Applying Patterns of Cooperative Interaction to Work (Re)Design: E-Government and Planning

David Martin, Mark Rouncefield and Ian Sommerville

Department of Computing
Lancaster University
UK
(d.b.martin@lancaster.ac.uk, m.rouncefield@lancaster.ac.uk, is@comp.lancs.ac.uk)

Abstract

This paper presents *patterns of cooperative interaction* derived from ethnographic studies of cooperative work as devices for generalisation, re-use and design. These patterns consist of examples of similar social and interactional phenomena found in different studies that serve as resources for defining and envisaging design concepts, and potential work process and technical solutions. We outline new pattern examples and demonstrate their use in application to a complex setting: e-government in local government planning.

Keywords

Patterns of cooperative interaction, e-government, ethnography, design

INTRODUCTION

We are currently involved in a project that has the purpose of delineating and demonstrating the use of *patterns of cooperative interaction*. This project has the aim of reviewing the corpus of ethnographic studies of work and technology (see [15] for a review), extracting examples of similar recurrent phenomena across studies, summarising and presenting them in a standard framework (a pattern), and showing how they can be pertinent to design. Other work on patterns [17] is related to research into patterns undertaken in software engineering [13] and HCI [3][5][8][9][12], but has its own particular flavour. It originates in the work of Christopher Alexander in developing architecture patterns, outlined in two books; *A Timeless Way of Building* and *A Pattern Language* [1][2]. Alexander presents a pattern as *"a solution to a problem in context"* which takes account of the relevant *social* and *physical* aspects of the setting, or what Erickson has termed 'a fundamental invariant in the deep geometry of the world.' Utilising ethnography as a resource for design, such a characterisation holds particular appeal for translation to a number of domains [18]. Over the course of our studies, we have sought to highlight the importance place of cooperative interaction, which is facilitated and supported by the context in which it takes place, in enabling the achievement of work.

Like Erickson [10][11] we are attracted to the idea of patterns as a way of representing knowledge about a workplace, 'telling a story about a workplace', that allows it to be re-used and communicated to a multidisciplinary design team and used in the "messy, indeterminate situation" of design. In this approach patterns are regarded as complementary to fieldwork investigation - a device to be used after the fieldwork stage and as part of the process of analysis and design. This paper addresses some of the issues of how patterns discovered in other settings may be used to aid understanding in a new setting, and generate concepts, issues and ideas for work and technology (re)design. The setting discussed is a council planning department in the North England. We demonstrate how patterns may be developed from ethnographic study and applied to the re-design of work, focusing on activities surrounding the processing of local government planning applications.

Background

Local government in the UK, following in the footsteps of other major institutions both private and public sector is going through changes that might be termed 'modernisation', 'rationalisation' or 'restructuring.' One major change is the movement towards *e-government*. By government directive, all district councils have the requirement to deliver 100% of their services electronically by 2005. This *technological* initiative is fuelled by computer-based technologies such as the Internet. As well as e-government, two other initiatives are currently prominent for the council studied; *Best Value* and *Access to Services*. Best Value, is about striving to provide an efficient and effective set of services, giving the constituent tax payer value for money and bringing a private sector market ethos into local government. Access to Services, however, is based on a more democratic ethos, one of social inclusion, providing multiple forms of access for constituents to services in order, in principle, to provide equal access to all.

These different initiatives cannot, however, be thought of as discrete projects that have no bearing on each other. Sometimes they may go hand-in-hand, sometimes they may suggest conflicting courses of action. For example, migrating

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process to a more electronic form for the purposes of e-government may also provide the opportunity for streamlining, removing areas of duplication and cutting down on paper consumption and photocopying costs. However, providing Best Value, financially, may mean cutting back on expensive types of service, especially those provided face-to-face and so may actually prevent certain access to services. These matters cannot be taken lightly, changing processes and developing technical solutions raises a number of issues. For example, previous experience tells us that what seems like the simple reduction of paper does not always turn out so, and providing electronic services does not necessarily ensure reaching a wider audience.

Setting and Methods

The field study consisted of a five day "quick and dirty ethnography" [13], conducted in the planning department of a local council, which processes and assesses applications for building and development. The particular form of ethnography employed for this study, ethnomethodological ethnography, involves recording the details of real-time activity as it occurs and paying attention to how work is achieved as a recognisable social accomplishment. We observed everyday work in the office, sitting with or shadowing different personnel as they carried out their work, (including going on site visits with a planning officer (PO)), unstructured interviews and attendance of the planning committee meeting. The materials collected were copious fieldnotes, and various artefacts (planning documentation, worksheets, process maps, photographs, etc.).

The Application Process

In this section we will detail the basic, idealised, process that a given planning application will follow. Figure 1, below is a copy of the outline of this process taken from an internal 'manual'.

Receipt: When a planning application arrives, an administration assistant (AA) checks the application form mainly to confirm whether there is a payment for the appropriate fee. The details of the application are entered in a notebook and logged on the system (UniForm). The system checks the address and produces a compound reference number.

Validation: The next stage is completed by an Area Administration Assistant (AAA), who carries out a more detailed assessment of the application, called 'validation'. This is not an assessment of the feasibility of the application itself but rather whether the right documents have been supplied in the correct format and been properly completed. In theory any invalid application may be sent straight back to the applicant for resubmission and cleared off the system. In reality it tends to be only those that are particularly problematic which are rejected. Ones with lesser problems (this is very common) are kept in a tray to one side while the administrator enters into dialogue with the applicant or their agent. Once a plan has been validated, the application is passed onto a planning officer (PO).

Planning Application Process Stages (figure 1)

Stage	Process	Working Days from Receipt
1	Receipt/Validation/ Consultation/Publicity	1-3
2	Overview/Allocation	3
3	Site Visit/Appraisal	No later than 9
4	Negotiation	up to 18
5	Report	19-
6	Decision	?
7	Appeal	

Site Visit And Appraisal: On receipt the PO will look over the case to see whether there are any particular features of the application that warrant attention. The next stage is a site visit. This involves a preliminary look and assessment of the site, the fixing of a public notice referring to the proposed development and the completion of a site visit form. The assessment involves making a set of judgements based on what can be seen and envisaged. It is reported to be crucially important to see the site for proper judgements.

Constraint Assessment: The 'technician' makes a formal assessment of all the '*constraints'* pertinent to the site of a particular proposal. This involves discovering whether there are particular considerations to be taken into account for building on a particular site. This involves layering different sets of constraints as system operations onto the map (using an application called Cartology). For example, listed buildings and sites of importance for nature conservation (SINCs) are on the system. These show areas and present patterns across the map where applicable and determine who should be contacted about the application. However, only some constraints are available on the system. Others are covered on a series of hand constructed maps held in a series of highly organised files.

Negotiation: Next there is a period of about three weeks in which *negotiation* can take place. In some cases this may simply mean slight adjustments to plans but clearly objections may come to light meaning resolution is a more complex outcome to achieve. In these cases the application needs to go to committee.

Planning Committee: Planning committee meeting are held monthly and serve as the forum in which applications with objections are resolved. For each application under consideration the Council presents their case and their recommendation. This is followed by an opportunity for one proposer and one opposer to address the committee. After a fairly brief debate, usually a decision is suggested and an informal vote via a show of hands is made. Usually, one of three decisions is made – approval, rejection or further consultation.

Patterns of Cooperative Interaction

The preceding sections outline the application process in a simplified fashion to provide background rather than showing the detail of planning as a lived set of activities. Before looking at some activity in more detail we will provide an introduction to the *patterns of cooperative interaction* to be applied to the setting. Previous studies provide opportunities to acquire experience that can help in making clear contingencies for design and their possible implications in new situations where the organisation of work, as a collection of everyday practices, bears similarities to previously encountered phenomena.

Patterns, as produced in computer science, have generally been solution oriented. In software engineering the move has been to produce books of re-usable templates [6]. For Alexander, however, description is a crucial component of a pattern and the particulars of the solution for every case in which it is used **must be worked out for that case**:

"each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice."

The patterns we have developed focus on description, illustrating recurring phenomena (patterns), through fieldwork vignettes (or 'stories' [7]) from different studies in the corpus of ethnographic studies of work and technology. The vignettes - like Erickson's notion of 'storytelling' in design or Orr's [20] account of 'war stories' - illustrate cooperative interactional phenomena without a necessary assessment of 'success' for the arrangement for the setting. Some vignettes clearly describe situations that work well, while others describe problematic arrangements, however in many there may be 'successful' and unsuccessful' features on display. Their use in application to new settings is threefold:

1. In providing a characterisation of newly encountered and described phenomena - i.e. providing a concept for understanding that may become a design concept (see [11] on *lingua franca,* 2000)
2. In drawing on previous experiences outlined in pattern examples and the studies they are from to understand a current situation, design problems and so forth.
3. In envisaging possible design solutions by, for example, considering alternative pattern arrangements from other studies, how patterns have been supported, altered, improved and so forth.

For our purposes we departed from the form of presentation developed by Alexander and developed our own (5 featured) presentation framework that draws on previous work concerning presenting ethnography under a mixture of *spatial and work oriented themes*. The production of this framework is described elsewhere [17]. The framework details each pattern according to a **name** and **descriptions** provided per vignette in five descriptive 'slots':

1. ***Cooperative Arrangement:*** details the actors, resources (artefacts, communication media) involved in the activity described in the pattern.
2. ***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).
3. ***Ecological Arrangement:*** features in the layout of the setting and artefacts and their affordances for the accomplishment of work.
4. ***Coordination Techniques:*** practices employed in carrying out action/interaction and how coordination is achieved.
5. ***Community of Use:*** the user groups or affiliation of actor's involved.

We have a set of 6 patterns of cooperative interaction: where each is illustrated by fieldwork vignettes from *at least two* different field studies:

1. **Multiple Representations of Information**
2. **Artefact as an Audit Trail**
3. **Use of a Public Artefact**
4. **Accounting for an Unseen Artefact**
5. **Working with Interruptions**
6. **Forms of co-located teamwork**

We also have a number of possible seed patterns where we have examples of recurring patterns of interaction where we have not fully developed the pattern. In the following sections we will demonstrate the application of pattern 5 - *Working With Interruptions* - to the council planning department and also discuss the relevance of two seed patterns to the setting: *Configuring The Customer*, (a phenomena discussed in [16]); and *Receptionist As A Hub*, proposed by Erickson [11]. As was described at the start of the paper the relevance of redesign in this setting must be seen in the light of moves to provide *access to services* by *e-government* while delivering *best value* in terms of effectiveness and efficiency.

Applying Patterns To A Council Planning Department

Thinking about patterns of cooperative interaction after carrying out the field study, one pattern which seemed particularly relevant was '*Working With Interruptions'* (see below). It was grossly observable that personnel had to deal with interruptions as a routine feature of their work. Not only did other council workers come in to speak to them and phones ring, there was a high level of talk amongst the staff themselves and periodically members were called to the front desk to answer the queries of members of the public. Furthermore, certain aspects of the organisation of work were clearly developed to respond to interruptions. Although it worked imperfectly, the rota system on the front desk was designed to remove those not on current duty from 'the firing line' (or one source of interruption). In the accounts of personnel it was also an organisational concern. One manager stated that they were *"actively discussing whether they were*

providing too good a service" going on to detail that the department ended up assisting many people in constructing their planning applications, helping them with more information and advice than they should and that many of these people should get an agent to carry out this job. Unfortunately, the openness of the council to these types of queries and the level of service the public had come to expect contributed to the situation.

To illustrate some of the forms of interruption encountered consider the following examples of interruptions from fieldnotes:

1. The administration assistant (AA) is adding a new application to the system. The address (house name rather than number) is not contained on the system records. She approaches a planning officer nearby to query this. The planning officer (PO) says she will check the precise address on her site visit. The AA manually inputs the address provided (for the time being).
2. *Sitting with an area administration assistant (AAA)…*The phone rings. It is an architect seeking information on sewers in area N. He has already talked to the water board (the principle authority for such queries) but is seeing if the council has further information in its records. A phone message is taken and the AAA passes this onto the technician (T).
3. PO approaches the AAA. *"Weren't you working on…*(case details)….., *do you know where the microfiche* (old record) *is"* . AAA - *"No, I didn't need to look it up because I know the* (physical) *location"*.
4. *Sitting with an AAA….* The phone rings. A member of the public wants to know if she can object anonymously to a planning application. She is told she cannot.
5. PO1 states to the group of workers on finishing a phone call, *"Do you know if Tony ** dropped off some bricks - farmhouse red* (a materials sample)". PO2 joins her in looking for the sample and pulls one up, but PO1 states that this is the wrong one. PO2 states, *"was this last Thursday"*. PO3 joins in, showing the correct sample and stating, *"these"*. She then provides PO1 with details of the site and whether the bricks have the 'right' qualities.
6. The AA is processing a decision notice when she points out an initialled post-it note on the case folder, with *"re-date"* written on it. She approaches the initialler who directs her to the manager who tells her to put today's date rather than the signing data (the usual practice) on the letter.
7. The AAA who has been manning reception comes into the office and consults with both the administration manager (AM) and a PO before returning to reception (and a client).

Looking at these examples of interruptions and, at this point, bringing in our pattern - *Working With Interruptions* (**see pattern with 2 examples from different ethnographies below, figures 2a,b**) - we can begin to analyse our phenomena. Interruptions can be basically characterised as originating from within the office (by co-workers - examples 1, 3, 6) or without (by members of the public, other agencies and so on, example 2, 4, 5, 7). As with our pattern examples, interruptions from outside are very much part of the work, however, in this case (as opposed to e.g. the help desk) they are not considered the 'core' work and instead, at best, augment planning processing. Managing these outside source interruptions is also more problematic, in that they draw on staff resource in an immediate fashion, often without being screening for whether the query is appropriate or the worker the right person to answer it. In example 2, it is questionable whether the council should field such a query as it is really meant to be dealt with by the water board, also the AAA needs to pass it on to the technician. In example 5, we see a phone call leading directly to interaction between 3 POs. It is through their teamwork that it emerges that it is PO3's case.

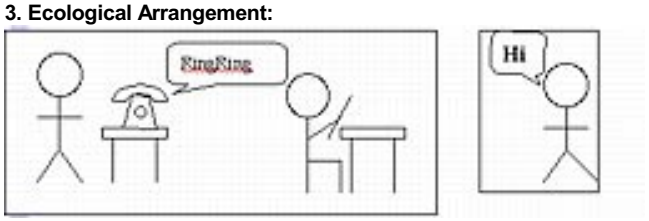
Figure 2a: Working With Interruptions

The Small Office – Hotel Training Centre [19]

1. Cooperative Arrangement: Small group of workers (manager plus three other employees). Location within a site and close co-location. Focus on the different forms of '*interruptions'* from different sources. Interruptions are both an integral feature of their work and its generation. Interruptions are contrasted with 'routine' paperwork.

2. Representation of Activity: The activity and the outcome of the interruptions becomes represented in the *"massive volume of paperwork"*, generated by the office. Interruptions come from phone calls, the front desk and from clients and other hotel workers. Interestingly, workers see the interruptions as the main activity of their job yet they are interruptions to the paperwork that is generated by them. The paperwork representations contain a lot of repeated information but this duplication is a lot to do with the different purposes and destinations of the various documents.

3. Ecological Arrangement:



One worker sits at their desk doing paper work while the phone rings and a client arrives at the front desk.

4. CoordinationTechniques: Workers must coordinate doing various paperwork tasks with dealing with the interruptions that come from various sources – telephone, front desk and so on. This involves deciding which types of paperwork can be interrupted, how long different tasks take and so on and coordinating this with different times of day and notions of the likelihood of outside interruptions. Workers must also coordinate with one another to decide who should deal with a particular interruption, who is in the best or most appropriate position to deal with it.

5. Community of Use: Inter organisational group of workers in a hotel training centre small office undertake various interactions with outside clients.

As with our other pattern examples, workers have the overhead of having to spend time re-familiarising themselves with interrupted work and furthermore are not credited with the time spent dealing with such interruptions except for

when they are on reception duty. As has been shown in other studies [19] some 'interruptions' in the planning department can be a positive work phenomenon. The collaboration achieved between co-workers, whether arising from sources inside or outside the office, allows personnel to draw on one another's local knowledge of cases, incidents, procedures, agencies, the landscape and so on. We can see this throughout the examples cited as facilitating getting the work done. Workers approach other workers for their particular knowledge, questions are asked in the open and picked up upon by others, interruptions are projected by putting attributable notes on cases and so forth. As well as aiding the immediate achievement of work, such interactions facilitate group development over time as skills and knowledge are shared. The other positive feature of co-worker collaboration as opposed to dealing with interruptions from outside is that these interactions can be negotiated in a way not possible when the interactors are not co-located. Workers can gauge when it is a good time to interrupt through, for example, glancing over and seeing what activity a co-worker is engaged in.

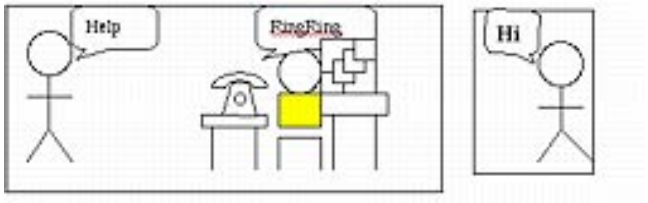
Figure 2b: Working With Interruptions

Bank Help Desk [12]

1.Cooperative Arrangement: Small group of workers (manager plus three other employees). Location within a site and close co-location. Focuses mainly on the way in which the routine '*interruptions'* of calls to the help desk (also from other sources) can be problematic for completing and recording the work generated by other calls, correspondence and so forth.

2. Representation of Activity: The business of the calls is recorded on a special application – 'Capricorn'. This involves opening up a session for the call and categorising the call upon completion, providing a text narrative, then closing. The time from opening to completion is measured. The study draws attention to the problems with these representations off the calls. Interruptions can mean open call sessions are forgotten meaning their times are inaccurate.

3. Ecological Arrangement:



One help desk operator is sitting by their computer and telephone with multiple windows open on their system (yellow backed chair). The phone rings while a colleague asks for help and someone from another department comes and says 'Hi'.

4. Coordination Techniques: Placing work in an interruptible state and picking up work from where one left off constitutes an extra time overhead. An informal system of first, second and third on the phones was operated by the call takers but had to be negotiated as some clients sought continuity of service with particular operators. Operators interrupted one another to draw on individual knowledge, elaborate records, engage in teamwork activities and so forth. Interruption also came from other areas of the bank.

5. Community of Use: Inter organisational group of workers on a bank help desk undertake various interactions with outside clients and each other.

Hopefully the reader can see from the above discussion how the interruptions pattern helps us to contextualise and understand through comparison the phenomena encountered in the planning department. Over and above adding another pattern to our collection, this informs work and technology (re)design for this situation along the lines that in the moves to e-government and the ensuing work re-organisation special attention should be given to minimising and managing interruptions from outside sources while maintaining the support for interruptions between co-workers within the office. Certainly, the council should be seeking to avoid creating more outside interruptions being generated through queries of all sorts related to electronic channels of delivery.

Realising Design Implications Through The Use Of Patterns

In the view of the contingencies created by moves to *e-government* and the *access to services* and *best value* projects the 'problematic' phenomenon of immediate interruptions from outside the planning department can be dealt with in a number of ways. Various goals in any work (re)design can be envisaged in order to improve the situation and in so doing, improve value. For example, the council may try to do one or more of the following, bearing in mind that a goal for the design of electronically delivered services is to reduce the time spent handling interruptions without reducing the quality of service as perceived by the public:

- Reduce the amount of interruptions.
- Reduce the unpredictability of timing of interruptions.
- Remove the requirement for immediate response to interruptions.
- Ensure the suitability of interruptions.
- Ensure interruptions reach the appropriate member of staff.
- Record the work of interruptions as part of their processes.

Reducing the amount of interruptions: Possibilities for doing this include cutting back on current access to the planning department. For example, restricting the hours of public telephone or reception access. Interestingly, the council benefits section already does this. The council could also look at changing its service provision, for example, in tightening its notions of reasonable assistance in helping with planning applications. Although some form the above might be implemented, it is also worth considering whether the amount of interruptions might be addressed if the council was to engage in a process of informing and integrating their clients more completely into their processes. This type of activity has been discussed elsewhere in connection with banking under the title of *configuring the customer* (see below and [16]).

Reducing the unpredictability of timing interruptions: We have already discussed the possibilities for restricting telephone and reception access to personnel. Building upon this we have to consider whether this restricting of access goes against the *access to services* project. Encouraging

clients onto other channels such as email might hopefully reduce the amount of interruptions while allowing staff to respond in a time that was more suitable to them. Any developments along the lines of introducing new channels while restricting access to others would have to be carefully monitored to find the best balance.

Reducing the requirement for immediate responses: Clearly, migrating clients onto channels such as email is one way in which the council might try to reduce the need for immediate responses to interruptions. Of course, it is acknowledged that one of the reasons for the preference for the phone is likely to be its *immediate* quality, therefore the encouragement to electronic services needs to be right. Another possibility for reducing both interruptions and the need for immediate responses is to provide some form of query screening. FAQ lists and/or temporary recording of questions at the point of access (phone and face-to-face) - the reception. Erickson [11], describes a pattern - *receptionist as a hub* (see discussion below) - along these lines in describing the receptionist's activities in a consulting firm.

Ensuring the suitability of interruptions: clearly the type of screening discussed in the previous point would be one manner of controlling the suitability of interruptions to the planning department. Currently, the main council telephone receptionist carries out a small degree of screening and filtering but since their knowledge of planning is necessarily small their ability to decide whether a call is appropriate or who it should be put through to is rather limited. In order for them to increase this substantial training would be appropriate and the fact that amongst other ramifications, part of the workload would shift from the department to the receptionist would need to be recognised. The departmental workers manning the reception desk, on the other hand, currently carry out more effective screening and filtering.

Ensuring interruptions reach the appropriate member of staff: Possibilities for screening and filtering interruptions have already been raised in the previous point. At this stage it is useful to also consider another choice; interactive voice response (IVR) call handling applications. IVR which would require the caller to select a service via touch tone interaction on their telephone is one method that is very popular for these services in, for example, the financial industry and utility services. This could undoubtedly help the job of the department, however, careful consideration would have to be taken in the design of such an application and this would have to be seen in the light of *cost-benefits* and *ambiguity over client usability and satisfaction*. It is again worth noting that a process designed to attempt to *configure the customer* might aid with this problem, however it is acknowledged that this is one method employed in other sectors to aid in doing precisely this (along with the use of scripts and the practices employed by phone operators,[17]).

Recording the work of interruptions: The work created in and from interruptions currently is seldom recorded, save for some telephone messages in the case files. In this way staff are not credited for this integral part of work. Official measures of work performance *(best value* ratings) centre on processing time rather than case complexity or number or detail of interactions with clients. A more realistic measure would take these features of the work into account. Given the overhead of recording such events either easy measures such as number of contacts would be sensible or simply this feature of work should be acknowledged.

In the preceding section we demonstrated how the phenomena of interruptions can be taken up as a design theme and usefully be employed to generate a series of design considerations. In delineating these we related the discussion to two types of phenomena discussed in previous research (seed or potential patterns); *configuring the customer* and *receptionist as a hub*. In the following sections we take up these themes and apply them in more detail to the design situation showing reciprocally how they may inform design for this situation while the situation may provide pattern vignettes to add to our pattern collection.

Configuring The Customer

Businesses and public services are now seeking to communicate with their clients or customers through a mixture of channels. Indeed, this is also geared to switch as many interactions between the public and the organisation to more 'remote' channels such as the telephone, and increasingly electronic (e.g. Internet supported) services. This, particularly in the electronic format, diminishes the role of the organisational representative (operator, clerk etc.) as a mediator providing explanations and so forth and translating company speak and company procedure into something understandable and relevant for the customer, and vice versa. Undoubtedly, a key reason for the introduction of 'remote' channels is to improve efficiency (staff and 'bricks and mortar' costs should be reduced), however if the type of mediation observed in face-to-face interactions is not available in remote channels or designed into the technology, envisaged savings may not materialise. Instead costs may be shifted to servicing and supporting the remote channel as can be seen by the boom in help desks (See [15], for an example). One way round this problem may be to design, for example, electronic channels to support customer practices and reasoning (see [15][6][18], for Internet banking examples). This can form the basis for the interaction model, functionality and interface design of the application.

Another option, one particularly popular with banks, is the idea of *configuring the customer*. The idea is that the organisation integrates the customer into their processes, teaching them to interact with them in the organisationally relevant manner, so translation is less and less frequently required. Martin and Rouncefield [16] describe ways in which bank telephone operators shape customer interactions, through explicit and implicit conversational practices, to be organisationally relevant. Over repeated interactions callers will be more likely to produce the correct information, in the correct form, more quickly. In this way, configuring the

customer is considered to have the benefit of reducing support requirements while also making interactions more efficient for both the bank and the customer.

This discussion clearly has relevance to the council, particularly concerning creating an electronic planning application process. Workers are fundamentally involved in a mediating role when dealing with interruptions from outside sources. Any move to an electronic process may simply generate more work in servicing and support. From creating electronic versions of the application (which may involve large scale scanning of paper documents) to answering a wide range of new, computer related, client queries over and above the current range of interruption topics. Clearly, when thinking of design the council should be including the client as part of the process. The client perspective should be understood and how they may be configured should be a high priority. For example, client centred, standard electronic templates (and other features such as context sensitive help) for the planning application might be made available through the council website that are compatible with the council's electronic record system. This could be supported by an email query service creating a fully electronic application process. With benefits that the council might reap, including time saved in not having to scan in documents and easier management of queries through email (not phone interruptions), clients could be encouraged by a reduced (electronic) planning application cost. The electronic process, clearly would supplement current partial electronic processes but begin a move towards e-government, with the clearest opportunity for recruiting users out of their regular clients (architects and agents) who already have the technological resources.

Receptionist As A Hub

Erickson, [11] presents *receptionist as a hub* as a potential pattern derived from a field study of a consultancy firm [4]. The 'pattern' describes how the receptionist acts to coordinate the activities of the firm. They deal with all incoming calls and visitors (interruptions), filtering and diverting to the correct people. Similarly, they are the 'front line' source for information about the firm and its workers, both for internal and external sources. In other words they know (basically) who is doing what when and where. Erickson makes no specific evaluation of the pattern, however, implicitly it is clear that the receptionist is integral to the running of the company. In the council we can see a similar phenomena, but different, and in the light of the discussion about interruptions we are able to offer a more critical appraisal of the pattern (at least for our case). From the planning department's perspective, the hub is 'manned' by the council receptionist who deals with all calls and council inquiries, with situated next to her, two planning workers (whoever is on the rota) on the planning front desk. As noted, currently the general receptionist can do little screening of interruptions as her knowledge of the department and its workings is limited. The planning desk can do, but that does not stop interruptions being carried through to the back office. Erickson's receptionist, undoubtedly highly skilled, can fulfil a more complex role presumably because of the size of the firm. The council receptionist covers many employees over disparate departments. In order to try and do a similar role she would doubtless have to be *trained up* and *multiplied* (i.e. one per department). Reducing the number of interruptions would have to be catered for by, for instance up-grading the job or employing more staff. An alternative possibility of IVR and the issues it raises has been discussed above.

Conclusion

Some researchers in the HCI and CSCW communities (e.g. [21]) have raised questions over the real usefulness of ethnographic studies for design. Firstly, this paper seeks to demonstrate one way in which both an ethnographic study of council planning and patterns of cooperative interaction (derived from the ethnographic corpus) as devices of *generalisation*, *comparison* and *re-use* can together be used to frame our understanding of phenomena in a new setting, generate design concepts and issues and envisage potential design solutions. The application of the pattern, *working with interruptions*, provided a theme for (re)design. Detailing the *specifics of this patterns for this situation* allowed us to make meaningful comparisons with similar situations [22] (other examples of the pattern) and so gain a better understanding of the current situation, design issues, potential solutions and their possible ramifications. The discussion identified outside interruptions as a design problematic and through the use of two other seed patterns - *configuring the customer* and *receptionist as a hub* - we were able to enrich this process. Several potential design ideas were put forward and discussed.

Whether the design ideas should be taken up and how they should be followed through is an issue for the project team or the designers. The work discussed here is meant to be presented in a manner where its accessibility and relevance to these stakeholders should be apparent. The work is designed to make apparent a number of design considerations in a manner that makes it accessible for future development. As part of the design process, the work of the ethnographer does not have to stop here. If the identification of outside interruptions as a problematic is agreed upon along with the ideas contained in configuring the customer and receptionist as a hub this can project further, more detailed study. For example, a thorough, more detailed study of the nature of client-organisation interaction (outside interruptions) might be undertaken to understand client practices and reasoning - what types of queries are raised, how are they formulated, how is translation achieved and so on. This might be used to help the design of an IVR call filtering system, or go into the design of a web application for electronic planning application (presentation, wording, help mechanisms and so forth). As prototyping and evaluation proceed further studies

or analysis might be required (notions of this form of design method are discussed in [13][6][18]).

In previous work on patterns we demonstrated and discussed the generation of patterns of cooperative interaction without showing how they might be used in an actual design situation. In this paper we have sought again to show how patterns and instances of patterns may be discovered and then made some suggestions as to how they might effectively be deployed. Although not shown here, (see web page instead), clearly we have found another pattern example of *Working With Interruptions* and by relating our work to the seed patterns of *Configuring The Customer* and *Receptionist As A Hub* we may have found the second examples of the phenomena that we require to turn a seed pattern into one of our collection. Primarily, we have been concerned with demonstrating how patterns may be usefully employed in design in the 'real world' example of local government. Hopefully, we believe we have also brought some interesting issues to light for the design of e-government services, which are currently a major consideration in this sector. Whether patterns are an effective means of communicating the lessons of fieldwork investigations, the critical problem of evaluation, is an issue we need to address in the future.

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