Sustainable Built Environment National Research Centre

Delivering Value with BIM

A Whole-of-life Approach

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Building Information Modelling

Virtual Design and Construction

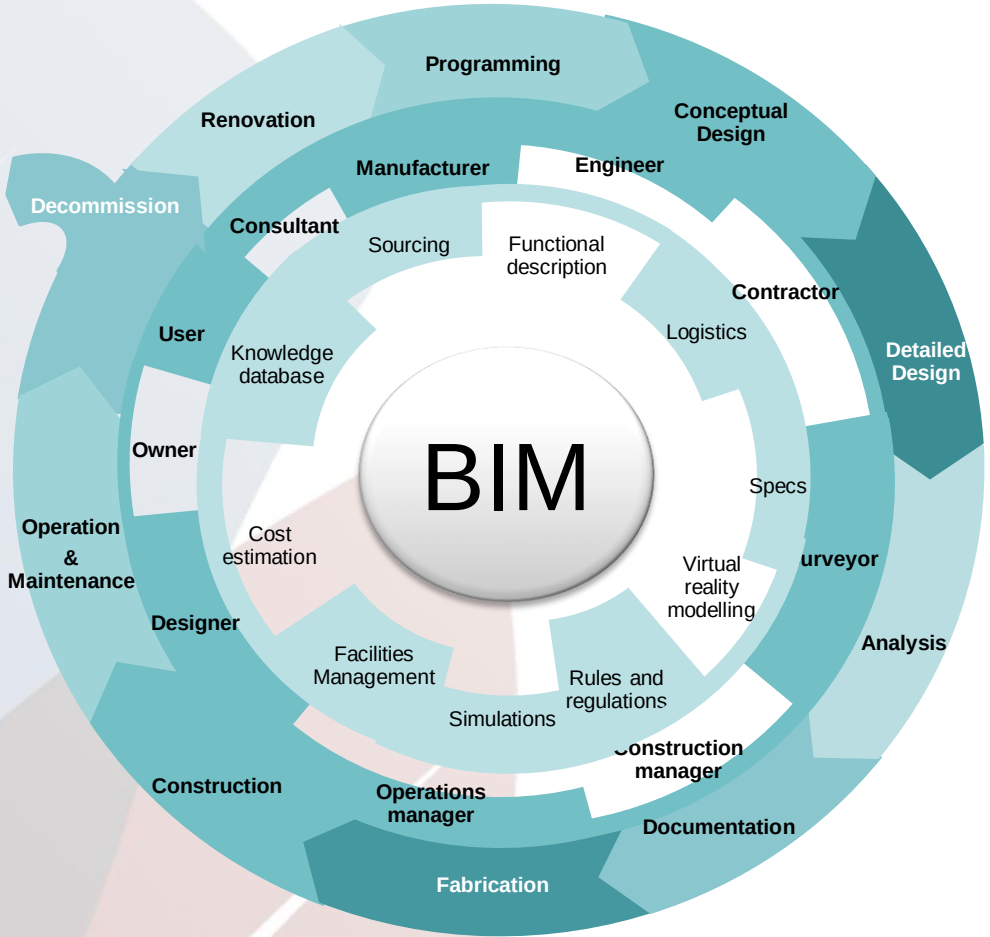
Building Information Modelling and Management - BIM(M)

Computer-aided Visualisation and Design

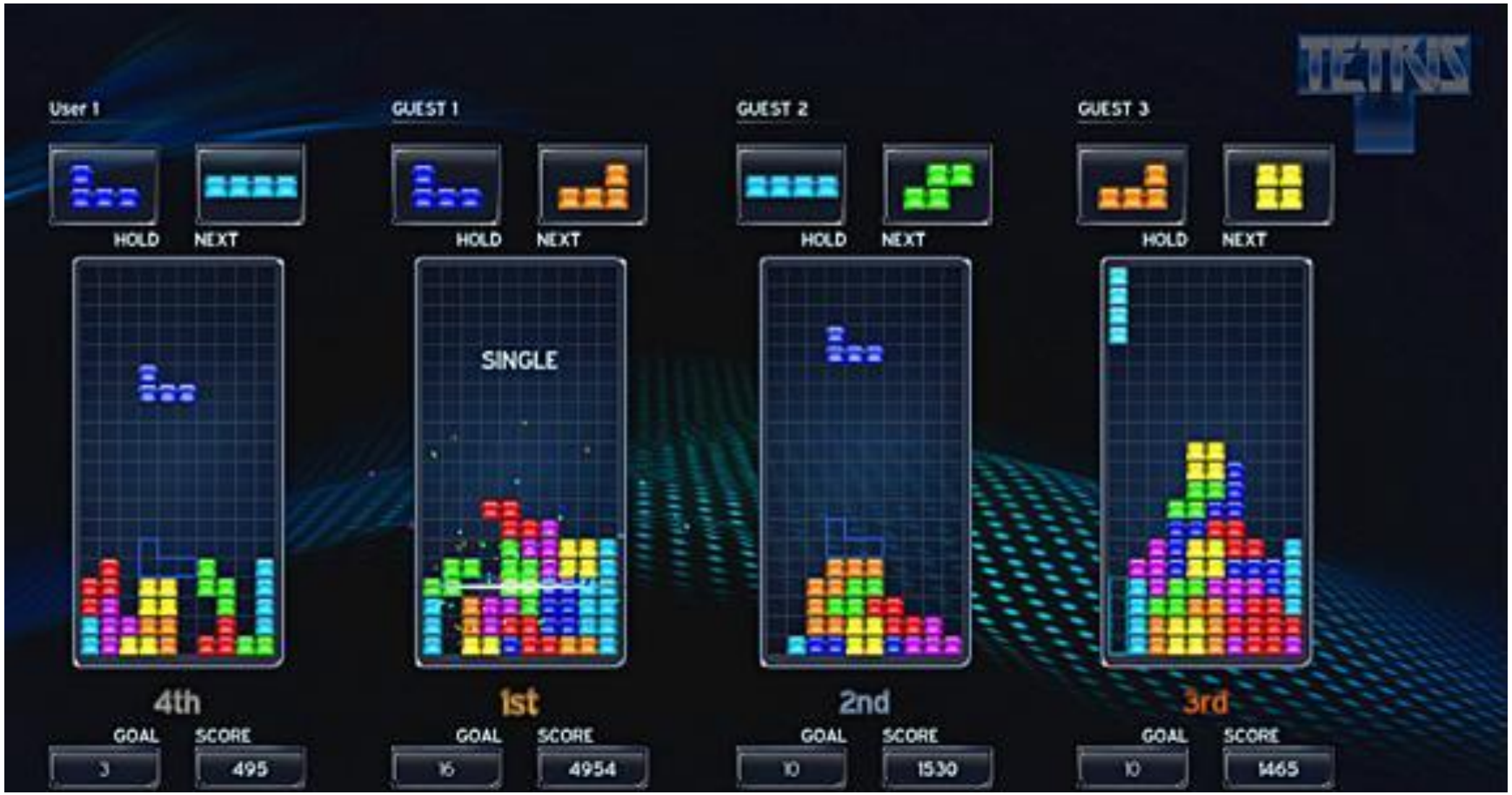
Digital Engineering

Building Information Modelling

A digital process that encompasses all aspects, disciplines and systems of built assets within a single virtual model.



More than Just a Software



More than Just a Software

New Generation Rollingstock Depot in Queensland

- 17 BIM-related processes and tools
- 25 benefits

Perth Children's Hospital in Western Australia

- 20 BIM-related processes and tools
- 26 benefits

Industry Challenge

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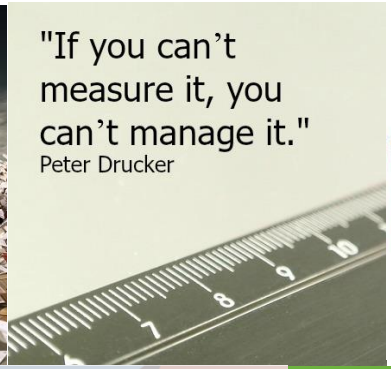
The Value of BIM

- Information about value spread across sea of publications
- Lack of adequate established metrics to measure whole-of-life value
- Reluctance to publish private performance data
- No industry benchmarks available



Topics

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BIM, Asset Management and Metrics

- What is BIM?
- What are the challenges associated with delivering value with BIM?
- What is its potential role in asset management?

Topics

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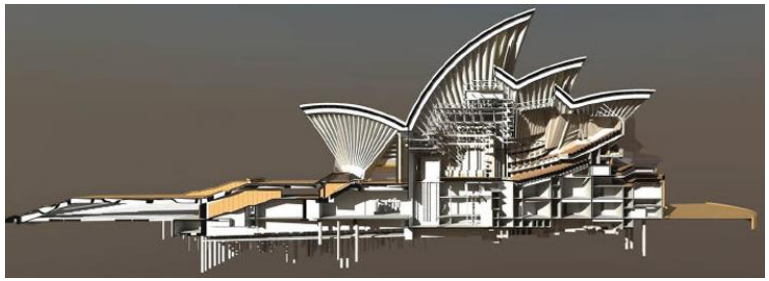
BIM, Asset Management and Metrics

Leadership in Implementation

BIM Performance and Capability

BIM Benefit Realisation Management



Implementation Tips with Hindsight

Examples: Benefits, Enablers and Metrics

Value Realisation Framework

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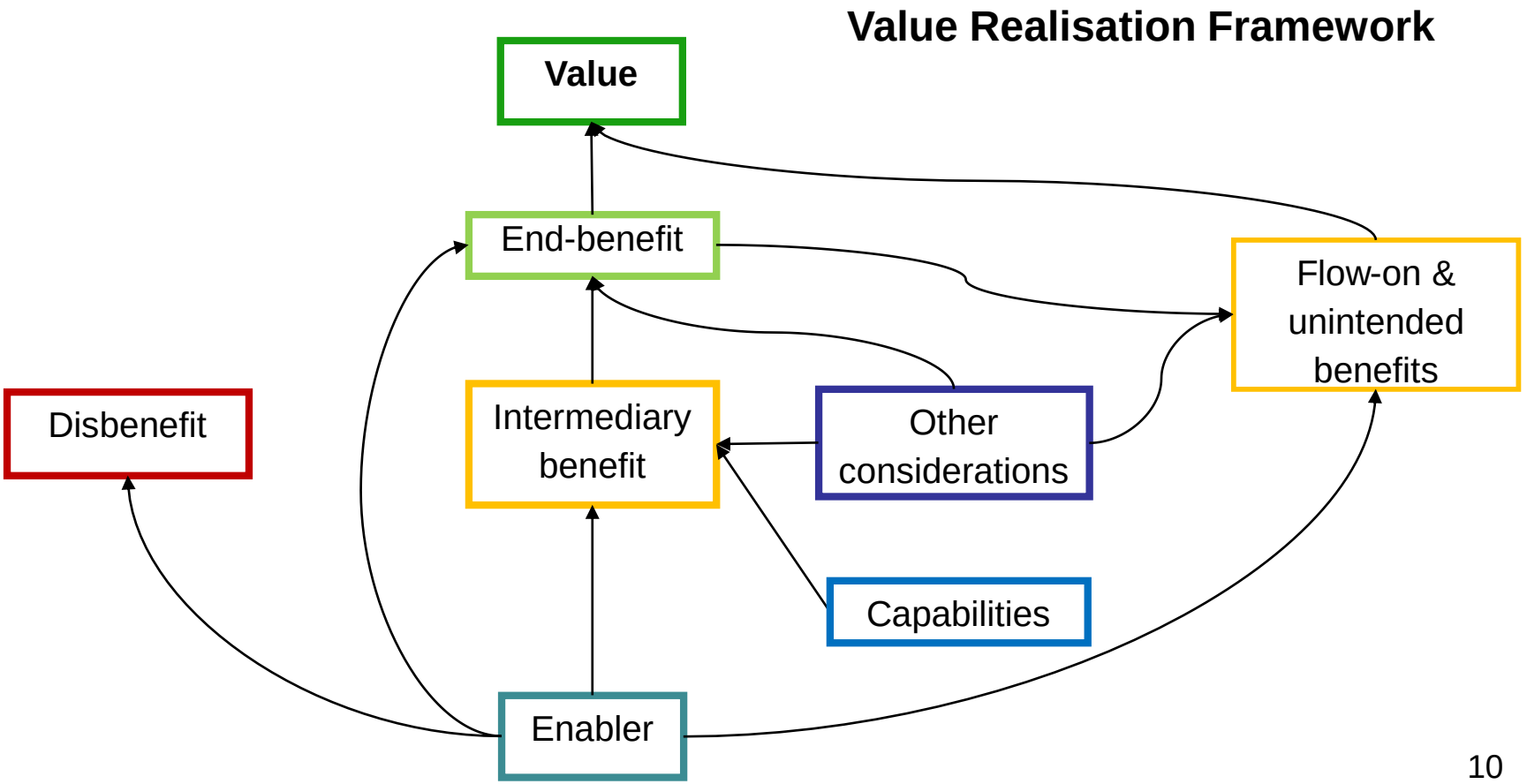
The Value of BIM



Value of BIM

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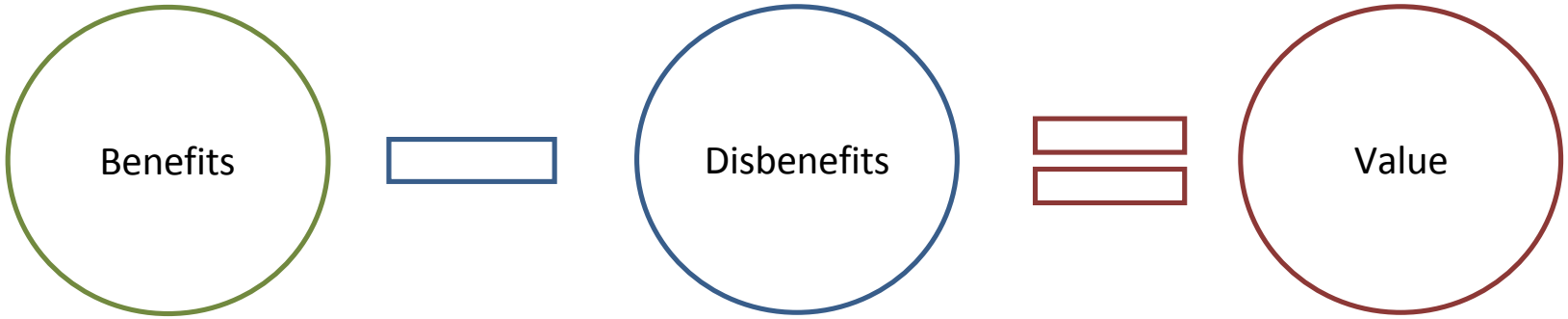

Improvement on current standards of practice and project outcomes

Negative outcomes

Organisational Goals

Value Realisation Framework

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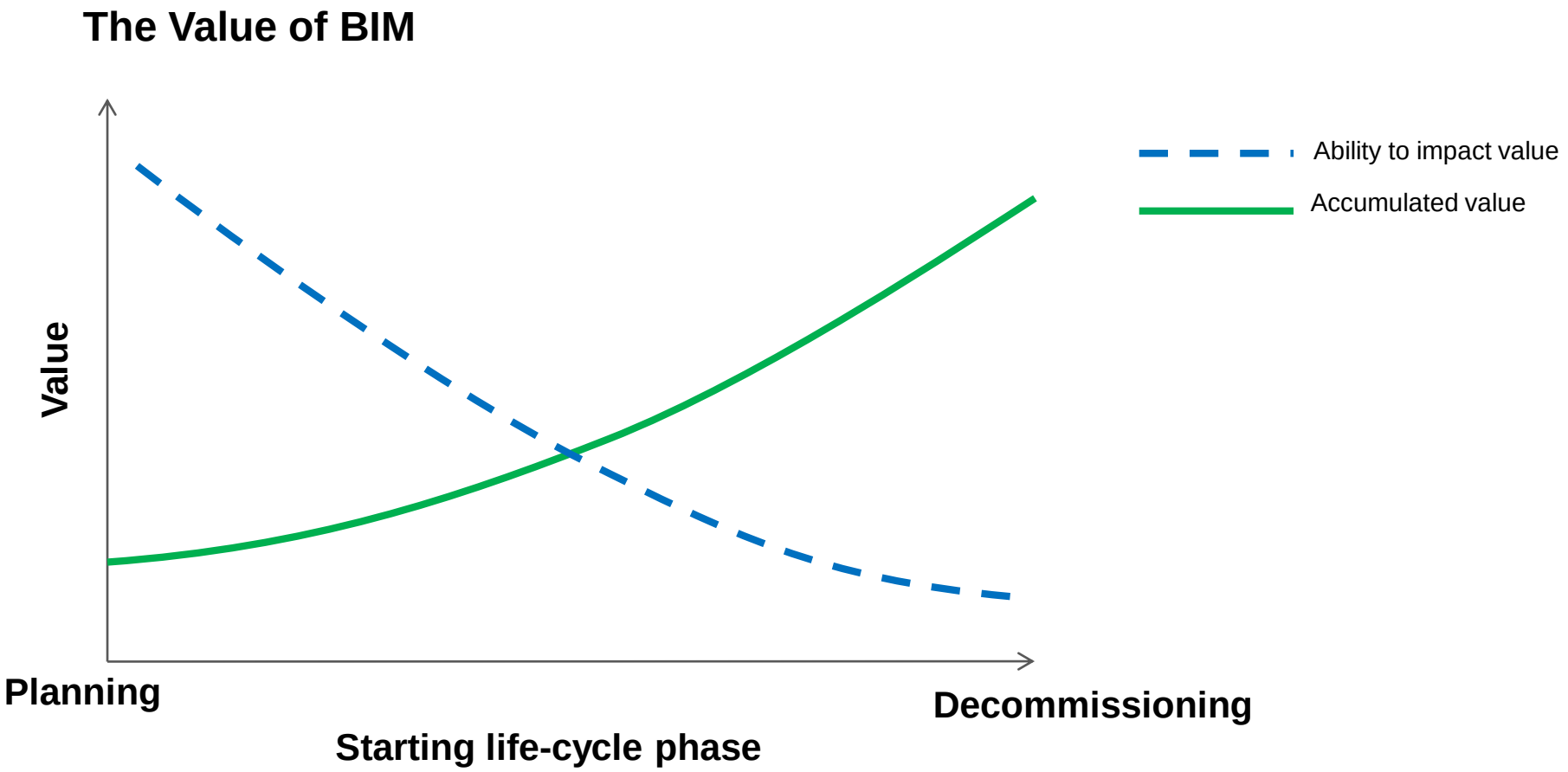

Value Realisation Framework

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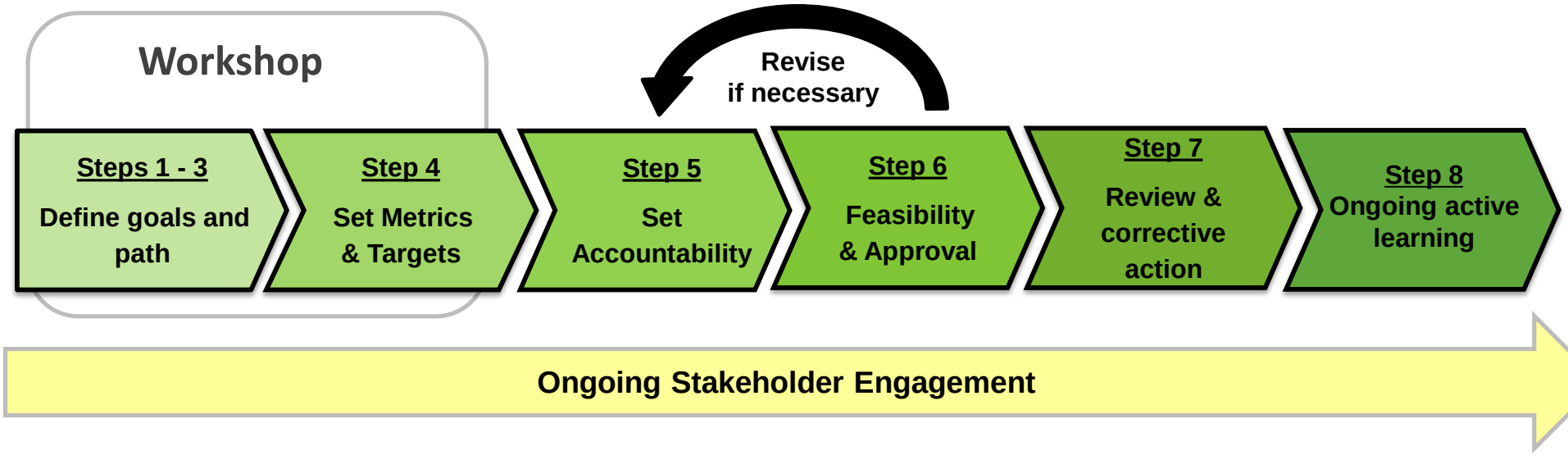

Dictionaries

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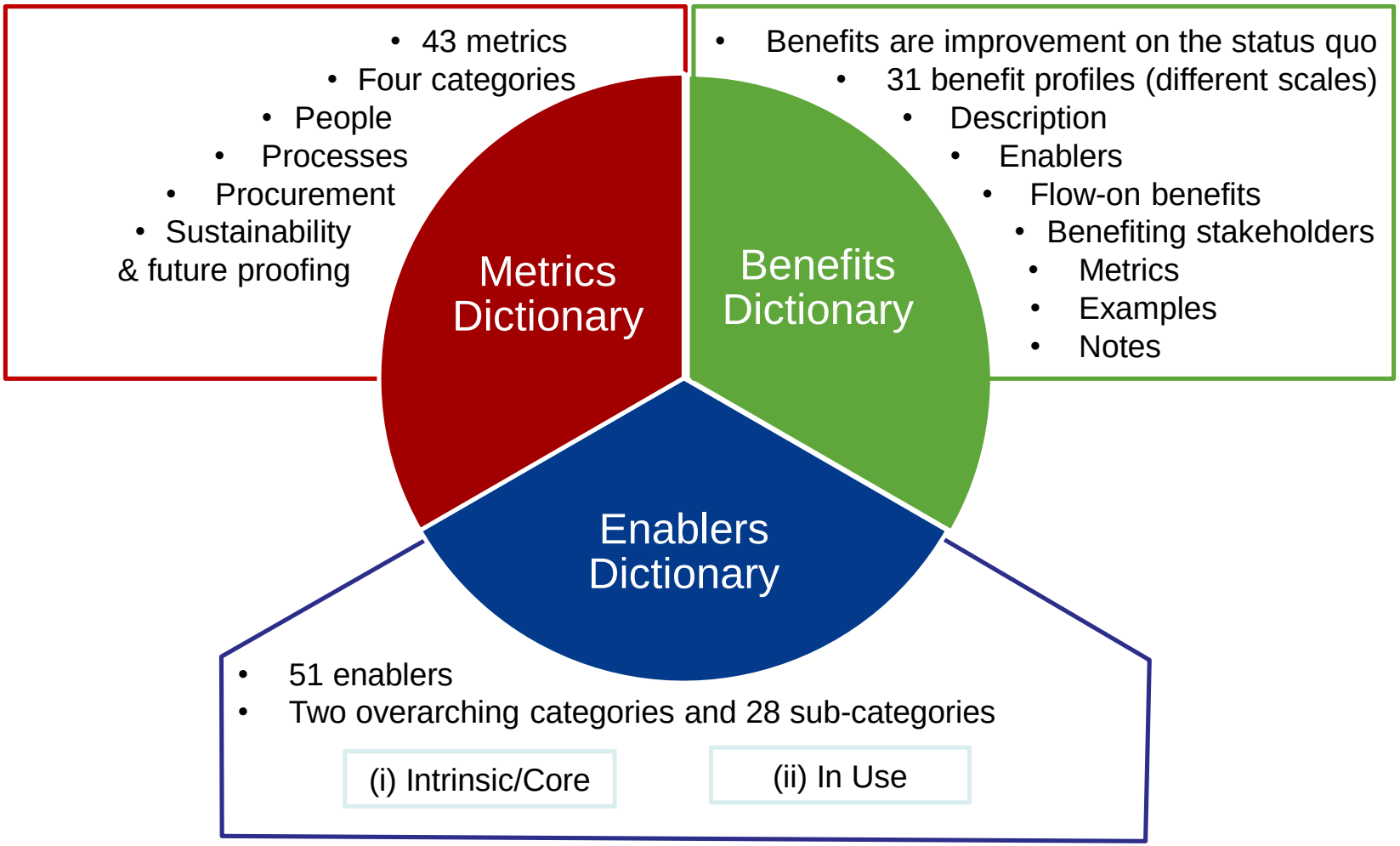


Reported Benefits

- **10-40% fewer unbudgeted changes**
- **60% fewer requests for information**
- In buildings – up to **30% cost reduction in electrical materials**
- **Handover packages created and uploaded** to commercial asset management systems **in minutes**
- **Cost estimates within 3%** of final value and **produced 44—80% faster**
- Up to **75-80% savings in operational energy cost** of transport infrastructure pilots

Specific Cases – Cost

Upgrade of Great Eastern Highway (WA) 2013

Context

- Widening from 4 lanes to 6
- BIM was used for: constructability analysis, traffic impact simulations, 3D Coordination, engineering analysis, clash detention, product master data, and field survey

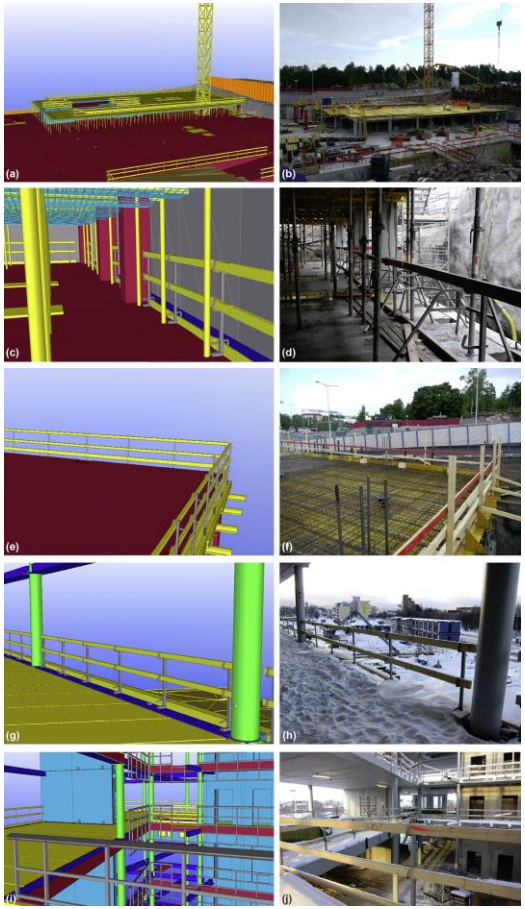
Outcome

- Use of BIM tools contributed to AUD24 million savings (14% of the total project cost) – AUD2 million/km avoided cost of relocating pipeline
- Project cost AUD7 million less than the target budget
- Completed 3 months ahead of schedule

Wang, X., 2015. *National BIM Guidelines and Case Studies for Infrastructure,* Perth, Australia: Sustainable Built Environment National Research Centre

Specific Cases - Safety

Office and Residential Building, Finland



Context

- Multi-story precast concrete apartment
- BIM-based fall hazard identification and prevention
- Automated-rule checking

Outcome

- Significantly less time requirement for fall hazard identification (only seconds or minutes with automated rule checking)
- Lower level of safety expertise required from modeller
- Less effort required to obtain new safety reports after design and schedule changes

Zhang, S.. Sulankivi, K., Kiviniemi, M., Romo, I., Eastman, C. M. and Teizer, J., 2015. BIM-based fall hazard identification and prevention in construction safety planning. Safety Science, 72, pp. 31-45

Specific Cases - Alternatives

Regional Road 22 (Norway), 2013

Context

- Road expansion to 4 lanes
- Objective: relieve congestion and improv emergency operations
- BIM for alternative analysis to investigate new routes and alternative locations for river crossing

Outcome

- 17 road alternatives and 8 bridge designs, including terrain, buildings and existing transport network
- All conceptual design alternatives evaluated within single model
- Drag and drop road types and alignments, tunnels, etc.
- Models linked to original data sources

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More information

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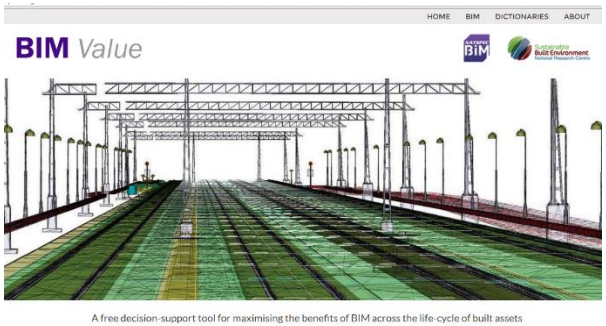
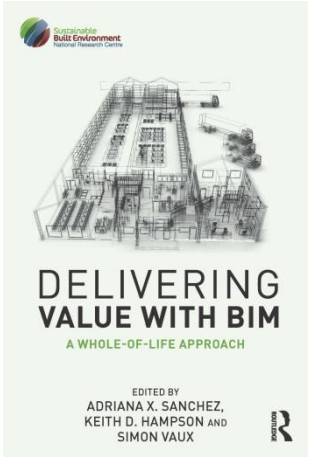
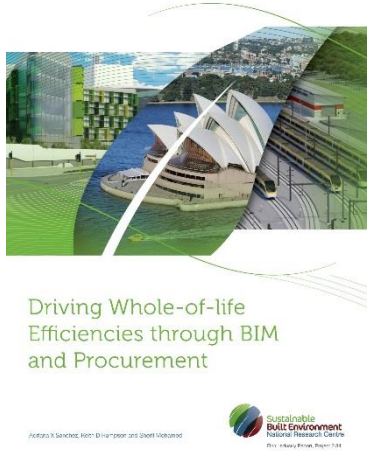




- Industry dissemination (reports and workshops)
- Online tool
- Book published by international publisher Routledge
- Case study reports & academic publications



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Research Collaboration

Thank You!