

Roadguards Assisted by Mobile Technology

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ABSTRACT

This paper describes parts of a project in progress. The occupational group roadguards at the Swedish National Road Administration-Production is currently using handheld computers in their work. Currently the system only supports the individual reporting phase of their work, even if their work, partially, is characterised as collaborative.

Keywords

Handheld computers, GPS, collaborative work, ethnography

1. INTRODUCTION

This paper presents preliminary findings from an initial field study in progress at the Swedish National Road Administration-Production.

At present the occupational group of roadguards are using handheld computers in their vehicles. These devices are connected with GPS-receivers, which in a certain sense make them context aware (Dey, et al., 1999). The major fields of application are to report their work and to receive a complete log of their tours of inspection.

The purpose with this research project is to gain knowledge about the road guards work and competence in order to understand how the mobile technology supports the different phases of their work. To achieve this goal the research adopted an ethnographic approach, including both observations and interviews. Up until now approximately 40 hours of observation has been conducted.

2. THE ROADGUARDS

The roadguards are a special occupational group, which primary tasks are to inspect the road network, to document defects and to repair acute defects along the road network. Their vehicles are equipped with mobile

computers, Psion Workabout, connected with a GPS receiver. By using this equipment they receive a complete log of their work. The system automatically logs the position, time and distance driven. All the defects are manually reported by the roadguards. On a monthly basis, part of this log is sent to the Swedish National Road Administration to verify the accomplishment of their mission.

A normal working day consists of 150 to 250 kilometres of truck driving. The bigger motorways have to be inspected every other day, smaller roads not that often. All the tours of inspection are scheduled in advance. During these inspections they are always driving alone, only when bigger repairs are planned they will work in teams.

3. EXPERIENCES FROM THE FIELD

During this limited field study following characteristics concerning their daily work, has been observed.

3.1 Planning and preparing

During Monday mornings, the week starts with a meeting where everybody is informed about last week's work, this week's work and future plans. These meetings gather all occupational groups at the office.

On a daily basis the flow of information is more informal, e.g. discussions with colleagues and managers. They inform each other of what has happened during previous days. Frequently the managers follow up earlier reported defects. Phone calls from the public are another source of incoming information, which has to be followed up. The roadguards try to keep this information in mind during their tours of inspection. As a tool for their memory, they sometimes take notes on paper. With this information in mind the roadguards decide which, and how much, material/equipment they should bring in their vehicle each day. They also have the possibility to make slight changes in their routes.

3.2 Performing and reporting

On the road, the work is concentrated to driving and observing possible defects. A sample of common defects during the study have been dead animals on the roadway, parts of automobile tyres on the roadway, smaller defects in the roadway and illegal signs close to the roads. All defects, taken care of or not, have to be reported in the handheld computer. During the study there has been a lack in reporting, not every single defect has been reported.

When conducting the tour of inspection the roadguards should keep in mind what has been said during the morning meeting, if there were any special task they were supposed to put focus on. During the study it happened a number of times that these tasks were forgotten, even if they had taken notes about them.

Another problem is to know whether a defect already has been reported. The computer does not have capacity enough to keep a version of the database.

The software has ten different categories of possible defects each of them has approximately 5-10 different alternatives. It is also possible to type in short notes, which will be linked to the actual geographical position. Even with this opportunity many of them use alternative methods. Some of the roadguards try to memorise, other use the phone to call the office and some take notes on paper.

Each day ends with updating the central database. They connect the mobile computer with a stationary one in the office. They have the possibility check all the reported data and eventually correct all duplicate input.

4. DISCUSSION

The main advantage for the roadguards to use the system is that they do not need to write all their formal reports on paper as they did earlier. Still there are some exceptions, but those are few.

As long as the reports are made for the central administration everything works well. When reporting for their later work, i.e. to remind them for a later moment, the system does not work properly. Some experiences from the field shows that there is a lack of information, or rather a lack of recalling information, during the performance of their work. Most of the days they were assigned different tasks before they left the office, but often they had problems remembering all of the tasks. In most cases they recalled the tasks when they passed the object of the task, otherwise they had to accomplish it at a later moment. Another example is all the illegal signs along the roadside, which are hard to keep track of. Some of the signs have exemption during a limited period of time. It is hard to keep track of these exemptions, which means that they sometimes dismount legal signs by mistake. There is an obvious need for updated information during their tours of inspection. In some cases, the mobile phone is used to solve these problems, but it is as common to solve the problem during a face-to-face meeting back at the office.

Even if they appear to have come quite far in using mobile devices there are still areas of development. The single field of application is the individual reporting to the central administration, even if their work partially is conducted in a collaborative way. To support their collaborative work the roadguards use other complementary "tools" such as notes on a paper, mobile phones and their memory.

5. FURTHER WORK

Further field-studies will be conducted, which will focus on the roadguards need for support while performing their work. Design workshops will be held where we intend to discuss the further development of the system.

6. REFERENCES

Dey, A. K. & Abowd, G. (1999). Towards a Better Understanding of Context and Context-Awareness, *Proceedings of HUC99*.