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W109: BIM and Facility Management – What Every Owner and Facility Manager Needs to Know

David A. Jordani, FAIA

Chair, buildingSMART alliance Business Process Task Team
President, Jordani Consulting Group

Finith E. Jernigan
President, Design Atlantic Ltd
Architecture - Planning - Management

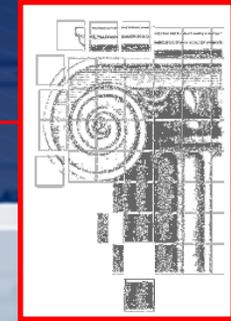
Scott Ebert
President
Soft Innovations

Stephen R. Hagan FAIA, CCM
Project Knowledge Center
Public Buildings Service, GSA

Toby Considine
Chair, OASIS oBIX TC
Facilities Technology Office, UNC

Jordani Consulting Group

Management and IT Consulting for Owners, Property Managers and Facility Managers



- IT for Facility Management Life Cycle
 - Business Process Analysis, Requirements Development
 - Project Management
 - Full Service Implementation & Systems Integration
 - Custom Software Design & Development
 - Ongoing Support
- building **SMART** alliance Board of Directors – Owners and Developers; Chair, Business Process Task Team
- Independent consulting group, 1985
- More information, see web site at: www.jordani.com



Audience Survey

■ Industry

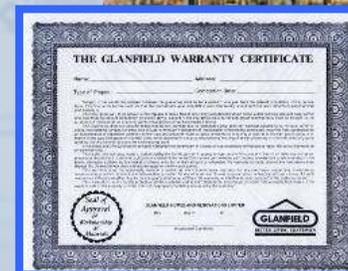
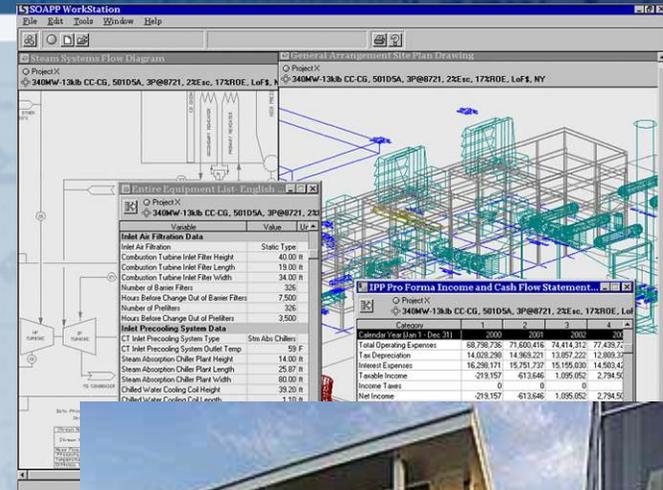
- Facility Manager, Owner, Property Manager
- A/E, Interiors, FM or other Service Provider
- Software Vendors or VARs
- Other?

■ BIM Experience

- For the Owners – how many of you have asked for a BIM deliverable?
- For the Service Providers – how many of you have provided a BIM?

BIM Buzz is Rather Intense...

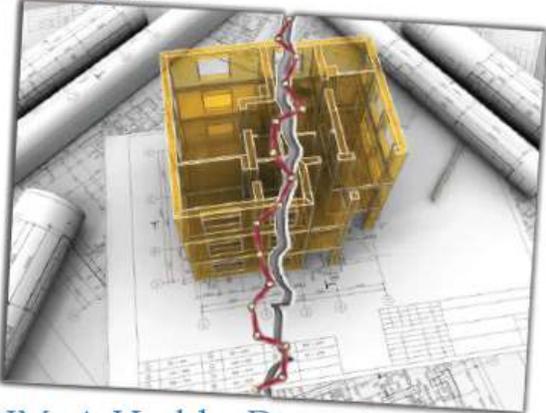
- Promise of major transformation for facility life cycle
 - Shorten development schedule
 - Improve design quality
 - Improve building performance
 - Improve facilities operations & maintenance profile
- Reduce cost of design, construct, operate
- Reduce facility delivery time
- Scent of \$



BIM - a Disruptive Technology

- Owners demanding improvement
- Portends realignment in industry
- New business relationships rapidly emerging
- Industry stakeholders scrambling for position
- Catalyst for linking a fragmented industry - silo mentality will not survive

Feature



BIM: A Healthy Disruption to a Fragmented and Broken Process

By David Jordani, FAIA, Jordani Consulting Group

I HAVE HEARD THE terms BIM and disruption used together quite often lately. Some tend to think of disruption as a sign of trouble. My preferred connotation for the term is unsettling. Is BIM the catalyst to unsettle and shake-up the construction industry? I hope so...and it's about time.

Much has been said and written about the inefficiencies of the construction industry. Fragmented in its makeup and slow to adopt change, statistics from the U.S. Bureau of Labor Statistics suggest that the construction industry productivity not only lags behind other industries, but is also in decline. The costs of these inefficiencies are palpable, costing billions of dollars annually.

Let's be clear, BIM is not the salvation of the construction industry. Efforts on many fronts will be needed to address issues that have gone unattended for too long. But there's good reason to believe that the introduction of BIM will serve as a catalyst for many of the necessary changes to unfold. The signs are already there.

At its core, a BIM based methodology is built around the notion of collaboration—people and systems exchanging information about a facility throughout its life cycle. Embracing a collaborative model is the most effective way I can think of to address fragmentation. Adopting this approach requires and results in a number of positive changes in the industry. While technology may be the catalyst, business process reform and vision is required to create meaningful change.

So how do we get there, and what kinds of changes will we see along the way?

OWNERS WILL DEMAND IMPROVEMENTS
No longer willing to yield to a tradition of inefficiency, building owners will lead the charge. As change becomes a public and their providers, all will require to life entire project construction applying the returns—t implement

JBIM Journal of Building Information Modeling
An Official Publication of the National BIM Standard (NBIMS) and the National Institute of Building Science (NIBS)
Spring 2010 buildingSMART Alliance

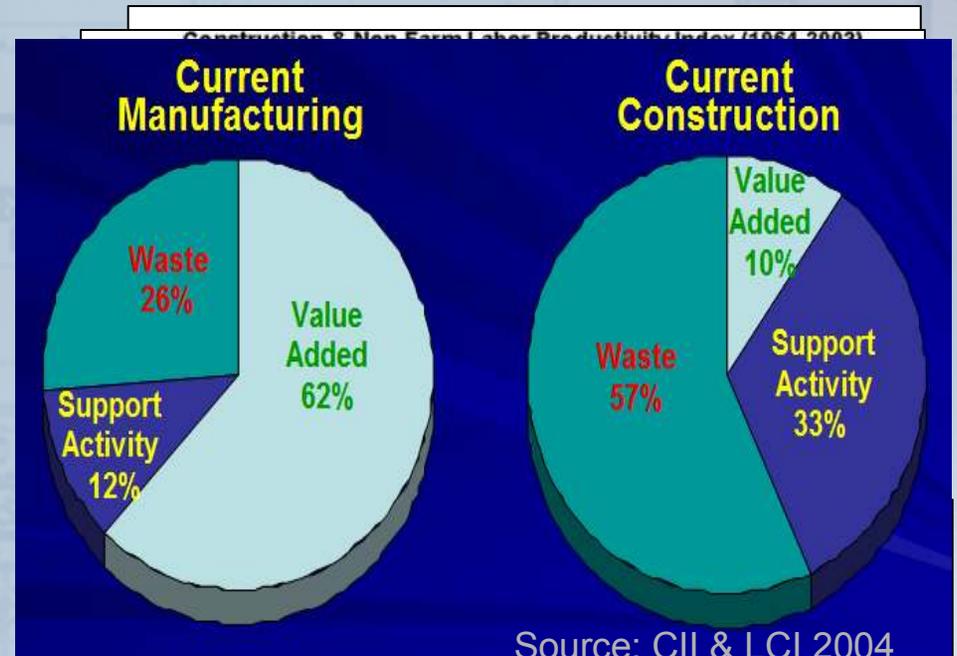
There's a **Storm** Brewing in the Construction Industry...
are you Ready?

NEW SUBS
The best design decisions will be

24 Journal of Building Information Modeling

Business Case

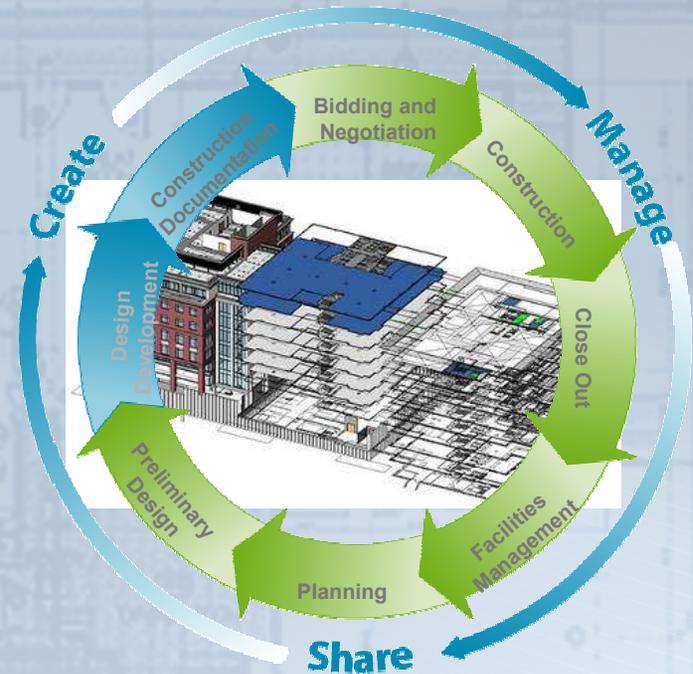
- NIST study identified \$15.8B lost to lack of interoperability
- Construction productivity in decline
- The numbers are significant



- Worldwide Construction Industry 2008 = \$4.8T (ENR)
 - US Construction Industry 2008 = \$1.288T (ENR)
 - **57% of \$1.288T = \$734B Annually**
 - **2/3rds of \$734B = \$492B Annually**
- | | | | | |
|-------------------------------------|-------|---------|---------|----------|
| General Contractors | 495.9 | 1,265.3 | 50.4 | 1,801.6 |
| Specialty Fabricators and Suppliers | 44.4 | 1,142.2 | 15.2 | 1,602.8 |
| Owners and Operators | 722.8 | 898.0 | 9,027.2 | 10,648.0 |
- Source: RTI estimates. Sums may not add to totals due to independent rounding.

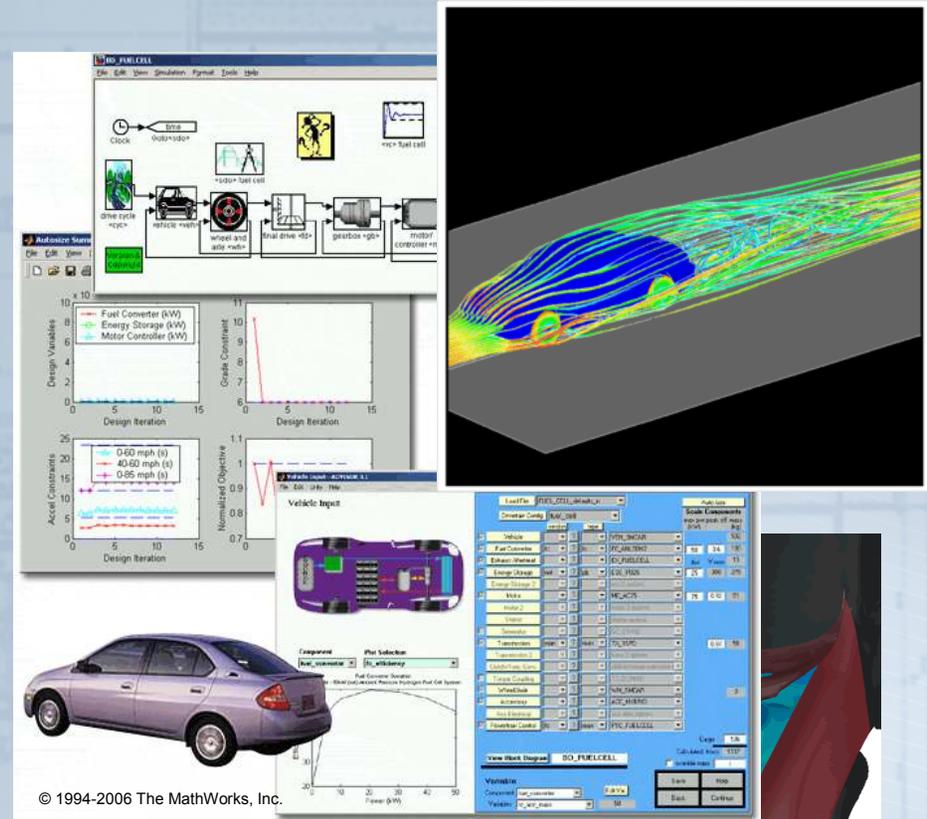
Owners are Catalysts in the Move to BIM

- No longer willing to yield to a tradition of inefficiency
- Lead the charge for a leaner, smarter process
- Challenge providers to deliver facilities faster, better, safer and at lower cost
- Expect design/construction partners to be proactive in applying concepts
- Looking for early returns—tangible results from bid through implementation at the site
- Require BIM to enable lean practices to identify and eliminate waste in the entire project cycle



The Move to Lean is not Without Precedent

- Automotive, electronics, aircraft
 - Supply chain automation
 - Compliance with standards entry level for participation - collaborate or out
- Applied to facility projects
 - Better value for their investment
 - More collaboration, all stakeholders, less combative
 - Ability to use information across full design/construct/operations teams
 - Increased focus on life cycle including operations



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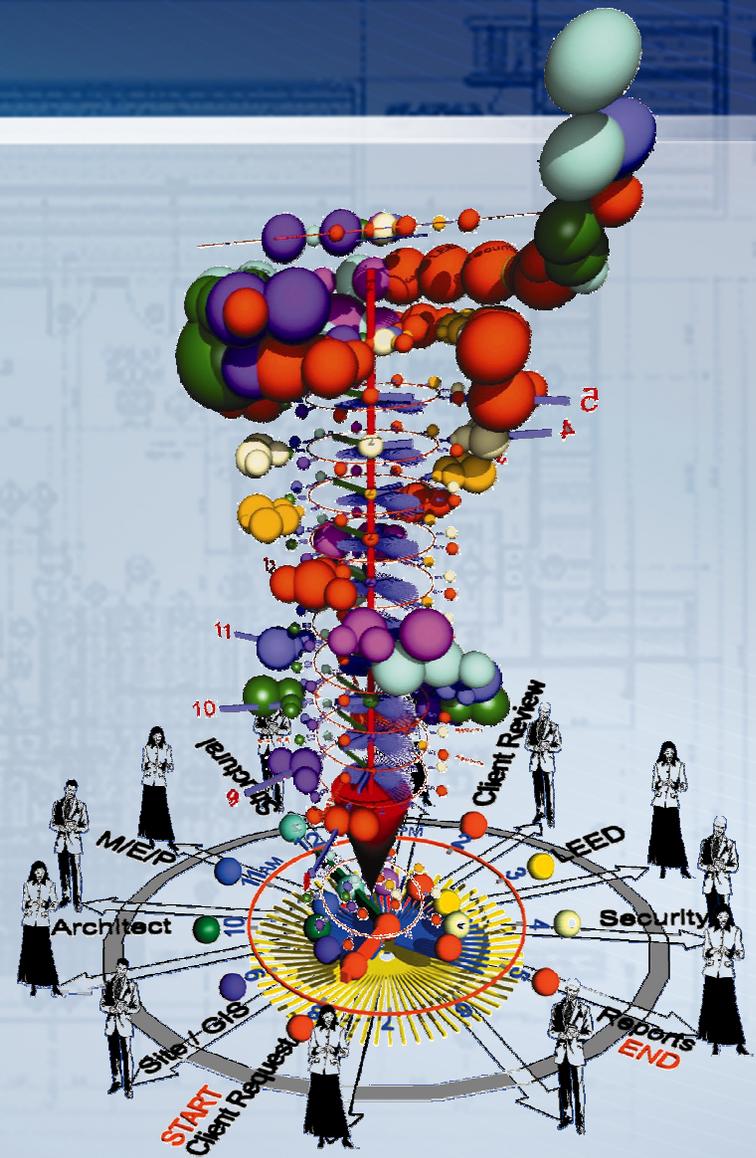
BIM Defined (NBIMS Project)

A Building Information Model (BIM) is a digital representation of physical and functional characteristics of a facility. As such it serves as a shared knowledge resource for information about a facility forming a reliable basis for decisions during its *life-cycle* from inception onward.

A basic premise of BIM is **collaboration** by different stakeholders at different phases of the life cycle of a facility to provide, extract, update or modify information in the BIM to support and reflect the role of that stakeholder. The BIM is a shared digital representation founded on open standards for **interoperability**.

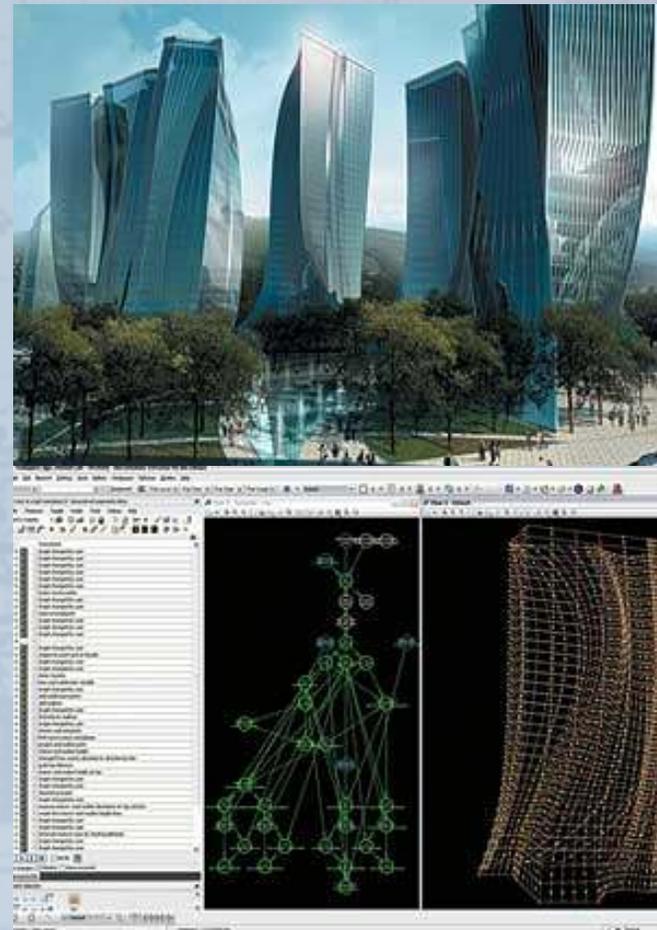
The US National BIM Standard promotes the business requirement that this model be interoperable based on open standards.

National Institute of Building Sciences (NIBS)
buildingSMART alliance
National BIM Standards Project Committee (NBIMS)



BIM Impact for Planning and Design Activity

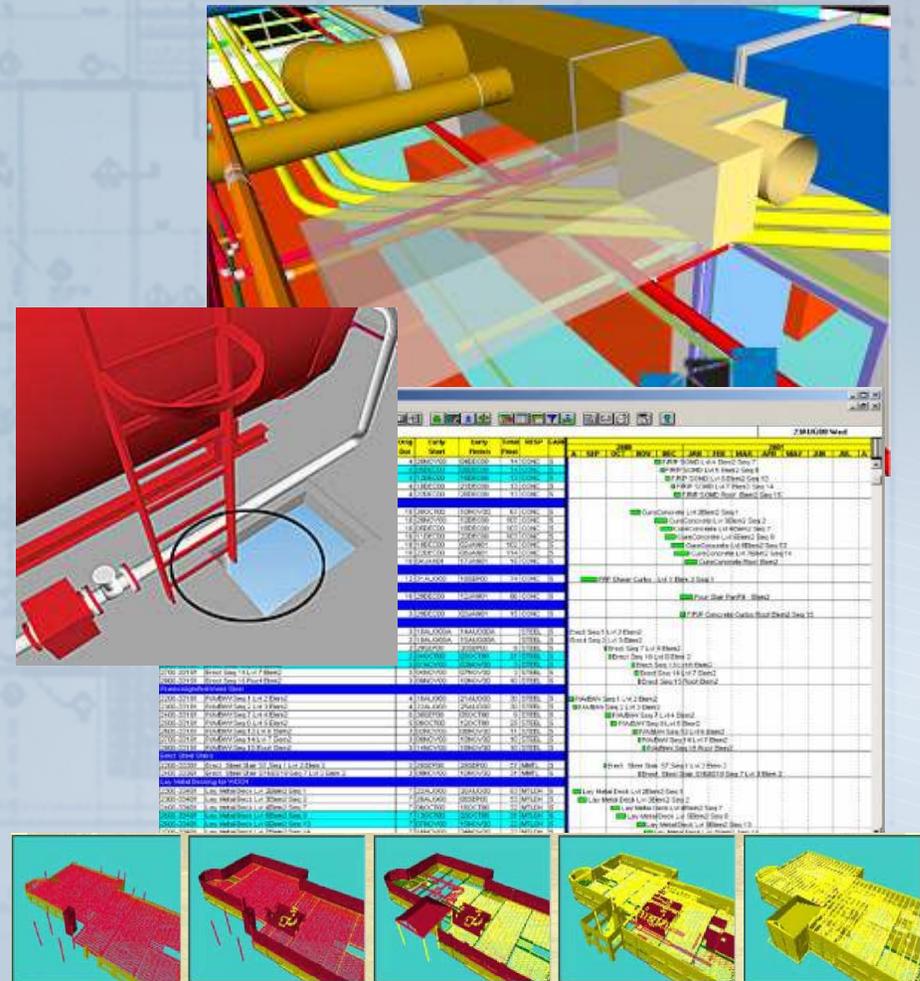
- Improve design quality and visualization
- Design process improved
 - Interdisciplinary coordination & collaboration
 - Increase design resolution
 - More informed decision making
 - Reduced time for documentation
 - Right decision makers at the right time
 - Reduce RFI
 - Design for constructability
- Better integration of design changes
- Cost implications predictable



Office Towers planned for Dostyk, Kazakhstan

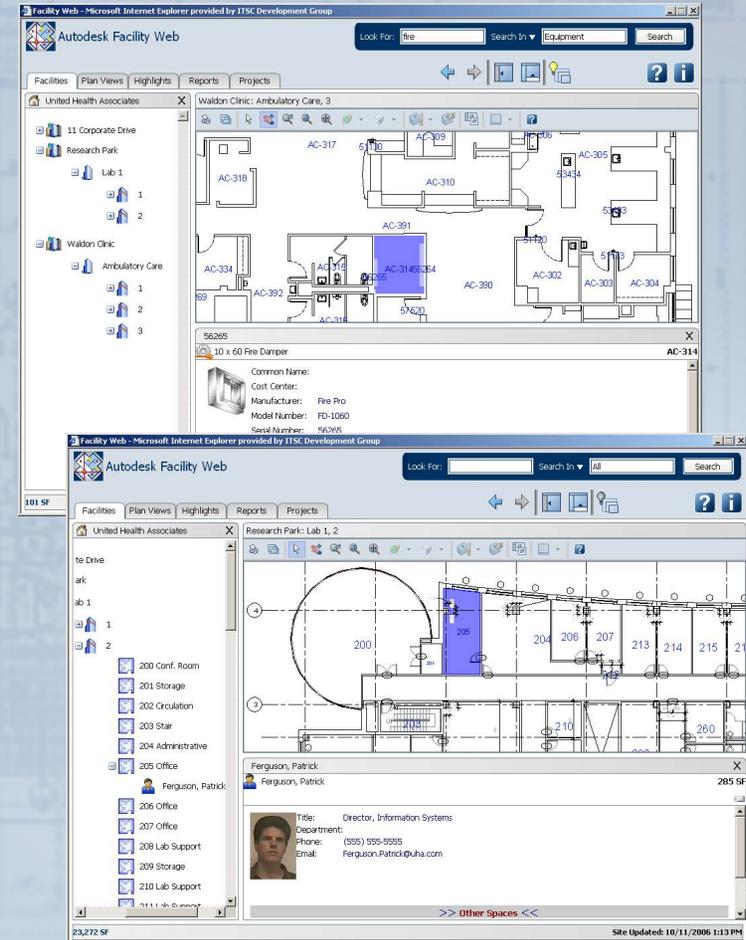
BIM Impact for the Construction Activity

- Constructability and coordination built into model
- Systems clash detection - no change orders from interferences
- Define access areas to service components
- Construction sequencing and scheduling (4D)
- Build virtually then for real; 3D “as-builts” before turning even one spade of dirt



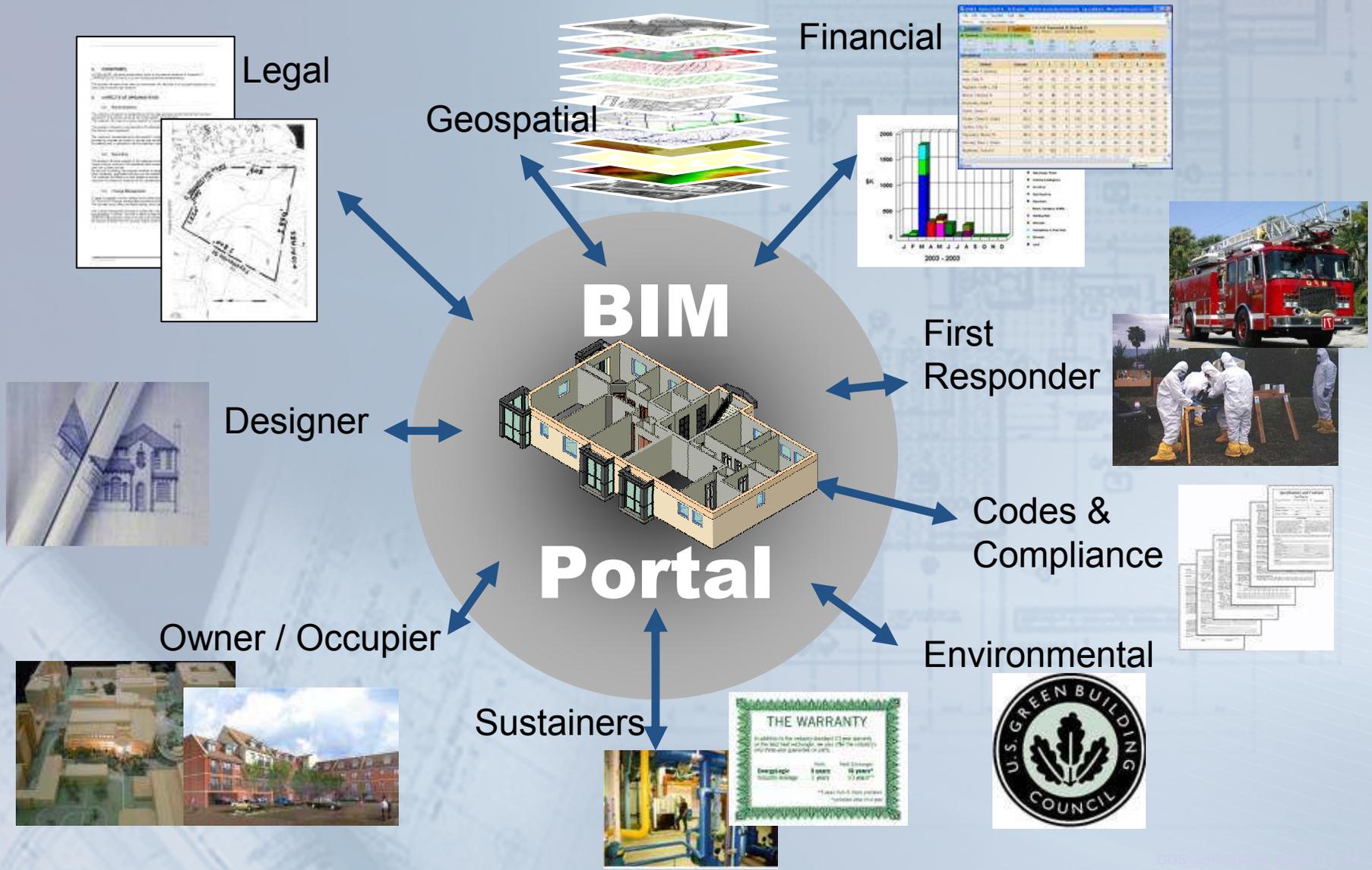
BIM Impact for the Facility Management Activity

- Commissioning provides BIM data for use by FM
 - As constructed documentation
 - Design decision audit trail
- Portal to Facility Information for Life Cycle
 - Asset management
 - Information about critical building components: Model, warranty, maintenance history.
 - Component replacement
 - Maintenance process and technical manuals
 - Condition assessment
 - Space management
 - Capital planning and renewal



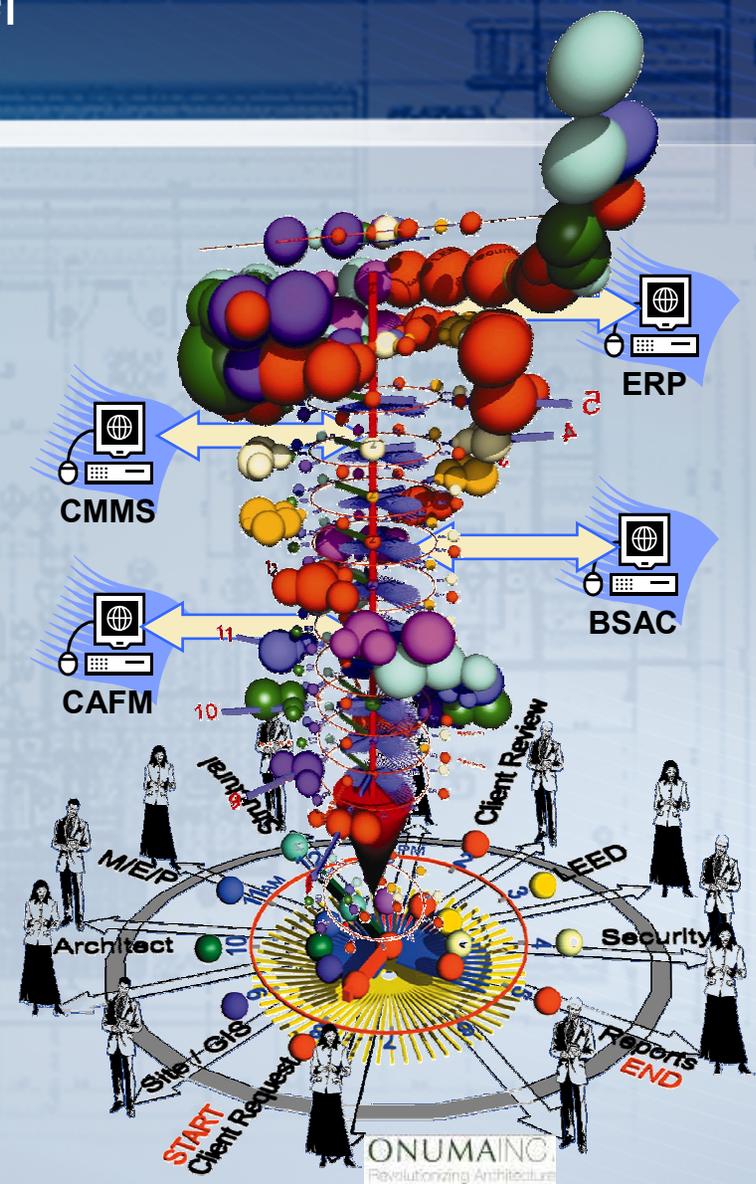
BIM – A Portal for Facility Information

Stewardship roles extends to information about the facility



For the Owner and Facility Manager

- Time and Cost improvements in Design and Construct
- Commissioning activity includes handoff of facility information in BIM
- Easy access to previously scattered and out of date information
- Capture facility knowledge for a changing workforce
- An opportunity to harvest business intelligence and operational information into a **Business Intelligence Model**
- A compelling vision.... if it can be realized.



Case Histories thru Design and Construct

- GSA
- Corps
- GM
- Holder Construction
- .. but little to discuss in the way of case history for the use of this data after construction

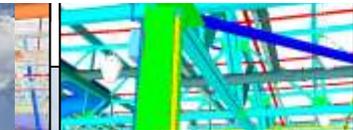


Major Projects: Completed

Year	Cost (\$M)	Project	BIM Scope			BIM Cost (HCC)	BIM Savings (Direct)	Net BIM Savings	BIM ROI	
			F/P	Des	PC VA					Const FM
'05	30		P		PC	CD	5,000	(135,000)	(130,000)	26.0
'06	54		F			CD FM	120,000	(395,000)	(232,000)	1.4
'06	47		P		PC VA		4,288	(500,000)	(495,712)	115.6
'06	16		P		PC	CD	10,000	(74,120)	(64,120)	6.4
'06	88		P			CD	3,150	(10,000)	(6,850)	2.2
'06	88		P			CD	1,440	(15,000)	(6,850)	9.4
'07	47		F	D	PC	CD	90,000	(800,000)	(710,000)	7.8
'07	58		P	D		VA	3,800	(200,000)	(196,200)	51.6
'07	82		F	D		CD	20,000	(67,500)	(47,500)	2.4
'07	14		F	D	PC VA	CD	5,000	(2,000,000)	(1,995,000)	399
'07	173		F	D		CD FM	75,000	(100,000)	(25,000)	.3
'07	32		P			CD	1,000	(330,000)	(329,000)	329
'07	200		P			CD	0	NA	NA	NA
'07	22		P	D			7,000	NA	NA	NA
Totals All Types						345,678	(4,626,620)	(4,280,942)	12 X +/-	
Totals w/o VA, Planning Phase						336,390	(2,126,620)	(1,791,620)	5 X +/-	



Michael Kenig
Holder Construction Company
 mkenig@holder.com

List Serv Thread on BIM > FM Case Histories

- Interest widely shared, still looms more as an vision than a reality.
- Projects either preliminary or proprietary; significant adoption has yet to occur
- Purpose built models a barrier - collaboration still needs to take hold
- Business and legal issues that limit data sharing
- Interoperability problems remain – little integration with IWMS/CMMS; proprietary integrations

Schinnerer's 45th Annual Meeting of Invited Attorneys

BUILDING INFORMATION MODELING: A GREAT IDEA IN CONFLICT WITH TRADITIONAL CONCEPTS OF INSURANCE, LIABILITY, AND PROFESSIONAL RESPONSIBILITY

by Howard W. Ashcraft, Jr., Esquire

WHILE THE DESIGN AND CONSTRUCTION INDUSTRY RAVES ABOUT THE BENEFITS OF BUILDING INFORMATION MODELING, DESIGN PROFESSIONALS SHOULD STOP TO CONSIDER THE PROFESSIONAL LIABILITY RISKS INVOLVED. WHAT ARE THE RISKS AND REWARDS OF BUILDING INFORMATION MODELING?

WHAT IS BUILDING INFORMATION MODELING?

Building information modeling (BIM) broadly encompasses a series of technologies that are transforming design and construction. In essence, BIM uses information rich databases to characterize virtually all aspects of a structure or system. The information can be traditional drawings and specifications, and 3D models that become the design replace even standard CAD drawings. Drawings, specifications, take-offs, and even construction details are not separate documents, but specific manifestations of the model. Because all aspects of a project are driven from a single database, issues of drawing coordination and conflict errors are greatly diminished. Integration of information from multiple disciplines also supports project visualization, simulation, and optimization. The model can even be used to drive computer-controlled fabrication tools, leapfrogging the tedious and error-ridden shop drawing process. Paraphrasing Dr. Pangloss, from Voltaire's *Candide*, "This is indeed the best of all possible worlds."

But will this be realized? Building information modeling assumes centralized information that is broadly accessible. Its utility depends upon being constantly

Mr. Ashcraft is a senior partner in the San Francisco law firm of Henson, Bridgen, Marcus, Vialco and Brady. A graduate of Stanford University and the University of California School of Law (Boalt Hall), Mr. Ashcraft represents designers, owners, and contractors in project formation, professional practice, and construction disputes with a focus on public infrastructure and complex private projects. In addition, he is the firm's technology partner and leads its Electronic Evidence Task Force. He is a Fellow and Former Governing Board Member of the American College of Construction Lawyers, a former member of the Governing Committee of the American Bar Association's Forum on the Construction Industry, and an arbitrator/mediator in the American Arbitration Association's Large and Complex Case Panel for Construction Disputes. He is a recognized construction lawyer listed by Chambers & Partners, USA, Best Lawyers in America, the Who's Who of International Construction Lawyers, and was listed in 2004 as one of the top law attorneys in Northern California.

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Howard W. Ashcraft, Jr., Esq.
Schinnerer 45th Annual Meeting of Invited Attorneys

List Serv Thread on BIM > FM Case Histories

- Best practices for maintaining a facility cycle life BIM model are immature at best
- Skill sets required to maintain the data may yet pose another set of problems.
- Won't happen all at once – FM fragmented, Owners need to be proactive to define lean processes; Use cases needed

Panel of Experts

- Finith Jernigan, AIA - Design Atlantic
 - Cradle to Cradle BIM
- Steve Hagan, FAIA – GSA
 - An Owner's Perspective
- Toby Considine, UNC
 - BIM and the Intelligent Building
- Break
- Scott Ebert, Soft Innovations
 - Standards for BIM and FM
- Q&A

Questions?

David A. Jordani, FAIA

djordani@jordani.com

Jordani Consulting Group

12 South Sixth Street, Suite 914

Minneapolis, MN 55402

612.333.9222 (Voice) 612.333.9210 (FAX)

<http://www.jordani.com>

