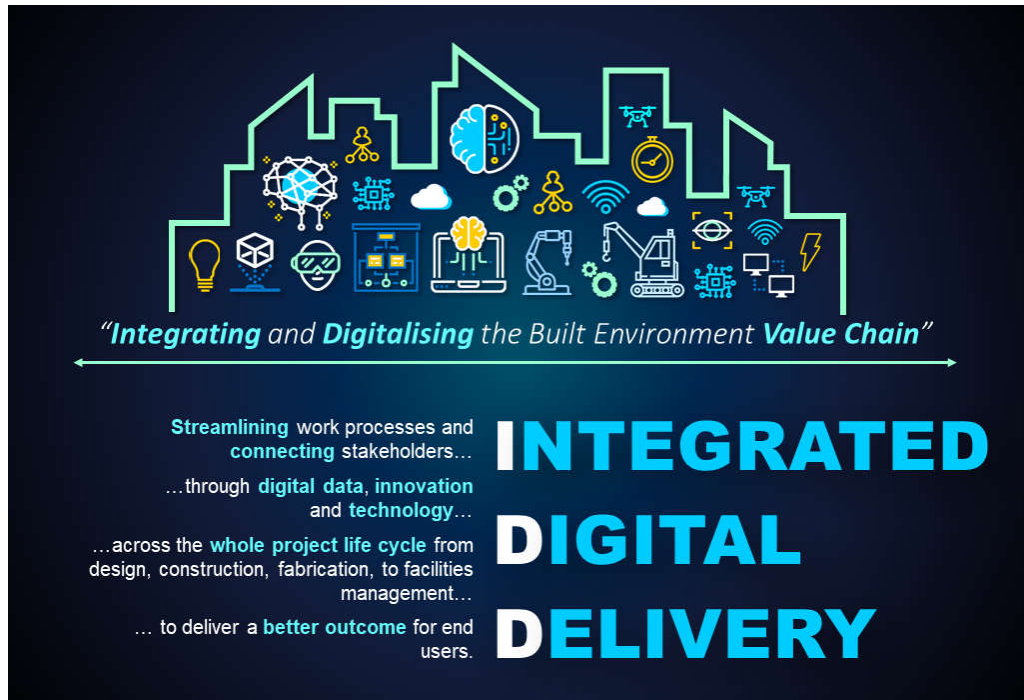


### Assignment 02: BIM as the core technology for Integrated Digital Delivery



(Image source: Building and Construction Authority BCA, Singapore – What is Integrated Digital Delivery (IDD)?)

The built environment is being transformed by digital technology and BIM is used as the core digital algorithm for integrating all other digital technologies such as Virtual Reality (VR); Drone photogrammetry; Construction Robotics; Digital Surveying; Artificial Intelligence (AI); Augmented Reality (AR), Internet of Things (IoT), etc. and allowing Industry stakeholders to collaborate and communicate effectively and efficiently in a common platform for achieving better results in the whole project life cycle from inception, design, procurement, fabrication, construction, to facilities management. This is Integrated Digital Delivery (IDD), an approach for managing construction projects that fully integrates processes and people over the entire course of a project.

#### Objective

- To study how BIM is being played as a core element in IDD areas (Digital Design, Digital Fabrication including DfMA, Digital Construction and Digital Asset Delivery & Management);
- To learn how to structure processes integration and people collaboration in a common digital platform. It is emphasized that the backbone of IDD is BIM, which enables you to plan and run for a project more effectively and efficiently, track its progress and share information instantly with stakeholders in the entire project life cycle.
- To implement Integrated Digital Delivery with strategic planning and action plans.

## Scenario

As the Chief Information Officer of a global data center client, you are assigned to lead a team of digital scientists for developing, formulating, implementing and assessing its results a IDD implementation plan for a new data center project at Tseung Kwan O industrial zone, Hong Kong.

You are required to prepare a presentation to the Executive Committee of the company in order to gain the top management's green light in implementing your proposed IDD for the project. Consideration will be given to your cost estimate, action plans, team organisation, stakeholders' platform and communication/collaboration mechanism.

In your proposal, you should include the following :-

- a) Identify possible digital tools (use BIM as core technology) in each development phases with consideration of cost, time, availability, compatibility, effectiveness, training and implementation difficulties;
- b) Design the framework of IDD for achieving better outcomes in quality, productivity, safety, value engineering, buildability, cost saving, programming and environmental excellence – the IDD ecosystem;
- c) Address the DfMA application in fabrication and its advantages;
- d) Estimate the cost of each digital application in the areas of digital design, digital collaboration, digital production and digital construction.

## Submission

Each student should prepare the proposal in the form of a written technical report which will be read by the Chief Executive and the Executive Committee of the company. The report should be not more than twenty (20) A4 pages including appendices. It should be neat and properly written and organised to communicate your thoughts and ideas. Proper credit and referencing should be provided to the information sources. Students making direct copy of the information in other publications or sources (plagiarism), if found, will be disqualified. The report electronic file should be submitted through the Moodle system. The assessment criteria include quality of the content, organisation, clarity of thought, and report/proposal writing skills.

Submission deadline (via Moodle): [Refer to the information on Moodle]

## Resources

ISO 19650 Building Information Modelling – BSI

<https://www.bsigroup.com/en-HK/Building-Information-Modelling-BIM/bim-deisgn-construction/iso-19650/>

The future is digital – UK Construction Online

<https://ukconstructionmedia.co.uk/features/the-future-is-digital/>

CIBSE Digital Engineering Series DE4: Common Data Environments

<http://www.cibse.org/Knowledge/CIBSE-Publications/CIBSE-Digital-Engineering-Series>

Digital Delivery for owners, designers, contractors – Integrated Design

<http://integrateddesign.hk/>

## References

BCA, 2018. *Integrated Digital Delivery (IDD)*, November 2018, Building and Construction Authority (BCA), Singapore.

[https://bca.gov.sg/IntegratedDigitalDelivery/Integrated\\_Digital\\_Delivery.html](https://bca.gov.sg/IntegratedDigitalDelivery/Integrated_Digital_Delivery.html)

Hong Kong Engineer Newsletter, 2018. *Integrated Design* – 17 September 2018, Hong Kong Institution of Engineers.

<http://www.hkengineer.org.hk/program/home/articlelist.php?cat=cover&volid=219>

## Assessment Criteria and Rubrics

Assignments are evaluated based on whether a student has presented ideas in such a way that reflects integration of course material and critical thinking skills. Grades are assigned not according to competition among students (who is "the best") but according to expectations for a particular assignment relative to the material covered in class up to that point.

This assignment requires students to study the core technology of integrated digital delivery (IDD) and learn how to implement IDD with strategic planning and action plans based on a practical scenario in Hong Kong. The assessment rubrics are shown as follows.

Criteria (weighting%)	Levels of performance and grades			
	Insufficient (1) F	Acceptable (2) D & C	Good (3) B	Excellent (4) A
<b>Content (40%)</b>	Shows some thinking and reasoning but most ideas are underdeveloped and unoriginal.	Content indicates thinking and reasoning applied with original thought on a few ideas.	Content indicates original thinking and develops ideas with sufficient and firm evidence.	Content indicates synthesis of ideas, in-depth analysis and evidences original thought and support for the topic.
<b>Organization and writing (20%)</b>	Writing lacks logical organization. It shows some coherence but ideas lack unity. Serious errors.	Writing is coherent and logically organized. Some points remain misplaced and stray from the topic. Transitions evident but not used throughout essay.	Writing is coherent and logically organized with transitions used between ideas and paragraphs to create coherence. Overall unity of ideas is present.	Writing shows high degree of attention to logic and reasoning of points. Unity clearly leads the reader to the conclusion and stirs thought regarding the topic.
<b>Clarity and coherence (20%)</b>	All the information is not clearly presented. Lack of coherence and logical consistency.	Some information is not clearly presented. Weak coherence and logical consistency.	The information is clearly presented. Logical interconnection and consistency are shown.	The information is clearly and effectively presented. Good coherence and logical consistency are demonstrated.
<b>Critical thinking and Innovation (20%)</b>	No critical thinking or innovative ideas are applied.	Some attempts to propose critical thinking or innovative ideas.	Critical thinking or innovative ideas are proposed, but no justification.	Critical thinking or innovative ideas are proposed with evaluation and justification.

Remark: To avoid plagiarism, all sources used in the report should be acknowledged and referenced throughout, in accordance with the preferred method of academic professionals.