

A FRAME OF NFC RESOURCES FOR THE DEVELOPMENT OF UBIQUITOUS APPLICATIONS IN INTELLIGENT AMBIENTS



The aim of the MIDAS Project, supported by the Ministry of Science and Innovation (TIN2009-07814), is to carry out some studies and develop new tools for the strength and move forward of this NFC technology, proposing new models for the user interaction with the environment and building tools to support them and allow the set up of intelligent environments adapted to the different applications and user characteristics. RFID / NFC technology is considered as the trigger of the new development phase of the Information Society, mostly called Internet of Things (IoT), that will allow in a not very far future the development of the ambient intelligence systems (Aml) ideally thought some decades before. Those intelligent environment allow the user to interact with any surrounding object and to interchange with it services and information. The applications of this technology cannot be numbered. They are not only payment and ticketing applications, but also applications devoted to ease the social integration of people with diseases, elderly and handicapped ones; applications devoted to the tourism, identification and security, marketing and loyalty, teaching, health care, social networks, education, etc., are some of the several examples that can be proposed.

Therefore, we propose the definition of an ontology and a computational solution in order to provide to the Tags the capacity of offering complex functionalities and services. This ontology will allow the definition of contexts in different ambients, so, in each context, each Tag can offer several services, keeping the relationship with the other Tags in the context.

For the development of the ambients/contexts where the Tags offer complex services, we will define a proper structure for the information storage within the Tags, always making use of the standards available (NFC-Forum, MAD, etc.) and we will develop a tool for the projects and Tags generation management that will allow us the development of NFC applications for ambients where augmented objects with complex Tags might exist and interact among themselves.

We will carry out the proposal of a NFC interaction model, adequate to different types of scenarios, contexts and user's characteristics. A model that considers that the interaction could be conducted by the Tag (T2P), as well as by the user (P2T), giving to NFC the capacity of complex interactions and offering NFC the capacity of a "memory record" of the user interaction, based in a model where the Tags can be related among them within the environment and

context where they are placed. For all of this, we will carry out the design, model and development of a software solution for the management and handling of information in the mobile device, for its use in the interaction processes of the NFC applications in a safe way; with a consistent interaction with the storage elements of the secure element, that will shadow the complexity of the handling of the secure element in the communication/transfer process, and that will allow the exchange with storage services through the update/synchronization processes. Furthermore, in order to make the NFC applications in those ambients able to be oriented to users with different characteristics and capacities, we will design and develop high level procedures that will allow the use of media resources (voice/sound) of the NFC devices.

We will build a tool for the generation of interfaces adapted to different types of NFC applications with different ambients, characteristics, needs and user capacities. This tool will make use of the interaction model proposed in this project and will link the developed products. It will also generate the APIs needed for the swift development of MIDlets.

The last step will be the publication of the results in international journals and prestige congresses and the contact and collaboration with top companies and organizations in the NFC and mobile area.