Talk and Visibility: ‘One person is out of the car—Did you hear that?’

Mårten Pettersson
Blekinge Institute of Technology
marten.pettersson@bth.se

Abstract: This article presents two examples of how call operators become involved in handling of cases within an emergency service center. The focus is on how the way operators talk and use artifacts in the room support that other operators become involved in the handling of the cases. The background to the field study is an ongoing project that develops a new Computer Aided Dispatch. One of the functions of interest in this new computer system is call distribution. This involves thinking of letting operators at different service centers cooperate and share cases across distance. It is argued that the way the operators talk and use artifacts inside the present shared room are to be considered in the design of the future computer system. It is also argued that those themes are important when dealing with the design of call distribution.

1 Introduction

In an ongoing research project the Swedish emergency service center and the Blekinge Institute of Technology work together in order to create a functional requirement specification for a new ‘technology platform’. This platform consists of different applications, including for example a Computer Aided Dispatch (ComAiDi) system. The service-centers are responsible for handling emergency calls to the emergency line 112 (the standard European emergency line number, corresponds to 911 in the US), responding to automatic alarms (i.e. for fires or break-ins) and keeping track of and coordinating the use of ambulances. Also, at the centers commercial services such as on-call duties are handled. Within the project we have conducted field studies with focus on the work practice of the operators at four centers of different sizes but with
similar technology, i.e. different versions of the ComAiDi system. The descriptions and analysis of the work practice aims at being a ground for departure in the work with the design of the new technological platform. The aim is also to investigate relations between studies of work practice and design activities. A ground for design means that we would like to account for how the work is carried out today, tell stories from the field in an informative way so that the design of artifacts such as a ComAiDi system can benefit from it.

An aim for this paper is to explore some design issues when designing a ‘center of coordination’ that is distributed in space. Those possibilities is to be related to the themes of talk and visibility. The following questions are in focus in the paper: How people at centers of coordination enter and exit the flow of activities? How the use of artifacts in the setting facilitates the movement out and in of the flow of activities? The focus on talk examines how service-center operators talk to callers and each other when handling calls. The concern with visibility focuses on how the use of artifacts in the center supports awareness of “what is going on.” An example of how this distributed center could work is that a call is answered at one site by one operator and resources dispatched in real-time by another at a different site. In this paper the term call distribution is used to approach this design issue. Today each center handles its own area of calls during normal circumstances, e.g. when the technology is up and running and the amount of calls are at normal levels. There is backup system for the centers, which allows calls to flow over to another center if they are not answered within a certain amount of time.

2 Background

2.1 Two themes: Talk and Visibility

Several researchers have reported on fieldwork in work settings characterized as centers of coordination. As Suchman (1993:1) writes

Centers of coordination are characterizable in terms of participants’ ongoing orientation to problems of space and time, involving the deployment of people and equipment across distances, according to a canonical timetable or the emergent requirements of rapid response to a time-critical situation.

Research on centers of coordination considers how people’s interaction with artifacts, for example computer systems and computer monitors, provides a way of letting others become aware of what is being done. Another issue explored is the way the talk of the operators, for example on the phone, lets others in the room know what they are doing.

The notion of flow of activities addresses the tasks and subtasks that the operators within the center do. The meaning of flows of activities is related to
the notion of flow of work discussed by Bowers et al. (1995). The authors describe how printers achieve a flow of work by an ad hoc re-planning of the organization of the task at hand to better suit what needs to be done. They write

Workflow from within characterizes the methods used on the shopfloor which emphasises the local and internal accomplishment of the ordering of work. Workers juggle their in-trays, jump the gun, glance across the shopfloor, listen to the sounds coming from machines, re-distribute the work in the here and now so that what to do next can be resolved. In the here and now, in real time, workers encounter multiple jobs of a varied nature, requiring artful scheduling and completion. (Bowers et al., 1995:63).

The notion of flow of work is promising when describing and analyzing the operators’ work. The notion of flow of activities addresses the tasks and subtasks that the operators within the center do. Instead of printers they see their colleagues. They also monitors the shared database for what is going on. I.e. handling of the cases is a set of tasks that can be performed either by one operator or with assistance of other operators. An incoming call is represented as a beep in the center. When it is answered the task at hand, i.e. to respond to the event, consists of several tasks that the operators should do. For example the operators has to dispatch ambulances and rescue services, call the police to inform their dispatchers, give advice to the caller of what to do to assist with first aid, call the local radio station and inform about the accident. Those tasks are planned in advance and to be found in a list referred to as an event plan accessible by all operators via the shared database. Entering the flow of activities when handling a call means to be involved in the management of the case(s) at hand.

Artifacts may be used in a way that they are visible to others. For example, the controller in the London Underground control room may enter the flow of activities when his/her colleagues switches camera, at the closed circuit television system (Heath and Luff, 1991). What operators do with shared materials supports an awareness of what is going on. Their own actions may be dependent upon what the others do, and within the literature there are many examples where operators in control rooms ‘render tasks visible’ (Heath and Luff, 1991:73).

Whalen (1995:164) describes the work of emergency call dispatchers and points at the importance for them of knowing the location of the available resources for dispatch. He also discusses how the dispatcher’s work is interdependent on the work of many other dispatchers. The dispatchers do not work by themselves, but ‘coordinating tasks’ and ‘perceiving information’ together with other operators. Whalen writes that the various dispatchers “develop a conjoint, closely interrelated orientation toward a set of task and activities” (ibid, p. 168). Heath and Luff give an example of a “collaborative technique” used by the staff in the control room (1991:74) where controllers talks aloud in a way that the other personnel in the room can hear what is
being said. For example, controllers use phrases, key words, and movements to get the attention of other controllers. Part of controller’s work is to make ‘publicly available’ their action to others (ibid, p 76). Artman and Waern (1999) points out that the operator in an emergency service-center often repeat the actual words of the caller in a way that what the caller says becomes accessible for the other operators in the room (p. 190).

Bowers and Martin (1999) describe the work being done by call-operators at an ambulance control center to “inform the development of Collaborative Virtual Environments” (p. 309). They, among other things, focus on how the locations of displays and the different information at the different computer monitors helps other operators monitor the actions of colleagues (ibid, p. 318). In a similar way the placement of the tables in the traffic room, where the access to the database is given, makes the operator to move around in the room. That is, the artifact might not be very far away and still it mediates a visibility of what is done.

Design in this paper includes the work with analyzing what functions the new system should have. The design in this sense includes questions about what the system should support, which places should be interconnected and which artifacts to be included. It is also of great importance to think about how the interface to the computer should look and where it should be placed.

3 Two examples

In the following section two cases focuses on how operators become involved in particular cases and assist other operators. Both cases are real cases observed in one of the emergency service centers. The cases are presented as stories of how the service center work is carried out today. In the analysis of the cases the focus is on how the operators move about the room, use particular artifacts and talk with the caller and each other. In the first case the point is about the interplay between visibility and talk and the way the call-taker Erik checks that Amanda has heard what he said. The way Erik embeds the talk with the colleague in the talk with the caller is also analyzed. The second case is an example of how many operators enters the handling of a cas. It is also an example of how the map is used as a shared artifact that makes visible what is going on.

3.1 A brief overview of the setting

Inside each service center there is a control room called the traffic room. The terminals have different numbers (from one to 12) and are grouped as shown in figure 1. In the middle of the room at each side of the traffic room there are sets of paper maps, hanging from the ceiling. The maps are called rescue-maps and shows what are called rescue zones. The rescue zones represents
areas within which a certain rescue-service or ambulance or police shall be dispatched.

The operator that answers a call or an automatic alarm, the call-taker of that call, has the possibility of dispatching ambulances and the rescue-service by him- or herself after the call is hanged up. He or she also has the possibility to request help in the form of listening-in when the call is still going on. Listening-in is a function that lets another operator listen to the call and assist with the dispatch. The emergency service center sometimes describes this function as a two-and-a-half part conference where the caller and the call-taker are defined as two parts, and the listening-in operator(s) is the half-part. The half-part refers to the fact that what the listening-in operator says can only be heard by the call-taker, not by the caller. All cases become visible since they are stored in the ComAiDi accessible for the other operators in the traffic room. It becomes available for the others in a sense that all actions taken in a case, for example calls, communication radio conversations, and advise given are logged by the system with time and signature of the operators. This makes it possible for the operators to see what has been done within a case and by whom it has been done.

3.2 Case 1: ‘One person is out of the car – did you hear that?’

The operator Erik sits in position 4, and is answering calls to the 112-line. Amanda who sits at his right (position 11) is the ambulance director for the day. As ambulance director she is responsible for keeping track of, and contact with, the fifty ambulances within the area.

A beep, indicating a new telephone call, is heard from the terminal. At the screen the call becomes visible in the call-queue. Erik looks at the screen and answers the call by pressing the answer key on the keyboard. He says “SOS one-one-two. What has occurred?” The caller says he is calling about a traffic...
accident outside a village some kilometers from the emergency service center. The operator asks if there is any person injured, and then requests listening-in by pressing the listening in button. He directs the request to all operators in the room by pressing an asterix (*). Another beep is heard; the request becomes visible at the call-queue at the screen. Amanda answers the request and looks at her computer monitor for the ComAiDi system. When answering the request the basic form for the case is created and appears on her screen with whatever updates Erik makes. Erik starts to describe the event by entering information into the basic form. The description includes the incident code, the name and address of the caller, and the driver. He says: “Well it is a car that has overturned, then?” The caller answers affirmatively. The operator asks if it is a single-car accident. The caller answers yes and Erik adds a respond form for the rescue service and the ambulance dispatch. These forms are used to add information and comments that are specific for ambulance dispatch and the rescue-services. Erik says: “Ahah… is it a single-car accident? … mmm” and continues to ask where the accident has occurred by saying “and where on the road fifty-five is this? After about a second later he continues “is: it the Vicksburg towards Oldmanville, or?””. When saying this Amanda, turns her head towards her computerized map. At the map she can see the current position of the ambulances. Erik continues: “Well: Five kilometers south of Vicksburg; … At Flyburg: How many persons are there in the car?”

Amanda raises and walks from her position towards the maps hanging from the ceiling. She pulls one of them down and a lamp in the ceiling lights up. She starts to point at the map that corresponds to the area where the accident has occurred. Erik raises and leans over his desk towards the map. They point at it together and Erik after about 7 seconds says “Flyburg. Is: it one person that=He comes out now=So there is no one left in the car then accordingly?” He sits down again and continue the description of the event. Amanda is still looking at the map. She says which rescue zone it is and then asks “How far from Flyburg?” Erik continues to say “okay, we will arrange that help arrives at once yes, indeed: we do that.” He then ends the conversation, saying bye-bye and hangs-up the call. Amanda returns to her terminal and sits down.

Figure 2. Amanda raises and walks to the rescue map. When she is there, and it is down, Erik raises from his chair and leans over towards the map—while continuing interviewing the caller.
When she sits down Erik turns his head to the computerized map screen and says what is shown in the following transcript:

11. The 3-2 is UA (Uppdrag Avlämnat - assignment ready) up there.”
12. Amanda: mmm (2.0)
13. Erik: Do you take the ambulance, the 3-2, there
He keeps a finger over the button for accessing the rescue service form.
14. [Amanda: yes
15. [Erik: so shall I take the rescue service, here. (0.1) One person is out of the car. You heard that:
16. Amanda: Yes (0.1) Do you know how many persons that were inside the car?
17. [Erik: Yes one. (.) According to the information.
16. Erik: (5.0) It starts to freeze now, you know.
17. Amanda: (4.0) Yes.

That the 3-2 is UA refers to its status. It is dispatchable, since it is ready with its current assignment. Erik then dispatches the rescue service and Amanda dispatches the ambulance.

3.3 Analysis of case 1

Amanda becomes involved in handling the case when she answers Erik’s listening-in request. The case becomes visible at her ComAiDi screen at the time she answers the request. The listening in function allows Amanda to hear the caller and talk to Erik without the caller hearing what she says. She can also see both what Erik is writing as well as enter additional information into the case that is visible to Erik and the other operators. She continues to listen to the call while standing in front of the map. Erik and Amanda communicate without directly saying anything to each other—the conversation between the operators is embedded in the conversation with the caller. The way Erik repeats what the caller says does two jobs. It serves as an indication that the operator has heard correctly. It also keep the other operators in the room informed about certain particulars of the call. Using the caller’s words can be considered to be an economical way of letting other operators know what is going on without interfering with the ongoing call. It is a way of talking with the other operators at the same time as continuing with the ongoing call.

When Erik hangs up the phone he says “One person is out of the car. Did you hear that”. This is a check that Amanda heard what was said to the caller. For example, at line 15 he says ”Flyburg. Is: it one person that=He comes out now=So there is no one left in the car then accordingly?” When saying later,
“did you hear that”, he is indicating that he expects Amanda to have heard what was said earlier. In line 15 Erik is confirming that Amanda heard that one person was out of the car—since he said that quite fast, and she was moving towards the map at the same time.

3.4 Case 2: The truck that hit the passenger car

At the time the call is answered four out of six operators in the room are involved in a conversation and are placed as is shown in figure 3:1. Karin answers the first call reporting the traffic accident. She starts to interview the caller about what has happened and where it has happened. She requests listening-in, which is answered by Erika at terminal 11. Karin says “Yes, you mean the road from Libertyville, do you mean the 52 then or (road number 52, authors comment)? Yes you know we have to know where you are. You can take… where do you come from? You come from the downhill slope then” Simone rises and walks towards the maps hanging from the ceiling (figure 3:2). She pulls down the map that corresponds to the area of the accident. When she pulls it down the light in the ceiling is turned on, and the electrical engine is heard.

When the map is down Karin rises from her chair, walks towards the map and continues to speak with the caller (figure 3:3). Amanda turns her head towards the map. Simone and Karin point at the map. Erika walks to the map. Her headset is still connected to the ComAiDi system. All three of the operators look at the map. Karin returns to her seat and enters some information into the case form. She tells the caller: “My colleagues are dispatching while we are talking”. Erika turns towards Karin and asks: “Is it the exit to Erikslund, or?” Karin says, “It is not the Erikslund, but the other one?” to the caller. Erika says: “Ask about the road description”, and then she

![Figure 3. The pictures shows how the different operators move in the room when handling the cases. 3:1 is before the call is answered (Please note that the operator at terminal 4, Paul, is not involved in the case), 3:2 when Simone moves to the rescue maps. 3:3 when Karin joins Simone in front of the map and Erika is on her way there. The last picture 3:4 shows Amanda standing in front of the map.](image-url)
returns to her seat and dispatches the ambulances.

About six minutes later Amanda answers the second call about the same accident. She says “SOS one-one-two, what has occurred?” And then “What was it about?” “The traffic accident, yes”, she continues. She asks the caller if he has been involved in the accident. He answers that he has been involved in it. At the same time as she associates the call with the ongoing case and then presses the button to access the respond forms for the case. The caller is told that the rescue service is on its way to the scene. Karin is in front of the rescue map and gives a road description. The caller tells Amanda that the driver of the car is alone, and still in the car. Erika, the ambulance director says: “Ask about the address, just to be sure” Amanda asks for the location of the accident: “there is no risk not seeing it if you come from that way, huh?” She raise from her seat and walks to the map. Takes a look at it, and then returns to her seat (figure 3:4). On her way back she tells the caller “They are on their way to you so they will be with you momentarily”. Karin that is on the phone with the same one as before, right after Amanda has said it, says “Yes, he knows that you are coming” Amanda sits down and asks the caller how he is doing. At the end of the conversation the caller says that he can hear the sirens of the fire trucks. That the fire trucks is about to arrive at the scene is entered into the case form. Amanda says “Yes then they are with you soon”. The call is then hanged up.

3.5 Analysis of Case 2

This case is an example of how several operators enter the flow of activities. Notable is that Simone who temporarily sit between Amanda and Karin in the beginning of the call walks toward the map and pulls it down. Moments later the three operators stand looking at the map. Erika has answered the listen-in request that Karin sent and can hear the caller. What Erika says is also heard in Karin’s headset. Simone at Karin’s screen sees what is typed in, and also hears what is said. The way it is said may also indicate the seriousness, or an uncertainty in the information given by the caller. For example Karin interrupts the caller in the phrase “You can take… where do you come from?”

Karin walks to the map that is down points at the map while continuing to interview the caller. Erika also joins them and after a while Karin returns to her terminal and continues to enter information into the database. Amanda looks towards the map, but does not participate in handling this call. Instead she sits at her position and answers other calls. Amanda enters the flow of activities for the case when answering the second call. When answering the call, Amanda looks up the traffic accident in the list of ongoing cases. She does not directly speak to any of the operators about this—but when she enters the information into the ComAiDi system, it becomes available for the other operators. The ambulance director, Erika, also asks Amanda to get the address once again. She does this and repeats what the caller says and then she walks to the map for a quick glance. Not only does Amanda seem to know
what to do, but her colleagues also take the opportunity to get updated information about the scene via her contact with it.

4 Design Issues

4.1 Call distribution

In the beginning of this paper the design idea of call distribution, where calls can be directed to other emergency-centers and operators at different centers might cooperate in the handling of cases, was introduced. Today operators at the emergency service centers enter and exit the flow of work when handling a case by occupying a shared space where talk and the use of artifacts are available for everyone to monitor. Previous research (see Artman and Waern, 1999, Bowers and Martin 1999, Suchman, 1993 and Heath and Luff 1991) and the cases presented in this paper indicate that the operators in the room monitor what the others are doing through glances, speech conventions, and the use of common artifacts. At the same time call distribution might make a more flexible handling of cases possible, there are some design issues to deal with. One of the challenges when designing a new system would be to support the awareness of what is going on over distance. The question then is about how to design support for this awareness off the situation.

Different levels of call distribution are being discussed for the redesign of the ComAiDi system. The first idea is to distribute part of the traffic, i.e. calls with lower priority than emergency calls to other centers within the region. This could ease the burden of the operators in situations when an emergency requires time and personal not available at a single site. The difference of this idea and the present solution is that today all calls are transferred to a backup center if a given center cannot for whatever reason handle incoming calls. In order to deal with associated calls from the scene of the accident a possibility would also be to direct all related calls from an accident site to the same emergency service center. Another level of implementation is an idea that suggests that operators at different centers share the handling of cases. To illustrate this idea one scenario might be that an operator at the center in Town 2 answers a call from the area of South East Town. After deciding that the event needs a quick response he requests listening-in. The listen-in request first is visible in the call queues at the ‘home site’, i.e. the site closest to the accident—in this case Center 1 (about 100 kilometers from South East Town). The request becomes visible in both Center 3 (230 kilometers from South East Town) and Center 1, but since all operators in Center 1 are handling other calls of high priority, no one answers it. Instead an operator in Center 3 answers the request. The operator in Center 3 answers the call and says ‘I am listening’, sees the case on her screen and starts to ask clarifying questions. After half a minute one of the operators in Center 1 is free, looks at the ongoing events in her own area, and accesses the on going call. When the call
is completed the operators says what they will do. In this way a temporal working group consisting of operators at different sites is created to deal with the case.

4.2 Visibility over distance

The first design issue concerns what aspects of awareness should be supported when moving into the distributed case handling setting. Glance, techniques for speech, and the use of common artifacts all are important aspects of the work and the setting—aspects that, in some way, are to be considered in the design process. Perhaps operators need to see it all—everything that is visible and hearable within the traffic room needs to be present in the remote setting. Perhaps it is enough to have shared access to the database. The database is used both during the calls to type in information about what has occurred, where it has occurred and to call out resources in accordance with the incident plan. What is done and by whom it is done is information that sometimes is used by the operators to inform callers about what actions are taken and when to hand over the call to the responsible operator. An operator can then when available go in a case and do task that are prescribed by the incident plan. What is typed in the database and information via the event plan about what actions are taken can be a part of the support of the awareness of the situation since it keeps a record of what has happened, what is done and what is planned to do within the case.

The same functionality as today, but over distance may mean that we have to look for something completely different in the technology support than today. There are some areas that broaden our thinking about what kind of systems can be constructed. Examples are Tangible Bits (Ishii and Ullmer 1997) and Calm Technology (Weiser and Brown 1996). Tangible Bits includes thoughts about interacting with computational power by using everyday artifacts or other graspable objects. Weiser and Seely-Brown present their thoughts about Calm Technology (1996). Calm Technology is about designing computational power in a way that it is not too distracting for its users. For example it might be possible to consciously aware of where it will be placed in relation to the users design computer systems. Information that is important, but not critical, may be placed somewhere at the periphery, or represented by an artifact whose changed state indicates that attention is required.

Perhaps ‘all’ may be represented in a combination between an abstraction of the remote setting, and the very concrete access to a database with cases. Either way the issue points at a need to think about what is important information in order for the operators to enter and exit the flow of activities when handling a case. Consider “The truck that hit the passenger car” case when Amanda answers a call from the site of the accident that her colleagues handles. After some questions she clarifies that it is the same accident as in another case and walks to the map. In the beginning of the same case Simone
looks at Karin’s screen, hear what is said and then walks to the map and pulls it down. What if the first part of this case should be handled at a remote site and the second call would arrive to another site? The challenge would then be to design something that supports the awareness in a similar way, as if the operators would be in the same room. By requesting listening-in today the call-taker involves another operator in the same room. The assisting operator may then look at the call-taker to see for example how he or she sits and if the medical index is used or not.

Regarding the maps in the ceiling the operators can see where the colleagues go, which map they pull down, and which operators goes there. As an issue for design the map in the ceiling points at an artifact that is visible for other operators. Information that are not visible at the big hardcopy maps today, i.e. the location and status of ambulances, but are in the computerized map, in one form or another, can be considered being added to the hardcopy map or projections of the map at a table or at the centers’ wall.

Perhaps the properties of the map today could be kept in the design of a new artifact that is used both within a single center, but also support the awareness of what is going on at a remote center, in a way that it supports that the remote operators enter and exits the flow of activities when handling a case. An example would be that the maps are linked to each other, if an operator in Center 1 pulls a map down; the corresponding maps are coming down in the centers within the regions. When the operator points at the right rescue-zone in Center 1, the area is displayed in the ComAiDi and at the map artifact in the remote setting.

4.3 The operators’ talk

The second issue concerns the way operators talk. The listening-in function invites another operator to assist with the handling of a case. The talk in the room, the way the operators embed information to their colleagues when talking with the caller, is important to consider too. When listening in to a call the operator hear the operator and the caller, but what we need to think of is what a colleague needs to know in order to enter the flow in the handling of a case when not at the same place and if listening in is not requested. In the room the operators overhear the conversations and make conversations available for others, for example by repeating the words of the caller. What is said, for example when Erik says, “is it a single car accident?” serves as an indication that assistance might be needed. When Erik repeats the words of the caller it is a fast and economical way of informing her and other operators of what is going on. Although there is a lot of information in the database the talk and the use of artifacts may support that the focus of others are directed to the case at hand.

As an overall research issue for handling calls across centers it is suggested to think about letting operators from remote locations ‘listen-in’ to the center instead of to single calls. The center of a case can be considered to
be the desks where the actual call is going on. Listening-in to a center, can be considered as a metaphor that point as issues including hearing what is said and discussed (i.e. media spaces), who the operator talk with, and is involved in the case and get access to the material—cases, incident plans and status reports of ambulances. In short the aim would be to let the talk of the operators and the visibility of what other operators are doing, in some way or another become available at the remote site in the distributed center of coordination. The listening-in to a center function would for example include a possibility for the operators to focus on conversations going on at different tables in different traffic rooms. One of the pitfalls to explore with this idea is the one of how to support that the operator knows which case is discussed remotely.

5 Conclusion

A center of coordination today is not a setting that is thought of as being distributed. A large amount of research has been done at centers of coordination of different kind. The distributed Swedish emergency service center does not yet exist, since every emergency service center in Sweden is a local center. In the introduction of this paper it was written that two questions was of special interest, namely first how the operators enters the flow of activity and secondly how the use of different artifacts may support that they are entering the flow of activities.

The operators in the cases presented in this article becomes involved in the handling of cases by request from the call-taker, by associated calls from the scene of the accident or by seeing and hearing that something is going on. The way the operators repeat the words of the callers embeds a conversation with the other operators in the traffic room in the conversation with the caller. A clarifying question from another operator than the call-taker may be answered by a repetition of what the caller says. Similarly updated information from the scene may be forwarded to the ground services, e.g. the dispatched resources, by other operators in the room. The repetition of the callers words does also serve as a check that everything is understood correctly.

Regarding the use of artifacts in the room this article has focused on the rescue-maps in the ceiling. When the maps comes down from the ceiling it is both visible and audible within the room. The visibility is in to the change of light and the audibility in the sound of the electrical motors. The maps becomes shared by many operators and the operators not involved in the case may see at a glance where the operators point. Another visibility in the use of artifacts is the shared database where all information typed in about cases becomes available.

The stories of how operators enter and exits the flow of activities when handling cases within the same room today point at issues important when consider the call distribution of tomorrow. These stories are not enough when working with design issues of the distributed center of coordination, but in
many ways they are an important basis for what to think of in the design. In this paper two themes, talk and visibility, has been identified. Those themes are important when talking about the design issues of the distributed centers of coordination of the future.

6 Acknowledgements

I would like to thank the following people for suggestions, advices and comments: professor Bo Helgeson, professor Jeanette Blomberg, Jenny Lundberg, Maria Normark, Bertil Axelsson and Philippe Rouchy.

7 References


