

Frontiers in Built Environment

Specialty section on Construction Management

A benefits prioritisation analysis on adopting BIM systems against major challenges in megaproject delivery

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Supplemental Data

The questionnaire used in this experimental study

Section 1: General Information

1. What is your company's role in megaproject development?

- ☐ Client (Project investment decision-maker; Project owner; Project sponsor)
- ☐ Project Manager (In-house or consultant)
- ☐ Design Team (Architects; Engineers; Technology specialists)
- ☐ Consultant (Quantity surveying; Project planning; Construction management)
- ☐ Specialist Contractor (or Subcontractor)
- ☐ Facilities Manager
- ☐ Other role/s (Please specify: _____)

2. What is the approximate annual turnover of your company?

\$_____million.

3. What is your current role with the company in relation to megaproject delivery?

- ☐ Project Support (Please specify: _____)
- ☐ Technical Professional (Please specify: _____)
- ☐ Manager (Please specify: _____)
- ☐ Executive Director (Please specify: _____)
- ☐ Other role/s (Please specify: _____)

4. What is your level of experience in megaproject delivery?

- ☐ Less than 2 years
- ☐ 2 – 5 years
- ☐ 5 – 10 years
- ☐ 10 – 20 years
- ☐ 20+ years

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5. How would you categorise your megaproject experiences?

- ☐ Buildings
- ☐ Transport
- ☐ Energy (Oil and Gas)
- ☐ Mining and Resources
- ☐ Other type/s (Please specify: _____)

6. Tender price of your current or most recent megaproject?

\$_____million

7. Contract period of the project?

_____ years

Please specify the start and finish time (mm/yyyy): from _____ until _____

8. Please identify any major climatic impacts to the project which occurred over the course of the contract period.

Section 2: BIM and your company in the context of current or the most recent megaproject delivery

9. Was willingness to implement BIM a prerequisite to winning the contract?

- ☐ Yes (Please provide details: _____)
- ☐ No

10. Had your company worked with BIM prior to this particular project?

- ☐ Yes (Please provide details: _____)
- ☐ No

11. Did your company already have standard procedures for the implementation and use of BIM in place?

- ☐ Yes (Please provide details: _____)
- ☐ No

12. What was the approximate tangible cost impact to your company as a result of BIM use on the project (e.g. software, human resources etc.)?

\$_____million

13. What were the semi tangible and intangible costs to your company as a result of BIM use on the project (eg. changes to project workflows, re-training of staff)? Please detail, and assign an approximate total value.

Details: _____

\$_____million

14. Was the BIM implemented and updated across all phases of the project lifecycle?

- ☐ Yes (Please provide details: _____)
- ☐ No (Please provide details: _____)

15. What benefits did your company achieve in terms of costs and value by deploying the use of BIM on the project? (Please tick all that may apply)

- ☐ Capital cost savings (Please specify: \$_____)

- ☐ Operating cost savings (Please specify: \$_____)
- ☐ Time savings (Please specify: _____ weeks)
- ☐ Enhanced design capacity (Please specify: _____)
- ☐ Flexibility and the ability to facilitate changes (Please specify: _____)
- ☐ Improved quality (Please specify: _____)
- ☐ Improved safety performance (Please specify: _____)
- ☐ Environmental benefits (Please specify: _____)
- ☐ Exchange/resale benefits (Please specify: _____)
- ☐ Community support (Please specify: _____)
- ☐ Accuracy and consistency of data (Please specify: _____)
- ☐ Improved collaboration and communication (Please specify: _____)
- ☐ Multidisciplinary planning and coordination (Please specify: _____)
- ☐ Enhanced performance analysis capabilities (Please specify: _____)
- ☐ Other benefit/s (Please specify: _____)

16. With the benefit of hindsight, would you use BIM on this type of project again?

☐ Yes

☐ No

Please explain: _____

17. What would you do differently in your next megaproject in terms of the use of BIM?

Section 3: BIM and other megaproject stakeholders

18. Which of the other project stakeholders had worked with BIM prior to this particular project, if any? (Please tick all that may apply)

- ☐ Client (e.g. Project investment decision-maker; Project owner; Project sponsor)
- ☐ Project Manager (In-house or consultant)
- ☐ Design Team (e.g. Architects; Engineers; Technology specialists)
- ☐ Consultant (e.g. Quantity surveying; Project planning; Construction management)
- ☐ Specialist Contractor (or Subcontractor)
- ☐ Facilities Manager
- ☐ Other role/s (Please specify: _____)

19. Did any of those companies already have standard procedures for the implementation and use of BIM in place?

☐ Yes (Provide details regarding each of the stakeholders ticked above: _____)

☐ No

20. Please provide an estimate of the tangible cost impact to all project stakeholders as a result of BIM use on the project.

- | | | | |
|---|-----------------|-----------------------------------|-----------------------------------|
| <input type="checkbox"/> Client | \$_____million, | <input type="checkbox"/> Decrease | <input type="checkbox"/> Increase |
| <input type="checkbox"/> Project Manager | \$_____million, | <input type="checkbox"/> Decrease | <input type="checkbox"/> Increase |
| <input type="checkbox"/> Design Team | \$_____million, | <input type="checkbox"/> Decrease | <input type="checkbox"/> Increase |
| <input type="checkbox"/> Consultant | \$_____million, | <input type="checkbox"/> Decrease | <input type="checkbox"/> Increase |
| <input type="checkbox"/> Specialist Contractor | \$_____million, | <input type="checkbox"/> Decrease | <input type="checkbox"/> Increase |
| <input type="checkbox"/> Facilities Manager | \$_____million, | <input type="checkbox"/> Decrease | <input type="checkbox"/> Increase |
| <input type="checkbox"/> Other role/s (Please specify: _____) | | | |

21. What benefits do you perceive that other project stakeholders achieved in terms of costs and value by deploying the use of BIM on the project? (Please tick all that may apply)

- ☐ Capital cost savings (Please specify: \$_____)
- ☐ Operating cost savings (Please specify: \$_____)
- ☐ Time savings (Please specify: _____ weeks)
- ☐ Enhanced design capacity (Please specify: _____)
- ☐ Flexibility and the ability to facilitate changes (Please specify: _____)
- ☐ Improved quality (Please specify: _____)
- ☐ Improved safety performance (Please specify: _____)
- ☐ Environmental benefits (Please specify: _____)
- ☐ Exchange/resale benefits (Please specify: _____)
- ☐ Community support (Please specify: _____)
- ☐ Accuracy and consistency of data (Please specify: _____)
- ☐ Improved collaboration and communication (Please specify: _____)
- ☐ Multidisciplinary planning and coordination (Please specify: _____)
- ☐ Enhanced performance analysis capabilities (Please specify: _____)
- ☐ Other benefit/s (Please specify: _____)

22. Which project stakeholders do you believe achieved the most value from using BIM? (Please tick all that may apply)

- ☐ Client (e.g. Project investment decision-maker; Project owner; Project sponsor)
- ☐ Project Manager (In-house or consultant)
- ☐ Design Team (e.g. Architects; Engineers; Technology specialists)
- ☐ Consultant (e.g. Quantity surveying; Project planning; Construction management)
- ☐ Specialist Contractor (or Subcontractor)
- ☐ Facilities Manager
- ☐ Other role/s (Please specify: _____)

23. Please provide any other comments.

Section 4: Contact details

Please provide your contact details should you wish to receive the results of the study.

Name: _____

Email: _____

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