Template Questionnaire

Cost Benefit Analysis

BUILDING INFORMATION MODELLING (BIM) FOR ORGANIZATION BASED

21st July 2018

VERSION 1

LEMBAGA PEMBANGUNAN INDUSTRI PEMBINAAN MALAYSIA (CIDB)

SURVEY ON COST BENEFITS ANALYSIS OF BUILDING INFORMATION MODELLING (BIM) IMPLEMENTATION IN MALAYSIAN CONSTRUCTION INDUSTRY 2018

The value of BIM throughout organization is often measured by benefit and ratio of return to investment, or ROI. Difficulties in measuring all these factors reveal the need for a value chain approach that accounts for the project lifecycle. Currently, there is limited evidence of consistent recorded data of BIM internal and external company best practices between projects, industry, nations and governments. This research project aims to develop a framework that able to prove value, returns and assessment methods surrounding the technological, processes and investment required to adopt BIM.

The present survey aims to justify the initial investment and analyse the benefits of BIM through case studies. The **objectives** of the survey are as follow:

1. To analyse the relationship and use of BIM to the overall performance, benefits, implications and costs involved in the implementation of BIM.
2. To identify the overall factors involved in an organization making decisions in the use of BIM.
3. As a reference by the players industry to implement BIM.

The results of this survey will be used solely for the CIDB research purpose and all personal information is guaranteed to be confidential.

Thank you very much in advance for your participation.

GENERAL INFO

Name of organization/company : _____

CIDB Registration Number : _____

Position of respondent : _____

LEVEL OF BIM IMPLEMENTATION IN CONSTRUCTION PROJECT

1. Please list down the **building construction** projects involved by your company, by specifying the project title, location, and project status.

Project Title	**Project**	**Project Status**		**Using BIM**
(*e.g. Constructing High Rise Residential Building)*	**Location**	Government / Private	Completed / Ongoing	Yes / No

1.0 BACKGROUND INFORMATION

1. Please indicate your major profession:

	Architect		Civil Engineer		Manager
	Quantity Surveyor		BIM Manager		Electrical Engineer
	Site Engineer		Mechanical Engineer		BIM Coordinator
	BIM Modeller		Others (Please specify) : _____		

2. Basic salary profession:

	< RM 3000		RM 3001 – RM 4000		RM 4001 – RM 5000
	RM 5001 – RM 6000		RM 6001 – RM 7000		RM 7001 – RM 10,000
	RM 10,001 – RM 15,000		RM 15,001 – RM 20,000		> RM 20,001

3. Types of organization in which you are engaged in:

	Public Client		Private Client		Project Consultant
	Main Contractor		Sub - Contractor		Academician/Research Institution
	Others (Please specify) : _____				

4. Types of **BIM Software** commonly used in your **Building Construction Projects**:

	Autodesk BIM		Navisworks		Archicad
	Revit		Tekla		Vico
	Others (Please specify) : _____				

5. Before using BIM, what types of software or tools used in your Building Construction Projects?

	AutoCad		Esteem		StaadPro
	AutoCad Architecture		Revit		Primavera
	Others (Please specify) : _____				

6. Years of professional working in construction industry:

	< 1 year		1 – 3 years		4 – 5 years
	5 – 10 years		11 – 15 years		16 – 20 years
	Others (Please specify) : _____				

7. Years of professional working experience in BIM:

	< 1 year		1 – 3 years		4 – 5 years
	5 – 10 years		11 – 15 years		16 – 20 years

8. How many projects has your company involved using BIM:

	1 - 5		6 - 10		11 - 20

☐ 21 – 25 ☐ 26 – 30 ☐ > 30

2.0 READINESS ON BIM IMPLEMENTATION

Please answer the following questions by stating **Yes** or **No**

Items	Yes	No
Technical Skills and Expertise		
Does your company have enough BIM manager/coordinator to monitor and conducting project using BIM?		
Does your company have enough BIM modeller to support BIM project?		
Does your company have more than 5 years of experience in conducting project using BIM?		
Knowledge and Experience		
Does your company have own BIM standard/guideline?		
Do you undergo several training or professional course on BIM?		
Do you understand the adoption of BIM in details?		
Productivity and Efficiency		
Does BIM implementation in your company enhance overall project quality, productivity, and efficiency?		
Does overall project delivery meet with the schedule compliance by using BIM?		
Does BIM implementation in your company increase the worker's productivity?		

3.0 IMPACT ON BIM BENEFITS

Please rate the level of agreements on the following factors as in construction projects based on your general experience using a 5 - point Likert scale:

1 - Strongly Disagree 3 - Average 5 – Strongly Agree

2 - Disagree 4 – Agree

Items	**Rating Scale**				
	1	2	3	4	5
During the design, construction and post construction process, how do you find BIM can increase:					
Financial Performance					
Have your company achieved Return on Investment (ROI) of BIM implementation in your company?					
Has your company gain reduction of construction works and improvement in overall project cost performance?					
Provision of cost information for early decision making					
Time Productivity					
Allow for time efficiency during design stage					
Ease of re-design and design changes process					
On-time completion of the overall project timeline					
Allow for clash detection before construction process					

Enhance the accuracy of as-built drawings					
Reduce time for Request for Information (RFI)					
Information and Data Sharing Process					
Ease of information and data sharing through a single centralised drawing					
Reduction of site-based conflicts					
Enhance information changes and employer information requirements					
Coordination of schedules with several parties involved (client – consultant – contractor)					
Improve collaboration between project team					
Design Drawing					
Early detection of clashes during design stage					
Production of architectural design of buildings at different perspectives					
Allow for simulation tools and building analysis such as visualization of sunlight penetration					
Increase drawing accuracy and efficiency					
Improve visualization of the projects					

4.0 BARRIERS TO INTEGRATION OF BIM IN CONSTRUCTION PROJECTS

Please rate the level of agreements on the following factors as in construction projects based on your general experience using a 5 - point Likert scale:

1 - Strongly Disagree 3 - Average 5 – Strongly Agree

2 - Disagree 4 – Agree

Items	**Rating Scale**				
	1	2	3	4	5
Organization					
Lack of support and awareness from Top Management					
BIM is not being practiced by client's project					
No enforcement for BIM implementation from the stakeholders					
BIM is not being practiced through several project team					
Financial Barrier					
High cost of BIM investment at early stage					
High cost of BIM software, license, and hardware upgrading					
Investment in training cost and new personnel on BIM					
Knowledge and Learning Curve					
More time required to adapt to the new technologies					
Lack of expertise and personnel that are knowledgeable in BIM					
Lack of experience personnel in using BIM projects					

5.0 COST ANALYSIS

5.1 Recurring Costs

Recurring Costs	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Computer supplies						
Desktops (incremental to the project)						
Help Desk support						
Ongoing Additional Personnel						
BIM staff costs						
Staff training						
Maintenance of hardware / server and network						
Software maintenance and upgrades						
Workplace						
Telecommunications						
Software Licensing						
Staff turnover cost						
Other (please specify): _____						
Total Recurring Costs						

5.2 Non-Recurring Costs

Non-Recurring Costs	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Preliminary						
Hardware						
Servers						
Telecommunication equipment						
Software (packaged or custom)						
Workplace upgrades						
Furniture and fixtures						
Postxxx						
Procurement (BEP, EIR, Standard)						
Contract negotiations						
Management						
Training of employees (pre-implementation)						
Transition costs (parallel systems)						
Post implementation reviews (monitoring)						
Others (please specify): _____						
Total Non-Recurring Costs						

6.0 BENEFITS ANALYSIS

6.1 Quantifiable Benefits (Tangible Benefits)

6.1.1 Cost Savings

Cost Savings	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Decreased cost of services provided						
Time savings						
Productivity gains						
Request for Information (RFI)						
Reduced staffing cost (incl. overtime)						
Reduced staff turnover costs						
Others (please specify): _____						
Total Cost Savings						

6.1.2 Cost Avoidance

Cost Avoidance	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Clash Reports						
Total Cost Avoidance						

6.1.3 Revenue

Revenues	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Total Revenues						

6.1.4 Other

Other Benefits	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Total Other Benefits						

6.2 Non-Quantifiable Benefits (Intangible Benefits)

Summary of Intangible Benefits						
Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Time savings						
Total Benefits						

7.0 RECOMMENDATION TO INTEGRATION OF BIM IN CONSTRUCTION PROJECTS

Please rate the level of agreements on the following factors as in construction projects based on your general experience using a 5 - point Likert scale:

1 - Strongly Disagree 3 - Average 5 – Strongly Agree

2 - Disagree 4 – Agree

Items	**Rating Scale**				
	1	2	3	4	5
Financial Support					
Government initiatives to start up BIM initiatives to increase adoption of BIM in construction projects					
Adequate construction cost allocated with respect to usage of BIM					
Training incentives to BIM's new user					
Industry Level					
More engagement and collaboration in terms of knowledge transfer for BIM importance					
Legal and Policy					
Establishment of BIM Guideline for each discipline					
Development of legal framework for BIM usage and deployments in projects					
Enforcement of BIM usage in construction project with suitable requirement and conditions					

Others (please state): _____

- THANK YOU FOR YOUR PRECIOUS TIME -

References:

http://bimexcellence.com/scoping/

https://vdcscorecard.stanford.edu/sites/default/files/bim_deployment_plan_final_0.pdf