

KISS the Tram

Exploring the PDA as Support for Everyday Activities

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Abstract. *KISS the Tram* is an example of a PDA application supporting everyday activities. It helps people catch the tram. We tested the application on a group of users who gave good and even surprising feedback. In this paper we present this feedback as inspiration for others who want to make PDA support for similar activities.

1 Introduction

A real personal assistant is there to assist you in your everyday life. He does so by supporting your everyday doings, such as managing your schedule, contacts and correspondence. A Personal Digital Assistant (PDA) can be seen as having the same purpose, supporting your everyday doings. Most current PDA applications focus on tasks inherited from other technologies such as the Filofax and your favourite email application. In this context the physical characteristics of the PDA, for instance its limited screen size, may be a limitation on the design and development and applications.

Support for everyday activities should be provided beyond the notion of a memory-prosthesis; that is the calendar, the todo-list, the contact database etc. We further believe that the desktop computer is not the best place to look for inspiration. For us, the PDA is at its most interesting when it does not remind us of a typical office tool. To help us see the PDA in a new light, our focus is on supporting people in catching the tram to get home. Our purpose is to explore the use of PDA for supporting everyday activities.

We have developed a tightly focused application and given it to users to explore how they perceived the application and the support it provided. In section 2 we present works of others relevant to our own. Section 3 gives a brief description of our application. Section 4 describes our user test and our findings. In 5 we give some concluding remarks.

2 Related Work

Past and current research in mobile computing tend to focus on the fundamental challenges of the restricted resources commonly available in mobile devices [11,

4]. Others have argued that most applications for mobile devices are so strongly influenced by traditions from the stationary world that they might just as well be stationary [5, 6]. They suggest focusing on the mobility of users and their devices, describing different modalities of mobile work. This is discussed in relation to alternative paradigms for user interface. Others have proposed focusing on the mobility of tasks [10], identifying dynamic user configuration, limited attention capacity, high-speed interaction and context dependency as important characteristics of mobile work. Although these results from mobile work helps avoid the influence of a traditional, stationary approach, we feel that one should free oneself even more. In our case, we have found inspiration in everyday appliances, such as the watch and traffic lights.

When designing a new medium, Oren[9] suggests seeking inspiration from the introduction of new media throughout history. He uses the word *incunabulum* to describe a new technology being used in an old and well-known way. We believe research on mobile computing today is in an incunabular stage, and that a wide variety of applications will emerge that does not focus on the PDA as a computer.

To help focus our work, we have sought problems in everyday life. The problem we want to support is catching the tram. This type of support can be described as *everyday computing*, which is “*to support informal and unstructured activities typical of much of our everyday lives*” [1, page 42]. In particular, one must consider that these activities may not have a clear beginning or end, and that multiple activities may operate concurrently. Any interface should be continuously present at the periphery of the user’s attention.

Deciding when to leave work for home is often done when working on something else. In a typical office work setting, ones attention is usually directed towards the computer screen. Our application should be in the periphery of this attention.

One way of minimising the attention required could be to give some sort of reminder saying “*Go home!*”, perhaps in a slightly more polite tone. Others have worked on making such reminders context sensitive and able to adapt according to your context trace. This places a focus on two different aspects of the required support:

1. identifying and providing programmatic access to and processing of context information (see for instance [2] and [3]), and
2. developing algorithms that learn from your context trace, for instance in relation to time and location, using that information to improve context sensitivity (see for instance [7]).

We think that even if we could make our reminders as smart as we want them, they represent a solution to a group of problems fundamentally different from catching the tram. Support for unstructured and informal activities should be given as information and suggestions aiding your everyday life, not as reminders or decisions controlling it.

3 KISS the Tram

Catching the tram to get home is an activity without a clear beginning or end. To support this we designed a user interface meant to be continuously present at the periphery of the user's attention. A quick glance should be enough to get the information one needs.

A guiding principle behind the design itself was *"Keep it simple, stupid!"*, hence the title of the application. For this initial test we wanted no interaction beyond setting your personal settings. In fact, setting and updating your personal settings is the only interactive functionality. The main part of the application is pure presentation. Since the main part of the application requires no interaction at all, the term interface may not be appropriate. However, since much of the literature on user interfaces discusses presentation, we still use the term interface in our discussion.

Our test application is implemented for the PocketPC. The screen is divided into vertical sections, one for each of the relevant stations for catching public transport home. The stations include two subway stations, one tram station and two bus stops. For any given user a set of three stations are selected. A basic assumption is that each of these three stations provides a good starting point for the journey from work. The application itself was mapped to one of the application buttons, making it easy to bring the application to the screen.

The application is based on three different types of information. The scheduled departures from each station are the main source of information. The second type of information is the users walking and running speeds, and the time used to pack and get ready. The third piece of information is the users current location and the location of the different stations.



Fig. 1. Screen shots

Figure 1 shows some typical screen shots of our application. The three stations are presented in separate panels. A station is always presented in the same panel. Each panel includes three types of information. The *name* of the station is written on the top. The *departure* time for the next tram you are likely to catch is written at the bottom of the panel. The third type of information indicates the *urgency* of your decision. This is done using colours, with a supporting text.

For this prototype we provide the user with the option of specifying the information related to himself, that is his ordinary walking speed, his fastest walking speed and his fastest running speed. Packing time is given in minutes while the different speeds are given in minutes per second.

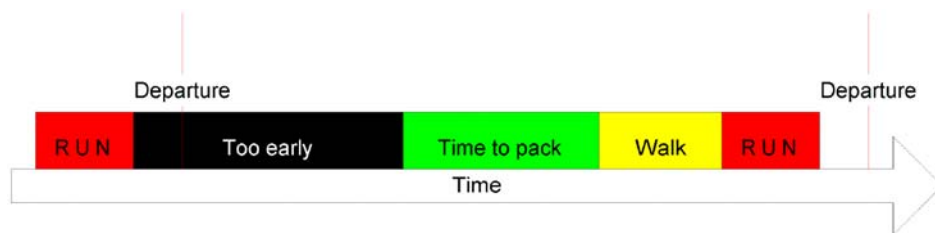


Fig. 2. Colour changes over time

Figure 2 shows an example of how the colours change over time. If it is too early to leave for the tram, the panel itself is black with the text “*Too early*” in the middle. If it is time to pack the panel turns green, showing the text “*Time to pack*”. The next two levels are based on your walking and running speed. When it is time to start walking at your normal pace, the panel turns yellow showing the text “*Walk*”. Once your fastest walking speed is insufficient to catch the tram, the panel turns red showing “*RUN*”. Once your fastest running speed is insufficient, the panel turns black again.

The schedule of each station varies in complexity. One of the subway stations is served by only one line in 15-minute intervals during the day and 30-minute intervals in the evening. The bus stops are similar, with the 30-minute intervals starting earlier in the evening. Two lines service the other subway station, with changes in the interval between departures sometime in the evening. Three different lines service the tram station. One of the lines runs in the early morning and early evening only. The interval between departures from this station varies several times during the day.

In our original plan, we wanted to test our prototype on a Compaq iPaq equipped with a PCMCIA GPS card. We wanted to use the location information to dynamically adapt the display according to your distance from the relevant stations. However, since the device itself is indoors most of the time it receives no GPS signal. Once outside, acquiring the first position takes several minutes,

during which the user has almost reached the station. Consequently, we decided to discard the GPS information and use fixed points during the user test.

4 Our User Test

As the basis for our exploration we chose a quantitative approach. 6 IT students and 7 IT researchers tested the application for approximately one week each. All of the subjects worked in the same geographic area and used public transport as their main means of transportation.

All subjects were shown how to start the application and how to work around known bugs. They were told little or nothing about how the application actually worked. After one week of testing all but one of the subjects were put through a semi-structured interview. The last one gave us written feedback before we got around to scheduling an interview.

Our analysis of these interviews have given four major findings relevant to our exploration:

1. *The support provided by the application was perceived as useful,*
2. *this type of application could make people see PDAs in a new light,*
3. *while in the cradle the PDA can be used as a complement to the PC, and*
4. *the right type of support can make people feel carried by technology.*

1: Usefulness of Support for Everyday Activities

Our analysis of the interviews uncovered four different models used by the users to describe how the application actually worked. These four models can be described as

- *a chronological list of departures (misleading),*
- *a list showing departures in two directions relative to a station (wrong),*
- *an advanced watch (orthogonal), and*
- *departures from three different stations (correct).*

Given that the application was not explained to the subjects, this is not surprising. Still, even though some of these are actually wrong, most of the subjects indicated that the application gave them more control. More importantly, they perceived the application as useful.

Different reasons for the perceived usefulness were given. Some described themselves as unstructured or whimsical, with no clear notion of the departure times. These people had a common strategy for catching the tram. They would work normally and at some time decide to head home. They would then leave the office, walk to a station and wait for the next tram. One of them even used to run, because if he just missed a tram he would at least know that he did his best! These users indicated that the application changed their strategy and that they spent less time waiting for the next departure.

Other subjects had a working knowledge of the time schedule for their normal stations. For their daily travel, these users just indicated that the application could be useful. However, since the application showed three different alternatives, some of these users indicated that the application was very useful when they had to catch one of the other trams where they did not know the schedule.

2: Seeing the PDA in a new light

When analysing how the different users related *KISS the Tram* to other PDA applications they had knowledge of, we made an interesting observation. One user have had a PDA for some time without using it. He commented that this application made him see his PDA in a new light. He also commented that this kind of application could actually make him start to use it.

One user compared our application to Trafikanten [12], a web-based travel planner for public transportation in Oslo. He commented that *KISS the Tram* was simple and felt that it was “*much closer to him*”, making it more suitable for his use.

Another aspect of this is taken from the answers we got on how this application may be extended or the concept applied in other areas. Some suggestions tried to connect our application to known applications, such as reminders and travel-planners. Others expressed that the application inspired them to envision new applications they had not thought about before.

3: Use of the PDA in the Cradle

Putting the PDA in its cradle is usually associated with charging its batteries and synchronising with a computer. *KISS the Tram* is designed for use also when the PDA is in its cradle. One user commented that he liked being able to detect the changes in colour in the corner of his eye. He also commented that since the colours keep changing over and over again, this was somewhat distracting during the day when he wasn't going anywhere.

Another user said he liked the idea of having the display present next to his screen. His problem was that he already used the PDA's screen for displaying the Today list, a list showing his appointments for the day and his todo items. Both these users discussed the possibility of having *KISS the Tram* appear only when needed. The first wanted to reduce the distraction caused by the colour changes, the other to enable him to continue using the Today screen.

The two examples above illustrates using the PDA in its cradle as a complement to the PC. It can be used as extra screen space that is never hidden by windows. It can also be used to support activities that are not directly related to the work task.

Another user wanted the application on the task bar during the day, and then “zoom” in to cover the whole screen sometime during the evening. This zoom could be triggered in several ways. The user could manually zoom in or out. The application could also allow the user to specify a time span for when

he was planning to leave that day. Another possibility discussed was to have the application automatically adapt to the users normal work rhythm, zooming in sometime before the user usually leaves. All these three varieties could of course be available together or independent of each other.

4: Feeling Carried By Technology

One user described an actual situation where he was on the phone with a friend he was going to meet. He used a travel planner on the web to find out how to get to his friend's place. By coincidence the first leg of his journey was using bus 23 east, one of the lines shown on his version of *KISS the Tram*. When he discovered that he expressed that he *"felt in a way carried by technology ... [laughter] ... yes, it was really like that ... a very particular feeling - now you really have support ... so this [KISS the Tram] was for me very useful then and there"*.

This situations has two interesting aspects. The first is the directness of the experience, he felt "carried by technology". He did not have a explicit goal that he wanted to achieve using the PDA. Furthermore, he did not do anything through an interface. We feel that this direct feedback and immediate support is important.

We believe that the applications simplicity is vital in providing this feeling. Support is given without any explicit interaction. An interesting aspect is the integration with the travel planner. To preserve the directness of the application, the integration should be seamless without any explicit interaction by the user. Other types of integration were discussed, such as using real departure times instead of the scheduled ones. Most of these can be described as trivial extensions of the application, and do not really contribute to this paper.

5 Concluding Remarks and Future Work

The user test of our application provides useful information about support for everyday activities. Our first observation indicates that the users found the application useful in their everyday lives. Secondly, this type of application may give people inspiration to see their PDAs in a new light. As a third point, our test users found it natural to use the PDA in its cradle. Few applications seem to consider this type of use. Finally, the effects of the users feeling of support is an important aspect. We believe that this is related to the simplicity and directness of the application.

All of the above observations should be explored further. Presenting applications and concepts like this is a good way of picking up new inspirations, new ideas and identifying new ares of exploration.

What surprised us is the wealth of opinions our test subjects expressed about our simple application and the mundane task of catching the tram. Most people probably do not consider catching the tram as problematic. Still, our test subjects found the application useful, and had lots of comments and suggestion about it.

We want to continue this type of experiments, focusing on everyday activities. It is our goal to free ourselves even more from the paradigm of the PDA as a small computer. To quote Henry Mintzberg:

"It is discovery that attracts me to this business, not the checking out of what we think we already know." [8, page 584]

Acknowledgements

The work described herein was in its entirety financed by NR. We would like to thank Dalip Dewan for making it possible.

We would also like to thank all of our test subjects for volunteering to test our application for an entire week.

Thanks to Michael Gritzman for invaluable discussion on the user interface and this paper. Thanks Lars Aarhus for checking the paper, and also to Anders Kluge for providing the initial inspiration for this work.

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