BIM Application In Project Management in Oil & Gas Projects

Babak Vahedi

Project Management Consultant

شرکت طراحی و ساختمان نفت
OIL DESIGN & CONSTRUCTION CO.

(ODCC)

Table of Contents

- Introduction

- Overview

- BIM Application Values for PM (WHY?)

  ✓ Engineering and Design Phase

  ✓ Procurement and Construction Phase

  ✓ Hand-Over and Operation phase

- BIM Application in PM (WHAT?)

- BIM Implementation (HOW?)

  ✓ Level 1&2 (Client/MC)

  ✓ Level 3 (MC/Contractor)

  ✓ Level 4&5 (Contractor/Subcontractors)

  ✓ Advanced Work Packaging

Introduction

- MSc. Construction Management

- PMP & RMP Certificates

- Positions: PCM, PM Consultant, 4D Planner, Forensic Sch.

- Industries:
  - ✓ OG&C
  - ✓ Rail Transit
  - ✓ Power
  - ✓ Airport
  - ✓ Shipbuilding
  - ✓ Mining & Metal

Overview

- Best Practices Prospective

- Project Management:

- Smart Project Manager (Why?, What?, How?)

- Challenge of Execution

  ✓ Knowledge?

  ✓ Experience?

  ✓ Effort?

  ✓ Software?

  ✓ Let's figure it out…
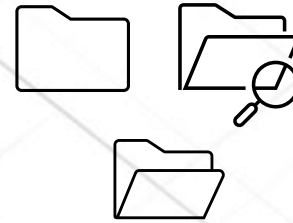
Overview

Information accuracy and consistency…

The same value is shown differently in multiple systems and is also different again to what is on the drawing - which value is correct?

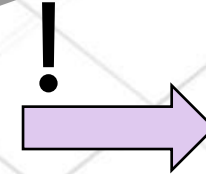The other Designer uses a different name for this property. Why don't they use the same names?

At time of system completion and hand-over...

So you're telling me I've got to process all of these handover documents and drawings – hardcopies and pdfs - lift information from them and input it all manually into our operating systems?
We don't have time for that!

Looking for information….

So where do I look to find this required test pressure value again? I have to hurry, the crew are waiting for this.
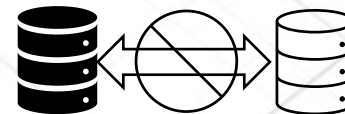
Waiting crew.. Work held up until information is found

Reporting abilities and integration of data & systems…

It'd be great if we could summarize all this information in real time to identify and focus efforts on areas of concern.
It takes me a long time to create a manual report each fortnight.

When I work in this application I have to manually copy over information from another system. It'd be great if they were integrated and required information pre-populated.

BIM Application Values for PM (WHY?)

- **Engineering and Design Phase**

  - ✓ Alignment between engineering design and construction using advanced work packages (AWPs) ensures constructability at the right time and place

  - ✓ Improves engineering productivity by allowing material take-offs broken down by Advanced Work Packages to be produced from the BIM model

BIM Application Values for PM (WHY?)

- Procurement and Construction Phase

    ✓ Improves (HSE) by better visualization of facilities and site layout

    ✓ Maximizing time on tools in construction by linking information between data sources and thus reducing time spent looking for information

    ✓ Improves construction productivity by analyzing sequences of work in time and space

    ✓ Visualizing construction site logistics in time and space such as laydown sequencing, temporary crane locations and excavations

BIM Application Values for PM (WHY?)

- Hand-Over and Operation phase

  - ✓ Improves data knowledge transfer and reduces setup time by utilizing BIM Application direct from Project information databases to Operations information databases

  - ✓ Provides visualization in a virtual environment of the physical assets for early Operations training programs to commence prior to start up.
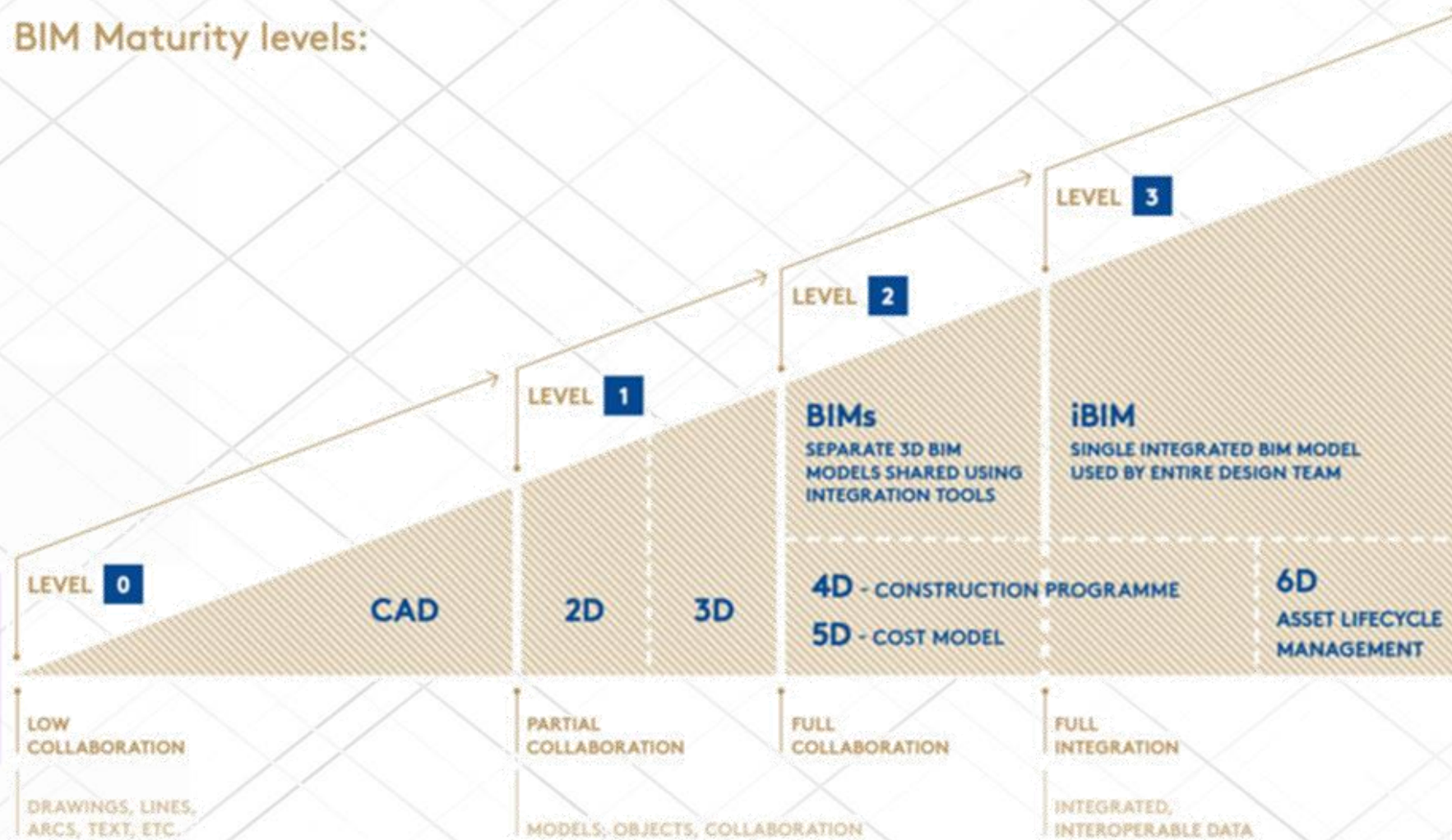
BIM Application in PM (WHAT?)

- **4D - Schedule**

  The use of the 4D model is to enhance the project scheduling process through visual communication

- **5D – Cost & Quantities**

  5D refers to the process of incorporating cost and quantities to the information models including:

  - ✓ Baseline Quantities

  - ✓ Material Take-Off

  - ✓ Material Management:

    - o Material Identifiers (either as tagged items or bulk materials)

    - o ROS Dates (when is the material required on site according to the schedule)

    - o Lead Times (from manufacturing & traffics and logistics)

BIM Application in PM (WHAT?)

- **6D – Operations**
  - ✓ Asset Information Data Exchange
  - ✓ 3D Model Handover

- **7D – Risk**

BIM Implementation (HOW?)

- Level 1&2 (Client/MC)

  - ✓ Ensure alignment between the parties (EPCS) on priorities (Control Interfaces)

  - ✓ Identification of work sequence for area-based work and lay out of priorities within major buildings/work faces

  - ✓ Zoom out to demonstrate impacts of out of sequence work

  - ✓ Visualization of external interferences like overhead power lines

BIM Implementation (HOW?)

- Level 3 (MC/Contractor)

  - ✓ Zoom in to specific work areas for prioritizing major equipment deliveries

  - ✓ Work front analysis for Insulation and Siding/Roofing contracts

  - ✓ Select critical, congested pinch points (geometrical and operational) and create more detail 4D models based on Level 3 schedule information to confirm the execution approach, duration, and logic

BIM Implementation (HOW?)

- Level 4&5 (Contractor/Subcontractors)
  - ✓ Clarity of craft activities as shown to the field engineers in real time
  - ✓ Ability to modify planned operations if needed, and communicate the plan
  - ✓ Ability to identify safety risks prior to starting work

BIM Implementation (HOW?)

- Advanced Work Packaging
  - ✓ CWA
    - o Discipline
      - – EWP (Boundaries defined with construction)
      - – PWP
      - – CWP (Ex. Scaffolding)
        - ▪ IWP (Foremen Level/ One Crew for 1-2 week) by WorkFace Planners