etc. All of these are obtained with a combination