MOBILE COMPUTING IN CONSTRUCTION

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EDITORIAL

Mobile technologies bring new potential to modern information society. Much research is focusing on detailed aspects or single facets of mobile computing, perhaps even too fast for papers to be published. As one technology overtakes another and technical solutions are undoubtedly becoming more consistent and reliable, it is more reasonable to concentrate on general concepts and problems of implanting mobile computing.

The A/E/C & FM domain is an excellent example for developing such general concepts of complex problem solutions because of its specific characteristics, such as field work, integration of various project partners, the high level of less formalized process specifications, etc. Mobile computing is the missing link to effectively use IT in an integrated and holistic way in construction – especially in the construction and operation phases of built artefacts.

However, the peculiar exclusive feature of mobile computing is not the technology itself, but the way of embedding it in our work processes and integrating it into the existing IT-environments. Effective usage of mobile technologies strongly depends on appropriate usage scenarios. Terms like mobile computing or ubiquitous computing reflect that space is inherently present. The aim of this kind of computing is the desire to transcend physical distance when accessing or manipulating information.

Before we continue with this hypothesis, let us define what exactly is meant by mobile computing. In our opinion, mobile computing consists of three major components:

1. **Computers which can be used indoors and outdoors while the user is in motion**
   This excludes conventional notebooks but includes tablet PCs and all kinds of pocket computers, palmtops and wearable computers.

2. **Networks with sufficient bandwidth which can be accessed while in motion**
   This certainly excludes wired networks but includes all kinds of wireless ones.

3. **Mobile applications supporting context-sensitivity and personalization,**
   which means supporting the work-process, being aware or making use of user location, responding to specific characteristics of mobile computers and wireless networks.

However, the potential of mobile computing has not yet been fully recognized. Therefore, mobile computing is not implanted on a broad basis by the construction industry, except in some rare cases. At first sight it looks as if mobile computing is just another information technology, with which some eager researchers are trying to push (or even force) the construction industry to change its traditional well established way of working. With this special issue of IT-Con we want to convince the reader about the very importance of mobile computing in construction.

The series of 10 papers are to lead the reader from "best-practice" examples to the methodologies of how to broadly implant specific mobile technologies towards the vision of further and broader usage of mobile technologies in the A/E/C & FM domain. The papers either directly prove the effectiveness of mobile computing in specific construction operations or show the high potential for the construction of some more sophisticated successors of the first generation of mobile technologies. The effects of mobile computing application concepts on a much higher level of collaboration by project or task team members are presented as well as the high

potential of mobile computing to trigger a quantum leap in the effective use of IT in the construction industry by improving its way of working.

None of the papers, however, addresses only a single aspect listed. We would prefer to speak about their major contributions than to try and classify them. The sequence of papers is therefore only an approximation to the aspects listed.

The first paper, *Feasibility Study of Field Force Automation in the Swedish Construction Sector* illustrates very well the potential of mobile computing in the AEC&FM-domain. The second paper, *Implementation and Control of Wireless Data Collection on Construction Site*, is an excellent case of "best practice". These papers are followed by some more technology-oriented ones with a strong impact on implementation in construction: *Mobile Ad-Hoc Communications in the AEC-Industry, Construction Sites Communications Towards the Integration of IP Telephony, Voice and Multimodal Technology for the Mobile Worker, Mobility Support for Video-Mediated Collaborative Teamwork*, and *Semantic Web-Based Services for Intelligent Mobile Construction Collaboration*.

The technology-oriented papers conclude with a paper entitled *Mobile Internet Enabled Sensors Using Mobile Phones as Access Network*. It describes a future vision and current research work in the area of sensors. These technical solutions might help in the future to collect data from mobile workers as well as from built artefacts, thus contributing to more efficient, and more precise usage of mobile systems as well as contributing to improved, more effective working scenarios in AEC&FM.

The last two papers develop an integrated approach and illustrate a way of integrating mobile computing systems into the current work processes and the existing IT-infrastructure. The paper entitled *Using Patterns and Templates to Support Mobile Computing in A/E/C* addresses the holistic approach whereas the paper *Effective Control of Unanticipated Events on-site: a Pragmatic Human Centred Problem Oriented Approach* more specifically addresses management and organisational problems.

We hope the selected papers will give the reader a good overview of recent research, stimulating further research, as well as encouraging those working in the construction industry to seriously think about applying mobile computing in their business environment.

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