

# Digitally engineered built environment: the future is in information fusion

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Forum topics	<input type="checkbox"/> Energy in 21st Century	<input type="checkbox"/> Cultural Heritage in Digital World
	<input type="checkbox"/> Engineering Capacity Building	<input type="checkbox"/> Disaster Risk Management & Governance for Resilient Communities
	<input checked="" type="checkbox"/> Construction 4.0	<input checked="" type="checkbox"/> BIM Lifecycle, Facility & Asset Management

**Abstract:** (250 to 500 words: for each heading use the bullet points or narrative - the submission including graphics should not exceed one page)

Problems - Issues / Challenges-Needs	Decision making problems in engineering design and asset management may be characterized by two information mismanagement extremes: <ul style="list-style-type: none"> <li>Information loss: changes and insufficient information transfer between project phases, information systems, and active stakeholders</li> <li>Information overflow: the speed, ease of generation and inexpensive exchange of information result in huge volumes of information</li> </ul> Challenges that relate to the need to improve information management for informed engineering decision making in built environment are how to: <ul style="list-style-type: none"> <li>Identify, capture and make available critical information from digital and physical environments and remove barriers to intelligence</li> </ul>
Solutions - Methods / Results - Findings	Some methods and strategies to improvements using information systems and information models of environment, infrastructure and buildings are: <ul style="list-style-type: none"> <li>Action research, pilots and other participatory forms of professional and non-professional stakeholders of projects in built environment</li> <li>Synchronization of planning and design activities on multiple scales, professions, physical domains (water, land, infrastructure, buildings)</li> </ul> Sustainable and interoperable solutions leading to advanced digital built environment shall support: <ul style="list-style-type: none"> <li>Process-centered approach to management of information about relevant built asset and technology, along with involved stakeholders</li> <li>Standardization on the level of information and digitized material processes in the project context throughout the lifetime of built assets</li> <li>Integration, filtering and visualization of different types of information from different scales, phases, stakeholders' software and sensors</li> </ul>
Novelty - Value / Relevance to ...	<ul style="list-style-type: none"> <li>Advanced management of built environment by employing information fusion from multiple sources and forms for multiple stakeholders</li> <li>Live digital models reflecting the actual state of physical counterparts on multiple levels identifying possible risks and better utilization</li> <li>Professional and non-professional stakeholders that implement, learn and take advantage from the cyber-physical systems</li> </ul>
Forum statement	'Information fusion with feedback loop' within and between projects from physical and digital worlds are the core of digitally engineered environment

**Keywords:** (up to 5 keywords)

BIM cube, project information management; digital built environment; information fusion, cyber-physical systems

**Graphics:** (please use the gray area below for *representative graphics* or *graphical summary*; select the gray area below and paste your graphics)

