8:00 - 8:05 Welcome and Housekeeping
8:05 - 8:10 Welcome & Introduction
8:10 - 8:35 Autodesk
8:35 - 9:00 EcoDomus
9:00 - 9:25 FM Systems
9:25 - 9:50 Onuma
9:50 - 10:00 Q&A, Open Discussion and Wrap Up

About IFMA

- International Facility Management Association
- Founded in 1980
- The world’s largest international association for facility management professionals
- 22,695 members in 78 countries
- 129 chapters and 16 councils worldwide
- Member organizations manage 3.7 billion square feet of property and purchase $US1.6 trillion in products and services.
- Mission: “To advance the facility management profession by providing exceptional services, products, resources and opportunities”
The Core Competencies of Facility Management:
- Communication
- Emergency Preparedness and Business Continuity
- Environmental Stewardship and Sustainability
- Finance and Business
- Human Factors
- Leadership and Strategy
- Operations and Maintenance
- Project Management
- Quality
- Real Estate and Property Management
- Technology

MISSION:
To acquire and disseminate educational content to IFMA's 23,000 worldwide members on the topic of Building Information Models (BIM), including technologies, processes, policies, industry standards, best practices and change management requirements.

LinkedIn Group:
IFMA Building Information Modeling (BIM) Lifecycle Operations

EVENT SCHEDULE:
- COP Working Group Meeting
  - World Workplace 2013, Wed., October 2, 8am—Philadelphia, PA
  - Facility Fusion 2014, One Day BIM Conference April 14, Washington, DC
- Web-Conference Presentations
  - March 13: Building Information Model Fundamentals
  - June 12: How Integrated Project Delivery and BIM are Used to Provide Value for Your Capital Projects
  - September 11: Evolving Technologies for BIM Enabled Projects
    - Presented by Autodesk, ECIForm, FM Systems, and others
  - November 13: Capturing and Sharing BIM Related Information
    - Presented By NIBS/COGIE and IMMERSIVx, Inc.
Evolving Technologies for BIM Enabled Projects

Each vendor was asked to respond to the following questions:

- How does your software provide value to Facility Managers?
- What BIM features does your software have that provides value to FM's?
- What other features or add-on applications are available?
- Describe how your application integrates and exchanges data with other stakeholder applications.
- Describe how your software is deployed (your cloud, clients local cloud, desktop) and what devices the application works on (Mac, PC's, Tablets, iPads, Smart Phones, etc.)
- Describe how clients purchase your product, e.g., subscription, one-time payment, etc.

Rich Mitrega
Business Development Manager - AEC
OMI, Facilities and Asset Management
Autodesk, Inc.


Rich has been at Autodesk for 14 years and has held various sales and technical positions. He has 30 years industry experience in Facilities Management, Operations and Maintenance BIM, CAD, and GIS applications and has been involved in consulting, implementing, and customization of these applications as well as integration with various systems and enterprise applications.

Prior to Autodesk, Rich worked for a software reseller as Vice President, managing all sales, support, and consulting services.

Igor Starkov
President and Co-Founder
Ecoformus, Inc.

Mr. Starkov is a computer scientist and entrepreneur with over 25 years of experience in software development. Mr. Starkov also has over 12 years of experience leveraging technology to improve construction project delivery and management of the built environment.

Mr. Starkov's experience in the AEC, IT, and Facilities Management arenas and his in-depth knowledge of Lean Construction methodology, Energy Management, and BIM workflow issues provide him with the unique capability of developing versatile information-enabled solutions.

He brings particular expertise in technology-enabled COBie workflow analysis and in creating applications that combine relational databases with analytical and visualization capabilities.
Brian Haines is a fifteen year veteran of marketing and product management of cloud and desktop products specifically created for the building industry. Brian recently joined FMI Systems as Director of Marketing where he manages all aspects of marketing strategy and planning as well as analyzing industry trends. Brian is a frequent speaker and has presented at events such as Autodesk University IFMA World Workplace and the American Institute of Architects convention.

Prior to joining FMI Systems, Brian was an Industry Marketing Manager in the Building Industry Group at Autodesk. His primary responsibility included the Co-To-Market execution for the Autodesk Building Design Suite and several key Cloud initiatives. Brian has a bachelor of architecture degree from the University of Arizona and is currently pursuing a MBA at the University of New Hampshire.

Kimon Onuma, FAIA
President
Onuma Inc.

Having practiced architecture for three decades, Kimon Onuma, FAIA, is known for his innovative approach to building information modeling (BIM). Kimon recently completed a six month strategic roadmap for 210 million square feet of ENR Top Facility Projects for the State and Equipment Planning System (SEPS) and Defense Medical Logistics Standard Support Facility Management (DMSF/SMFM) recommendation made by Onuma Inc. was implemented before project completion.

Kimon serves on the Board of Directors for the buildingSMART alliance and is 2013 AIA TAP Chair.

Rich Milenga
Autodesk, Inc.
Worldwide Business Development Manager
Facilities Management, O&M

carl.milenga@autodesk.com

Enabling Technologies for BIM-enabled Projects

BIM for Facilities Management and O&M
BIM is an intelligent 3D model-based process
BIM provides insight for creating and managing projects faster, more economically, and with less environmental impact.

What is BIM?
Building Information Modeling

An integrated process
Allows professionals to explore a project’s key physical and functional characteristics digitally – before it’s built.

Coordinated, consistent information is used to:
Design
Visualize, Simulate, & Analyze
Document
Deliver

What is a BIM?
Building Information Model

Contains model elements/objects
Doors
Walls
Windows
Rooms
Equipment

Element definition
Graphics
Attributes/Properties
Relationships to other elements
Traditional CAD

- Focus on drawings production
- Project's information in multiple files and formats
- Difficulty to manage changes late in the design
- Risk of data loss during multidiscipline coordination
- Challenging data management during lifecycle

CAD vs. BIM

CAD

- Graphical representations of building components
- Elements can be tagged with supplemental data
- Relevance and meaning of elements must be inferred

CAD vs. BIM

BIM

- BIM elements are simulations of building components
- Elements know what they are and their characteristics
- Elements simulate the actual element's behavior
Building Information Modeling

Workflow

Fundamental Shift in Project Delivery
- Traditional drawing-based methods inadequate
- Alternative project delivery driving collaboration changes
- Sustainability goals require better insight

Deliver Projects Faster and More Economically
- Visualize design ideas
- Simulate multiple alternatives
- Identify clashes
- Communicate intent
- Improve productivity

BIM Development

Model Progression

Where BIM Delivers Value Today

Reduced Conflicts During Construction
Improved Collective Understanding of Design Intent
Improved Overall Project Quality
Reduced Changes During Construction
Reduced Number of RFPs
Better Cost Control/Predictability

Source: Autodesk Revit and AIA Research Foundation
BIM - Benefits to the Owner for O&M

- Comprehensive building information at handover in a standard digital format
- Interoperability
  - COBie, IFC, etc.
- Efficient upload of handover data into O&M Systems
- High Quality Data Quality due to standardized datasets
- Run the facility when you move in
- BIM integrations provides "As-built" and transitions to "As Maintained"
- Know "what’s out there"
  - Preventive and corrective maintenance
  - Building modification, renovation, disposal
Q&A

Lifecycle BIM
ecodomus
Igor Starkov, President

About EcoDomus
- Software and consulting firm with several offices in the U.S. and international partners in Australia, China, Russia, UK and Middle East.
- Focus on BIM for Facility Lifecycle Data Management
- Pioneers of BIM for FM, CCSI integration & industry standards
- Some of our clients:
What is Lifecycle BIM

- Application of Building Information Modeling to the whole lifecycle of facilities and related infrastructure
- Lifecycle BIM ("visual database") is the data foundation platform—it is the most complete information about your facility.

Financial Benefits of Integrated Lifecycle BIM

- Design & Construction is a small part (~20%) of total building lifecycle costs
- ~$150 per square foot is not every year that hits hospitality issues

Focus Areas for Lifecycle BIM

1. LEED Score Integration (Shorten Score Calculation Time)
2. Project Cost Reduction (Energy Efficiency)
3. Risk Management (Quick Reactions)
4. Field and Financial Documentation (Cost Control & Audit)
5. Construction Management (Improved Productivity)
6. Data Accuracy (Submittals vs Site Survey for As-Builts)
7. Regulatory Compliance (Net-Zero Building Code)
8. Space Optimization (Smart Allocation)
9. Project Delivery Management (Space Plans)
10. Configuration Management (Reduce Internal Conflicts)

Building owners/managers need it all:
One focus area (even as popular as energy efficiency) may not provide sufficient ROI.

Example: Work Order Workflow Comparison

Goal is to show time savings and reduced impact on operations when using lifecycle BIM-driven environment. Data collected by the RAA.

<table>
<thead>
<tr>
<th>Step</th>
<th>傳統方法</th>
<th>BIM方法</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>提出工作單</td>
<td>BIM工作單是由系統生成，自動化和智能化的，不需要人工編制。</td>
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<tr>
<td>2.</td>
<td>導入表單</td>
<td>BIM工作單是由系統生成，自動化和智能化的，不需要人工編制。</td>
</tr>
<tr>
<td>3.</td>
<td>工作單分發</td>
<td>BIM工作單是由系統生成，自動化和智能化的，不需要人工編制。</td>
</tr>
</tbody>
</table>
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

Facility Information Model
- Facility is a complex combination of interrelated systems: HVAC, Electrical, Structural, Plumbing, PFAE, Information Technology, etc.
- To optimize building performance facility managers need information about all facility elements and how these elements are combined into systems, where they are located, what are their properties
- BIM can describe this - unfortunately it is not easy to implement and continuous Quality Control is required to create and maintain proper BIM

Current Data Management Methods
At the completion of a project, the construction manager typically delivers a truck full of boxes, or a CD containing PDFs and project files to the facility manager.

The recent move to the delivery of digital information is not helping much, data is not well integrated - information is not properly organized...
Use Case: Energy Management

- 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.
- EcoDomus implemented it for GSA working with Lawrence Berkeley National Laboratory and Affiliated Engineers, Inc.
- Energy model is created using BIM and EnergyPlus.
- The same model is used by facility managers to perform maintenance tasks (including accessing BIM using tablet PCs like iPad).
**Use Case: Mobile Work Orders**

- OVM application generates a work order. Push notification is sent to iPad.
- Technician opens EcoDomus BIM viewer to find the equipment that needs servicing, and attaches it to the work order.
- The equipment's corresponding documents are reviewed.

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**Use Case: Visual Inventory**

- Thousands of facility assets/reports exist in FM application (OVM)/CMMS.
- CAD drawings (Dwg), old paper drawings scanned into PDF and stored in Electronic Document Management System (EDMS).
- Contact and drawings into 3D As-Built (BIM/ARCHICAD, etc).
- Verify accuracy of As-Built with laser scanning if needed.
- Map 3D objects to FM records via EcoDomus software.
- Keep As-Built up to date via EcoDomus FM due to bi-directional synchronization.

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**Use Case: Compliance Support**

- 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.
Step 1: Creating BIM

- Laser scanning
- CAD in BIM environment
- Building information model

CAD is used as the baseline, confirmed and augmented by the laser scan data.

Step 2: Getting BIM into EcoDomus

- Original BIM is filtered, data is split from geometry, and data is pushed to the web.

Step 3: BIM Quality Control

- Currently most of BIMs are created only for 3D visualization and design coordination, not for data management.
- Optimized ways of collecting data and quality control are not enforced by owners.
- Without standards-based quality control enabled process, all the BIM efforts will go to waste - the resulting BIM is not much better than old CAD models.

Original BIM is filtered, data is split from geometry, and data is pushed to the web.

Original BIM is filtered, data is split from geometry, and data is pushed to the web.
**Step 4: Integrating BIM with FM**

CMMS/CMFM/PMMS

BAS/EMS

Portals

GIS

EcoDomus is an official partner of most of the above companies.

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**Using COBie and OmniClass for Lifecycle BIM**

- COBie is an open industry standard for collecting project data once it becomes available and storing it in a standardized, common dataset.
- Enables Data Quality Control due to standardized datasets.
- Quick upload of handover data into CMMS/CMFM (minutes vs. months).
- Owner learns how to run the facility before moving in.

EcoDomus is the leading provider of COBie-compliant software. EcoDomus was the first construction software to get COBie certified in 2009.

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**Suggested Data Collection Workflow**

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

A/E/C project team members create a detailed BIM/COBie 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 EcoDomus.

Final acceptance of data handover as a COBie spreadsheet, preferably as a database imported into CMMS/CMFM, and integrated with EcoDomus FM.

Continuous improvement of a Facility Management Program meets future project requirements.
Three Things to Remember!

1. BIM acts as a platform enabling integration of all facility systems – BAS, CMMs, CAFM, GIS, ERM, 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 (COBie, OmniClass, HC) to reduce costs, ensure continuity and future-proof your investments.

Thank you!

EcoDomus

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Evolving Technologies for BIM Enabled Projects

Q&A
About FM:Systems
Focused, Experience and Proven

- Focused on Facility Professionals Since 1984
- Occupancy costs reduced by 15 percent
- Move spend reduced by 83 percent
- Annual enterprise productivity savings of $1.5 million
- An internal customer satisfaction rate of 97 percent