



**Background:**

Building Information Modelling (BIM) is believed to improve the AEC industry projects' productivity: including cost, schedule and sustainability. However, the usage rate of BIM is extremely low due to:

- Lack of benchmark / yard stick of BIM requirement among project participants - lead to inconsistency of performance;
- Lack of prioritized key implementation areas - lead to over-estimation of BIM cost;
- Experience based BIM implementation approach - lead to low in return and reduced people's willingness of using BIM.

**Problem Statement:**

The solution for the aforementioned issues is to develop a strategic decision making framework to assist BIM practitioners to have BIM customised for specific scenario –project and organisational level. However, existing tools have limitations in the followings: criteria selection, criteria weightage calculation, assessment coverage and effectiveness of tools.

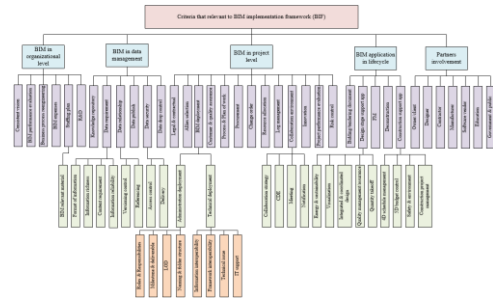
**Research questions (RQs):**

1. What are those dimensions and criteria for BIM implementation and evaluation?
2. What are the most applicable criteria for BIM implementation in the design stage in a specific context, e.g. China?
3. How to develop a multi-criteria decision making tool to assist in strategic BIM implementation and assessment for an organisation?
4. How to validate whether the proposed evaluation framework is practical to use, as well as its efficiency, effectiveness and user satisfaction?
5. How to, by implementing BIM, to achieve the most preferable strategic goals (e.g. sustainability, customer satisfaction and commercial value) for an organisation through altering their current criteria priorities?

**Research Aim:**

To develop a strategic decision framework to assist AEC projects to meet BIM Level 2 requirement

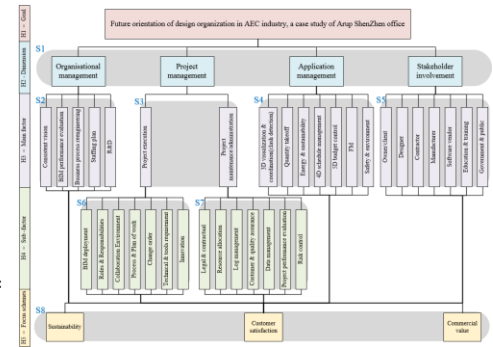
**Research Step 1 – 4 (RQ 1 & 2) outcome: Generic framework for BIM implementation:**



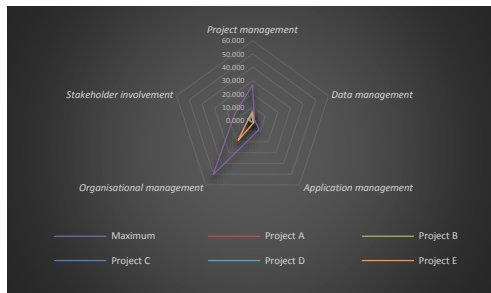
**PhD outcome: Strategic decision making framework:**

Factor (related for China Context only)	Description	Level of BIM capabilities				Maximum level	Maximum weight/available (based on China context)	Criteria Level		Target level	
		0	1	2	3			4	Priority level (Close BIM tag)	Sub-factor weight	Priority level (Close BIM tag)
<b>1. Project management related factor</b>											
Information and data availability	Project delivery schedule required to be clearly defined and followed by all project participants e.g. exact time and date for use need to be	Project delivery information are only locally available, only data has been maintained	Project delivery information are clearly defined at data requirement	Project delivery clearly defined at contract throughout the entire project with mandatory enforcement by manager	1	0.480	1	0.240	2	0.480	
Administration requirement	Level of Detail describes the amount of information delivered to the model in order to fit the purpose of a specific drawing	No LOD has been defined or used	LOD defined but limited to certain project	LOD has been consistently defined throughout the entire project with mandatory enforcement	3	1.440	0.480	0.180	2	0.320	
1.1 BIM Requirement	Training and skills resource	An open standard or training manual and technical support working efficiency	No training manual has been adopted	Training manual utilized for certain area of the design work and business documentation, by all project teams	1	2.400	0.240	0.120	2	0.240	
Technical requirement	Interoperability (e.g. IFC)	Its compatibility between different design programs among all stakeholders	No compatibility between different design programs has been considered	Partial interoperability has been achieved by exchanging data between the same vendor e.g. use of COBie	3	0.480	0.180	0.180	3	0.480	
	Technical issues	Essential skills that required for BIM activities e.g. modeling, etc. coordination skills are	Basic essential modeling skills e.g. Revit, Bentley, etc.	Advanced BIM usage skills e.g. BIM skills for construction programs e.g. Quantity take-off	1	0.480	0.180	0.320			
							<b>Total</b>	<b>1.188</b>		<b>Total</b>	<b>2.188</b>

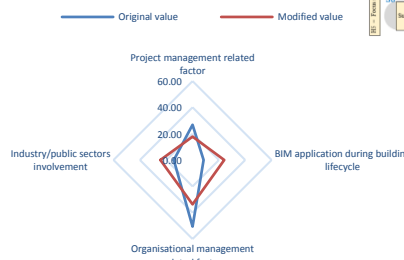
**Research Step 5 (RQ 3-5) outcome: Customised framework for BIM management in a specific scenario:**



**Research output 1: Evaluation results comparison among projects:**



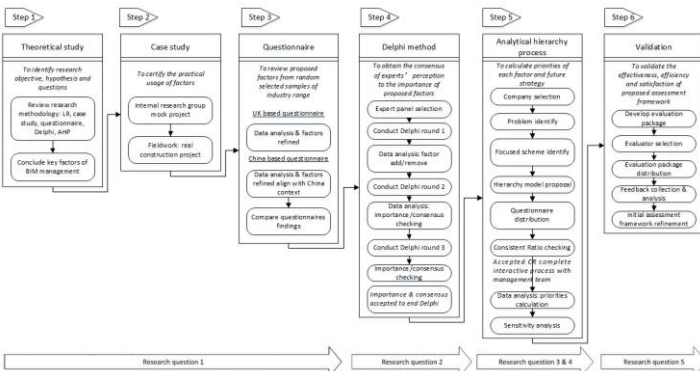
**Research output 2: Adjustment of criteria priority:**



**Research output 2: Comparison of attitude on various objectives before and after priority shifting:**



**Research methodological framework:**



**Application of PhD outcome in practical project:**

