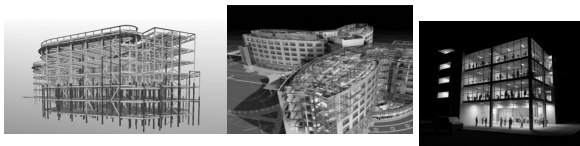


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SMART CONSTRUCTION IN SINGAPORE

Cost Estimation & Quantity Take-Off

21 September 2011

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Initial Perception about BIM

“Cost is known immediately.”

“We will know cost impact of all changes/variations immediately.”

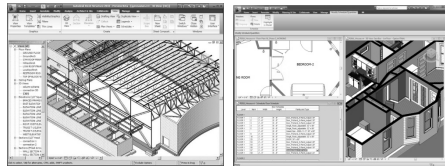
“BIM is able to perform immediate cost study & analysis of different building designs.”



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Role of the Quantity Surveyor

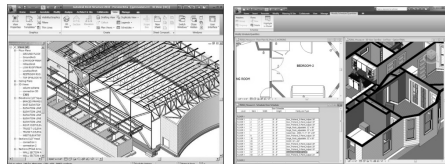
- Cost estimate for budget, tender, project accounting
- Cost management
- Contract management
- Cost engineering
- Value Engineering



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Preparation of Cost Estimate

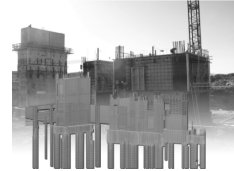
- A systematic scientific method
- Elemental cost and trade pricing
- A Good QS has analytical mind and is disciplined



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Key Building Elements

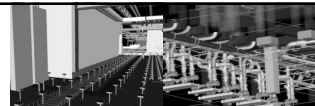
- Foundation
- Basement construction
- Super-structure work
- Architectural work
- Architectural finishes
- Mechanical & electrical services
- Furniture, fitments and equipment
- External work



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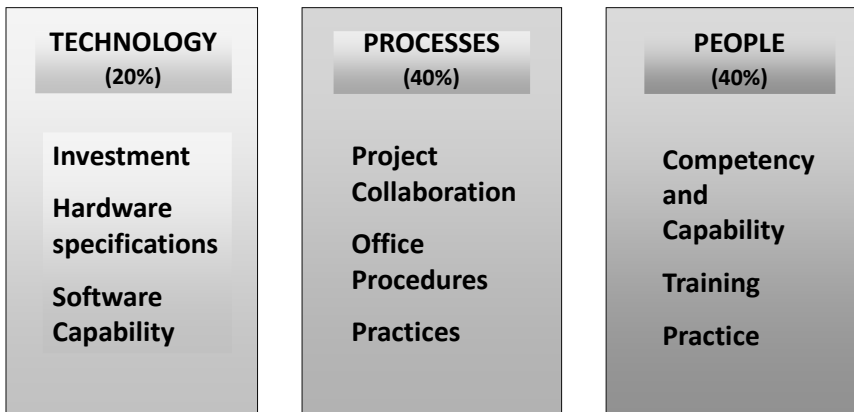
Work Trades

- | | |
|------------------------|-------------------|
| • Piling | • Ironmongery |
| • Concrete work | • Tiling work |
| • Steel reinforcement | • Plaster work |
| • Formwork | • Paint work |
| • Structural steelwork | • Plumbing work |
| • Brickwork | • Electrical work |
| • Masonry work | • Mechanical work |
| • Curtain wall | • Pipe work |
| • Carpentry | |
| • Joinery | |
| • Metalwork | |



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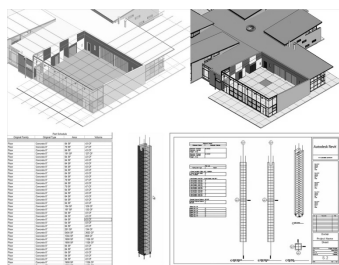
3 Pillars of BIM



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Realistic Expectations & Benefits

- Gradual transition and adoption as BIM culture unfolds
- Save time in QTO
- Enhance accuracy
- Able to relate cost to specific elements & components
- Able to trace changes and cost impact



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BIM QTO & Cost Estimating Workflow

QTO Workflow

- Receive BIM model in dwf and ifc format
 - Audit the model to verify the completeness of the components and building elements.
 - Extract model map and object properties for QTO
 - Prepare cost plan and bills of quantities
-
- Example - Single Element, with multiple trade pricing:
 - Column/pillar - Structural (concrete, formwork, reinforcement, steel & fire-proofing), finishes (plaster, tiles, paint, cladding)

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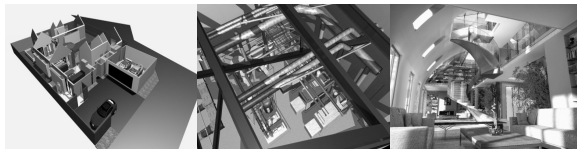
Productivity

- With BIM, QTO time could be reduced by half
- Accuracy of quantities improves reliability
- Quantities and dimensions are linked to drawings
- Revision of design could be tracked and quantities revised promptly through all stages of the project

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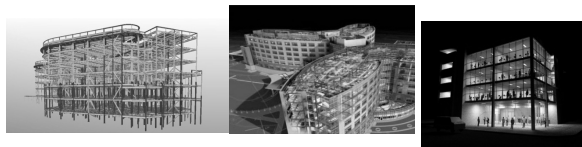
Conclusion

- BIM enhances productivity and save time and money
- It benefits everyone in the supply chain, from developers to subcontractors
- Benefits will vary according to procurement arrangement



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THANK YOU

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