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Advanced Infrastructure for Knowledge Based Services for Buildings Restoring

Reporting

Project Information

H-KNOW

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Final Report - H-KNOW (Advanced Infrastructure for Knowledge Based Services for Buildings Restoring)

Big construction organisations strive to stay on the bleeding edge of the today's global competition employing the latest Information and Communications Technology (ICT) tools, which allow them to streamline their works and stay competitive in the marketplace. Due to the 'innovation prone' nature of these companies, they are able to dedicate enough resources and capabilities to adopt expensive ICT existing solutions or even develop and customise their own tools. On the other hand, smaller construction companies, such as the Small and Medium Enterprises (SME) that comprise the majority of Europe's building industry, do not always count with enough resources to promptly adopt expensive knowledge management software systems that would allow an efficient performance of collaborative construction works. Additionally, the sub-sector working on restoration, retrofitting and maintenance of old buildings, which may belong to the Cultural Heritage objects, requires a special need to efficiently protect sensitive features in the buildings, such as, historical, social and usage value. These requirements urge this sub-sector to find an immediate and affordable way to get their in-house know-how managed. In this regard, H-KNOW project was motivated by the increasing number of complex works of rehabilitation of buildings that require a rapid and systematic access to specific knowledge. The project approach is to provide this sub-sector with innovative solutions that facilitate a promptly access to suitable competitive knowledge through building a business cooperative network among SMEs and Research & Technical Development (RTD) partners. Based on the identification of a business opportunity, this net-worked infrastructure enables the creation of a private collaborative space, which empowers their members to share knowledge regarding a specific construction industry project derived from that business opportunity. Summarising, the project developed technical solutions based on ICT that are affordable for the targeted SMEs, including knowledge sharing, collaboration management and training services for engineers.

The growing number of sophisticated works required in old building restoration, retrofitting and maintenance activities urgently requests an advanced, systematic and promptly access to the relevant knowledge. In the complex sector of restoration, there is a still a non-optimal information flow between the different actors taking a role in the processes, such as the final users of the building, the administration responsible for the works, the contractors, architects or SMEs involved in specific works. This situation becomes even more complex if multidisciplinarity is required (Archaeologists, Architects, Scientists, Sociologists, Engineers, etc). A highly promising approach to enable such an access, and to foster the advance of construction industry Small and Medium Enterprises towards the knowledge organisations paradigm, comprises the implementation of innovative forms of collaborative knowledge management and e-Learning services through the creation of novel business networks of Small and Medium Enterprises (SME) and Research & Technical Development (RTD) organisations. In this regard, H-KNOW project http://www.h-know.eu developed a software solution supported by a methodology suitable for "Small and Medium Enterprises", which includes innovative/competitive knowledge and training providing services surrounded by collaboration services.

H-KNOW project was a 36 months project that consisted of two phases. During the first half of the project (M1-M18), the focus was put on the investigation and review of State of the Art methods and tools relevant for their support in project concepts, the analysis of requirements in collaboration with the system end

users, the development of Business Cases scenarios, the specification of H-KNOW Ontology, Methodology and Software System, the Early Prototype development and the release of a revised version of the Plan for Using and Disseminating Foreground, which included, on the one hand, the dissemination activities performed to demonstrate the project impact within the European Community, and on the other hand, the identification of the exploitable foreground generated in the project and the plans for its future exploitation. At the beginning of the project, a public project website http://www.h-know.eu with internal communication functionalities was set up and a dissemination plan for the entire project duration was compiled. The first work package (M1-M6) was dedicated to User Requirements & ICT Concept. Four deliverables were produced, which included the State-of-the-Art and Requirements Analysis, the H-KNOW Concept and Public Concept as well as the detailed definition of the four Business Cases. During the next step (WP2, M7-M12) the H-KNOW methodology, ontology framework and ICT system, including Specification of the platform and MSI services and Specification of the KM and TEL services for the H-KNOW solution were specified. WP 3 (Implementation) started in M10, producing the Early Proto-type, which comprises a limited scope of services for KM and MSI, supported by a basic on-tology. In this regard, the identified Construction Industry domain knowledge was collected in order to create the specified H-KNOW ontologies. All activities were carried out in parallel with the methodology structuring and development, which supported the whole Early Proto-type implementation. Initial Knowledge Collection, Early Prototype Testing, as well as its assessment were carried out under WP4. In M18 the Early Prototype was finished and, based on the assessment of the Consortium, the Full Prototype and its supporting Methodology and Ontology was developed along with the refinement of the Exploitation Plans.

During the second half of the project (M18-M36), the focus was put on the Full Prototype development and its harmonisation with the supporting Methodology and Ontology. H-KNOW Full Prototype comprises the SoA - based H-KNOW platform integrated with the complete set of core services for network set-up (NSS), collaboration (MSI), e-Learning (TEL), knowledge management (KM), ontology and ontology services. Once the prototype and the supporting methodology were finalized (M27), H-KNOW partners collected extended knowledge so as to populate the Common Knowledge Repository and carry out, on the one hand, the Full Prototype Testing and Assessment activities, aimed at new functionalities and system characteristics verification and assessment, and on the other hand, the four business cases Demonstrators. These demonstration activities provided: feedback and recommendations collected from the end-users of the project for further platform improvements during the post-project exploitation phase, demonstration of software usability and how H-KNOW can be integrated in the daily operation, and market feedback and potential measurements with a perspective of further exploitation by the Exploitation Committee. Aligned with these development, testing and demonstration activities, a revised version of the PUDF was released at month 27, which included two Business models proposed by the H-KNOW partners. Based on the market feedback, the final version of the PUDF was released at month 36. This final version included the selection of one of the business models and the description of the initial marketing plans, specifically, identification of potential customers, promotional plans, pricing strategy, and financial plans. These marketing plans will be developed further on by the Exploitation Committee, constituted under the scope of the H-KNOW Exploitation Agreement, which will supersede the Consortium Agreement after the end of H-KNOW FP7 funded project. Some continued efforts were carried out in dissemination so as to demonstrate the project impact within the European Community. Thus, the dissemination activities were intensified during the second part of the project, and, in particular, during the demonstration of the Business Cases, where H-KNOW results were exhibited within the partners'

collaborative net-works and, eventually, brought to the related Construction Industry community.

H-KNOW project addresses the urgent need of the European Construction Industry, and particularly SMEs, for an ICT support to the establishment of knowledge and business communities dealing with old buildings maintenance/restoration activities. Keeping in mind the specific application for buildings restoring/maintenance and the fact that a huge amount of the related problems are tightly connected with environmental aspects, which are global, the expected results of the project are required by the EU as a whole, i.e. they are not only needed by certain countries or regions. The H-KNOW consortium provided complementarity of expertise and resources existing in different organisations and countries, and leveraged a fruitful exchange of experiences at EU level. Since one specific topic addressed by H-KNOW is to overcome problems connected with Cultural Heritage (CH) aspects in terms of provision of optimal restoration procedures, it is especially important and critical for Europe due to the high number of inventoried CH objects.

H-KNOW results will contribute to an increment of opportunities for development of communities where the restoration works will be executed, and thereby to the promotion of local/regional and common European identity. In addition, the more intensive restoration works will have a positive impact on employment. The results will also contribute to the improvement of the quality of life of SME employees in terms of higher training quality and facilitated knowledge access and deployment, and in terms of increment of motivation by providing fast and comfortable access to specific contents, which optimally fit their working/business objectives.

In principle, two exploitation ways have been foreseen. On the one hand, H-KNOW may be rented by an ICT provider as a service on-demand (SaaS) to a Construction Industry professional association, which would commercially exploit the platform contents and offer it to its associates. The association would behave as a hub for its associates and would be responsible for handling the daily operative of the H-KNOW Community and H-KNOW Collaborative Spaces, as well as feeding, updating, maintaining the contents and assuring their quality and assuring users' validation within the tool. On the other hand, a joint venture may be established for the commercialisation of H-KNOW. In both cases, the H-KNOW methodology would be implemented and adopted by the users via consultancy and a user's handbook.

It is obvious that one of the more common drawbacks of this type of collaborative services is the reluctance to share knowledge and, on the opposite, the need of motivation to populate the system, create a critical mass and achieve a fruitful level of use. On this sense, the consortium thinks there are several reasons by which users may find the needed motivation, the more relevant ones being: easiness to generate better and higher added value business opportunities by combining different expertise from partners in the H-KNOW Collaborative Space, as well as increasing the sources from where the opportunities may rise; feeding trust and reliability among the partners in the Collaborative Space creating a core of top level partners; possibility of reaching higher levels of knowledge by sharing knowledge from different actors, shifting the mind from competition to collaborating in adding value to the end customer.

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