

eWORK AND eBUSINESS

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1. INTRODUCTION

eWork and eBusiness contain the potential for wide-ranging changes to architecture, engineering and construction practice. We foresee a world where everything is available 24/7; where it is possible to access any service necessary for a project at any time; where problems can be solved through access to the relevant practitioners and their design tools whenever needed; where the design progresses across time-zones to provide faster and more comprehensive solutions. We foresee even more fluid partnering arrangements; where a project can identify partners from any geographic location who match the requirements and prior expertise for this project; where who you know is less important than what you can really do. We foresee the ability to identify the most suitable manufactured products and design solutions globally; where the project constraints and requirements are relayed to manufacturers and suppliers to propose new and innovative solutions; where the latest research is instantly at the fingertips of the practitioners. We foresee dramatic changes to current business processes; where the nature of the construction professional changes from that of brute labourers to skilled information professionals, manipulating information and materials as we would expect in professions such as medicine and biotechnology.

How close are we to these dreams? In this special issue we bring you ten papers that provide a broad overview of international research into eWork and eBusiness. These papers address a wide variety of issues central to ensuring the realisation of these dreams, from business process re-engineering through to specific services which showcase emerging functionalities. Shaaban et al study the patterns of interaction between practitioners and online resources. They highlight particular behaviours that are visible from users of an information system. This helps us understand what types of information system we need to build to satisfy the investigative modes of our practitioners. Meissner et al detail the EU funded COSMOS (CONstruction Site Mobile Operations Support) project. The benefits of high bandwidth connections between the construction site and construction office are explored. Case studies of motorway and railway construction sites are used to detail the extended functionalities supported by these linkages. Lima et al examine the development of the markup language bcXML from the EU funded project eConstruct. This markup language is used for business communication within the architecture, engineering and construction fields. The utility of this language is demonstrated through its use in a manufactured product catalogue which provides far greater functionality than current catalogues. Mangini and Pelli describe the type of functionality we may expect from small consultancy companies, in one of the outcomes of the EU funded eLegal and ISTforCE projects. Specialised consultancy services are made available through the Internet with a business model that enables a small firm to extend its market to all those wishing to work in their country and regulatory framework. Kazi and Charoenngam report on results from the EU funded projects GLOBEMEN and OSMOS, showing the interactions which can be supported for one-of-a-kind settings in a virtual enterprise. The authors consider specific scenarios of interaction which may occur between participants in such an enterprise. Sriprasert and Dawood introduce a new methodology called 'multi-constraint planning', which possesses five superior characteristics comprising: collaborative and multi-level planning; multi-constraint consideration; effective uncertainty handling; appropriate visual representation; and practicable optimisation. They aim to synchronise the two paradigms of strategy-pull and technology-push research and strive for a universal planning methodology and support tools that will be able to remedy the critical problem of separation of execution from planning in construction. Bäckblom et al present a case study on the use of document management systems in the Finnish construction industry. They present the results of empirical studies carried out during 2002 concerning the current usage of EDM systems. The studies employed three different methods in order to provide a multifaceted view of the problem area, both on the industry and individual project level. This study shows that the use of electronic document management is growing rapidly in the Finnish building

construction industry and becoming commonplace at least in bigger projects. Jain and Augenbroe report ongoing work exploring the role of electronic product catalogues in design management, and the new opportunities offered by e-commerce applications related to building product information in the construction industry. With the advent of e-catalogues and the ability to search for a product type across many of these catalogues, the number of product hits will greatly increase. This paper identifies the biggest challenge in scaling the service up to industry strength is the realization of a sufficiently large set of 'virtual experiments'. Finne presents a proposal for a multi-tier architecture for how service providers should structure their future information systems in order to meet the new demands they are facing. In particular, an information middleman's services should cover the whole life-span of the CFM process, since the same information stored in databases can be provided in different combinations for different purposes throughout the process, thus offering significant economics of scale. Katranuschkov et al highlight that while several research and development projects in the last decade have shown that product data technology (PDT) can successfully and beneficially replace the traditional document-centred approach to project realisation, actual PDT application in the A/E/C domain is still limited to CAD data exchange and some basic project-centred data management facilities. They propose that appropriate support of PDT environments by domain-specific ontologies can greatly improve their value-adding capabilities in construction project work, and that ontologies can hide most of the complexity of a product model from the end users and can pave the way for more user friendly interfaces.

Having read the ten papers in this special issue we hope that you have gained some insight into the potential of eWork and eBusiness within the architecture, engineering and construction industries. There is obviously much that needs to be progressed to fulfil the dreams we have for this area, but the research covered in this special issue points the way to this future.