Classifying Mobile Services

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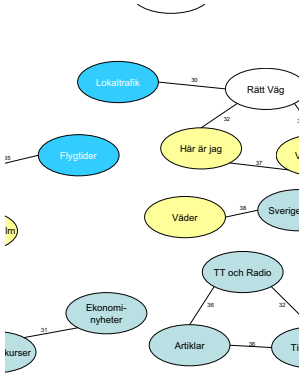

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EXECUTIVE SUMMARY

Deliverable

A categorization of telecommunication services is presented, together with an explanation of the method used. Any categorization pertains to a moving target, due to the ongoing changes in the supply of services from mobile operators and third-party providers, in the terminals available, and in the customer demand. The method used is generic, however, and makes it possible to reanalyze and restructure categories over time. The main deliverable is hence the method, with the suggested categories constituting a current recommendation on the naming and classification of an important set of telecom services.

Method

The method consists of two elements. The two elements proved complementary and necessary, since some services were not uniformly classified in the two elements.

The first element is a means to acquire common-sense categories, using results from empirical studies. Since market analyses provide few clues about end-user preferences, individual end-user preference elicitation was attempted, using a basic set of 60 telecom services (included here with their Swedish descriptions, as Appendix B). A hierarchical cluster analysis was made on the empirical data. This method is explorative and allows for approaching data with-

out any preconceived hypotheses about the groups of different services.

The second element is an analysis of the aspects of services important to the user/service-interaction, also taking some data sharing aspects into consideration. The analysis is parametric and, in comparison to the prevailing kind of technology-related analysis, relatively stable. Focus was on intrinsic aspects that directly influence service behavior, as experienced by the end-user, and a three-step procedure was used. In the initial phase, brainstorming and a literature search gave a frame of reference for the subsequent service analysis. In the second phase, the 60 services from the user study were described, each in terms of its properties. In the final phase, the parameter set was refined and new parameters were introduced that had been missing or inadequately specified in the first phase.

Results

The user-study yielded a common-sense classification, which proved surprisingly stable with respect to user experience, age, and gender. Among the differences revealed, an interesting example is the clustering of telephony and messaging (see the poster included here as Appendix A). The three most clustered groups of services in the user study were: ***Games and entertainment***, ***News and sports***, and ***Communication and planning***. Relaxing the clustering requirement two additional clusters appeared: ***Travel information*** and ***Banking services***. At this relaxed level, ***Games and entertainment*** was divided into ***Games*** and ***Entertainment guides***, while ***News and sports*** was also split in two. Finally, the

Communication and planning cluster split in three clusters: one with ***Phone-related***, one with ***Calendar***, and one with ***E-mail*** services. There were some surprises. For instance, ***Download ring signals*** and ***Download music*** seem related but did not cluster. The ***Address book*** function was not tightly coupled to any other service. The parametric analysis resulted in a classification into ***Information***, ***Community***, ***Bank***, ***Geographic***, ***Profile***, and ***Calendar*** services. An integration of the two classifications was then made. Out of these five, the ***Information*** and ***Community*** services were well clustered also in the user study, whereas the other three overlapped less well with the common-sense classifications. A possible explanation is that these are uncommon at present and not yet well understood by end-users.

Additional Output

A DVD that explains the workings of the user study was produced. A number of posters presenting the main results of the cluster analyses of the study were pre-printed, and any subset of these may be professionally printed upon request. Finally, the full transcriptions of the deep interviews of the 42 subjects in the card-sorting study are available, as are the Excel sheets for producing the cluster analyses.

Future Work

The method developed in this first phase of the project enables us to form a well-informed hypothesis about relevant categorization structures. In future phases, verification methods as well as design recommendations based on mobile service categorizations will be pursued.

A natural next step is to pursue the results of the user study, now having been completed into an integrated suggestion of services, by presenting this suggestion to a new group of end-users. This second empirical study will let participants fit services into the suggested categories, and it will also make investigations into the attitudes of end-users. This latter point is motivated by the fact that most of the participants in the first study had services they wanted to eliminate altogether. This second study can be used as a basis for opt-in/opt-out and other design aspects. It can also take willingness to pay into consideration.

A more long-term goal is to investigate the effects of the proposed categorization on usage. Steps towards this goal can be taken by putting results in the user context, for example through mock-ups. This line of research can then be pursued to show how the service categorizations should be used in the structural design of service offers, and how changes are to be accommodated for in future service offers.

BACKGROUND

The Internet services that have gained widespread acceptance on home and office computers do not readily transfer to small, mobile devices that are used on the move. To a large extent, this is due to the limited interaction and screen size, but also because mobile devices are used in completely different situations and environments. The special features of small mobile devices must also be taken into account: they are highly personal and move with the user. Finally, the services available to end-users vary with the phone as well as with the chosen subscription. Mobile phone services must thus be seen as phenomena in their own right, naturally overlapping with computer-based services and services for other mobile devices, but with restrictions (Ericsson *et al.*, 2001) and opportunities of their own that relate to this particular mobile media.

A typical user will want to access operator-specific services (e.g., answer phone), services operated in agreement between an operator and a content provider (e.g., Allsvenskan's agreement with 3 for football highlights), and services that are provided totally by a third party (e.g., bus timetable information). Understanding the full implications of using these services (including cost), configuring your handset for use, and becoming familiar with the services through regular use, are all vital issues (Palen and Salzman, 2002).

We can identify at least three approaches to how mobile services can be classified. The prevailing approach to service organization in today's phone interfaces and marketing strategies is to rely on a strongly technology-oriented service classification model. This model can be confusing, with overlapping functionality provided by services that are seen as separate and have very different usage models. An alternative approach is to distinguish between services on technologically independent, inherent properties of the services. One attempt at a parametric analysis of mobile services has been developed by Carsten Sørensen *et al.* (2002), and in our parametric analysis described below we expand on their work. A third approach to service classification is to directly study how end-users prefer to classify and organize services. There are two main approaches to this. One is market-oriented, and serves to organize services by which ones are used or desirable in particular markets or market segments. This approach has been taken in some market studies, as for example by *Ericsson Consumer Labs* (Lewis, 2003). The other approach is to directly ask users how they classify and organize services, and seek common patterns for all users or particular subgroups. In our work we have performed an empirical user study focused on eliciting such patterns.

Existing Classification Schemes

Several mobile operators, including *TeliaSonera*, have produced service classifications. Some of these classifications were motivated by business concerns, but in some cases more ambitious long-term goals have also been heeded (Areskoug, 2003). For the purpose of this report, we will assume that the characteristics of such classifications are well-known, and we focus instead on two other kinds of classification schemes here.

Web search engines

Web search engines categorize more or less the same content as mobile services. Of the search engines that we have examined, two (`yahoo.com` and `excite.com`) have two separate categorizations, three (`lycos.com`, `spray.se`, and `euroseek.com`) have a single content-based categorization, and three (`altavista.com`, `google.com`, and `alltheweb.com`) only provide a simple search feature with no categorization at all. The engines that have different sites for different countries all use the same approach for the different sites, but show variations in the categories and the presentation. For example, *Yahoo* uses the same categories on all sites, but not all sites are organized alphabetically. *Lycos* and *Excite*, however, have about twice as many categories at their American site as on their British and French sites.

The engines that provide two different categorizations have one more goal-oriented categorization and one more content-based. The goal-oriented categorization has a small number of categories, 5-7, and mostly verb names; for example, *connect*, *find* or *shop* for `yahoo.com`, and *communiquer* and *personnaliser* for `yahoo.fr`. A few of these categories have content-based names, such as *news* at `yahoo.com` and *tools* at `excite.com`. All of the goal-oriented categories have links to sub-categories visible on the main page.

Even though each search engine is quite consistent in its content-based categories between their own different sites, there are large differences between engines. Some of them have sub-categories presented on the main page while some only show the main categories. No category is used by all search engines, but news, travel, games, sports, employment, real estate, and computers are common categories. More site-specific categories are, for example, *blogs* and *family zone* on `lycos.com`, *celebrity* on `lycos.co.uk`, *insurance* on `euroseek.com`, *people* on `excite.co.uk`, and *lifestyle* on `excite.com`. These categories are not used on any other site.

Mobile Services

One useful parametric analysis of mobile services has been developed by Sørensen *et al.* (2002). It classifies services along two axes: the availability of information for generating the required service, and the complex-

ity of the service. When all information is available and the service can generate a programmed response, the service is classified as having low uncertainty. Complex services are those that require much information or a complex setup to function. These must by necessity also have a longer relationship with the user. All four combinations of high and low uncertainty and complexity are possible and create four groups of services: computational services, adaptive services, networking services, and collaborative services. For example, phone services such as voice communication and SMS have low complexity and low certainty, whereas personalized or position-based information services have high complexity and high certainty. Sørensen *et al.* also distinguish relationship-based and encounter-based services, where relationship-based services save information about the user between usage sessions and encounter-based services do not. Sørensen *et al.* claim that all services with high complexity must be relationship-based. However, we believe that it is perfectly possible to envision a system where encounter-based services can utilize information gathered previously from other services, to provide a service with high complexity. Examples could be an encounter-based service that uses position information sent to the service by the phone, or shopping services that use payment information from other services in the phone.

COMMON-SENSE SERVICE CATEGORIZATION – A STUDY

One approach that has commonly been used for finding common-sense organizations of existing information is to do a card-sorting study (Nielsen and Sano, 1994). Such a study is an experiment where people are instructed to sort concepts or pieces of information into meaningful structures, for example groups or hierarchical structures. Our own card-sorting study is a means to acquiring common-sense categories from end-user. The information items were short descriptions of 60 different mobile services. Most of the services were, at the time of the study, available from Swedish operators for today's mobile phones, but the set also included some examples of new types of services on prototype or idea level from the research literature.

In the study the participants performed three tasks. First, they were asked to sort 60 cards, representing the services, into meaningful heaps. Each service was described by a name and a short text. Participants were allowed to create up to 20 heaps, and were instructed to provide a name for each heap. No time limit was set; the subjects were encouraged to use as much time as they needed. They were left alone during the sorting, and the experiment leader checked if they had problems or questions 2-3 times during the study. After that the participants were

interviewed about their classification and the strategies they had used in sorting the services. They were also asked to rank the heaps in order of importance, if possible. Finally, the participants filled in a questionnaire about their mobile phone experience, and they were also interviewed about their mobile phone habits. The interviews were recorded, and the recordings were later transcribed.

Participant Information

In the study, 42 subjects aged 19-68 participated. The subjects were categorized as young (age 19-29, m=23.10), middle-aged (age 30-50, m=39.50), and middle-aged/elderly (age 51-68, m=61.58). Of the 42 participants, 23 were men and 19 were women. No experience of mobile phones was required to participate but in a questionnaire the subjects both rated their own experience with mobile phones and marked their use of several different mobile services and functions. The use of different mobile services was furthermore used as a measurement of experience. This measurement is presented in Table 1 both for each category of services and as an overall measurement (use of services with

respect to all categories together). For all measurements regarding experience and use, intervals between 1 and 7 were used. The data presented regarding the use of different services are average scores for each category.

Table 1: Background variables and age differences.

	Age 19-29	**N=10 (5 men, 5 women)**	**Age 30-50**	**N=20 (13 men, 7 women)**	**Age 51-68**	**N=12 (5 men, 7 women)**
	Mean	SD	Mean	SD	Mean	SD
Age	23.10	3.04	39.05	5.52	61.58	5.00
Experience with mobile phones	5.00	1.16	5,25	1.803	4.83	1.64
All categories	2.05	.36	2.03	.56	1.99	.46
Calling/ sending messages	4.85	.96	4.62	1.53	4.84	1.22
Phone functionality	2.78	.80	2.76	1.33	2.69	.96
Positioning based services	1.00	.00	1.00	.00	1.21	.52
Information search/bookings	1.22	.27	1.23	.45	1.15	.35
Downloading services/games	1.24	.24	1.26	.27	1.12	.21
Other services	1.18	.55	1.31	.69	1.00	.00

Table 2: Background data for experienced vs. inexperienced participants.

	Experienced (≥2.28)	**N=11 (8 men, 3 women)**	**Inexperienced (≤1.70)**	**N=11 (4 men, 7 women)**
	Mean	SD	Mean	SD
All categories (basis for classification) ***Significant, F(1,20)=94.92, p<.05***	2.62	.34	1.48	.18
Calling / sending messages	6.20	.56	3.09	.77
Phone functionality	3.89	1.23	1.76	.42
Position-based services	1.15	.50	1.00	.00
Information search / bookings, etc.	1.54	.58	1.03	.10
Downloading services / games	1.36	.30	1.02	.05
Other services	1.54	.93	1.00	.00
Experience with mobile phones ***Significant, F(1,20)=24.14, p<.05***	6.36	.92	3.91	1.38
Age	42.45	11.67	43.91	17.64

To be able to study differences with respect to experience, eleven of the most experienced participants were placed in one group, and the eleven most inexperienced participants were placed in another. This categorization was based on the overall measurement regarding the use of different

mobile services and functions. The background data for these two groups of users are presented in Table 2. As seen in the table, the self-rated experience with mobile phones are in line with the categorization made, and the differences between the groups were significant with both measurements of experience.

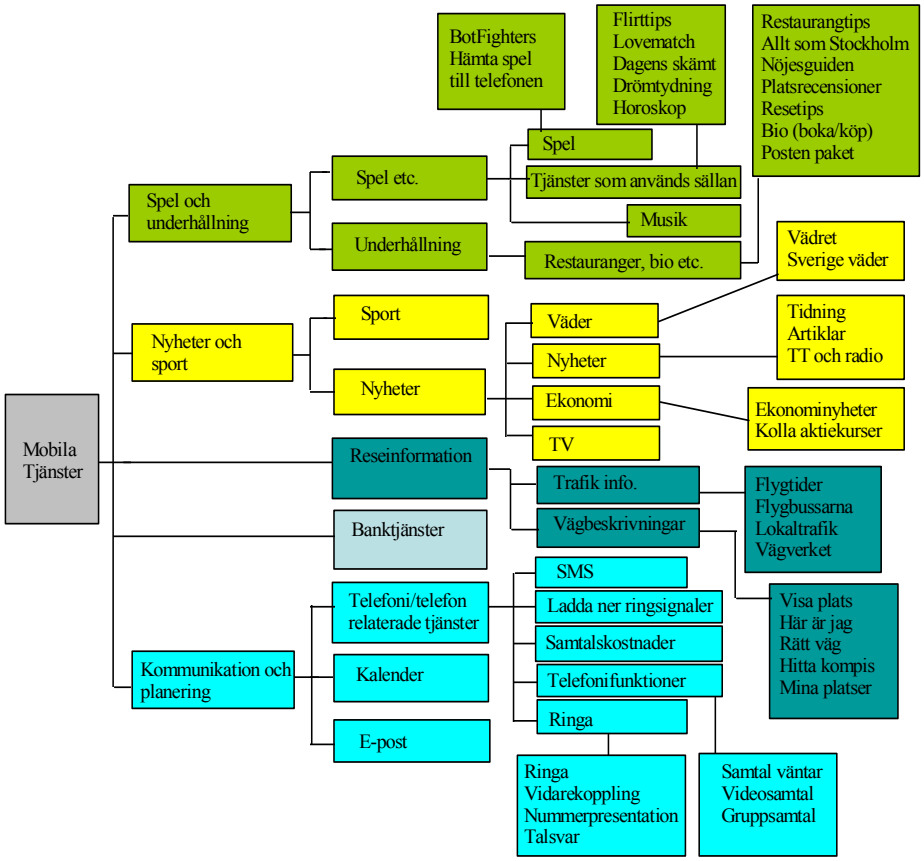
The categorization between experienced and inexperienced subjects used might indicate a gender difference between experienced and inexperienced. Only three women were categorized as experienced, whereas only four men were categorized to be inexperienced. However, no significant gender differences were found regarding any of the experience measurements, neither in analyses including all subjects, nor in analyses with only the experienced vs. inexperienced groups.

RESULTS

A hierarchical cluster analysis was performed on the data obtained from the study. This method is explorative and met our purpose of approaching the data without any preconceived hypotheses about the grouping of different services. Three clusters were found on the highest level: ***games and entertainment***, ***news and sports***, and ***communication and planning***. At the second level, two new clusters appeared that did not belong to a category on a higher level: ***travel information*** and ***banking services***. At this second level, the ***games and entertainment*** cluster was also divided into ***games*** and ***entertainment guides***. Moreover, ***news and sports*** was also at this level split into ***news*** and ***sports***. Finally, the ***communication and planning*** cluster was at this level divided into three clusters: ***phone-related***, ***calendar***, and ***e-mail*** services.

As a complement, we performed an analysis where our requirement for the lowest cluster level was that 75% of all subjects would connect these services to each other. Using this criterion, 44 services were clustered into 14 clusters, while 16 services did not cluster. The clusters contain between 2 and 8 services; on average 2.9 services. The clusters were mainly the same as those found in the hierarchical cluster analysis.

Figure 1: The hierarchical cluster analysis (names in Swedish).



To investigate the stability (whether the clusters will be the same for subgroups of the participants) of the identified clusters, we reiterated the analysis with identifiable subgroups: men and women, young (<30 years) and old (>50 years) participants, and finally inexperienced and experienced mobile users as defined above. The clusters were surprisingly stable in these analyses, with only a few services moving in and out

of clusters, or two related clusters merging. For example, the ***financial news*** cluster and the ***weather*** cluster merged for experienced participants, and the ***travel information*** cluster merge with the ***flight-related*** cluster for inexperienced participants. The inexperienced group tended to add more services to each of the clusters. The most interesting differences concerned the ***telephony*** cluster and the ***messaging*** cluster. For all users, these two clusters were tightly related but not enough to be considered as the same cluster. For inexperienced users, the two clusters merged into one. For young users, however, the messaging cluster did not manifest itself. Instead, MMS was clustered with e-mail and SMS was not tightly connected to any other service. A possible explanation of this result is that the larger experience of e-mail and computer-based SMS services in the young user segment made them more aware of the large functionality overlap between e-mail and MMS.

Sorting Strategies

All the participants in the study got the same instructions, namely to group the services in a way that they found meaningful. However, we found that they used widely differing strategies in their categorization. Many of them also had difficulties explaining what strategy they used and merely enumerated the names of their groups, or stated "I just did it like this" when asked. In those cases we have looked at the names and the content of the groups to determine a strategy.

The most common strategy was to group services based on content, which almost 75% of the participants did. Other strategies found in the study were to group services according to how important they were, how much the participant liked them, or what kind of device the participant wanted to use when accessing the service. Many of the participants used a combination of strategies. Those that used service content as their main strategy created a larger number of groups than the others, and also a larger number of groups than the average participant.

Service content

Participants that based their groups on service content simply put services with similar content together and named them after their content, for example *sports services*, *entertainment services*, *bank services* and *travel services*. The participants using service content as their main strategy created 11 groups on average (average for all participants was 9.5). Many of them combined the service content strategy with personal preferences or importance rank for some services, resulting in groups categorized as rubbish: *onödiga saker*, *trams*, *skulle aldrig använda*, *förbjud dessa i mobiltelefoner*.

Personal preferences

Participants using personal preferences as their main strategy grouped services that they want or are using vs. services they do not want or do

not use, resulting in groups named *användbart för mig, kanske, skulle aldrig använda*, or *om jag var 50 år yngre*. On average, they created 4.5 groups.

Importance rank

Participants using importance ranking as their main strategy grouped services that they found equally important, resulting in groups named *basic*, *viktigt*, *mindre viktigt*, or *inte viktigt*. On average, they created 4.7 groups.

Device for usage

Participants using device for usage as their main strategy grouped services that they wanted to access from the same device, resulting in groups named *mobiltelefontjänster*, *datorhögen*, or *vanlig telefoni*. On average, they created 3.5 groups.

The variations in how many groups each participant created were large, between 2 and 19 groups. However, the number of groups did not correlate with the participants' age or experience. We had expected that inexperienced users would create fewer groups than experienced, but the results rather show a weak tendency towards the opposite (in average 8.1 groups for experienced and 9.9 for inexperienced).

Detailed Cluster Analysis

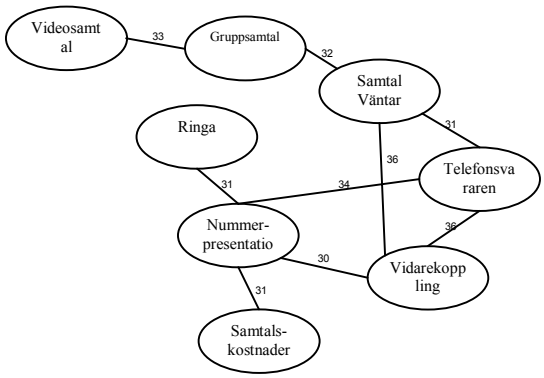
This section goes into more detail for each cluster. In this analysis we will use the 'threshold level' analysis and require that 75% of all participants in a group sorted services into the same groups, and analyze in more detail the different sorting patterns between the different user categories. Below, the clusters will be discussed in the five main groups that were shown in the cluster figure shown earlier.

Communication and planning

Communication and planning contains four of the 14 clusters, the ***telephony*** cluster, the ***messaging*** cluster, the ***organization*** cluster and the ***e-mail*** cluster. In this section, the first two will be examined in detail.

The ***telephony*** cluster and the ***messaging*** cluster contains the services that traditionally are associated with telephony or mobile telephony. The ***telephony*** cluster contains eight services. For young participants, the services *ringa*, *videosamtal* and *gruppsamtal* do not cluster; for experienced participants, *video samtal* do not cluster, and for men, *videosamtal* and *samtalskostnader* do not cluster. Moreover, 25 participants have grouped 75% of the services in the ***telephony*** cluster together, and 14 have grouped all eight services. Examples of names for the cluster are *telefon*, *telefontjänster*, *kommunikation*, or *bas*.

The ***messaging*** cluster contains only two services: MMS and SMS. They were grouped by 35 of the 42 participants. However, for young participants, the cluster is not stable, and the MMS service is instead included in the ***e-mail*** cluster. For inexperienced participants, the ***messaging*** cluster disappears and both services are included in the ***telephony*** cluster. Looking at both clusters together we can see that 12 participants placed all ten services together, and 19 participants placed 75% of the services in the same group. Suggested names were *telefoni*, *telefontjänster*, *standard*, *nödvändiga tjänster*, *bra tjänst för mig*, and many others.



The last two clusters in this group are the ***organization*** cluster that contains the services *kalender* and *anteckningar*, and the ***e-mail*** cluster that contains the services *e-mail* and *hotmail*. They are both strong clusters that are stable for all selections of participants. However, for young participants, the e-mail cluster also contains the MMS service.

News and sports

The news and sports group contains four clusters: the ***general news*** cluster, the ***financial news*** cluster, the ***weather*** cluster, and the ***sports*** clus-

ter. In this section, ***general news*** and ***financial news*** will be discussed in detail.

The ***general news*** cluster is a strong cluster that contains three news services (*TT and radio*, *artiklar*, and *tidningen*), and the ***financial news*** cluster is a weaker cluster containing two services (*ekonominyheter* and *kolla aktiekurser*) for financial news. Fourteen participants placed all five services in the same group, and two of them did not include any other services in that group. Eleven participants placed four of the five services in the same group and one of them did not include any other services in that group. For female participants, the *TT and radio* drops out of ***general news***, while the *ekonominyheter* service is close to the ***general news*** cluster. For experienced users, ***financial news*** includes the services of the ***weather*** cluster. The services in these clusters are often grouped with sports and weather services. Suggested names were *nyheter*, *nyheter och väder*, *internetjänster*, *ointressant*, *tidningen i sängen*, and *förbjud dessa i mobiltelefoner*.

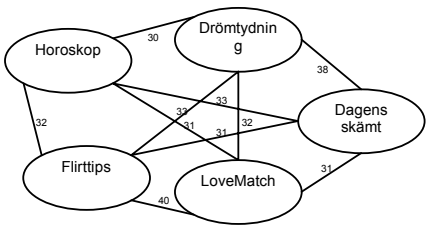
The other two clusters in this group, ***sports*** containing four services and ***weather*** containing two, are both strong clusters. The ***sports*** cluster holds for all selections of participants, while the ***weather*** cluster is included in ***financial news*** for experienced participants.

Games and entertainment

This group contains three clusters: the ***game*** cluster, the ***entertainment guide*** cluster, and the ***fun-related*** cluster.

The fun-related cluster is completely connected and contains five services and 28 of the 42 participants grouped these five services. They were often grouped with the services in the ***game*** cluster. For the elderly participants, the *horoskop* service dropped out, and for the female participants *dagens skämt* dropped out. Otherwise this was a stable cluster. None of the five services in this cluster were highly ranked by any of the participants, and several of them placed these services in groups with negative names like *onödigt* and *trams*.

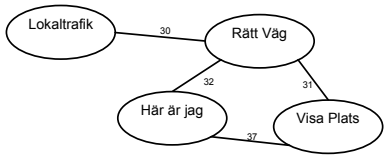
The ***game*** cluster is stable for all selections of participants except for experienced ones, which included the services in ***fun-related***. It contains two services, *botfighters* (a position-based game) and *ladda hem spel*.



The ***entertainment guide*** cluster contains three services, *Nöjesguiden*, *Allt om Stockholm*, and *restaurangtips*. This cluster is stable for all selections of participants except the experienced.

Travel information

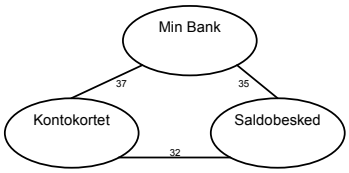
This group contained two clusters: ***travel information*** and the ***flight-related*** cluster. The ***travel information*** cluster contains four services related to transportation and/or position; 19 participants placed these four services in the same group. For elderly, inexperienced, and male participants the *lokaltrafik* service do not cluster. For inexperienced participants, *hitta kompis*, *platsrecensioner* and *mina platser* were also included. For young participants, the cluster was divided into two: one cluster containing *lokaltrafik*, *rätt väg* and *vägverket*; and one containing *visa plats* and *här är jag*. For experienced participants, the services of the ***flight-related*** cluster were included in this cluster, but the connection was weak. These services were often grouped with the flight-related services. Suggested names were *vägvisare*, *hitta rätt*, *praktiskt men inte nödvändigt*, or *jag och min omgivning*.



The ***flight-related*** cluster contains two services: *flygtider* and *flygbussar*. It is a fairly stable cluster except for inexperienced users, who included the two services in ***travel information***.

Bank services

The ***bank services*** group contains only one cluster and 31 of the 42 participants grouped its three services. Two of them did not include any other services in that group. Six participants created a group with these three services and the *betala med telefonen* service. For the young participants, the *saldobesked* service dropped out. These services were often kept separate from other services, but sometimes grouped with organization services. Suggested names were *bank*, *ekonomi*, *mina pengar*, *banktjänster*, *oviktigt*, and *personligt*.



Inconsistently Grouped Services

Some services were grouped very differently. Most of these were unfamiliar to the participants, such as *boka och köp biobiljetter* and *betala med mobiltelefonen*. There were also some more well-known services that users had difficulty in categorizing. For example, *ladda hem ringsignaler* and *musik* seem similar in nature but were not commonly grouped together. Furthermore, the *adressboken* function, essential for basic mobile phone functionality, is not tightly related to any other service. The user-service interaction model of the address book is closely related to how data is shared between services in the phone, which makes it

hard to classify the address book as a service of its own. Rather it is a phone utility used in several functions (phone, send SMS or e-mail, view sender, etc).

A few of the services that seemed difficult to classify are particularly interesting, since they often have been placed in groups that the participants have ranked as important (e.g., one of the three most important groups). We have drawn the conclusion that while these services are considered important, there is no consensus on where they belong and which other services they are related to. These services are commented on below. SMS and MMS are included in this section since they belong to an unstable cluster. The numbers on how many participants that placed a certain service in a group ranked as important should be considered with the fact that five participants did not rank their groups at all.

Adressboken

The address book service has been grouped with all services used in the study at least once. This spread contributes to the fact that the address book is not included in any of the clusters that the study resulted in. However, most of the participants (35 of 42) considered it as an important service and placed it in a group that they ranked important. The address book was closest to the ***organization*** cluster, where 24 people placed it, then came the ***e-mail*** cluster and the ***telephony*** cluster.

SMS

SMS belongs to the ***messaging*** cluster, which is a cluster that breaks down for the participants younger than 30. 33 participants of 42 placed SMS in a group that they ranked important. All age groups seem to find the service equally important, which is most notable for elderly participants since it demands a lot of dexterity. For the young participants, SMS has been grouped with several services from the ***telephony*** and the ***e-mail*** cluster.

MMS

MMS belongs to the ***messaging*** cluster in the overall analysis, but that cluster breaks down for the participants younger than 30. For them, the MMS service belongs to the ***e-mail*** cluster. 30 participants of 42 placed MMS in a group that they ranked important. It is particularly interesting that many participants considered MMS an important service even though it is new and relatively unknown.

Sök privatperson

Sök privatperson is one of the important services with the largest spread in the categorization. It was grouped with all services in the study at least three times. Of the clusters, it is closest to the ***e-mail*** cluster, but still only 16 participants grouped it with the e-mail services. It has also

been grouped with several of the position-based services that are divided over ***travel information***, the ***game*** cluster, and the ***flight-related*** cluster. This service seems to be preferred by participants older that 30. Of the 23 that placed this service in a group that they considered important only four were younger than 30. Nine of the 23 were inexperienced, while only five were experienced.

Lokaltrafik

Lokaltrafik is very close to, but not included in, the ***travel information*** cluster. It is also quite close to the flight-related cluster. It was grouped with all services in the study at least once, and 21 participants placed it in a group that they ranked important.

Ladda ner ringsignaler

Ladda ner ringsignaler has a wide spread; it was grouped with all services in the study at least twice. It is closest to the ***telephony*** cluster, but only around 20 participants grouped it with these services. *Ladda ner ringsignaler* is quite similar to *musik*, but these two services were grouped together by less than 10 participants. 20 participants placed this service in a group that they ranked important. Quite surprisingly, only one of them belonged to the young group (<30), 8 to the age group 30-50, and 11 to the elderly group (>50). No differences were found regarding experience.

Betala med mobiltelefonen

Betala med mobiltelefonen is close to the payment cluster, but not included in the cluster. It was grouped with all services in the study at least once, and besides the services in cluster 7 it was often grouped with other services associated with money like *samtalskostnader* and other shopping services. 20 participants placed the service in a group that they ranked important.

Intrinsic Properties – A Parametric Analysis

The aim of the parametric analysis was to identify concrete service properties that could influence the user-service interaction patterns and thus contribute to the classification of services. We focused on intrinsic properties that directly influence service behavior, as experienced by the end-user. Identifying such properties is useful since they are pivotal to the organization of service interfaces: services with similar behavior should also have similar interfaces and interaction models.

The current set of parameters was arrived at through a three-step procedure. In the initial phase, we brainstormed a set of properties for services that seemed important for their usage. Although some of these properties were vaguely expressed or provided little distinction between actual services, this process provided us with a frame of reference for the subsequent literature search.

In the second phase, we used the same 60 services as were used in the user study, and described each in terms of its properties. This method achieved two things. Firstly, some of the initially identified properties (level of intrusiveness, for example) turned out to be too vague to be useful, or provided no distinction between services. An example of the latter concerned an initial distinction between services that were avail-

able in different spaces, be they physical or virtual. In the analysis of real services, the only distinguishing spatial property turned out to be if the service contained any kind of physical reference (i.e., used the device's geographical position) or not. Secondly, we compared our intuitive list of properties with service classifications from literature. We found few classifications that focused on interaction-related properties, but the Sørensen *et al.* classification was in part similar to our properties, providing an additional motivation for the parametric analysis and enabling us to divide the parameter set into distinct subcategories.

In the third phase, we introduced more concrete versions of the parameters that were discarded in phase two. These parameters did not necessarily encompass the full original concept, but provided good indicators of it. For example, the vague 'level of intrusiveness' property, was replaced by a distinction between services that the user must call on, and services that can proactively alert the user. We also introduced parameters that were found to be missing in phase two. The most notable example was services that add something personal to the phone, such as a ring tone download service (Takeishi and Lee, 2003).

The set of parameters is now well-defined, making it fairly straightforward to classify a service according to the following parameters.

Position

We distinguish between position-based services and services that are independent of user (device) position.

Other personalization

We distinguish between personalized services and services that provide exactly the same functionality to all users.

Duration

We distinguish between three cases: encounter-based services, and two kinds of relationship-based services, viz. those that are pre-installed in the terminal and form a basic service offer of it, and those that are 'subscription-based' and can be added to the device by an active user action. This may be an actual subscription, or an action such as downloading or installing a piece of software with the device.

Community

Community-dependent services vs. services that can be used by the user alone. Community-dependent services have low certainty according to Sørensen *et al.* We distinguish between three cases: synchronous community-dependent services, asynchronous community-dependent services, and single-user services.

Additional parameters

In the final phase of the parameter identification process, we introduced a few new parameters that covered areas identified in phase two. The level of obtrusiveness is often a very important factor in user acceptance of a service, in particular on mobile devices (cf. the FEEL project, `www.feelproject.org`). Since it seemed too vague to use as a parameter of analysis, we have included two parameters that at least partly capture the notion of intrusiveness. The first one distinguishes between services that the user must query, and services that can proactively call upon the user. The second one concerns if users must actively input information to the service to be able to use it. Finally, we have added a parameter that captures the case when a service is used to change or configure the end-user device (which in the future could be extended to concern personalization of the user's service environment independent of device). This is a property that has often been identified as very important to the youth segment. Below follows definitions of the parameters introduced in the final phase.

Obtrusiveness

User-initiated vs. proactive services.

Required input

Services that require user input require higher attention and involvement from the user. We define required input as alphanumeric input from a keyboard or keypad. Clicking OK or navigating a menu tree is not defined as required user input.

Device personalization

Services that add something to the device to make it more unique or personal.

Table 3 shows some typical services that are becoming available on high-end mobile phones. From this table, we can already see that there are large differences in the usage models of different services.

Categories of services with similar properties

Based on the parametric analysis, we can identify service categories based on similar behavior rather than on similarity in topics. This gives a possibility to classify many of the services that did not belong to any of the clusters that resulted from the common-sense classification.

Table 3: Example services and their parametric analyses.

Service	Position-based	Personal	Community-dependent	Duration	Requires input	Obtrusiveness	Device personalization
Ringa	No	No	Synchron ous	Permanent Preinstall	Yes	Proactive Reactive	No
SMS	No	No	Asynchro nous	Permanent Preinstall	Yes	Proactive Reactive	No
Nummer-presenta-tion	No	No	Synchron ous	Permanent Subscription	No	Proactive	No
E-post	No	Yes	Asynchro nous	Permanent Subscription	Yes	Proactive Reactive	No
Min bank	No	Yes	No	Permanent Subscription	Yes	Reactive	No
Här är jag	Yes	No	No	Encounter	No	Reactive	No
Flygtider	No	No	No	Encounter	Yes	Reactive	No
Ladda ner spel	No	No	No	Encounter	No	Reactive	Yes
Ekonomi-nyheter	No	No	No	Encounter	No	Reactive	No

Information services

The information services are all user-driven and encounter-based. Examples are restaurant and entertainment guides, news services, and sports results. A subset of the information services is the user-driven and encounter-based services that also require user input, for example the *flygbussarna* service and the *sök privatperson* service.

Community services

The community services are characterized by being relationship-based, proactive, and requiring more than one user to function. They can be either synchronous or asynchronous. All community services have some proactive behavior, but most of them can also be initiated by the user. The community services can be divided into two groups based on if they are synchronous or asynchronous: messaging services (SMS and MMS), e-mail (*e-post* and *hotmail)* and *telefonsvararen* are asynchronous, while call services (*ringa*, *videosamtal*, and *gruppsamtal*) and complementary call services (*nummerpresentation* and *samtal väntar*) are synchronous. The e-mail services form a subgroup among the asynchronous services by using personal information: *nummerpresentation* and *samtal väntar* form a subgroup among the synchronous services by not having any user-driven features.

Bank services

The bank services are all user-driven, and use personal information. They differ in that some of them are relationship-based while others are encounter-based. Some, but not all, also require user input. The relationship-based services are: *min bank*, *kreditkortet*, *betala med mobiltelefonen*, and *samtalskostnader*. The encounter-based services are *buketten*, and *boka och köp biobiljetter*. As seen from this analysis, services that supply payment are typically relationship-based whereas the 'shops', services that require payment, can be encounter-based.

Geographic services

The geographic services are characterized by their use of user's position to deliver content. Most of the geographic services that were included in our set of example services were encounter-based and reactive: *här är jag*, *visa plats*, *väder*, and *allt om Stockholm*. Not all services that make use of positioning fall into this group: *hitta kompis* and the *platsrecensioner* service differ in that both are relationship-based. *Friend-finder* is also a personalized service.

Profile services

The main feature of the profile services is that they add something to the mobile phone to make it more personal. The profile services used in

this analysis were all reactive and encounter-based: *ladda hem spel, musik, ladda hem ringsignaler.*

Calendar services

The calendar services are relationship-based, reactive services that reside in the telephone: *adressboken, kalender,* and *anteckningar.*

Ungrouped services

Some services had unique characterizations that made them distinct from all of these categories. These were *botfighter, samtalskostnader, vidarekoppling, hitta rätt, målbevakning, mina platser, platsrecensioner, hitta kompis,* and *kolla bågen.*

SYNTHESIS

We now turn to the question of how the parametric analysis and the common-sense classification are related. We will find both similarities and distinct differences.

Information Services

The information-related services that cluster together in the common-sense analysis are also closely related in the parametric analysis. In the parametric analysis, the largest group consists of 19 information-related services, that are non-personal, not location-based, encounter-based, and user-driven. Furthermore, six services are similar to these, but also require the user to provide input. Basically, these are search services. These 25 services occur in the same six common-sense clusters (***fun***, ***sports***, ***entertainment guide***, ***general news***, ***weather***, and ***financial news***). From the end-user perspective, these clusters differ only in the type of information provided, hence the content-related clustering of these services.

Community-Based Services

There is also a close relationship between the parametric analysis and the common-sense clusters for the community-based services. In the

parametric analysis, this group includes all types of phone calls and call-related services, as well as SMS/MMS and e-mail. These services are relationship-based, they combine user-driven with proactive modes, and are not location-based. All of these belong to the same three common sense clusters *telephony*, *messaging*, and *e-mail*, but within these there is no clear relationship between the parametric analysis of the services and the common-sense clusters. Furthermore, as noted previously, these clusters were not entirely stable as different user subgroups combined these services differently.

Payment Services

The services that concern money and payment are not well connected in the common-sense clusters. In the parametric analysis, these services are personally configured, user-driven, and subscription-based (four services in all). In the common-sense clusters, the bank services clustered, whereas the services *betala med mobiltelefonen* service (pay for something with your phone) did not cluster with these or any other services. Closely related are the services that require personal information but are encounter-based, since this group contained services where the user could order and pay for a purchase. These were also not clustered in the user study.

Personalization

The personalization parameter enables us to identify a set of services that are similar in that they personalize the phone. These services were however not well connected in the common-sense analysis. The services included in the study were *ladda ned ringsignaler*, *ladda ned spel*, and *musik*. These did not belong to the same common-sense cluster. One reason is that they concern entirely different media resources; the music download service was clustered into a ***music*** cluster. It is also possible that the naming of the services on the cards influenced the users' sorting of these services. The service concerning music download was named *musik* with the download feature in the explanation at the back of the card, while the other two had the download feature in the service name.

Position

The purely position-based services fall out as a group of their own in the parametric analysis, but position also appears as a factor in many services that are not otherwise similar: the *hitta rätt* requires additional input from the user, and the *botfighter* and *hitta kompis* services are community-based as well as position-based. In the common-sense analysis, these services were not clustered together with the other position-based services. But even for the purely position-based services, position was not a dominant feature in the common sense clustering of services since

the content type was more important for the classification of services. For example, the travel information cluster included both position-based services as well as the *lokaltrafik* service that was not position-based. Also the weather cluster contains both a position-based and a search-based service.

Two services fall entirely outside service groups formed by the parametric analysis. These are *vidarekoppling* and *samtalskostnader*, both utility services closely related to the basic phone functionality. These services naturally occur in the common-sense cluster for telephony services.

A Data-Sharing Analysis

The parametric analysis done so far does not take into account the fact that some services are closely related to each other and are commonly used together. This is unsatisfactory since the common-sense classifications will take this into account. For example, the *telefonsvararen* that takes messages when nobody answers is naturally included in the telephony cluster, even though it is an asynchronous service and its handling model is similar to those of text message services such as SMS.

One way to analyze the relationships between services is to investigate the extent to which information from one is needed to execute another. In general, IT-based services can share data (Bylund, 2001) to enhance their functionality with contextual and personal information.

Sharing data between services can raise integrity constraints and typically, a good model for data sharing is that shared data is stored locally with a personal device, and shared locally between services. In theory, there is no limit to the types of data that could be shared between services. But in practice, it is important to establish a common agreement on data types that are interesting and possible to share between services.

Based on the same set of 60 services as was used in the user study and the parametric analysis described above, we investigated how services could be used together to provide added personalization and contextualization. In the analysis, we includes such data sharing that already is in use on mobile phones of today, or that could be shared between services given a suitable computational structure. The results are shown in Figure 10.

The data-sharing analysis showed that within the analyzed set of services, the set of data types that were suitable for sharing was quite limited. However, the set of sources and usages of data were quite varied. The same source could offer several types of data, and the same type of date could have several usages. The conclusion from this is that it is useful to introduce a set of services for intermediary data storage. The address book is a typical service of this kind. This may explain why the address book did not cluster in the study; since it can be used together with several other services the users did not agree on which services it was closest related to.

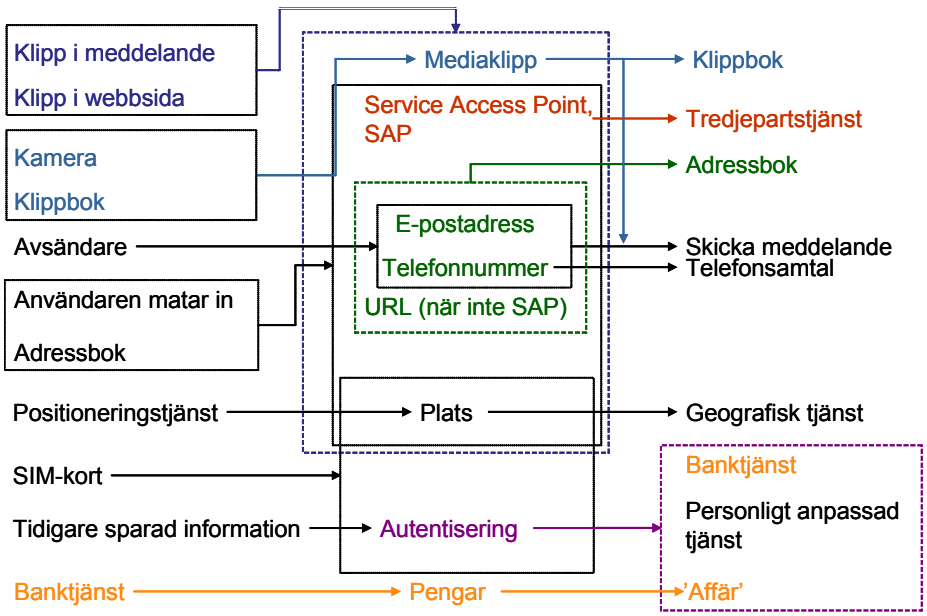


Figure 2: Potentials for data sharing in the 60 services.

Here, we list the types of data involved and their possible origins and usages.

Services to which the user must save a reference

Typically, these are services that are provided by the operator or a third party developer, and are not built into the phone interface. To get back to a service of this type, the user must either save a 'bookmark' or remember exactly how to get to the service. This bookmark is typically a URL, but it may also be a phone number or a downloaded application. We will use the term Service Access Point (SAP) to refer to this type of

references. SAPs are usually obtained from web pages, downloads, or messages. The phones of today do not include any uniform way to store SAPs. A useful SAP storage would provide users with a common interface to service usage, but also to information about the service such as help files, and finally to service configuration options.

Services that require a phone number, an e-mail address, or a URL

URLs, phone numbers and e-mail addresses can also be saved for their own sake: as a contact point to a person or a company, or simply as a piece of information worth forwarding to other users. They are obtained from incoming calls, messages, or from web pages. The address book typically works as the intermediary storage for this type of information.

Services that require that the user to be identified

There are many ways in which services can identify the user, and there are some established standard models, such as extracting the calling phone number, which are shared between several services. User identity can be obtained from the device, from the user supplying a password, or from saved preferences for the service.

Services that require payment

There are several ways in which services can obtain payment, such as by SMS, by a micro-payment service, or from a bank account or credit card. Independent of the choice of technology, from the user interaction perspective the money transfer is best seen as a type of data which is passed from one service (e.g., a bank service) to another, and the user would benefit from storing his or her configuration of payment options in one single payment service.

Services that require one or several locations

If we assume that there is one common data type for locations, there are many ways a location can be obtained. The most obvious use of location is when a service is adapted to the user's current position, but other sources for location information can be the geographic coordinates for, e.g., a restaurant or another person. Geographic coordinates for places such as restaurants may be obtained for example from web pages or SMS messages and could potentially be stored in the address book.

Services that can use some copied media clip

Finally, many other types of data sharing can be achieved through a generic copy and paste functionality for media clips. It is useful to introduce a scrapbook as an intermediate storage service for media clips.

CONCLUSIONS

The user study showed that there is a certain consensus on how the majority of services should be classified, in that 44 of the services belonged to a cluster in the overall analysis. However, there were some services that turned out to be difficult to categorize, or that belonged to different categories for different groups of participants. An interesting example is SMS and MMS services, which formed a cluster of their own when all participants were considered, but were included in the telephony cluster for inexperienced users. For young participants, the MMS service belonged to the e-mail cluster and SMS did not belong to any cluster.

We also identified different strategies of classification among the participants. The most common one was the content-based strategy that was used by almost 75% of them. Other strategies were personal preferences, device for use, and importance ranking. Many participants combined the content-based strategy with personal preferences, which revealed strong attitudes towards some services. Almost all participants created a category with a negative name that contained services that they did not want to use.

The parametric analysis showed that people only to a limited extent use the behavior of services to classify them: the content is often more

important. Data sharing between services also complicates the classifying, since some services are used as data storage for others (for example the address book). Furthermore, the positioning and personalization parameters in the parametric analysis were not good indicators of which common-sense cluster a service belonged to. This result can be interpreted in two different ways. One possible interpretation is that such functionality is still used only rarely in services, and that users will start to use them as determining factors once the general awareness of these opportunities increase. However, the indications from our study are that the content type dominates; the type of service provided is more important than the method used to obtain the service. If this proves to be correct, then it is important to provide a uniform interaction model for services that use personal and position information, and those that do not. It is also easy to envision services that have positioning and personalization as an optional feature.

FUTURE WORK

To draw definite conclusions from this first project phase, several further steps are needed.

Hypothesis verification

The methods employed during this initial phase of the project focused on knowledge acquisition and enabled us to form a well-informed hypothesis about both intrinsic properties of mobile services, and common-sense attitudes towards service classifications. Further studies are needed to verify the validity of the classification models arrived at.

Attitude analysis

As a side effect of our user study, we obtained strong attitude expressions for the services used in the study. In particular, many users created a 'trash' cluster, which contained services that they would not like to use at all, and strongly objected to having in their mobile phone. The strong negative expressions were unexpected and motivate further study. We propose to investigate this further, possibly in connection with the previously mentioned study for verifying the classifications. In this further investigation of user attitudes, existing market studies will also come into focus.

Design recommendations

Since the classifications developed within this project target the end-user experience of services, it is important to develop design principles and recommendations that build on the obtained classifications. We aim to develop these through the experimental design and evaluation of service offers. In this work, we will be guided by the opportunities and limitations given in the context of TeliaSonera's service offers.

Dynamics of service classifications

The final and hardest task to address is to extend the methodology with methods that enable redesign of service classifications. The methodology must be able to detect changes in service usage as well as new service offers, and accommodate these in the service classifications. An important issue is how service classifications can be gradually changed to accommodate the new requirements, while they remain understandable to users that have been using the old classification models. In this phase of the project, we will use ethno-methodology, deep interview methods, and experimental redesign to investigate the effects of changes in service offers and service classifications.

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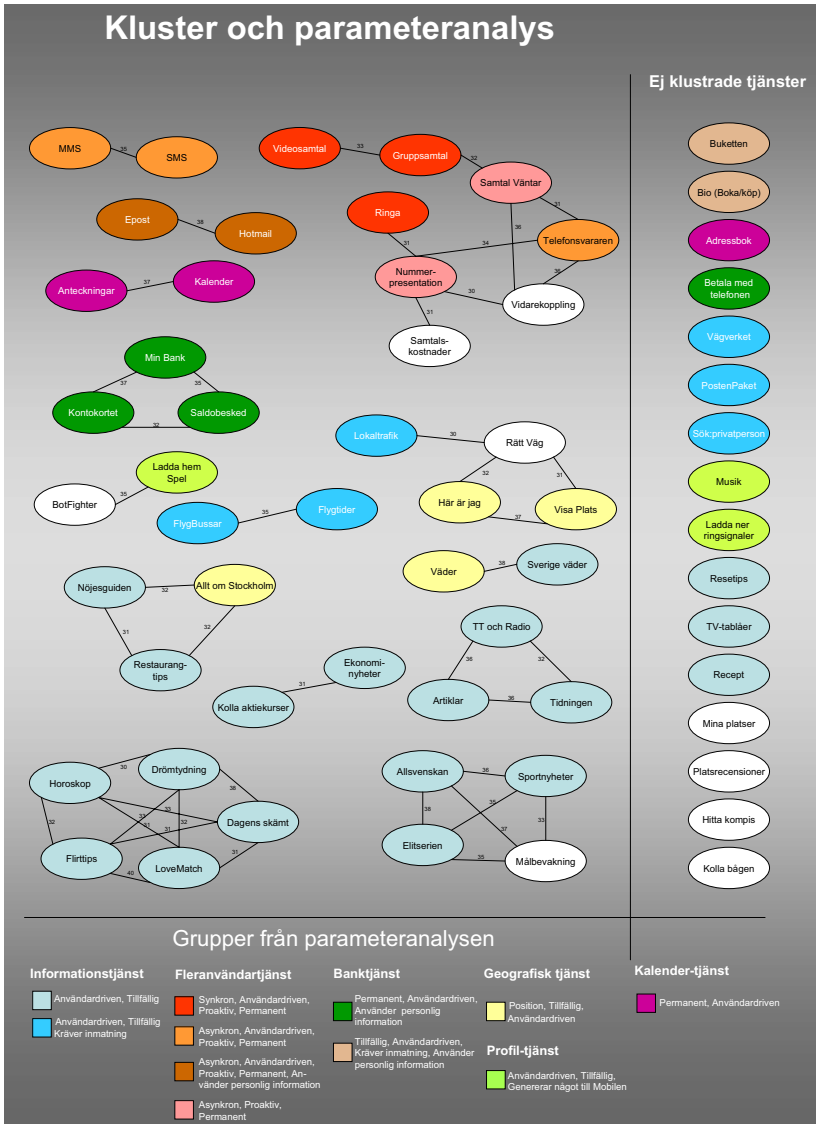
Appendix A:
RESULTS OF CLUSTER ANALYSIS



Appendix B:
THE 60 SERVICES USED

No	Service name	Description
1	SMS	Textmeddelanden (SMS) knappar du in i din mobil och skickar det sedan till en GSM-telefon eller ett faxnummer. Ett meddelande som du mottagit läser du direkt på skärmen.
2	Kolla aktiekurser	Följ utvecklingen på börsen timme för timme, oavsett om du ligger i hängmattan på landet eller är ute och springer på stan.
3	TV-tablåer	Välj mellan kvällens filmer och program.
4	Horoskop	Läs ditt horoskop för idag, kärlek, arbete och pengar.
5	Flirttips	Ta emot flirttips och skicka vidare till en kompis. Nu kan du få flirttips direkt i mobilen.
6	BotFighters	Spåra andra spelare i verkliga världen, och kämpa mot dem med virtuella robotar i din mobiltelefon. Skapa och utrusta din robot via webben.
7	Ringa	
8	MMS	Ett MMS-meddelande kan bestå av ljud, bild och text. Använd en funktion åt gången, eller kombinera alla tre i ett samma meddelande. Har din mobil dessutom en kamera, kan du skicka egna foton.

9	Nummerpresentation	Med Nummerpresentation ser du i mobiltelefonens display från vilket telefonnummer samtalet kommer. Vill du spara ett nummer lagrar du det enkelt i din telefonbok.
10	Ladda ner ringsignaler	Här hittar du ringsignaler till mobilen. Kanske vill du ha en av de senaste poplåtarna eller en skön jazzlåt?
11	Videosamtal	När du ringer ett videosamtal visas en bild av dig eller din omgivning för den du ringer till. Du kan också se den du pratar med på displayen.
12	Målbevakning	Skickar ett SMS till dig när ditt favoritlag gör mål!
13	Kalender	Koppla din kalender direkt till telefonen. Med hjälp av denna tjänst kan du hålla reda på din dags- och veckoplanering via mobilen.
14	Flygtider	Med tjänsten Flygtider kontrollerar du tidtabeller och status på flighter världen över så att du kan utnyttja din tid bättre.
15	Betala med telefonen	Med den här tjänsten kan du göra inköp direkt via mobilen. Beloppet dras sedan från din teleräkning eller från ditt kontantkort.
16	Kolla bågen	Ta reda på vem det var som just körde förbi på en fin motorcykel, få upp hans eller hennes hemsida med information om motorcykeln.
17	Lokaltrafik	Skriv in varifrån och vart du vill åka och inom några sekunder får du en beskrivning av hur och när du kan ta dig till ditt resmål.
18	Musik	Lyssna direkt eller ladda ner och spara för att lyssna på senare
19	Dagens skämt	Med den här tjänsten får du dagens skämt skickat direkt till din mobiltelefon.

20	Nöjesguiden	Med nöjesguiden kan du söka bland tusentals skiv- och filmrecensioner. Läs topplistorna med månadens bästa skivor, filmer och dataspel. Kolla upp klubbarna, konserter, konstutställningar och teaterföreställningar i Stockholm, Göteborg, Malmö och Lund.
21	Buketten	Skicka blommorna direkt, så fort som du får impulsen. Betala via mobilen, antingen på räkningen eller direkt från ditt kontantkort.
22	Hotmail	Läsa din Hotmail e-post med din mobil
23	Posten paket	Har ditt paket kommit bort? Med PostenPaket har du som leverantör eller mottagare möjlighet att ange kollinumret på ditt paket och få reda på var det befinner sig.
24	Samtalskostnader	Ta reda på hur mycket ditt användande av mobiltelefonen har kostat under perioden.
25	Samtal väntar	Med Samtal Väntar kan du svara i stället för att det tutar upptaget. När du hör två korta tonstötar under ditt samtal, vet du att någon söker dig. Du kan välja att inte svara och den som söker dig får då en upptaget ton eller blir kopplad till mobilsvar.
26	Elitserien	Hockey: matchinformation från Elitserien.
27	Sök: privatperson	Sök på rubrik, sökord, privatperson eller företag och ange postadressen för den stad du är intresserad av.
28	Rätt väg	Hitta vägen i de flesta svenska tätorterna.
29	Restaurangtips	Vill du äta thailändskt, indiskt eller annat i närheten av där du befinner dig. Här kan du söka efter en restaurang.
30	Hitta kompis	Se var dina vänner befinner sig. Du får deras position på en karta, eller via SMS och kan snabbt få fram en vägbeskrivning dit.
31	Allt om Stockholm	Ska du ut i Stockholm är det här en mycket bra guide. Här hittar du krogar, teater, hotell, etc.

32	Recept	Hämta läckra recept i din mobiltelefon.
33	Vidarekoppling	Med den här tjänsten kan du styra över dina telefonsamtal till ett nummer där du kan svara.
34	Saldobesked	Kontrollera saldot på ditt bankkonto via mobilen.
35	Mina platser	Här sparar du dina smultronställen i tillvaron för att alltid hitta dem när du behöver.
36	Sportnyheter	Läsa senaste sportnyheter på mobilen
37	Tidning	Läsa tidningen via mobilen.
38	Vädret	Snabbt och enkelt få en väderprognos från SMHI för området där du befinner dig.
39	TT och radio	Lyssna på korta sammanfattningar av dagens viktigaste händelser i din mobil.
40	Ekonominyheter	Läsa de senaste ekonominyheterna på Dagens Industri dygnet runt
41	Visa plats	Får en kartbild över den plats du söker.
42	Allsvenskan	Fotboll: matchinformation från Allsvenskan.
43	Flygbussarna	Med tjänsten Flygbussarna har du alltid tidtabellen i fickan så att du lättare kan planera ditt resande till och från Arlanda.
44	Telefonsvararen	Tala in ditt eget hälsnings-meddelande och berätta varför du inte kan svara. Då kan de som ringer lämna ett meddelande eller ringa tillbaka senare.
45	Anteckningar	Med den här tjänsten kan du använda mobilen som anteckningsblock och skriva upp viktiga saker.
46	Här är jag	Love MATCH är det perfekta sättet att hitta en date som uppfyller dina önskemål! Vill du ha kontakt med någon? Leta igenom attraktiva profiler och skicka och ta emot kärleks-SMS.
47	Lovematch	Visar din position på en karta.

48	Min bank	Sköt dina bankärenden via mobilen, t ex flytta pengar mellan konton.
49	Bio (boka/köp)	Titta på bioprogrammet, boka eller köp biljetter.
50	Vägverket	Hur är väglaget? Har det inträffat olyckor eller finns det vägarbeten på sträckan du planerar att köra? Vilka är de senaste trafikmeddelandena? Med denna tjänst får du informationen direkt till din mobil.
51	Gruppsamtal	Lägg upp planerna för kvällen med ett enda samtal. Eller red ut begreppen med alla dina kunder på en gång. Med tjänsten gruppsamtal kan du tala med upp till fem personer samtidigt.
52	Drömtydning	Har du en återkommande dröm eller drömde du något spännande i natt? Är du nyfiken på vad drömmen betyder? Nu kan du få svar direkt i din mobil.
53	E-post	Läsa eller skicka E-post via din mobil.
54	Sverige väder	Daglig väderprognos med morgondagens väder i hela landet
55	Resetips	Hittar du information om historia, restauranger, var du ska bo och hur du bäst reser mm.
56	Adressbok	Här kan du spara alla e-postadresser, telefonnummer, namn och post-adresser till vänner och bekanta.
57	Hämta spel till telefonen	Ladda ned java-spel via WAP.
58	Platsrecensioner	Lägg in tips och recensioner av filmer, restauranger, klubbar etc. på en position. Läs andras tips när du passerar en plats där någon har lagt upp information.
59	Artiklar	Hämta och läsa intressanta nyhetsartiklar.
60	Kontokortet	Koppla ditt kontokort direkt till mobilen och använd sedan mobilen när du ska betala. Med en enkel knapptryckning dras beloppet från ditt kontokort.