

Designing for the Evolution of Mobile Contacts Application

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ABSTRACT

We describe the design drivers, prototype and one-month field study results of a mobile contacts application incorporating new features and design elements. The design was inspired by 8 hypotheses on the potential new uses of a mobile contacts application. A total of 16 users from varying age groups and prior experiences with mobile phones participated in the trial of a prototype application running on Series 60 platform. The results of the user trial show that allowing personalization and reflection of own communication behavior are key factors motivating users to explore new usage of Contacts application. We also discuss a cultivator vs. communicator dimension of user preference towards contacts application use observed during the trial.

Categories and Subject Descriptors

H.1.2 [Models and Principles]: User/Machine Systems, H.5.2 [Information Interfaces and Presentation]: User Interfaces

General Terms

Design, Experimentation, Human Factors, Theory

Keywords

Concept design, concept exploration, prototyping, user studies, mobile communication, user preference modeling

1. INTRODUCTION

'Contacts' or Phonebook application is the central place for actively managing and retrieving contact data on mobile phones. This application acts as the site of initiating various types of communication. The emergence of new communication channels available through mobile devices, such as video or VoIP (Voice over IP) call necessitates revisiting the design of Contacts. Novel approaches in consolidating contact information in one place and updating it easily have become available through various Internet services, such as Plaxo [1]. Furthermore, an increasing number of people started to use contact information in social networking services such as Facebook [2] as a means to initiate communication. Some internet services such as Skype [3] also

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MobileHCI 2008, September 2–5, 2008, Amsterdam, the Netherlands.
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support making phone calls through the web interface. Projections may be made to assume linkages between contact information stored on the mobile device and the Internet services in the future. However regardless of the sources of contact information database, the features and design of contact database available on mobile device still poses unique challenges, which may make it impossible to adopt the same contact information or design approaches as the Internet service. The main differentiating challenges are the limited screen asset, higher cost of mobile communication, and the higher level of intimacy and accessibility that contact information on mobile devices provides. The legacy factor cannot be easily ignored either, as voice calls to conventional phone numbers are still a dominant usage of mobile phones as of 2008. It is apparent that the availability and accessibility of contact information influences our communication behavior [4]. In some user groups, the inclusion or exclusion of contact information in one's device has acquired certain symbolic meaning as to declaring the intended closeness of the relationship **Error! Reference source not found.** With the increasing popularity of mobile device use, the amount of contact information also has been on the increase, which poses another set of design challenges. Our intention to initiate this project was both for improvement in mobile Contacts design to be better suited for the context of use, and for exploration of new roles that mobile Contacts can take on. The development of a working prototype application and the field trial were chosen as the method to validate our assumptions and to derive a set of conclusions to apply to the design of the commercial products, as it is difficult for users to form their opinions on the design without putting it their own context of use and social relationships.

2. DESIGN DRIVERS

We were set to explore ways to create unique value for contacts information in mobile devices (henceforth, Contacts). We hypothesized that the design of Contacts would be able to facilitate novel user benefits by becoming more personal and enriched with social information, beyond the simple communication enabler. We worked with following hypotheses as our design drivers. These were informed by our previous research on the use of Contacts application as well as understanding the market and development in technology.

Efficiency of accessing contacts: Speed and ease of accessing contact information are key factors in the current user experience of the Contacts, and should be the top priority in future designs. This also includes speedy exchange or creation of new contact information.

Differentiating important contacts: Interviewed users expressed their needs for differentiating special contacts from the rest, both for emotional and practical purposes. As the size of mobile Contacts increases, we observed people manually changing the order of appearance of a certain contact in the list (e.g., by adding a number “1” in the name field) or adding a visual mark to the name field to stand out in the textual list (e.g., by adding symbols such as “*” or “<3”, a heart, to indicate her boyfriend). The nature of relationships change over time and not all contacts are equal in terms of importance [4]. On a very practical level, the use of dynamic list in Contacts was widely discussed in the company, generated based on the frequency and recency of communication. We were asked to find out about people’s preference to the design of automatically generated shortlist of frequently used contacts over manually chosen ‘top contact’ list.

Customization and personalization: Contacts can be a highly personal application that accommodates varying user preferences and lifestyles. Therefore it is necessary to find a model to understand the range and patterns of user preferences that can be translated into user preference settings. We intended to explore the area of personalization in the context of Contacts application in a very broad sense, by providing features that allow personalization of the content on various levels (e.g., adding a picture, an icon, or a note to a contact entry) to examine the varying importance of the different personalization options [6]. Again on a practical level, it was necessary to define the user interface convention of personalizing the data and customizing the UI that was usable within the larger context of mobile phone UI.

Contact as repository of personal information: It is a wrong notion that Contacts are only about other people. Our interview revealed that people store personal information unrelated to communication that may potentially be retrieved more than once, particularly passwords or account numbers. More advanced users develop a way to codifying the private information to ensure the security (e.g., naming the visa card password as ‘Jonny’ in Contacts). Furthermore, we found it necessary to promote users to store user’s own identity in Contacts, as a solution to make the sharing of contact information easier. In exchanging contact information with a newly met person, interviewers often employed the strategy of calling each other and then manually entering the name. This works for simple phone numbers but cannot support the full exchange of one’s digital identity.

Contacts as social piggy bank: When the contact information is about a person, people consider adding other information that is related to the social relationship and communication a natural fit (e.g., birthday, social network, communication history). Active mobile phone users tend to wish possibilities to add further information about the person to the contact information, such as photographs as to providing or reinforcing the context of the relationship, especially when the person has strong-social ties with the user [5]. It is necessary to design the editor/viewer of the contact information that can accommodate both the people-centric and the information-centric types.

Assistance to social management: While there is very little notion about benefiting from reviewing one’s own communication patterns at present, the interviews revealed areas where users will benefit from making use of the analysis of past communication behaviors (e.g., showing the time stamp of when

the contact information was created, which may mark the date when the user met the person for the first time). Compared to the previous design driver “Contacts as social piggy bank”, this benefits users who do not proactively store additional information as most information can be collected and presented automatically.

Flexibility in organization: Regardless of the current adoption, interviews revealed several potential reasons why users would introduce hierarchical or grouping organization into the contact information. One such a reason was to assign common attributes such as personalized ringing tone to a group of people. Another reason was to facilitate faster access or eliminate the visual clutter when there were too many names identical or starting with the same alphabet.

Accessing contacts information beyond my own: The increasing mobility may necessitate access to the basic information in a different locality (e.g., taxi, hospital, directory service) in an unexpected situation; hence it was seen desirable to have access to the locally relevant information. Instant access to external contact information database will have the potential to turn the notion of what gets stored on personal database, as the prevalence of search engines influenced the bookmarking behavior in Internet use.

3. PROTOTYPE DESIGN

Our design proposals were incorporated into a working prototype running on Series60 2.6 devices (Nokia 6630, 6680). Some of the features had to be left out of the implementation due to the time constraint in the project schedule. The biggest constraints we worked with in designing the prototype were as follows.

Stability: The reason behind our implementation effort was to test the design and our assumptions with the actual trial use. In our previous research, it always proved difficult for users to form any opinion on the new design when it closely involves personal information but if the test was done with someone else’s data [7]. So the prototype had to function as the main Contacts application reliably for the whole duration of the study.

Compatibility: We had to respect the data compatibility and portability between the existing Contacts application to our prototype, as all participants had to move their existing contact database to the prototype.

The following subsections present a small selection of screenshots of the implemented prototypes and some design sketches.

3.1 Basic structure

We defined 4 areas of Contacts application, each corresponds as a tab. **Names and groups** tab hosts the main list of all contacts and groups, with search features, and the top contacts as additional feature to the list. **Smart groups** tab hosts contact groups that are automatically generated based on user’s context or communication history. Smart groups do not contain new contact information, but they highlight certain aspects of the contacts relevant for the user. **About me** tab allows user to define his/her identity both online and on the device, and store personally sensitive information. **Directory search** tab allows user to access external databases of contact information such as Yellow pages (USA) or Fonecta (Finland) with seamless search interface that resides on the phone. *Names and groups* tab was designed to be

the central access point of the application, which could be linked as shortcut from mobile phone's idle screen.

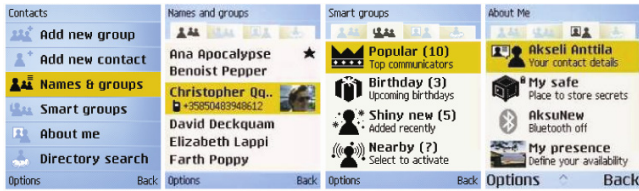


Figure 1. Basic structure of the prototype design comprised of 4 tabs.

3.2 Names and groups tab: the main list

Several new features were added to this list, while keeping the access to the contact information simple. The 'quick find' functionality was available whenever user typed in a character. Groups were embedded in the list, searchable in the same way with the name. Personalizing entries in this list was possible by adding icons, or changing the layout. 3 different layout options were provided for the names & groups list. By default, the 'magic lens' layout was chosen, which showed the default phone number and the picture thumbnail of the selected item.

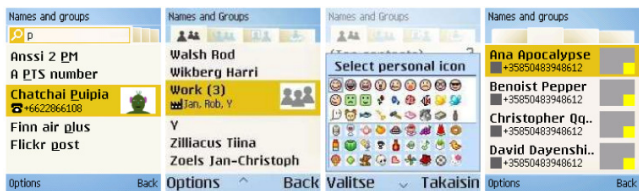


Figure 2. Names and groups tab: Quick find, group entry, and personalization icon, one of 3 layout options.

3.3 Top contacts

Top contacts, which were considered as a method to make it easier to access distinguished contacts, were experimented with two options in the implemented prototype: Manual or automatic. Automatic top contacts showed 10 most frequently communicated contacts on top of the alphabetically sorted main contact list. With the automatic top contacts option active, the initial selection upon opening the list was on the first top communicator, which was shown right above the first item in the main contact list. The rationale behind this was that the automatic top contact list changes without user's conscious control so it was necessary to show the stable list together with the top contacts.

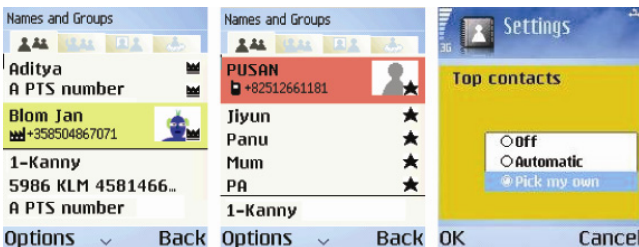


Figure 3. Automatic top contacts; manually selected top contacts; options for selecting top contacts

Another option was to choose top contacts manually. Users were allowed to choose up to 10 top contacts. With manually chosen top contacts active, the initial selection upon opening the list was

on the first chosen contact by the user, which was placed on top of the whole list. The rationale behind this was that the user understands the manual selection and will thus be less likely confused about the whereabouts of the main contact list. By design, it was required for the user to choose one of the three options given upon the initial use: automatic or manual top contacts, or turning the feature completely off.

3.4 Contact viewer

Most mobile phones allow initiating the communication through the user interface while on the list, without having to open the contact details. On the other hand, the design of contact viewers in common mobile phones available at the time tended to focus on displaying information for the ease of editing the information later (Figure 5). Therefore the rationale behind the viewer design was that the contact viewer would provide additional information about the contact. In order to promote the use of images, a thumbnail was automatically created when a new contact was added. The time of the last communication and the date of contact creation were shown next to the thumbnail, which may provide the social context of the contact. The layout had to work even though user does not fill in much information as will be the case for a lot of contacts. Therefore we prioritized the order of presentation of the detail fields.

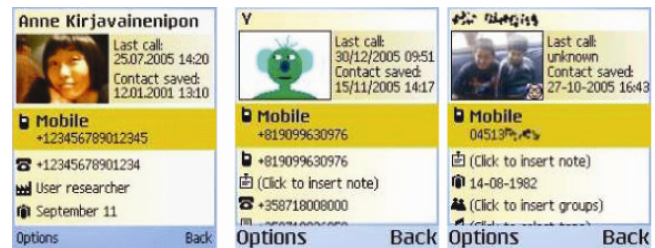


Figure 4. Contact viewer. A few selected fields were visible to promote adding the details.



Figure 5. Screenshots of contact viewer of commercial mobile phones from Nokia (S60), Sony Ericsson, Microsoft, Samsung, Nokia (S40)

3.5 Smart groups

Smart groups tab shows automatically formed contact groups that have common attributes that are worthy for user to take note. Among a long list of possible smart groups, 3 of them were implemented in the prototype: Popular (top communicators, based on both messaging and voice calls), Birthday (contacts who have recent birthdays, both past and upcoming), and Shiny new (contacts added recently).

These groups appeared on the second tab, completely separated from the main contact list so that there is no confusion with the user-created groups, making the use of the information is complementary and optional.

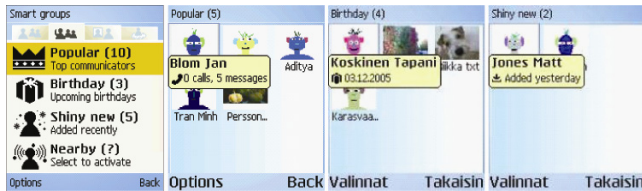


Figure 6. Smart groups showing the selected contacts that fit specific conditions.

The purpose of the smart groups was to elevate certain information for user's attention, which is otherwise not very noticeable. We intended to bring this layer of information without user intervention for the coherence of the conceptual separation between the first tab (main contact list) and the second tab (smart groups).

4. USER TRIAL SETUP

To validate our design, we ran a 1-month user trial with 16 users from varying age groups and prior experiences with mobile phones. The user trial was carried out October - December 2005 in Helsinki, Finland. The participant group represented greatly varied lifestyles and mobile phone usage experience, recruited through newspaper advertisement. In order to encourage social use and reflection of the prototype, participants were recruited in 3 dyads, 3 triads, and one quartet. 14 of 16 participants were Finnish. 2 participants attended the study with their own phone; the rest used the phones provided by the research team. The research team set the test phone (Nokia 6630) ensuring the participants' contact data is transferred and in working order with the prototype, and the conditions in all participants' phones were set in the same way, such as placement of shortcut to the prototype application.

Three different sets of data were collected for analysis: i) **Pre-interviews** on participants regarding their pre-existing Contacts usage habits and **post-interviews** after the trial period, ii) **personal data on the prototype** as collected after the trial period, iii) the very detailed **log file data** tracking all commands and actions in the prototype.

5. RESULTS

Prior to the trial, participants viewed Contacts as communication enabler. Contacts application was mainly visited for launching communication and cleaning up the list in order to enable efficient access. After the trial, the basic level motivation of easy and efficient access to Contacts remained unchanged. Based on analysis of the log file, it is possible to conclude that close to **50% of Contacts use sessions** did not include initiating communication¹, implying there were **other reasons to open the prototype**. Supporting this figure, novel use motivations and patterns emerged during the post-trial interviews:

1) Contacts was viewed as more **personal** and **repository-like** nature of this application was emphasized: "Every single person I

¹ Average number of prototype use sessions per user: 4.3 times/trial day. Session was calculated by determining the number of continuous activity sequences separated by at least one minute from the previous sequence on the log file. Calls or SMSs were launched 2.3 times / trial day per user, on average.

took [a photo of] explicitly for putting as a thumbnail. They are all people I know" (6-DIII)

2) **Heightened awareness of participants' communication behavior** was both practically useful and emotionally satisfying: "I used 'Popular' smart group to determine whether it was lacking people I considered as important and with whom I should be in touch with." (2-DI, parents)

3) Value of Contacts in **assisting social management** was acknowledged: "'Shiny New' was great. When someone calls, I save the number but forget who they are." (5-DIII)

The overall **acceptance of top contacts** was very positive, both in terms of utility and emotional aspects. No participant turned the top contacts functionality off during the trial. Participants had clear personal preferences between automatic and top contacts, spread equally between automatic and manual options.

It was a common desire for all participants to use Contacts efficiently as well as to cultivate the most important contact entries. In designing future Contacts application, it will be useful to consider the user type dimension of **Communicator** (use Contacts as efficiently as possible) vs. **Cultivator** (personalize and add extra contents to contact entries), with most participants in this trial falling in between the two extremes.

We were aware of the limitations of the study: One month was still short for observing many of the features of the application, especially adding new contacts which depended on meeting new people. For most participants, using the loan test phone lowered their motivation to personalize entries. In addition, we had limited diversity of languages used by the participants. In the future, we hope to study the role of contacts and social network outside the boundary of a separate application, but rather a holistic mobile experience.

6. ACKNOWLEDGMENTS

Rob van der Haar was part of the main design team with authors. The implementation of the prototype was done by Panu Vartiainen. The layout design of a few key screens was aided by Paul Seymour.

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