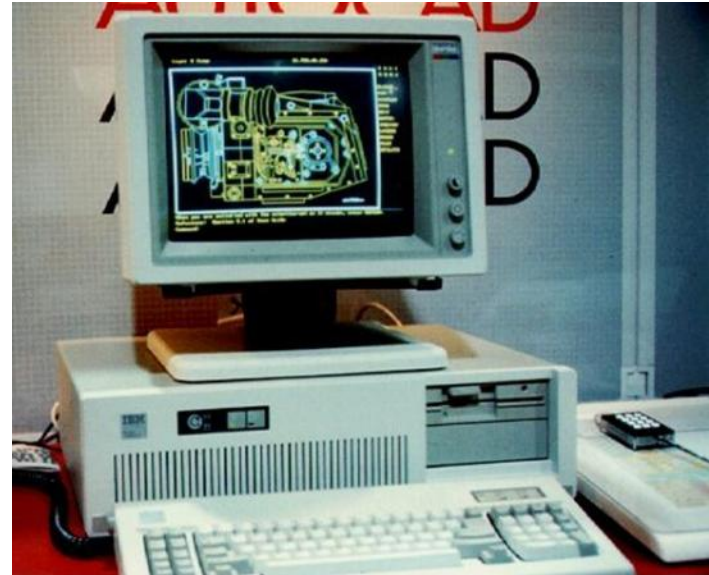
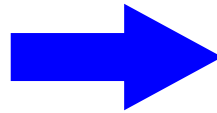
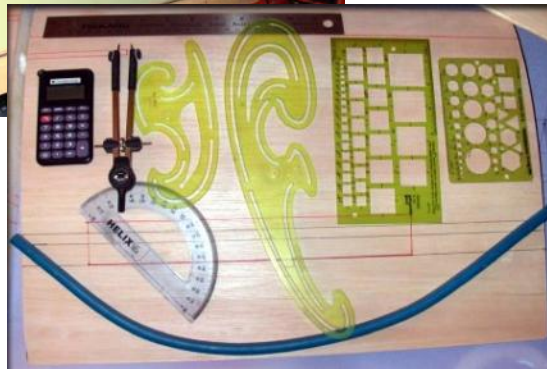


coordination view information exchange (cvie)

E. William East, PE, PhD
buildingSMART Alliance Project Coordinator

state of practice



CAD(D) didn't happen overnight...

- 1982 first version AutoCAD
- 1985 first version MicroStation
- 1990 Intergraph, Bentley, and Autodesk sales nearing \$100m

(ref: Hooghouse, Jeff (2008) SAME Joint Engineer Training Conference, Minneapolis, MN)

state of practice

Architects

“have gone from just exploring (BIM) to using it on a majority of their projects – a tipping point liked reached.”

Engineers

“½ of engineers using BIM are using it for interference detection.”

Contractors

“expected to reach a tipping point in 2009”

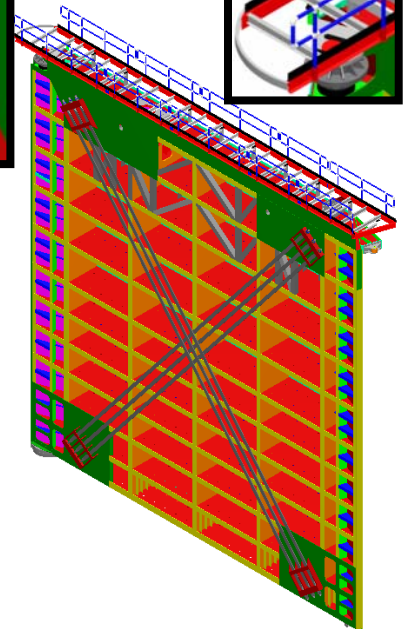
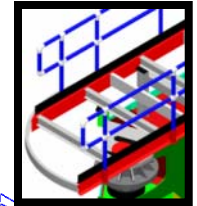
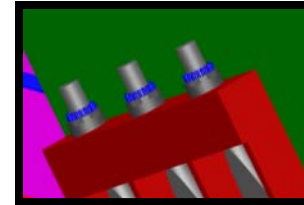


(ref: McGraww-Hill (2007) “Smart Market Report on BIM”

for civil structures as well



Pump Station (ref: USACE, Vicksburg District)



Mitre Gate (ref: USACE, Huntsville District)



Howard Hansen Fish Passage Facility (ref: USACE)

practical improvements?

Initial use of BIM results in:

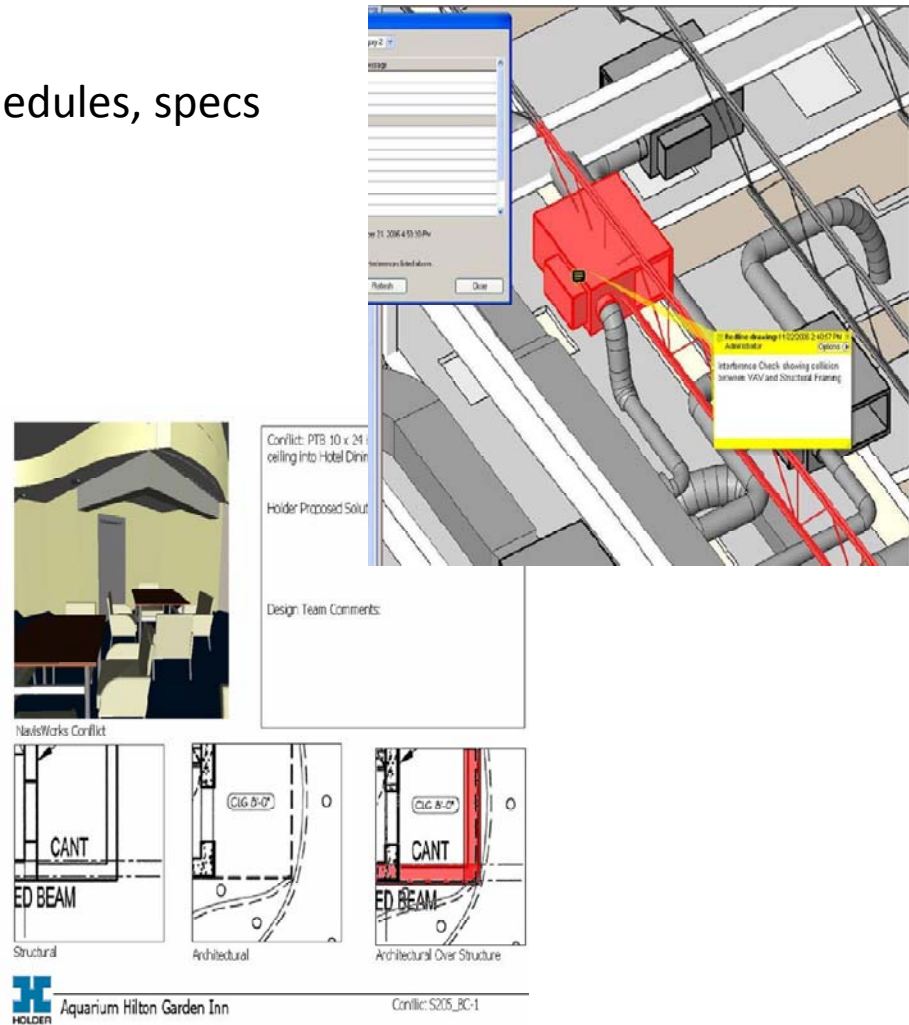
“better coordination of documents, schedules, specs
- less errors/change orders”

(ref: Pete Moriarty, IAI TAP presentation Feb-2008)

Project team:

- “identified 590 conflicts
- issues resolved prior to installation
- additional cost avoided
- enabled owner scope revisions”

(ref: Michael Kenig, IAI TAP presentation Feb-2008)



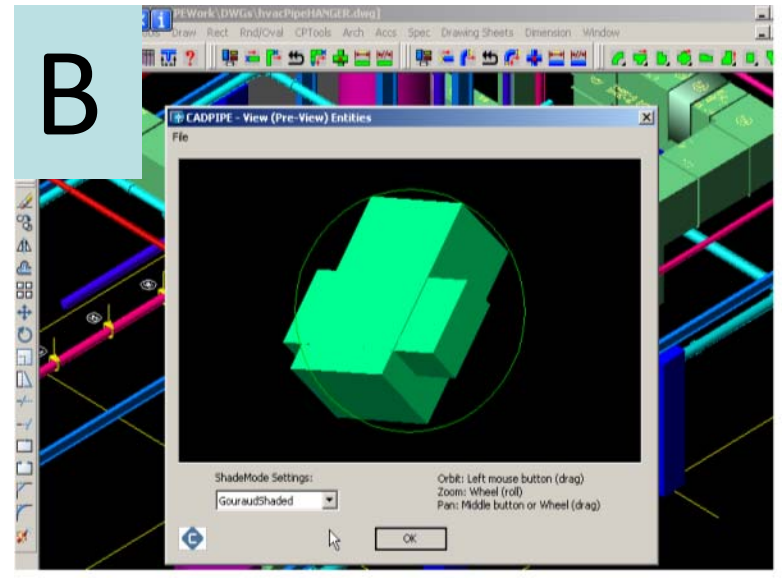
just like getting a new pair of glasses...

which is better?



A

or



B

(ref: http://www.cfa.ilstu.edu/normal_editions/bramson_drawing.jpg)

(ref: <http://www.cadpipe.com/hvac/hvacColChk.html>)

measurable goals?

AIA
The Cornerstone
The Voice of Public Architects

Architects as Community Builders | [Print this page](#) | [Email this page](#) | Fall 2007

BIM: Transforming a Traditional Practice Model into a Technology-Enabled Integrated Practice Model
By H. Thomas McDuffie, AIA, RIBA

Like most design firms, we are continually driven by our clients' need for faster delivery and lower cost. And like most design firms, we continually strive for design excellence, increased production efficiencies and opportunities to provide added value for our clients. However, unlike most design firms, our business model includes not only architectural and engineering services, but also design-build, construction management, and facility O&M services. And it is these additional services that prompted us to look for ways to leverage BIM not just as a tool for design, but as an integral part of the entire project development life-cycle.

As we looked at our use of the traditional linear design process, two opportunities for improvement became evident. First is accelerated decision-making. Early decisions based on good data save time and money. Second, is to create a more collaborative concurrent process. Removing the stops and starts inherent in the linear model results in improved coordination. Individual phase activities are pulled forward into the "big picture" context. This not only increases interaction between disciplines, but importantly provides added opportunities for front-end involvement by stakeholders.

Increased stakeholder involvement, particularly during early project activities, significantly enhances the ability to fully identify and address owner objectives and expectations, benefiting quality and functionality.

We were an early user of BIM tools and frequently applied BIM during the initial project phase efforts. However, while BIM was adding a visual dimension to our early architectural phases, it was not providing schedule compression nor was it significantly improving overall work efficiencies. We needed a solution that supported an integrated big picture...a solution that optimizes the use of BIM across all disciplines and activities from planning through design, construction, and occupancy.

Initial Actions
With this challenge in mind, we took three key actions.

- 1. Got informed.** We asked hard questions of staff, vendors, and industry. How was BIM affecting quality control activities? How was it impacting schedule? What cost benefits were gained? What added value was provided to clients? While pockets of innovation and success were found, we concluded that the full value of BIM was not being realized. What was needed were new work processes that engaged BIM not only in visualization of design interferences, but also in understanding impacts of design decisions on construction, commissioning, close-out, and operation and maintenance activities.
- 2. Commissioned a task force.** This group was given a mandate to identify procedural changes needed to maximize the value of BIM within and across each phase of work. To facilitate this

In This Issue

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- > The Public Architects Committee Holds Its 2007 Training Workshop
- > The 2008 Public Architect Action Plan Makes Progress

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“to **eliminate all** construction-related change orders due to design-related coordination issues.

Responding to our client focus, the metric quickly grew into the **elimination of all** client-generated review comments related to design coordination issues.

It next progressed to the **elimination of all** internal quality control review comments related to design coordination issues.”

(ref: McDuffie, Thomas (2007) "BIM: Transforming a Traditional Practice Model into a Technology-Enabled Integrated Practice Model," The Cornerstone, American Institute of Architects, Fall 2007.

public owner goals...

The point of view of the public owner is determined by law...

Federal Acquisition Regulation, includes a special section for architect/engineer contracting services.

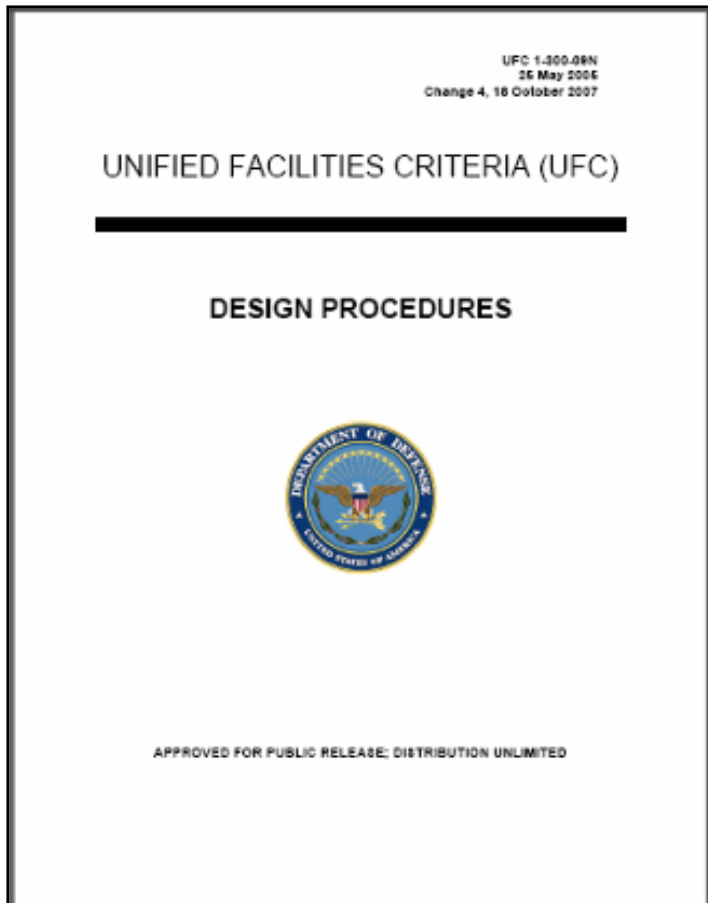
SubChapter F, Subpart 36.607. “Liability for Government costs resulting from design errors or deficiencies.”

This special responsibility is a primary reason that the government is able to have negotiated professional services contracts.

“Architect-engineer contractors shall be responsible for the professional quality, technical accuracy, and coordination of all services required under their contracts”

(ref: http://www.arnet.gov/far/current/html/Subpart%2036_6.html#wp1075548)

... a department's policy



“The DQC Manager has the responsibility for being cognizant of and assuring that all design documents on the project have been developed in accordance with the RFP, and have been properly coordinated.”

“design quality control” plans are requirements on a/e contracts for all federal government contracts.

QC Plans are unenforceable since there is no objective measure of designer quality management until now...

how does one verify quality?

demonstrate conformance with specified standard

“The Coordination View targets the coordination between the architectural, mechanical and structural engineering tasks during the design phase.

It has been the first view definition developed by the IAI and is currently the most implemented view of the IFC schema.”

(ref: www.iai-tech.org)

can it be used?

Product	Company	Restriction	Date
ACTIVE3d	ARCHIMEN Group	Import only	13-03-07
ALLPLAN 2006.2	Nemetschek		13-03-07
ArchiCAD 11	Graphisoft		13-03-07
AutoCAD Architecture 2008 SP1	Autodesk		13-03-07
Bentley Architecture 8.9.3	Bentley Systems		13-03-07
DDS-CAD 6.4	DDS		13-03-07
Facility Online	Vizelia	Import only	22-05-07
MagiCAD	Progman	Export only	22-05-07
ESA-PT	SCIA		25-02-08
Revit Building 2008 SP1	Autodesk		13-03-07
Solibri Model Checker	Solibri	Import only	13-03-07
TEKLA Structures	TEKLA Corporation		13-03-07

http://www.ifcwiki.org/index.php/IFC_Certified_Software

can it be used?

Product	Company	Restriction	Date
CADS Planner Electric Pro and Hepac Pro	Kymdata Oy	Export only	08-10-07
EliteCAD Architecture 11 SP1	Messerli Informatik GmbH		25-02-08
IFC für Oracle CADView-3D	NorConsult	Import only	21-05-07
ESA-PT	SCIA		21-05-07
VectorWorks	Nemetschek NA		21-05-07

http://www.ifcwiki.org/index.php/IFC_Certified_Software

please help reduce collisions ...



... leading to unneeded changes



coordination view information exchange (cvie)

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