MEASUREMENT & ESTIMATING
EXAM REVISION

TOPIC 1 – BIM

ADT = Advanced Digital Technology

Why do we need ADT?

- Due to the increasing project complexity (architectural, services and structures)
- Increased complexity in project coordination (i.e. no of parties involved causes fragmentation and information chaos)
- Transmittal and coordination of information (i.e many systems are incompatible, slow/lack of information sharing)
- Poor interoperability (ability to communicate and manage electronic data effectively without the need for human input and manipulation, cultural requirement)

BIM = Building Information Modelling

What is BIM?

- The process of generating and managing building data during its life cycle using three-dimensional, real time, dynamic building modelling software to decrease wasted time and resources in building design
- A modelling technology and associated set of processes to produce, communicate and analyse building models
- It encompasses building geometry, spatial relationships, geographic information, and quantities and properties of building components
- BIM is about change: Fragmentation → Integration

Where did BIM originate?

- CAD drawings
- Shift from 3D models to data (information) input
- Increase in capability – it is about what kind of information it can support, what it can be used to do (not about how the data base is constructed)

What are the characteristics of BIM?
Each of the building components that are represented within a BIM digital representation include:

- Computable graphic information
- Parametric rules allowing them to be manipulated in an intelligent way (i.e. door and wall)

- Contain data that describe how they behave as required for analysis, e.g. take-off and measurement
- Consistent data that can be represented in all views, e.g. once windows have been constructed they can be seen in plan, elevation and 3D model.

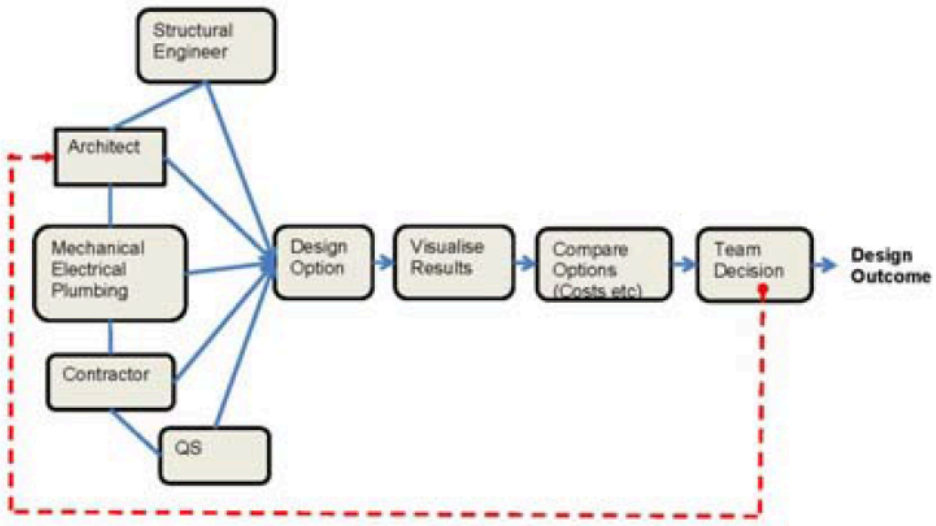
BIM is 'Information Model'

- 2D – schematics
- 3D model – spatial (x,y,z)
- 4D model – 3D + time
- 5D model – 4D + cost

→ It is not a software, software is just tools used to generate the information modelling; rather, it is a methodology.

What are the promises of BIM?

- Focus on lifecycle
- Integration and communication
- Interoperable workflow
- Knowledge can be simulated and manipulated in order to create less risk within a project
- Central model for a project (rather than having one for each discipline, i.e. architectural, services and a structural model)
- Virtual design
- Ability to modify the design if costs are exceeded
- Creating a model with context; i.e. being able to plan, design and engineer structures with real data and real time.
- Design visualisation (particularly important in areas such as building services clashes, or a scaffolding system)
- Model checking (clash detection of services/structural elements)
- 3D Printing



Why are companies struggling with the concept of BIM?

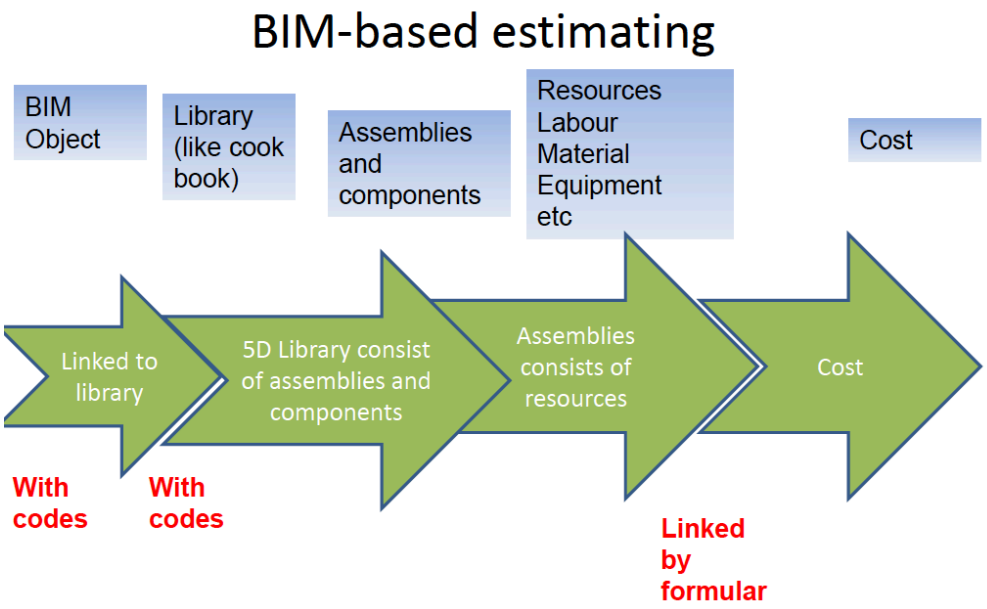
- Due to the large investment and minimal return
- Difficult to invest in the suppliers/subcontractors as it is too competitive in the market

TOPIC 2 – BIM AND COST ESTIMATING PRACTICE

What is the role of project cost estimating?

- Predict cost
- Establish budget
- Evaluate alternatives
- Economic feasibility of projects
- Profitability
- Resource requirement
- Basis for bid
- Basis for cost and schedule control

BIM-based Estimating
The process is outlined in the below flow chart:



Benefits of BIM in Cost Estimation

- Quantity automation which can save time
- Reduce laborious tasks of quantity take-offs from the 2D drawings
- Time can be then be utilised by cost modelling comparing alternatives
- Enables design iteration
- Obtaining quantities etc. from revisions is made easy