

Summary Breakout Session on Presentation Issues  
Carol A. Hert, 12/15/2004

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Attendees:

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The group's deliberations can be distilled into two major components. One is a model of the role of presentation as the "mediator" between users and their needs and task and data/metadata and their characteristics. The second is the set of research questions/themes that relate to the facilitation of that mediation role.

### **The Model**

Slides are available that show the model (but not available on this machine).

The Model Slide is Entitled: Presentations: influenced by User and Data

Essentially, the model suggests that presentation options must reflect dimensions of the user experience as well as the nature of the data but also have their own sets of "constraints" or dimensions that also need to be recognized in presentation.

On the User side, presentation types may need to reflect a number of user dimensions:

User Dimensions:

    User Needs

        Perhaps conceptualized as tasks

        Other relevant features of needs such as time available to user, his or her context for the activities

    User characteristics

        User preferences

        User (dis)abilities

        Computing capabilities

On the Data Side, presentation may need to take advantage of/reflect/other word, the nature of the data, the amount of data, metadata available, quality measures associated with the data/metadata, data preparation activities used, policies (such as privacy and confidentiality aspects).

Presentation Instantiations and approaches need to reflect the marriage of the user and the data sides. In addition, presentation media add their own “affordances” and issues to the mix that must be recognized.

There are different software modalities that may have different suitabilities for different data types. Hardware media have different costs, availability, permanence.

These three components to the model will suggest a range of research questions that will help us understand presentation for EI decision making.

### **Research Questions Related to the Three Components**

- Users
  - What tasks are users engaged in?
  - What are the components of EI decision making?
  - What user characteristics/abilities are important features of the EI decision making process?
  - How do people want to manipulate data/metadata in support of their tasks?
  - How do we present information relevant to the decision making process such as rationales for decisions, alternatives considered. These questions are particularly important in areas where regulatory decisions are at stake.
- Presentation Software/Hardware
- Data
  - What metadata is relevant to maintain for decision making?
  - What quality features are relevant to maintain for decision making?

These are just some of the types of questions about the three components. Others can be generated from looking at other domains that have also looked at these three components. Some areas of investigation in the digital government area are statistical information seeking, children’s use of information, also general information science and system design literatures offer more potential questions. The trick will be to find those areas in which we have adequate guidance from previous work versus those areas where EI decision making is either unique or able to add insights in these areas.

The model also suggests a flow of information amongst these three components that may facilitate discussion of other research questions. We might imagine that a user comes to an EI decision making experience or system and provides some information to that experience (such as “what do I need to know?”). The system responds to this question with the question “what should I display?” The question of what to display combined with the nature of the information/data results in the question “what should be displayed?” and the cycle returns to the user with the question “How can the display/presentation and embedded information be manipulated?”

The second theme of the breakout group was a set of “Cross-cutting” research questions that merge aspects across the three model components.

### **Cross-Cutting Research Questions**

We identified an extensive list of research questions relevant to presentation. These are grouped into several themes with discussion below.

The List of Questions:

- Information Visualization: What information is best in what medium?
  - What are the innate capabilities of medium/modality to consider?
  - What automated information-to-medium allocation processes can we develop?
  - Which aspects of displays affect decision-making and how?
- Cross-visualization data cross-reference: How do we follow data or references through various presentation media such as maps, charts, tables, reports and so forth?
- “Reach-back” from presentation into supporting/defining information: How to we best enable users to understand/explore/find the context that ties to the data?
- Representing Time and Change: How do we represent change over time in information, or present models of changing systems?
- Cultural/Social Aspects of Presentation: what do we need to know about the cultural contexts in which information is delivered? What types of knowledge and ways of knowing are not currently supported in presentation media?
- Collaboration: What presentations enable/support collaborative processes?
- New Media: what new media can be used in what ways in EI-decision making
  - Some of these media are 3D, dynamic change, overlaying data and reality in media, display goggles, sonification, tactile displays
- Definitions of User Tasks/Needs
  - (See comments in earlier section on a section of research questions).

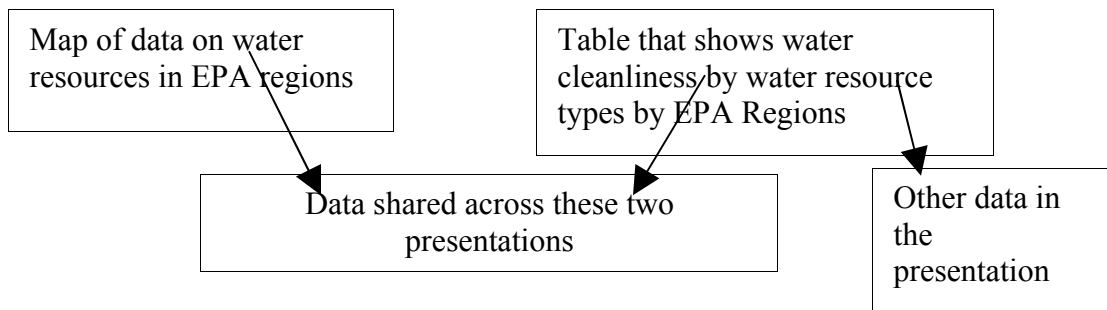
Not all of these are discussed below.

Information Visualization: The basic question here is “what information is best in which medium for what purposes?” Thus there are some basic research issues such as the innate capabilities of a medium or modality and of the information that drive the answers to the basic question. Additionally, we ask, what automated information-to-medium allocation processes can we develop.

A particularly interesting question for the group in this area was “which aspects of presentation affect decision making and how.” If we are in the business of facilitating EI decision making, are there aspects of presentation that need to be highlighted, are there particular features of the information that need to be pulled out via a presentation and so on. This question resonates with the larger issue of value-laden design. When we

privilege certain types of information, certain components of a design what are we enabling for users versus disabling for users.

Cross-Visualization data cross reference refers to the possibility that a user will want to access multiple presentations of similar information or identical information. How do we enable them to “drill down” from the presentations to the underlying data that may be the basis of each presentation. For example:



The two presentations share data (but perhaps not all). How do we enable users to navigate down from one presentation to the data and up to another presentation? How do we map and show the interconnections among data and presentations? How do we enable users to navigate those interconnections?

“Reach-back” refers to the multi-layered nature of data and presentations. A presentation might provide some of the data with some metadata and a particular user may want to know more about the data. How does he or she reach back into additional metadata? Again, how do we link the various layers? How do we enable metadata to travel with the data and be presented at appropriate moments to a user? Data and metadata are just some of the possible layers; you might also imagine layers of user analysis (here’s what I’ve done with the data/metadata) or data massaging (such as algorithms that recognize privacy issues in data release). Ideally, all the reach-back could be referenced to the individual datum but should also support aggregation activities. How to support these activities are critical research questions to supporting the presentation activities necessary for EI decision making.

Cultural/social aspects of presentation. There is an increasing awareness that existing computer technologies have tended to reify Western views of the world and Western ways of knowing about the world. We know more fully appreciate that other cultures have different presentation approaches (which might be as “simple” as the meaning of different colors in different cultures or as “complex” as ways of knowing and communicating knowledge via stories in Australian aboriginal cultures). Not only do we need to pay better attention to presentations that are intuitively useful to those cultures but also investigate presentation modalities that can support these different types of knowledge. “Citizen science” was also mentioned as one of those cultures that might need presentation support.

