

# cidb Building Information Modelling (BIM) Implementation Roadmap

12 September

2024



# OVERVIEW



Building Information Modelling (BIM) Diffusion

Legislative Mandate

Models for Diffusion

BIM Roadmap for BIM Adoption in SA

Conclusions

# Building Information Modelling (BIM) Diffusion





# Building Information Modelling (BIM)

- “Building information modelling (BIM) is the current expression of construction industry innovation, a set of **technologies**, **processes** and **policies**, affecting industry's deliverables, relationships and roles” (B. Succar, M. Kassem, Macro BIM adoption: Conceptual structures, 2015)





# BIM Adoption

- Succar and Kassem
  - differentiate between the notions of **BIM implementation** as the successful adoption of BIM tools and workflows within a **single organisation**, and '**BIM diffusion**' as the rate BIM tools and workflows are adopted **across markets**
  - use the generic term '**adoption**' to overlay the connotations of **implementation** and **diffusion** unto a single word
  - use '**macro**' to focus attention on **large collections of organisational adopters** operating within defined national borders (countries)





# Legislative Mandate





# cidb Legislative Mandate

## DEVELOPMENT

- Provide strategic leadership to construction industry stakeholders to stimulate sustainable growth, reform and **improvement** of the construction sector
- Promote sustainable growth of the construction industry and the participation of the **emerging sector** in the industry
- Determine, establish and promote improved performance and best practice of public and private sector clients, contractors and other participants in the construction delivery process

## REGULATION

- Promote uniform application of policy throughout all spheres of government and **promote uniform and ethical standards**, construction procurement reform, and improved procurement and delivery management – including the Construction Code of Conduct
- Develop systematic methods for **monitoring and regulating the performance** of the industry and its stakeholders, including the Registration of Projects and Contractors



# cidb Project Assessment Scheme

- In terms of Section 23(1) of the Construction Industry Development Board Act, 2000 (Act no. 38 of 2000), the Board **must** .... establish a **best practice project assessment scheme**, based on the **best practices** identified by the Board in terms of section 5
- Section 5(2), the Board is empowered to promote **best practice Standards**







# Digital 2D/3D Requirements

- The Board has identified **Digital 2D/3D Collaboration** as a **best practice** on construction works contracts (**Tender Value Threshold to be determined after consultation with industry stakeholders**) using **non-proprietary, open-standard format** for the exchange of information



**Industry  
Focus  
Group**

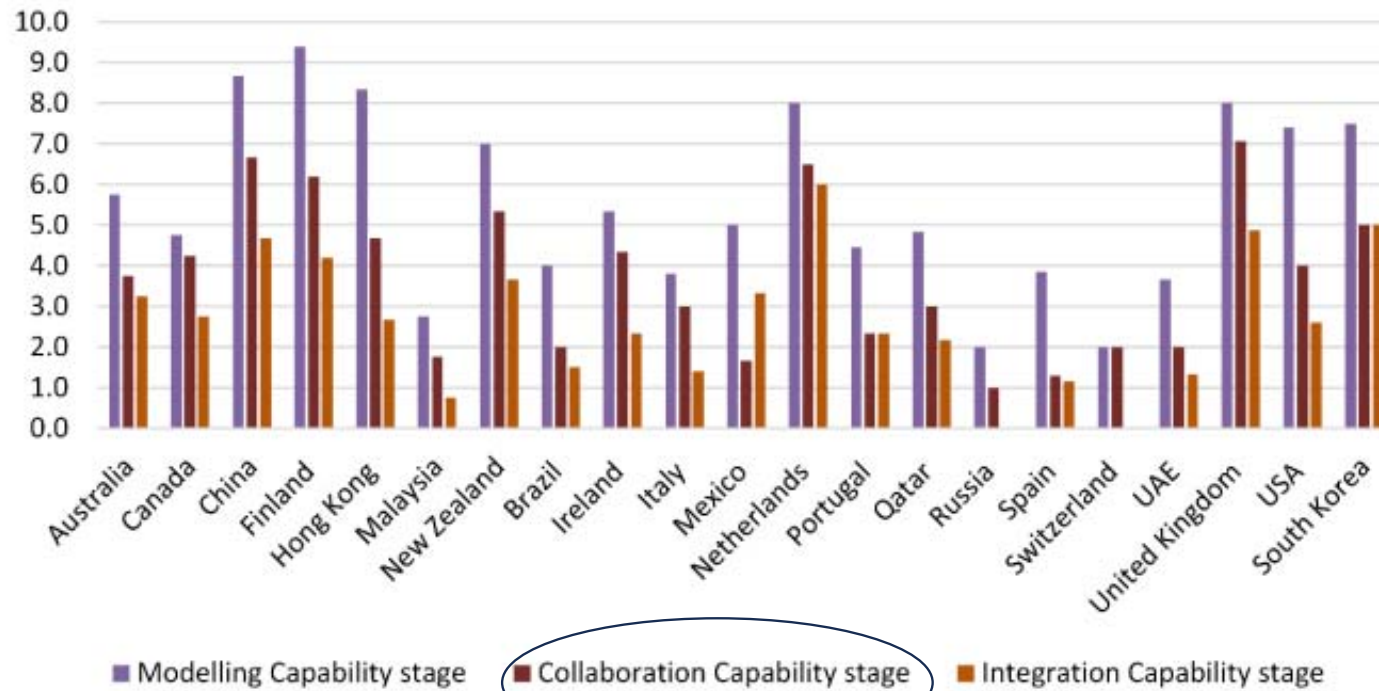


# Models for Diffusion





# Capabilities Stages across the 21 countries



Source: M. Kassem, B. Succar, Macro BIM adoption: Comparative market analysis, 2017.



# Diffusion dynamics in 21 countries

	Top Down	Middle-out	Bottom-up
Australia		•	
Brazil		•	
Canada		•	
China		•	
Finland		•	
Hong Kong	•		
Ireland		•	
Italy		•	
Malaysia		•	
Mexico		•	
Netherlands		•	

	Top Down	Middle-out	Bottom-up
New Zealand			•
Portugal		•	
Qatar		•	
Russia		•	
South Korea		•	
Spain			•
Switzerland		•	
UAE	•		
UK	•		
USA		•	

Source: M. Kassem, B. Succar, Macro BIM adoption: Comparative market analysis, 2017.



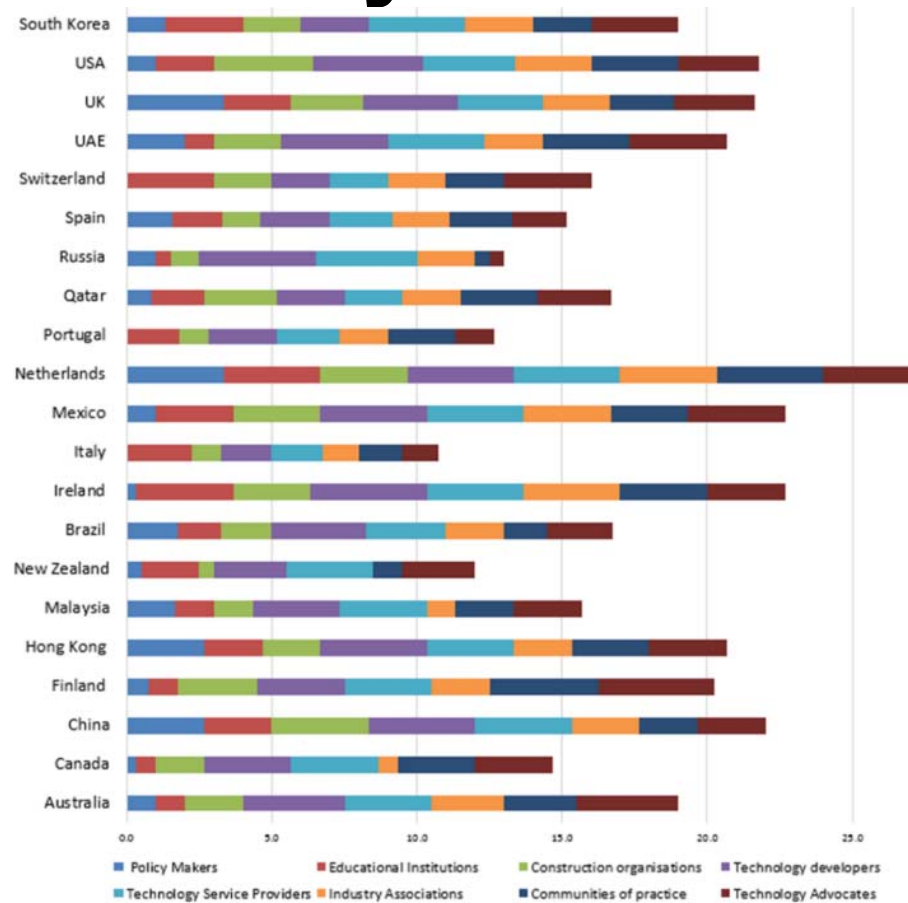
# Policy action types across the 21 countries

	Communicate			Engage			Monitor		
	A1 Make Aware	A2 Educate	A3 Prescribe	B1 Encourage	B2 Incentivise	B3 Enforce	C1 Observe	C2 Track	C3 Control
Australia	•			•			•		
Brazil	•			•			•		
Canada	•			•			•		
China		•		•			•		
Finland		•		•			•		
Hong Kong		•		•			•		
Ireland	•			•			•		
Italy	•			•			•		
Malaysia	•			•			•		
Mexico	•			•			•		
Netherlands		•			•		•		
New Zealand	•			•			•		
Portugal	•			•			•		
Qatar	•			•			•		
Russia	•			•			•		
South Korea		•		•			•		
Spain	•			•			•		
Switzerland	•			•			•		
UAE	•			•			•		
UK		•				•		•	
USA		•		•			•		
<b>Action type Frequency</b>	14	7	0	20	1	1	20	1	0

Source: M. Kassem, B. Succar, Macro BIM adoption: Comparative market analysis, 2017.



# Role of the eight stakeholders within each country



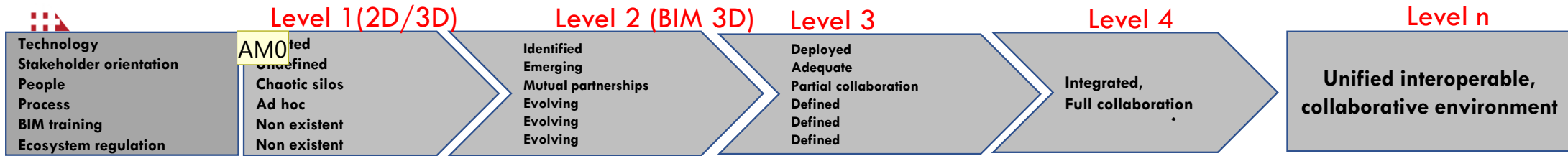
Source: M. Kassem, B. Succar, Macro BIM adoption: Comparative market analysis, 2017.



# BIM Roadmap for BIM Adoption in South African Construction Industry



# Roadmap to Building information modelling adoption in the South African Construction industry



2022

2026

2030+

<p><b>Awareness</b> Create a formidable industry engagement by the government, industry and academia for BIM promotion</p>		<p>Create BIM awareness among industry stakeholders</p>	<p>Create BIM steering committee</p>		<p><b>Projected state</b> Macro level industry awareness, support, triability, success story reportage, government support and promotion.</p>
<p><b>Structure</b> Development of South African construction industry specific BIM standards and guidelines to aid BIM adoption.</p>	AM2	<p>Development of national BIM standards</p>	<p>Communication of BIM strategies</p>		<p><b>Projected state</b> Articulated and well defined South African specific BIM standards, guidelines and policy statements for collaborative project environment.</p>
<p><b>Education</b> Extensive development and review of educational curriculum and programs for the development of BIM capability and competency.</p>	AM1	<p>Location of various BIM education and training community</p> <p>Articulated BIM education framework and training packages</p>	<p>Comprehensive curriculum review and development for BIM alignment</p> <p>Accreditation of BIM courses in HEI and provision of certifications for professionals</p>		<p><b>Projected state</b> Articulated, structured and well-defined educational framework accepted nation wide. BIM curriculums adopted and being taught in tertiary institutions and BIM learning institutes. Industry wide recognised certifications.</p>
<p><b>Deploy</b> Launch and implement BIM collaborative work environment projects to enhance BIM adoption in the South African construction industry.</p>	AM3	<p>Open data and information standards</p> <p>Develop the legal framework and standards supporting BIM adoption</p>	<p>Data ownership and protection standards</p>		<p><b>Projected state</b> Matured collaborative project delivery models. Widespread client demand for BIM</p>
<p><b>Evaluate</b> Achieve continuous improvement of macro level BIM adoption, measurement and assessment of the maturity of BIM and its impact on the South African construction industry.</p>	AM4	<p>Maturity assessment of the South African construction industry</p> <p>Online national maturity assessment tool accessible by stakeholders</p>	<p>Comparison of maturity levels</p>		<p><b>Projected state</b> Continuous assessment, improvement and progression in the macro level use of BIM.</p>
<p><b>Sustain</b> Maintain and enhance the achieved BIM collaboration project environment transition.</p>		<p>Strengthen partnership between the academia and the industry for BIM knowledge creation</p> <p>Continuously improve and align the BIM standards and guidelines with international benchmarks</p>	<p>Document and promote case studies and the SACI success stories</p> <p>Continuously communicate best practices to industry stakeholders</p>		<p><b>Projected state</b> Standardized BIM education and competency framework Wide BIM diffusion in the SACI Matured BIM standards, guidelines and maturity frameworks</p>

AM0  
AM2  
AM1  
AM3  
AM4

directi  
a national BIM adopti  
Catalyst

Cyclopaedic national BIM mandate

## Slide 16

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**AM0** This top part looks like a vision for BIM maturity. I think this should be showcased separately in a another/second slide (focussed on Evaluation/Monitoring/Assesment). In that slide it should be indicated that we will develop national maturity assessment framework as well as frameworks for assessment of maturity at organisational and project levels.

Currently leaving it on the same page as the rest of the road map can be confusing

Abdul-Majeed, 2022-09-28T20:05:07.182

**AM1** Consider the Following:  
BIM education framework  
BIM Training and Accreditation Framework  
BIM competency framework for training and education

Abdul-Majeed, 2022-09-28T20:14:13.201

**AM2** Consider renaming this as Policy?

Baseline review of Global best practice  
National BIM Policy Note  
National BIM Strategy  
Define Strategic Milestone Document

Abdul-Majeed, 2022-09-28T20:17:53.635

**AM3** This should not only be about open data standards:  
1. Baseline study/review of standards and guidance across the globe.  
2. Process and management standards  
3. Open data and information standards  
4. Data security standards  
5. Framework for National BIM library  
6. National BIM Library  
6. Procurement guidance note  
National BIM protocol (legal)

Abdul-Majeed, 2022-09-28T20:22:48.457

**AM4**

This is an important part: I suggest you consider re-arranging consider the following contents/elements:

1. Baseline Maturity Assessments  
2. National Maturity Assessment Framework

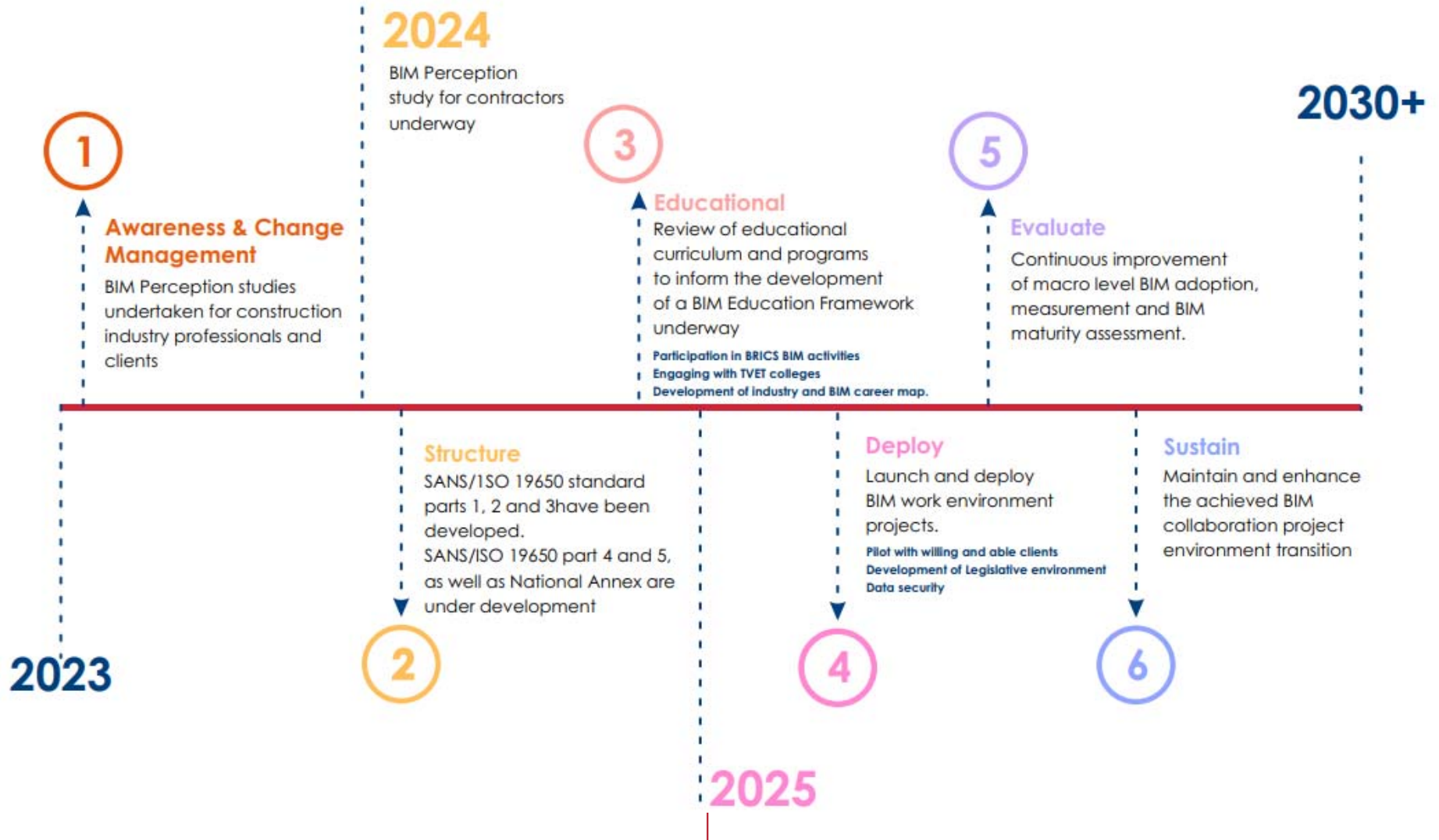
## Slide 16 (Continued)

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3. Organizational Maturity Assessment Framework
4. Project Maturity Assessment Framework
5. Return on Investment Assessment Framework
6. BIM competency framework

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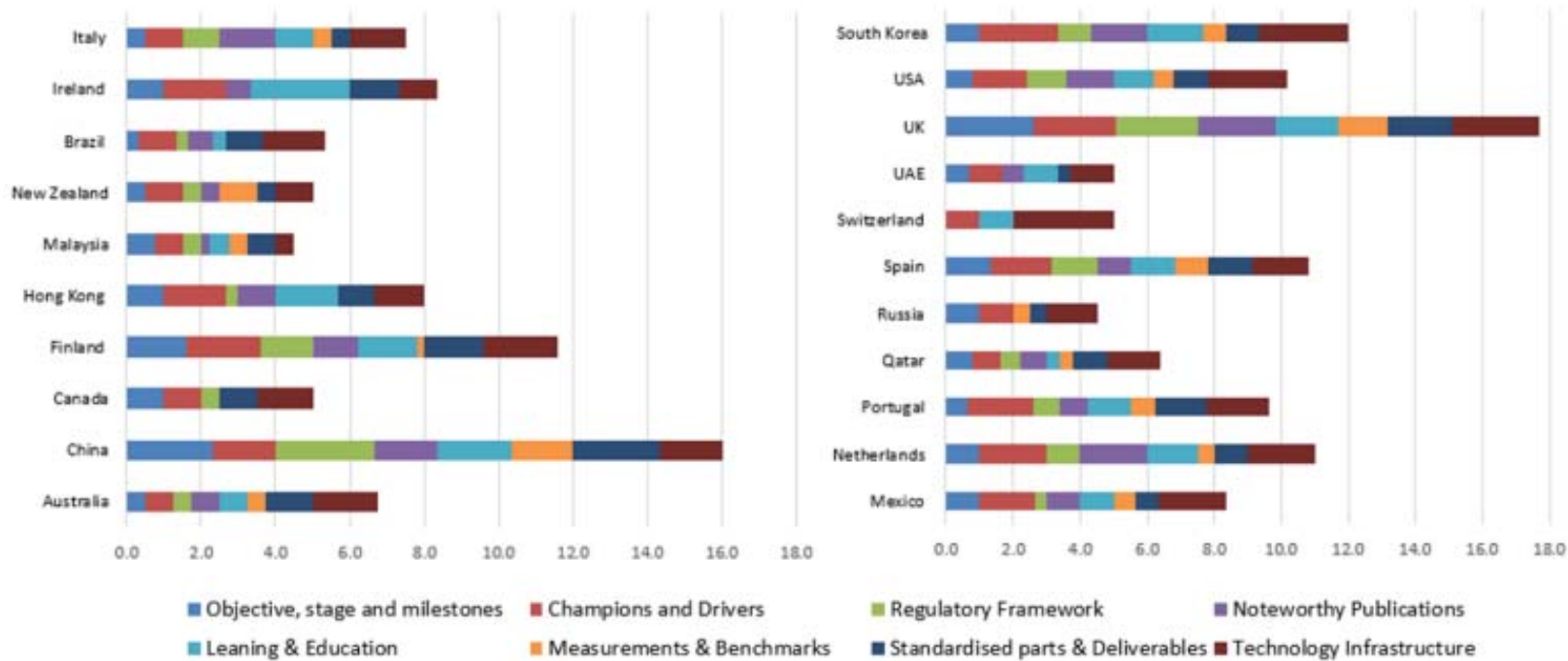
# BIM Roadmap Timeline







# Comparative rating of the macro-maturity components



Source: M. Kassem, B. Succar, Macro BIM adoption: Comparative market analysis, 2017.



# Conclusions





# Conclusion

- Major task to have BIM adoption for the industry
- Consider the stages of readiness when introducing a BIM level
- cidb has mechanisms to introduce BIM in the industry
- Introduction of BIM through a Best Practice or Mandatory Standard will determine policy action
- BIM diffusion in the industry is currently a middle-out, later addition of top-down approach
- BIM diffusion needs drivers and champions
- Tick most of macro-maturity components, but at various stages of maturity
- There is not a single dominant role player, all role players need to play their role



**THANK YOU**