

4th CitA BIM Gathering 26th September 2019, Galway, Ireland.



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Presentation Chapters

- 1. Introduction
- 2. Background
- 3. Methodology
- 4. Outcomes
- 5. Discussion and Findings
- 6. Conclusion



1. Introduction

Dissertation Hypothesis:

"The creation of a partnership and encouraging both the academic and administrative support areas of an Irish Higher Education Institute to collaborate to successfully adopt and implement Building Information Modelling can lead to improvements in existing teaching methods and support services." The Adoption of Building Information Modelling Through the Creation of a Partnership to Improve Teaching Methods and Administrative Support Services within a Higher Education Institution in Ireland

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- 1. Introduction (contd.)
- To investigate the current state of adoption of BIM both academically and in the administration/management of built assets and infrastructure
- To explore the challenges, barriers, risks and benefits of adopting BIM in academic and administrative areas
- To examine the potential for academic and administrative support areas to create a partnership to successfully adopt and implement BIM and to investigate if this can be mutually beneficial
- To assess if the successful adoption of BIM in an Irish HEI could lead to improvements in both constituencies, namely teaching and research and delivery of capital infrastructure and essential support services





1. Introduction (contd.)

What is a "Knowledge Transfer Partnership"?

A knowledge transfer partnership (KTP) is an undertaking between a HEI and a private company to share knowledge to assist with industry development.





1. Introduction (contd.)



Roadmap to Digital Transition

For Ireland's Construction Industry 2018-2021

RECOMMENDATION 3:

Develop a consistent, seamless and coherent digital experience for students in Irish education and industry to help grow industry capacity and maturity in the use of BIM and other innovative technologies.

RECOMMENDATION 4:

Support a public-sector BIM adoption mandate that will facilitate the implementation of Government policy objectives in the procurement of public works projects, in their construction and in their maintenance upon completion.

Source: National BIM Council

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NATIONAL BIM COUNCIL

Roadmap to Digital Transition

2. Background

For Ireland's Construction Industry 2018-2021





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2. Background (contd.)





Source: AECOM

CURRENT TRENDS IN SUPPLY AND DEMAND FOR SKILLS IN THE ECONOMY

The National Skills Bulletin¹⁷ highlights current skills demand by occupation. A review of the Skills Bulletin for each of the four years 2012-2015 highlights the following key trends:

- There are skills shortages for Professionals and Associate Professionals across sectors in areas of ICT, Science and Engineering.
- The shortage of ICT talent is potentially significant for a number of sectors where ICT skills are needed (e.g. Software, Data Analytics, Financial Services, Distribution).

Source: Dept. of Education and Skills



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2. Background (contd.)

Skills shortage and lack of expertise





Source: CIAT

Source: NBS National BIM Report 2019

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2. Background (contd.)	Intellectual Property Rights		Location/Isolation
li I	mproved Co-ordination	Lack of Skilled Staff	Reduced Waste
BIM Adoption for	Lack of a Clear Stra	tegy Disruption	
Industry and Academia:	Increased Productivity		Graduate Employabilty
	Contracto High (Quality Learning Enviro	nments Legal
Barriers	Staffing Shortage	Changing Estal	
Benefits	Future Skill Requirements	Space Shortage	Implementation Costs
	Copyrights	Improved Efficiency	Resistance to Change
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3. Methodology

Research Roadmap

- Structure
- Approach
- Stages



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- 3. Methodology (contd.)
- Secondary Research Literature Review



Primary Research – Online Survey Questionnaire

and Semi-Structured Interviews



Trends









4. Outcomes







4. Outcomes (contd.)





4. Outcomes (contd.)

Q. Do you think that there is a need for BIM adoption within any area of a HEI? (for example, to improve teaching and research or the design, construction and operation of built assets etc.)



Q. If a HEI adopted BIM what do you think it could be used for? (please select as many as you think are appropriate)



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4. Outcomes (contd.)

BIM Adoption for Industry and Academia:

- Challenges
- Barriers
- Risks
- Benefits

Q. Is there a BIM implementation strategy (BIS) to support BIM adoption and implementation within any area of your HEI?



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4. Outcomes (contd.)

BIM Adoption for Industry and Academia:

- Challenges
- Barriers
- Risks
- Benefits

Q. Do you think the estates management/administrative support area and appropriate academic areas of a HEI could benefit significantly were they to adopt BIM to fulfil their relevant functions?



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4. Outcomes (contd.)

BIM Adoption for Industry and Academia:

- Challenges
- Barriers
- Risks
- Benefits



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4. Outcomes (contd.)

Responses indicated that levels of BIM adoption in academic areas (66%) and estates management/administrative support areas (55%) was relevantly high. There is some evidence of collaboration between both areas, however, BIM adoption is happening in isolation and opportunities to form partnerships are not being fully explored within HEIs in Ireland Q. Have the academic and estates management/administrative support areas of your HEI collaborated to form a partnership for BIM adoption in order to enable both areas to benefit from it?



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4. Outcomes (contd.)

Responses gathered show that 66% of respondents were of the opinion that existing BIM expertise within their HEI could be used to form a BIM adoption knowledge transfer partnership (KTP) to benefit both the academic and estates management/administrative support areas. Results showed that BIM expertise was spread evenly amongst both areas of HEIs in Ireland, this suggests that a partnership of this kind could be possible to support BIM adoption Q. If there was BIM expertise already available within a HEI do you think this could be used to form a BIM adoption knowledge transfer partnership (KTP) to benefit both the academic and estates management/administrative support areas?







5. Discussion and Findings

The Extent of BIM Adoption Within HEIs in Ireland

- While the academic areas of HEIs in Ireland are adopting BIM for teaching and research purposes (NBC 2017), there is a lack of evidence to show that the administrative support areas of Irish HEIs are following suit
- Irish HEIs have required that BIM be used on large capital projects BICP (2016), although there was a lack of evidence BIM was being used for operational functions, instead, choosing to use BIM for the design and construction phases of large capital projects only





5. Discussion and Findings (contd.)

The Business Case for a HEI in Ireland to Adopt BIM

 It is clear from the research undertaken there are benefits to be realised from the adoption of BIM within HEIs in Ireland, but there also significant challenges, barriers and risks that will need to be overcome





5. Discussion and Findings (contd.)

Creating a Partnership to Improve Relevant HEI Functions

- Evidence from research undertaken suggests that existing BIM expertise within HEIs could be used to form a BIM adoption KTP to benefit both areas
- BIM expertise was spread evenly amongst both areas of HEIs in Ireland, this suggests that a collaborative KTP of could be possible for BIM adoption with HEIs in Ireland
- NUIG and Carleton University's 'DCI' project are evidence of the existence of living lab spaces and the collaborative use of data-rich information for academic and operational

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6. Conclusion

- Research has established the need for Irish HEIs to adopt BIM to improve relevant teaching, research and operational functions
- Benefits from BIM adoption could be realised if a strategy is in place to support this. Equally, any challenges or barriers that
 may exist can also be addressed with the use of a strategy to help to reduce or remove these
- A collaborative knowledge transfer partnership (KTP) and a strategic plan, to identify and communicates clear benefits to be gained by moving away from inefficient traditional paper-based process to smart digital technologies should be developed to support BIM adoption within HEIs in Ireland





6. Conclusion

Carleton University as a living lab: where research (and teaching) and operations meet



Liam O'Brien, Ph.D., P.Eng. Associate Professor, Civil & Environmental Engineering PI, Human Building Interaction Laboratory Carleton University





Source: Carleton University Digitial Campus Innovation

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6. Conclusion



Figure 6.3 NUIG New Engineering Building (NEB). Source: Jamie Goggins (NUIG)



Figure 6.4 NUIG New Engineering Building (NEB) Aim of Project Flow Diagram. Source: Jamie Goggins (NUIG)

Source: NUIG (New Engineering Building)

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6. Conclusion (contd.)

- TCD academics now have full access to the Trinity Business School (TBS) BMS and BIM model and plan to install wireless sensors to measure temperature, humidy the building to add to TCD's (FM) Point-of-Entry (POE) data
- MSc student working with engineers and architects on the E3 capital development project BIM process and model (prior to Stage 2b)
- No attempt at a KTP yet, but potential exists for a future case study



Source: TCD/STW Architects

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6. Conclusion (contd.)

DCU Campus Masterplan DCU Glasnevin Campus Future Tech Building DCU Glasnevin Campus Student Residences

DCU's digital campus vision provides an opportunity for DCU's Estates Office to form a collaborative partnership with academia through data-rich models of new buildings and the integration of existing buildings and infrastructure asset information for use in operations, teaching and research

DCU's Strategic Plan 2017-2022

4.3 Digital Campus Implement our Digital Campus Vision to establish an integrated, digitallyconnected university through an advanced network of connected infrastructure, digital platforms and people. Strategic Goal 4 (Objective 4.3) TALENT, DISCOVERY, AND TRANSFORMATION Strategic Plan 8.2 Sustainable Embed Sustainability as a key driver in 2017 - 2022 Operations DCU operations including building management, energy, water, CO emissions, transportation, operational resilience, public realm spaces and in the construction of new buildings. The new challenges facing DCU in operating a decentralised campus will have to be taken into account here.

Strategic Goal 8 (Objective 8.2)

Source: DCU

SMART DCU

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6. Conclusion







Source: Taylor Architects (DCU SPD Block F)/ Coady Architects (DCU GLA Student Residences)

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Thank you