Deke Smith, FAIA, Hon. FIGP
Executive Director, buildingSMART alliance
April 14, 2010
• 1974 - Public Law 93-383, Sect. 809
  – Bridge between Private and Public Construction
  – Non-governmental – Unique 501c3 Organization
  – Unique in that it represents all disciplines in industry
    • Architects, Engineers, Contractors, Insurers, Unions, Manufacturers, Legal,
      Housing, Vendors, Owners, Consumers, State & Federal Government, Codes &
      Standards, and Testing
  – buildingSMART alliance is a council of the Institute
  – North American Chapter of buildingSMART International
  – Formerly International Alliance for interoperability

• NIBS Related Products –
  – Construction Criteria Base - 1985
  – Whole Building Design Guide - 1992
  – National CAD Standard - 1999
  – National BIM Standard - 2007

An Authoritative Source of Innovative Solutions for the Built Environment
Agenda

• Our Vision of BIM
• National BIM Standard
• AECOO-1 Testbed
• Your Next Steps

Image courtesy of Mortenson Construction
Desired Outcome of BIM

1. Collect data once and use from inception onward and allow information to flow
   - Authoritative source collects information and records metadata
   - Information assurance is in place to protect intellectual property
   - Multi faceted analysis is supported by software
   - Facility management uses information for operations and sustainment
   - All facets of the lifecycle are supported
2. Build facilities electronically and completely before we build them physically. “Build a model then build the model”
   – Reduces risk and therefore litigation
   – Reduces RFI’s and change orders
   – Allows more activities to occur in parallel thus speeding delivery
   – Provides better estimates
   – Delivers true as-built

Courtesy Dennis Shelden – Gehry Technologies
Helsinki Music Center

- Owner: Real estate company Helsingin Musiikkitalo/ Senate properties
- Senate properties' external experts: Rakennuttajatoimisto-HTJ and A-Rakennuttajat Oy
- Project developer and consultant: ISS Proko Oy
- Main contractor/project management: SRV
- Architectural design: LPR-Architects (Finland)
- Acoustics design: Nagata Acoustics Inc. (Japan)
- Acoustics expert in Finland: Akukon Oy
- Structural design: Ins. tsto Mikko Vahanen Oy, Ins.
- Mechanical design: Ins. tsto Olof Granlund Oy
- Electrical design: Ins. tsto Lausamo Oy
- Automation design: AIRIX Talotekniikka Oy
- Fire protection design: L2 Paloturvallisuus Oy
- Traffic design: Ramboll Finland Oy
- AV-design: Pöyry Building Services Oy
- Sound and light design: Ins. tsto Akukon Oy
- Stage technique design: Akumek Oy

52 subcontractors
99 contracts

All coordination between 8 tools being done using IFC’s

- AutoCAD Architecture
- MagiCAD Mechanical
- MagiCAD Electrical
- AllPlan Engineering
- Tekla Structure
- Tekla Construction Management
- Solibri Model Checker
- Autodesk Navisworks

Graphics created by Maija Saastamoinen at SRV Toimitilat Oy © 2010 NIBS
Applicable To Both Large and Small Projects

Charles Town Casino & Slots Parking Garage

- Owner, Architect, Engineer of Record and Contractor were the customers
- Conversion of Contract Drawings to Initial Model was completed in 8 ½ Hours vs 60 Hours in 2D
- Web View of Model and PDF’s Submitted
- Additional Modifications
- Piece Report sent to Estimating for Pricing
- HCSI awarded project 3 Days following initial submittal

Project Requirements
- 585’ Long
- 240’ Wide
- 5 Supported Levels
- 1,290 Pieces of Precast
- Redesigned Bay Spacing from 36’ to 45’
- Multiple Exterior Finishes
- Accommodate Fire Codes & Future Expansion/Additions

- Zero drafting errors
- 15% Under Budget
  - Potential for greater savings as proficiency increases and libraries are developed
- Project erected 3 weeks ahead of schedule
  - Connections lining up
  - Pieces fit because the model fit

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• News
• Events
• Information about the Alliance
• Programs
• Projects
• Interest Groups
• Speakers Bureau
• Affiliated Associations
• Discussion Forums

www.buildingsmartalliance.org
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.

United States National BIM Standard V1, P1 Jan 2008
Travelers
Develop Use cases and Model Views

Associations
• PCI
• AIA
• AGC
• SMACNA
• MCAA
• NECA
• AACE
• NSPE

Road System

NBIMS

Rules of The Road
Referenced Standards

ISO
• 16739
• 15926
• 12006-3
• 29481

CSI/OmniClass
• Masterformat
• Uniformat
• Tables
Policy Statement:

- The AIA believes that all industry-supporting software must facilitate, not inhibit, project planning, design, construction, commissioning and lifecycle management. This software must support non-proprietary, open standards for auditable information exchange and allow for confident information exchanges across applications and across time. This is best accomplished through professional, public- and private sector adoption of open standards. The AIA encourages its members and other industry organizations to assume a leadership role in the ongoing development of open standards. (approved December 2009)
States Requiring BIM

Division of State Facilities
Master Specifications/Design Guidelines

DSF BIM Guidelines & Standards

Texas Adopts Building Information Modeling (BIM) capability for State Design and Construction Projects

Contact: Mike Blackwell, TFC Marketing and Communications Specialist (512) 263-4237/ (512) 794-9189
Michael.blackwell@tfc.state.tx.us

Austin - The Texas Facilities Commission (TFC), the agency within the State of Texas that oversees the state real estate development as owners and operators of state facilities, today announces its adoption of Building Information Modeling (BIM) for state design and construction projects. For over a year, the Facilities Design and Construction (FDC) division within TFC has diligently worked to standardize the use of BIM for its future projects. FDC is responsible for overseeing the design and construction of state facilities throughout Texas. Currently, FDC manages 125 projects valued over $500 million, in addition to maintaining the Facilities Master Plan. In an effort to promote workflow efficiency, streamline productivity and increase the return on investment for the State of Texas, FDC has adopted and encourages the use of BIM’s digital design technology.

This digital design technology, in the form of coordinated, data-rich BIM models, gives TFC and its architectural and engineering design professionals the ability to explore early design concepts in 3D, visualize and analyze and simulate projects before construction begins, helps identify and reduce costly design conflicts, and work in a more collaborative way to produce a better, faster, and more cost-effective state building. After construction, the BIM...
Architecture, Engineering, Construction, Owner Operator Phase 1 (AECOO-1) Joint Testbed buildingSMART alliance™ (bSa) and The Open Geospatial Consortium, Inc. (OGC®)

Sponsors

Architecture Firms: HOK, Burt Hill and Ellerbe Becket
General Contractors: Webcor and Gilbane
Government Agencies: US General Services Administration and Statsbygg (Norway)
Trade Associations: American Institute of Architects and Large Firm Roundtable
Involved Organizations

- AGC (Association of General Contractors of America)
- ARBA Studios LC
- ASHRAE (The American Society of Heating, Refrigerating and Air-Conditioning Engineers)
- Bentley Systems
- BuildingSmart International
- CSI (Construction Specification Institute)
- Digital Alchemy
- ICC (International Code Council)
- Eppstein Uhen Architects
- Faithful & Gould
- Granlund
- Graphisoft
- LBNL (Lawrence Berkeley National Laboratory)
- Onuma
- OSS Nokalava
- OSCRE (Open Standards Consortium for Real Estate)
- PhiCubed/Sofi Exec
- Nemetschek North America
- NewForma
- NIST (US National Institute of Standards and Technology)
- Tokmo Systems
- TU Berlin
- University of Florida, Department of Building Construction
Process Model for Design Energy Analysis

Stakeholder Information Exchange

Stakeholder Information Exchange

Stakeholder Information Exchange

Design Team Stakeholder Information Exchange

AECOO Testbed: BPEA (Bldg Performance Energy Analysis)
Process Model: (05-1) Concept Design Energy Analysis

Version Management by Technical Team/Consultant

Version Management by Designer
Participating Vendors

Bentley
Digital Alchemy
Faithful and Gould
Graphisoft
Lawrence Berkeley National Laboratory
Nemetschek, NA
Phi Cubed/Sofi Exec
Stanford Center for Integrated Facility Engineering
Tokmo

IFC Data Exchange in Demonstration

Bentley Architecture
Graphisoft ArchiCAD
Nemetschek VectorWorks

Space Validation
Systems Coordination
Facility Handover
IDF Generator
DOE EnergyPlus
TOKMO
Code Compliance
OGC bSa Joint AECOO-1 Testbed

Baseline BIM

Reduce all window size by 25%

Add overhangs on south and west facade

Change glazing type

Change roof construction type

Graphic courtesy of Andy Smith of Bentley Systems
Multifaceted Decision Making

Initial Cost
Energy / Power use
Lifecycle cost / Maintenance
Environmental impact / HVAC
LEED Rating
Lean Constr. / Pre-construction
Raw Material Usage
Carbon Footprint / Carbon Neutral
Recycles at end of life
Combustion / Flame spread
Out gassing / Health issues
Resistance to mold / rot
Functional characteristics
Quality / Durability
Mean Time Between Failure
www.buildingsmartalliance.org
– Click on News – View All
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Strategic Planning for Success

The optimal approach to design, build, operate and maintain buildings.

- Written for the decision maker
- Understand the important issues for success
- Reasons for and possibilities of BIM
- Builds the business case for BIM
- BuildingSMART and NBIMS based

From Paul Teicholz –
“I recently finished reading your book and just wanted to tell you how much I enjoyed it and learned from it. The extensive treatment of business process modeling and use of building data to support more effective business processes is really an excellent contribution.”

Review by: Vance Drumadoir

It's finally here: This is the book to read if you are straddling the Building Information Modeling fence, wondering if the grass really is greener on the BIM side. (Bottom line: It is, so jump on over!) And if your firm already is on BIM terra firma, this book, written on the level of strategies thinking, can help you both see the big picture and refine your work processes to build on the full potential of BIM for all players in the industry.
Your Next Steps

• Subscribe to JBIM – it's free
• Read my book for more in depth insight and to develop your implementation strategy
• Visit www.wbdg.org to learn more
• Join the Alliance
• Make the decision to implement and promote open standard based BIM
  – Determine what you need to do before selecting software products
• If you are able become a sponsor
• Stay informed through www.buildingsmartalliance.org
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Thank You