Humans + Data: The VDC Conundrum

Ian McGaw, ENGworks
About Me

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Vice President of Technology & Innovation
ENGworks

• Degree’s in Computer Science and International Business
• AEC/O Consulting & Software Development for over 15 years
• Started with AutoCAD R13 & Revit 9.1
BIM + Data
Key Takeaways

• Understand how to better connect project delivery teams during the project life-cycle.
• Discern and manage facility data from design and construction through Turn-Over.
• Recognize process efficiencies to become more effective during the life cycle of a project.
Enhanced Integration
Overview
survey
Do you feel that BIM is Becoming Too Complicated?

- Yes: 30%
- No: 51%
- Not Sure: 19%
Do you feel that BIM is Cost Effective?

- Yes: 69%
- No: 11%
- Not Sure: 20%
Do you feel that BIM is Being Delivered to Owners in an Efficient Way?

- Yes: 1%
- Not Sure: 16%
- No: 83%
mercy
We are the people of Mercy Health Ministry. Together, we are pioneering a new model of care. We will relentlessly pursue our goal to get health care right. Everywhere and every way that Mercy serves, we will deliver a transformative health experience.
About Mercy
Primary Service Areas

Missouri
Kansas
Oklahoma
Arkansas

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About Mercy
By The Numbers

35 Hospital Facilities
23+ Million Square Feet of Managed Facilities
$4.6 Billion – Operating Revenue
5th Largest Catholic Health Care System

40,000 Employees

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About Mercy

30% Challenge

- Reduce Design & Construction Cost by 10%
- Deliver Facilities 10% Faster
- Reduce Operational Cost by 10%
integrated lifecycle management
Integrated Lifecycle Management

Definition

Finding business value in Integration Lifecycle Management (ILM):
Proactive integration management through ILM can reduce cost and risk while creating tangible business value.

Identify and unify the data management processes

Current-State Maturity Evaluation and Assessment of Organization, Process and Technology

Implementation and Management of a Secure Data Lake & Digital Twins
Strategic Issues

- Multiple Enterprise Asset Management (EAM) Platforms
- Siloed Approach to Planning, Resource, Asset, Facility + Real Estate Management
- Duplication of Data Entry Efforts. Bad Data as a result
- Operational Inefficiency due to disjointed data that is difficult to find.
- No Data Analytics = Non-Intuitive Decisions

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Single Integrated Workplace Management System (IWMS) Platform

Integrated, Top Level driven inter-departmental approach to Management

Single Data Source = Clean & Useable Database

Cloud-Shared Data = Improved Operational Efficiency

Intuitive Data Analytics = Continued Process
Discovery & Findings

- In-depth review of PD&C, Real Estate, Facilities Management, Clinical Engineering, Mercy Technology Services (IT) departments.
- Five Unique Asset Management Platforms.
- No complete Asset Management Standard(s).
enterprise asset management implementation

- Development of RFQ from Asset Management Requirements
- RFQ Management
- Curation of a EAM Shortlist
- EAM Solution Selection / Negotiation
- EAM Solution Implementation & Replacement

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the people side of Integrated Lifecycle Management

Operating Model Change = People Change

New Roles & Responsibilities

Education about the changes necessary to their operating model, roles, skills

Employ appropriate levers to support the shift to digital while still delivering on legacy services
enhanced integration
Enhanced Integration

Definition

A Phased Approach
Identifying and unifying the design and construction process

Lifecycle Execution Plan
Implementation & Management

Data Structure
Implementation & Management

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Tactical Issues

- Disconnected Design + Construction = Coordination + Cost Issues
- Duplicated Drawing/Modeling Efforts that cost time and money
- Lack of Transparency & Project Understanding due to guarded deliverables
- 3D Models used only for Design and Construction. No value or use after Turn-Over
- Tremendous Owner Effort and Cost to gather Asset and Facility Data after Turn-Over

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“Have a Core Principle, *Everything Else* is just Tactics”

-Nelson Mandela
Streamlined Virtual Design and Construction (VDC) workflow = Buildable Design

Shared, Single Source of Truth Model = improved Schedule + Budget

Improved Transparency and Data Sharing with Cloud Computing & Virtual Reality

3D Modeling done by appropriate parties, at the right time = As-Built models at Turn-Over

Asset and Facility Data gathering integrated with Design and Construction model from Day 0

Desired Tactical Improvements

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people
the people side of Enhanced Integration

- Impacting Peoples Environments / Experiences
- Improve Employee Efficiencies
- Increase Operational Efficiency
- Educational Enhancement

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Enhanced Integration
Change Transition

Establish sense of urgency, create a guiding coalition, communicate the vision for buy-in, empower broad-based action, generate short-term wins, and incorporate change into culture.
Enhanced Integration
Technologies

Advanced Visualization Technologies
Allowing the entire project team to visualize, understand and optimize the design and maintainability of future facilities ahead of the construction process.
Enhanced Integration

Technologies

Construction Technologies

Allowing the Construction Team to precisely coordinate complex systems, and effortlessly translate and keep track of the Virtual Design as it becomes the Built Environment.
Asset Data Technologies

Allowing the Owner, Design and Construction teams to identify and keep track of important facility assets as a single source of truth from early design stages, thru enhanced turn over of federated as-built models, corresponding asset data, and ample additional valuable deliverables to be used post occupancy for various operational optimizations.
Technology

Tools

BIM 360 Design
Navisworks / BIM 360 Glue
Revizto
SmartSheet
Dynamo

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Technology
ROI Gains for BIM to FM

*Main Points:*

- Reduced Costs
- Integrated Systems
- Improves Performance
Enhanced Integration

The Initial Pilot

The scope is a new 4 story bed tower along with new cardiology, oncology, labor and delivery centers, a renovated central utility plant in addition to a new main entrances to the hospital and integrated clinics.
Enhanced Integration
The Evolution Pilot

The scope is an 8-story bed tower addition in conjunction with 80% of the existing hospital being renovated. The revolutionary feat lays in the fact the sub-contracting partners are not only assisting in the design they are concurrently working in the same model as the engineer of record.
Enhanced Integration
Numbers – MHJ Overall Process Comparison
Enhanced Integration

Numbers - ROI

- Area: 700,000 gSF
- Est. Initial Savings: $900,000
- Est. Annual Investment: $42,000
- Est. Investment: $650,000
- Initial Cost: $250,000
- Total Savings: $551,750 / Yr. $0.79 / gSF / Yr.
- Est. Ongoing Savings: $501,560 / $50,190
- Annual Savings: $509,750
- Value: 25 Yrs. @ 6% $2.19 M
- ROI: 6.75%
- Net Value: $1.94 M
- Payback Period: 0.49 Years

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changing demographics

A younger generation, well versed in the power of technology, is moving into leadership positions within consulting engineering firms, contractors and owners. These digital natives are:

• Focused on productivity and efficiency within their operations
• Expect to use software tools to solve most problems
• Possess a 24/7 mentality – expecting to find what they need, whenever they need it
• Seek out vendors who are easy-to-do-business with, having little regard for legacy relationships or brand
begin with the end in mind

It’s All About the Data...

• Using model data to replace manual input. Reducing input cost and increasing data quality.

• Providing actual visualization of area where maintenance will be performed.

• Interaction with data from model on Energy monitoring, reporting, and adjustment.