Finding Decisions Through Artefacts

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Abstract

This paper addresses the use of artefacts as a resource for analysis. Artefacts are particularly useful in situations where direct observation is ineffective, in particular for infrequent activities. We discuss two classes of techniques: focusing on the 'artefact as designed' as a means of recovering designers' explicit and implicit knowledge and 'artefacts as used' as a means of uncovering the trail left by currently inactive processes. These techniques have been applied using a meeting capture system and meeting minutes as the artefact resources. This is part of a wider study to understand the nature of decisions and so reduce rework.

1 Introduction

The ethnographic literature is full of the importance of artefacts as the means with which individuals represent, mediate and negotiate work in collaborative settings (Hughes, O'Brien, Rouncefield, Sommerville & Rodden 1995). This is also recognised in approaches such as distributed cognition (Hutchins, 1990) and situated action (Suchman, 1987) as well as some more traditional cognitive models (Howes & Payne, 1990). In our previous work, we have studied the way in which artefacts in their setting act as *triggers* for action (Dix, Ramduny & Wilkinson, 1998) (Dix, Ramduny & Wilkinson, 2003) and *placeholders* for formal and informal processes (Dix, Wilkinson & Ramduny, 1998). In related work, we emphasised the centrality of artefacts as the focus of work and as the locus of communication *through the artefact* or feedthrough (Dix, 1994).

Because of this we have proposed various forms of artefact-centred analysis to run alongside more direct methods of observation (Dix, Ramduny, Rayson & Sommerville, 2001). We consider both:

- the artefact *as designed* – looking at the ways in which the explicit and implicit knowledge of the designer are exposed in artefacts
- the artefact *as used* – looking at the way on which people have appropriated, annotated and located artefacts in their work environment

Artefact centred sources are particularly useful where an activity occurs or is only active infrequently so that direct observation may fail to record any instance or part of the activity at all. In the Tracker[1] project we are seeking to understand the nature of decisions in teams and

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[1] http://www.comp.lancs.ac.uk/computing/research/cseg/projects/tracker/

organisations (Rayson et al., 2003); in particular the way past decisions are acted on, referred to, forgotten about and otherwise function as part of long term organisational activity. In one of the ethnographic studies we carried out, we found that 'real' decisions were made between meetings or implicitly assumed, but rarely explicitly voiced during official meetings. Furthermore, interactions between decisions take place over periods of month or years. In other words, they have exactly the properties that make artefact-centred approaches attractive.

2   The artefacts as a resource

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. But where a class of activity happens infrequently or is only active infrequently, direct observation can only record the activity if it happens to overlap with one of the infrequent episodes.

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.

3   The artefact 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[2] (Richter et al., 2001), which is related to the very successful Classroom2000 (eClass) system (Abowd, 1999). In the version of TeamSpace we tested, 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.

4   The artefact 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 prior 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.

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[2] http://www.research.ibm.com/teamspace/

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 manual 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 (Conklin & Begeman, 1988), QOC (MacLean, Young, Bellotti & Moran, 1991), DRL (Lee & Kai, 1991). 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 responsible persons and 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. With this more flexible structure, the analyst is no longer restricted to a fixed repertoire of concepts. While the analyst is reading the minutes, if she feels that any issue ought to be recorded she can now easily do so by adding 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.

5 Conclusion

We have seen using the example of TeamSpace, how it is possible to use the artefact as designed as the analytic resource. Similarly, our analysis of minutes is an example of using artefacts as used. In both cases, the permanent record embodied in artefacts has given us an understanding of the nature of decisions which otherwise prove elusive to direct observation.

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