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Annual Conference &  
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2014  
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Incorporating  
Owner-Driven BIM  
into Your Facility  
Management Program

Turning  
Building Information **Modeling**  
into  
Building Information **Management**

**SURVIVAL**  
%e **FITTEST**

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Introduction



BIM Innovative  
Services Manager  
TME, LLC  
Little Rock, AR

I want BIM?  
Are You requesting a  
BIM+FM deliverable?  
Do you have standards and  
guidelines for BIM+FM?

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Learning Objectives

- Describe how the BIM process can be used as an effective facility management tool.
- Identify elements of a BIM package that empower the owner to manage facility data.
- List key steps in planning for BIM implementation as a facility management tool.
- Discuss recommendations for implementing an owner-driven effort to integrate BIM into the facility management program.

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### Agenda

- Discuss how technology has changed.
- Empowering the decision making process.
- Steps in planning for BIM/FM
- Steps in implementing BIM/FM.



**BIM..FM..**

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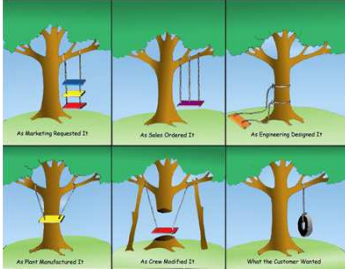
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### Agenda



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### BIM+FM Execution

**Planning – Design – Construction – Operations**



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### BIM Execution: The Old Thought Process

- **Building Information Modeling**
  - The old process
  - Model is Central
  - All data to model

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### BIM Execution: The New Thought Process

- **Building Information Management**
  - The new process
  - The system is central
  - All data to the system
  - The system becomes the data hub

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### BIM Tools

Revit	Navisworks	EcoDomus
Bentley	ArchiCAD	FM:Systems
Tekla	AutoCAD	Facility Dude
Sketchup	Rhino	Field 360
TMA Systems	YOUBIM	eQuest

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### New Technology



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### BIM+FM Process

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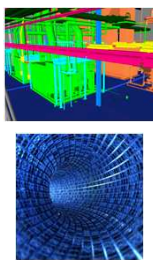
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### BIM+FM Process

- Application of Building Information Modeling to the whole lifecycle of facilities and related infrastructure
- Includes use cases: BIM for Maintenance, Energy Efficiency, Cost Management, Life Safety, Risk Management, etc.
- Lifecycle BIM (“visual database”) is the data foundation platform – it is the most complete information about your facility.



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**BIM+FM Process**  
**Begin with the End in Mind**

**Current State of Affairs:**

- Non-integrated FM Software and Hardware Solutions
- Multiple Stakeholders (Capital Projects, FM Services, Real Estate, Energy, HR, Procurement, etc.)

**What's Needed:**

- Decisions should be made on complete information from all these systems working *together*
- Interests of all stakeholders should be considered and matched

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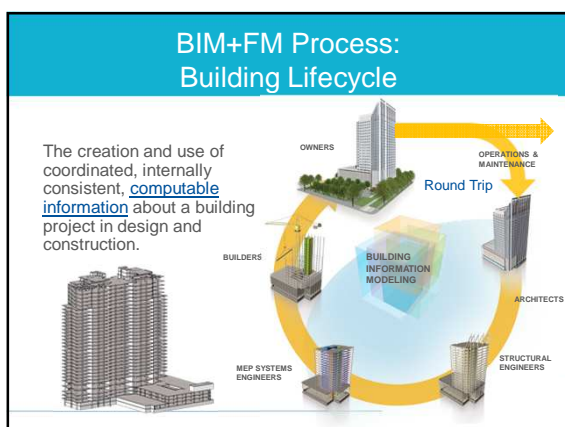
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### BIM+FM Process: Building Information Management

- FM Labor Utilization Savings (Shorter Work Order Time)
- Utility Costs Reduction (Energy Efficiency)
- Risk Management (Quick Reaction)
- Fuel and Material Savings (Less Travel & Waste)
- Comfort Management (Improved Productivity)



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### BIM+FM Process: Building Information Management

- Data Accuracy (No Need to Re-Survey for As-Builts)
- Regulations Compliance (Auto-Checking Codes)
- Space Optimization (Smart Algorithms)
- Improved Inventory Management (Spare Parts)
- Configuration Management (Impact/Functional Conflicts)



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### BIM+FM Process: Model Data




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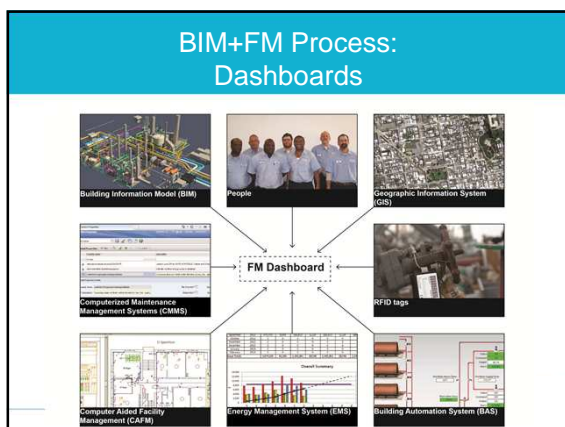
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### BIM Integration - Empower the Owner

- BIM should be a tool to make sound judgments that assist in transforming vision into reality, all within budget and scope.
- Re-evaluate the traditional processes and eliminate layers of complexity that add time and cost to a project.



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### BIM Integration - Transparency

- Team members share ideas.
- No hidden agendas.
- Information flows.
- Earlier decisions.
- Better decisions.
- Better product.



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### BIM+FM Workflows

1. Energy Management & Commissioning
2. Preventative Maintenance Work Orders
3. Up-to-date BIM from Legacy Data
4. Facility Condition Assessment
5. Litigation Support



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### BIM+FM Owner Driven Energy and Commissioning

- Create a calibrated energy model that would provide a way to compare an ideal, simulated building performance vs. actual performance to identify areas of concern.
- Energy model is created using BIM and EnergyPlus.
- The same model is used by facility managers to perform maintenance tasks (including accessing BIM on Tablet PCs like iPad).

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### BIM+FM Owner Driven PM and Work Orders

- CMMS application generates a work order
- Click the Link to the BIM viewer to view the details about equipment that needs servicing.
- The equipment's corresponding documents are attached, and can be accessed immediately (including access on Tablet PC like iPad).

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### BIM+FM Owner Driven Legacy Data

- Thousands of facility assets/records exist in FM application (CMMS/CAFM).
- CAD drawings (DWG), old paper blueprints scanned into PDF and stored in Electronic Document Management System (EDMS).
- Convert old drawings into 3D As-Built (Revit, ArchiCAD, etc).
- Verify accuracy of As-Built with laser scanning if needed.
- Map 3D objects to FM records via software.
- Keep As-Built up-to-date via s FM due to bi-directional

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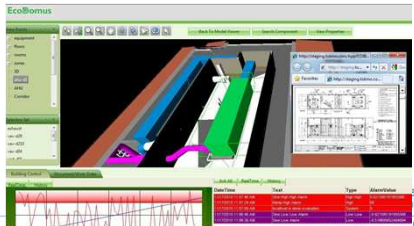
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### BIM+FM Owner Driven Facility Assessments

- Tens or hundreds of buildings under management.
- How to improve budgeting of repairs and renovations in the most optimal way.
- BIM-based Facility Condition Assessment for spaces and assets improved by real-time data from sensors.



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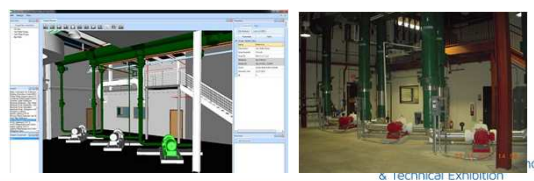
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### BIM+FM Owner Driven Support Analysis

- As-Planned vs. As-Built Model performance analysis
- Use extensive data to analyze performance and compliance factors
- Documentation checklist enables collection of required documents
- Level of Development (LOD) report enables visualization of model readiness



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### BIM+FM Keys To Success

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**BIM Integration – Key Questions:**

1. How will you implement?
2. What is the cost?
3. What is the purpose?
4. What is the level of detail?
5. What information should you track?
7. What asset data do you want to manager?
8. Do you want to extract life cycle cost analysis?



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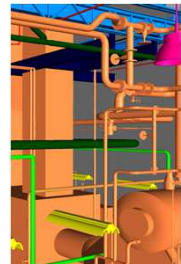
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**BIM Integration – Key Questions**

9. Do you want to track trending history?
10. Do you want to own and control the BIM standards for release to the Design Team?
11. Does you want access to model numbers, warranty information and O&M manuals?



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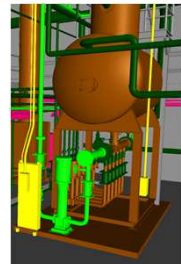
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**BIM Integration – Keys To Success:**

1. Determine a budget. This should include software, allocation of manager position, training and hardware.
2. Set target dates.
3. Determine what you want to accomplish with the BIM+FM.
4. Hire or train existing personnel to run the BIM+FM department.



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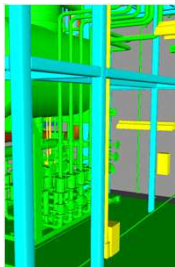
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**BIM Integration – Keys To Success:**

5. Select the right project for implementation.
6. Start small - do not try to implement system-wide.
7. Set BIM+FM deliverable standards and guidelines, and stick to them.
8. Define custom BIM+FM Parameters for your facility.



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**BIM Integration – Key To Success:**

9. Use all available tools and resources, such as consultants and the software vendor, for guidance
10. Incorporate key management personnel into the BIM Facility Management tool.
11. Educate maintenance personnel on the BIM+FM deliverable. They are key to performance.



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**BIM Integration – Key To Success:**

12. Inform consultants that a switch is being made to BIM+FM, and that certain expectations will be met in the future. They will need to know what the expectations are.
13. Stress the “I” in BIM. If you do not have that, you will not have a quality BIM+FM deliverable.



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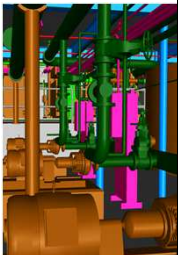
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**BIM Integration – Key To Success:**

14. Be involved during the design and construction process. Don't sit back and wait for an as-built model to show up and expect to start using it.
15. Meet with vendor representatives, and let them know that BIM content will be used for Facility Management purposes.



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**BIM Integration – Contracts:**

1. Define the BIM+FM objectives in the contract.
2. Set BIM+FM Standards for the deliverable in the contract.
3. Define the Architects, Engineers, Consultants and Contractors obligations for the BIM+FM deliverable in the contract.



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**BIM Integration – Contracts:**

4. Determine who will be responsible for ownership of the BIM+FM deliverable.
5. Clarify who will manage the BIM+FM deliverable from concept through construction.
6. Define the BIM+FM Deliverable clearly in the contract.



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**BIM Integration – Contracts:**

7. Determine the software package in which the BIM+FM deliverable will be delivered.
8. Define model sharing for collaboration among the design team.
9. Define Fee Structure. BIM+FM deliverables require more design time during the schematic design and design development stage.



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**BIM Integration – Key Recommendations:**

1. Conduct a needs analysis and author a comprehensive BIM execution plan for your facility Projects.
2. Integrate existing processes into the BIM+FM tool.
3. Develop Parameters for data integration specific to the needs of your facility.



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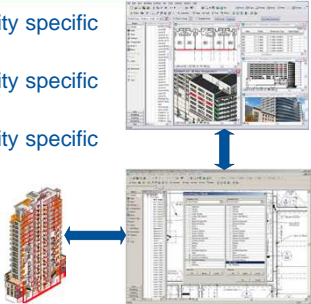
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**BIM Integration – Key Recommendations:**

4. Develop your facility specific Content.
5. Develop your facility specific Model Templates.
6. Develop your facility specific data Schedules.



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### BIM Integration – Key Recommendations:

7. Set comprehensive Modeling standards assisted by the following documentation:

- AIA Document E203™–2012, Building Information Modeling and Digital Data Exhibit
- AIA Document G201™–2012, Project Digital Data Protocol Form
- AIA Document G202™–2012, Project Building Information Modeling Protocol Form
- Penn State BIM Execution Plan for Owners



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### BIM+FM Summary

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### BIM+FM Summary

Owners provide detailed project requirements based on existing Facility Management Program, A/E's, FM technology consultants, and Contractors help set up a program if it doesn't exist.

↓

A/E/C project team members create a detailed BIM Execution Plan based on owner's project requirements.

↓

Continuously collect and check quality of entered data and documents throughout the project in the appropriate software

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Final acceptance of data handover as a data spread sheet or, preferably, as a dataset imported into CMMS/CAFM

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Continuous improvement of a Facility Management Program feeds future projects' requirements.

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**BIM +FM**  
**Things to Remember**

1. BIM acts as a platform enabling integration of all facility systems – BAS, CMMS, CAFM, GIS, ERP, etc. providing significant savings via improved data flow and analytics.
2. Creating BIM requires well thought out data collection rules and stringent Quality Control – otherwise it's all just nice 3D pictures, no business value.
3. Use Open Standards to reduce costs, ensure continuity and future-proof your investments.
4. Commission the building.

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Questions?



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