Use of Building Information Modelling in Responding to Low Carbon Construction Innovations: An Irish Perspective - Presentation

Barry McAuley
Technological University Dublin, barry.mcauley@tudublin.ie

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Use of Building Information Modelling in responding to Low Carbon Construction Innovations: An Irish Perspective

By
Barry McAuley, Dr. Alan Hore & Dr. Roger West

Presented by
Barry McAuley MSc, BSc (Hon), Dip.Eng
PhD Candidate, Dublin Institute of Technology
Ireland and the need for change

- Ireland - huge financial losses in the public works
- Reduce greenhouse gas emissions by up to 20%
- Public sector must own or rent only buildings with high energy-saving standards and
- Promote the conversion of existing buildings to "nearly zero" standards
- UK Low Carbon Construction Innovation and Growth Team Report
- BIM can be utilised on future and present public works projects in Ireland
Lit Review

- 46% of the CO² emissions and generates 40% of all man-made waste (Hallberg and Tarnardi, 2011)

- 74% of Western European BIM users report a positive perceived return on their overall investment in BIM (McGraw Hill, 2010)

- Over 25% of the survey participants views BIM as highly applicable for use in green retrofits (The McGraw–Hill Green BIM Report, 2010)

- BIM has the greatest potential to transform the habits and, eventually, the structure of the industry (UK Government’s Construction Client Group BIM Working Party Strategy Paper, 2011)

- In order for Ireland to create a similar framework to the UK there are a number of obstacle to be addressed in the form of both legal and technical categories (McAuley et al, 2012)
Methodology - RIAI / CITA BIM Workshop

• Raise awareness and promote a higher level of understanding of BIM

• Demonstrate a more effective way for teams to collaborate

• Assess / demonstrate some of the BIM software tools available

• Validate designs through digital analysis

• Test BIM technologies in responding to low carbon construction demands
RIAI / CITA BIM Workshop

– 2011 RIAI showcase of integrated and collaborative Working

- 3D BIM Model on Screen
- Laptops On Meeting Table (No Paper)
- Instant Access to Sophisticated Information and Analysis
- Digitally Recording Decisions in Real-Time

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Pilot Team and Process

- Leading design professionals from selected firms within the AEC/FM sector
- Consulting engineers, services engineers, architects, and consultants
- Additional support from contractors, QS's, technical support, FM support for handover documentation and BIM energy specialists

- Digital brief with the overall goal to design a BIM model of a standard generic DOES school
- Exploded down to its components
- Synchronised with a central server
Pilot Analysis

Generic School broken down to its core elements

Build the Base BIM Model ➤ “Explode” to Standard Components ➤ Prepare a New Design
Pilot Analysis

- Designers to create four mass models at different orientations and to perform exercises in concept energy analysis
- Calculate the energy usage for the year and so, therefore, assuming discounts rates, a life-cycle energy usage / cost could be generated
- CO2 emissions from electricity and fuel consumption for the analysed model, minus the renewable energy potential
- The energy analysis enabled a relatively easy calculation to be performed with regard to whole-life energy usage for all four design iterations
Pilot Analysis
Low Carbon Options

Figure 6: Mass Model 1

Figure 7: Mass Model 2

Figure 8: Mass Model 3

Figure 8: Mass Model 4
Findings

• BIM process permitted a different and more sustainable method of construction to be undertaken.

• Design changes best impacted the carbon output of the model.

• BIM enabled the designer to have the option to choose a carbon friendly design for the primary school.

• Still requires “an act of faith” for the Irish Government to fully embrace it.

• Reluctance to incorporate more change.
Ireland’s challenges

- Getting people up to speed and training is key
- Getting people to change mindset
- Irish Government to step up to the challenge
- Investment is needed by AEC businesses
- Need to utilise BIM champions with your organisation
- Interoperability of BIM products to be addressed
Major BIM Activities in Ireland

What major BIM activities ....

- Collaborative networking effort
- Gaining international interest
- Discussion on Key Topics/Obstacles
- Expert Opinion and Table Discussions
- Record & distributed outcomes back to Industry
- Promote/Communicate Industry Consensus & Joined-up Thinking

Construction IT Alliance
BIM WORKSHOP SERIES 2012

A series of workshop events designed to facilitate a high level discussion of the key stakeholders on the immediate obstacles to the implementation of building information modelling in Ireland. Specifically the workshops are designed to assist in:
- Facilitating the general adoption of BIM in Ireland,
- Disseminating best practice and application of BIM in a variety of direct and indirect construction related work processes,
- Facilitating a consistent and co-ordinated message back to industry in how to best implement building information modelling in Ireland.

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What major BIM activities .......

CITA | Construction IT Alliance
BIM | Building Information Modelling | Ireland’s Opportunity

Presentation To
GCCC | Government Construction Contracts Committee

Wednesday 2nd May 2012

Presentation by:

Dr. Alan V Hore
Executive Director, Construction IT Alliance

Ralph Montague
Director, Arcadox
Co-Ordinator CITA LinkedIn Group

Accompanied by:

John McGowan
Director, Construction IT Alliance

Barry McAuley
Phd Student
Dit Bolton Street

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CITA BIM Survey 2012

Should Ireland follow the UK in mandating BIM
- Yes: 62.2%
- Neither Yes or No: 27.0%
- No: 10.8%

Can BIM help Ireland reach its Carbon Targets
- BIM is the answer: 45.9%
- BIM can play a significant role: 29.7%
- I am undecided: 12.2%
- BIM can play a minor role: 8.1%
- BIM has no role: 4.1%

BIM as FM Tool in Managing the Government Estate
- BIM can be a crucial FM tool: 31%
- BIM can be a significant FM tool: 36%
- I am undecided: 22%
- BIM can be a minor FM tool: 5%
- BIM has no role to play: 4%

BIM Importance in 5 years Time
- No importance: 24%
- Low importance: 31%
- Moderate importance: 5%
- High importance: 4%
- Very High importance: 5%

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Thank You!