Prototypal Ambient Intelligence Framework for Assessment of Food Quality and Safety

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Abstract. The holistic view of Ambient Intelligence proposed by the European IST Committee [1] suggests to start with the creation of an Ambient Intelligence (AmI) landscape for seamless delivery of services and applications [14][6]. In this paper we show the efforts that have been made to realize the AmI vision in a very challenging test bed such as the fine grained, continuous quality monitoring and traceability across entire food-chains. We employed our ideas in the framework of the GoodFood Integrate Project (FP6-IST-1-508774-IP)[3] which aims at developing a new generation of analytical methods based on Micro and Nano Technology solutions for safety and quality assurance along the food chain in the agrofood industry. The project proposes an AmI GRID vision that involves Remote Data Acquisition (RDA) for gathering information over a sensed environment, a communication infrastructure transporting data across the actors of the framework and a software component (AmI Core) represented by a set of systems involved in storage, monitoring, intelligent analysis and presentation of the data. We concentrated on both the infrastructure and the AmI Core. Regarding the infrastructure, we worked on the definition of a protocol for interconnecting the "Ambient hemisphere" of AmI (RDA) with the "Intelligence hemisphere" (AmI Core) and we developed a highly scalable, loosely coupled and bus-based interconnection scheme for the AmI Core. The AmI Core has been then populated with software entities (AmIDevices), in charge of the storage, monitoring, intelligent analysis and presentation of data. Fundamental results have been obtained in the definition and development of seamless integrating components designed for the abstraction, automatic composition, interaction between the Ambient and the Intelligence, user-friendly human interaction, computational efficiency, scalability and evolution. These results will guarantee the integration int the AmI framework of computer aided Decision Support Systems designed as a management tool to assist the domain experts in the different food-chains to achieve their target levels of efficiency, quality and risk management.