BIM & DIGITAL CONSTRUCTION
Hadjar Seti Adji
BIM (Building Information Modeling) is an intelligent 3D model-based process that gives architecture, engineering, and construction (AEC) professionals the insight and tools to more efficiently plan, design, construct, and manage buildings and infrastructure.
Level Of Development (LOD) BIM
Detailed information that we can obtain from construction stages

Pre-Design
Schematic Design
Design Development
Construction Documents
Construction Stage
As-Built

LOD100
LOD200
LOD300
LOD350
LOD400
LOD500
Dimension of Digital Construction (BIM)

Information obtained from BIM based on the functions

**3D**
- 3D Building data & Information
- Project Scope
- Prefabrication
- Structural Detailing
- Object Specification
- Field layout & civil data

**4D**
- Project Schedule & Phasing
- Just in Time schedule
- Installation schedule
- Payment Approval
- Last Planner schedule
- Critical Point

**5D**
- Work Breakdown
- Structures
- Conceptual Cost Planning
- Quantity Take off
- Trade Verification
- Value Engineering
- Prebarication

**6D**
- Energy analysis
- Green Building Element
- Green Building certification
- Tracking
- Green Building Point tracking

**7D**
- Building Life Cycles
- BIM as built data
- BIM cost operation & Maintenance
- BIM Digital lease planning

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**PRE DESIGN**

**SCHEMATIC DESIGN**

**DESIGN DEVELOPMENT**

**CONSTRUCTION DOCUMENT**

**CONSTRUCTION STAGE**

**AS BUILT**
3D image
Scope
Detailing

Construction Time
Sequencing
Critical path

Quantity
Price
BIM 5D

Integrated Process Overview

Column
  'Type 1'

  Rebar
  Formwork
  Concrete

  Cladding; Surface Finish

  Equipment
  Labor
  Materials

TOIs
Takeoff Items
$/Qty

TOQs
Takeoff Quantities
$/Qty

Resources
$/Qty

Design
Cost
Time

LBS
Benefit of BIM: Design & Shopdrawing Coordination

Proyek NewPort Makassar

Proyek Jembatan Kendari

BIM 3D
Scheduling & Sequencing Simulation (4D BIM)

Proyek Stadium Jayapura

Jalan Tol Pandaan Malang

Proyek Gedung BI Gorontalo

BIM 4D
BIM 5D – PROGRESS MONITORING

- Structure
- Architecture
- MEP
- Civil

MULTIDISCIPLINE BIM MODEL

- Documentation
- Quantification
- Estimating
- Scheduling
- ERP/SCM/O & M

- Visualization
- 4D Sequencing
- Clash Detection / Coordination
### Nipah Mall Makassar Project

#### Progress / Project Monitoring

**BIM 5D**

<table>
<thead>
<tr>
<th>Installed</th>
<th>Not Installed</th>
</tr>
</thead>
</table>

#### Installed

<table>
<thead>
<tr>
<th>Material</th>
<th>Area</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masonry - Brick</td>
<td>827 m²</td>
<td>82.37 m³</td>
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</table>

#### Not Installed

<table>
<thead>
<tr>
<th>Material</th>
<th>Area</th>
<th>Volume</th>
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</thead>
<tbody>
<tr>
<td>Masonry - Brick</td>
<td>691 m²</td>
<td>66.77 m³</td>
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</table>

### Additional Information

- Progress monitoring using BIM 5D tools for Nipah Mall Makassar Project.
- Comparison of installed vs. not installed materials with area and volume details.
- Utilization of technology for efficient project management.

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*Images show workers using technology and a 3D model of the building.*
BIM 5D – ERP DATA SUPPORTING

Structure

Architecture

MEP

Civil

MULTIDISCIPLINE BIM MODEL

Documentation

Quantification

Estimating

4D Sequencing

Scheduling

Visualization

Clash Detection / Coordination

ERP/SCM/O & M

BIM 5D – ERP DATA SUPPORTING
BIM 5D – ERP DATA SUPPORTING

BIM DATA - ERP SYSTEM

Project Systems (PS) → SCM (MM) → Finance (FI-CO) → Sales (SD) → Kinerja - Dashboard (BI & BPC)

Check → SCM (MM) → Finance (FI-CO) → Sales (SD)

HR (HCM) → SCM (MM) → Finance (FI-CO)
BNI 46 Pejompongan Building – Green Building Design & Build

Energy analysis
Green Building Element
Green Building Certification Tracking

Computational Flow Diagram
BNI 46 Pejompongan Building – Green Building Design & Build

GBCI, 27 SEPTEMBER 2017

GOLD DESIGN RECOGNITION

GREENSHIP
Bring your Digital World/Virtual to Real World

AUGMENTED REALITY
VIRTUAL REALITY
Bring your Real World to Digital World/Virtual
VIRTUAL REALITY
Bring your Real World to Digital World/Virtual
3D Photogrammetry Modeling
Ciamis Dam Project

DSM (Digital Surface Model)
DTM (Digital Terrain Model)
DEM (Digital Elevation Model)
A digital model of an area or region that has coordinate position information and elevation of that point.

A set of data points similar as a cloud and has coordinate and elevation information.
Geoelectrical method is one of geophysical subsurface survey method to identify the type of soil layers by utilizing electrical current which is injected into the soil to measure the resistivity value of each type.

Similar with CT Scan in medical field, the method uses electrical wave (electromagnetic) which is injected to the body part to identify the composition.

The benefit of this method for construction field is to determine the stratification of soil layer.

Higher resistivity value means higher rock hardness value.
CAPABILITY OF GEOELECTRICAL METHODS TO BIM & CONSTRUCTION

- To support BIM implementation through 3D modeling of soil layer stratification
- To complement the boring log data that is effective to be used in large area
- To ease the identification of rock and soil excavation volume
- To ease identification of areas prone/vulnerable to landslide
3D PRINTING - IMPLEMENTATION
BRI PEKANBARU PROJECT

3D PRINTING
Bring your Digital World to Real Works
BIM & DIGITAL CONSTRUCTION

• Construction Work would be more effective & efficient in Time, Cost & Quality due to Better on....
  1. Understanding
  2. Design Quality
  3. Coordination

• We would enter the New Era of Construction Business Process

Welcome to the New World
Tomorrow is Today