Arch 355:
Computer Skills - 2

Introduction

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Computer in project life cycle

Pre-design

Feasibility Study

Program
Brief
TOR

Design

Conceptual, Preliminary

Developed

Final & Documentation

Construction

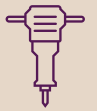
Tendering

Construction

Operating

Operation & Maintenance

Post Occupancy Evaluation POE



Demolition & Recycling

Computer in project life cycle

Feasibility Study

Program Brief TOR

Pre-design

Information / Data : Gathering, Analyzing
Presentations and reports

Information / Data : Gathering, Analyzing
Site Analysis
Sketches & Drawings
Presentations and reports

Power BI

Computer in project life cycle

Conceptual, Preliminary

Developed

Final & Documentation

Design

Modleing	Evaluation	Ideation	Simulation
Modleing	Evaluation	Ideation	Computational Design
			AI
Evaluation	Analyzing	Modeling & Documentation	Clash Detection
			Bills of Quantities

Computer in project life cycle

Tendering

Construction

Construction

Analyzing & Comparing

Construction Management ▷

CAM
Precast
Prefabriction

Robotics ▷

3D Printing ▷

Computer in project life cycle

Operation & Maintenance

Post Occupancy Evaluation POE

Demolition & Recycling

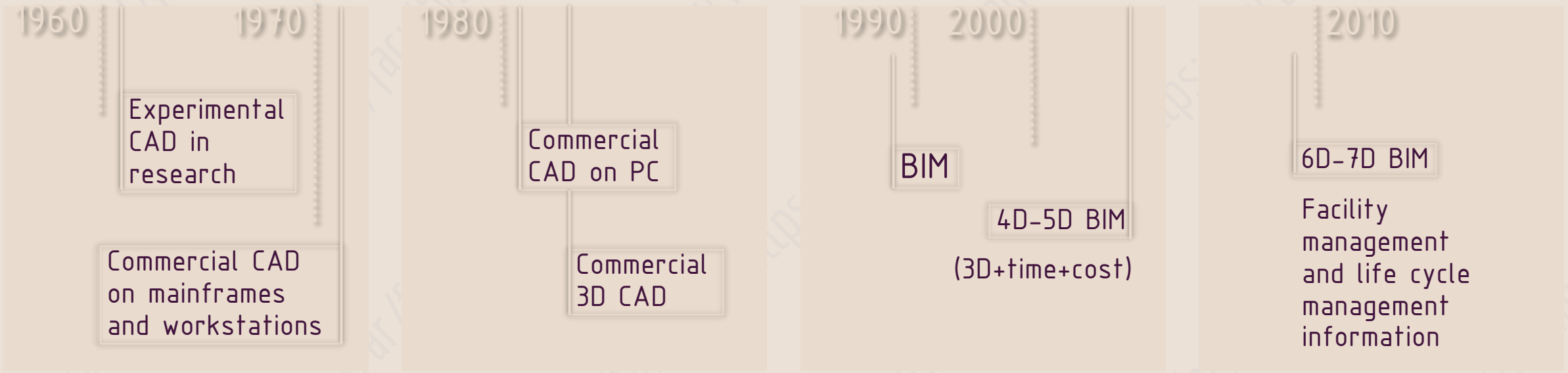
Operating

BMS

Simulation

Demolition (Design, Simulation, & Analysis) ▷ Waste Management ▷

Development



Source: Graphisoft BIM Curriculum 2015 http://www.graphisoft.com/learning/bim-curriculum/

Terminologies

CAD
Computer
Aided
Design/Drafting

CAAD
Computer
Aided
Architectural
Design

BIM
Building
Information
Modeling

CD
Computational
Design

Modeling Workflows

(Manual, Static, Hand) Modeling

The model is constructed by a human using software modeling tools manually

Procedural Modeling

Create 3D models based on sets of rules.

Procedural computing is the process of creating data algorithmically instead of manually.

Procedural rules are used for creating complex models.

Methods:

- Fractal geometry
- Grammar-based modeling (shape grammar)
- Algorithmic modeling
- Parametric modeling
- Generative modeling

Data-Driven Modeling

Scanning

laser scanners are used to obtain

(Point cloud)

And create models from these points.

Data

Topography - Revit

Reality (Capture) modeling

Aerial photography and/or photography are used to build models of buildings, cities, or any existing object. Using for example:

3D imaging and photogrammetry with

UAVs (unmanned aerial vehicle)

These images are produced and then processed using programs that convert two-dimensional maps into three-dimensional models, such as:

ContextCapture by Bentley, Drone2Map by ESRI, Metashape by Agisoft

Ai in 3D Modeling & Rendering

in Architecture & Planning

Text to Image
Image to Video

- Sora ▷
- HailuoAI ▷
- Firefly ▷
- Artlist ▷
- Vivago ▷
- ……

Image to 3D

- Meshy ▷
- TRIPO ▷
- 3D AI Studio ▷
- cgdream ▷
- HYPER3D ▷
- Alpha3D ▷
- ……

Rendering

- Midjourney ▷
- mnml ▷
- VISOID ▷
- PromeAI ▷
- ArchiVinci ▷
- rendair ▷
- Architect AI ▷
- MyArchitectAI ▷
- ……

- VERAS ▷

Design

- Architechtures ▷
- PlanFinder ▷
- maket ▷
- Spacio ▷
- Finch ▷
- Laiout ▷
- TESTFIT ▷
- Auodesk Forma ▷
- Digital Blue Foam ▷
- Archistar ▷
- ……. …….

- Cost (Education)
- New Skills (Prompting)
- Consistency
- Developing

Softwares

BIM Modelers

Objects are not only three-dimensional shapes, but also include information (properties, specifications, installation methods, etc.). Among their features are:

1. Deals with objects with Its same properties as they would in the real world.
2. Modeling is mostly done by specifying properties, not graphically.
3. Self Behavior Objects: self-acting elements, windows and doors, that create an opening in the wall.
4. Consistency: The concept of a virtual model from which outputs are extracted, where modification to any part is reflected in all outputs.
5. Providing an interactive tabular view of elements: Modifications to elements are mirrored in the tables, and vice versa. This feature is useful for creating quantity and specification tables.

General Modelers

Objects have basic shapes and no specific properties. Their characteristics include:

1. Deals with objects as general shapes that are interpreted or defined by the user.
2. Modeling is done graphically.
3. More flexible in modeling and creating complex or irregular shapes.
4. Models are often smaller (File size), especially those bult by surfaces.
5. Include several techniques for representing surfaces, and they may all be available in the same program, such as:

   Mesh, NURBs, SubD

Documentation Tools

Design Tools

General Modelers

General Low-end


FormIt


form-Z jr


SketchUp

CAD


TurboCAD


IntelliCAD


Microstation


AutoCAD

General High-end


Cinema-4d


Maya


3ds Max


Blender


Rhino3d


Form Z

BIM Modelers


Vectorworks


Revit


ArchiCAD


Open Buildings Designer


Allplan


Digital Project

Generative (Parametric)

Grasshopper


Generative Components


Dynamo

Renderer


Lumion


Artlantis


V ray


KeyShot


Twinmotion


Enscape


Corona


Maxwell


Substance