National Institute of BUILDING SCIENCES
National BIM Standard
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Notes to Readers

These slides were presented to the AEC-ST 2008 Winter Conference; as part of the buildingSMARTalliance™ BIM track.

Speaker's notes were added to annotate the slide content.

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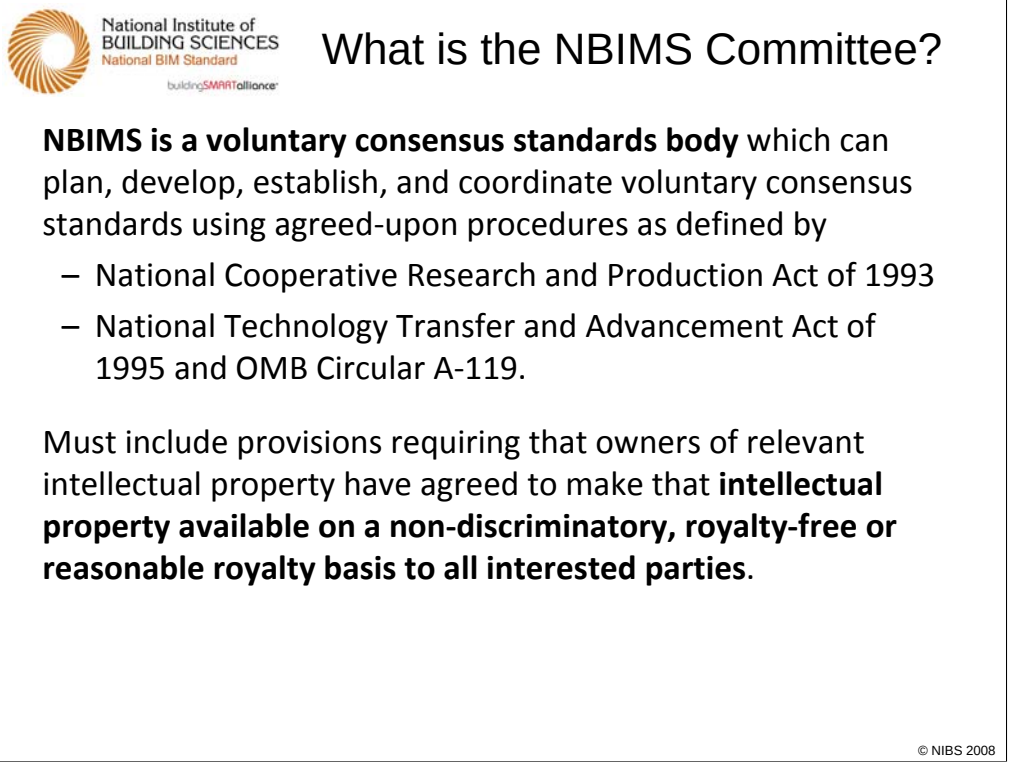
National Building Information Modeling Standards

Update Briefing

Presented by
Alan Edgar, Assoc. AIA
OSCRE Workgroup Program Manager
Chair, NBIMS Executive Committee

December 10, 2008



NBIMS is being built on a foundation of established legal, organization, business informatics, and IT standards.

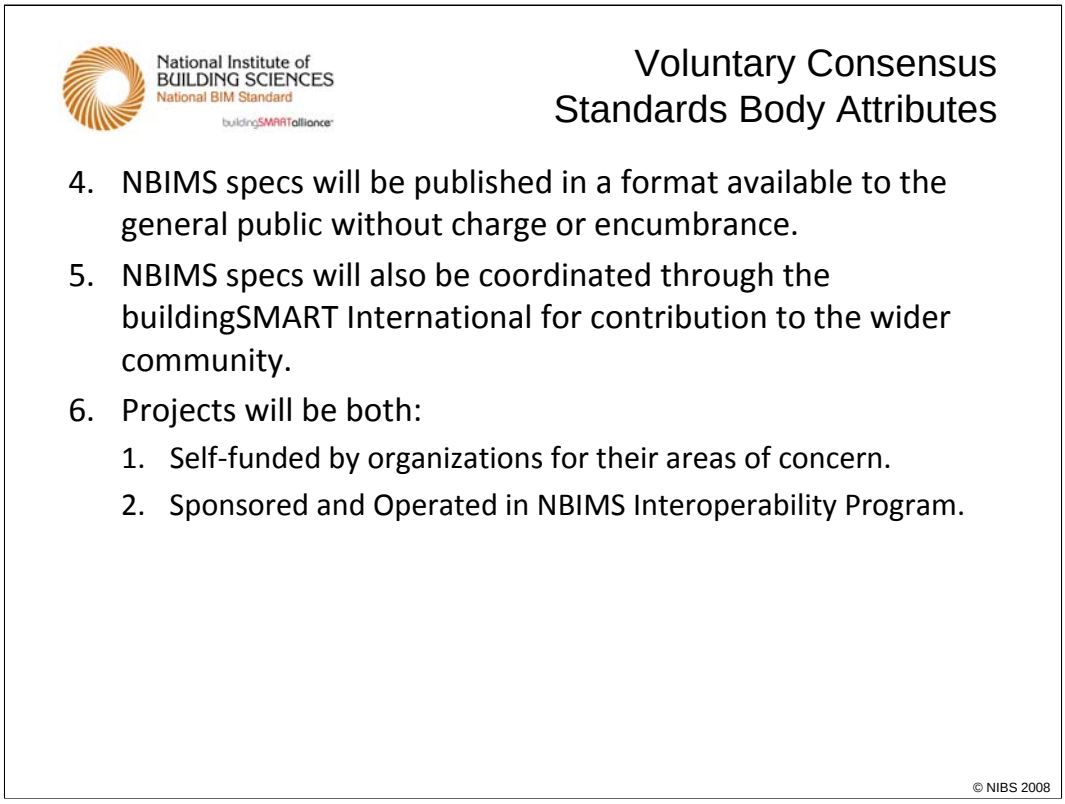
NBIMS fits into the category of an organization developing and/or accepting industry standards and it is based on US and International Standards Development bodies such as ANSI and ISO.

These aren't all listed here but a couple of examples illustrate this.

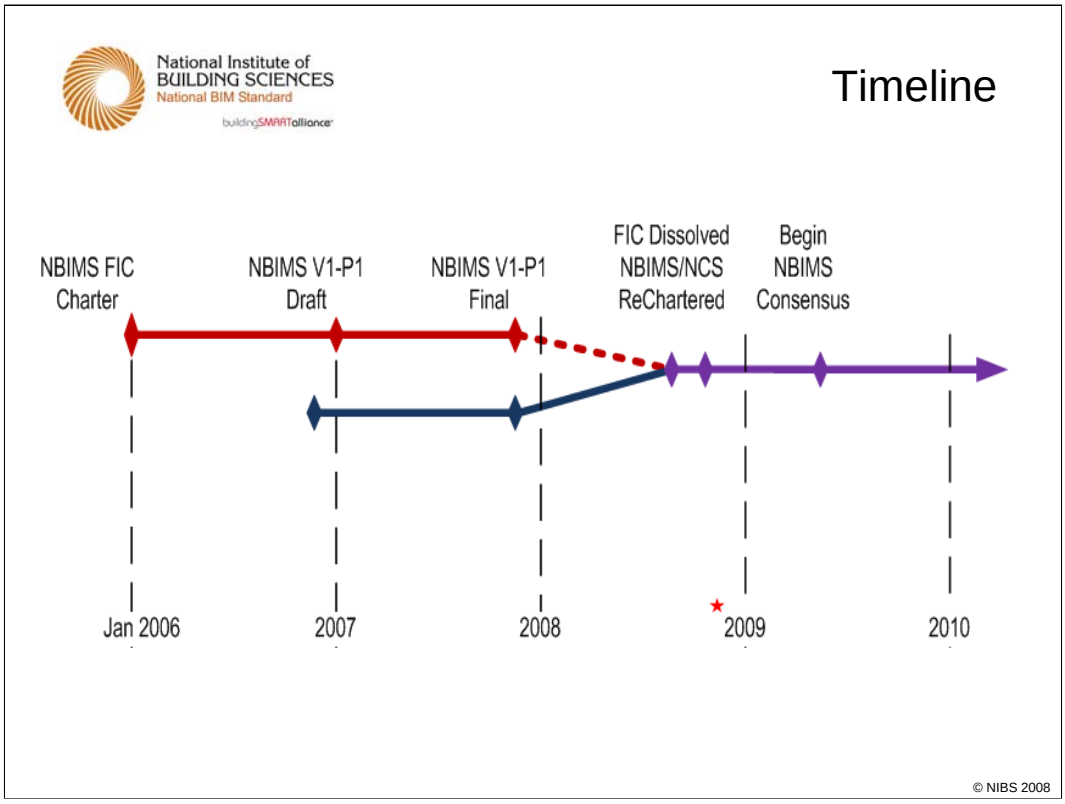
Voluntary Consensus Standards Body Attributes

1. Fundamental Fairness
   - Openness.
   - Balance of Interests and Participation among competing interests
   - Due process
   - Consideration of views and objections. An appeals process.
2. Consensus in the Body & in the Approval Methods
3. Process must:
   - Be transparent and repeatable outside the original development and testing team
   - Be flexible – different methodologies to meet different product, technology and service sectors.
   - Yield consistent and reusable deliverables
   - Be coherent; avoid overlap or conflict

Lists general attributes of Voluntary Industry Consensus-Standards Bodies.



Lists general attributes of Voluntary Industry Consensus-Standards Bodies (cont.)



Jan. 2006 - NBIMS Founding – Re-definition of Industry-wide goals for lifecycle interoperability. Organizational activities.

Dec.2006 (blue line) Alliance Founding – Expansion and extension of the IAI-NA Chapter. Industry Coordination, Outreach & Community Adoption

Jan. 2007 NBIMS Version 1-Part 1 – Informative Document setting out the industry overview, principles and initial methodologies for transformation to information and process interoperability in the Building Industry.

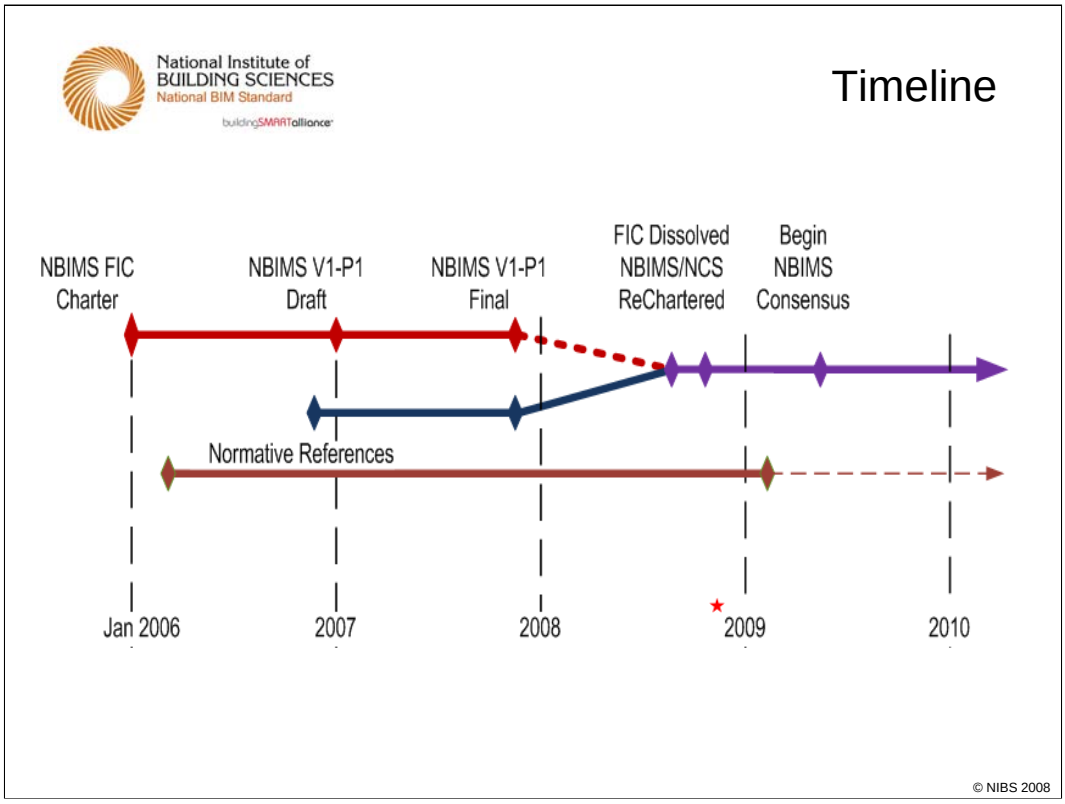
Dec. 2007 – NBIMS V1-P1 Final; incorporating significant new material largely as the result of seeing for the first time a comprehensive view of the problem and possible solutions in a single document. The final document also presented for the first time a unified view of an information exchange standard development process.

Beginning in Feb. 2008 a need was identified and acted upon to streamline and consolidate governance for National CAD Standard (NCS) and NBIMS within the Alliance and, as a result, suggested decommissioning the NIBS Facility Information Council.

Sep. 2008 – NIBS Board approved motion to decommission FIC and move NBIMS and NCS to Alliance governance.

Dec. 2008 (current) – NBIMS and NCS have been re-chartered as Alliance Projects & structuring of the organization for operations is underway. Publication of NBIMS v1-Part 2 is scheduled for Q1 2009 containing operational details.

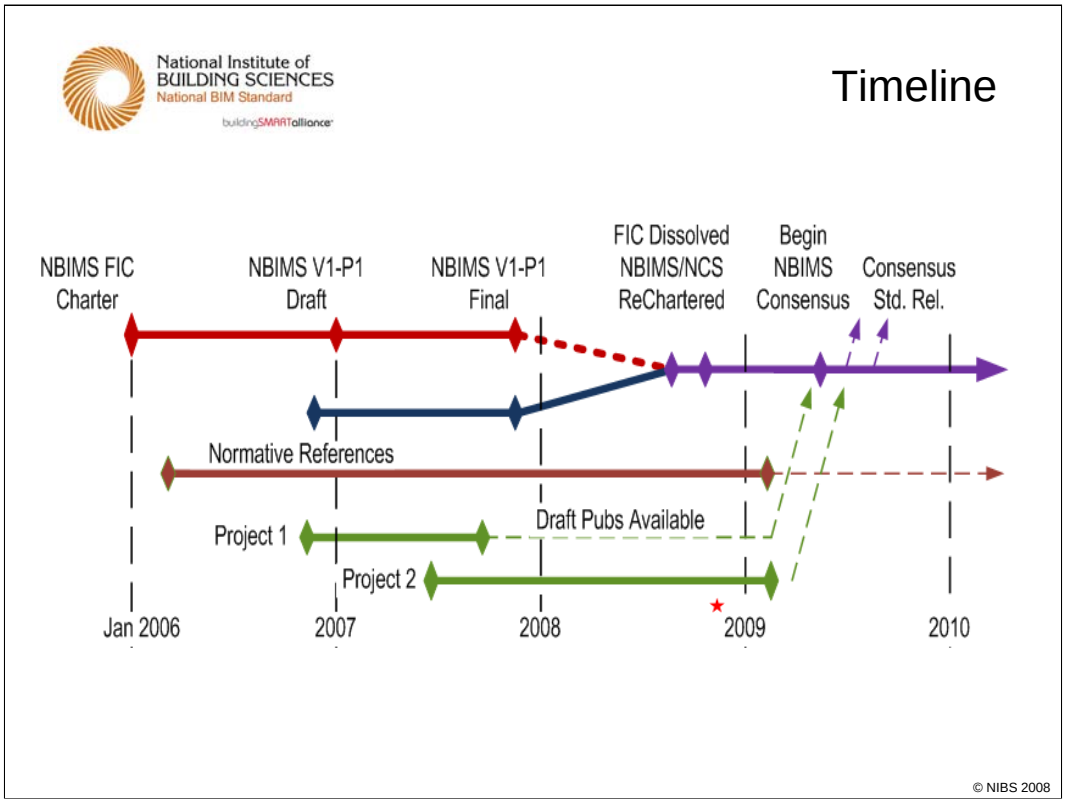
Q2 2009 – Anticipate first processing of candidates (documents referred from in-progress, separately funded projects) through NBIMS TC.



(add brown graphics labeled ‘Normative References’)

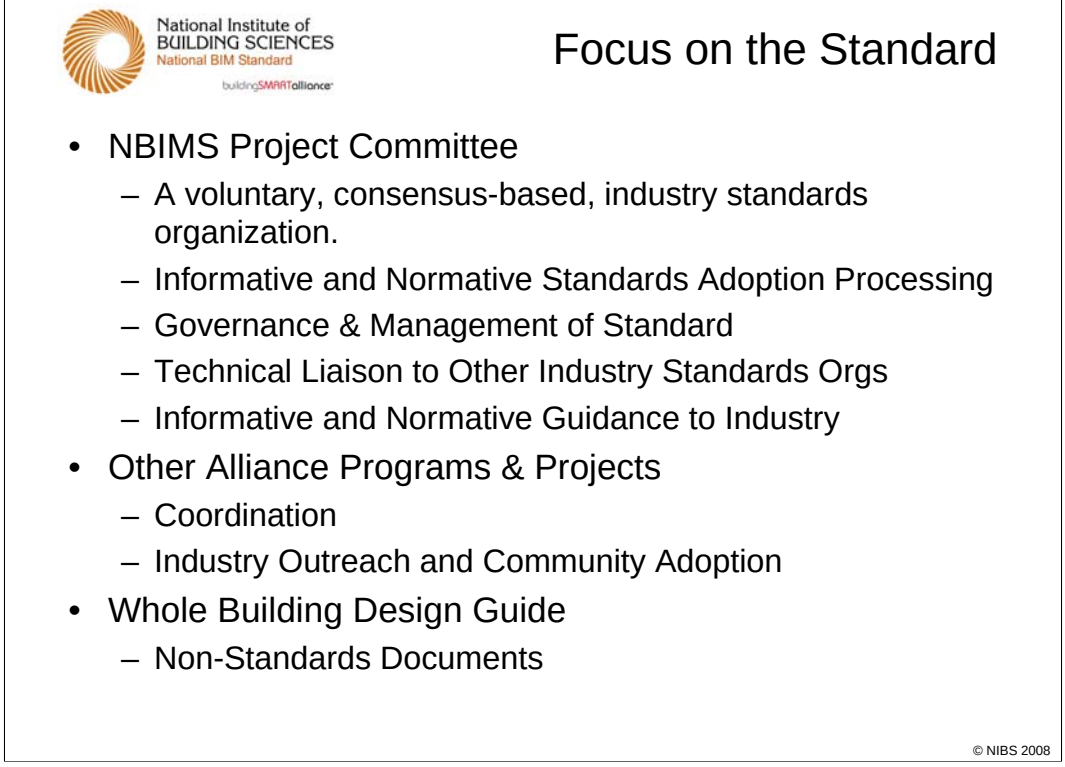
Prior to 2006 and accelerating with initiation of NBIMS, parallel development of Normative and Informative References; e.g.: IFC, UniFormat, OmniClass Tables, IFDLibrary, Exchange Standard Development Process, etc. has been occurring.

Also Business Process Improvements; e.g.: AIA Integrated Project Delivery (IPD) and BIM Progression, AGC Consensus Docs, are ongoing in the industry influenced and guided by NBIMS/Alliance committee discussions, presentations, publications and especially the personal initiative of individuals, etc.



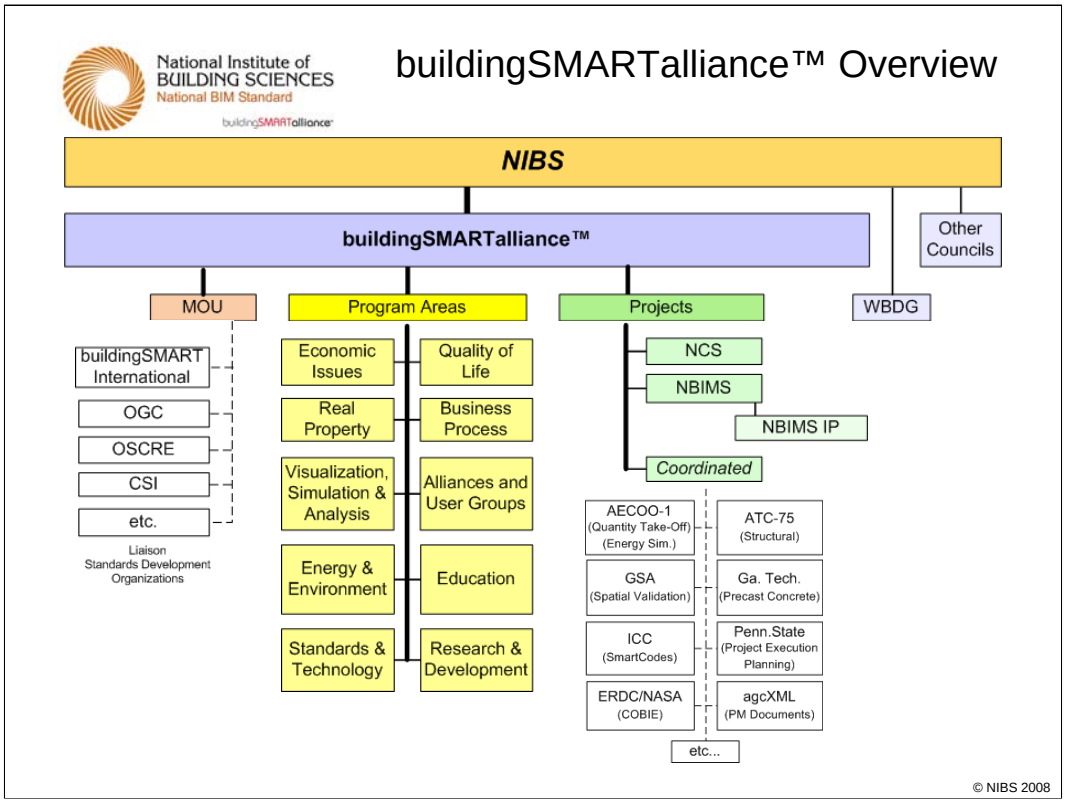
(add green graphics labeled ‘Projects’)

Since approx. Mar. 2006 parallel development has been ongoing with several Projects that will yield informative and normative standards candidates. Most are separately funded but coordinated with NBIMS outreach and proposed/developing methodologies. Interim results are being shared with NBIMS Committees but no formal standardization review will occur until the TC (see subsequent slides) is operating – approx early summer 2009.



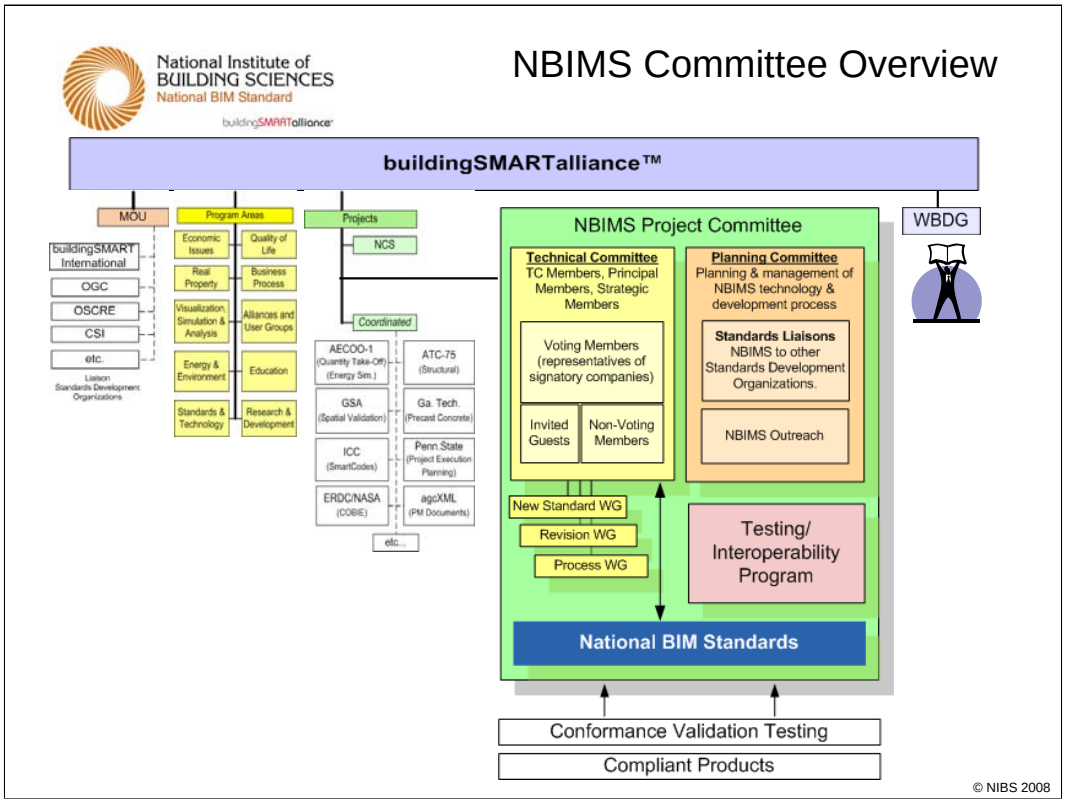
Focus of the NBIMS Project Committee turned in 2008 from general organizing and industry alignment to standing-up of formal operations for managing the Standards.

Bullets identify Separation of Concerns under the NIBS umbrella between NBIMS Specification Program, Alliance outreach and community adoption & Whole Building Design Guide (WBDG) online publication resources.



Illustrates the Unification of Governance within the Alliance for Standardization, Projects Coordination, Enrichment by Program Areas, Strategic Alliances with other Organizations, and utilization of other NIBS resources such as the Whole Building Design Guide and other NIBS Councils.

Purpose is open coordination and enrichment. Individual initiative and innovation is preserved and encouraged even as BIM standardization in the A/E/C industry is managed through the NBIM Standard Project.



Expand the NBIMS Project area of the diagram:

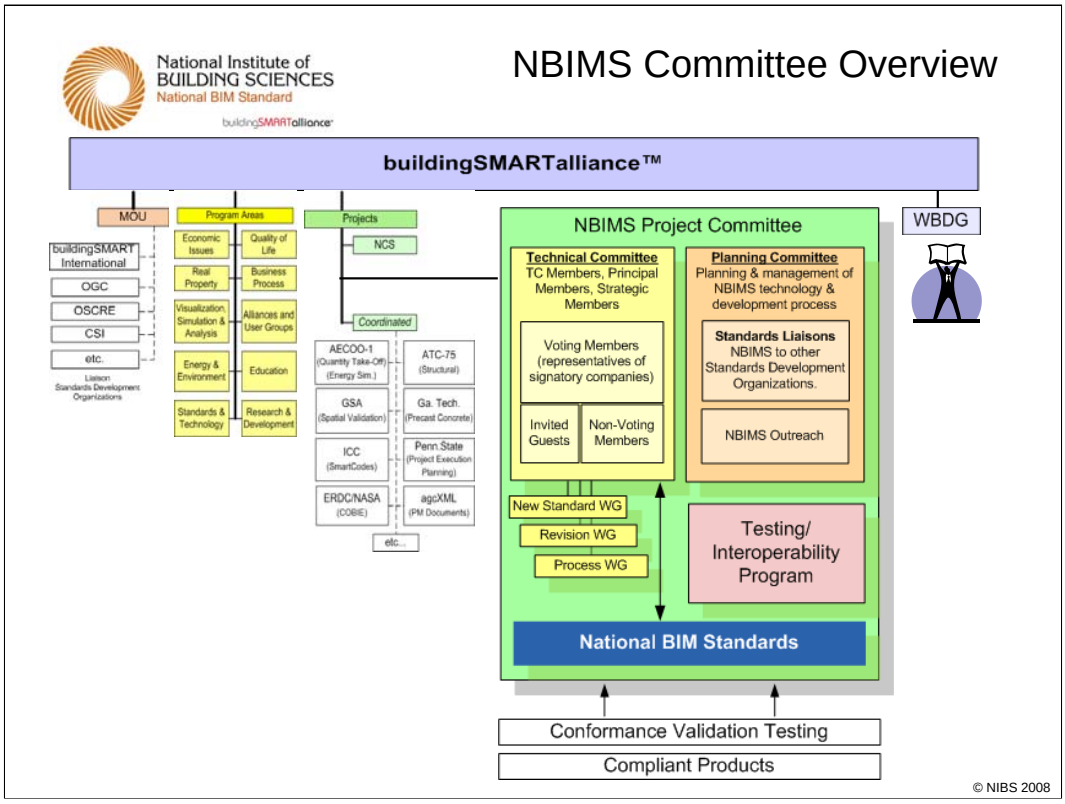
The Planning Committee (PC) provides Governance and NBIMS Liaison functions. PC includes Chair, Vice Chair, Secretary, rep from TC & IP, and Advisory Group at large.

The Technical Committee (TC) provides management of the NBIMS Standards Adoption functions including Working Groups for New, Revision and Process-type topics and the general member bodies which participate through comment and balloting activities.

The Interoperability Program (IP) is a controlled, rapid-prototyping environment for investigating, developing and demonstrating interoperability topics. IP is also where limited engineering testing is carried out to evaluate technical aspects of achieving interoperability.

National BIM Standards is the repository for approved Candidate and Accepted Standards.

(next slide speaker's notes for Task Team Transition information)



(cont.)

Task Teams Transition:

Communications Task Team (Alan Edgar) transitioned to Alliance staff

Business Process and Legal Issues Task Team (David Jordani, Howard Ashcraft) transitioned to – Alliance Program,

Scoping Task Team (Dianne Davis) transitioned to – IDM Process Working Group

Development Task Team (Bill East) transitioned to – Alliance Projects Coordination

Models & Implementation Guidance Task Team (Richard See) transitioned to each Standard & Revision-specific Workgroup and NBIMS Outreach Liasion.

Testing Task Team (Patrick Suermann) transitioned to – Interoperability Program including Testing

Granted Charter Signatories and active task team members a one year membership.

Fundamental tenants of NBIMS which are necessary to assure relevance and rapid acceptance in the Market (cont.)

> An ***organizational and standards development process*** that is inclusive and represents the disparate interests of stakeholders

ANSI Accreditable, NIBS Consensus Requirements,

Member-based; Market-driven but accessible for input, comment, and observation.

Openness is not just about a process.

Balance competing interests. Plain language, consistent and discrete directions to software companies.

Well defined Policies and Procedures.

An appeals process.

Inclusive - Vertical and horizontal voluntary consensus processes that are transparent and accountable

Relevance - AIA IPD, BIM Progression, ConsensusDocs, Authoring/Analysis applications,

Exists within a larger Official Standards Body context – ANSI, ISO, UN

Fundamental tenants of NBIMS which are necessary to assure relevance and rapid acceptance in the Market (cont.)

Without standards there can be no Interoperability.

NBIMS presents a defendable strategy and process for standards development for interoperability.

Based on…

An ***IT Architecture*** independent of platform that respects competition and market differentiation.

An ***IT Architecture*** using proven & well understood

Informatics - Defining and packaging information.

and ***IT Standards – Protocols and Physical Layer***

Fundamental tenants of NBIMS which are necessary to assure relevance and rapid acceptance in the Market (cont.)

> Utilize ***proven technical and consensus methods*** for implementation standards development that reflect market expectations for results - time to market, accuracy, completeness

Abstract Exchange Standard Development Process Working Group

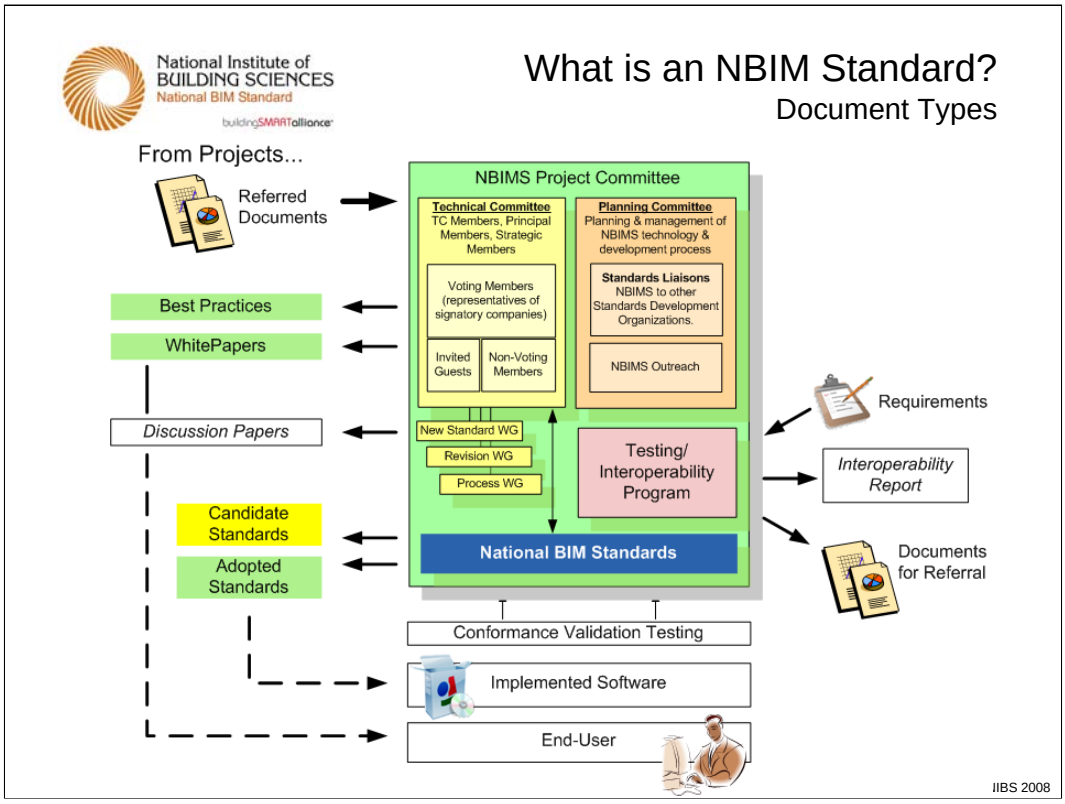
Interoperability Program

NBIMS Performance Metrics:

Making an interface a standard and publicly available **significantly increases** an information standard's usefulness and can be measured by:

> The ease with which it can be implemented.
>
> The number of times it has been implemented.
>
> The number of times those implementations are used.
>
> The ease with which those implementations interact.
>
> The number of times it has been extended through inclusion in other useful standards.

Fundamental tenants of NBIMS which are necessary to assure relevance and rapid acceptance in the Market (cont.)



The activities of the Committee

Inputs and Outputs – Dynamics of the process

Two main products:

NBIMS Abstract Specifications

NBIMS Implementation Standards

Additional products – informative documents. (see following slides for details of document types and purposes).

Green are 'official positions' of the NBIMS.

White are not 'official positions' of the NBIMS – Typically commentary.

Note that work of the TC may be 'Referred' to the IP for additional development, demonstration and/or testing. Results of the IP may be 'Referred' to the TC for standardization.

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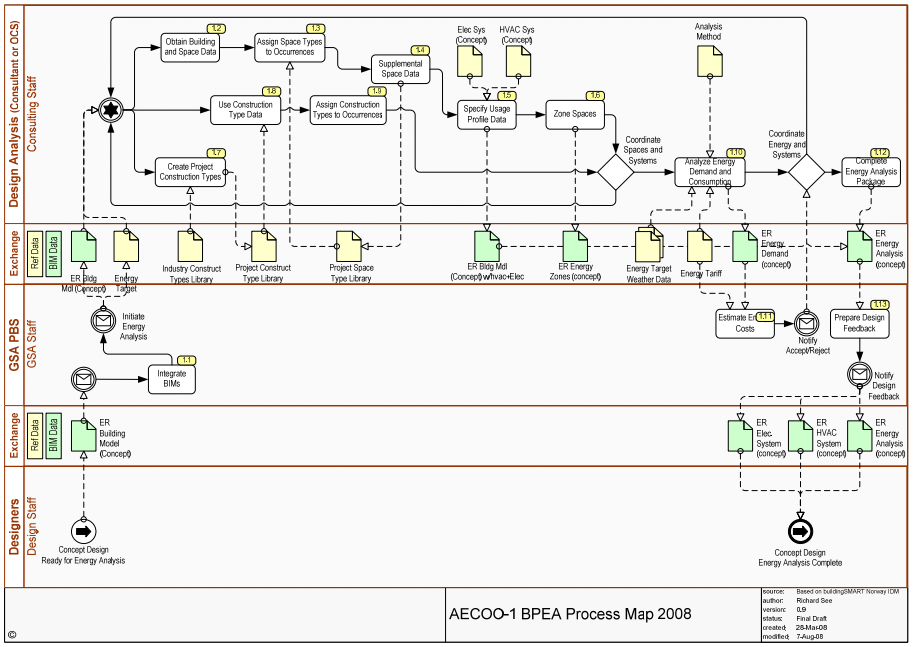
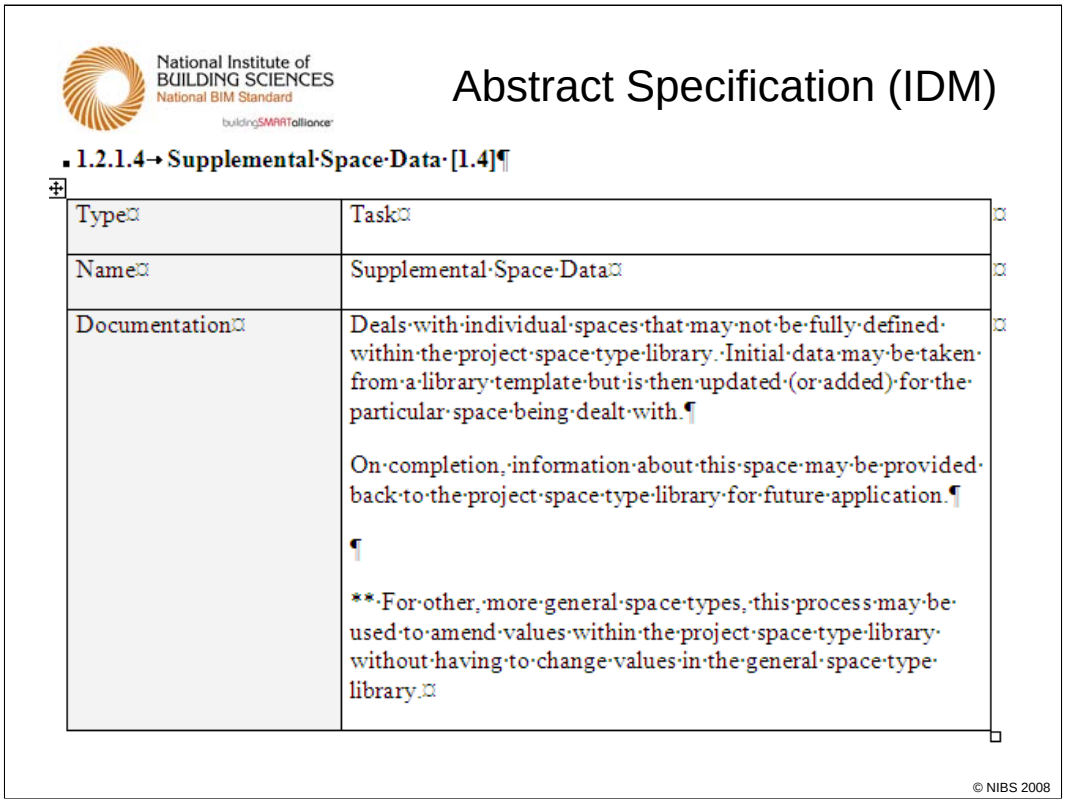
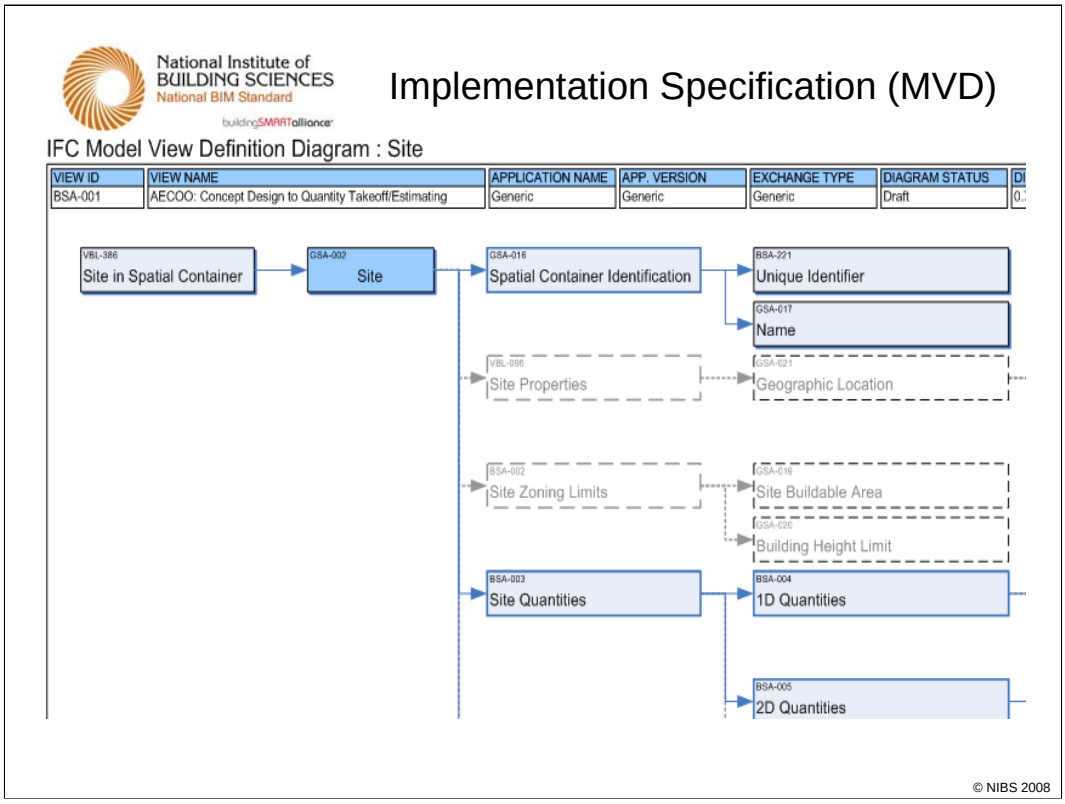
Sample IDM Process Diagram



An example of a Process Diagram created as part of the Abstract Specification (i.e.: IDM) document.



Example of a Information Delivery Manual document – a type of 'Abstract Specification'.



Example of a Model View Definition specification document – a type of ‘Implementation Specification’.

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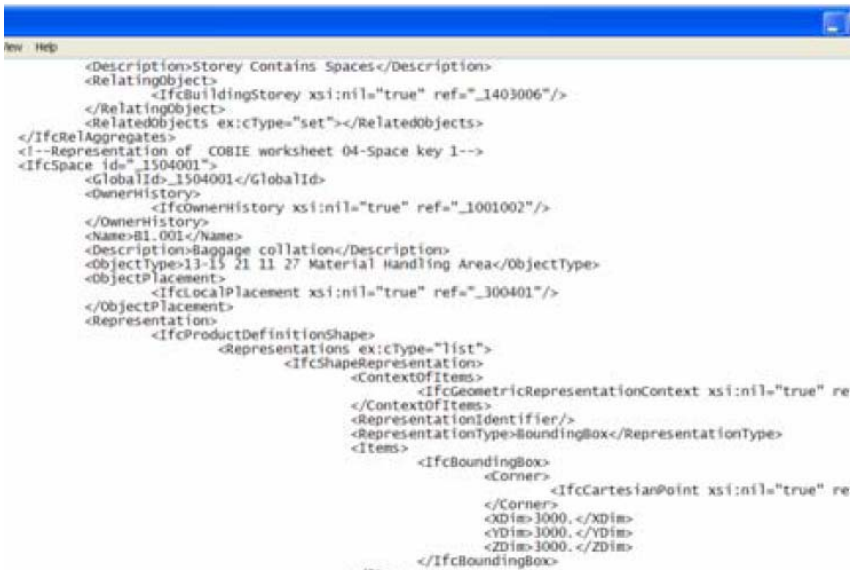
Encoding

Example is ifcXML Schema but Express is common for IFC-based exchanges.



```
lew  Help
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        <RelatedObjects ex:cType="set"></RelatedObjects>
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                                                        <ZDim>3000.</ZDim>
                                                </IfcBoundingBox>
```


Example of an Encoding-type document.

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What is a NBIM Standard?
Document Types

1. **NBIMS Adopted standards**
   - Abstract Specification (high level – informative and normative)
     - IDM – (Information Delivery Manual) Business case, Information, narratives
   - Implementation Specification (normative/atomic level definition)
     - MVD Model View Definition (*partial definition*)
       - Interface
       - Encoding
       - Profile
       - Application Schema
2. **NBIMS Candidate standard** - Adopted but not yet demonstrated and/or tested.

Types of NBIMS Documents.

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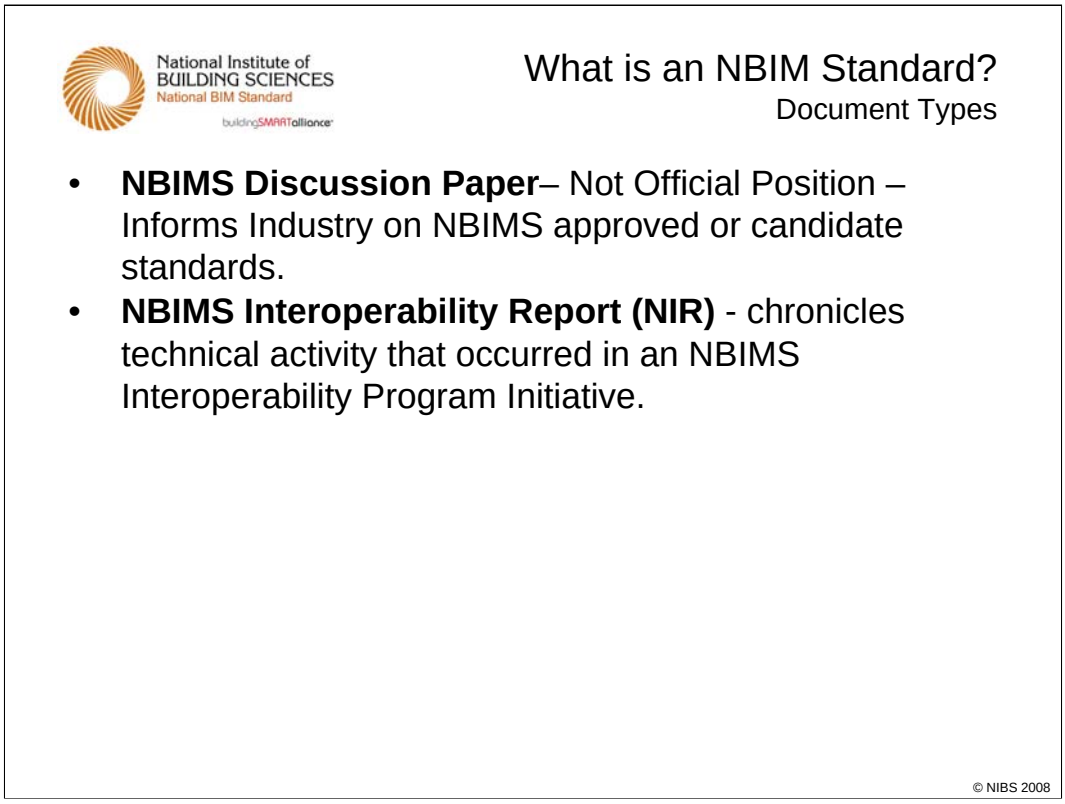
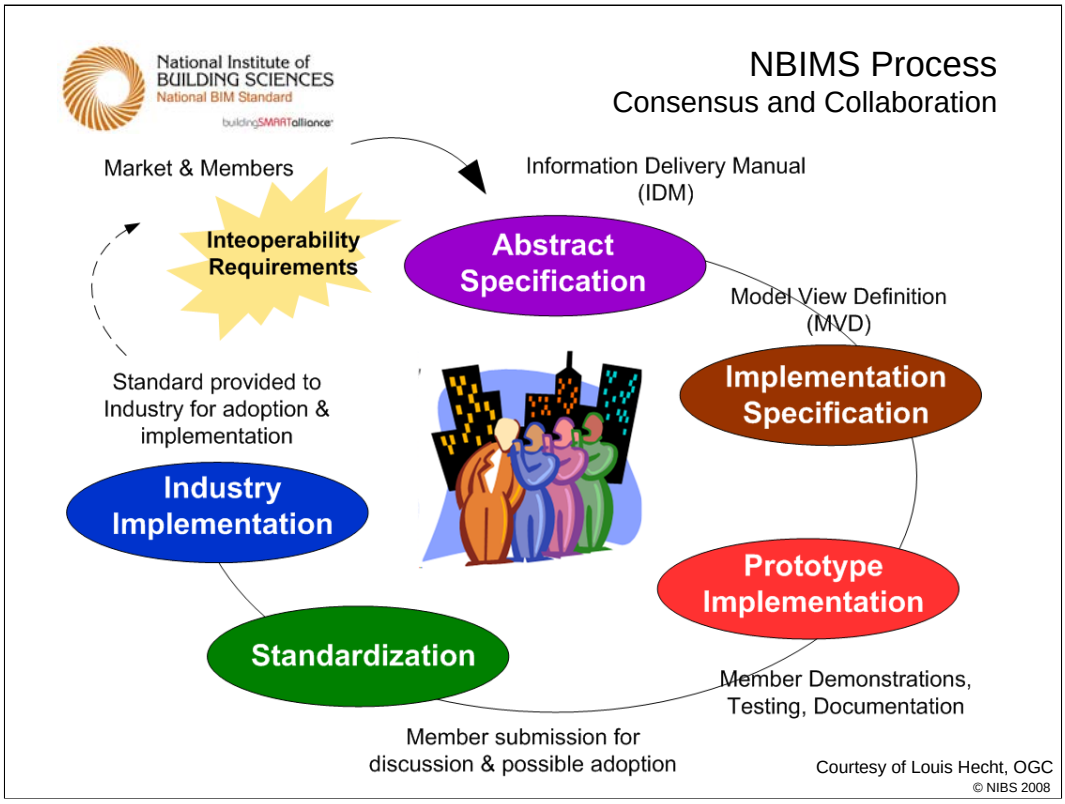
What is an NBIM Standard?
Document Types

3. **NBIMS Best Practice** – Official Position - use and/or implementation of an adopted NBIMS standard or related technology and for release to the public.
   – A best practice is a technique or methodology that, through experience and research, has proven to reliably lead to a desired result. A best practice tends to spread throughout a field or industry after a success has been demonstrated
4. **NBIMS White Paper** – Approved by Members. released by NBIMS to the Public that states a position on a social, political, technical or other subject, often including a high-level explanation an information framework about a solution.

Types of NBIMS Documents (cont.)



Types of NBIMS Documents (cont.)



Interoperability Requirements (pain points, opportunities for value creation) come from the Market and from Members.

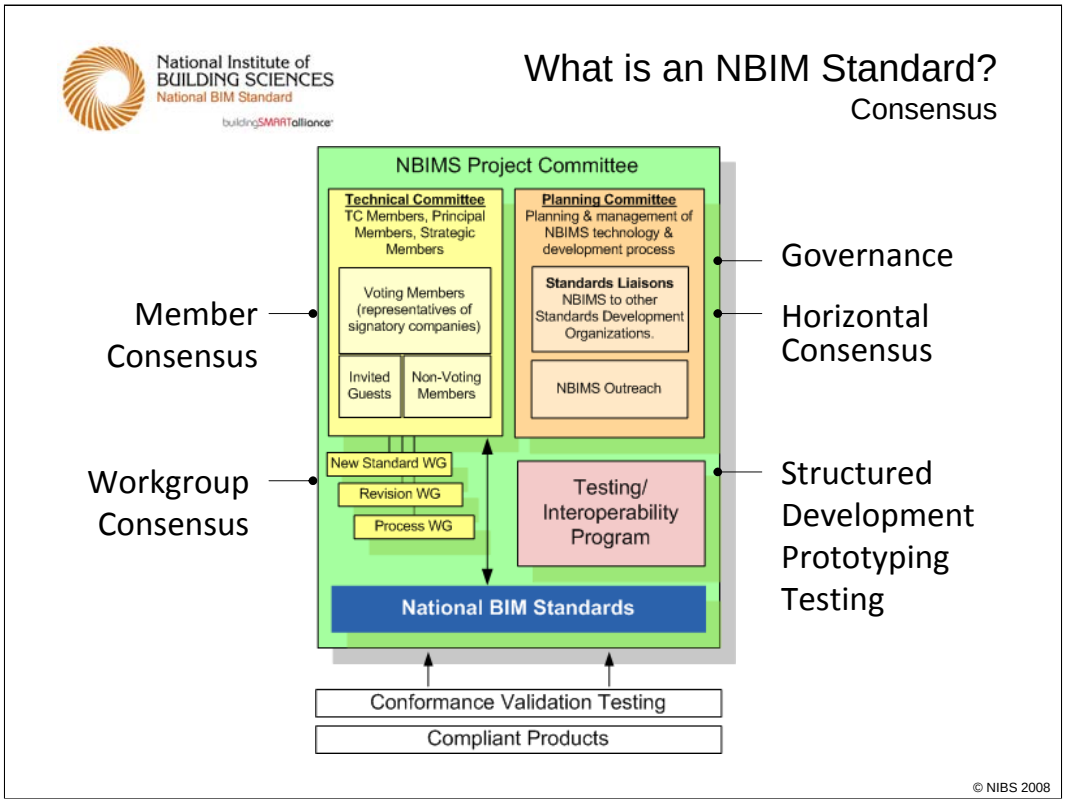
Abstract specifications involve (generally) use case & process specific to a business context, and information required to support use case.

Implementation Specification – Requirements are matched to Concepts and Data Elements in a specific Reference Model, Schema are explicitly stated.

Prototype Implementation – Demonstration Implementations using a platform-independent industry architecture are performed to validate and demonstrate usually a suite of Implementation Specifications.

Standardization – Defined document types are submitted to NBIMS for review and possible adoption. These may be released as Standards Candidates, Discussion Papers, Whitepapers, Best Practices or they may be referred to IP projects for further Development and/or Testing. This is the stage where Workgroup and Member balloting occur.

Industry Implementation – Standards Candidates and approved Standards are made available to Industry for implementation. A conformance process for testing implementations is provided. Feedback from implementers forms part of the basis for iterative revisions with subsequent ongoing Standards management activity.



Overview of Consensus

Types of consensus –

Governance – The structure of the organization, principles and policies enable and enforce consensus.

Horizontal Consensus – Representation and contributions by many, sometimes competing interests in the PC leadership and advisory enable and enforce horizontal consensus across the membership and the industry.

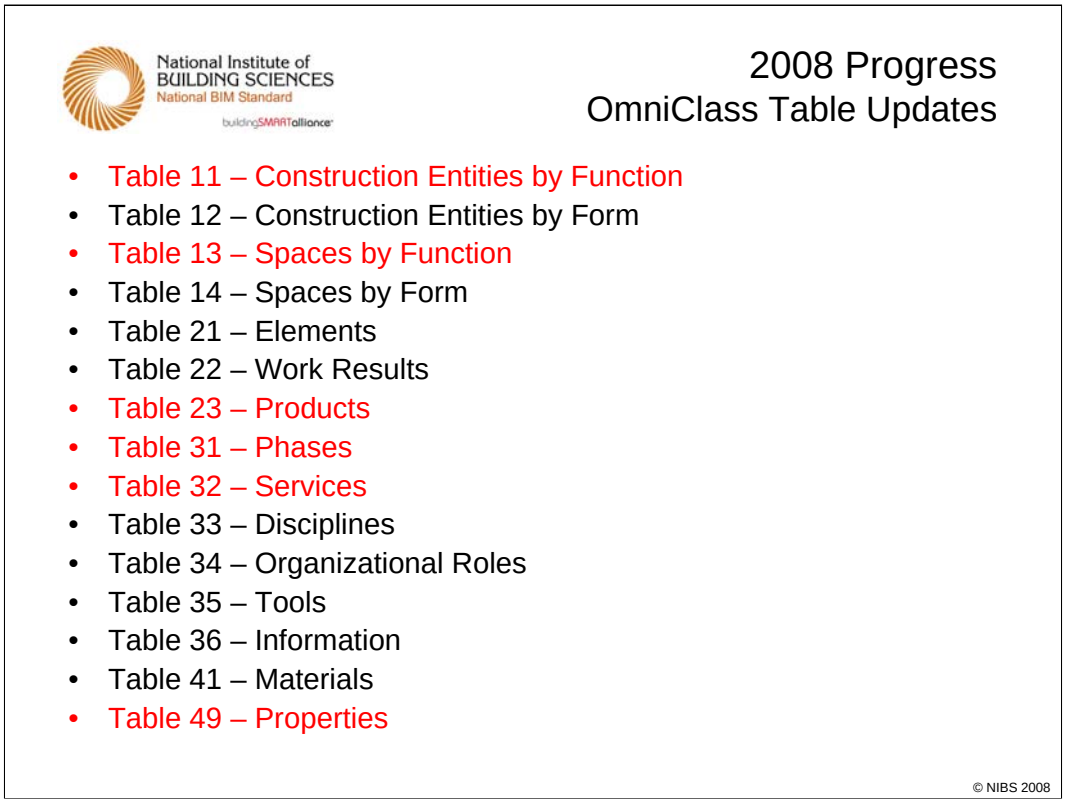
Structured Development, Prototyping & Testing – The operating policies and methods of the IP enforces rigor and consensus in rapid prototyping team-based projects, prototype demonstrations and in engineering testing.

Workgroup Consensus – Makeup, discussion and voting procedures create Vertical Consensus on documents before they are recommended to the full TC.

Member Consensus – Makeup, discussion and voting procedures create Vertical Consensus on the documents approved by the TC.

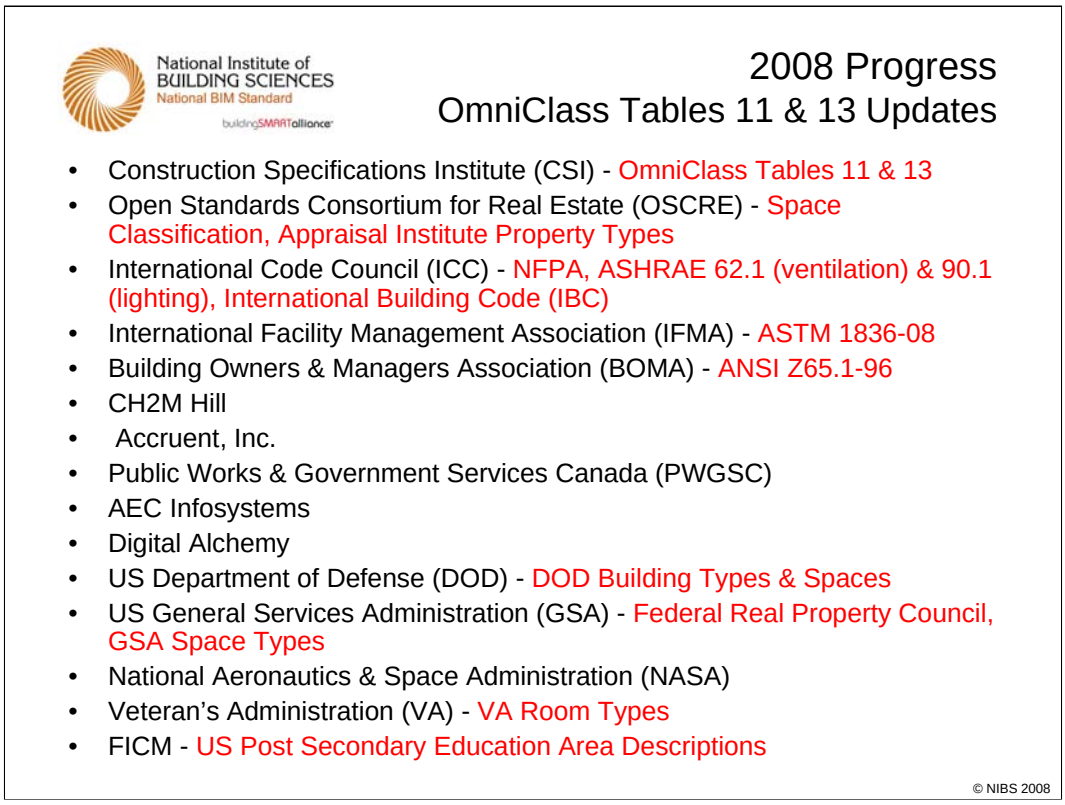
Methods of achieving consensus – Referral and review of document referred to NBIMS for consideration, process, discussion & voting.

Member and Non-member access, roles – Maintaining ‘openness’ and ‘fairness’.



Illustrates the percentage of OmniClass tables being revised.

Red = Active revisions in progress.

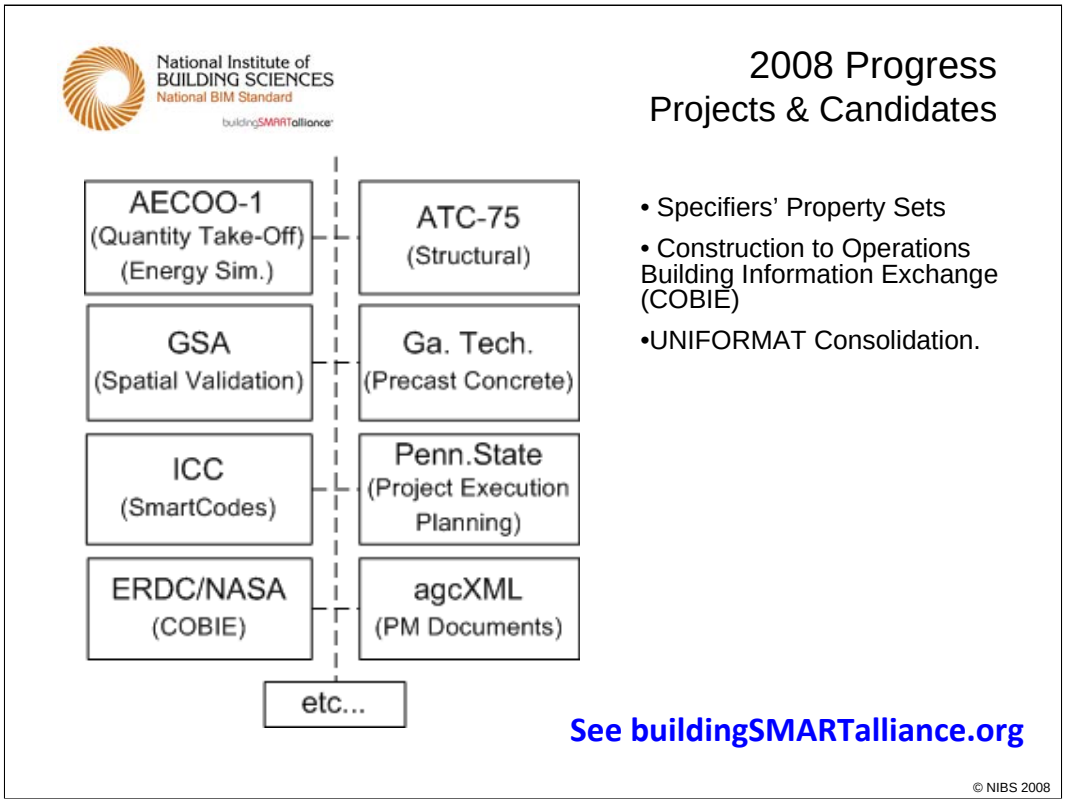


There are a lot of words on this slide - but the quantity attests to the many lists and the level of interest in the industry to harmonize the various classification lists – just for Building Types by Function and Space Types by Function.

Estimate Workgroup Draft 01 in late January 2009, and WG Final in late February 2009.

Black text = Organizations participating.

Red text = Lists under consideration.



Identifies some of the projects underway that are anticipated to generate NBIMS Candidates of various sorts.

Monitor buildingSMARTalliance Projects web pages to keep informed about updates.

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2008 Progress
NBIMS Version 1 – Part 2

- NBIMS Specification Program
- Roles and Responsibilities
- Narrative for Candidate to Standard
- Guidelines for Good NBIMS Candidates
- Technical Committee Policies and Procedures
- Workgroups – New, Update, Process / Standards, Software
- Consensus Balloting
- Publication of NBIM Standard results
- Process Infrastructure Technology
- Agreements and Interactions with Externally-Funded Project Organizations
- Agreements and interactions with Liaison Organizations
- Appendix A - Initial Candidate Submissions

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Next Steps

- Complete Operations Startup
  - Exchange Standard Development Process
  - Consensus Balloting
  - Infrastructure for Technical Committee, Interoperability Program, Standards Publications.
- Publish NBIMS Version 1 – Part 2.

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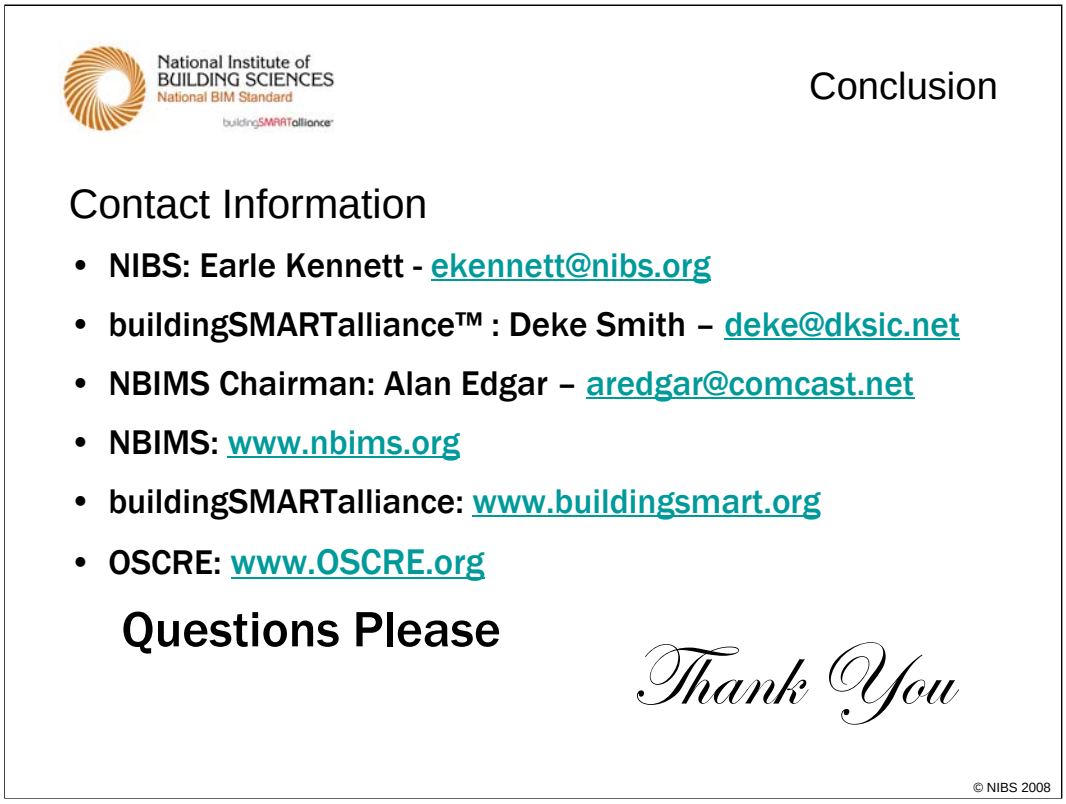
A Culture of Investment

Stage 1 (Current time) Implement integration in homogenous, proprietary teams with 'lean' aims. Gain benefits from BIM tools and methods used in project-specific scope. Pocket benefits.

Stage 2 - Same as Stage 1 but pocket most benefits and use some to fund interoperability development and industry adoption. Funds the 'hump' of early interoperability start-up.

Stage 3 - Implement interoperability across greater scope of lifecycle in heterogenous, project-specific and 'loose' federations. Gain much greater benefits from higher use of methods and software. Pocket greater benefits and continue to use a percentage of gains to fund the body of transformation.



•Here are the points of contact that you might need to get further specific information

•Any questions?

•Thank you!