



National Institute of Building Sciences  
Facilities Information Council  
**National BIM Standard**

## *Update Briefing*

Presented by  
Alan Edgar, Assoc. AIA

December 13, 2007



## What is NBIMS?

The NBIMS Initiative

The NBIMS Committee

The National BIM Standard

## NBIMS Initiative BIM Definition

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



National Institute of Building Sciences  
Facilities Information Council  
**National BIM Standard**

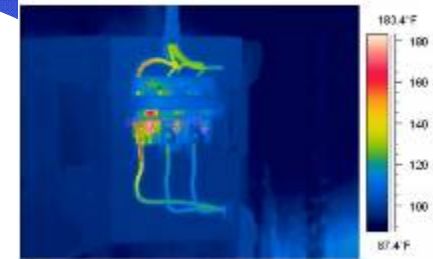
# Industry Presentations



IFC-based  
Product Library



Object placed  
in BIM model



Automated model  
analysis

BIM for **NEMA**



Maintaining, Repair,  
Replacement



Commissioning &  
Operating

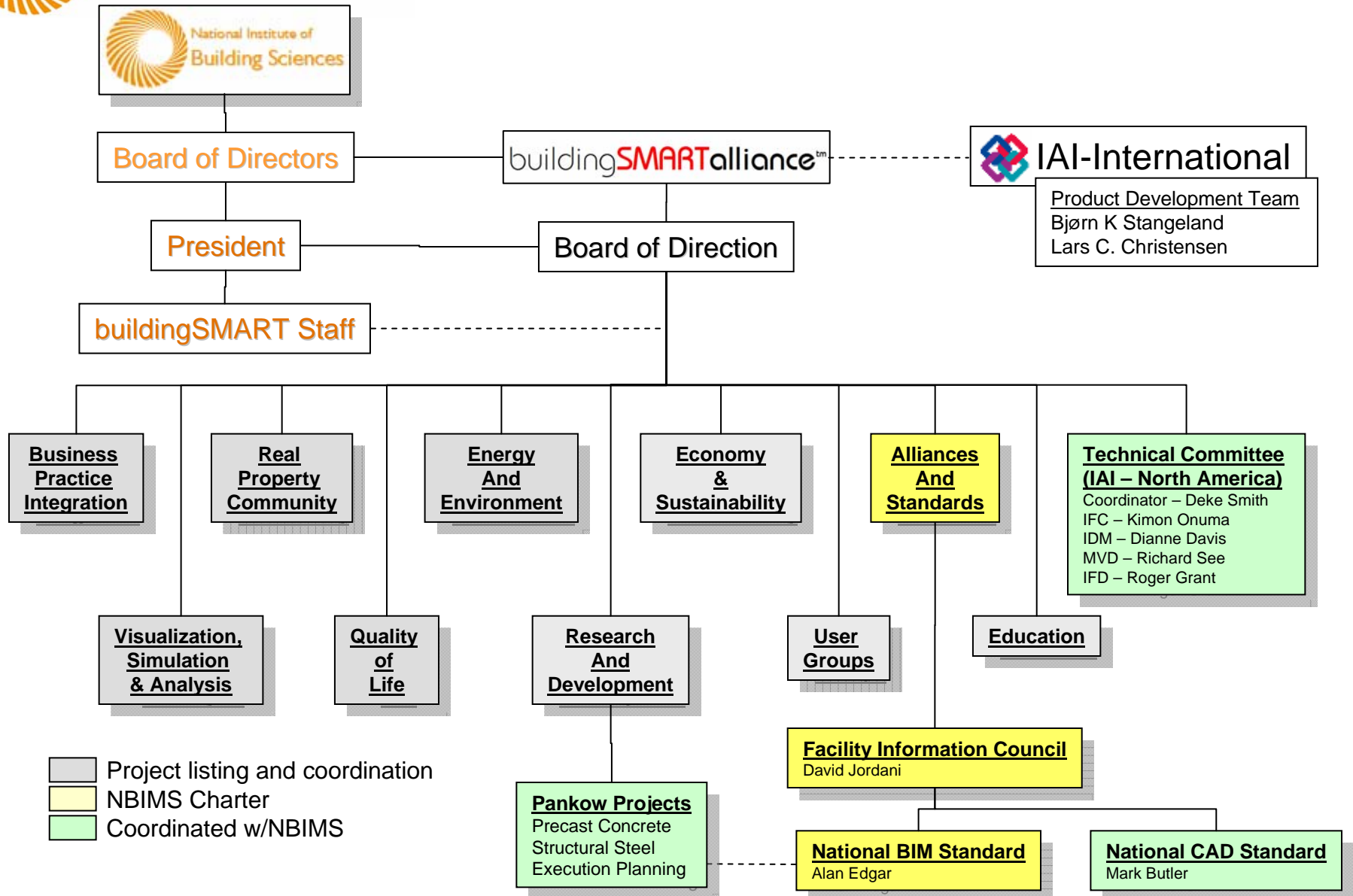


Construction &  
Installation

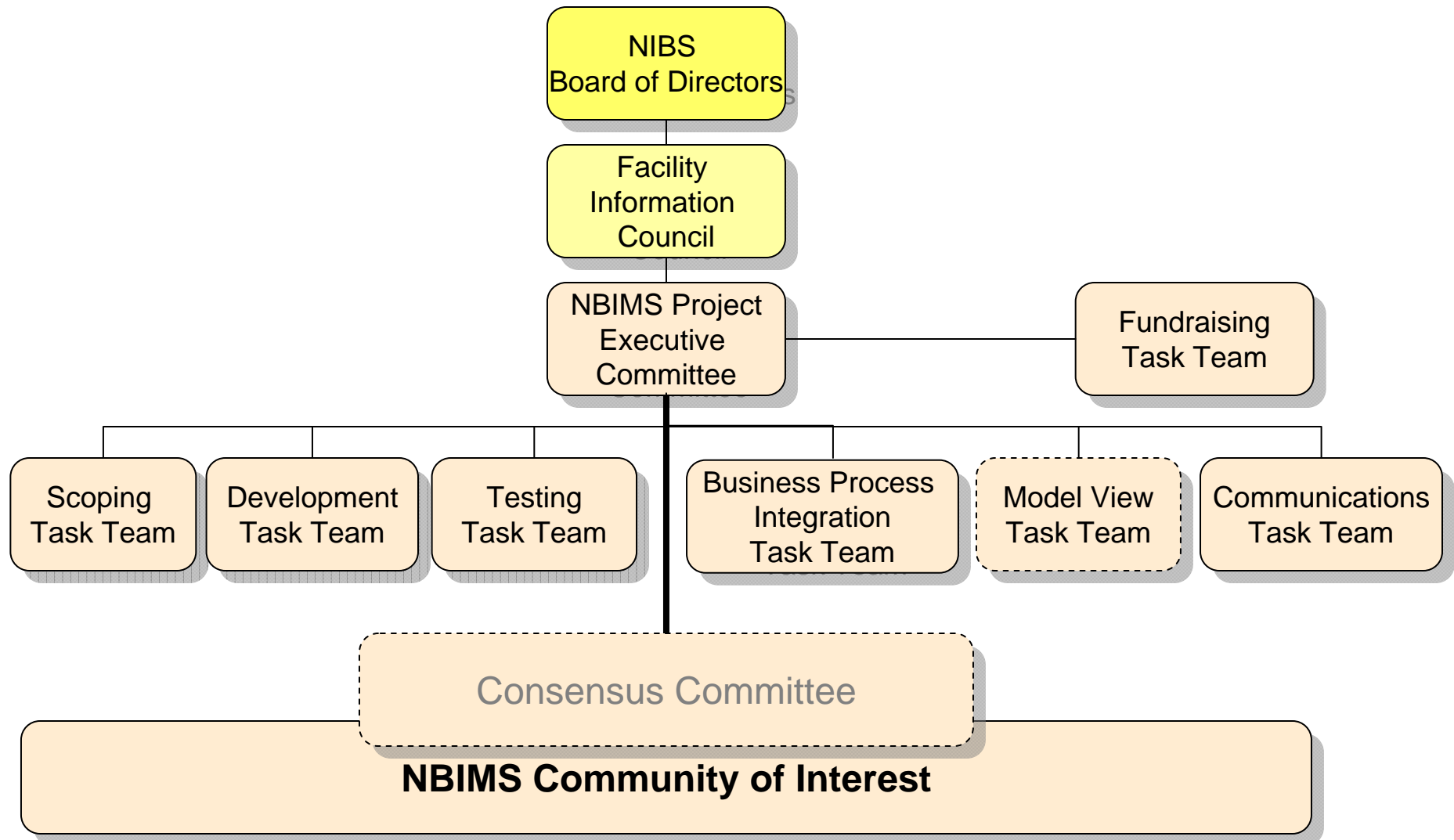


Procurement

# Organization – North America



## NBIMS Committee Organization Chart

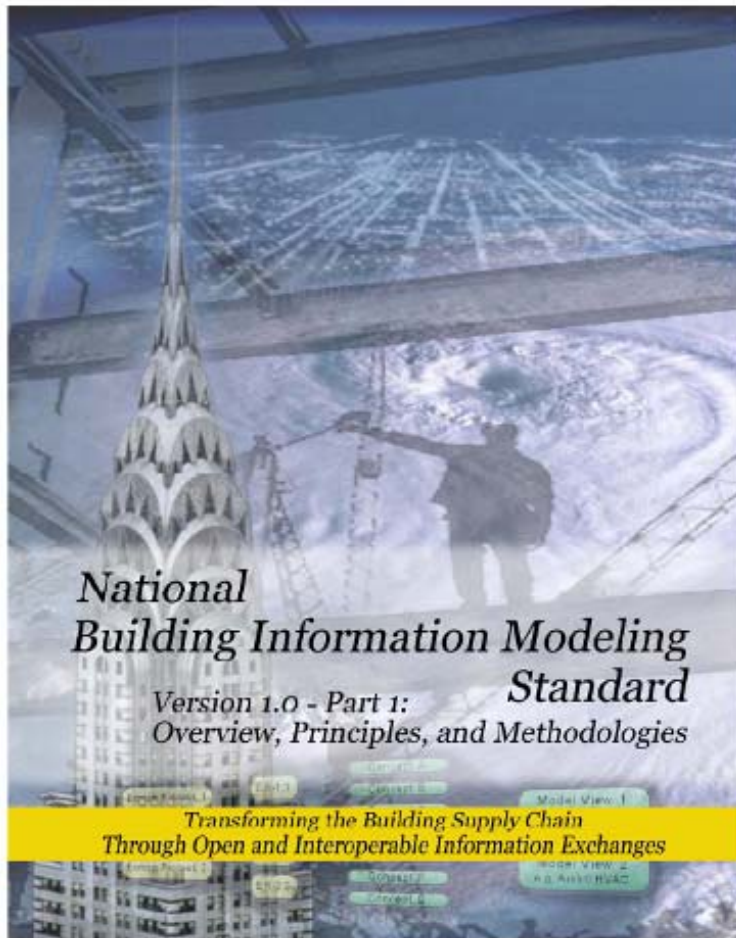




## Committees and Charters

- **NBIMS Executive Committee** – Alan Edgar, Chairman
  - Provides oversight, direction, and guidance on all aspects of the NBIMS initiative
- **Scoping Committee** – Dianne Davis, Committee Chair
  - BIM/IDM Implementation “Roadmap” and North American Standards Mapping
- **Development Team** – Bill East, Committee Chair
  - Supports creation of IFC based Information Delivery Manuals
- **Model View Team** – Richard See, Committee Chair
  - Supports rapid deployment of IDM and IE schemas into IAI/IFC model
- **Testing Team** – Patrick Suermann, P.E., Committee Chair
  - Support the testing of BIM implementations and process “best practices”.
- **Business Integration & Legal** – David Jordani, Committee Chair
  - Focus on “Building Lifecycle” legal and business documentation
- **Communications** – Patrick Davis, Committee Chair
  - Supports the distribution of information about the NBIMS activity, brand management, publication of standard documents.

# NBIMS V1-P1 Final



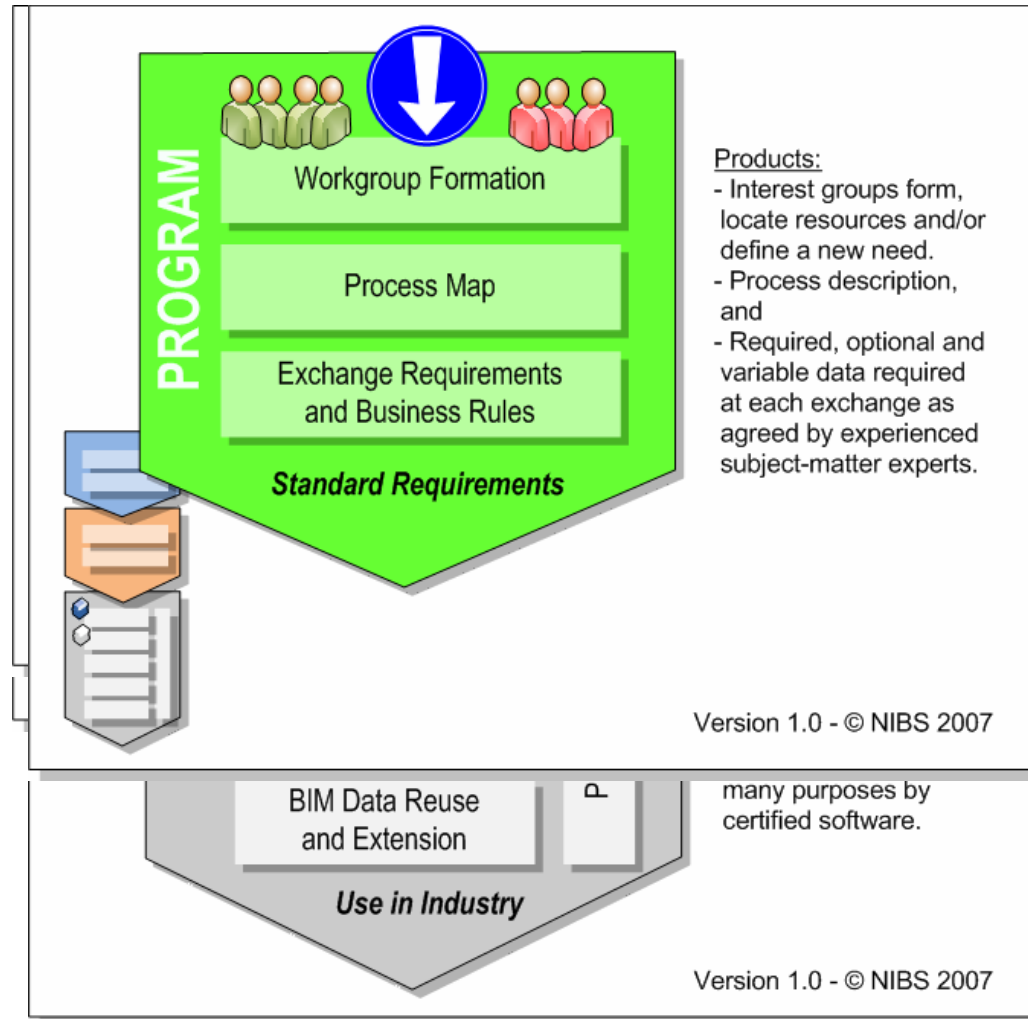
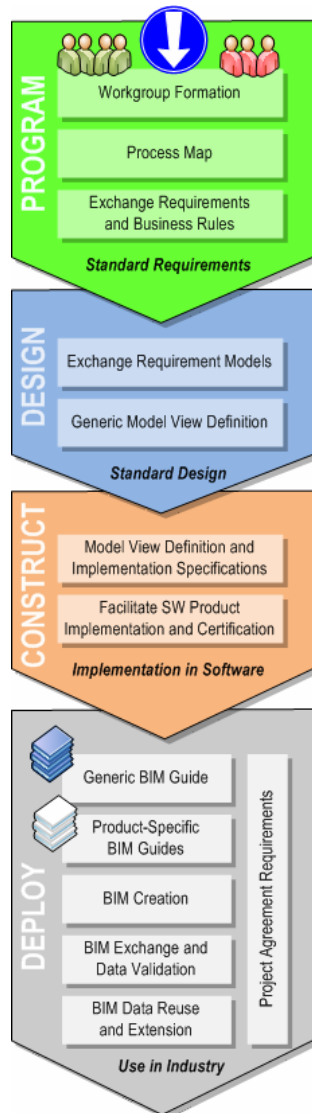
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- First draft released March 07
- Two month review period
- Revision period extended
- Dec. 9 Revisions complete
  - Initiative
  - Info Exchange Concepts
  - Dev/Use Process
  - References (guides)
  - Appendix (normative)
- V1-P2 in planning

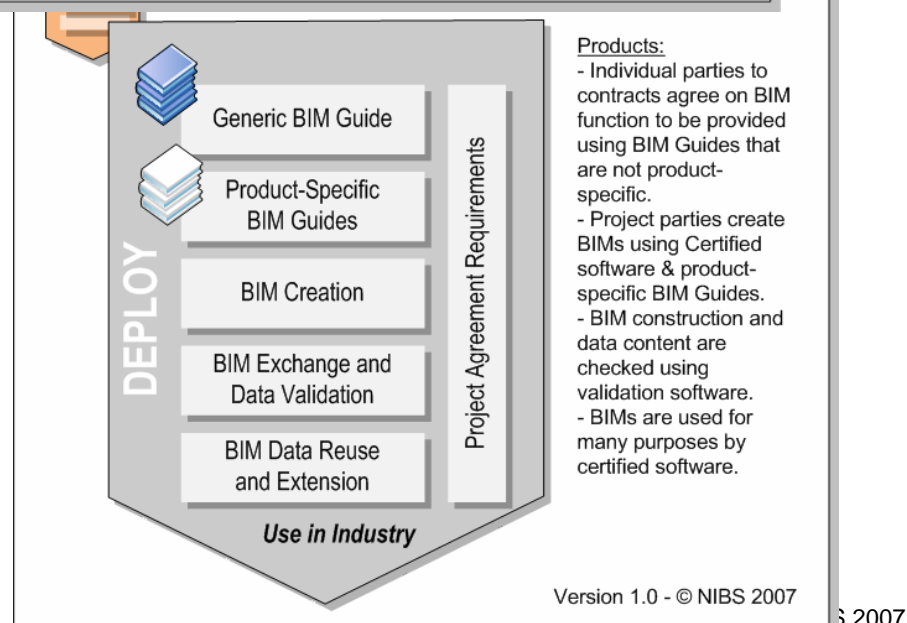
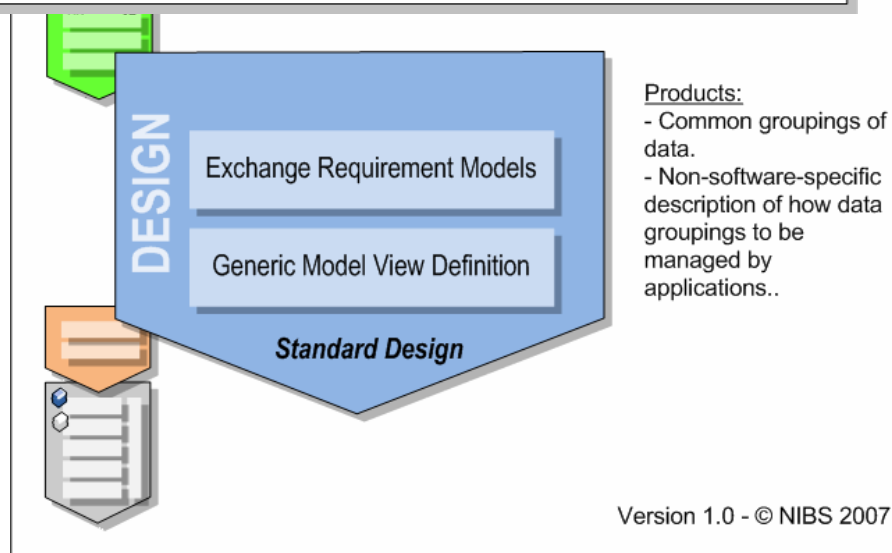
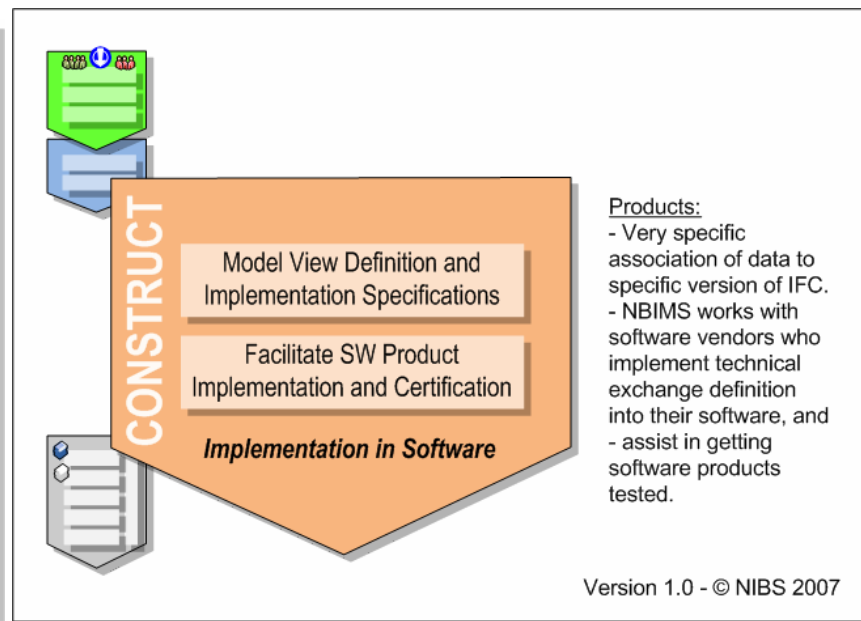
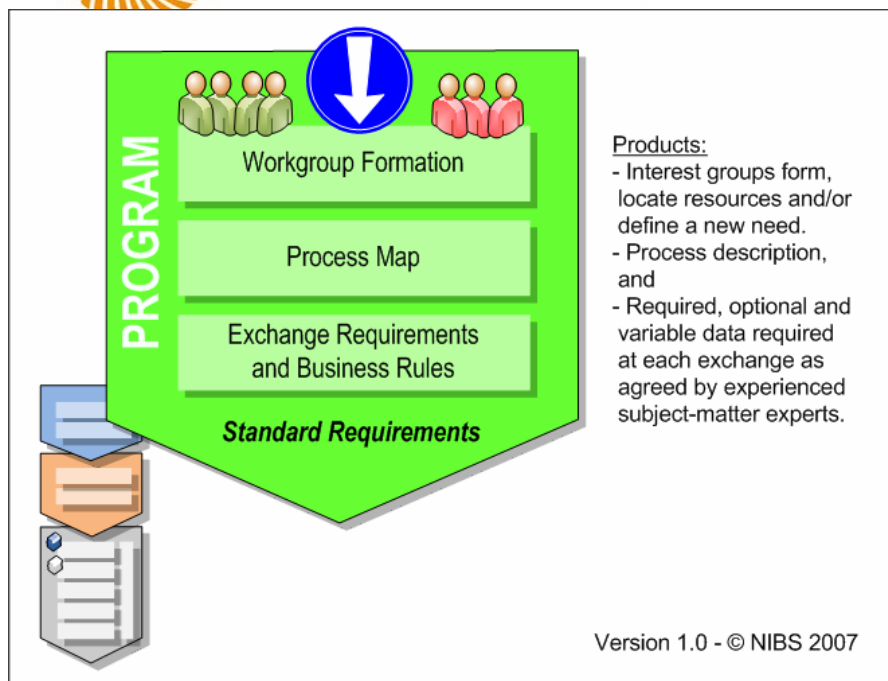




# NBIMS Production and Use Process

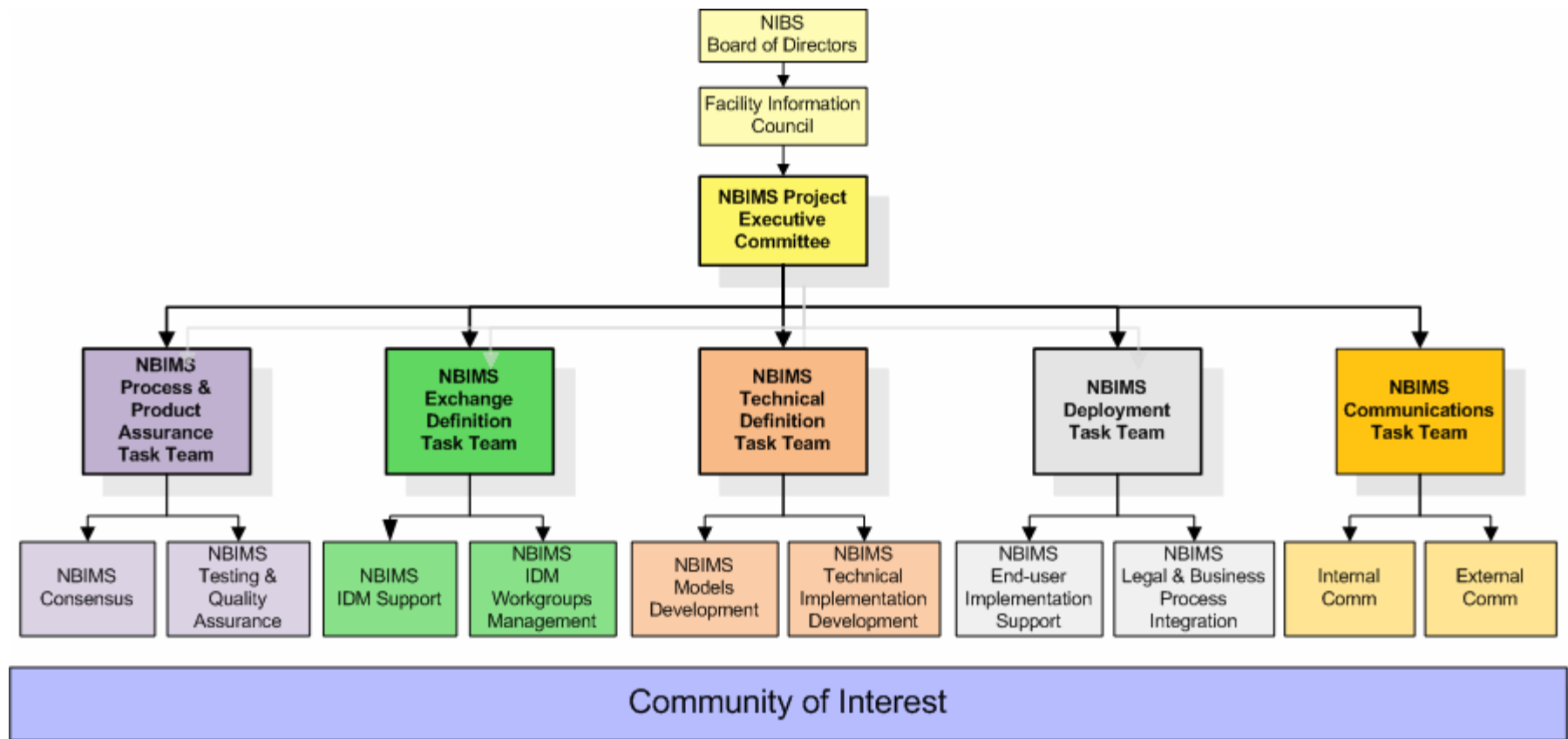


# NBIMS Production and Use Process



# NBIMS Committee

## Proposed Reorg to Align w/Process



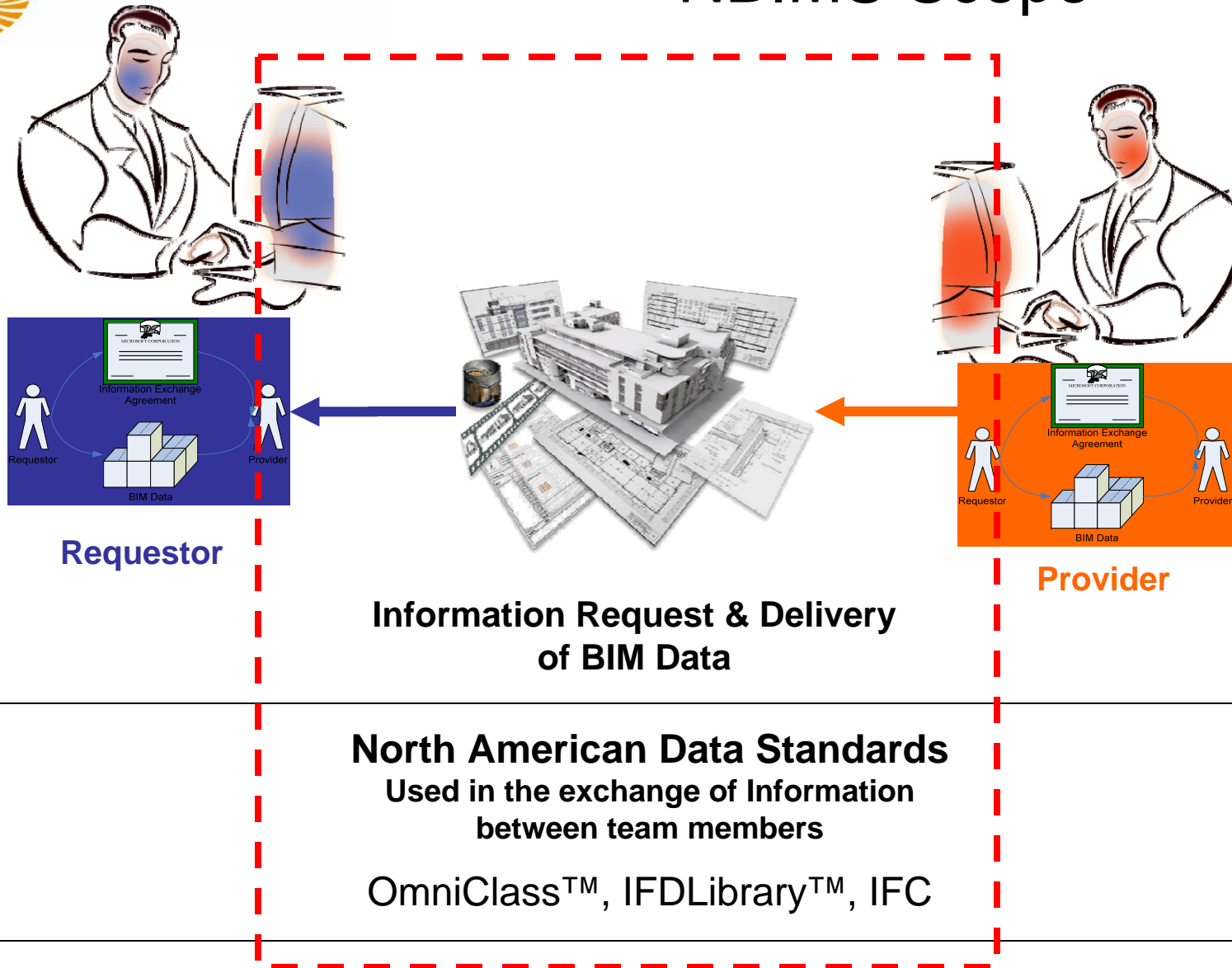
# NBIM Standard Product

- The National BIM Standard will consist of specifications and encodings to define the requirements for exchanges of data between parties using building information modeling processes and tools.
- NBIMS will
  - a.) Organize groups of industry professionals to define requirements, then publish **exchange specifications** for use in specific business contexts within a holistic facility lifecycle framework
  - b.) Publish **encodings for the exchange specifications** employing internationally acceptable open standards as normative references
  - c.) Facilitate **implementation by software developers** of encodings in software
  - d.) Facilitate **use of certified software by end-users** to create and use interoperable building information model exchanges.



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Facilities Information Council  
**National BIM Standard**

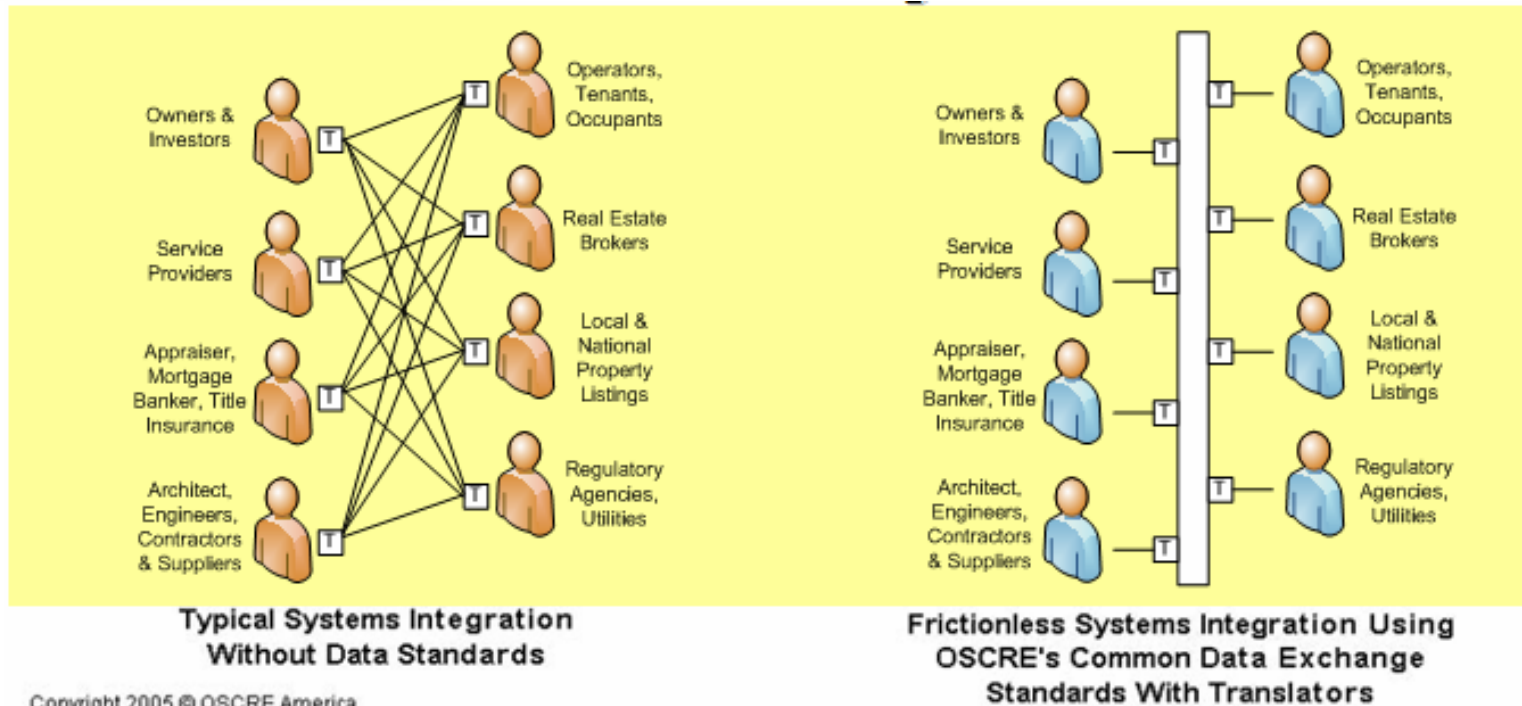
# NBIMS Scope







# Exchange Value Proposition



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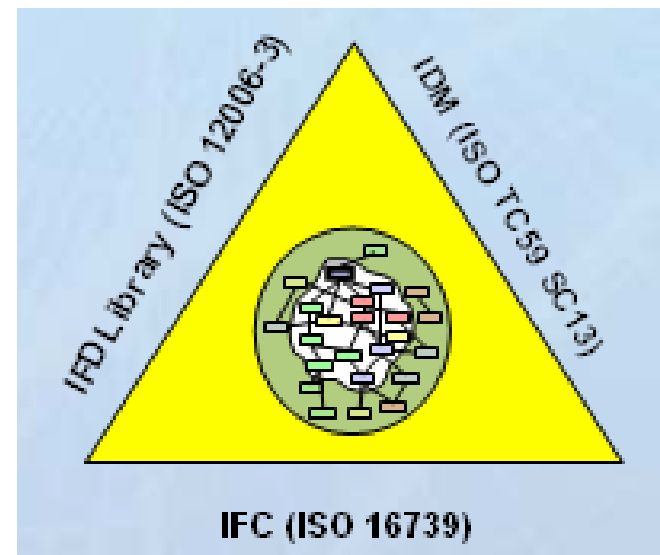
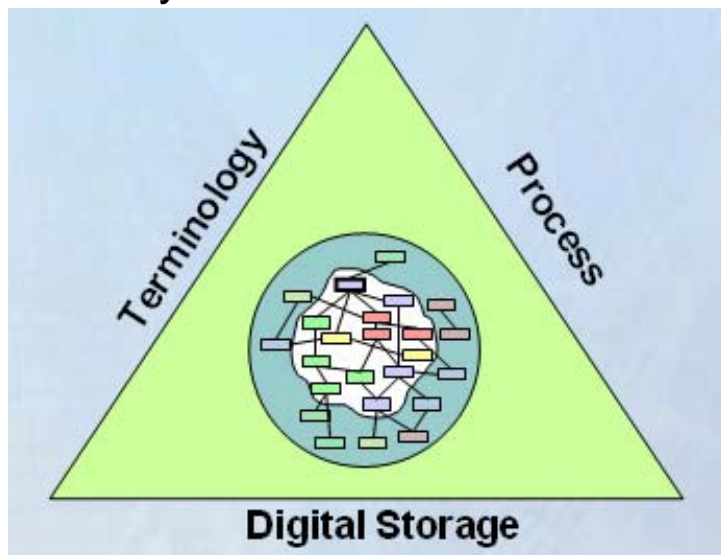
Number of Components to Integrate	Formula/Calculation (See Last Slide for Calculation Details)	Cost of Integration (FTE's)	Labor Cost (\$50,000/FTE)
20	$N(N-1)$ 20(19)=380	38	\$1,900,000
20	$N=2.0$ 20(2.0)=40	4	\$ 200,000
<b>NET SAVINGS</b>	<b>340 CONNECTIONS</b>	<b>34 FTE's</b>	<b>\$1,700,000</b>

Study performed by the Open Application Group (OAGi)

## 3-Legged Stool Supporting NBIMS

**In order for a real free flow of information to occur, three factors need to be in place:**

1. The format for information exchange,
2. A specification of which information to exchange and when to exchange the information, and
3. A standardized understanding of what the information you exchange actually is



**Interoperability through Standards,**  
courtesy Janne Aas-Jakobsen, Jotne EPM Technology AS

# Streamlining What Can be Streamlined

## User Facing Knowledge Capture for IDM Development



### Login IDM Information Database

Please [sign up for a password](#) if you don't have a Username yet.

Please [contact us](#) if encounter any difficulties with the login.

**Sign in:**

Username

Password

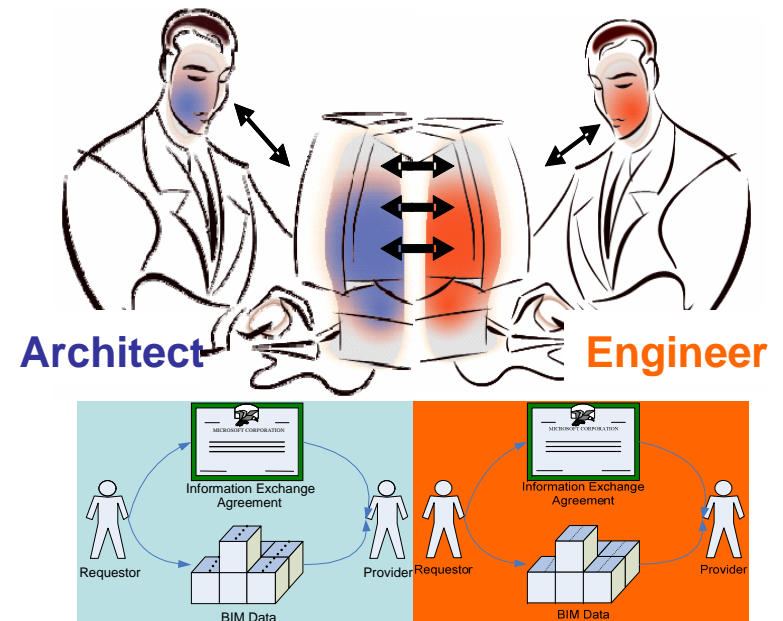
☐ Remember Username and Password  
(For this Computer to "forget" this information you can use the "logout" link at the top right.)

[Forgot your password?](#)

**Cookies and JavaScript must be enabled to use this system.**

(In Windows IE, instead of allowing all cookies you can also specifically add this domain "bimsmart.com" to a list of "allowed" websites ->Tools ->Internet Options ->Privacy ->Edit)

Username and Password are not case sensitive.



***Tell me and I'll forget.  
Show me and I'll remember. Involve me and I'll understand.  
Confucius***

# Business Case Development – Aligning OmniClass™ to BIM Process

## IDM Business Case Development

1

### WHO (is requesting)

Actor requesting information to support a process or decision  
(Authoritative Reference OMNI CLASS – Table 33 & 34)

2

### WHY (project/process use or benefit)

Why is this information important for a project activity  
(Authoritative Reference OMNI CLASS- Table 32)

3

### WHEN (stage in project)

(Authoritative Reference OMNI-CLASS-Table 31) Table 31 is tied to IFC Phases (Project Lifecycle)

4

### WHAT

Dataset in BIM that supports the request and benefit  
Because BIM use aggregates information several tables support this activity .  
Authoritative Reference OMNI-CLASS Tables 11, 12,14, 21, 23, 41, 49

5

### To WHOM

Group/Actor that provides/fullfills the information need OMNI-Class 33 34

6

### HOW

Tools/formats/results Table 35 & 22

7

### INPUTS & OUTCOME

Information, Product or Service Delivered Omniclass 36

## Answers – From OmniClass™

1. (Table 34) Architect aka: 34-25 21 00
2. (Table 32) Conception services, Designing, Preliminary Designing aka: 32-11 14 13
3. (Table 31) Conception Stage aka: 31-10 00 00
4. (Table 12) Building 12-11 00 00; (Table 21) Superstructure, Enclosure aka: 21-41 31 00; (Table 23) Electrical Power and Lighting 23-80 00 00
5. (Table 34) Engineer 34-25 31 00
6. (Table 36) Design Tools (OmniClass NA for IFC)
7. (Table 36) Building Envelope Design Information:36-21 17 21



Descriptive Name for Exchange Requirement:

Early Planning

Description:

Create early planning diagram

Added by: Kimon Onuma on Dec 5, 2007 / modified on Dec 5, 2007

[Update Exchange Requirement](#)

Develop the context of a business case for an exchange requirement:

- Search for terms by starting to type in each field. (Hint: tap the space bar to see all available)
- Setting the fields from left to right filters the fields to the right to only contain the children of the OmniClass
- Entering values in the fields on the right will automatically populate the empty fields to the left with the pe
- Green values are already "SET" - red values have to be "SET" (i.e. saved) before continuing.

► **Who is requesting / Requirements: (34)**

Management > Executive Management > Chief Executive (OmniClass: 34-11 11 11)

► **Requesting Of Whom / Organizational Roles: (34)**

Design Roles > Architect (OmniClass: 34-25 21)

▼ **Why is this information important for a project activity: (32)**

Level 1:

Conception Services

SET

Level 2:

Planning

SET

Level 3:

Concept Development

SET

► **Project Phase ('When'): (31)**

Design Stage > Preliminary Project Description Phase > Conceptual Design Phase (OmniClass: 31-20 10 14)

► **Dataset in BIM that supports the request and benefit ('What'): (21/23)**

Manufactured Structures > Complete Buildings (OmniClass: 23-55 30)

► **Project Type: (11/12)**

Learning Facilities > Higher Education Facilities > Business School (OmniClass: 11-12 24 13)

► **Work Result / Quality: (22)**

General Requirements (OmniClass: 22-01)

Streamline Narrative Activity  
 to Key Information  
 Normalize Naming for Data  
 Entry & Mining  
 Support Consensus  
 Educate by Doing

Supports ratio of technical  
 teams to user community



# Information Exchange Repository (IDM-User Facing)

Searchable, Aggregated, Viewable, Reporting Capability, Creation, Editable,  
Information Exchange Requirements Normalized & Omniclass Database

## National BIM Standard™

A buildingSMART Initiative

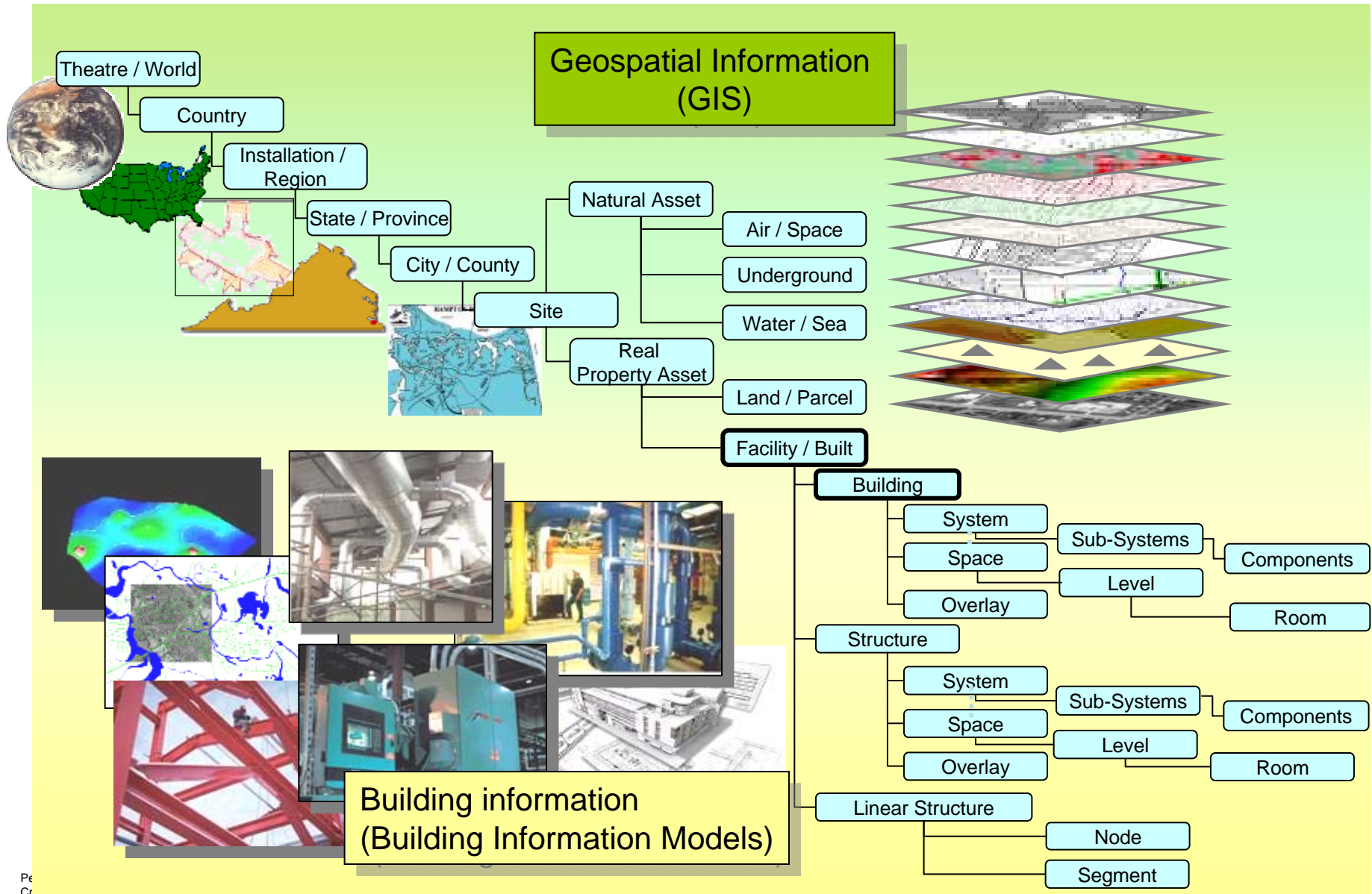
a product of the  
Facility Information Council  
— a NIBS Council

in collaboration with AEC Infosystems & Onuma, Inc.

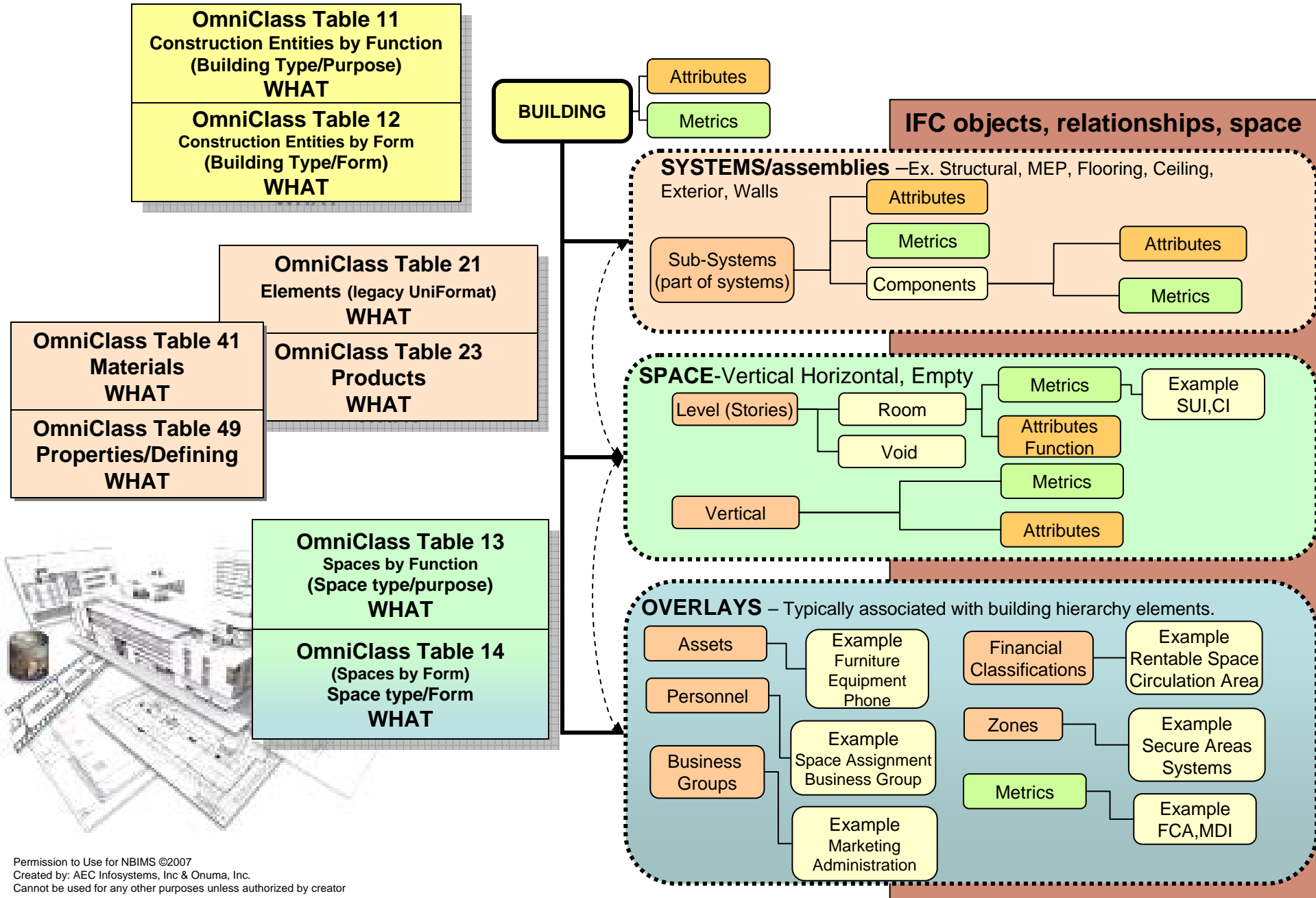
[Start Page](#)
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[Files](#)
[Exchange Requirements](#)

<a href="#">Exchange Name</a>	<a href="#">Who Requests</a>	<a href="#">Requesting of Whom</a>	<a href="#">Why</a>	<a href="#">Project Phase</a>	<a href="#">What</a>	<a href="#">Project Type</a>	<a href="#">Work Result</a>	by	<a href="#">Create New</a>	
Early Planning	Chief Executive	Architect	Concept Development	Conceptual Design Phase	Complete Buildings	Business School	General Requirements	KO	<a href="#">Edit</a>	<a href="#">View</a>
	Lighting Designer	Engineer						DD	<a href="#">Edit</a>	<a href="#">View</a>
Cost Earth Movement	Architect	Engineer	Preliminary Designing	Conceptual Design Phase	Rough Grading	Land Forms	Assessment	TD	<a href="#">Edit</a>	<a href="#">View</a>
Space Program	Owner	Accountant						KO	<a href="#">Edit</a>	<a href="#">View</a>
Structural Analysis	Architect	Engineer	Planning	Conception Stage	Structural Frames	Other Mixed-Commerce Facilities	Stressing Tendons	KO	<a href="#">Edit</a>	<a href="#">View</a>
Door Specification	Draftsperson	Space Planner	Preliminary Designing	Design Development Phase	Doors	Low-Rise Attached Buildings	Architectural Woodwork	TD	<a href="#">Edit</a>	<a href="#">View</a>

# GIS/BIM Information Taxonomy



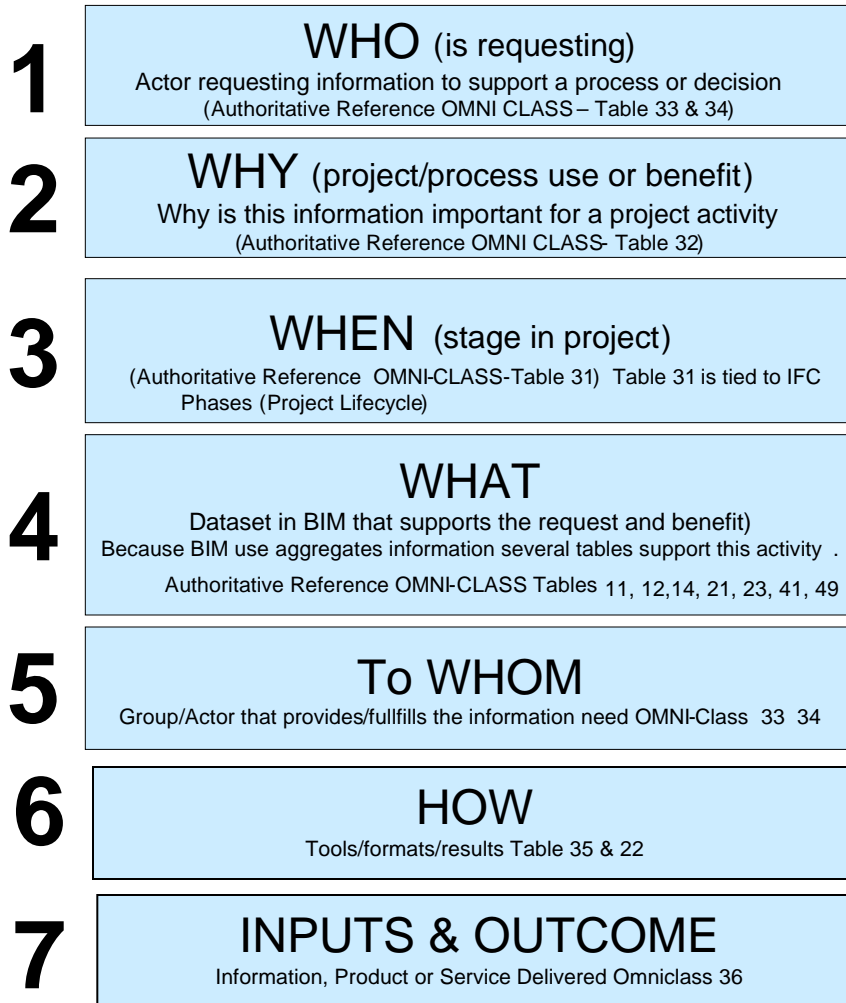
# Aligning Omniclass to the BIM Model



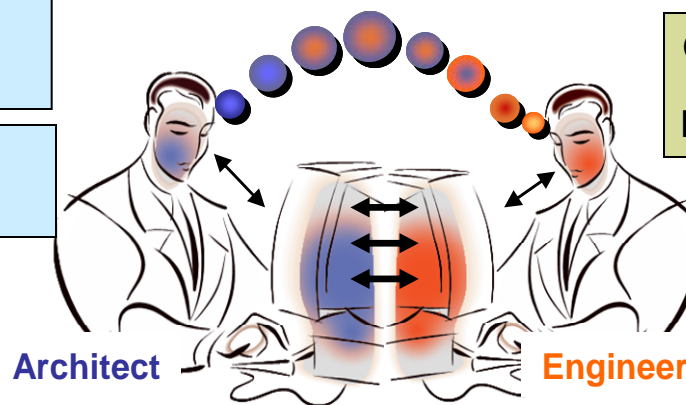
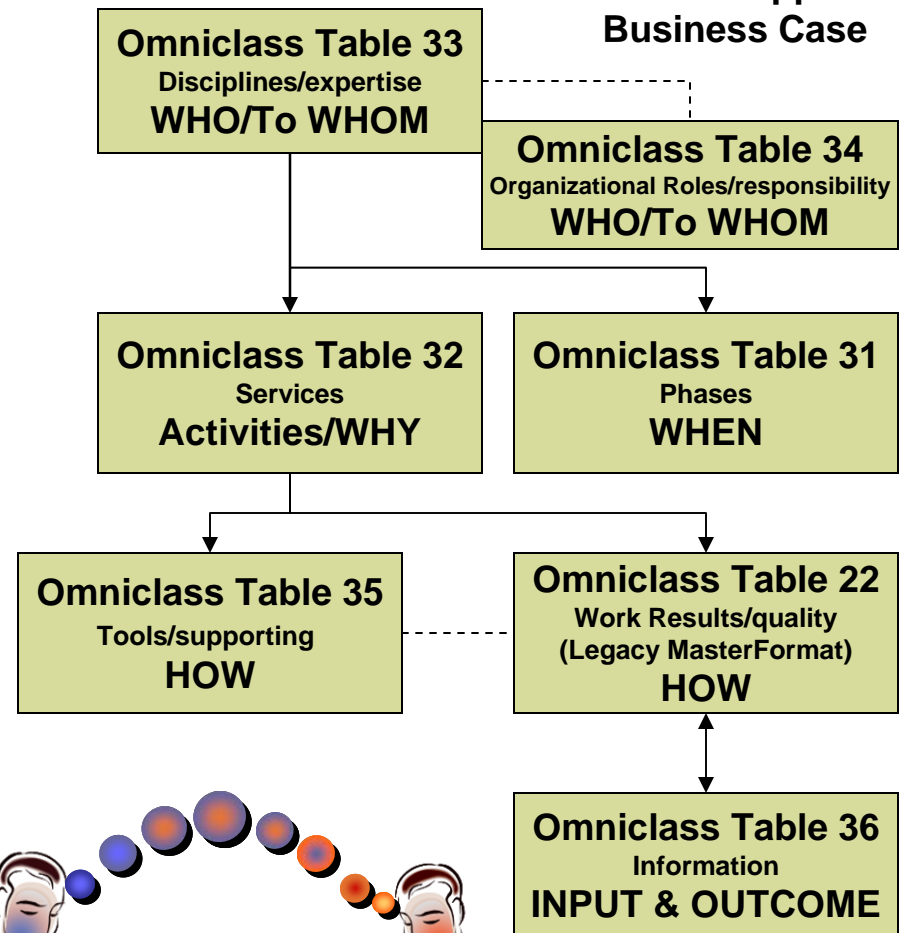
# Content Enabled Business Case Development

## Aligning OmniClass to BIM Process

### Business Case Development

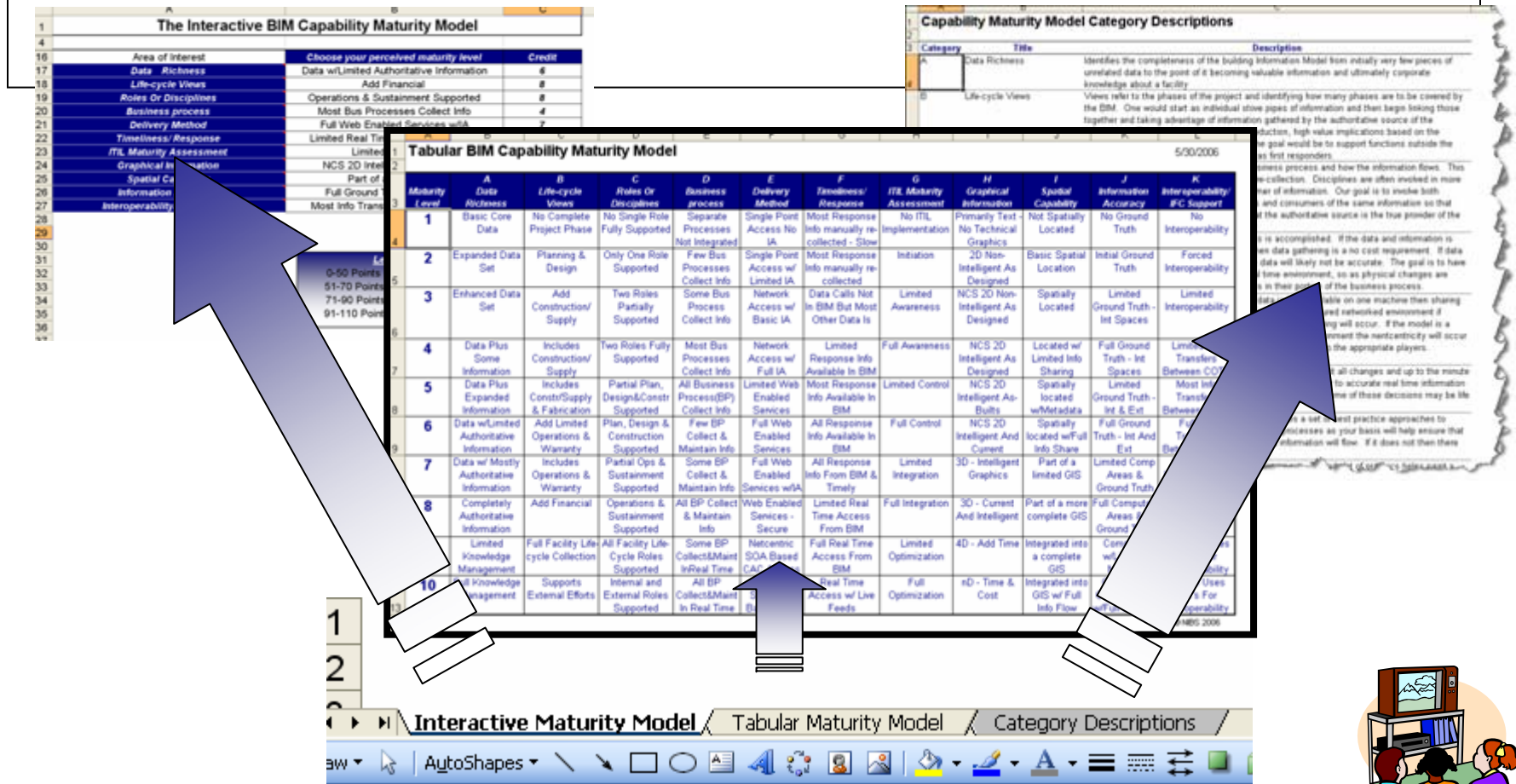


### Data Sets to Support Business Case





# BIM Capability Maturity Model



Article: [http://www.aecbytes.com/viewpoint/2007/issue\\_33.html](http://www.aecbytes.com/viewpoint/2007/issue_33.html)

Download: [http://www.facilityinformationcouncil.org/bim/pdfs/BIM\\_CMM\\_v1.8.xls](http://www.facilityinformationcouncil.org/bim/pdfs/BIM_CMM_v1.8.xls)





# Charles Pankow Foundation BIM for Precast Concrete



## BUILDING INFORMATION MODELING (BIM) FOR PRECAST CONCRETE

Draft Final Report

for the

Charles Pankow Foundation



PROF. CHARLES EASTMAN

ASSOC PROF. RAFAEL SACKS

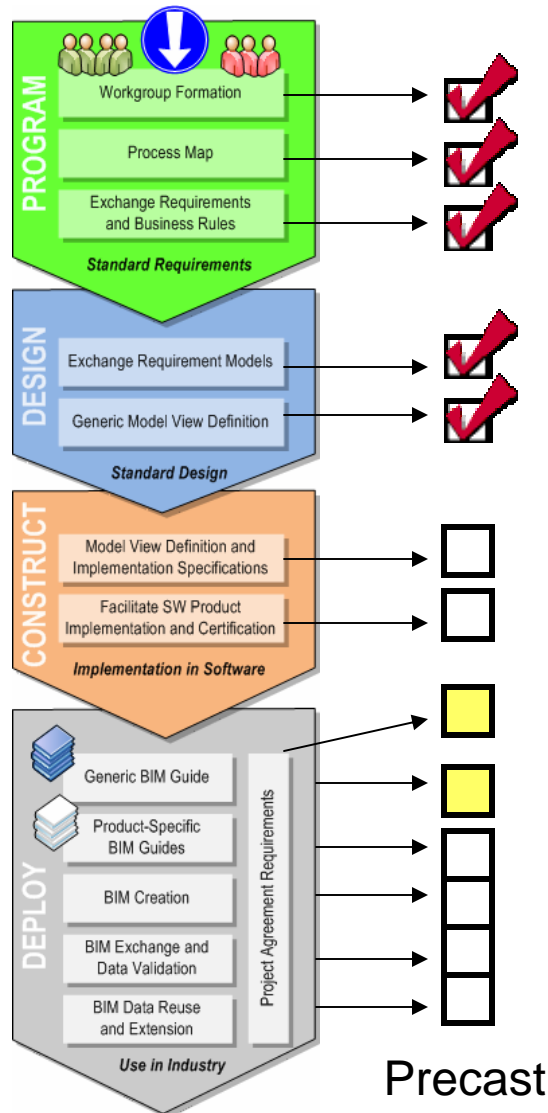
DR. YEON-SUK JEONG

ISRAEL KANER

November 5th, 2006

- Charles Pankow Foundation
- \$150K,
- NIBS, FIATECH (PM), Georgia Institute of Technology, Technion, Israel Institute of Technology
- Prof. Charles Eastman, Assoc. Prof. Rafael Sacks, Dr. Yeon-Suk Jeong, Israel Kaner
- HKS Dallas, High Concrete, Arkansas Precast, Tekla, Structureworks, Autodesk, Design Integrations (Graphisoft), Bentley, Gehry Technologies
- 3D BIM over 2D CAD - up to 58% more productive in detailing precast and shop drawings

# NBIMS Process



GSA Spatial Validation

COBIE

Automated Code Checking

Specifiers Property Info Exchange

Sheet Metal

Owner's Deliverable

Structural Steel

Early Design

# COBIE

- Early implementers documentation on Whole Building Design Guide
  - <http://www.wbdg.org/om/cobie.php>
  - Technical report
  - Step-by-step guide for technical users
  - Example files
  - Overview briefing
  - Detailed briefing
- Integration with IFC community
  - Draft Information Delivery Manual (IDM) published on international IDMwiki (<http://www.iai.no/idm/index.html>)
  - ifcXML translator for COBIE data is ready in alpha-version
- Early-adopters of workgroup product:
  - U.S. Dept. of State (all FY07 construction contract awards)
  - Corps of Engineers (all FY08 MILCON Transformation awards)
  - NASA (identified several projects to start)
  - Army Installation Command (maintenance and renovators use)
  - Naval Facilities Engineer Command (considering transition from OMSI to COBIE)
- Mapping of early adopter processes used for COBIE to NBIMS process
- Complete IFC Express notation for COBIE data (NASA funding at NIBS)
- Vendor coordination meeting
- (Official Sources Sought Notice to be posted as an official solicitation February 2008 in Chicago)

## Journal of BIM

- NIBS publication
- Issue #1 on the street
- Issue #2 in production
- Semi-annual for now.
- 





## Business Process Integration & Legal Task Team

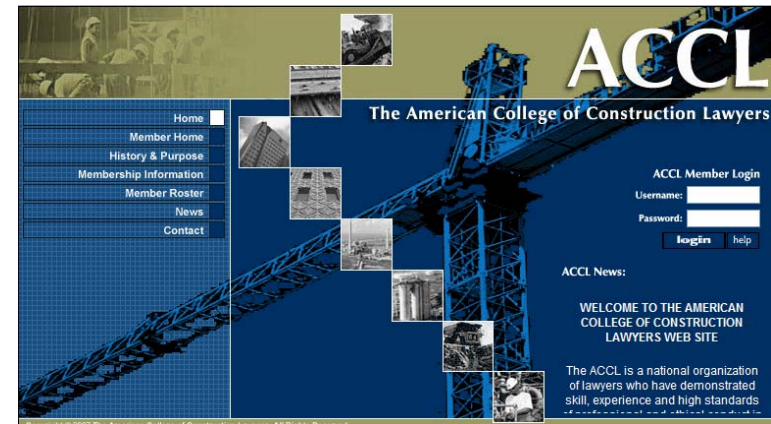
David Jordani

### Mission

- BIM Is changing the process, product and delivery requirements for facilities
- Less concerned with the technology per se, relying on other TTs
- Focus on business process adaptation - the “organizational therapy” aspects of BIM integration
- Facilitate identification and analysis, and provide recommendations regarding the integration of BIM into the business models of all those who are involved in the facility life cycle.
- Inform, educate, facilitate dialog and consensus, and provide direction to industry regarding the impact and opportunities



- Working Groups:  
Contracts, Risks, and Liabilities
  - Chair – Howard Ashcraft
  - Examine legal relationships, liabilities and responsibilities
  - Develop better understanding of BIM legal implication so that benefits can be achieved



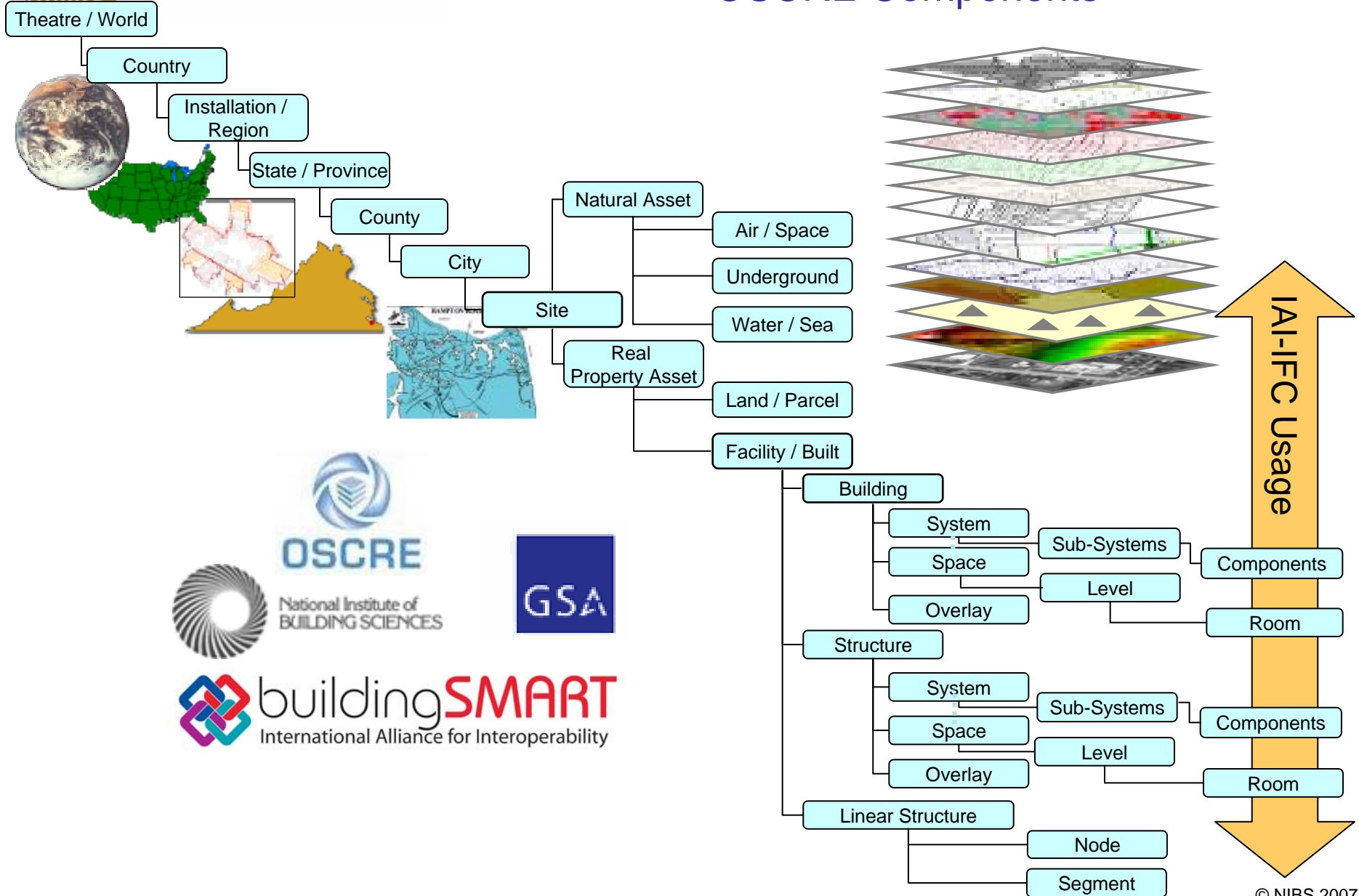


- Working Group: Implementation Process
  - New workflows
  - Best practices
  - Information exchange and handoffs

- **Working Group: Staffing & Skill Sets**
  - Develop staff to meet the demands of a BIM centric process.
    - Constructability
    - Expand the need for information specialists in the facility life cycle processes.
  - New models for collaboration and outsourcing will emerge.

- Working Groups
  - BIM integration from perspective of *owner*
    - *What do building owners need to understand to assume an appropriate collaborative role?*
  - BIM integration from perspective of *service provider*
    - *What do 'service providers' need to understand to assume an appropriate collaborative role?*

# GeoLocation Hierarchy in OSCRE Components







## OSCRE



## Next Steps – Related Activity

- **Business Process Roadmaps** – Provide the business relationships of the various activities of the real property industry. May be basis for organizing the business processes - help organize the NBIMS and the procedures defined in the Information Delivery Manuals (IDM's). (FIATECH Capital Projects, USACE BIM Roadmap)
- **Candidate Standard** – Candidates to go through the NBIMS development/consensus process in the future. (COBIE, Early Design).
- **Guidelines** – Available from several organizations and some items should be considered for inclusion in NBIMS.(AIA-IP, AGC BIM Guide, Coast Guard Model Guidelines, General Buildings Information Handover Guide, GSA 3D-4D-BIM Program)
- **Other Key References** – Parallel efforts being developed in concert with the NBIMS however are not part of the NBIMS and in fact, may be standards in their own right. (ICC SmartCodes, OGC® OWS-4, OGC® AECOO Interoperability, OSCRE Real Property Exchange Standards, Pankow/NIBS/FIATECH Architectural Precast Concrete, US National CAD Std., ISO 15926).

## Next Steps – Related Activity

- NIBS Related Products –
  - Construction Criteria Base
  - Whole Building Design Guide
  - National CAD Standard
  - National BIM Standard



<http://www.buildersnet.org/IFC-BIM/>



## Next Steps – NBIMS Committee

- Version 1 – Part 2
- Task Team realignment
- NBIMS Consensus Process
- Scoping - Exchange website
- Scoping - Classifications enhancement
- Precast MVD & Deployment
- Additional Charles Pankow Foundation grants and ‘spontaneous’ sources.
- Capability Maturity Model enhancements
- Harmonization, adoption to NBIMS – ISO 15926
- Transition to operations mode.



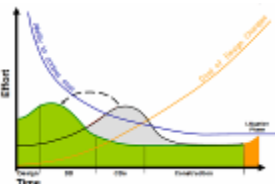
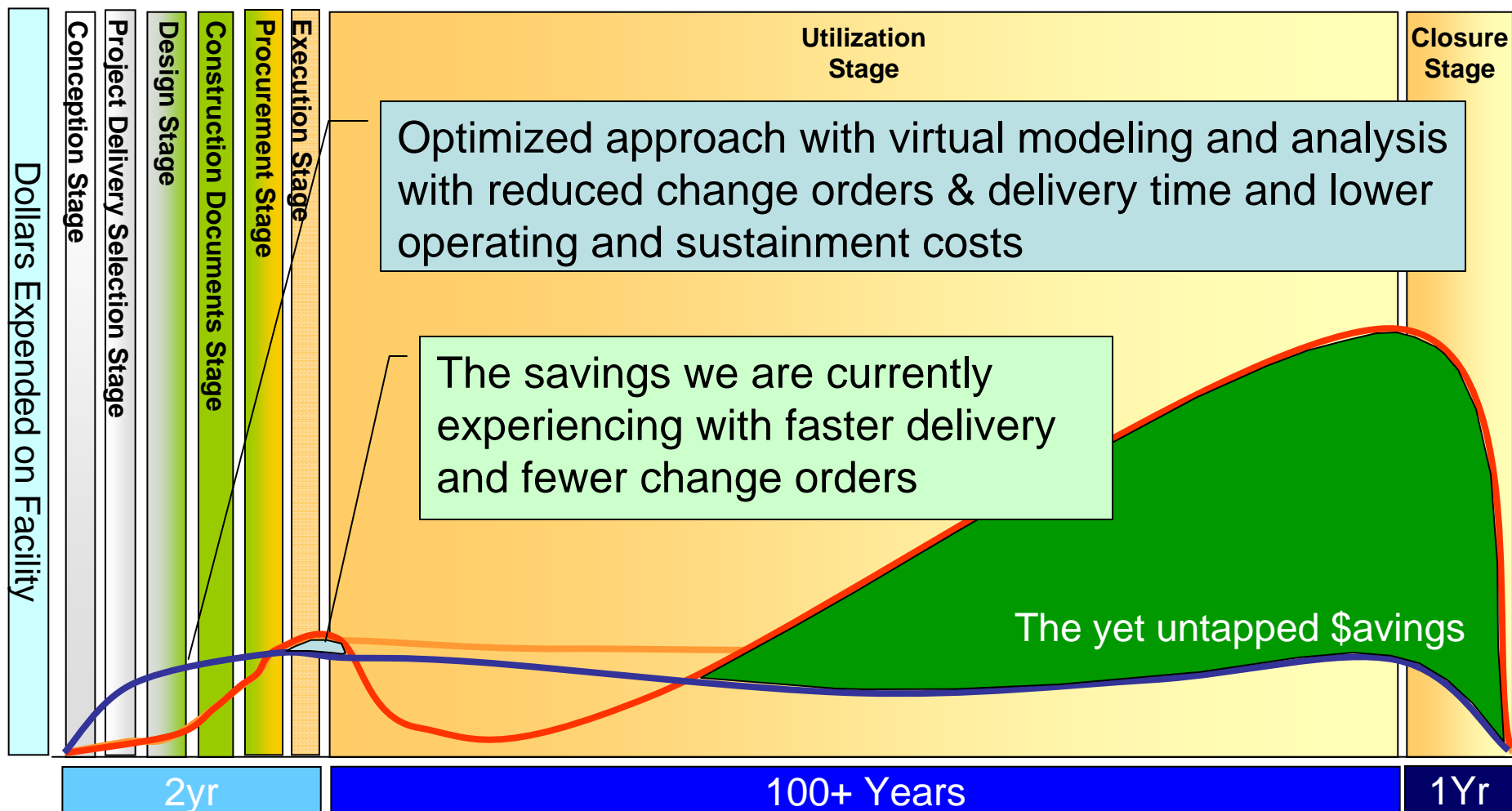
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**National BIM Standard**

# Funding Transformation

*-- Getting There From Here --*

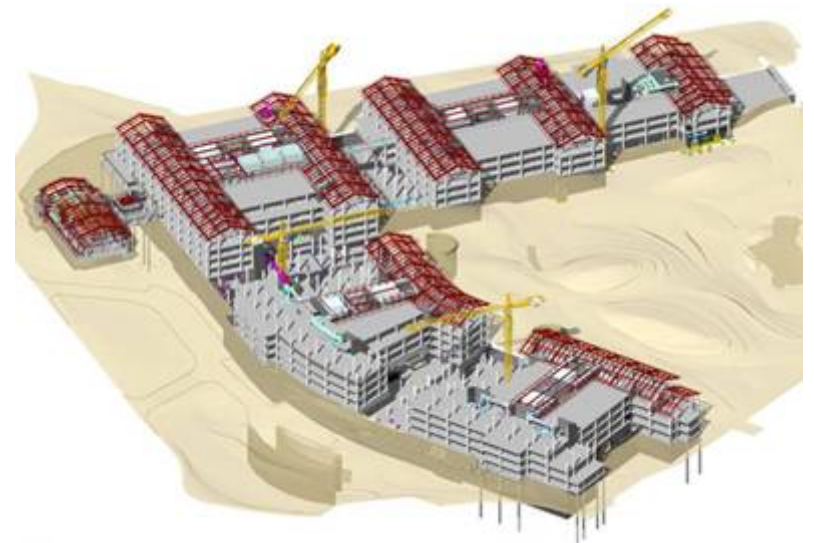
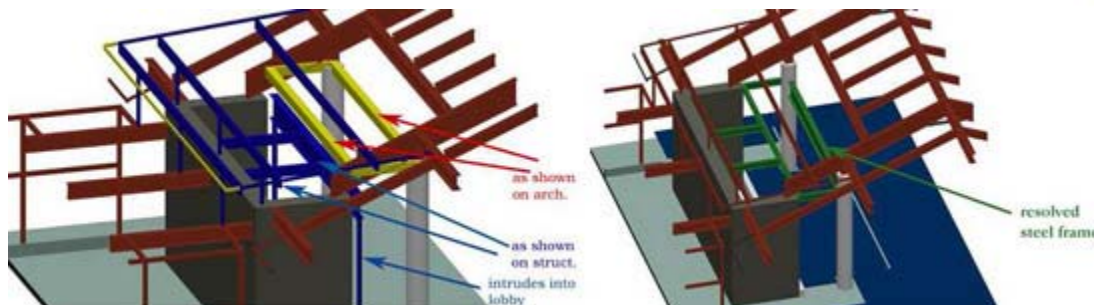


# Business Model – Future Values



## Case Study – Letterman Digital Arts Center

- “Despite numerous design layout changes that were required by Lucas Film Ltd. due to company restructuring, the LDAC project was completed on time and below the estimated budget...over two hundred design and construction conflicts were identified, most of which were corrected before construction, resulting in an estimated savings of over \$10 million on this \$350 million project.”



Courtesy of AECbytes "Building the Future" Article (September 30, 2006)  
Building Owners Driving BIM: The "Letterman Digital Arts Center"  
StoryMieczyslaw (Mitch) Boryslawski, Associate AIA  
Founder, View By View, Inc.

# A Culture of Investment

1. Implement integration in homogenous, proprietary teams with 'lean' aims. Gain benefits from BIM tools and methods used in project-specific scope. Pocket benefits.
2. Same as #1 but pocket most benefits and use some to fund interoperability development and industry adoption.
3. Implement interoperability across greater scope of lifecycle in heterogenous, project-specific and 'loose' federations. Gain greater benefits from higher use of BIM tools and methods. Pocket greater benefits and continue to use a percentage of gains to fund more transformation.

## Conclusion

- Contact Information
  - NIBS: Earle Kennett - [ekennett@nibs.org](mailto:ekennett@nibs.org)
  - Chairman: Alan Edgar – [aredgar@comcast.net](mailto:aredgar@comcast.net)
  - Task Team Chairpersons
    - Business Process Integration: Dave Jordani - [djordani@jordani.com](mailto:djordani@jordani.com)
    - Scoping: Dianne Davis - [d.davis@aecinfosystems.com](mailto:d.davis@aecinfosystems.com)
    - Development: Bill East - [Bill.W.East@erdc.usace.army.mil](mailto:Bill.W.East@erdc.usace.army.mil)
    - Models: Richard See - [RichSee@digitalalchemypro.com](mailto:RichSee@digitalalchemypro.com)
    - Testing: Patrick Suermann - [suermann@ufl.edu](mailto:suermann@ufl.edu)
    - Communications: Patrick Davis - [pdavis@hntb.com](mailto:pdavis@hntb.com)
  - NBMIS: [www.facilityinformationcouncil.org/bim/index.php](http://www.facilityinformationcouncil.org/bim/index.php)
  - Questions Please

*Thank You*