



CIB NEWS ARTICLE

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CIB Priority Themes

Integrated Design Solutions

Conference Report on CIB IDS2009 – Improving Construction and Use through Integrated Design Solutions

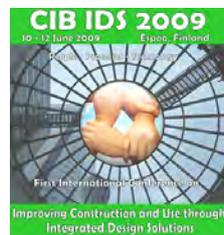
“Integrated Design Solutions use collaborative work processes and enhanced skills, with integrated data, information, and knowledge management to minimize structural and process inefficiencies and to enhance the value delivered during design, build, and operation, and across projects.”

by

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Overview

The first international conference of CIB's new Priority Theme: Integrated Design Solutions (IDS) took place on 10-12 June, 2009 in Espoo, Finland. It was held in the Otaniemi campus that was designed by Alvar Aalto in the 1950's, and continues to remain a "must visit" destination for tourists for both its architectural splendour, and numerous high-tech firms and organisations such as VTT Technical Research Centre of Finland, Nokia, Kone, Aalto University, etc.



The conference attracted forty five experts from twelve countries from Asia, Australia, Europe, and North America. They represented the views and expertise of industry (such as, Shimizu Corporation [Japan], Arup [UK], Skanska [Sweden], SRV [Finland], TEKLA [Finland], etc.) academia (such as, Stanford University [USA], University of Salford [UK], Kyoto University [Japan], the University of Auckland [New Zealand], Middle East Technical University [Turkey], Delft University [Netherlands], etc.) and research (such as, VTT Technical Research Centre of Finland, National Institute of Standards and Technologies [USA], CSTB [France], FIATECH [USA], SINTEF [Norway], etc.). They shared their research, ideas, and thoughts during themed sessions on: competence requirements for IDS, Utilisation of Building Information Models, Integrated Processes, Sustainability, and Beyond Building Information Models.

The conference featured technical sessions, interactive sessions and expert interviews, technology showcases and site visits, and ample time for social interaction.

Technical Sessions

The featured main themed technical sessions, and some key messages/topics from each, included:

Competence requirements for IDS: need for development of next generation teaching/training tools to support holistic understanding and systemic design of buildings; the role of knowledge within and across people, processes, and technologies; unified design will be made possible through a shift from multi-disciplinary to pan-disciplinary teams.



Utilisation of Building Information Models: BIMs as vehicles for simulation and virtual prototyping; BIM for supporting safety process on construction sites; use of BIM for location tracking of construction components; use of BIM to generate design alternatives and construction process sets.

Integrated Processes: knowledge sharing processes to supported integrated design and construction; identification and classification of challenges in integrated design; need to share processes across disciplines; using BIMs to structure and manage tasks on construction projects.

Sustainability: improving building design through parallel building and environmental costing; human thermal responses in energy-efficient buildings; environmental assessment of buildings;
Beyond Building Information Models: connecting structural buildings models to different construction classification systems; optimisation of construction planning through virtual prototyping and BIMs; integrated design systems for homes; BIM as a service offering; IT-based innovation in construction; construction automation for modular assembly.

Expert Interviews & Interactive Session

A series of interviews were held with twenty experts (spanning a combined 464 years of relevant experience) along with an open interactive session to identify some key problems and opportunities for IDS from people, process, and technology perspectives. The participants were also asked to provide their vision for IDS. Some key findings/messages are summarised in below overview of "The Problems" and "The Opportunities" as shown further on. This resulted in the definition of the following visions of construction in the future.

Visions

- Construction will be like manufacturing: very lean, very low defect, very efficient, very integrated from the materials to the final product, as the client gets it. Very digitally maintained, controlled and modelled
- The industry will be 30-50% industrialized construction
- True collaboration of distributed teams enabling system & service integration at all levels throughout the building life cycle
- Demanding customers define their needs together with professional designers. Designers give the well-analysed guidelines and parameters for construction processes. An effective supply-chain fulfils all technical requirements precisely by utilising shared information

Technology Showcases & Site Visits

The participants were provided with ample opportunities for learning and social interaction through technology showcases, and different site and social visits.



Technology showcases and demonstrations included virtual reality, augmented reality, and new IT-based service concepts for utilisation of BIM to improve quality, cost, time and safety. There were two site visits: at Nokia's Research labs participants were shown latest innovation innovations in wireless sensor technology for mobile navigation services within buildings; at the construction site of Helsinki's new music hall, the SRV Group introduced participants to the use of BIM on site and conducted a site tour.

Proceedings

The Proceedings of the Conference will appear in the VTT Symposium series later this year. The papers will also be made available in the ICONDA@CIBlibrary database.

Future of the IDS Priority Theme

One of the outcomes of the Conference was that having only "design" in the title does not sufficiently describe the whole issue. A small group of experts is currently drafting a White Paper on "Integrated Design and Delivery Solutions". The paper will elaborate further the visions and strategies discussed in the Conference. The paper will be soon available for comments by the CIB membership at large.

Discussions of the second international conference of the Priority Theme have also started. The event shall, most likely, take place in Northern America, but no decisions have been made yet.



Organisers and Sponsors

The IDS 2009 conference – Improving Construction and Use through Integrated Design Solutions was organised by the Finnish Association of Civil Engineers (RIL), and VTT Technical Research Centre of Finland, in collaboration with the International Council of Research and Innovation in Building and Construction (CIB).
 The conference and its activities were co-sponsored by NOKIA, SKANSKA, SRV Group, and TEKLA.



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The Problems		
<i>People</i>	<i>Process</i>	<i>Technology</i>
<ul style="list-style-type: none"> • Lack of motivation for change • Lack of communication and trust • Gap between education and industry requirements • Personal egos • Lack of holistic view • Islands of professions 	<ul style="list-style-type: none"> • No "why" behind process descriptions • Models not a basis for contracts • Service logic missing • Multiplicity of issues and interdependency of actors • Model ownership 	<ul style="list-style-type: none"> • Information exchange across disciplines • Existing standards and technology hinder interoperability • Excessive and unrealistic expectations • Islands of automation

The Opportunities		
<i>People</i>	<i>Process</i>	<i>Technology</i>
<ul style="list-style-type: none"> • Education by the people and for the people • Well trained, motivated, and skilled workforce • Current market recession provides opportunities for skill tune-up • Multidisciplinary, distributed teams collaborating across organizational boundaries 	<ul style="list-style-type: none"> • Process modularisation • Automation to allow concentration on what matters instead of routines • Focus on results not routines • Use of manufacturing knowledge • Common inter-organisational incentives • Shift from cost-driven process to value provision 	<ul style="list-style-type: none"> • Interfaces to standards • Technological penetration through demonstration of benefits • Solutions for learning from "models" • Multiple user type and context specific interfaces and solutions • Adaptation and not adoption • Creative use of technology