

# Gathering



Does Ireland need a Small  
BIM (sBIM) Standard ?

Jonathan Reinhardt MCIAT, MSc. BIM, BSc. Arch. Tech.  
Diatec - Technical Consultant  
TUD - Part-Time Lecturer

## - *Work in progress...*

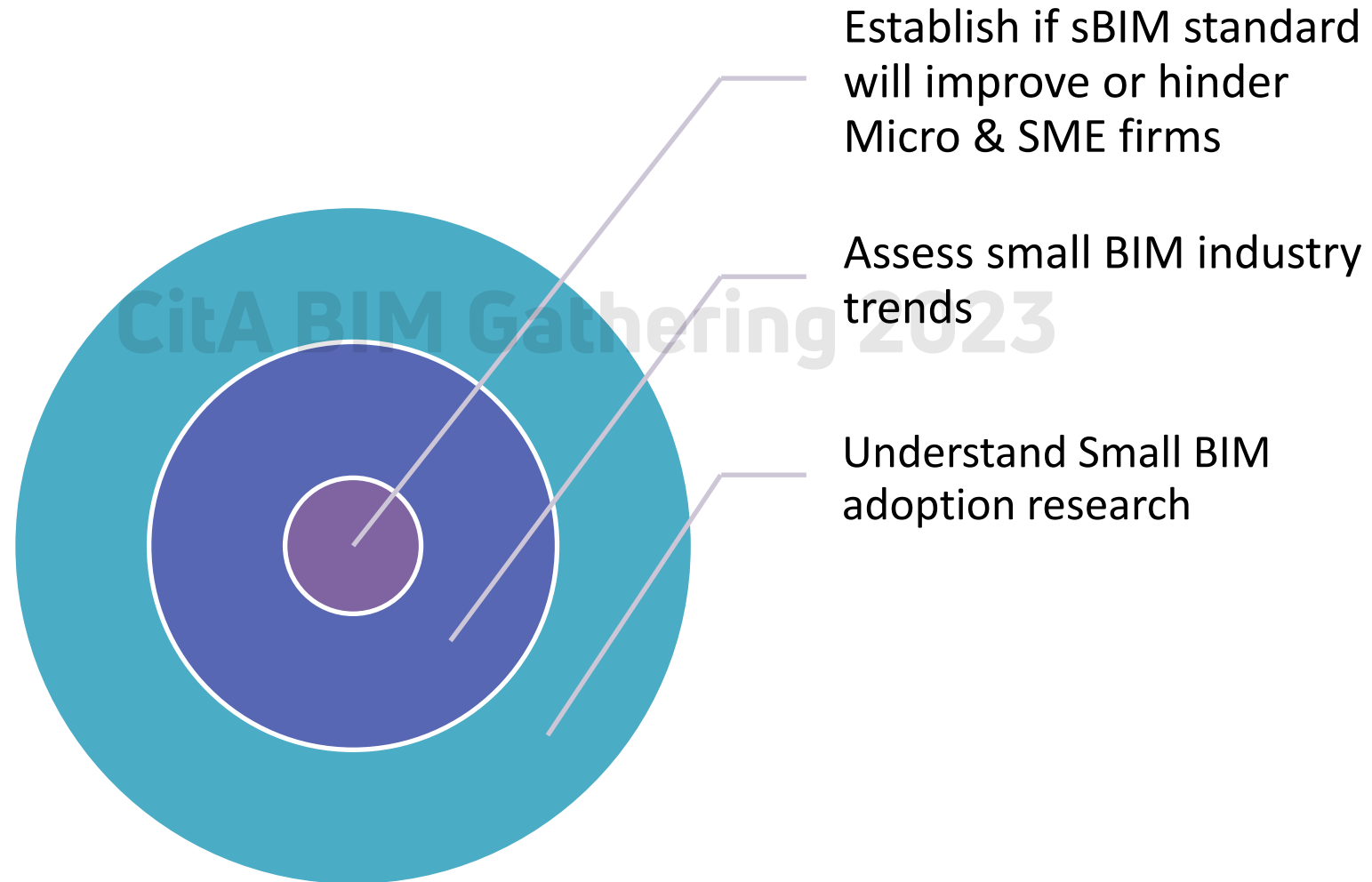
- Initial review stage of Small BIM Implementation
- Review of academic & published research literature
- Qualitative Analysis of literature
- Commencement of 4 x Case Study projects

## Further Stages

- Quantitative analysis & case study ROI Small BIM
- Will a Small BIM Standard improve or hinder Small Firms?

Gathering23





# Gathering23

Accelerating BIM adoption

CitA BIM Gathering 2023

## Literature Review

Summary

# Establishing the Key Pillars of Innovation Required to Execute a Successful BIM Strategy Within a Construction SME in Ireland

Authors - Carroll, P. and McAuley, B. (2017)

Jonathan Reinhardt MCIAT  
MSc. BIM., BSc. Arch. Tech. (Hons)

BIM Barriers Access to Finance, Cultural Change, Poor communication, technology adoption, lack of skills, construction coordination, standards & legislation.

The research established that the productivity gains associated with BIM can be realised by both larger and small enterprises

If BIM forms a fundamental part of this business model then it can assist in breaking down these barriers by encouraging collaboration between stakeholders

potential to increase consumer expectations, greater exposure to larger and more profitable projects and to clients that they otherwise wouldn't have had access to

## Gathering23

### Reference

Carroll, P. and McAuley, B. (2017) Establishing the key pillars of innovation required to execute a successful BIM strategy within a Construction SME in Ireland , Proceedings of the 3rd CitA BIM Gathering, Dublin, 23rd - 24th November, 2017.

# Multi-criteria analysis of barriers to building information modeling (BIM) adoption for SMEs in New Zealand construction industry (2022)

Jonathan Reinhardt MCIAT  
MSc. BIM., BSc. Arch. Tech. (Hons)

Primary focus should be training of local market (particularly SMEs)

an SME with a lack of knowledge around the benefits of BIM will also lack an understanding of how they can adapt to new, more efficient procedures

more publicity with examples of BIM utilization from the perspective of SMEs needs to be accomplished

caution recommended to ensure all company sizes have access to the required skills and support

Gathering23

Reference

Hall, A.T., Durdyev, S., Koc, K., Ekmekcioglu, O. and Tupenaite, L. (2022), "Multi-criteria analysis of barriers to building information modeling (BIM) adoption for SMEs in New Zealand construction industry", Engineering, Construction and Architectural Management, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/ECAM-03-2022-0215>

*Table 1:*

	⌞
Motivation	35
Knowledge	26
Cooperation	34
Software	20
Skills	33
Costs	18

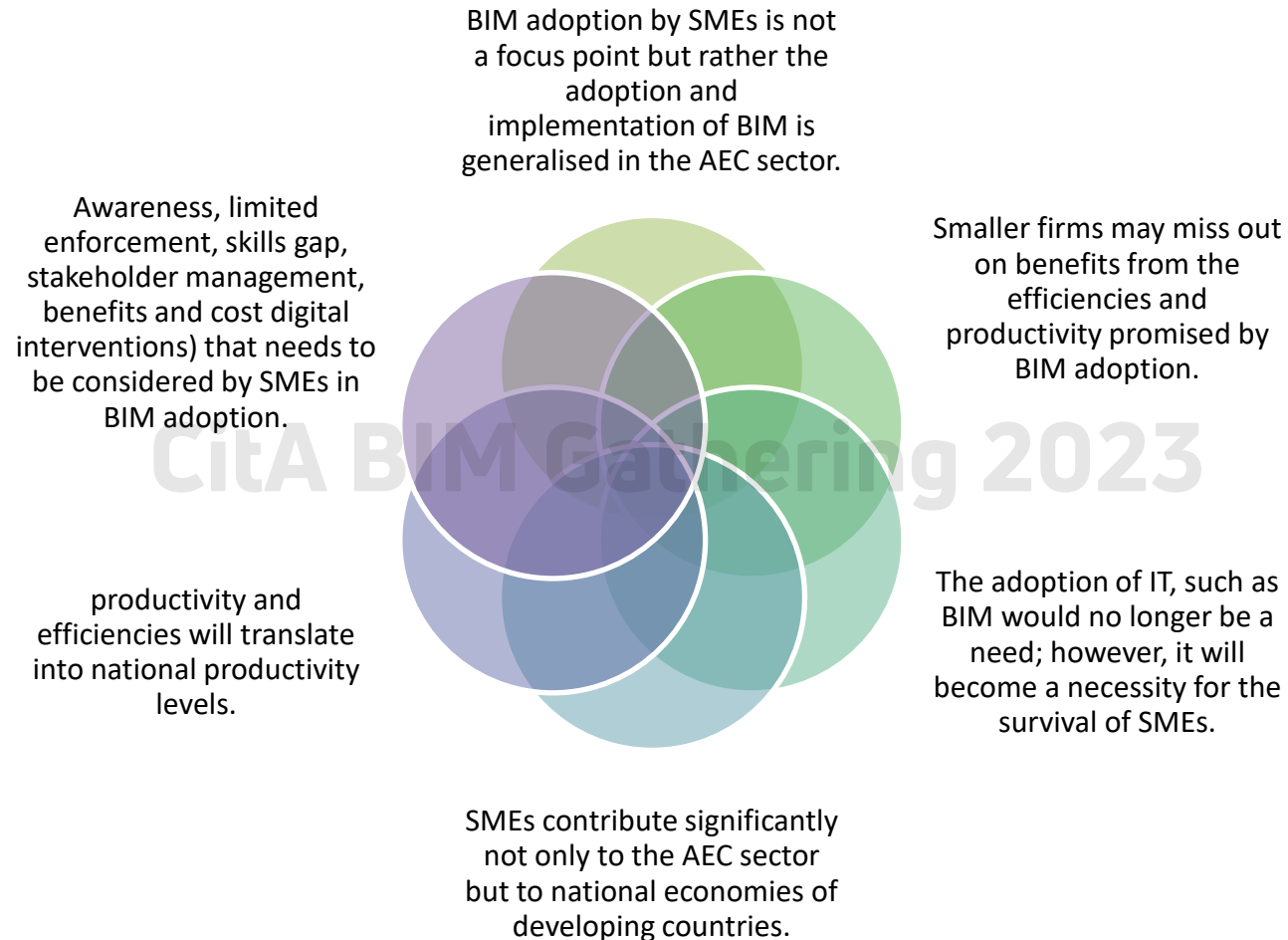
CitA BIM Gathering 2023

*Reference - Makowski, P. et al. Table 1*

Gathering23

# Scientometric analysis of BIM adoption by SMEs in the architecture, construction and engineering sector (2022) Makabate et al.

Jonathan Reinhardt MCIAT  
MSc. BIM., BSc. Arch. Tech. (Hons)



## Gathering23

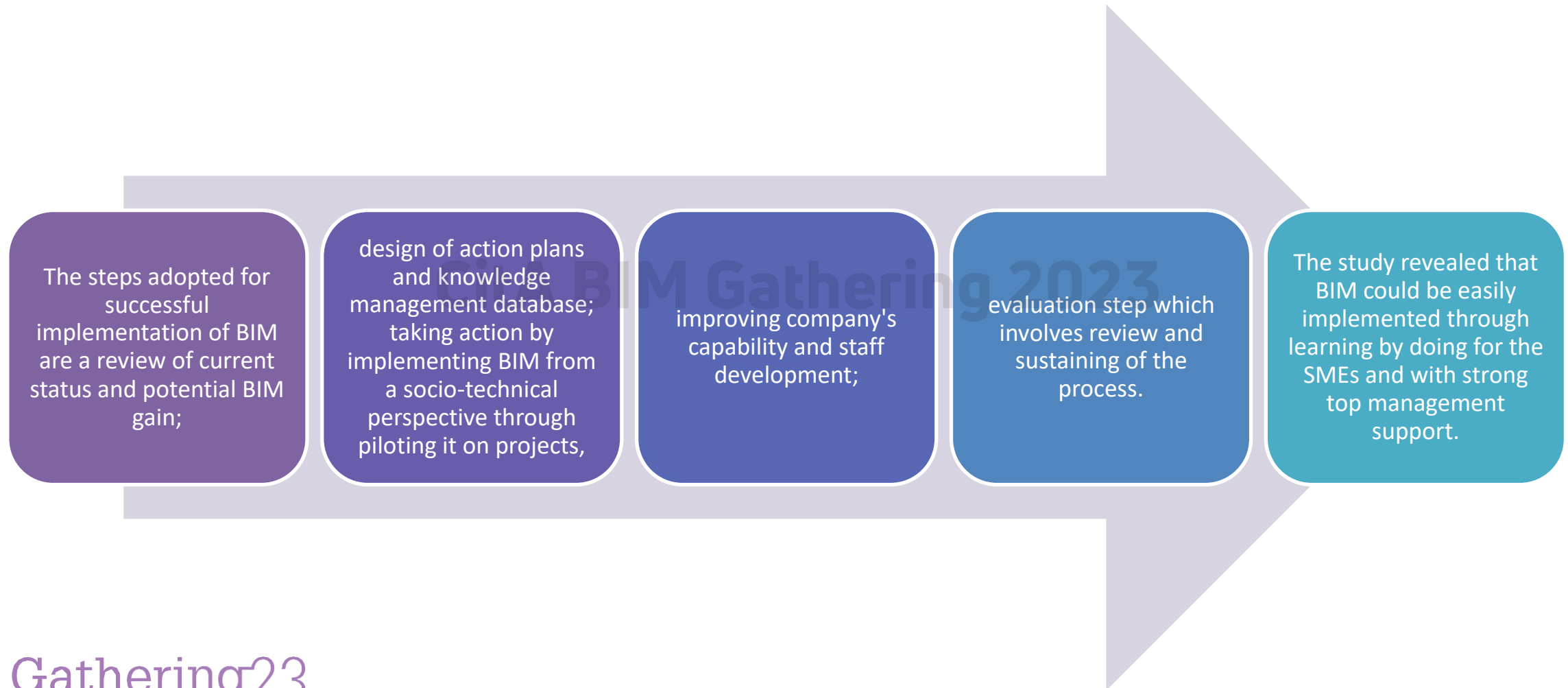
Reference

Makabate, C.T., Musonda, I., Okoro, C.S. and Chileshe, N. (2022), "Scientometric analysis of BIM adoption by SMEs in the architecture, construction and engineering sector", Engineering, Construction and Architectural Management, Vol. 29 No. 1, pp. 179-203. <https://doi.org/10.1108/ECAM-02-2020-0139>



# Adoption and implementation of building information modelling (BIM) in small and medium-sized enterprises (SMEs): a review and conceptualization

Jonathan Reinhardt MCIAT  
MSc. BIM., BSc. Arch. Tech. (Hons)



Gathering23

Reference –

Adoption and implementation of building information modelling (BIM) in small and medium-sized enterprises (SMEs): a review and conceptualization Saka, Abdullahi B.;Chan, Daniel W.M.Engineering, construction, and architectural management, 16 Jul 2021, Vol. ahead-of-print, Issue ahead-of-print, pages 1829 - 1862

# BIM Framework for Small Home Building Businesses (2018) Garcia et al

Jonathan Reinhardt MCIAT  
MSc. BIM., BSc. Arch. Tech. (Hons)

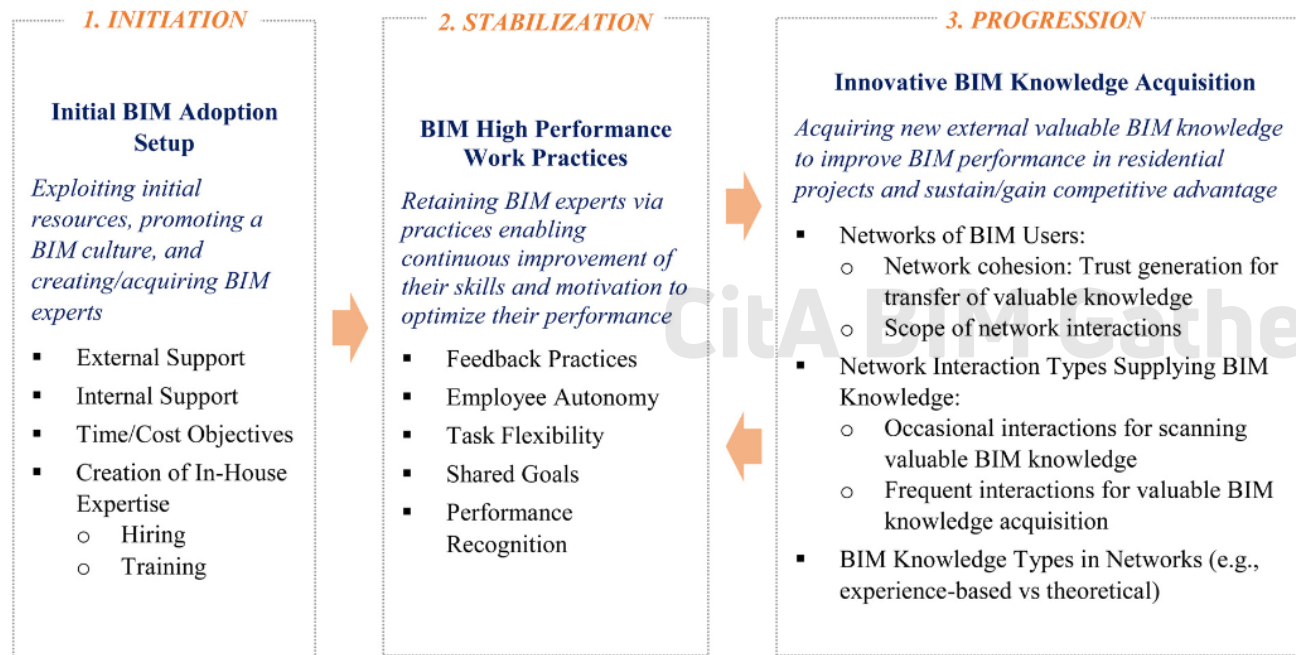


Fig. 1. Framework for effective BIM implementation in small home-building businesses

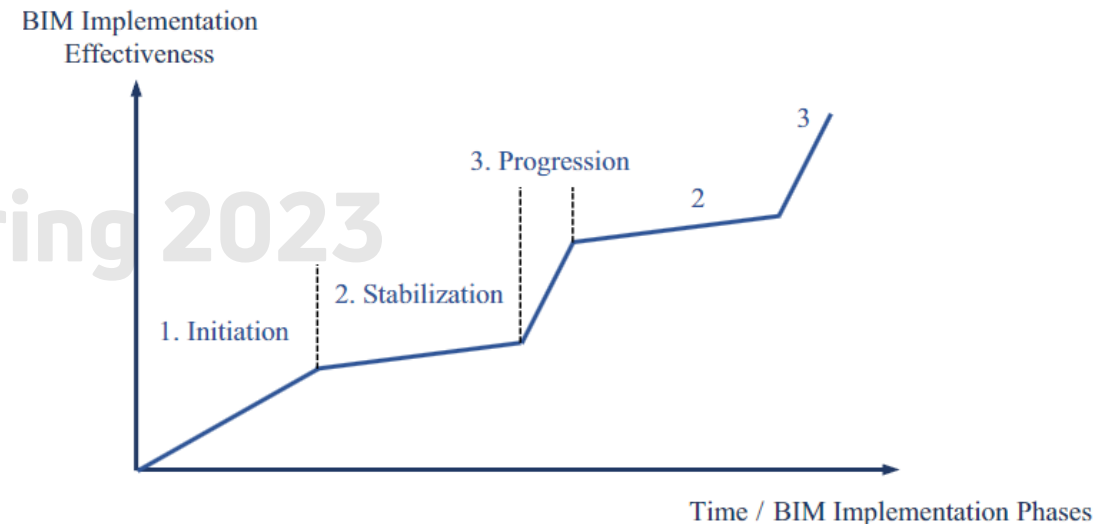


Fig. 3. Phases and effectiveness of BIM implementation

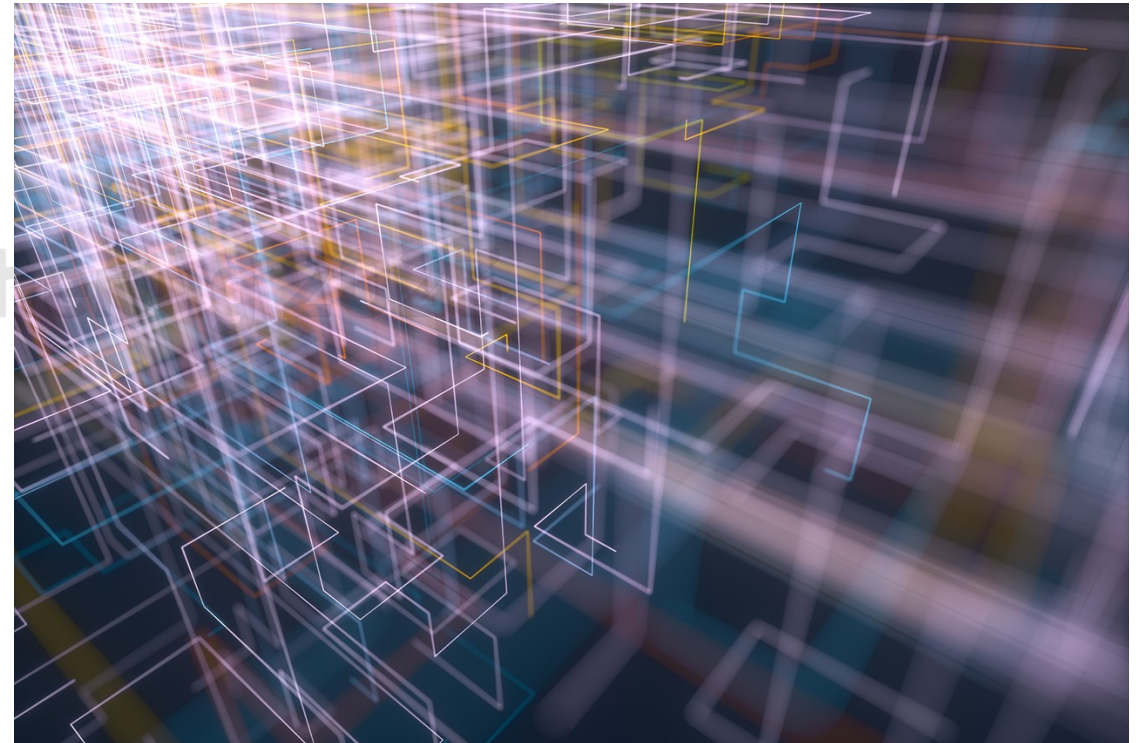
Gathering23

# An integrated model of BIM return on investment for Australian small- and medium-sized enterprises (SMEs)

Jonathan Reinhardt MCIAT  
MSc. BIM., BSc. Arch. Tech. (Hons)

Findings reveal that a lack of reliable quantification methods for the ROI factors associated with BIM significantly affects the organisation's commitments to implement BIM.

CitA BIM Gath



Gathering23

## Reference

[Sompolgrunk, A.](#), [Banihashemi, S.](#), [Hosseini, M.R.](#), [Golzad, H.](#) and [Hajirasouli, A.](#) (2023), "An integrated model of BIM return on investment for Australian small- and medium-sized enterprises (SMEs)", *Engineering, Construction and Architectural Management*, Vol. 30 No. 5, pp. 2048-2074. <https://doi.org/10.1108/ECAM-09-2021-0839>

- A lack of research into small BIM adoption
- Cost of technology & investment is a common barrier
- BIM knowledge gap in staff
- Return on Investment calculation prior to Implementation improves adoption
- Cumulative small wins across value chain brings greatest efficiencies

Gathering23



# Gathering23

Accelerating BIM adoption

CitA BIM Gathering 2023

## Small BIM in Industry

# RIAI BIM Pack 2 BIM Guide for SMEs

Jonathan Reinhardt MCIAT  
MSc. BIM., BSc. Arch. Tech. (Hons)

<https://www.riai.ie/uploads/files/general-files/RIAI BIM Guide for SMEs.pdf>

Smaller Scale	Medium scale	Large Scale
Sole Practitioner	Sole Practitioner – SME	SME – Large Practice
Low Level of Coordination	Medium Level of Coordination	High Level of Coordination
One individual executes many roles	Multiple individuals for different roles	Multiple individuals for different roles
Standardised process recommended	Standardised process recommended	Requirement for standardised process

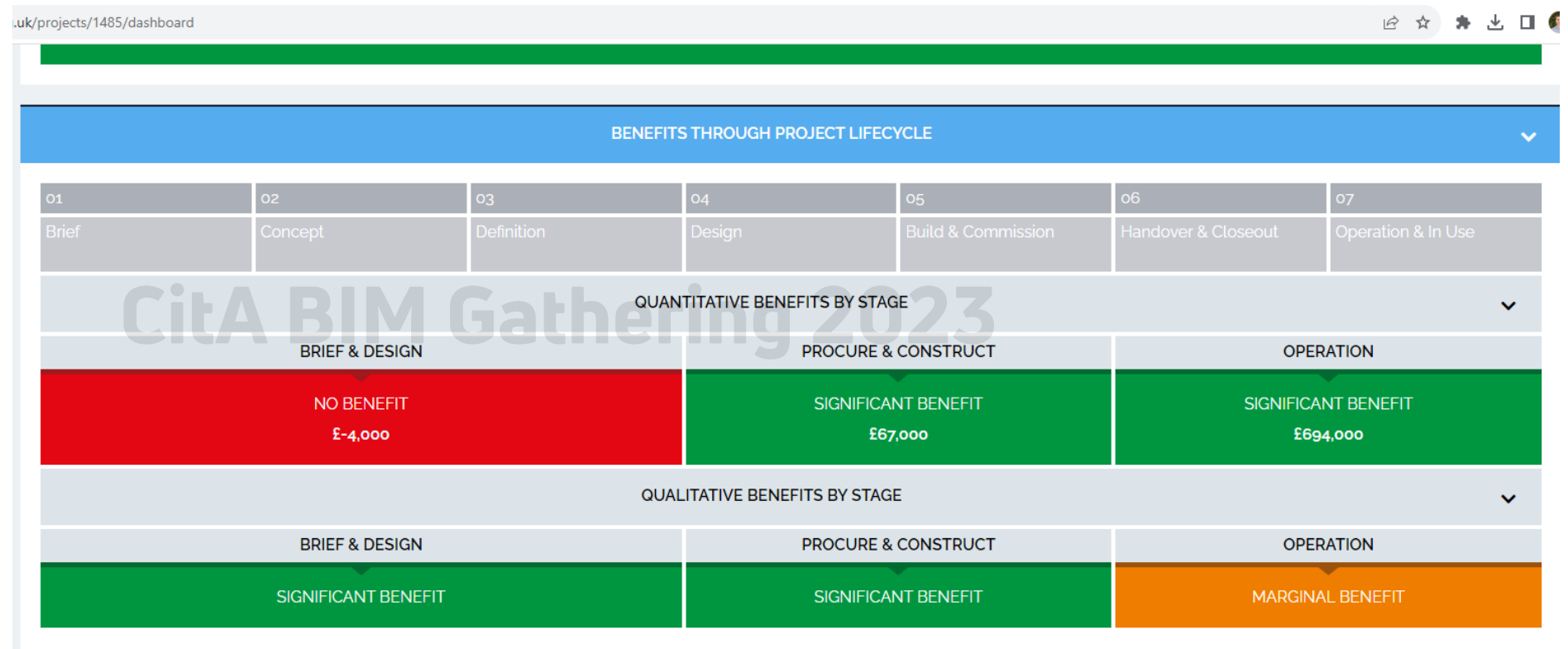
Gathering23

September 2022

Reference <https://www.riai.ie/uploads/files/general-files/RIAI BIM Guide for SMEs.pdf>

(2022) M. Earley, R. Montague, B. Voortman, D. O Connell, R. De Palma, M. Hinshelwood, D Bracken, E Prunty, P Slattery

- Tested for 250k project
- Results suited a larger project
- Tool not suited for small projects



## Putting BIM at the Heart of a Small Practice – David Millar Architects, London

Jonathan Reinhardt MCIAT  
MSc. BIM., BSc. Arch. Tech. (Hons)

- Tipping point was a one-off bespoke home separate 2D vs 3D.
- To compete for larger publicly funded projects needed to move to BIM.
- Change Management in a small practice (4-people initially) gave speed & agility their competitors didn't have to change.
- 6 x day training schedule broken down into 40-min slots.
- For new starters – 3 x day bootcamp before starting on projects.
- Assigned a staff champion to **each workflow part.**



## Gathering23

Reference - Miller, D. (2017), Putting BIM at the Heart of a Small Practice. Archit. Design, 87: 42-47. <https://doi.org/10.1002/ad.2172>



BIM Essential Guide – BIM Adoption in an Organization

1.1 STEP BY STEP QUICK START

- BIM Mandate above > 500SQM projects
- Smaller project recommendations

STEP	DESCRIPTIONS	REMARKS
<b>3</b>	<b>Information</b> <ul style="list-style-type: none"> <li>• Define BIM Standard</li> <li>• Define BIM Quality Assurance Checks</li> <li>• Define BIM Information Management</li> </ul>	<ul style="list-style-type: none"> <li>• *</li> <li>• *</li> <li>• *</li> </ul>
<b>4</b>	<b>Process</b> <ul style="list-style-type: none"> <li>• Define Project BIM Process</li> </ul>	<ul style="list-style-type: none"> <li>• *</li> </ul>
<b>5</b>	<b>People and Capability</b> <ul style="list-style-type: none"> <li>• BIM Competency Map</li> <li>• BIM Training Roadmap</li> <li>• BIM Roles (Project BIM Manager and/or Coordinators)</li> </ul>	<ul style="list-style-type: none"> <li>• *</li> <li>• *</li> </ul>
<b>6</b>	<b>Customer Engagement</b> <ul style="list-style-type: none"> <li>• BIM Execution Plan</li> <li>• BIM Conditions</li> </ul>	<ul style="list-style-type: none"> <li>• *</li> <li>• *</li> </ul>

CitA BIM Gathering 2023



## 1. Retail Fitout (4-person Engineering Firm Dublin)

- Earlier design sign off
- Won next fitout project based on 3D's
- Increased the firm's commercial project focus.

## 2. Home Extension (Freelance Architect, Dublin)

- Design visualisation benefit – earlier design sign-off
- Detail design stage benefit varies

## 3. 30 x Apartment Scheme – (Small Firm Architects) Co. Kerry

- Lack of BIM mandate by client lead to design teams being at different stages of BIM
- Lack of senior designer BIM knowledge makes them less aware of processes to ask from modellers is restrictive
- Floor area scheduling at tender stage beneficial

# What might an sBIM Standard look like?

Jonathan Reinhardt MCIAT  
MSc. BIM., BSc. Arch. Tech. (Hons)

Design Modelling Standards for Carbon Modelling

Quantification Standards for QS information use

Value chain efficiencies –  
Design > On-site > Suppliers



Gathering23

A nighttime photograph of a stone bridge over a river. The bridge has several arches and is illuminated by streetlights. In the background, a large church with a dome and two towers is visible, also illuminated. The scene is reflected in the water.

# Gathering23

Accelerating BIM adoption

CITA

THANK YOU