1. Publishable summary

The goal of INSEMTIVES is to bridge the gap between human and computational intelligence in the current semantic content authoring R&D landscape. The project is producing methodologies, techniques and tools that enable the massive creation and feasible management of semantic content in order to facilitate the world-wide uptake of semantic technologies. In a nutshell, this is facilitated through principles and methods that capitalize on insights from organizational management theory, participatory design, and gamification to encourage and leverage user contributions, and seamlessly integrate them into machine-driven technology pipelines and tools. Application scenarios cover the full life cycle of semantic content management, including representative core technology extended into human computation features, and end-user tools and applications in knowledge management, online virtual worlds, and casual games.

In order to meet this challenging goal, INSEMTIVES brings together European excellence from eight European countries and several disciplines - computer scientists, software engineers, economists, social scientists and end-users to develop a generally applicable solution for large-scale semantic content authoring, which will be showcased in three case studies. The foundations therefore are guidelines and best practices that assist end-users in creating semantic content via incentives-minded applications and tools, and optimally combining these methodology-oriented efforts with automatic methods and techniques. The INSEMTIVES platform and a variety of front-end tools for knowledge elicitation and representation, as well as for semantic annotation of different media content build upon these foundations.

The technology is used in case studies targeting the management of enterprise knowledge, the annotation of Web services and APIs, and the management of multimedia in online worlds and games.

Review on 2011/2012 and outlook

The third year of INSEMTIVES was dedicated to the consolidation of the R&D results achieved, and their transfer and evaluation by the case studies. In this context, the consortium payed special attention to the elaboration of business models and strategies, and devised concrete plans for uptake by the industrial partners. Complementarily to these impact-oriented activities, INSEMTIVES continued its pioneering work in the area of human computation and its application to Semantic Web-related scenarios. A variety of crowdsourcing approaches and technologies are becoming ubiquitous in sectors as diverse as office productivity, open innovation, and marketing. In the same time, the underlying principles and insights are finding more and more adopters in core areas of ICT and intelligent data management; this is demonstrated not only by an increasing number of papers proposing methods and techniques to optimally use specific types of crowdsourcing in e.g., document summarization, translation, and image understanding, but also and foremost by a broader-reaching research trend which proposed hybrid architectures combining human and computational intelligence for query processing, machine learning and natural language processing. Throughout its operation, INSEMTIVES has been the main promoter and driver of this trend in the Semantic Web community. In the final phase of the project we continued these activities by investigating further directions of research and development, which resulted into prototypical technology, architectures and tools for Linked Data interlinking and query processing, as well as conceptual modeling (Prot g plugin). Our technology was further extended and customized towards the needs of the case study partners, and extended experiments have been carried out leading to empirically grounded guidelines for incentives-minded technology design. In parallel, we have released new end-user applications, in particular a new release of the L!NKS media annotation tool and a restaurant recommendation app for mobile devices.

Dissemination, exploitation and community building have improved at various levels, including an increasing number journal publications targeting all relevant research communities engaged in the project, a second tutorial at the International Semantic Web Conference ISWC2011, presentations at SemTech London and Berlin, and invited talks. Collaboration with the KSRI institute at KIT and IBM resulted in a joint workshop organized early 2012. Discussions with microtask platform providers such as CrowdFlower and clickworker opened new opportunities for incorporating results of the project into visible, real-world crowdsourcing technology.

INSEMTIVES has significantly contributed to the development of the crowdsourcing field in the Semantic Web community. Its core achievements and findings are just a first step towards the establishment of hybrid computational models in intelligent data management, which optimally combine automatic and human-driven functionality for different types of tasks, application sectors and user bases. The sustainability of these results is ensured through collaborations established during the project with independent organizations, academia as well as industry, and through the uptake by the case study partners. As a main line of research for the near future the consortium will further develop INSEMTIVES solutions and integrate them into Linked Data management technology and tools, which will be offered to the community in order to tackle tasks such as entity interlinking, data curation, and labeling.