

Chapter 11

Patterns of Cooperative Interaction

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Summary

Patterns of Cooperative Interaction was a project we conducted in order to try to structure a series of findings from different ethnographic fieldwork studies. We created a uniform pattern template which named and discussed a regular pattern of work arrangement and activities found in various fieldwork studies then described the various individual variants we had found in different studies, noting their core similarities but also their differences. The patterns collection is intended to:

- provide a common language for talking about different fieldwork findings across different settings
- give a means of comparing and contrasting similar work arrangements and practices within different settings, and
- enable a variety of practitioners to access fieldwork results easily and to have an introduction to the analytic approach of fieldwork.

Importantly, as well as having these pedagogic features, the patterns can also be used alongside requirements analysis as a means of leveraging analysis in a novel site. The idea is that practitioners interested in social analysis can see whether any activities, arrangements or technologies in the new site are similar to those

discussed in any of the patterns. This can aid them in thinking about important activities to support in any redesign and whether discussed technology solutions might be appropriate.

Background

After the first ethnographic field studies in the computing domain in the late 1980s during the following decade there was a steady stream of them – from control room studies, to industrial settings, to offices, finance and banking, looking at cooperative applications, video conferencing and even moving on to leisure and gaming. This pointed to the success of the confluence of computer science and sociologists, especially in the fields of Computer Supported Cooperative Work (CSCW) and Human Computer Interaction (HCI). However, various complaints were levelled at field studies research – it was just a series of individual studies with little to connect them, relevant only to the individual sites studied, and in a related fashion, field studies did not produce theories with predictive power.

Furthermore the studies did not tell you what to design to bring project success. It is very arguable that a number of these criticisms could be applied broadly to many approaches – there is no silver bullet – even theories and approaches that promise prediction or a suggest a method to guarantee results do not in themselves do this. Design is often more of a craft discipline – yes dependent on method – but often very dependent on personnel and their ability to understand who and what they are designing for, and to work diligently and make good calls in a constrained and contingent setting. However, this did not cover all the criticism of ethnography. While it was legitimate to claim that individual field studies showed their value in themselves it was also clear that there had been few attempts to look more broadly across the corpus and to see in what ways it added up to more than a collection of studies united solely by approach.

Problematically for this project, many of the field studies conducted in CSCW and HCI were 'ethnomethodologically-informed'; an approach that is a-theoretical and seeks to understand settings as they are locally organised according to how they are understood by participants. Understanding settings in their own terms precludes taking theory and applying it across the board. Hence any attempt to look more generally across settings needed to compare and contrast features in ways that were still faithful to local particularities or else the specific features that made ethnography appealing to designers – its in-depth understandings of work – would be lost.

Pragmatically, however, it was clear that within individual research articles people did re-use concepts such as awareness (of work between actors) and articulation work (the work to coordinate the work across actors) and this was useful when local instantiations were honoured and the local findings could be used comparatively. But there was just a need to undertake this project more systematically.

Around this time (late 1990s) there had been a flurry of interest within computing about the work of the architect Christopher Alexander. Alexander had produced a magnum opus of theory linked to architectural design patterns about 'designs that worked' functionally and aesthetically. These patterns had names, descriptions of features and of the 'problems' they dealt with and how they resolved 'forces' as well as a diagrammatic form and even photograph. They nested within each other according to scale – neighbourhood or park within it, house or bedroom. There was something interesting here if also slightly strange and idealistic.

Patterns had been taken up in computing where there had been successful books that collected together software engineering patterns – elegant designs for recurrent problems in development. Patterns as an idea were spreading through computer science in general. Consequently we undertook a project to see if we could marry elements of the idea of patterns with the idea that we wanted to try and build connections in the corpus of ethnographic studies. The idea of naming patterns of work – or as it became 'Patterns of Cooperative Interaction' – seemed appealing in terms of describing the arrangements of people and technologies, the activities they carried out, problems and solutions, diagrams and so forth. So the idea became one to extract patterns where we had seen similar phenomena in different settings and design a pattern template to present them.

Pattern Structure

In beginning the patterns project, our first goal was to look for findings or phenomena across settings that bore close similarities. A considerable amount of work was undertaken simply to go through papers in the corpus of field studies. One of the difficulties of this became apparent early on – often in the published studies all one had was the fieldwork material selectively cut, prepared and presented for the purpose of making a particular argument. Of course this is what paper writing is about but it made the comparative project harder and we needed to focus largely on our own materials or where we had access to several papers or data, allowing for further analysis.

However, we did find some good candidate patterns so we developed our pattern template that would be loose enough to accommodate the different patterns and would crucially focus on recurrent elements of cooperative work that ethnographic studies dealt with. For example, the group of people and resources used, and the practices they used to coordinate their work. The template is as follows:

1. **Name**: captures the central idea of the pattern
2. **Cooperative Arrangement**: details the actors, resources (artefacts, communication media) involved in the activity described in the pattern.
3. **Representation of Activity**: how the activity is represented (e.g. on an artefact or plan) and the relationship between the two (the activity and the representation).
4. **Ecological Arrangement**: features in the layout of the setting and artefacts and their affordances for the accomplishment of work. Can also have pictorial representation
5. **Coordination Techniques**: practices employed in carrying out action/interaction and how coordination is achieved.
6. **Community of Use**: the user groups or affiliation of actor's involved.

Pattern List and Website Development

In the end we developed a list of ten patterns, and for each we had two or three instantiations of how they played out in different field studies. Each instantiation was described according to the template above. We decided to turn the patterns into a web-based resource. We also added a 'front page' (literally in the case of the web pages) to each pattern. For the front page a high level description of the phenomena is provided under the heading 'the essence of the pattern'. Below this are three more sections entitled 'why useful?' 'where used?' and 'design implications?'. 'Where useful' details why we have chosen to draw attention to the pattern. 'Where used' details the two or more specific fieldwork settings we have found examples of the pattern in, and also some brief remarks on similarities and differences between the settings. 'Design implications' is used to make some comments about what the identification of the pattern may mean for certain questions concerning 'good', usable, dependable design.

The ten patterns are as follows:

1. Artefact as an audit trail
2. Multiple representations of information
3. Public artefact
4. Accounting for an unseen artefact
5. Working with Interruptions
6. Collaboration in Small Groups
7. Receptionist as a hub
8. Doing a walkabout
9. Overlapping Responsibilities
10. Assistance Through Experience

To give a brief flavour of what the patterns contain we can take the first – artefact as an audit trail – and summarise as follows.

In essence this pattern is concerned with the way in which an artefact can serve as a stratified record of work. Amendments and attachments to the artefact, such as comments, date stamps, post-it notes, other documents and so forth readily provide information to actors about the process through which the artefact has progressed in the workplace, seeing who has carried out work, when and why. In this way the artefact serves as a means of coordination between workers.

In this case the pattern was drawn from two studies – one of the use of paper flight strips in air traffic control, and the other of the movement of an invoice around an office in a catering firm. We discussed this pattern because both artefacts physically showed what had happened to them, in terms of the work carried out on them during a process. This was recoverable to those in that setting, just like an audit trail, and furthermore, their material nature and placement within the settings could serve as a means for understanding the status of work. This has clear design implications when one thinks that these visible features may be lost in movements to more electronic solutions.

Retrospective: An Unfinishable Project

Overall the patterns of cooperative interaction project was a successful one, however, the more optimistic side of the project was not reachable probably for very understandable reasons. We had produced a patterns resource of reasonable size and managed to place different findings together in a manner that was both faithful to the similarities but also the particularities of the instantiations. The patterns did provide an introduction to some of the findings across ethnographies and the analytic sensibilities of the approach – so certainly could be pedagogically useful for a range of practitioners interested in social analysis.

We had also shown – how at least in our hands – the patterns could aid in the analysis of a novel setting. However, this also pointed to a problem – we were experienced with ethnography and field work and therefore could deploy the patterns skilfully, using them in tandem with our requisite knowledge. And although quite a number of people were interested in reading our work and viewing the collection, and drawing on it in a number of ways, we are not aware of anyone else taking it up for analysing a novel setting.

Furthermore, although we spoke with other researchers undertaking similar tasks we were never able to get anyone to contribute further to our collection. This might have been an ownership issue. People would rather start a collection than contribute to someone else's unless it is really successful, but it is also possible that our collection was not really going to be generative in this way. Reasons for this could be that cooperative work seems a bit less inductive to the patterns idea than architecture; our solution and template were always a bit of a forcing device; and it was actually harder to find recurrent patterns across sites, particularly without access to richer fieldwork data. Nevertheless we believe that the patterns collection is useful for those wanting an introduction to ethnographic findings and sensibilities.