Investigating Police Patrol Practice for Design of IT

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ABSTRACT
This paper describes an ongoing research project aiming to find design implications for information technology supporting police patrol work. A field study of approximately 300 hours over a twelve-month period has been conducted. Tentative findings are structured as three design dimensions that are used to discuss a possible IT design.

Keywords
Police patrol, IT, field study, design dimensions

INTRODUCTION
Police patrols are difficult to study since most of the activity is conducted *backstage* where only the police have access [1, 2]. In this project the researcher negotiated access to study patrol practice and information technology supporting the work. IT for patrols has been explored previously [3], but not through field studies. This paper describes the first phase of a research project aiming to find design implications for information technology supporting police patrol work. The following research question is to be elaborated further in this paper:

What are the characteristics of police patrol work, and how can we design IT to support this work?

RESEARCH APPROACH AND METHODOLOGY
The overall research approach applied is design-oriented study of information technology use, with the ambition to put that technology to good use, acting both on the technology and the organization of its use. A three-phase methodology briefly described is applied in this research.

Field study – Different interpretations of *ethnography* has for several years gained interest from IT researchers [4, 5]. Often this research has the character of *quick-and-dirty-ethnography*.

Design - Based on the analysis of the data collected, a design proposal is made and a demonstrator or prototype is designed and developed.

Evaluation - The prototype is evaluated in real-life context with potential users. The purpose is to validate and examine the positive effects and the drawbacks concerning the user group.

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RESULTS
300 hours of fieldwork has resulted in an overall picture of police patrol work on the street is conducted and how these officers are related to the dispatcher. The fieldwork was conducted in two settings; patrols with two officers and one car (250 hours), and in the dispatcher central (50 hours). The researcher rode with several different patrols, and observed several different dispatcher shifts. Due to limited space the field study is not presented. The research is below discussed in three design dimensions.

Design Dimensions
The notion of design dimensions is an attempt to capture the aspects of the practice that are important to balance in the design of IT support. Three dimensions are described below and exemplified with excerpts from the fieldwork.

Dispatched vs. Local autonomy
Police patrols are to a large extent based on calls, or orders, delivered from the dispatcher to the patrol. The patrol receives orders on events where the police are requested. The order contains the nature of the event, the location and some background information if available. The dispatchers articulate the event as more or less important and acute. The patrol then decides how to get to the location, e.g., which route to take and at what speed. Riding with a patrol:

"7610 We have a domestic at 21 Family Street, flat 4B. The neighbors said it is the second time this week, and we have been there before. Can you drive by there?"

One officer responds to the call. The two officers then negotiate on how to deal with the situation. Since the call is routine, i.e., it is not an emergency and the location of this particular street is obvious, the patrol proceeds to the scene. They solve the dispute and leave the apartment. Back in the car they send the status "ready at the scene" to the dispatcher and starts to roll around freely in the city.

Reactive intervention vs. Proactive work
As contrast to the reactive intervention briefly described above, much of the police work is conducted by just being present, i.e., proactive.

Driving slowly on a dark deserted street downtown 3.15 am Saturday morning one of the officer turns slowly to me. *"You know, by just driving here this time of the night we might prevent some crimes, I mean maybe that guy [pointing at a young man walking on the side walk] is planning to brake into a car, but when he see us he might*

think that we will be back and therefore decides to not do the brake in."

Control vs. Support

This dimension can be exemplified by relating to the possibilities with GPS (Global Positioning System) and similar technologies. Navigations systems with maps and driving directions are gaining popular among many categories of drivers, e.g., truck and cab drivers, but also among everyday drivers. In the police, the dispatchers are equipped with electronic maps and when the events are registered they appear on the map in front of the dispatcher. By this, all dispatchers have an overview of the events currently going on. The dispatcher uses the map to give driving direction when necessary. The officers and the dispatchers are aware of how others use positioning systems and there are two main positions taken on this technology.

Observing the dispatcher central. The operator I am sitting with this shift is a bit frustrated: *"I need a car [to send to an event] and I have no idea where the cars currently are. With GPS in all cars, they would appear here on the map [points on the screen] and I could send the closest patrol instead of picking one in random. Usually I have a pretty good notion of where the cars are, but it is sometimes difficult. I think it is very important that we know where they are, both to be effective, and for safety reasons."*

Late one night riding with a patrol we talked about positioning one officer expressed: *"GPS and such stuff might be good, but I think I would feel like we are monitored and not able to do what we find suitable. It is important that we preserve the integrity, and our freedom to patrol as we find appropriate. I am not sure that the work will be better by having us as moving dots on a large map. Of course for safety reasons, but it should be in some other way. It should be possible with new technology."*

Awareness technology

How police patrols act depends very much on the situation at hand and on the context. Obviously a hostile situation is dealt with quite differently from a friendly situation. The importance of information is obvious, and so are the consequences of a lack of information. For patrol officers it is crucial to know or be aware of the whereabouts of the partner and other patrols in case of an undesired situation. This is true for both officers at the same scene, but it is also important to know how far backup is in case something goes wrong. With the three design dimensions as background a tentative functionality of a position-based application is outlined.

The application can run on a small display in the vehicle, a car computer. The application provides a list of the patrols on the shift, their call signs, their status (available, occupied with event, or on break), and their proximity (relative distance or time to the other patrols). Driving around being proactive they are aware of the other patrols. When called to an event, the officers before leaving the vehicle take a quick look at the display to get proximity information concerning their colleagues. With this information they can make more appropriate decisions on how to act in the situation at hand. The absolute position of each patrol car is available for the dispatcher.

DISCUSSION

The design dimensions are proposed to be useful in designing IT support for police work. The first dimension shows that police work on the street is in one way controlled by the dispatcher since they distribute the calls among the patrols on duty. At the same time, each patrol is acting autonomously when at a call, or waiting for a call. The application gives the dispatcher information concerning the positions, and it gives the patrol information otherwise difficult to obtain quickly. Both the dispatcher and the patrol use the technology. The second dimension, going from a proactive state to a reactive state is common. A call about a *serious crime* will instantly involve a number of patrols. The awareness of the others can make the coordination of several patrols more efficient, and safe. The third dimension, in case of such situation the dispatcher and the patrols cooperate in the coordination of the involved patrol cars.

CONCLUSIONS

The research question raised in this short paper was: *What are the characteristics of police patrol work, and how can we design IT to support this work?*

The characteristics of police work, from an IT design perspective, was structured as design dimensions. The design dimensions capture crucial aspects of police work. The contribution of this research is the concept of research dimensions as both conceptual and analytical tools to expand the three-phase approach described in the paper.

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