

THE MOBILE PHONE AS CONTROL ROOM OF LIFE

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Abstract: Current mobile phones have separate lists for call information, text messages, e-mails and pictures and a separate calendar. It is therefore difficult to find all information related to a specific point in time or a specific event. In contrast, this paper describes a concept that gives the user one undivided overview of the part of his or her life experience that involves use of the mobile phone, and it is shown that the concept can be implemented on a mobile phone. A cognitive walkthrough shows that navigation in general requires less manual operations than navigation in a conventional phone, and that the concept makes it easier to get an overview of past activities and to combine messages, pictures and notes for reflection or when writing a report.

1. Introduction

A review of six state of the art mobile phones from three major manufacturers shows that all phones have separate lists of phone calls, pictures taken with the phone, incoming and outgoing e-mails, text messages and picture messages, and all of them have calendars that are entirely separate from all the lists.

That is not a problem if the mobile phone only is used as a communication device with no intention of storing any information about each communication after it is completed. In contrast, if the user wants to get an overview of his or her activities at a specific time or with a specific contact, he or she may have to look into as many as nine different lists of information. This means, that even though a modern mobile phone may store an amount of information that is comparable to what a computer could store ten years ago, it may be too cumbersome to navigate and use the information.

In current graphical interfaces the user can place files and documents in folders that he or she feels are logical and convenient. However, a mobile device is often used on the street or in other situations where it is not possible to organise new information manually. It is therefore necessary to find ways to organise the information automatically in a manner that appears to be logical and convenient for the user.

I propose to provide access to all information in the phone through a timeline that shows all events where the mobile phone is involved, including appointments, phone calls, taking of pictures and making of notes. This makes it possible to design a much simpler information structure. In addition, such a timeline reflects that each moment or event is one total experience for the user, and it makes the mobile phone a more suitable tool for reflection or writing of reports. It is for instance easy to get an overview of all pieces of information that are related to a particular meeting.

2. Earlier similar examples

In addition to the standard graphical user interface, where it is possible to list pieces of information chronologically, there has been a number of other concepts based on a chronological organization of information. Erickson (1996) describes how such a concept was useful for capturing and organizing information for future use. He reports that the largest benefits were the portability and the synergy, and he describes in particular the use of so-called dog-ears to mark points of interest, for instance a name he should remember to add to his contact list. Freeman and Gelernter (1996) describe a concept that integrates document storage, e-mails and a calendar function and Krishnan and Jones (2005) describe a concept where information in "activity oriented workspaces" is organized chronologically. None of these concepts have become widely adopted. That is probably because they were designed for use on full size graphical screens, where they did not offer substantial benefits compared to existing graphical interfaces.

3. Background of the current concept

A mobile phone can be regarded as a control room of life, where the user "gets an overview of his or her daily life and social network, receives from other persons messages or alarms that he or she must react upon, interacts with the environment in different manners and tries to influence it" (Strom, 2007). This concept of the mobile phone as "a control room of life" is one of the inspirations of the current concept. I have observed how technicians in a control room mainly used a chronological list of all alarms and status signals

to keep an overview of the status of a system. It appears that such a list – a timeline – is the most effective information format, when a person shall keep an overview of what is happening and decide when it is necessary to react.

The current concept is also inspired by the Sense-Making Methodology (Dervin, 1992), which describes how each individual on his or her path through life meets obstacles and has to find ways to overcome them. The timeline may then be regarded as a device that makes it possible for the user to capture information that has been useful to progress at different points in his or her life. It shall therefore be useful both as a normal calendar and as a sort of diary or scrapbook with pictures and notes that capture different experiences.

I have earlier described (Strom, 2004) how writers use notebooks to capture small pieces of information that later may be used in their writing, and I have used notebooks to capture observations and reflections during field studies. One particular aspect is that each note may touch two points in the user's path through life: The time when the events described in it occurred, and the time when the note was entered. Often it is then necessary to know both points in time and how they relate to other events, in order to understand the context and implications of a note.

In conclusion, it shall be possible to use the timeline as an ordinary calendar, to find call information, messages and to store and retrieve information, and the timeline shall in addition support the user's actions, planning and reflection on his or her path through life.

4. Description of the current concept

The following describes the characteristics of the different types of events that can be handled by the timeline, navigation in it and use of contact and location information.

4.1. TYPES OF EVENTS

Everything stored in the timeline is shown as events. See Table 1. The simplest type is a dog-ear as described by Erickson (1996). It signifies only a point in time that the user has marked as being of interest. The timeline registers communication events as calls that are made, missed or

TABLE 1. Types of events.

Event	Possible types
Dog ear	-

Calls	Incoming, outgoing, missed
Text (SMS)	Send, received, drafts
E-mail	Send, received, drafts
Appointments	With or without reminder
Notes	With or without a related time
Capture	Pictures, audio
Time interval	With user defined text

received, messages that are send or received, and capture events as when a picture is taken or an audio recording made.

E-mails and notes may have headlines, and part of a headline can be shown in the timeline. An earlier paper (Strom, 2004) describes how the first words of a text may be shown if no headline is entered. That is done for notes or e-mails without a headline and for text messages, in order to make it easier for the user to identify the text.

A note or an appointment may be related to two different times in the user's life. Appointments are related to the time when they occur, but they are also related to the time when they were created. In a similar manner, notes are related to their time of creation, but a note may also be related to a separate time, for instance the time of a meeting it refers to. Appointments and notes may therefore be shown twice in the timeline. The capture of such events is initiated through a suitable menu or icons in the phone. It is then in particular possible to use the timeline to select the time of an appointment to be entered, or a time that is related to what is described in a note.

Finally, it is possible to have events that are related to an interval of time, as when the user has reserved a period of time for a vacation or a specific activity.

4.2. NAVIGATION

When the user accesses the timeline, he or she sees first a view of the actual day with all events. Each event is shown on a separate line with an icon at the left that shows its type, and a text on the right that changes between the time of the event, and a contact for a communication or a

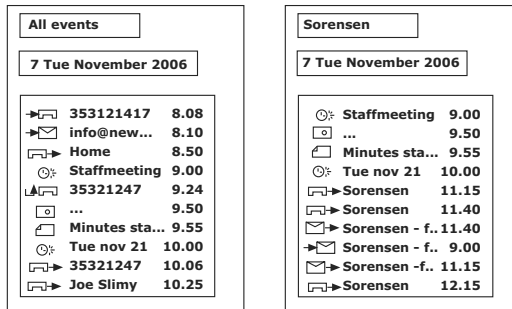


Figure 1. Day view. The one on the right is filtered so only events involving one specific contact are shown.

headline for a note or a meeting. This compact view is similar to the manner in which e-mails are shown in a mail program, and it saves screen space by omitting uneventful periods of time. See Figure 1. It is possible to navigate the timeline and access specific types of information by using only a five-key joystick on the phone (and a back or return key to leave some states). That is done in order to free all other keys on the phone, so these can be used for other functions while navigating the timeline.

The Up and Down keys are used to navigate between items in the timeline. When the top or bottom of the screen is reached, the list will scroll so new events are shown. The Middle or Enter key on the joystick is used to open or access an event for further information, for instance to read a message or a note. The Left and Right keys are used to navigate between the day-view, week-view, month-view and year-view. The last three views have layouts similar to those of a normal calendar. That is done in order to make it easy for the user to navigate between them when retrieving information or entering appointments. See figure 2.

Each time the user moves from one view to another, the orientation turns ninety degrees. A week is for instance shown vertically in the week-view, whereas it is shown as a single horizontal line in the month-view, similar to the experience when browsing some paper-based calendars. This principle supports an extremely consistent interaction, where the vertical keys always are used to move up or down between the displayed items, and the horizontal keys always are used to move between views. See figure 2.

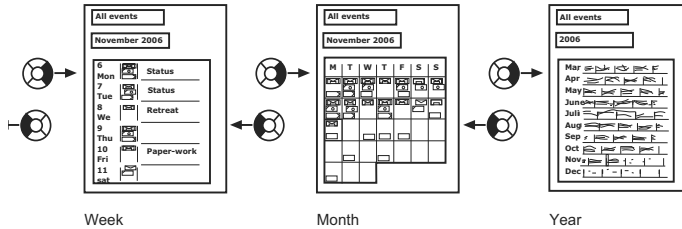


Figure 2. Different views in the timeline. The day view at the far left is not included.

In the week, month or year views it is not possible to show all events that have occurred in each period. Therefore these displays show only the amounts of voice and text communication, of appointments, of notes, and of captured pictures and audio recordings. This makes it possible for the user to identify for instance a vacation period or a period when he or she has been particularly busy.

4.3. USING CONTACTS, LOCATIONS AND CONTEXT INFORMATION FOR FILTERING

The user often remembers contacts: Names of people involved in an event. In addition, the persons involved in an event may be registered automatically, so the user does not need to devote any attention to capturing their names.

Probably all mobile phones contain a Contact list with each contact's name, phone number and in some cases other personal information. If a contact is registered in the phone, the name of the contact is automatically associated with all calls made by or to the contact, all messages exchanged with the contact, and all appointments where the contact is listed as a participant. The name of the contact can also be automatically associated with pictures taken during a meeting where the contact is registered as participant and to any message or note where the contact is mentioned in the text.

This means that it is possible to go into a communication event, an appointment or another event, select a contact and use it for filtering events shown in the timeline so only those involving that contact is shown. It is also possible to go into the Contact list from standby or from the timeline and select a contact, so only events in the timeline associated with the specific contact are shown. See figure 1.

In the future, phones with location or context sensitive devices may make it possible to capture location and context information and use that for filtering the events stored in the timeline, so for instance only events related to the user's work-place is shown.

5. Evaluation

I have made a simple electronic prototype of the concept and as a comparison a simplified electronic prototype of the structure of a current mobile phone, where the information was divided according to types.

I found that it was possible to realise the timeline concept on the same size of screen as a PDA or a feature phone, and that it may be possible to realise it on smaller screens on ordinary mobile phones.

A comparison between the structure of the current mobile phone and the timeline shows that the structure of the timeline prototype is simpler and that navigation in general requires less manual operations.

I also found that the results of a usability test almost solely would depend on the tasks selected for it. I therefore decided to do a cognitive walk-through based on different types of tasks that users may do with a mobile phone.

Ling's (2004) account of use of mobile phones indicates that users often have a number of contacts with the same person within a short period of time. The timeline may then feel slightly less convenient if all contacts are done through the same medium, for instance phone conversations or text messages, whereas the timeline makes it substantially easier to get an overview of an interchange through a combination of for instance text messages and phone conversations

Ling's (2004) account of use of mobile phones indicates that users may browse a list of text messages, pictures or sounds in order to get emotional satisfaction. The satisfaction and flow of the user may then be slightly reduced when using the timeline, where the user has to deal with different types of information while browsing.

It is possible to register appointments in current mobile phones, but it requires several menu selections to access the calendar. In contrast, the user only has to press one key to access the timeline.

It is much easier to get an overview of past activities in a timeline, where it is possible to see the order of all types of registered events at the same time. It is also substantially easier to get an overview of all events involving a specific contact. This means that it is much easier for a user to combine messages, notes and pictures stored in the phone for use when writing a report or other accounts.

6. Discussion and conclusion

It is possible to design a timeline for a mobile phone with the limited number of keys and with a screen size as a normal PDA. The described timeline has a simpler structure than the interface in current mobile phones, and the number

of manual operations required for navigation are in general lower than in current mobile phones.

In contrast, a timeline may slightly reduce the emotional satisfaction when browsing messages or pictures stored in the phone.

The tentative evaluation shows that the timeline compared to a normal phone makes it much easier to get an overview of past activities and to combine notes, pictures and messages for instance when writing a report. This may stimulate use of the mobile phone as a diary and for reflections based on related notes, pictures and communications, and it may thereby facilitate the user's planning and reflections on his or her path through life.

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