BIM

BUILDING INFORMATION MODELLING. UNDERSTANDING ITS FUNCTION IN THE FUTURE OF THE ARCHITECTURAL PROFESSION.

Ar Chan Seong Aun.
Immediate Past President PAM 2015-2016
CONTENT

1. WHAT IS BIM
2. BENEFITS OF BIM FOR ARCHITECTS
3. OVER COMING COMMON BIM BARRIERS
4. ARCHITECTURAL BIM SOFTWARE
5. WORKING WITH OTHERS
COMMON ASPIRATION OF CLIENT BODIES

CLIENT

Frequent design changes
Proper arrangement of funds
Timely payments
Owner's interference
Slow decision making and Approvals
Un-realistic time durations

CONSULTANT

Delay in approval of variation statements
Discrepancies between contract documents
Delayed preparation and approval of drawings
Quality assurance
Waiting time for approval of test and

CONTRACTOR

Poor site management
Improper planning
Improper construction methods
Organizational structure
Lack of Procurement schedule

INTEGRATED PROJECT DELIVERY
1 WHAT IS BIM

1.1 When is it NOT BIM?
1.2 What is the status in Malaysia & elsewhere
1.3 Why BIM not accepted? Common myths!
BIM DEFINITIONS

INFORMATION
WHAT IS BIM ANYWAY?

ISO BIM Definition:

Shared digital representation of physical and functional characteristics of any built object (including buildings, bridges, roads, etc.) which forms a reliable basis for decisions

BS ISO 29481-1 2010
WHAT IS BIM ANYWAY?

NBS BIM Definition:

A Building Information Model is a rich information model, consisting of potentially multiple data sources, elements of which can be shared across all stakeholders and be maintained across the life of a building from inception to recycling (cradle to cradle).

NBS, 2010
NBS BIM Definition:

A Building Information Model is a rich information model, consisting of potentially multiple data sources, elements of which can be shared across all stakeholders and be maintained across the life of a building from inception to recycling (cradle to cradle). The information model can include contract and specification properties, personnel, programming, quantities, cost, spaces and geometry.

NBS, 2010
The most meaningful way to differentiate your company from your competition ... is to do an outstanding job with information. How you gather, manage, and use information will determine whether you win or lose.

Bill Gates, 1999
Building: a structure, an enclosed space, a constructed environment...

Information: an organised set of data: meaningful, actionable

Modelling: shaping, forming, presenting, scoping...
BUILDING INFORMATION MODELLING DEFINITION

- Must be Three Dimensional,
- built from Objects (solid modelling - object oriented technology),
- have encoded and embedded discipline-specific information (more than a mere database)
- have interwoven relationships & hierarchies between their objects (rules and/or constraints: similar to a relationship between a wall and a door where a door creates an opening in a wall),
- describes a Building of some sort.

BIM 2015
BUILDING INFORMATION MODELLING DEFINITION

BIM, how to read the term:
- **Building**: a structure, an enclosed space, a constructed environment…
- **Information**: an organised set of data: meaningful, actionable
- **Modelling**: shaping, forming, presenting, scoping…

The BIModel manages objects, non-structured data, and their relationships. The objects persist within the database, objects with encoded data are referenced into the BIModel. (Succar, 2008)
BUILDING INFORMATION MODELLING DEFINITION

BIM, how to read the term:

Building: a structure, an enclosed space, a constructed environment…

Information: an organised set of data: meaningful, actionable

Modelling: shaping, forming, presenting, scoping…

---

Colour signifies ‘industry sector’ or ‘knowledge domain’:
Examples:
- Client Requirements
- Authorities & Regulators
- Architectural Design
- Engineering & Analysis
- Quantity Surveying
- Facility Management
- Etc...

Shape signifies type of data within a domain:
Examples:
- Design Data
- 4D Data
- Cost Data
- Code Compliance Data
- Maintenance Data
- Performance Data
- Etc…

---

(Succar, 2005-2007)

Building Information Modelling
BUILDING INFORMATION MODELLING DEFINITION

Surface Modellers (like SketchUp® for example), Entity-Based Modellers (like 3D AutoCAD®) and Geometric Modellers (like Autodesk® VIZ) do not qualify as a BIM modellers. The exclusion is also passed onto 3D object-based platforms that are outside the Architectural Engineering and Construction domain (like SolidWorks®, Solid Edge® and Inventor®).
UK SURVEY OF BIM USE 2011

Awareness and use of BIM

- Neither aware nor using, 43%
- Aware and currently using BIM, 13%
- Just aware of BIM, 45%

Have you ever heard of BIM (Building Information Modelling)?
BIM USE IN MALAYSIA

PAM SURVEY OF BIM USE 2013
PAM BIM SURVEY 2013

Implementation of BIM in my company

- No plan to implement BIM: 6.7%
- Creating awareness to BIM: 0.0%
- Planning to implement BIM: 46.7%
- Currently using BIM: 46.7%
PAM BIM SURVEY 2013

We use the following software for production of 3D drawings

- Others: 37.5%
- Graphisoft Architecture: 25.0%
- Microstation: 0.0%
- Autodesk MEP: 6.3%
- Autodesk Revit: 37.5%
- Autodesk Architecture: 18.8%
PAM BIM SURVEY 2013

Lack of BIM adoption by key market players

- Absolutely easy: 0%
- Easy: 0%
- Moderate: 12.50%
- Difficult: 75%
- Extremely Difficult: 12.50%
Cost changes to work flow, procedure & method

- Very expensive: 6.25%
- Expensive: 56.25%
- Affordable: 31.25%
- Cheap: 6.25%
- Very cheap: 0%
PAM BIM SURVEY 2013

Cost Training staff

- Very expensive: 12.5%
- Expensive: 50%
- Affordable: 37.5%
- Cheap: 0%
- Very cheap: 0%
PAM BIM SURVEY 2013

Lack of BIM standardisation in industry

- Absolutely easy: 0%
- Easy: 0%
- Moderate: 18.75%
- Difficult: 75%
- Extremely Difficult: 6.25%
Lack of or insufficiency trained staff in industry

- Absolutely easy: 0%
- Easy: 0%
- Moderate: 12.50%
- Difficult: 62.50%
- Extremely Difficult: 25%
PAM BIM SURVEY 2013

Lack of BIM compliant component in e Library

- Absolutely easy: 0%
- Easy: 6.25%
- Moderate: 12.50%
- Difficult: 68.75%
- Extremely Difficult: 12.50%
Improved Cost efficiency/increase profitability

- Strongly Agree: 26.70%
- Somewhat Agree: 66.50%
- Neutral: 6.70%
- Somewhat Disagree: 0%
- Strongly Disagree: 0%
INTERNATIONAL BIM SURVEYS
BIM provides a common environment for all information defining a building, facility or asset, together with its common parts & activities.

This includes building shape, design and construction time, costs, physical performance, logistics and more.

More importantly, the information relates to the intended objects (components) & processes, rather than relating to the appearance & presentation of documents & drawings.

Source: www.rics.org
PHASED MANDATORY BIM E-SUBMISSION

2013
Mandatory Architecture BIM e-Submissions for all new building projects > 20,000 m²

2014
Mandatory Engineering BIM e-Submissions for all new building projects > 20,000 m²

2015
Mandatory Architecture & Engineering BIM e-Submissions for all new building projects > 5,000 m²

** will be calibrated in a gradual manner by taking into consideration the readiness of the industry practitioners and technology.

Singapore Building and Construction Authority
UK SURVEY OF BIM USE 2011
Have you ever heard of BIM (Building Information Modelling)?

- Neither aware nor using, 43%
- Aware and currently using BIM, 13%
- Just aware of BIM, 45%
Which of the following statements apply to you personally?

- 65% write project specifications
- 55% produce 2D CAD drawings
- 25% produce 3D CAD drawings
- 52% write schedules of work
- 60% I administer contracts
- 53% prepare building regulations submissions
- 16% None of these

3D CAD
- Drawings only: 3%
- Both 2 and 3D CAD: 22%

2D CAD
- Drawings only: 42%

No CAD
- Drawings: 33%

BIM 2012
When producing CAD drawings, which of the following tools do you mainly use?

- None of these: 0% (1%)
- Other (please state): 7% (10%)
- Nemetschek Vectorworks: 9% (13%)
- Nemetschek Allplan: 0% (0%)
- Graphisoft ArchiCAD: 5% (10%)
- Google Sketchup: 6% (6%)
- Bentley Microstation: 7% (7%)
- Autodesk Revit: 2% (8%)
- Autodesk Architectural Desktop: 3% (5%)
- Autodesk AutoCAD: 42% (57%)
- Adobe Illustrator: 0% (0%)

Legend:
- Green: I produce 3D CAD drawings
- Orange: I produce 2D CAD drawings
When producing CAD drawings, which of the following tools do you also use?

- None of these: 26%
- Other: 7%
- Nemetschek Vectorworks: 6%
- Nemetschek Allplan: 2%
- Graphisoft ArchiCAD: 13%
- Google Sketchup: 45%
- Bentley Microstation: 3%
- Autodesk Revit: 12%
- Autodesk Architectural Desktop: 14%
- Autodesk AutoCAD: 16%
- Adobe Illustrator: 10%
MIDDLE EAST BIM SURVEY

MAIN OBSTACLES TO THE ADOPTION OF BIM

- Availability of skilled staff: 51%
- Cost of software: 48%
- Cost of implementation: 34%
- Availability of training: 34%
- Senior management buy-in: 30%
- Availability of standards: 28%
- Disruption to current process: 25%
- Cost of hardware upgrades: 25%
- Lack of buy-in from other trades: 18%
- Other: 18%
- Affordability: 15%
- Competitors don’t use BIM: 9%
- BIM has not been proven: 9%
BIM COMMON MYTHS

1. Other Consultants have not started to use BIM
2. BIM software is very expensive & NOT worth the cost
3. BIM training is very expensive
4. Local Authorities DO NOT require BIM
5. Clients are NOT willing to pay for BIM
2. BENEFITS OF BIM FOR ARCHITECTS
2.1 Improved skills and faster delivery
2.2 Less mistakes. Automating building plan production
2.3 Lower dependency on low skill staff
2.4 Getting back to a position of authority
BUILDING INFORMATION MODELLING

1980’s
- Procedural languages - arrays, linked lists, stacks, queues etc.
- Geometry
- Graphics
- CAD
- Drawing exchange

1990’s
- Object oriented data models
- C++, Java, etc.
- Object/product models

2000’s
- Web based technology, information models
- XML
- Information and process models
BUILDING INFORMATION DISCONNECT

Diagram:
- Design phase data
- Construction phase data
- Building Use Phase data
- Building components, spaces
- Content information (people, goods)
- Process information (energy, structures, etc.)
BIM PRIMARY BENEFIT

Primary Benefits of BIM

<table>
<thead>
<tr>
<th>Social</th>
<th>lonely</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>I</td>
</tr>
<tr>
<td>COORDINATION</td>
<td>PRODUCTION</td>
</tr>
<tr>
<td>IV</td>
<td>III</td>
</tr>
<tr>
<td>INTEGRATION</td>
<td>DESIGN</td>
</tr>
<tr>
<td>little</td>
<td>BIG</td>
</tr>
</tbody>
</table>
BUILDING INFORMATION MODELLING

<table>
<thead>
<tr>
<th>Current paradigm</th>
<th>New paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interoperable ICT solutions</td>
<td>Integration of BIM</td>
</tr>
<tr>
<td>Architect, Civil, Struct., HVAC, Facilities, Constr.</td>
<td>Architect, Structural, M&amp;E, Building, Facilities, Constr., Control, Shared Information &amp; Risk Reward</td>
</tr>
</tbody>
</table>

Integrated project work:
- Owner
- Information Exchange

Vision on role change:
OVERCOME COMMON BARRIERS

3.1 Getting Started. Learn a new skill
3.2 Choosing the software.
3.3 Knowing what is important
3.4 Getting the required training for Architects
3.5 Training for support staff
WHAT IS BIM ANYWAY?

Summary

• Industry awareness improving
• Standards for consistent use and delivery made available
• BIM Hubs and interest groups beginning to form

• 'The secret to BIM – get started now'

• But beware the BIM Wash.....
Which BIM software should I use?
When you really look at that question, the answer is insanely simple.

The one you will enjoy using most.
All BIM programs (Revit, ArchiCAD, Vectorworks, Bentley Systems, Allplan...) have their pros and cons. Some do more than others. Each has its strengths when working with others (ie, collaboration and interoperability). Each program handles all the levels of BIM differently. But none of that really matters. If you don’t enjoy using the software, it is irrelevant if the program is the best thing ever. You won’t take advantage of it. Who cares if the program can exchange data with everyone under the sun or can model the craziest things you can image. If you hate working in the program, you won’t do any of that. If during your commute home you just mope about missing the joys of hand drafting, then you’ve made a huge mistake. You either need to find the joy in the software you’ve chosen or pick another.
Which BIM software should I use?

Being angry and sad every day sucks; the answer is obvious.

The one you will enjoy using most.

Do your research, get the opinions of experts, poll your team, test the applications out. But in the end, find a program you feel comfortable using and exploring. You’ll be much happier, much more productive, and actually succeed at BIM.
Both ArchiCAD and Revit are easy programs to learn, but hard to master. HOWEVER... if you know one, learning the other will be easy IF you don’t try to make Program A act like Program B.

Support OPEN BIM
ARCHITECTURAL BIM

4.1 BIM Software available
4.2 Cost of BIM Software. Is it worth the cost?
4.3 Revit, ArchiCAD, Bently or Sketchup PS?
4.4 Sketchup PlusSpec and open BIM
4.5 Sketchup Warehouse
BIM ARCHITECTURE SOFTWARE

1. Autodesk Revit Architecture
2. Graphisoft ArchiCAD
3. Bentley Ecosim Architecture
4. Nemetschek Vectorworks Architecture
5. Nemetschek Allplan Architecture
6. RhinoBIM
7. Sketchup PlusSpec
8. 4MSA IDEA Architectural Design from IntelliCAD
9. Gehry Technologies – Digital project designer
10. CADsoft Envisioneer
11. Softech spirit
12. ACCA Edificus
BIM STRUCTURAL SOFTWARE

1. Autodesk Revit Structure
2. Bentley Structural Modeler
3. Bentley RAM, STAAD and ProSteel
4. Tekla Structures
5. CypeCAD
6. Graytec Advance Design
7. StructureSoft Metal Wood Framer
8. Nemetschek Scia
9. 4MSA Strad and Steel
10. Autodesk Robot Structural Analysis
BIM SOFTWARE Cost

2D AutoCAD LT cost RM 5,000
Autodesk Revit cost RM 15,000
Cost Difference 3x

LT Productivity 1
Revit Productivity 5
Cost Difference 5x
<table>
<thead>
<tr>
<th>Products</th>
<th>Revit LT 2016</th>
<th>AutoCAD LT 2016</th>
<th>AutoCAD Revit LT Suite 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Architects, Designers</td>
<td>Drafters, Designers</td>
<td>Architects, Designers, Drafters</td>
</tr>
</tbody>
</table>

### Desktop Subscription

- Pay-as-you-go access
- Up-to-date software
- Online support
- Scalable licensing

### 3D BIM

- Walls, floors, roofs, ceilings, and columns
- Design options
- Create groups for repeating elements
- Family editor environment

### Documentation

- 2D documentation, drafting, and detailing
- Dimensioning, tagging, and annotation
- Schedules
- Material takeoff
- Revision tracking
- Command line

### Visualization and presentation

- Sketchy lines
- Realistic view styles
- 3D orthographic and perspective views
- **A360 Rendering**
- Animations and walk-throughs

### Collaboration

- TrustedDWG™ technology
- Reference DWF file format
- Revit file exchange
- PDF and DWF™ publish/underlay
- Geolocation system and live maps
BIM SOFTWARE COST

Take your BIM Journey with LOWEST investment COST, NOW THAN EVER!

It’s time to move to BIM and understand BIM methodologies and processes. With Autodesk® Revit LT you can take a soft approach and start transitioning your traditional 2D process into an easy to use BIM tool at your own pace while learning BIM along the way.

Autodesk® Revit LT uses the Revit Native RVT file format which is the same as Revit, Revit Architecture, Revit Structure and Revit MEP and allows exchange and sharing of model files with other Revit users with the extended project teams.

<table>
<thead>
<tr>
<th>AUTODESK® REVIT LT</th>
<th>Promo Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Seat With</td>
<td>RM 2,950 + 1 Day Jump-start Training (FREE)</td>
</tr>
<tr>
<td>2 Years Desktop Subscription</td>
<td></td>
</tr>
<tr>
<td>1 Seat With</td>
<td>RM 4,450 + 1 Day Jump-start Training (FREE)</td>
</tr>
<tr>
<td>3 Years Desktop Subscription</td>
<td></td>
</tr>
</tbody>
</table>
# BIM Software Cost

<table>
<thead>
<tr>
<th>Autodesk Material Description</th>
<th>Promo Price (RM)</th>
<th>Normal Price (RM)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Building Design Suite 2016</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autodesk Building Design Suite Premium</td>
<td>27,820.00</td>
<td>31,827.00</td>
</tr>
<tr>
<td>Autodesk Building Design Suite Standard</td>
<td>21,750.00</td>
<td>23,615.00</td>
</tr>
<tr>
<td>Autodesk Building Design Suite Ultimate</td>
<td>43,740.00</td>
<td>49,957.00</td>
</tr>
<tr>
<td><strong>Revit 2016</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autodesk Revit Architecture</td>
<td>23,540.00</td>
<td>26,934.00</td>
</tr>
<tr>
<td>Autodesk Revit Structure</td>
<td>23,540.00</td>
<td>26,934.00</td>
</tr>
<tr>
<td>Autodesk Revit MEP</td>
<td>23,540.00</td>
<td>26,934.00</td>
</tr>
<tr>
<td><strong>Infrastructure Design Suite 2016</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autodesk Infrastructure Design Suite Premium</td>
<td>27,820.00</td>
<td>31,827.00</td>
</tr>
<tr>
<td>Autodesk Infrastructure Design Suite Standard</td>
<td>22,320.00</td>
<td>24,185.00</td>
</tr>
<tr>
<td>Autodesk Infrastructure Design Suite Ultimate</td>
<td>43,740.00</td>
<td>49,957.00</td>
</tr>
<tr>
<td><strong>Civil 3D 2016</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autodesk AutoCAD Civil 3D</td>
<td>25,508.00</td>
<td>29,193.00</td>
</tr>
</tbody>
</table>

---

Find out more, email your enquiry to
cheonglip@progressive.com.my & cyndichan@progressive.com.my
WORKING WITH OTHERS

5.1 Transferring 2D dwg to other Consultants
5.2 Extracting Cost information
5.3 Extracting floor areas and volumes
5.4 Extracting Schedules
5.5 Model Interoperability
5.6 IFC Industry Foundation Class
BIM SUSTAINABILITY SOFTWARE

1. Autodesk Ecotect Analysis
2. Autodesk Green Building Studio
3. Graphisoft EcoDesigner
4. IES Solutions Virtual Environment VE-Pro
5. Bentley Tas Simulator
6. Bentley Hevacomp
7. DesignBuilder
1. Autodesk Revit MEP
2. Bentley Hevacomp Mechanical Designer
3. 4MSA FineHVAC + FineLIFT + FineELEC + FineSANI
4. Gehry Technologies - Digital Project MEP Systems Routing
5. CADMEP (CADduct / CADmech)
BIM CONSTRUCTION MANAGEMENT

1. Autodesk Navisworks
2. Solibri Model Checker
3. Vico Office Suite
4. Vela Field BIM
5. Bentley ConstrucSim
6. Tekla BIMSight
7. Glue (by Horizontal Systems)
8. Synchro Professional
9. Innovaya
BIM FM FACILITIES MANAGEMENT

1. Bentley Facilities
2. FM: Systems FM: Interact
3. Vintocon ArchiFM (For ArchiCAD)
4. Onuma System
5. EcoDomus
Figure 4 IFC release history (extracted from http://www.iai-tech.org)
IFC MODEL

[Diagram of IFC model showing relationships between IfcRoot, IfcObject, IfcProduct, IfcElement, IfcBuildingElement, and specific Ifc elements such as IfcWall, IfcBeam, IfcColumn, IfcSlab, IfcWindow, IfcDoor, and IfcWallStandardCase.]
# BIM IFC & Green Buildings

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Before use stage</th>
<th>Use Stage</th>
<th>End of Life Stage</th>
<th>Disposal Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Product Stage</td>
<td>Construction Stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GWP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste</td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>IEQ</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stages included for each indicator</th>
<th>Required in 2009 version</th>
<th>Optional in 2009 version</th>
<th>Not included in 2009 version</th>
<th>Not relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BIM 2015
Figure 7 Virtual Prototyping and IFC BIM tendering process for the Aix-en-Provence campus development process.
## ECOTECT REVIT

<table>
<thead>
<tr>
<th>Software</th>
<th>name</th>
<th>Autodesk Ecotect Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>vendor</td>
<td>Autodesk</td>
</tr>
<tr>
<td></td>
<td>short description</td>
<td>Autodesk Ecotect Analysis is an environmental analysis tool that allows designers to simulate building performance right from the earliest stages of conceptual design.</td>
</tr>
<tr>
<td></td>
<td>nature</td>
<td>commercial, prototype</td>
</tr>
<tr>
<td>Analysed indicator(s)</td>
<td>Resource depletion</td>
<td>Indoor environment</td>
</tr>
<tr>
<td></td>
<td>Energy</td>
<td>Thermal comfort</td>
</tr>
<tr>
<td></td>
<td>Water</td>
<td>Indoor air quality</td>
</tr>
<tr>
<td></td>
<td>GWP</td>
<td>Wastes</td>
</tr>
<tr>
<td></td>
<td>Life cycle stage</td>
<td>Before use</td>
</tr>
<tr>
<td></td>
<td>BIM integration</td>
<td>Use stage</td>
</tr>
<tr>
<td></td>
<td>Remarks</td>
<td>End of life</td>
</tr>
<tr>
<td></td>
<td>e.g. open format used is IFC</td>
<td>Internal, External</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Proprietary format</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open format</td>
</tr>
<tr>
<td>Calculation method</td>
<td>to be described</td>
<td>Uploads data from BIM into a webservice.</td>
</tr>
<tr>
<td>Software</td>
<td>name</td>
<td>vendor</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td>name</td>
<td>vendor</td>
</tr>
<tr>
<td>----------</td>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td>EcoDesigner</td>
<td>Graphisoft</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analysed indicator(s)</th>
<th>Resource depletion</th>
<th>Indoor environment</th>
<th>Building emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Energy</td>
<td>Water</td>
<td>Thermal comfort</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indoor air quality</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GWP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wastes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Life cycle stage</th>
<th>Before use</th>
<th>Use stage</th>
<th>End of life</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>BIM integration</th>
<th>Internal</th>
<th>External</th>
<th>Proprietary format</th>
<th>Open format</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Remarks</th>
<th>BIM-integrated energy modeling for ArchiCAD</th>
</tr>
</thead>
</table>
e.g. open format used is IFC

<table>
<thead>
<tr>
<th>Calculation method</th>
<th>VIPCore Calculation Engine - when all necessary input data is provided, StruSoft’s high-end energy calculation module is activated within EcoDesigner.</th>
</tr>
</thead>
</table>
**Building Information Modelling**

<table>
<thead>
<tr>
<th>Software</th>
<th>name</th>
<th>Athena Sustainable Materials Institute</th>
<th>ATHENA® Impact Estimator for Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>short description</td>
<td>A software tool that is designed to evaluate whole buildings and assemblies based on internationally recognized life cycle assessment (LCA) methodology.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nature</td>
<td>commercial</td>
<td>prototype</td>
<td></td>
</tr>
<tr>
<td>Analysed indicator(s)</td>
<td>Resource depletion</td>
<td>Indoor environment</td>
<td>Building emissions</td>
</tr>
<tr>
<td></td>
<td>Energy</td>
<td>Water</td>
<td>Thermal comfort</td>
</tr>
<tr>
<td>Life cycle stage</td>
<td>Before use</td>
<td>Use stage</td>
<td>End of life</td>
</tr>
<tr>
<td>BIM integration</td>
<td>Internal</td>
<td>External</td>
<td>Proprietary format</td>
</tr>
<tr>
<td>Remarks</td>
<td>Excel-based.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.g. open format used is IFC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calculation method to be described</td>
<td>Material manufacturing, transportation, on-site construction, renergy use, building type, assumed lifespan, maintenance and replacement effects, demolition and disposal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PAM CPD WORKSHOP 2012

Saturday, 24 March 2012

Building Information Modelling (BIM) Training Workshop for Architects

Trainers  Ar Gary Wong, Mr L S Chew & Mr David Lim

Time
8.30am Registration  •  9.00am BIM Presentation
10.00am ArchiCAD Hands-on Workshop  •  1.00pm Lunch
2.00pm AC Workshop Continues  •  4.00pm Presentation on Design Management  •  4.30pm Presentation on offers from VNIX  •  5.00pm End

Venue
Taylors University, Lakeside Campus, 1 Jalan Tayfors, 47500 Petaling Jaya (Map available on PAM website)

Registration Fee
RM 200.00 PAM Member  •  RM 400.00 Non PAM Member
RM 100.00 PAM Student Member
RM 150.00 Non PAM Student Member

Venue Sponsored by TAYLOR'S UNIVERSITY

LAM CPD Points have been applied
1. BIM for absolute beginners
2. Structure grid and setting up the structural frame
3. Importing and exporting dwg files. Layer set up and control
4. Advanced BIM modelling tools stairs mesh shells and morph
5. Best Practices in BIM modelling
6. Modelling basic M&E Objects
7. Modelling Interiors and landscaping
8. Creative Imaging in 3d photo rendering, walk through and BIMX models
9. Detailing, cataloguing and cross referencing 1
10. Detailing, cataloguing and cross referencing 2
THANK YOU
adssb1@gmail.com