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Coherence, engagement, and usefulness as sensemaking criteria in participatory media practice

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Coherence, Engagement, and Usefulness as Sensemaking Criteria in Participatory Media Practice

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ABSTRACT
When skilled practitioners create media artifacts such as web pages, newspaper articles, videos, or business presentations, they are engaging in a pursuit which has consequences for the people who will interact with those artifacts. The juncture of practice, artifact, and consequences involves diverse normative considerations. We have summarized these into three criteria: coherence, engagement, and usefulness. In this paper we report on initial progress to develop a method for assessing these criteria in a particular form of skilled real-time media practice.

INTRODUCTION
When skilled practitioners create media artifacts such as web pages, newspaper articles, videos, or business presentations, they are engaging in a pursuit which has consequences for the people who will interact with those artifacts. The juncture of practice, artifact, and consequences involves several normative considerations, which we have summarized into three criteria: *coherence, engagement, and usefulness* (defined below) or CEU for short. However, the sensemaking challenges of media practice take on a different character when the media artifacts are created in real time, with the active participation of people in groups or audiences.

In this paper we report on initial progress to develop a method for assessing CEU in a particular form of skilled real-time media practice, which we call participatory hypermedia construction (PHC). PHC practitioners create hypermedia artifacts with and for participants, in face-to-face or virtual meetings.

The current paper extends the research we presented at the Sensemaking workshop at CHI 2008 [12], where we described the improvisational and narrative dimensions of micro-moment sensemaking [6] in PHC. Here we augment that micro-analytical approach with a more macro-analysis that builds a visualized "sensemaking profile" of whole PHC sessions. We do this by segmenting PHC sessions and characterizing each timeslot in terms of the three CEU dimensions. This analysis provided a way to characterize and contrast six PHC sessions. We propose that CEU analysis, and an example heat-map visualization, makes a contribution to research methodology for studying sensemaking, which could be applied to other domains and representational artifacts.

In this paper, we will first briefly sketch how our previous research relates to the current subject, then describe the three CEU criteria. We will then describe the task and settings, and the analytical method. We then provide discussion and next steps.

BACKGROUND
In earlier research [11], we focused on expert practitioners and conducted several in-depth micro-analyses of long PHC sessions, looking at how highly skilled practitioners encounter and solve sensemaking challenges in the course of working with their participants. Our settings were 'in situ' sessions, often several hours long, held as part of larger projects, where the tasks carried out emerged from the highly contextual needs of those projects (such as a NASA remote science team looking at geological data during virtual meetings). Much was learned from those analyses, but looking at the expertise of the practitioner alone seemed to obscure, to some degree, the role of participants in the shaping of hypermedia artifacts.

For the current paper, we created a different kind of setting. This time our informants were practitioners at varying levels of expertise, including relative novices. We also looked at the role participants can play in the shaping of the artifacts. The sessions were held in a more laboratory-like setting that provided a pre-defined, consistent, bounded task that could be easily compared from informant to informant. The first setting for the sessions was at a workshop at NASA Ames in May 2007, while the second setting was at the Rutgers University in June 2007.

COHERENCE, ENGAGEMENT, USEFULNESS
The three CEU criteria are a distillation of a larger model of the ethics and aesthetics of participatory media practice, based on constructs from Dewey [7], Schön [12], Bruner [3], McCarthy & Wright [9], and others. By *ethics*, we mean considerations of how a practitioner's actions will affect the interests and well-being of participants, audience, and stakeholders. By *aesthetics*, we mean considerations of the form that artifacts and utterances take in the process of constructing media artifacts like knowledge maps, and the shaping and crafting that practitioners and participants apply.

We use the model to help think about practitioners using a medium to help a group create and share meaning, through a representation such as hypermedia knowledge maps, in the context of "expert servicing" [1]. The model provides a set of components, elements, and exploratory questions to help determine how a context of service, the unique set of people, goals, constraints, situation, and subject matter, can inform the "shaping" the practitioner performs on the representational object(s), and vice versa. Understanding and characterizing this has both normative aspects (notions of what practice in such settings should be) and descriptive aspects (how do we look at and characterize situated practice in service) aspects [2].

The larger model has fifteen components. For the purposes of the analysis reported here, we distilled these into the three CEU elements, which preserve the descriptive and normative power yet provide a more tractable set of three criteria that could be used to characterize any moment in a session.

Coherence involves keeping the information display, and the interaction of participants with it as well as with each other, understandable, clear, evocative, and organized. At any moment, the meaning and organization of the visual and textual elements of the display should be clear to participants (as well as practitioners).

Engagement refers to the relationship of participants to artifacts in sessions involving any sort of representation, whether a whiteboard, easel sheet, or software projected in front of the real or virtual "room." The value of the display is directly related to the degree that the participants are engaged with it – whether they are looking at it, talking about it, referring to it, and involved in its construction or reshaping.

Usefulness refers to the extent to which the representation appears to be adding value for the participants and helping to fulfill the goals of the session, the participants, and/or the larger effort of which the session is a part. It is the responsibility of the practitioners to make sure that the representation is a useful part of the proceedings.

In order to highlight these three dimensions in a consistent, bounded, and easily comprehended context, we constructed a "laboratory" task that even novice practitioners could understand and perform, described in the next section.

THE TASK
We intended the practice task to be one that required neither expertise with real time use of the software (a knowledge mapping tool called Compendium [4, 5]), nor in the subject matter, so that the preparation and practice session could occur within a couple of hours without any advance knowledge on the part of the informants. We chose space travel as the subject matter, and provided a set of 127 images inside Compendium that could be used in the exercise. Informants were informed that the sessions would be recorded for research purposes. They were given advance access to the task materials if they wanted to review them before the workshop.

The tasks were conducted in face-to-face meetings. We divided the informants into groups of 3-4 participants. Each group was given about ninety minutes to prepare (see Figure 1). Some groups included a more experienced practitioner, who was allowed to help design and prepare the exercise but not to play an active part during the large group exercise itself. After the preparation period, each group took turns introducing and conducting their session with the larger group of participants. Typically each group had one person acting as the mapper (hands on the keyboard/mouse controlling the Compendium display) and one as facilitator (guiding the discussion from in front of the room). Each group had fifteen minutes to conduct their session, followed by a debrief discussion in which they also received feedback from the larger group. After the sessions, all informants completed a questionnaire that asked questions about their background with Compendium and related tools, as well as about the sessions themselves.

Figure 1: Informants preparing their large group exercise

ANALYSIS
For each session, we divided the video and screen recordings into 30-second timeslots. For each timeslot, we rated how the session had fared in that timeslot in terms of coherence, engagement, and usefulness of the relationship of the participants to the hypermedia display. There were three ratings: High (three points), indicating a high or strong degree of engagement, coherence, and usefulness; Medium (two points), indicating a medium or average degree of the three criteria; and Low (one point), indicating that there was a low degree of one or more of the criteria during that timeslot.

By assigning a color to each rating in the spreadsheet, we generated "heat maps" that provide a gestalt visualization of the whole session in terms of the three criteria (see Figure 2). Such heat maps make it easy to identify the tenor of the session, and to point out where sensemaking moments, or breakdowns, may have occurred – typically when the 3s

(High ratings, green shading) drop to 2s or 1s (Medium (yellow) or Low (red)), indicating something went wrong. In turn, a few sessions kept High ratings throughout, indicating that the preparation as well as execution of the session (design and realization) was well thought out and handled in practice.
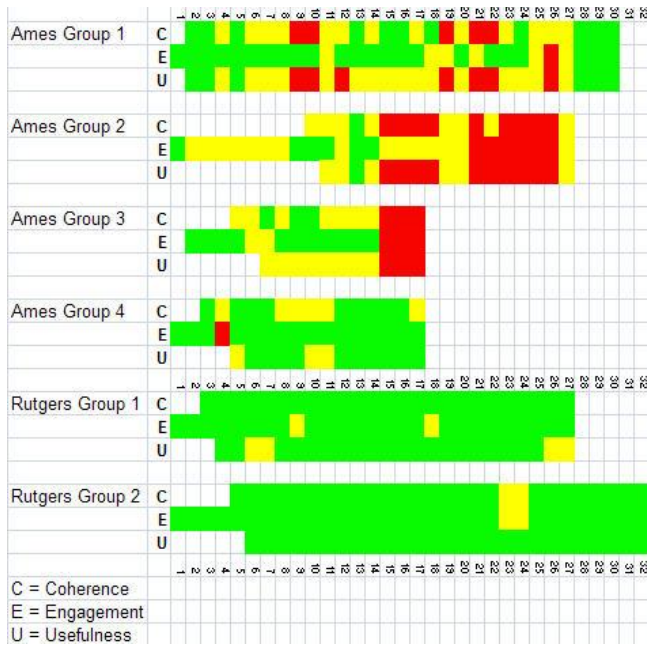

Figure 2: Heat maps from CEU analysis

In Figure 2, we get an at-a-glance overview of the sensemaking character of the six sessions studied. We can see that three of the Ames sessions contain a fair amount of red cells, indicating Low ratings for one or more of the CEU elements. These are moments in the session where something went wrong, when the session went somewhat off the rails. These would be prime locations to look at the sensemaking triggers (what set off the drop in the ratings), as well as what the practitioners and/or participants did to restore the session to better functioning. We can also see that the remaining Ames session as well as the two Rutgers sessions had few or no drops, indicating that the practitioners and participants experienced smooth sailing. In fact those sessions proceeded very close to plan, where as the Ames groups 1, 2, and 3 all experienced sensemaking challenges.

For example, Figure 3 shows the full-session heat map for Ames Group 1:

Figure 3: Heat map from Ames Group 1

It is apparent from the heat map that timeslots 9-12, 19-22, and 26 contain some sort of anomaly or event that caused the coherence and usefulness scores to drop to the Low level. Figure 4 shows a fuller picture of the analytical grid used to develop the CEU ratings for timeslots 19-22 (and the "recovery" in timeslots 23-24). Here we see a narrative description of the events in each timeslot, the CEU ratings, and explanations of why each rating was given for each timeslot. Taking this approach requires the analyst to think about each timeslot in terms of coherence, engagement, and
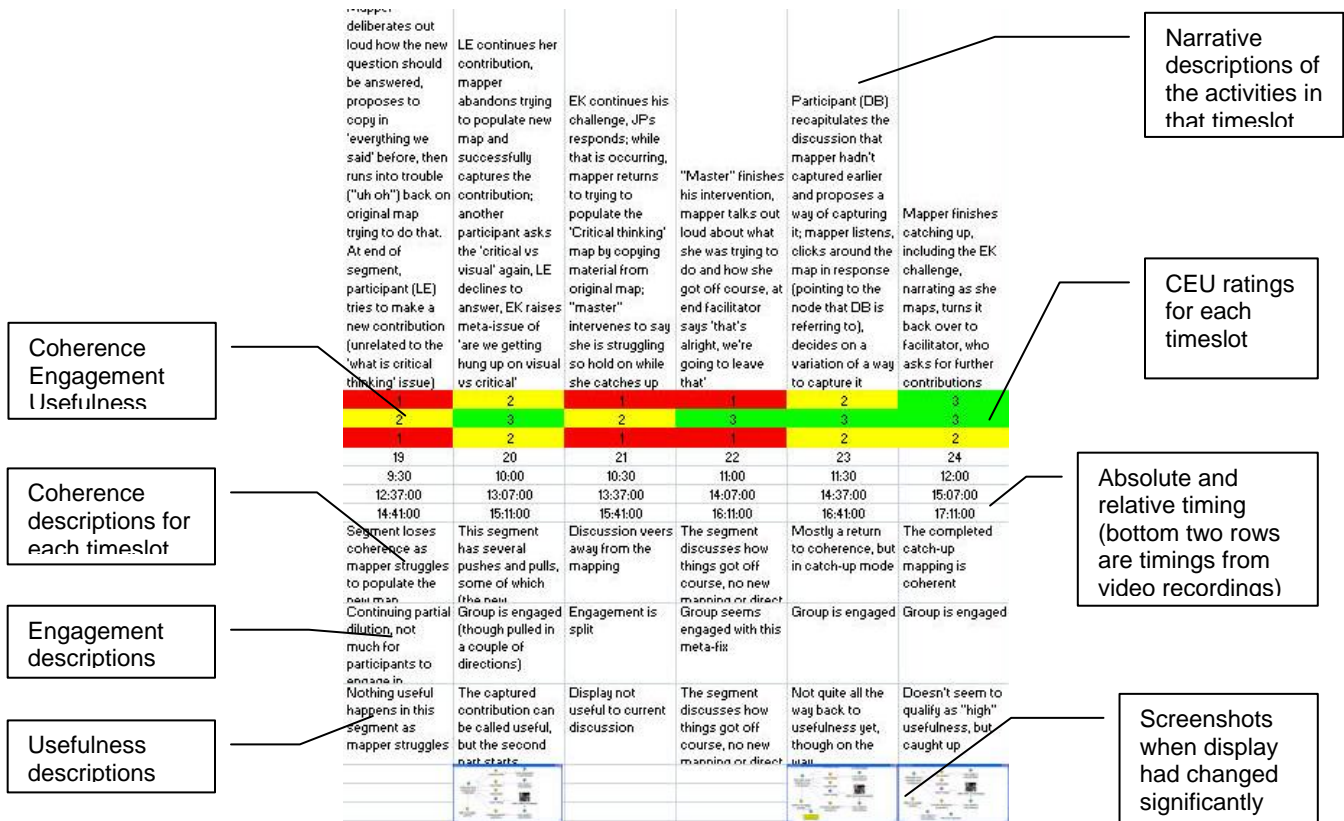
usefulness, and assess the level of each in light of the overall trajectory of the sessions, the dynamics at play between practitioners, media artifact, and participants, and other factors.

The CEU analysis pictured here provides context for finer-grained analysis of what happened in timeslots 17 through 24, the trajectory of a complete "sensemaking episode" starting with a trigger and ending with the resolution. This finer grained analysis was exemplified in the micro-moment sensemaking reported in our 2008 paper [12].

DISCUSSION
We have described an approach to analyzing sensemaking in real-time media practice which looks at *coherence, engagement,* and *usefulness* during a participatory, hypermedia construction session. We emphasize that the CEU analysis is intended to be descriptive and comparative. That is, at this early stage we are not making claims for it as a research method beyond its utility for the present analysis. It relies on interpretation on the part of the person assigning the ratings. Future research could apply inter-coder reliability assessments and thus contribute to a stronger claim for the validity of the method, but that is not our present aim. Rather, we are locating the CEU analysis in a broader set of tools aimed at providing multiple layers of analysis, and a degree of "triangulation" [8], in our studies of practitioner sensemaking.

In qualitative research, one often moves from coarser-grained to more finely grained dimensions and criteria [1]. The work we presented last year was at a very fine grain indeed, looking closely at PHC practitioner choices and moves often within the space of a few seconds. The CEU analysis provides a coarser-grained set of dimensions within which to better locate the finer-grained work.

As Figure 5 indicates, the CEU analysis provides a broader picture of sessions as a whole and timeslots as units. It seeks to provide a concise picture of the trajectory of a session as a whole, from start to finish. Micro-moment sensemaking analysis gives a finer-grained look at specific choices and moves in the context of one or more timeslots, focusing on sensemaking moments where anomalies or other triggers cause sensemaking behavior on the part of practitioners.

NEXT STEPS
By the time of the 2009 workshop, we will have identified a sensemaking instance in each of the remaining sessions, and analyzed them in terms of the larger theoretical framework (this has already been done for two of the sessions). If no real sensemaking instance occurred, as is the case in three of the sessions, we will instead analyze what moves and choices the practitioners made to keep the sessions on track, again at a micro-moment level. This analysis will be correlated with the results of the informant
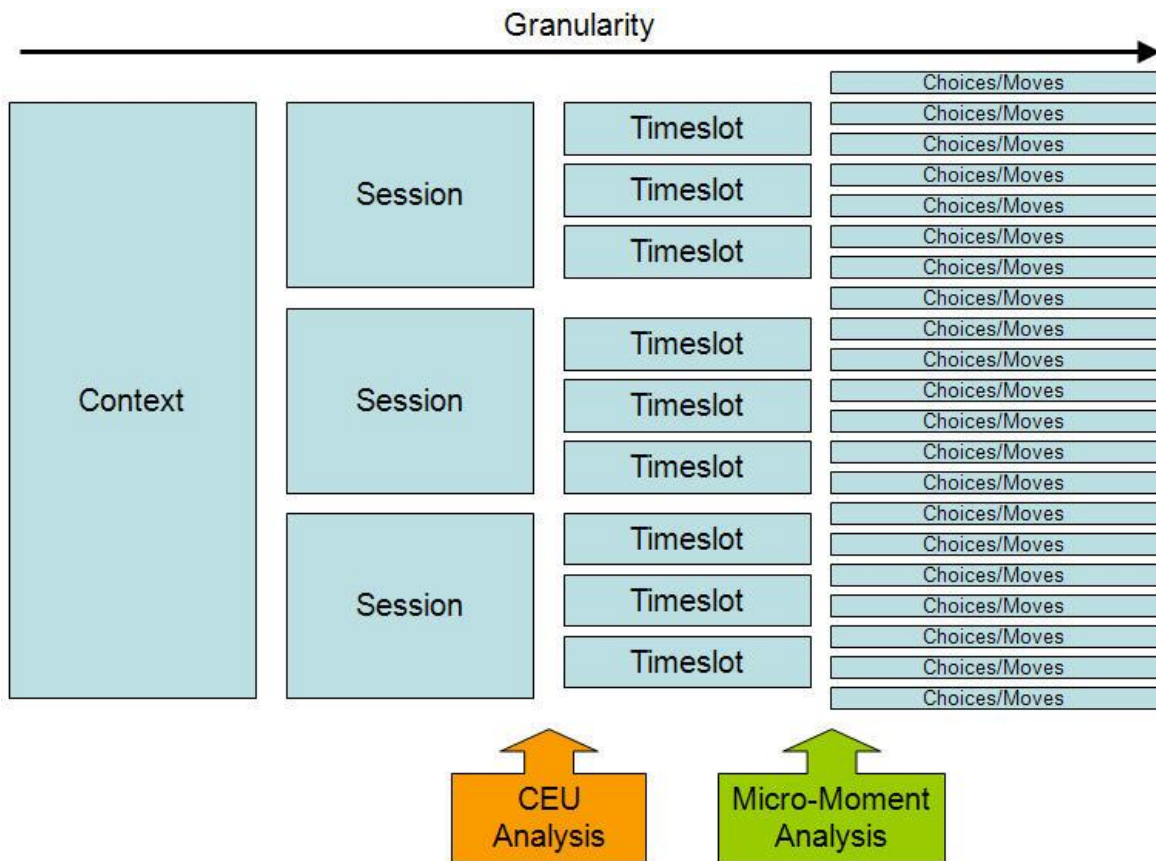

Figure 5: Relative granularity of the real-time media practice analysis approaches discussed in this paper

questionnaires, for example to give some insight on levels of experience and informant evaluations of the effectiveness of the sessions. We will also supplement our own findings with the comments and ratings provided by the participants. We will draw comparisons across the sessions, working toward a refined set of qualitative categories and dimensions. We will further compare the six sessions with the previous expert practice analyses, again refining dimensions and criteria.

By completing this line of analysis, we hope to create a comprehensive and well-triangulated inquiry into the nature of sensemaking in the specific practice of constructing participatory hypermedia artifacts. More broadly, our aim is to offer a methodology which we hope will inform research into the dynamics of sensemaking with other mediating representations.

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