BIM Standards

Where are we?  |  Where are we going?
Session Overview

In this session we will share an update on the current state of national BIM standards and what BIM standards will attempt to address in the next few years. We will also identify some of the challenges in the standards development process. Our presentation will be followed by a BIM standards leadership panel discussion on standards development now and in the future, with representatives from across the industry.

The views presented are those of the speakers and do not necessarily represent the views of Agencies/Organizations.

Speakers

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Bullock Tice Associates, Inc. is a 35-person architectural and interior design firm based in Pensacola, Florida. The practice offers services in architecture, sustainable design, strategic facility planning, programming and budgeting, space planning, interior design, and construction administration.

BTA focuses on the Southeast US in three target markets: Department of Defense, Commercial Development, and Governmental/Institutional. BTA is a member of Structured Parking Solutions (SPS); a total solution provider including design, construct, turnkey, lease back, and operate.

The firm is also a leader of BIM implementation in its region and markets.
Creating **innovative** research contributions focused on information technology and process transformation; Serving the **community**; and Developing future **leaders**.

The Computer Integrated Construction (CIC) Research Group was formed at Penn State in the late 1980s. Through the years, our research has continued to expand with more people, and more diverse topic areas such as visualization, project delivery methods, energy efficiency, virtual and augmented reality, automation and robotics, educational gaming, lean construction and many others. While we continue to explore new topics, we always maintain a focus on process improvement, and how technology can be leveraged to achieve improved project and professional outcomes. We are very proud of our research accomplishments through the years, but we take even greater pride in the many students who have graduated from Penn State and are making an impact in the Construction Industry.

[cic.psu.edu](http://cic.psu.edu)
Perspectives

AEC Practitioner
Small Business
BIM SME/Consult.
Regional Trainer

USACE/Industry BIM and CIM Consortia
buildingSMART alliance
National BIM Standard

Academia
Owner Perspective
Construction
International Research

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# Agenda

### Where are we?
- Problem Statement
- Standards Overview
- What’s Available Now

### Where are we going?
- Proposed Solution
- Background Goal
- BIG ideas
- Current Status
- Future Direction

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**Leadership Panel**

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**Practitioner Note:**
Throughout this presentation you will see notes that emphasize the relevance of a given topic to the practitioner.
BIM Standards: Where are we?
Problem Statement

Many Good Implementation Examples...

Several Good BIM Requirements...

**Little Consistency of Requirements which yields varied results**

*The nice thing about standards is that you have so many to choose from.*

- Andrew S. Tanenbaum, Computer Networks

Practitioner Note:

Variation is expensive and confusing

We just need to know where to start and what applies to the current project
What is appropriate BIM Contract Language?

Practitioner Note:
Those who are writing project requirements may not understand how to leverage the standards

Provide BIM per NBIMS-US™ Version 3
Provide Level 2 BIM
What is a Standard?

ISO Standards

What is a standard?
A standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose. We published over 21000 International Standards that can be purchased from the ISO store or from our members.

What are the benefits of ISO International Standards?
ISO International Standards ensure that products and services are safe, reliable and of good quality. For business, they are strategic tools that reduce costs by minimizing waste and errors, and increasing productivity. They help companies to access new markets, level the playing field for developing countries and facilitate free and fair global trade.

Learn more about the benefits of ISO standards

ISO standards in action
We also have information about how ISO standards work in the real world. For example, ISO Standards in action: Water explains how ISO standards help solve the global water challenge.

Learn more about ISO standards in action

Practitioner Note:
Why do I care?

Efficiency
Integration
Innovation

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Who Develops Standards

buildingSMART Alliance, a council within the National Institute for Building Sciences

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BuildingSMART International

International Standards Organization (ISO)

UK British Standards Organization

Practitioner Note:
These are some of the organizations I should become involved with if I want to help steer the development of standards.
Standards Example - Industry Foundation Class (IFC)

Practitioner Note:

These type of standards are what enables my data to be accessible by others and vice versa.

IFC – Levels of Maturity

- **IFC1 & IFC2**: First trials to move
- **IFC2x**: Learning to play
- **IFC2x3**: First trials to stand up
- **IFC4**: Looking ahead to a bright future
- **IFC5**: Growing up (includes infra)
- **IFC6 & beyond**: The peak of openBIM (all in place)
- **Unknown**: A new paradigm arrives. OpenBIM will have to give way to the next generation schema.

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What’s Available Now? NBIMS-US

**Standard**
- National CAD Standard
- Information Exchanges
  - COBie
  - Spatial Program Validation
  - Energy Analysis
  - Quantity Takeoff
- Referenced Standards
  - LOD Specification
  - IFC
  - Omniclass

**Guideline**
- BIM Project Execution Planning Guide
- BIM Planning Guide for Facility Owners
- MEP Coordination
- The Uses of BIM

**Implementation**
- Practical BIM Contract Documents
- Minimum BIM

**Commentary**
- Scope (Version 3)
- Methodology (V 1, Part 1)
- Terms and Definitions

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BIM Standards: Where are we going?
Time for a New Approach

Insanity: doing the same thing over and over again and expecting different results.

- Albert Einstein
NBIMS-US Goal

Create a collection of Standards and Guidelines that support the implementation of Building Information Modeling in Planning, Design, Construction, and Operations of buildings and infrastructure in the US and beyond.

Collection of Standards & Guidelines
What’s the BIG Idea? Agile Development

Before: Primarily consumed external content

After: Existing and New Content

Content Origin
- Original
- Collaborative
- External
What’s the BIG Idea? Agile Development

Before
• Very Linear
• Long revision cycle
• Constricted output

After
• Continuous Development
• Short revision cycle
• Expanded output
NBIMS-US™ Current Status

- Planning Committee (PLC) formed (15 members)
- Working Groups (WG) identified and forming (8-10 members each)
  - Core BIM Requirements
  - BIM Uses
  - BIM Project Execution Planning
  - Modeling Requirements
  - Information Exchanges
- Project Committee (PC) initiated

Practitioner Note: @fortunejohnny @cic_pennstate
Where are we going?

National CAD Standard
OmniClass Standard
LOD Specification Standard
IFC Standard
COBie Standard
Information Exchanges Standard
CORE BIM Requirements Standard
Terms & Definitions Standard
NBGO Guideline
Project Execution Planning Guideline
BIM Uses Guideline
Planning Guide for Facility Owners Guideline
Practical BIM Contract Requirements Guideline
REFERENCE
STANDARDS
GUIDELINES

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Where are we going? Modular Approach

**Modules Include:**
- Core BIM Requirements
- BIM Use Definitions
- BIM Project Execution Planning
- Modeling Requirements (e.g., LOD)
- Information Exchanges (e.g., COBie)

Establish a baseline for minimum BIM requirements with opportunity for project specific customization

Core BIM Requirements

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Challenges

• Resolve conflicts/discontinuity in current standard
• Identify content to retire
• Harness volunteer time and efforts
• Coalesce efforts between organizations
• Manage overall quality

Practitioner Note:
My involvement is mutually beneficial. I can help develop the standards as well as glean from them.
USACE/Industry BIM and CIM Consortium

Representatives

**USACE** – BIM/CIM managers, Designers and Researchers

**Industry** – Architects, Engineers, Constructors, Service Providers, Academia, Legal

**Motto**

Develop processes and deliverables that are\n**fair, reasonable, and practical** to all project stakeholders.
USACE/Industry BIM and CIM Consortia

• A new Initiative in development...

Model-Based Design Review

Practitioner Note:
Show me the Model!

The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation.
Practitioner Note:
Industry and Federal Agency collaboration means well-developed common BIM Requirements
Collaboration

What we are hearing from BIM/VDC professionals in Government Agencies...

- Willingly to adopt national standards that meet agency needs
- Will invest in solutions that address common BIM requirements across multiple agencies
- Not interested in developing/maintaining isolated and custom agency standards

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Thank You!

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Practitioner Note:  
We need your support!

www.nibs.org/bsa  
www.bim.psu.edu
BIM Standards Leadership Panel