

artefacts speak and artefacts to speak

Position paper for "Analyzing Collaborative Activity" – CSCW 2002

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scope

There are two topics that I would like to bring to this workshop. The first is the experience I'd like to offer *to* the workshop on artefact-centred analysis. The second is the experience I'd like to gather *from* the workshop on the variety of means used to record and present rich field data for further research and design.

context

This position paper, particularly the use of artefact analysis, is set in the context of a project "Tracker" [[T01]] that is focused on understanding the nature of decisions in teams and organisations. In particular we are interested in the way past decisions are acted on, referred to, forgotten about and otherwise function as part of long term organisational activity.

artefacts speak

The ethnographic literature is full of the importance of artefacts as the means with which individuals represent, mediate and negotiate work in collaborative settings [[H95]] and this is also recognised in approaches such as distributed cognition [[H90b]] and situated action [[S87]] as well as some more traditional cognitive models [[H90]]. In work over several years with others at Lancaster and elsewhere, we have studied the way in which artefacts in their setting act as *triggers* for action and *placeholders* for formal and informal processes [[D98,D02]] and in early work on the nature of CSCW as a field I focused on the centrality of artefacts as the focus of work and as the locus of communication *through the artefact* (feedthrough) [[D94]].

Like the fossil left where the soft parts of the body have decomposed, artefacts act as a residual record of work done and work in progress. In and of themselves they form a resource for analysis.

Furthermore, just like the palaeontologist looking at fossils there are a variety of circumstances in work domains where the 'soft tissue' of lived work, the ephemeral actions and words, are difficult or impossible to collect and so the matrix of artefacts that remains needs to be interpreted.

This may be because the actions have already taken place and so the physical remains are our only resource. In the Tracker project we have access to a corpus of meeting minutes. The meetings have long past; we cannot go back and observe what happened; at best we can interview some of the participants; but the formal minutes remain – fossils of the moment. We will return to these formal minutes later.

Perhaps more fundamentally there are some classes of human activity that direct observation cannot, or cannot easily, capture. Where a class of activity is frequent and short lived we can expect that periods of direct observation, such as ethnographic studies, will completely capture some instances of the activity from end to end. Where activities are longer lived, direct observation

can at best hope to capture aspects of the activity at different points and so piece together the complete story from parts. Even worse is where a class of activity happens infrequently or is only active infrequently so that direct observation fails to record any instance or part of the activity at all. However, these activities, even when inactive must in some way still have a representation within the organisational ecology: in people's memories and in physical or electronic artefacts. The 'and' in the previous sentence is not just in the sense that both will be present, but in the more holistic recognition that the interpretation of artefacts is itself invested within the human understanding of the context. Artefacts tell a story to the extent that they invoke stories. To some extent as analysts we may understand the contexts well enough to 'read' artefacts, in others the artefacts can form the prompts to evoke memories during formal and informal interviews.

We have used two main types of artefact-centred analysis – one based on the artefact *as designed* and the other on the artefact *as used* [[D01]].

as designed

Long lasting artefacts: tools, procedures, documentation, buildings, organisational structures, have all by explicit action been 'designed'. As we know these designs can often fail and so are not paradigmatic. However, they are a powerful resource embodying the knowledge, skills and assumptions of the original designer. We call this *archaeologically-inspired artefact analysis*. An archaeologist will look at the artefacts produced by long-dead civilisations and by considering the design infer the patterns of use, work and social activity that surrounds those artefacts. This process is problematic as we may draw tenuous conclusions from meagre evidence, but is in fact more robust as a contemporary technique as we are in a better position to understand the target context and may also be in a position to use this as a resource in participative critique.

In the early stages of the Tracker project we reviewed a number of meeting support systems. We analysed in greatest detail TeamSpace [[T01b]] which is related to the very successful Classroom2000 (eClass) system [[A99]].

In looking at TeamSpace we found various classes of context assumptions. Some are explicitly embedded in the software; for example, TeamSpace requires meetings to be scheduled. Some are explicit in the documentation but not enforced; for example, the suggestion that a facilitator is necessary. Some are implicit in the software; for example, if you stop and then restart a meeting, the audio recording for part of the meeting is lost, implicitly assuming meetings do not break and reconvene. So far, this material is simply recorded as descriptive list of issues and we do not have a systematic recording method.

as used

In previous work we have focused especially on the fact that artefacts encode the state and trigger action not just by their explicit content or significance, but also by their disposition in the environment. A piece of paper at a particular location on the desk may mean "file me"; in another location, perhaps in a straight pile means "in progress"; and on the same pile, but higgledy-piggledy at an odd angle means "to be read". By taking an office at the end or beginning of a day we can use these artefacts to tell the story of the activities that are, in a temporal sense, passing through the office at that moment. Most significantly this includes activities which are not currently captured in the 'official' systems or whose state is indeterminate or intermediate between 'official' stages. We call this *transect analysis* as it is similar to the field biologist's use of a transect through an ecosystem such as a shoreline.

Unfortunately meetings are an extreme case of 'clean desk policy'. The documents and artefacts are removed from the room with the participants – the only remnant of the meeting is the explicit records and the changed memories and attitudes of the participants.

The one obvious artefact that is left behind by a meeting is the formal minutes. These are problematic as they are not a record of *what happened* at the meeting, but rather a *sanitised account* prepared for a purpose, by an individual. Although problematic the minutes are significant as they are the foci by which the participants agree (or are forced to agree) to a fiction that in some way legitimises future actions. In the extreme, in certain legal situations, minutes of meetings are created which never occurred – quite literally legitimising the desired end state by an agreed legal fiction of the process.

To some extent the artificial nature of the formal minutes reflects the artificial nature (in the sense of artifice) of collaborative activity. Ethnomethodology makes a strong focus on the accountability of individuals – that they can make stories (accounts) about their actions that legitimise them socially.

We have to read formal minutes carefully, more like an *historical document*, written by someone, for a purpose, but nonetheless exposing aspects of the real process.

As noted our focus is on decisions and this has proved even more problematic. In ethnography of actual meetings one of the marked results was the fact that decisions did not 'happen' in the meeting. This is not to say that formal minutes would not record decisions (or their consequences), but that there are not clear points of decision making instead decisions have either clearly been made previous to the meeting and are merely brought into the meeting to validate them, or alternatively decisions are 'made' implicitly by simply discussing an issue that the minute taker reads later as a particular outcome.

This problematic nature is also evident in the minutes themselves. Formal minutes do not explicitly record 'decisions' but instead either note agreed statements or 'actions', usually relating to formally numbered items in the meeting. Whereas formal actions are explicitly marked there is no such explicit marking for decisions (or related topics such as options, issues etc.). Instead an extensive hand analysis was required to identify salient features.

When the analysis started we had some discussion about the level of structure required in the analysis. The minutes we studied themselves had a fairly consistent formal structure: date, participant list, numbered items, comments and listed actions against each item. Also there are a number of ontologies of decision making from the design rationale and decisions support literature (e.g. IBIS [[C88]], QOC [[M91]], DRL [[L91]]). Based on these a database structure was created to record decisions, actions, issues and relations between them. So, for example, a decision would have associated actions, actions would have a responsible persons optionally a deadline.

As the analysis proceeded it became increasingly clear that the reality of the 'formal' minutes was, perhaps not surprisingly, far less structured and far more ad hoc than our predefined structure. Even the explicit 'actions' sometimes turn out to be more comments or statements of intent and some actions are not marked as such. Decisions are far more complicated as they are sometimes explicit in the text and sometimes inferred from context (e.g. an action presupposes a decision to take action).

In the end the rigid structure has been dropped, except for the record of the explicit structure of the minutes themselves, and the analysis uses a simple recording (in a database to make it amenable to search and analysis) of 'things' and relations between them. Now anything the analyst reading the minutes feels is recordable can be added as a 'thing' with as many named attributes as desired. Only a short title/description, link to the raw transcript and 'type' field are required. The last of these is to enable the recording of terms such as 'decision', 'action' and the like, but not constrained to a predetermined vocabulary. The aim is to see an ecologically valid ontology *emerge* from the ongoing analysis.

As well as feedback on our own artefact centred techniques, one of the things I would like to get from this workshop is a wide view of the representation methods used for research and design. In Lancaster we have a number of projects that include aspects of representing rich data to make it accessible for design. This includes standard HCI guidelines, ethnographic results captured in patterns, vignettes from ethnographic studies and detailed scenarios.

There is a tension in such representations between concrete contextually-valid accounts and more abstract theoretically-derived descriptions. Grounded stories allow the full richness of the work (or leisure) environment to tell its own story away from the blinkers of particular theories or agendas (or at least in principal do). For design too, we can look at a grounded example and say "yes my situation feels like that". However theory is the *language of generalisation* and without some understanding of theory it is hard to know how one grounded situation helps us understand another.

In teaching I have found myself using what I have termed *just-in-time theory*. Instead of examples to demonstrate theories I use rich case studies, full of trade-offs and incomplete answers that often emerge from the process of teaching itself (the physical and social environment of the class) but explicate them using rich theory. As well as being effective for teaching this appears to offer potential as a paradigm to communicate situated experience for design.

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