

ASCE TCCITP
DATABASE AND INFORMATION MANAGEMENT (DIM) COMMITTEE
MINUTES OF COMMITTEE MEETING

July 12, 1998, Washington D.C.

ATTENDEES (3)

Francois Grobler (FG), USA CERL, <f-grobler@cecer.army.mil> (Chair)
Thomas Froese (TF), University of British Columbia, <tfroese@civil.ubc.ca> (Secretary)

Tomasz Arciszewski (TA), Chair of ASCE AI and Expert Systems Committee,
<tarcisze@GMU.EDU> (for part of meeting)

Committee mailing list at: <dim-asce@civil.ubc.ca>

1. INTRODUCTION

Although other committee members could not attend, FG and TF took the opportunity to being in Washington for IAI meetings to meet and review committee activities, and to meet with TA to discuss issues relating to merging the committees.

2. SPECIAL ISSUE OF JCCE

The committee is proceeding with planning for a special issue of the ASCE Journal of Computing in Civil Engineering. The suggested topic is "Information Technology for Life-cycle Infrastructure Management." FG distributed notes for the Special Issue in May. Several committee members expressed interest in participating in preparing the special issue, but there were not volunteers for the various specific positions that FG had proposed. Two members, Lisa Spainhour and Yung-Ching Chen, had volunteered to be editors for one of the themes. It was decided to see if they would like to co-edit the special issue. FG will confirm and follow-up on these arrangements. We will soon request members to submit names of potential authors and paper topics, so that we can finalize themes and start to solicit papers. ACTION FG

3. COMMITTEE MEETING IN OCTOBER

A full committee meeting will be held during the ASCE Computing Congress in Boston, Oct. 18-21. Among other topics, the issue of merging with the AI&ES committee will be voted upon at this meeting. FG will arrange for a meeting time and room at the conference. ACTION FG.

4. TAXONOMY

The committee had proposed creating a taxonomy of computing in civil engineering topics. The intent was to be able to use the taxonomy to index and classify research efforts, areas of high priority for Civil Engineering Computing, etc. A draft taxonomy was prepared with input from several members. The result tends towards two main axis, one which lists areas of civil engineering (broken down by several different criteria such as discipline, life cycle phase, etc.), and the other that lists areas of computing technology. The intersection of these two axis seems to define computing for civil engineering. The draft taxonomy is still very preliminary and is attached as an appendix to these minutes. It's not clear where to go with this from here. Any comments on the taxonomy itself or on possible uses for/actions relating to the taxonomy should be sent to TF and would be appreciated.

5. WEB PAGE

The Committee Web page has not been updated for some time. TF will review. ACTION TF.

6. MEMBER DATABASE

The Committee membership and mailing list database will be converted from a Filemaker/Mac database to an ACCESS database. ACTION TF

8. COMMITTEE ACTIVITIES

Several ongoing DIM Committee activities were identified in the ASCE TCCP Strategic Plan developed in the fall of 1997 (a list of these DIM activities is included in Appendix C, from an e-mail by FG on Oct 14, 97). The status of some of these activities is as follows:

8.1. Develop white paper on infrastructure life cycle: This has been superseded by the Journal special issue effort.

8.2. Contribute to IAI and STEP activities: This is ongoing through efforts by several DIM members (e.g., FG, TF, ...)

8.3. Explore links to other standardization activities and related legal issues: FG has done some work on this and hopes to be preparing a paper on the topic.

8.4. Organize session on legal issues in CIT at 98 Congress: This was presented to the conference organizing committee, but was not accepted.

8.5. Organize round table on future directions for CIT at 98 Congress: This was presented to the conference organizing committee, but was not accepted.

8.6. Develop taxonomy of CIT field & identify research needs: In progress (see Item 4 above).

8.7. Establish interactions with CERF to identify research: Martin Fischer was going to follow up on this.

8.8. Liaison with Str & Geo Institutes and other divisions and TCs: We will await the outcome of the committee mergers before proceeding with this.

9. FUTURE GOALS AND ACTIVITIES

Finally, there was some discussion about the disparity between the potential activities of the DIM Committee and the practical level of effort attainable. On one hand, the Committee could provide a very important and useful link or communication vehicle between the developers and experts in developing IT technologies and the practicing professionals that are the users of these technologies. The committee could help identify and disseminate information about research needs and technical solutions. On the other hand, the committee seems to have been able to generate and sustain little active effort from members. The AI and ES committee has identified the development and delivery of tutorials as an effective means of delivering on their mandate, but minimal effort has been committed to these activities by members as well.

Any discussion on the role and methods of the committee are welcome on the committee mailing list.

APPENDICES:

APPENDIX A: TAXONOMY

APPENDIX B: MERGER NOTES

APPENDIX C: DIM STRATEGIC PLAN

MEETING ADJOURNED

MINUTES SUBMITTED: TF (secretary), FG (Chair), July 24, 1998

APPENDIX A: TAXONOMY

A Taxonomy of Computing and Information Technologies for Civil Engineering
7/10/98

Civil Engineering Disciplines and Applications

Life-cycle Engineering phases

Design

- Preliminary Design
- Material Testing
- Material Selection
- Material Design
- Cost Analysis
- Structural Analysis
- Performance Analysis
- Component Testing
- Detailed Design

Manufacturing/Construction/Project Management

- Process Selection
- Estimating
- Scheduling
- Planning
- Procurement
- Assembly/Processing
- Materials Management
- Equipment Management
- Document Management
- Project Information Systems
- Quality Control
- Inspection/Quality Assurance

Use/Operations/Maintenance

- Operation
- Inspection
- Maintenance
- Repair

Disposal

- Failure Analysis
- Substitution
- Salvage
- Recycling
- Disposal

Life-cycle Engineering Elements (?)

Properties

- ASTM standard test data
- Non-standard test data
- Test metadata
- Supplier data (costs and availability)
- Design allowables

Catalog data

Product

Design history
Expected loading and service environment
Subcomponents and constituents
Final shape, geometry, and features
Required and actual processing

Service

Service environment
Service loads
Maintenance and repair history
Performance evaluations
Failure conditions and mode
Disposal method

Materials

Identification
Source
Composition
Substructure
Properties/test data
Performance
Availability
Safety
Environmental interaction
Manufacturing
Geometry and shape
Tolerances
Costs

Engineering Disciplines

Environmental
Geotechnical
Hydrotechnical
Structures
Transportation

Engineering Applications

CAD
2D CAD (drafting)
3D CAD (Modeling)
4D CAD (Temporal CAD)

Computing and IT Technologies

Artificial Intelligence
Computer Vision
Constraint Programming
Expert Systems
Fuzzy Logic
Machine Learning

- Natural Language Processing
- Neural Networks
- Ontology
- Robotics
- Spatial Reasoning
- Communications, Networking, and Distributed Computing
 - Communications and Networking
 - Distributed Architectures
 - Internet
 - World Wide Web
 - Video Conferencing
 - Networks
 - Telecommunications
- Computer Systems
 - Computing Hardware
 - Mobile Computing
 - Operating Systems
 - Supercomputing and Parallel
- Data and Information Management
 - Data Mining
 - Data Warehousing
 - Data Marts
 - Information Engineering
 - Process/functional Modeling
 - Data Modeling
 - Data Standards
 - Database Management Systems
 - Relational Database Management Systems
 - Object-Oriented Database Management Systems
 - Object-Relational Database Management Systems
 - Temporal Databases
 - Spatial Database Management Systems
- GIS
 - Temporal GIS
- Security and Encryption
- Human-Computer Interaction
 - Handwriting Recognition
 - Multimedia
 - User Interface
 - Virtual Reality
- Software
 - Programming
 - Programming Languages
 - Algorithms
 - Object-Oriented Programming
 - Software Engineering

Standards Software Evaluation and Application

APPENDIX B: MERGER NOTES

The Merger of the ASCE Databases & Information Technology Committee with the ASCE ES & AI Committee

ADVANTAGES AND DISADVANTAGES

ADVANTAGES:

The evolution of each engineering system can be described by an S-curve. Both committees were established about 10 years ago and both have already reached the plateaus of their respective S-curves. Therefore, to improve the progress rate a fundamental qualitative change is necessary (a new paradigm) in order to start a new S-curve. The merger may become a part of such qualitative change.

Engineering, including civil engineering, is in the process of integration of its various domains and technologies. In this context, the merger of both committees would simply reflect the ongoing changes in our profession.

When both committees were established about 10 years ago, their missions were clear. Today, however, the differences are less significant and many members are active in both committees.

The creation of a new integrated committee could create a new momentum and could lead to new developments, difficult to predict today.

Considering the limited number of actually active members in both committees, combining human resources could be an effective way to increase our activities.

A large committee with a clear mission would have more weight within the ASCE than two committees competing for resources.

A new committee could develop a better multi-context understanding of Information Technology.

DISADVANTAGES:

Reduced technical identity resulting from the use of a necessarily general committee name encompassing our all activities.

Less formal specialization of our activities.

Reduced diversification of approaches to computing within the ASCE TCCP.

Smaller number of formal positions and many hurt egos.

Smaller number of committee affiliations to list for members of both committees.

Potential for the reduced total amount of activities.

Potential for creation of a very large committee with too many inactive members.

Potential for reduced total funding from the ASCE for committee activity. This could be an advantage if the necessary activity can be maintained.

Prepared:

Tomasz Arciszewski, Francois Grobler, Thomas Froese

APPENDIX C: DIM STRATEGIC PLAN

TCCP Strategic Plan

Database and Information Management (DIM) Committee -- Planned Activities.

(Oct. 1997)

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1. Objective: 1.1
2. Strategy: Develop white paper on infrastructure life cycle management with IAI-IFCs
3. End product: White paper
4. Date of Completion: October 1998
5. Action for 1998: The International Alliance for Interoperability (IAI) is a non-profit public organization with the goal to establish a standard method to model buildings and related design, construction and facility management processes. This standard is called the Industry Foundation Classes (IFC) and revision 3.0 is currently in progress. Different types of software used by different project participants will be enabled to use and interact with the standard

model and communicate to other programs without the loss of relevant information. During 1998 the DIM committee will review the status of the IFC from the perspective of Civil Engineering life cycle management. The white paper will discuss the usefulness of this approach to the needs of the civil engineering profession and identify potential extensions to IFC to better enable civil engineering to benefit from this effort.

6. Responsibility: Database and Information Management (DIM) Committee.

7. Contact: Francois Grobler, (217) 373-6723, f-grobler@cecer.army.mil

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1. Objective: 2.3
2. Strategy: Contribute to IAI and STEP activities
3. End product: Influence the IAI and STEP standards to further the goals of the Civil Engineering profession
4. Date of Completion: Ongoing participation through 1998
5. Action for 1998: At least one committee member will regularly attend meeting of the IAI and contribute to the development of standards. More effective ways of contributing to STEP will be sought.

6. Responsibility: Database and Information Management (DIM) Committee.

7. Contact: Francois Grobler, (217) 373-6723, f-grobler@cecer.army.mil

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1. Objective: 2.3
2. Strategy: Explore links to other standardization activities and related legal issues
3. End product: A report summarizing the evolving standards relevant to CIT and their potential effects on ASCE members

4. Date of Completion: October 1998

5. Action for 1998: Perform a survey of standards organizations active in areas relevant to CIT. Assess the importance of the efforts to CIT as needed by ASCE members. Determine opportunities for leveraging and coordination.

6. Responsibility: Database and Information Management (DIM) Committee.

7. Contact: Francois Grobler, (217) 373-6723,
f-grobler@cecer.army.mil

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1. Objective: 3.3

2. Strategy: Organize session on legal issues in CIT at 98 Congress.

3. End product: A conference session with 3-4 speakers on the topic of legal issues in CIT.

4. Date of Completion: October 1998.

5. Action for 1998: Create a forum to address important legal concerns in using CIT for business and professional work. Identify potential speakers and select practical legal topics of interest to a broad range of ASCE CIT users.

6. Responsibility: Database and Information Management (DIM) Committee.

7. Contact: Francois Grobler, (217) 373-6723,
f-grobler@cecer.army.mil

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1. Objective: 3.3

2. Strategy: Organize round table on future directions for CIT at 98 Congress.

3. End product: A conference round table session with 4-5 speakers to discuss future directions in CIT.

4. Date of Completion: October 1998
5. Action for 1998: Organize a round table to discuss future directions in CIT and how it will change the business and professional environment. Identify potential speakers/roundtable members and devise an interesting, interactive and informative format.
6. Responsibility: Database and Information Management (DIM) Committee.
7. Contact: Francois Grobler, (217) 373-6723, f-grobler@cecer.army.mil

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1. Objective: 4.3
2. Strategy: Develop taxonomy of CIT field & identify research needs
3. End product: A web document containing a proposed structure of CIT and knowledge about CIT, with links to research, and a summary of research needs.
4. Date of Completion: October 1998
5. Action for 1998: Perform a survey of the scope of CIT and create a proposed taxonomy. Begin to link research references to the taxonomy. Simultaneously survey research needs for CIT (accomplished in part by strategy 5.3 and CERF interaction), and link that to the taxonomy.
6. Responsibility: Database and Information Management (DIM) Committee.
7. Contact: Francois Grobler, (217) 373-6723, f-grobler@cecer.army.mil

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1. Objective: 4.3
2. Strategy: Establish interactions with CERF to identify research
3. End product: Document identifying CIT research needs
4. Date of Completion: Ongoing

5. Action for 1998: Committee member(s) will review the ongoing CERF efforts and interview CERF personnel to determine common and unmet CIT needs, and to identify possible support, collaboration and leveraging.

6. Responsibility: Database and Information Management (DIM) Committee.

7. Contact: Francois Grobler, (217) 373-6723,
f-grobler@cecer.army.mil

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1. Objective: 5.3

2. Strategy: Liaison with Str & Geo Institutes and other divisions and TCs

3. End product: Better collaboration on CIT and better dissemination of CIT expertise

4. Date of Completion: Ongoing

5. Action for 1998: Committee members(s) will establish a mechanism for interaction with members of the Structural and Geotechnical Institutes, as well as other divisions and TCs. The purpose is to determine common and unmet CIT needs, and to identify possible support, collaboration and leveraging.

6. Responsibility: Database and Information Management (DIM) Committee.

7. Contact: Francois Grobler, (217) 373-6723,
f-grobler@cecer.army.mil