Empathic and Participatory Research for the Development of We-Centric Services for a Police Organization

Marc Steen 1, Nicole de Koning 1, Ingrid Mulder 2

1 TNO Information and Communication Technology, P.O. Box 5050, 2600 GB Delft, The Netherlands
m.g.d.steen@telecom.tno.nl; n.m.dekoning@telecom.tno.nl
2 Telematica Instituut, P.O. Box 589, 7500 AN Enschede, The Netherlands
ingrid.mulder@telin.nl

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Abstract. The aim of the project that underlies this paper is to advance our understanding of we-centric ICT services. Such services are meant to support people who work, communicate and cooperate in dynamic groups. An exploration of the qualities of such services yields delicate questions about for example group membership, social appropriateness, dynamic tasks, control and privacy. These questions need to be addressed based on a thorough understanding of people’s daily lives. To that end we propose an approach characterized by empathy for end-users and participation of end-users. This approach was applied practically in fieldwork in cooperation with a police organization, with the goal of identifying problems which police officers encounter and which may be solved with we-centric services. The main research question of this paper is on the process level: What happens when you apply an empathic and participatory approach in developing and evaluating we-centric services together with police officers?

1 Introduction

The authors work in the “Freeband FRUX” project [8]. The aim of this project is to develop and evaluate we-centric ICT services; to advance our understanding of benefits and limitations of such services, and to develop guidelines for developing and provisioning of such services. We-centric services seem to be of particular added value for groups of people that work together when work is event-driven (or emergency-driven); for example police officers who need to cooperate with other police officers, or with ambulance personnel.

The project runs from 2004 until 2007, and is set-up interdisciplinary, including end-user, business and technology perspectives, and includes research and development cycles and iterations.

At the start of the project we only had imprecise ideas about we-centric services; we had ideas about applications that would support people working in dynamic groups and changing contexts, because these applications would adapt to people’s dynamic roles and tasks. In section 2 we explore the benefits and disadvantages of we-centric services from the perspective of end-users, and identify aspects that are important for developing and evaluating such services.

When developing we-centric services, one has to deal with multiple users in dynamic groups and contexts, who have dynamic roles and tasks, and one has to address delicate questions about for example group membership, social appropriateness, dynamic tasks, control and privacy. This asks for an approach that goes beyond traditional user-centered design, which often deals with one user, one task or one application. Jordan [14] goes as far as stating that usability-based approaches “tend to encourage the view that users are merely cognitive and physical components of a system consisting of the user, the product and the environment of use” and “encourage a limited view of the person using the product. This is – by implication if not by intention – dehumanising”, and he proposes instead a holistic understanding of people’s daily lives and role of products in their lives. In this line of thought, ISO 13407 prescribes an approach with the following four principles: “the active involvement of users and a clear understanding of user and task requirements; an appropriate allocation of functions between users and technology; iteration of design solutions; multi-disciplinary design” [12].

We propose an approach similar to contextual design [2], participatory design [e.g. 3] and empathic design [15] that aim to understand the daily life of people in their context, to involve users in the design process, and to study latent needs which are hard to discover with approaches that focus on functional qualities. Our ‘human centered’ [cf. 24] approach is characterized by empathy towards end-user, participation of end-users, multidisciplinary teamwork and an iterative process, see Fig.1:
• To apply empathy towards the people who will (or will not) use the ICT service which is going to be developed, and aim for a comprehensive or holistic ‘view on man’ while studying daily lives; paying attention to behavior, needs, wishes, experiences and emotions. This may happen for example when researchers and developers meet end-users in their daily lives in ‘rapid ethnography’. Please note that empathy aims to make accurate diagnoses, and does not necessarily imply sympathy;

• To facilitate participation of end-users in the development process, and facilitate dialogue between researchers, developers and end-users, including the will and ability to change the services based on what happens during such dialogue. This may happen for example when end-users participate in a workshop to design or evaluate an innovation. Participation also refers to cooperation within the research and development team, between people with technical, business and market perspectives;

• Crucial in this approach are cooperation within a multidisciplinary team, and iterations within the process. The idea is to articulate and advocate the end-user perspective within the team; to study end-users several times and to bring the results into the project, and to invite end-users several times for validation of the ideas as they are developed in the process. Only with such cooperation and iterations can the approach optimally facilitate the advancement of insight.

Fig. 1. Our approach is characterized by empathy and participation; empathy is associated with researchers or developers moving towards the daily life of end-users; and participation is associated with end-users moving towards the practice of researchers and developers.

One of the project’s partners is the police organization, which gives the opportunity to relate our (theoretical) concepts to a (practical) organizational domain. Section 3 reports on the empathic and participatory fieldwork that we carried out in close cooperation with police officers. The aim of this fieldwork was to study their daily work, and to identify problems they encounter which may be solved by applying we-centric services. Based on this fieldwork a first draft for a we-centric service is proposed to support the communication and cooperation between police officers and others.

On the content level, this paper is about whether and how we-centric services can support a specific group of end-users – in our case police officers on the beat – in their daily work.

The main research question of this paper, however, is on the process level: What happens when you apply empathic and participatory in a practical domain? And more specific: What happens when you apply empathy and participation in research and development of we-centric services in cooperation with police officers? Our approach and methods are by no means new. However, we feel that it is worthwhile to report extensively on the fieldwork we executed (including sidesteps, pitfalls and dead-ends), and to critically reflect on the practical implications of our approach.

2 We-Centric, Context-Aware, Adaptive Services

In this section we explore the concepts of ‘we-centric’, ‘context-aware’, and ‘adaptive’ from the perspective of end-users, in order to identify possible benefits and disadvantages of such services, and to identify aspects that are important for developing and evaluating such services [for details: 7].

In the articulation of these concepts we follow an explorative approach and use ‘sensitizing concepts’ [cf. 9] rather than strict definitions upfront. The idea of using sensitizing concepts is to make one sensitive to certain qualities and help to explore these qualities further in an iterative process – defining these concepts too early has the risk of narrowing down one’s scope too much. We start with a storyline to illustrate our initial ideas; the occurrence of behavior and functionality related to ‘we-centric’ is indicated with <w>, to ‘context-aware’ with <c>, and to ‘adaptive’ with <a>:
Dave is 27 years old and lives with his girlfriend Anne. Dave works as a policeman. Today Dave and his colleague Els ride their bikes for a routine control tour. Dave is in the lead today. Their colleague Theo, who is at headquarters, receives a call about domestic violence, and monitors that Dave and Els are close-by. Dave and Els receive a text message from Theo (and not a voice message, because they are in a noisy situation and hurrying). Dave asks for the retrieval of historical data on the location of the report. At the same time, Els looks at an electronic map for the quickest route. Based on these data, Theo adds psychiatrist John, a specialist in domestic violence, to the ad-hoc team. As they approach the block, Dave receives a short report on the headset of his (small) device, and Els receives a detailed report and floor plan on her (large) device. Dave rings the doorbell, and opens a voice channel to Theo, so they can call for assistance, and relevant information is stored automatically for reporting and filing.

This storyline covers both work and private contexts, and illustrates that people belong to different groups and have different roles – that is central for our conceptualization of we-centric services.

2.1 We-Centric – Group Dynamics

Man is a social being. The needs hierarchy of Maslov [19] classifies the need to belong to a group as a basic human need. Interestingly, people belong to (or choose to belong to) different groups, including family, friends, colleagues, interest groups, etc. This is key in our understanding of “we-centric” services: Services that support interaction between people in groups. Conceptually, we prefer the label “dynamic personal social contexts” [11] instead of “groups”, because it helps to take into account that one belongs to different groups and has different roles, and that groups and roles are dynamic and fluid.

Our we-centric concept is different from an I-centric concept [cf. 1, 26] in which ‘I’ is central, and which tends to make relations somewhat asymmetrical. In our understanding of we-centric services, relations between people are (potentially) reciprocal, and ‘I’ is not the pivot. Our we-centric services are also different from traditional groupware or CSCW applications. Although user-centred design approaches seem to be generally accepted [e.g. 5, 16, 25], little of this has been applied in groupware design. Groupware design still originates too often from a technical point of view and concentrates on an individual user. As a result, existing groupware systems rarely match either the needs of collaborating groups or the dynamics of these groups. Often fixed or stable groups are starting point, and groupware only supports specific tasks.

With we-centric services we refer to applications that support these dynamic and fluid groups of people in work as well as non-work contexts. Put differently, several kinds of tasks depending on specific contexts. People have always combined groups and roles, however we think that innovative personal, mobile communication means can enable people to do so in more effective, efficient and pleasant ways. One can, for example, use a PDA with communication functionalities, to communicate within different groups, going from one context to another. Such applications can only be successful if their use matches the dynamics and culture of each specific group. What is appropriate in one group, may not work in another. Therefore, when designing such services, attention must be given to make these socially appropriate. Here are two examples of we-centric services:

• We-centric communication services help people to get or keep in touch with different groups of people, depending on what is relevant for a group of people at a certain time and place. Currently available services like group-SMS or e-mailing lists support communication within relatively fixed or static groups – but do not support communication within dynamic groups;
• We-centric information services help people to look for or consume information or media. This is often related to a social experience, like going to a movie. Such events are a joint experience before, during or after the ‘consumption’. Such services could offer “conversational content” [18] and support communications and interactions to accompany information or media.

Developing and evaluating we-centric services raise several questions about group membership. For example: Who is inside the group and who is outside at a given moment? And what happens when you are member of several groups? Suppose that you are ‘unavailable’ for group A, and someone from group B needs you? What do membership and engagement mean within such “dynamic personal social contexts”? These questions can be approached from an experiential perspective (“Do you feel like part of this group right now, and who else do you feel is part of this group right now?”), or from a...
technological perspective (“How can the system determine who is part of this group right now?”). Other questions relate to studying the experience of people who use we-centric services. Suppose that ten people use the service, do you then ask all ten to tell about their experiences? Separately or as a group? And how to deal with differences in experience between persons? These questions are not yet answered in the current research, but will be studied in depth in the remainder of the research program.

Summarizing, developers of we-centric services have to address questions like: How to deal with group dynamics, with people who belong to different groups and have different roles, and the (different) experiences of group membership? How to do so in socially appropriate ways?

2.2 Context-Aware – Dynamic Contexts

The context of use plays two roles. People use services because of specific needs in specific contexts. And, the other way around, the context of use influences the user experience. In other words, needs, behavior and experience are contextual. The concept of we-centric services is connected to the idea that people are related to different groups, depending on their context and on the context of the other. We speculate that such services are more valuable when the service automatically detects contextual factors, and to a certain degree adapts the service accordingly. We associate ‘context-aware’ services with services that take dynamic contextual factors into account – of different people – and offer functions appropriate for those contexts [cf. 6].

Context-awareness is relevant since we develop mobile services, where contexts change constantly. Developing we-centric mobile services requires taking into account contextual factors like:

- Location and social-cultural context: A person moving around may use different devices or networks, as in ubiquitous communication. Or a person may want to connect to a group member who is close-by (socially, culturally or location-wise), and receive an alert in such cases;
- Task and attention: A person who moves around will choose to do some tasks in the office, and other at home. This impacts his or her availability for others. And one may use a mobile application with less attention or for a shorter time (compared to desktop use);
- Technology and user interface: Applications may run on different mobile devices, with varying processing power, memory and network availability. A keyboard, mouse or large screen may not be appropriate, and speech, touch or pen must be considered.

It may seem appropriate when a context-aware service monitors these factors and adapts automatically. However, it is, extremely difficult to automate this in a satisfactory way, because many vague or imprecise factors have to be taken into account. Unlike people, computers cannot do that very well. Furthermore, in applications like instant messaging [21] or group scheduling [23] it is just this vague or imprecise context information that gives people the right cues about what is socially acceptable or not.

Summarizing, developers of context-aware services have to address questions like: How to detect contextual factors, and detect changes of these factors? How to apply these factors to offer appropriate functions?

2.3 Adaptive – Control and Self-Management

We plan to develop we-centric services, which adapt to group dynamics and to dynamic contexts [cf. 13]. In doing so, we take the state of the art of personalized services a step further. Current personalized services – for example a personalized view on a news website – adapt to relatively stable characteristics of one end-user, for example a service that shows certain content, based on one person’s taste. For that process, such services may draw from two sources for data about end-users (user profiles), either data that end-users provide or edit actively (explicit personalization, for example by filling-in a form), or data that is generated automatically while an end-user uses the service (implicit personalization, for example by monitoring browsing). Both systems have their pros and cons. Using a service with explicit personalization can be cumbersome, but may be appropriate when one wants control. Using a service with implicit personalization can be easy-to-use, but one may feel a lack of control. Which method suits best, depends on the kind of service, the user, and on the context.

In the domain of we-centric and context-aware services, we associate ‘adaptive’ services with services that offer different functions (service bundles), depending on the dynamics of a group of interacting people, their relations, and on their contexts. Such services aim to help a (dynamic) group of
people to better achieve their different goals in different contexts. This is different from current personalized services, which aim to help one person achieve her/his goals better in her/his context. We plan to have user profiles that are more dynamic, and we want to develop applications for “dynamic personal social networks”, and not for individuals, which raises some issues about dynamics:

- Data about end-users can be extremely dynamic: People go in and out of contexts, and in and out of groups, and their needs and wishes change accordingly. The needs and wishes of other group members change as well. Obviously, people do not want or cannot use applications that are totally dynamic. We think that, in order be useful and usable, adaptive services must offer self-management functions, for example to tune the adaptive functionality of the service, or to turn it off;
- Current personalized services adapt to one person, whereas we want to develop services that adapt to people in “dynamic personal social contexts”. Such service uses characteristics of several group members, and then offers a service adapted to several group members’ roles, tasks and contexts. This implies that data about one person will be shared with other group members, and introduces questions about privacy, trust and control.

Summarizing, developers of adaptive services have to address questions like: How to make a service adapt to group dynamics? How to obtain data from and share data amongst group members? What about control, privacy and trust? Who is in charge?

As said before, this exploration of we-centric services yields delicate questions about for example group membership, social appropriateness, dynamic tasks, control and privacy. In order to adequately develop and evaluate we-centric services, we need to address these questions based on a thorough understanding of people’s daily lives. In order to gain this understanding, we executed fieldwork in cooperation with police officers, and tried to apply empathy and participation.

3 Fieldwork in cooperation with police officers

In this section paragraph we report on explorative fieldwork which was carried out in cooperation with police officers. More specifically, we executed a workshop with police officers to validate the initial problem statement and to formulate opportunities, then we executed a number of observations of the daily work of police officers (rapid ethnography), and finally, we executed a workshop with police officers to explore and create concepts for innovative services, see Fig. 2.

The aim of this fieldwork was to study the daily work of police officers on the beat, and to identify problems they encounter which may be solved by applying we-centric services. Special attention was paid to the groups and contexts in which police officers work; their roles and tasks, and processes of communication and cooperation. Based on this fieldwork a we-centric service is proposed to support communication and cooperation between police officers and others.

![Fig. 2. This paper reports on explorative fieldwork in close cooperation with police officers on the beat: two workshops in which they participated, and a number of observations of their daily work](image-url)

At the start of the project, people from the police organization who participate in the project proposed an initial focus and problem statement; namely to support policemen on the beat in their work. The
rationale behind this is that these police officers are on the street a large part of the day, in different contexts, and during their working day they perform different roles and tasks and they cooperate with different people. Within the police organization there is a trend that is relevant for the project. Police officers are encouraged to build and maintain relations with ‘network partners’, with people from the municipality, with shopkeepers, headmasters, doctors, etcetera, in order to anticipate and react more adequately to events. Furthermore, access to information and communication are crucial for the work of a police officer. Or, as one policeman said: “A policeman’s job is not to catch villains, but to produce files full of information for the prosecutor to prosecute villains.”

Summarizing, policemen on the beat are an interesting target group for we-centric services; they work in dynamic groups, have different roles and tasks, and information and communication are crucial for their work.

It is our ambition to develop applications that support their daily work. In the course of 2005 and 2006 we plan to build mock-ups and prototypes and to test these in the field in order to evaluate the benefits and disadvantages of these applications in realistic settings, again in close cooperation with the police organization, and in an iterative way – these activities are outside the scope of this paper.

### 3.1 Workshop 1: Identifying Opportunities

The goal of Workshop 1 is to get acquainted with the daily work of police officers on the beat, to validate the initial focus and problem statement; to see what kind of problems police officers encounter, and whether these problems may be solved with we-centric services.

Six police officers with management functions (and who have been police officers on the beat for years) participated in the workshop of three hours, which was facilitated by two project team members. The workshop started with an open exploration of a police officer’s daily work and style, and then the focus moved to a discussion about current processes and means of communication and information collection, exchange and retrieval. The workshop closed with the formulation of several opportunities; problems or bottlenecks that may be solved with innovative communication or information services. The facilitators were keen not to mention the type of services that are focus of the project – the words ‘we-centric’, ‘context-aware’ and ‘adaptive’ were not mentioned. This was done in order to minimize any bias or steering effects from the project towards the workshop.

Out of the workshop came interesting characterizations of the work of police officers: “A police officer is eager to solve problems, curious and even suspicious, and he/she is a doer, a go-getter.” Police officers on the beat work often independently, and much of their work is driven by incidents, which requires a lot of improvisation. Furthermore, communication proved to be crucial for police officers; communication with other police officers, as well as communication with ‘network partners’. It also became clear that police officers spend a lot of time doing paperwork (“produce files of information”).

Another interesting result is that this type of work is difficult to manage and to monitor; furthermore, it is difficult to measure the results or quality of this type of work. For example: If a police officer does well, and the number of burglaries drops, what can one say about the relation between these? The decrease of burglaries may be coincidental. Another example: Management tries to monitor the work of police officers with such measures as ‘number of tickets for offences’, ‘the more the better’. However, one may argue that if police officers do their work well, there will be fewer offences.

Four opportunities were mentioned, problems that may be solved with we-centric services:

- When a police officer is on the street he/she may need some specific information – an update, a history or details – and these are currently not available. Currently, he/she will have to go to the office to retrieve it. Some innovative information or communication service may solve that problem, by offering mobile access to that information, or communication with one who can provide that;
- Part of the police officers’ work is ‘paperwork’. Currently, they often have to do that twice; they make notes on paper while they work outdoors, and later on, back in the office, they type the same data into a computer system. Some information or communication service may streamline that, for example by taking notes digitally and beaming these to the office;
- In order to react adequately to emerging events, management wants to know where their police officers are, and who is doing which job. With this knowledge, they could change priorities and better steer police officers. Currently management’s view is incomplete. Some information service may provide such view, for example by using localization technology;
- Police officers on the beat need to communicate with other police officers, or with firemen or ambulance personnel, for example in emergency cases; and with ‘network partners’ like shopkeepers
or headmasters for example for prevention of theft. The police organization wants to facilitate this kind of communication, but currently lacks appropriate tools.

Out of these four opportunities we chose to follow-up the fourth one, because the problem of communication within such heterogeneous and dynamic groups is directly related to our ‘we-centric’ concept, and because police officers lack appropriate tools. We keep the third opportunity – to localize police officers – in mind, because it is related to ‘context-aware’ and may be combined with supporting communication and cooperation. We will not go into the first and second opportunity, because these are too much related to administrative and information processes, and less related to communication.

3.2 Rapid ethnography: Developing Storylines

Out of the workshop came a characterization of the police officer’s work. The next step was to advance our understanding of the daily work of police officers via a number of observations. These observations were executed in an average town, with urban as well as rural qualities. The goal of these observations was to get to know the daily work of police officers via personal experience, and to identify problems they encounter regarding communication and cooperation in different contexts. Seven researchers were each coupled to a police officer for a day, either during a day shift or during a night shift. The researcher accompanied the police officer during the entire working day, both in the office as well as on the street and in the car. Each researcher made a report of his/her observations.

A few days after the observations all researchers came together to report and share their experiences. The project members of the police organization were also present. Many of the characterizations of the police officers work and the corresponding problems that were mentioned during the workshop reappeared. We saw that police officers’ work is driven by incidents and requires a lot of improvisation. Police officers communicate with different people. They often need information that is not easily available, and have to call a colleague at the office for this information, or have to go to the office to look it up. For communication between police officers, they use radio telephones (porto-phones) or cell phones, and for communication with others they use cell phones. Interestingly, we found that these services have some context-aware affordances. For example, police officers say they do not raise a question via their porto-phone when they hear too much noise “on the other side”. They interpret that their colleague is busy and choose not to border him right at that moment.

Additionally, police officers spend a lot of time at their desk in order to process and file information.

In order to summarize and interpret our observations, we created three ‘personas’, Bert, Theo and Ad, each with a specific age, private situation, work goals and attitude, etcetera, and three ‘storylines’, each describing a working day of them [cf. 4]. For the creation of personas and storylines, we combined elements of persons and events that we observed frequently. In order to focus our research, we then selected three scenes in which police officers communicate with their network partners:

[…] Ad is continues walking around in ‘his’ area. He decides to go to the swimming pool to have a quick look how things are. The weather is beautiful and it will probably be very busy in the swimming pool. The last few days a group of teenagers has been causing a lot of trouble. Ad arrives at the swimming pool and looks for his contact person, John. John however appears to have a day off. […]

[…] Bert has to ‘serve a writ’ [go to someone’s home and personally deliver a legal letter] today. Bert does not like this job. When he presents such documents, people often say: “This is a mistake, the person you are looking for moved a few weeks ago.” Bert has no photo of the person the document is meant for, so he never knows whether the other one is lying. Additionally, the document may be for some small crime like refueling at a petrol station without paying. And attempting again and again to ‘serve a writ’ feels like a waste of time. Bert goes to the address. Nobody answers the door. Bert wants to calls a judicial officer to ask whether the document can also be presented tomorrow. Unfortunately, he does not have a phone number to do that. […]

[…] The neighbors of an 80-years old lady called the police, because they haven’t seen her for two days and they worry about her. Ad arrives at her apartment, and calls at the lady through a cantilever window above the door. Fortunately the lady can hear him. She cannot open the door however, since she is fallen and cannot walk anymore. Ad enters the apartment by forcing the window. When he is inside, he starts to take care of her, and asks her whether she takes any medication. The lady is too confused to answer, so Ad asks her the name of her general practitioner. […]
The researchers who were involved in this ‘rapid ethnography’ all reported that this fieldwork gave them valuable insights. The added value was not so much in obtaining new information, but more in having first-hand experiences of spending a day with a police officer. Experiencing a working day together with police officer Bert is a different experience than reading about what a police officer does.

3.3 Workshop 2: Developing Concepts

The goal of Workshop 2 is to explore and develop ideas for we-centric services that may support police officers on the beat in their daily work. Six police officers (some of whom we spent a working day with in the ‘rapid ethnography’) participated in this workshop.

The workshop started with a brief introduction about the goal and method of the workshop; to create ideas for innovative ICT services that will support police officers in their work. We then presented three ‘scenes’ as a starting point, and expressed our preference to focus on communication and cooperation, rather than on administrative processes and accessing information. During the workshop, we stimulated a creative atmosphere. We explained the basic rules of a ‘brainstorm’; postponing critique, striving for many ideas, and associating on each other’s ideas [cf. 22].

The facilitators were keen not to mention words like ‘we-centric’, ‘context-aware’ and ‘adaptive’ in order to minimize any bias or steering effects. Furthermore, we encouraged the police officers to tell about their behavior, and fantasize about how they would like to behave differently “If you had a magic staff and you could create the ideal support for you as a police officer in 2008, what would that support look like?” We did not encourage the police officers to talk about technology, neither as an enabler, nor as a barrier.

Many of our earlier observations about police officers, their need to communicate and cooperation with many different persons in many different situations, re-appeared in this workshop, and our ideas for we-centric services to support these activities were thus validated.

Additionally, they said that a lot of their activities do not actually belong to their core tasks, for example helping at incidents with elderly people who are locked up in their own homes, or going to a house several times in order to ‘serve a writ’ for a small crime. On the other hand, one police officer said: “We are here to serve the community.” When they execute such non-core tasks, they sometimes have negative feelings of being someone’s assistant. This relates to another problem, namely that the quality of their work is difficult to measure. How can one measure the quality of walking around preventively, or how can one measure the quality of helping a kid not to turn to crime? Due to this, police officers on the beat can have a difficult position within the police organization.

In order to illustrate the added value of the work of police officers on the beat, one police officer told proudly about the good results they achieved in a very large block of flats. This block of flats was problematic for years, with vandalism, fights between occupants, and crime. By working in close cooperation with the doorkeepers of this block of flats the police officers improved this situation. They achieved a substantial reduction in criminality. He also commented that “these things you don’t read in the newspaper, they are not interesting for journalists.” Other examples were told to indicate the added value of police officers on the beat, especially of the intimate and detailed knowledge they have of a particular neighborhood and the people who live there or come there. They speculate that this knowledge may be valuable for other people within the police organization – however, this knowledge is currently not available to those people.

Additionally, the police officers mentioned problems that they experience in their work, but that cannot be solved by we-centric communication services. For example problems related to administrative processes or financial choices. They do a lot of ‘paperwork’ and want to do less. And in their view the police organization lags behind when it comes to using ICT: “We want laptops in our cars, but there is no budget for that.” And two other interesting things happened. The initial focus of our research, the focus on police officers on the beat, was questioned, and one person suggested choosing another target group within the police organization, for example police officers specialized in emergency tasks. And during the discussion about the ordinary laptops that they would like, one person was skeptical about innovations, and critical questioned the goal of the project: “Within the police we have so many experiments already. Why would we want yet more innovations?”
3.4 Service Visualization

Based on the fieldwork we developed draft visualization for a we-centric service to support the communication and cooperation between police officers on the beat and their ‘network partners’ as well as other police officers.

This service is a variation of the service prototype “Live Contacts” which was developed in a forerunner of the project (Freeband B4U). This service runs on a smart-phone and gives insight in the availability of several others by showing information derived from their digital calendars (Microsoft Outlook). Prior to contacting that person, you can see in a glance whether he/she is in a meeting, or en route, or at home. Based on that ‘context information’, you can decide on an appropriate time to contact him/her, and choose an appropriate medium: face to face, via fixed phone, via mobile phone, via email or via instant messaging. Pilot tests indicate the added value for end-users of seeing this context information, because it enables people to be aware of relevant others; it enables ‘group awareness’ [10]. We should mention that “Live Contacts” was developed for a similar problem, and with a similar scope as the current project, so it is no coincident that the current (proposed) service is a variation of “Live Contacts”. Hence, it serves as a visualization to evoke feedback from the police officers in the field, rather than being the perfect device.

The service we propose is sketched in Fig. 3, and aims to support police officers to communicate and cooperate more effectively and efficiently with different people in different contexts.

A police officer carries a mobile device which displays a short list of people which are relevant in that context, on that moment and that location, and for each person some ‘status’ information about that person is displayed, for availability or location of that person. When the police officer goes to another context, or when her/his role or tasks changes, the list of relevant people changes accordingly. From this screen she/he may contact these persons for personal communication.

Fig. 3. Draft visualization of a we-centric service to support the communication and cooperation between police officers on the beat and their ‘network partners’ as well as other police officers

An additional goal of introducing this service is to ‘empower’ police officers on the beat; to equip them with a tool that may show or prove their added value to other people. The service aims to improve communication and cooperation between police officers and network partners – so that network partner will experience a higher quality of service. And the service aims to improve communication and cooperation between police officers on the beat and other officials within the police organization, for example by making accessible to others the intimate and detailed knowledge of police officers on the beat – so that the added value of police officers on the beat is leveraged.

At this stage, this service is presented on purpose as a sketch, without details, in order to invite others to react to it, and to fill in details. Sketches will be presented to police officers for verifying the added value, and to team members who are involved in technical and business sides of the development of this service. The functional and organizational benefits and disadvantages of this service will be tested using mock-ups and prototypes, in close cooperation with the police organization in the course of 2005 and 2006.
4 Conclusions and Reflection

The fieldwork with police officers suggests that we-centric services can support police officers in their daily work. Police officers on the beat work in dynamic contexts, perform different roles and tasks, and need to communicate and cooperate with different people. They need to communicate with other police officers, or with firemen or ambulance personnel, for example in emergency cases. They also need to communicate with ‘network partners’ like shopkeepers or headmasters for example for the prevention of crimes. The police organization wants to facilitate this kind of communication, but currently lacks appropriate tools.

Current products or services like radio phone (porto-phone) or cell phone fall short in supporting the dynamics within groups, contexts, roles and tasks. Interestingly, we found that even these traditional services have context-aware affordances.

Reflecting on the research and development process, on the ambition to execute empathic and participatory research and development process, we would like to explicitly express the following.

Empathy for end-users. In our rapid ethnography we aim to study the daily work of police officers, and their behavior, needs, wishes, experiences and emotions. But how much can one learn of another person’s life by observing only one working day? Traditional ethnography is very time intensive [20], but in many projects there is time pressure. And there is another factor that may hinder empathy; our own intentionality of doing our research. We have our own agenda and focus. There is a risk that we are so keen to situations in which people communicate and cooperation in dynamic groups that we see precisely that – and only that. Then we can only see problems that can be solved with we-centric services – like finding an Easter-egg which you have hidden yourself. The issue of empathy raises questions about whether or how one can open up towards other people, or see things outside the domain on which one focuses.

Participation of end-users. In the workshops police officers participated in identifying problems that may be solved with we-centric services. But they also mentioned problems which fall outside the scope of the project. And they critically questioned the scope and goal of the project; for example choosing the police officer on the beat as a target group was questioned. We want to take our fieldwork seriously and react constructively to this. But will we, for example, do our rapid ethnography all over again with another target group? Are we going to re-focus our research every time a person questions or criticizes our focus? We think it will benefit our aim of developing and evaluating innovative we-centric services – and fair towards the organizations who fund our project – if we stick largely to our focus and goal. Paying too much attention to solving problems of the police organization could jeopardize our research project – like an anthropologist who is ‘going native’ and does not return home safely.

Iterative process. The project started with ambitions to work on certain services, and with assumptions about certain problems within the police organization. We did find matches, but we also found mismatches. We encountered problems within the police which we cannot solve with we-centric services. And what will we do when we find shortcomings of we-centric services when we apply them practically within the police organization? Knowledge creation via iterations and the advancement of understanding lean upon the assumption of being open towards new perspectives – and therefore has a strong relations to empathy and participation.

Multidisciplinary teamwork. During 2005 and 2006 we will cooperate within the team with people who have technical and economic perspectives and goals, and we will jointly develop prototypes and business models and test these in the field. During those activities there will be many negotiations. It is our ambition to articulate and advocate the end-users’ perspective, but it is our experience that this is not always easy. One possible solution is to apply a reflexive approach in which assumptions of team members are made explicit, in order to facilitate negotiations and joint decision making [17].

In order to advance our understanding of we-centric services, we will extend our research in 2005 and 2006 by building mock-ups and prototypes, and testing these in close cooperation with police officers.
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