

Minutes on FACADE Advisory Board Meeting

The FACADE Advisory Board held its first of two annual meetings at MIT on September 17 and 18, 2007.

This document provides the "minutes" as a set of *summaries to key topics*.

(There is also a fuller "Notes" document for an *approximate* transcript of the two-day meeting.)

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Attendees

Advisory Board

Bill Mitchell (chair)
Alonzo Addison
Howard Burns
Kristine Fallon
Bill Regli
Dennis Shelden

FACADE Project Team

MacKenzie Smith
Ann Whiteside
Larry Stone
William Reilly
Simon Kim

<http://facade.mit.edu>

Target Audience

We reversed one key assumption, by deciding to place architecture practitioners of today as our first target audience, vs. our assumed primary audience(s) of future instructors of architecture, and future architectural historians. We expect these to benefit subsequently from the work done for the practitioner domain now.

First – practitioners

This is broadly defined, including preservation/heritage as well as practicing architects.

Rationale for this choice of working with practitioners first includes:

- We have access to them today (vs. historians, instructors of future)
- They have problems, data, motivation
- New practices will benefit archives at practitioners' firms

Second – instructors

Use Cases to justify archiving effort for this audience include:

- energy analysis of existing building
- structural analysis of building (finite element mesh)
- building representations (library of 3D models)
- relating images and animations to 3D model
- teaching building process (model plus)

Third – researchers

- In theory our ultimate primary clientele, but no access and no use cases today.
- Organizing project collections usefully should benefit

Data Sources

We expanded the range of potential dataset sources from the original plan to work only with newly constructed buildings, to now embrace the 3D CAD model use found in activity on heritage and preservation projects.

Design projects (from scratch)

- E.g. Frank Gehry (Stata Center), Moshe Safdie Associates (Institute of Peace, Wash. DC (forthcoming))
- Can also include survey data (e.g. for building context)

Heritage projects (already existing)

- Survey organizations for conservation projects (multiple parties hold pieces of the collection)

Historical reconstructions (no longer existing)

- E.g. World Trade Center

Focus on the first for now

We acknowledge these other new source types, but will continue to primarily focus on the new design projects. (One key exception (pending): a major renovation project in the heart of the historic center of Pisa, Italy. More information forthcoming.)

Metadata and Search

High-level description for the Project Information Model (PIM)

For the building overall (i.e. the collection of assets that constitute the entire building project), we propose the use of some 7-10 Dublin Core-like descriptive fields (see Gaudi guidelines)

- Who, when, where, how, what [type, style, size (footage), cost range]

Possible descriptive metadata on select objects

We will explore the feasibility of finding candidate objects, modules, within the overall PIM that may merit application of metadata. For example the set of client deliverable presentations ("issuances") may be such a type.

Provenance – define scholarly standards

It was noted the importance of ensuring the capture of scholarly, authoritative information for documentation and citation for CAD models (i.e. not open, wikipedia-like unattributed data).

Support user-supplied tags and machine-derived tags (e.g. popularity)

Search collection-level description; other possible descriptors are geometric constraints or function composition.

- OMNICLASS & AAT, AIA for classification
- Master Format = older format in common use (subsumed by OMNICLASS)
- Look at standards for architectural slides (e.g. CDWA).
- Richer for collections part when possible, e.g. for output files or CAD models (model type, 2D v 3D, CATIA v Revit)
- High-level should also include square footage, cost, GSA-type required data
- Search by location (i.e. via gazetteer or geographic coordinates).
- Should be able to personalize to add additional fields for indexing...

Unit of retrieval is the project (PIM).

Search results should return something useful to depict that project overall – site plan, view, 5-10 facets, etc.

Model Interactivity

What do we anticipate will be the ways in which CAD models would be useful in terms of interaction? (beyond simply viewing or manipulating (turning) in a viewer)

Modify, analyze, report from the model

Practitioners (and future instructors) want to be able to change the model, to perform analysis upon it, and get reports from the model.

Native parametric model

Not particularly interesting... doesn't equal design intent, no one's asking to reuse it. Can re-parameterize in different tool for later uses. Keep native parametric model "just in case". Possibly under emulation the native model and its parametric information may be of interest to architectural historians.

CAD Models - archiving and preservation formats

We devised a strategy for archiving the CAD models in various formats to meet various needs.

Keep native files (DWG, CATmodel, etc.)***Export to neutral geometry file***

- IFC preferred – coordination model view?
- STEP (geometry AP203), IGES if no STEP

Generate mesh file (PDF/E or VRML) for viewing***Convert 2D into PDF/A******Think about PDF/E + U3D as archival master format...*****Intellectual Property**

One deliverable from the FACADE project that has received increased emphasis seeks to create useful language to obtain permissions to archive and make publicly available some portion of the data from each building project.

Embargos inevitable

Watermark of CAD model, other significant content...

Provide read-only (e.g. PDF/E) version for public access

License project data for various types of use

Research use, permanent access? Public access?

This is a work-in-progress for the first two datasets on the FACADE project.

Deliverables

Guidelines for architectural firms

What they should keep, in what formats (i.e. IFC)

Software for other libraries/archives, building on the DSpace platform

New DSpace code for ingest, management, and preservation of CAD models and related files in the PIM. Likely to also include software outside DSpace, used to package up building project datasets for submission to DSpace.

Use cases for teaching

Provide a vision to help justify why you would archive digital design data

Metadata recommendations for PIM, individual files

Guided by use cases and search requirements, establish best practices for cataloging PIMs overall, and explore feasibility of applying descriptive metadata to some subset of individual files. Recommendations also on technical metadata for all individual files.

PIM ontology (BIM, documentation)

Perhaps to employ Semantic Web technologies, develop an ontology for a Project Information Model (embracing both the BIM (Building Information Model) and all other available related content). Apply this ontology to the various project datasets to arrive at a "relationship map" or PIM for each building project.

UI for search, navigation through PIM

- Generic central starting point... IFC model or output files... let user decide where to start (because content is unpredictable)
- Include view of georeferenced models on a map

Remaining Questions

What data to keep? Which project files?

3D, 2D, outputs, communication, but what about for example the steel detailing neutral file?

What else is missing from our inventory? (e.g. contractor's data?)

New Category: Available inputs (e.g., client brief, survey data)

What format(s) to keep?

IFC model (when possible), using the "coordination model view" (or other model view); or STEP; the native model; VRML or PDF/E; PDF/A for 2D and outputs (other standard formats); and the usual text formats for communications.

What relationships (ontology) – need to define this

What metadata – 7-10 fields plus rich item-level metadata

- Use cases from design firms for searching?

How to manage and preserve – file format migration? emulation?

How to deliver to users – define use cases for using digital archives (e.g. by practitioners)

- Structure around the drawings, relationships to 3D model
- Full-text indexing of communication data
- Presentation outputs – need individual tagging as “issued” or “non-issued”

Where is the design/building process here? i.e. the BIM

- If not available, don't worry about the final as-built... acceptable to use the last submission. (Facilities would have final plans.)
- Add to PIM ontology as a place-holder

What other projects?

Discussed ideas ranged from residences to large office buildings to "wet lab" science buildings to entire cultural heritage projects.

Note that the Pisa project listed below is currently under careful consideration as to becoming the third FACADE project dataset.

- Pisa reconstruction project (Chipperfield) (competition – brief, survey data, designs)
- Kieran Timberlake Loblolly house in Delaware (Revit)

- SOM office tower (3D AutoCAD) [Gensler as alternative to SOM]
- Ellensweig cancer center @MIT – lab building
- FOG/A Arena building in Brooklyn (CATIA)
- Tom Mayne's Cooper Union building (Microstation)