
Smart-Object Services for Consumers

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Abstract

Auto-id technology, i.e. technology to uniquely identify real world objects, has drawn considerable interest from researchers in the past few years. While most projects are directed towards improving enabling technologies, such as RFID, or applications in closed-loop corporate environments, such as supply chain management, this thesis's focus lies on the use of auto-id technology for providing services to end-users. More precisely, the infrastructure that is needed to easily augment consumer goods with information services will be investigated and, as a result, a set of core software components will be implemented to facilitate the creation and deployment of such services.

Keywords

smart objects, tagging, infrastructure, architecture, law and economics, consumers, EPC Network

Problem Statement and Research Question

If we assume that it becomes common practice to bind information services to consumer products, it is obvious that there will be a need for a shared infrastructure to facilitate the creation of such services and avoid duplicate effort. This thesis thus aims at identifying infrastructure gaps and providing software components to fill them. Moreover, many of the scenarios on smart-object services have the potential to influence the value chains of suppliers, have an impact on market

structures, and give rise to controversial discussions among stakeholders. This thesis will thus also be concerned with the economic and social environment of future smart-object services.

Approach and Methodology

This thesis will start by describing and classifying a number of scenarios on how the value of physical objects can be enhanced by the offering of information services attached to them. These scenarios will be used to identify components that should be readily available in order to allow manufacturers to easily augment their products with information services. A software architecture will be proposed, implemented and validated by prototyping some scenarios. These activities will be accompanied by economic, social, and legal considerations, as it is a goal of this thesis to obtain a holistic view on application scenarios.

Related Work

EPCglobal [1] is currently the predominant standardization effort in the domain of software architectures for RFID systems and item-level tagging technologies in general. The architecture developed in this thesis should consider the relevant concepts proposed by the industry and, as far as possible, build upon them. Lessig [2] argues that software can have as much of an influence on the behaviour of people and society as a whole as law. This idea is a central motivation for this thesis to also study the economic and social environment of the technologies developed. Van Schewick [3] presents a framework to examine the merits of network neutrality. Since this thesis aims at designing an infrastructure that can potentially accommodate a broad range of services, issues of network neutrality play an important role.

Potential Cooperation

As this thesis seeks to take an interdisciplinary perspective, it would benefit from collaboration with researchers from the fields of both law and economics and sociology.

References

- [1] EPCglobal, EPCglobal Architecture Framework Version 1.0, 2005
- [2] Lawrence Lessig, Code and Other Laws of Cyberspace, Basic Books, Inc., New York, NY, USA, 1999
- [3] Barbara Van Schewick, Towards an Economic Framework for Network Neutrality Regulation, 33rd Research Conference on Communication, Information and Internet Policy (TPRC), Arlington, VA, USA, 2005