Collaborative Working: its effects on the AEC Organisation

Prof. Dino Bouchlaghem
Mark Shelbourn
Ozan Koseoglu
Bilge Erdogan
Fan Yang
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PIECC project

- Planning & Implementation of Effective Collaboration in Construction
  - [http://piecc.lboro.ac.uk/](http://piecc.lboro.ac.uk/)

- To investigate the business and project requirements for the planning and implementation of effective collaborative working in construction.
“…to develop a strategic decision making methodology that will guide organisations in the planning for effective collaborative working practices and the implementation of suitable tools and techniques…”
Project objectives

- Review state of the art in collaborative working
- Capture requirements for collaborative working in construction, and identify key areas for improvement
- Develop a methodology for the planning and implementation of effective collaborative working
- Test and validate the methodology
Collaborative Working Dimensions

BUSINESS strategy

TECHNOLOGY strategy

PEOPLE strategy
Collaboration Working key factors

all members agree on the collaboration objectives and priorities

leaders need to ensure that all key participants are consulted as to the practices and procedures to be employed in the collaboration

an agreement on those to be used, and how they are to be used

TIME AND RESOURCES allocated to enable all key participants to build relationships

for the project, that describe how the collaboration is to work on a day-to-day basis

standards and use of tools to be agreed by all key participants

VISION

TECHNOLOGIES

PROCESS ES

ENGAGEMENT

COMMUNICATION

TRUST

Business Strategy

Effective Collaboration

Technology Strategy

People Strategy

Dino Bouchlaghem

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Loughborough University
Business Dimension

- Culture
- Management structures
- Shared Vision
- Processes
- Protocols
- Management of Change
- Organisational boundaries (groups, departments, units)
People Dimension

- Build trust
- Engagement
- Transparency (processes and protocols)
- Motivation
- Foster knowledge sharing
Technological Dimension

- Flexible to support different processes
- User Friendly
- Adaptable to different needs
- Easily accessible for collaborative working
- Intelligent
- Supports learning
- Interoperable
Enabling Technologies

- Communication and Information/Knowledge management
- Advanced Visualisation Systems
- Grid
- Agent technology
Communication, Information/ KM management

- Network links:
  - LAN, WAN, VPN, Wireless
- Extranets
- Intranets
- Mobile Technologies
- Projects databases, Info. warehousing, KM systems
Advanced Visualisation Systems

‘The soul does not think without an image’ - Aristotle

- Need for shared views
- Technology convergence is enabling:
  - collaborative visualisation systems
  - shared simulation environments
  - group design
Grid Computing

- Grid Computing focuses on large-scale resource sharing, innovative applications and high performance computing;
- It provides the key infrastructure for distributed problem solving in dynamic data-intensive situations;
- Offers potential for the exploitation of large scale data sets and CPU-intensive applications in the construction sector (e.g. in emergency disaster response scenarios).
Agent Technologies

- Based on distributed Artificial Intelligence (AI)
- Agents ideal for large complex problems
  - distributed expertise
  - distributed collaboration
- Agents are core components of the Semantic Web and enable:
  - problem decomposition
  - system-system interaction/negotiation
  - integration with legacy systems
Needs & Requirements Capture

Methodology
Methodology

- Questions associated with organisational and collaborative working aspects
  - First instance
  - Concentrating on “decision makers” in the organisation

Analysis and reflection
Take lessons learned into second stage
Methodology

- Questions associated with project activities and ways of collaborative working
  - Second part
  - Concentrates on "project workers" in the organisation

Analysis
Add to first stage

Requirements for PI ECC
Methodology

- Identification of the main issues for a structured approach
- Can be used in a number of fora:
  - One-to-one interviews
  - Questionnaire
    - Over the phone
    - Completed individually / remotely
  - Subset are to be used in ‘workshop’ style events
Questionnaire contents

- Aim and introduction
- About you
- Organisational information & strategy
- IT strategy & implementation
- Collaborative working
- Any other information
- Shared vision
- Engagement of stakeholders
- Building trusting relationships
- Good communication
- Clearly defined processes
- Well integrated technologies
Planning and Implementation of Effective Collaboration within Construction

There is widespread recognition that the UK construction industry must embrace new and better ways of working if it is to remain competitive and meet the needs of its ever-demanding clients. Project delivery in construction is highly dependent on the effectiveness of the team put together to execute the project.

In many cases this is a function of how well members of the team work collaboratively and how effective the communications infrastructure used by the team is. Significant efforts have been invested in recent years to develop tools and techniques that enable distributed teams of professionals to work collaboratively. Some of these systems were able to improve some aspects of collaborative working but did not address the dynamics of construction organisations, projects, and processes sufficiently enough. The business and cultural environments within which collaboration takes place still remain important issues to be investigated.

Image adapted from: http://www.marcuswe.de/ajt/metodologie.html
Needs & Requirements Capture

Initial findings
Initial findings - 3 strategies
% of importance

- People: 42%
- Technology: 23%
- Business Processes & Procedures: 35%
Initial findings - 6 key factors
% of importance

- Communication: 23%
- Trust: 20%
- Process: 17%
- shared Vision: 17%
- Engagement: 15%
- Technology: 8%
Initial findings - 6 key factors

- COMMUNICATION
- TRUST
- PROCESSES & VISION
- Stakeholder ENGAGEMENT
- TECHNOLOGIES
Initial findings - essential factors for a protocol

- “...processes that enable participants to agree a common vision & priorities for the collaboration…”
- “...standards that facilitate interoperability between systems…”
- “...tools that measure business benefits of collaborative working…”
- “...procedures to promote trust in the collaboration…”
- “...a set of communication procedures that all stakeholders should use in the collaboration…”
Prototype framework

- A set of processes and protocols
- A list of resources to include:
  - Suitable technologies & techniques to collaborate
  - Organisational change considerations
  - Examples of good & poor practices from previous efforts
  - Others??

Feedback to next case
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Thank-you for listening

Any Questions?

PIECC