Enabling wider access to mobile information services

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Abstract. Mobile information services are still struggling to enter the mass-market. This paper outlines results of a study into the requirements for (location-based) information services and discusses implications for enhanced mobile service design. The research results show that aspects such as human-human interaction, personalisation of services and easy access to information are key factors in the design and delivery of successful mobile information services. Perspectives on technology adoption and customer-supplier relationships, and recent research on mobile services, help explain why certain users may prefer to use their existing mobile phones to access these services, rather than start using new technology. This paper outlines the user and commercial advantages of using a call centre approach to service interaction, and shows how a multimodal (voice/data) information delivery approach could be utilised.

1. Introduction

There are currently over one billion mobile phones in the world market and these are used by all age groups. Mobile network operators provide a range of mobile information services including weather, news, finance, sports, entertainment etc. Mobile information services also include location-based services (LBS) such as finder applications (e.g. find nearest restaurant), navigation applications (e.g. driving directions) and community applications such as 'friend location finder'.

However, mobile information services and even personal communication via short message service (SMS) are not used by all age groups (in contrast to the penetration level of mobile phones). A recent research study on short message market in Finland showed that 68 - 74% use SMS service (eBird Scandinavia 2003). Therefore, almost 30% of customers use their mobile phone solely for voice call purposes. This trend is emphasised with older users of mobile phones. A European-wide survey of older citizens and markets for ICT products and services showed that 48% of those over 50 year old have a mobile phone, but only 40% of those have ever received or sent a SMS (Kubitschke et al. 2002). Overall, there are a large number of mobile phone users that use the phone solely for voice calls.

Mobile operators are focusing on providing mass-market mobile services; these should be developed for all user groups while bearing in mind the number of basic mobile phones in the market and the slow pace of upgrading them. In addition, the number of elderly mobile phone users is increasing rapidly. If the mobile services are not usable by this age group then market exploitation will be adversely affected. Therefore, the requirements and needs of different user groups need to be clarified in order to provide services which are adopted by current and future users. However, the acceptance of mobile services (and new technology in general) is a gradual process, where users must understand the value added by services before they are readily accepted and integrated into everyday life. Indeed some authors contend that the real value of new services will come from their enabling properties, i.e. the 'the changing [of] the limits of the possible' (Keen and Mackintosh 2001). In this respect, the key is not to simply make services more usable, convenient and immediate, but to enable customers to achieve the previously unachievable.

2. Users' perspective

Recent years have seen the reporting of a range of user-centred studies that have attempted to understand the requirements for mobile services, including LBS. A summary of results from one such study is outlined below, and these results are then discussed in the light of other comparable research.

2.1. Basic requirements

A set of focus groups were undertaken with four separate participants groups, split according to age (20-25 or 55+) and gender. Each focus group comprised of 6 participants. Five potential LBS scenarios were presented to the participants, these were: "finding your nearest" (finding nearest cash machine, taxi rank etc), "travelling to a destination" (finding out train times, routes etc, receiving navigation information), "meeting up" (viewing location of friends and finding them), "shopping" (receiving special offers, finding suitable products) and "virtual messaging" (leaving spatially-tagged messages for friends). Each group then voted for their preferred scenarios, and discussed their three most preferred (i.e. most relevant) scenarios. Figure 1 below shows the preferences for the male/female, younger/older participant groups. No group chose to discuss 'virtual messaging'.
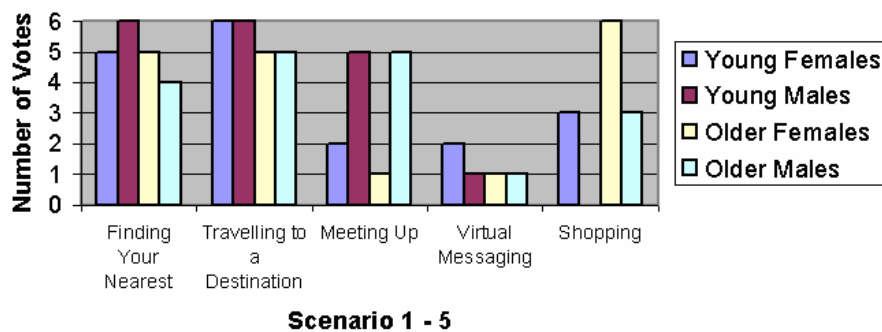

Figure 1. The results from preferred scenario voting.

Some general requirements emerged from this study which are applicable to a wide range of LBS or mobile information services: (1) information must be reliable and up to date; (2) LBS need to have a 'personality'; current mobile services are somewhat 'faceless'; (3) human-human interaction must be facilitated, not reduced; (4) ease of use is essential; (5) information access speed is a key requisite; (6) personalisation of services is required; (7) information should be available via a mobile phone.

2.2. Differences according to age and gender groupings

Some interesting gender and age differences came out of the study (see also figure 1 above). For example, older females were very positive towards shopping supported by LBS, while the younger females felt that shopping was more of a social rather than goal-centred activity, and were concerned that this social aspect of shopping may not be supported by LBS. In addition, the younger age groups were in general very wary of new services, which may reduce human – human interaction. This is perhaps a counter intuitive result, as younger users may be expected to want to 'play with' the technology more, to the possible exclusion of the social aspect. The results demonstrate how LBS should be used to create a 'user experience' rather than simply supporting goal-based activities.

2.3. Discussion with other comparable studies

It is interesting to compare the results of the above study with the findings of Andersson et al. (2002) who studied younger peoples' perspectives on acceptance of mobile services. The research indicated that users' knowledge about existing mobile services and technology was low, with the main interest in mobile services relating to improving and extending existing services rather than developing new services with new technologies. The study suggests that in order to increase acceptance of mobile services knowledge about existing services must be increased. Increasing interactivity and promoting better contact between customer and service provider could do this. This study has similar results as the LBS focus groups presented above. In both studies users seems to prefer to use their existing reliable mobile phones than start using (and buying) new technology. Both studies also indicate that one main reason for using mobile services is the potential for saving time; therefore quick access to information is essential. This present a real challenge for future mobile services regardless of the access method used (messaging, browser or some extra menu in mobile phone etc.) – the minimising of the time and effort (e.g. the number of keypad clicks) needed to access information that is needed by the user.

As indicated in the introduction, even the sending of text messages is either too difficult or of no interest to some users. Younger users make frequent use of text messaging, but as our focus group study indicated, when mobile (location based) services were concerned they wanted instant and easy to use access to information and also some human interaction. In order to increase the number of potential mobile service adopters in all age and social segments, users must be exposed to mobile services without encountering any technological barriers. To capitalise on the widest potential market, mobile services must be provided to mobile phones that are currently in use, and in a way that everyone can access and use them.

A recent study on different access methods (WAP, SMS and voice call) to mobile services indicated that the most efficient (number of clicks) and fastest (time measured from phone idle state to information available for user) way to access information with a basic mobile phone was to make a voice call to a call centre with a human operator (Tarkiainen et al. 2003). Furthermore, speaking with a human operator gives the user a feeling of security and facilitates human interaction, which, as well as ease and speed of access, was one of the main user requirements from our LBS research focus groups. The development of user trust is one of the key factors determining the likelihood of acceptance of e-services (Ruyter et al. 2001).

3. Proposed solution − access to mobile services via a call centre

3.1. Requesting information

The most widely available current methods of accessing information services with a mobile phone are SMS or WAP (or i-mode). But this overlooks the most obvious method that everyone is familiar with: a voice call! Currently the directory assistance service (DA) is one of the few information services that can be accessed via a voice call.

By extending services such as DA service towards currently available mobile information services (like weather, find nearest, directions & traffic information etc.) and retaining the same simple user interface (voice call), mobile services can potentially attract more users. A part of current calls to DA services can be handled by automatic services that are based on voice-recognition applications (Sonera launched such service in Finland in November 2001). The new automatic speech-enabled directory assistance service offers a lower-rate alternative to those who do not want or need personal assistance. The current trend of outsourcing call centre operations to countries with lower labour costs also releases skilled resources to other more demanding tasks. These human operator resources could be used to handle more complex service requests - including mobile information services.

Adaptation to the user's current context of use is an important factor in mobile services, since it may vary considerably. A voice call is very effective information/communication channel. In human-human interaction a lot of information can be transferred in short time. Interactive human communication presents situational context information about the environment and to some extent personal preferences and needs. Information about the user (approximate age, gender), and user context (mood, busy, background noise, user alone/in group etc.) can be quickly captured by a human operator, even if this information is not specifically requested or offered. Currently, much of this context related information is impossible to explicitly identify or measure online. This kind of information gives added value to mobile service by enabling an operator to give the user more suitable alternatives and personalised information. Furthermore, a human operator can understand search terms that the users tend to use: e.g. company or product names, misspelled words, inaccurate addresses and variations in spoken language. Interaction with an operator can easily refine this ambiguous information. In many situations, the user needs a seamless, integrated service, e.g. location-based services, routes, events and booking information linked together. An operator can provide smooth transition of information

between these different services and provide the information (from mobile services and also internet) that is needed. This has the potential to reduce the mental workload of the user, and minimise the need for the user to process low-level information from a variety of different sources. The focus can be less on providing information to the user, and more on providing value. This is something that current automatic (SMS or browser based) services still lack.

3.2. Information search and receiving

When a user initiates a phone call to a call centre and defines the problem (or information need), the operator can use all the call centre facilities to solve the problem or request. In this way, the user benefits from human-human interaction, and much of the overhead of information search and human-computer interaction are displaced from the user to the call centre operator. This is highly beneficial to the user as the operator has the training, experience, fast access to both mobile services and the internet, up to date information, few adverse context of use influences, and no limitations of interfaces on mobile/portable devices.

Currently mobile services provide information mainly in the same format as it is requested (e.g. text input to text output in a SMS service). Multimodal user interfaces to mobile services that make the most of user terminal capabilities should be the target. The first step in this direction would be to combine voice call input (human-human interaction when requesting a service) and information channel output, according to the context of use. This is already partially used by several DA services that provide a voice channel for requesting a phone number and then send the number via SMS. This idea can be utilised more extensively in mobile services. When delivering information, a human operator could take into account users' preferences, (physical and mental) capabilities, usage context and user's terminal capabilities. Information can be transmitted to the user via a channel that is the most suitable one: the operator can read out the requested information, divert the voice call or send data (SMS, MMS, email, contact information, WAP/WWW link etc.) to the user.

By the human operator speaking/reading the information to the user, certain benefits can be obtained. It might be the best solution for delivering information (i.e. most accepted) for some users and a good way of learning how to use the service for most of the users. Self-efficacy (individuals' beliefs about their ability to perform specific task) significantly affects the acceptance of the mobile internet (Lee et al. 2002), and users' confidence towards their abilities to use the service would increase with a human operator involved. An operator can also explain to a new user how to best use the data received. Older users also experience difficulties in reading small text from a mobile phone screen. These difficulties can be overcome if information is given via voice. Although a proportion of users will have some degree of hearing loss, this is often corrected by the use of appropriate hearing aids. The voice channel is not suitable for delivering a lot of information to a user since they will not remember all information presented verbally. The optimal means of information delivery is multimodal. The operator can send the data (e.g. via SMS) to the user and make sure that user understands the given information. Information delivery can be matched with the expectations and abilities of the individual users. In interactive communication with a human operator, information can be delivered on the level that the user currently needs.

4. Implications for service design

General Motors have proven with Onstar that an information service employing human operators can be successful. In May 2002 it had already more than 2 million subscribers, who can access emergency, safety, directions and concierge services (Onstar 2003). One possible target group for service providers may be to offer an information and concierge service (through a call centre) to all customers that have a mobile phone and are willing to pay for a premium service. Also extending DA service towards mobile information services may be easy step to this direction.

Direct contact from the service provider to the customer can provide valuable service feedback and marketing information from real world users of a service. Information from different user groups could be gathered about how and when the users use the services, what their actual needs are, their context of use, how they define the problems, and what information (content) was needed etc. This information could be recorded during the session (i.e. the phone call to call centre) and after the session supplemented by the operator. This data can be subsequently analysed and used to generate better content, criteria for users' assessment of value, and ultimately more commercially successful services. Contact with users also gives the service provider an opportunity to guide users and promote new features of the service or mobile devices. These are all key elements in building relationships between customers and information providers, identified as the real business opportunity in the networked economy (Kelly 1998). The importance of this relationship is also underlined by Grönroos and Ojasalo (in press), where 'learning relationships' is described as a key to enhancing services and increasing their productivity.

There are compelling arguments why voice call access to a call centre should be provided as one means of accessing mobile services. However, there are also reasons why this may not the best approach for general access. Firstly, call centres require considerable human resources, which are costly to provide. If services were popular it would be likely that some calls will be queued, which would negate the concept of fast access to services. If a sufficient number of human operators are made available it will have implications on the overall cost of the service and it may end up being too expensive for the average user. The demand side must be managed so that an optimal balance between perceived quality and internal efficiency of the service can be maintained (Grönroos and Ojasalo, in press).

Even though device manufacturers tend to promote new services via the purchasing of new devices, service providers should target their services to all potential users. There are a number of reasons why the voice call access method should be offered at least to specific user groups, who may be first time users of the service, occasional users and the older users. Some user groups may take more time (or do not want) to learn to use current SMS or browser-based services. The content of the service, which is accessed via voice, must be designed with keeping in mind that speech-based interaction may create privacy problems for users when used in public places (Marmasse et al. 2000).

A voice call should not be the only way in which the user of a mobile service is able to receive information; rather they should have the flexibility of choosing either direct use or voice call access. In addition, automatic services that are directly

accessed via a mobile browser should have an option for contacting a human operator if the user doesn't know how to use the service or is experiencing difficulties.

Figure 2 describes how a mobile information service could be used via a call centre. The traditional mobile service value chain (content->SP->network->user) enables current mobile phone users to access mobile services with e.g. SMS. The call centre provides a new access method to the same information and extends information search to include the internet by utilising the expertise of the human operator.
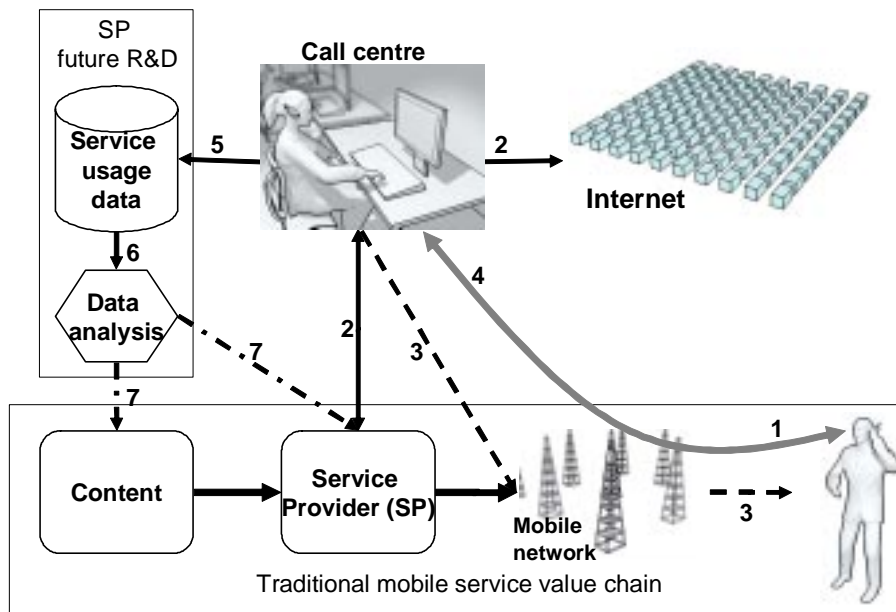

Figure 2. Scenario of mobile information service usage through a call centre.

1. User initiates a voice call to the call centre and with the operator assistance, defines the information need. [Human-human interaction]
2. The operator uses all available services from the service provider and the internet to obtain the information needed by the user. [Human-computer interaction]
3. The operator sends information to the user (e.g. via SMS) and possibly related adverts, if user has accepted.
4. Using a voice call, the operator can provide guidance on how to use the information relayed to the user, if user needs. [Multimodal information]
5. Service usage data (e.g. context, information accessed) is gathered automatically during session; after the call the operator can add any other value-adding information (e.g. extra details on the context of use) for future analysis.
6. Usage data is analysed and used to improve content, user experience and mobile service in general.

5. Summary and conclusions

Mobile information services are currently not used as much as the widespread acceptance of the mobile phone might suggest. In order to reach additional markets such as older users and first time users, services must be easily accessible also through mobile phones that are currently in use. This can be done by providing access to services via a call centre using a voice call, as it provides quick and easy access to information. Human operators can also cater for usage context, understand search terms that the users tend to use, and the human-human interaction will create a feeling of security and confidence for users. Operators can also aid learning of the service.

By enabling access to mobile information services with basic mobile phones, the number of potential users would therefore be increased, and introductions to mobile services and positive user experiences helps these services to be accepted and integrated into everyday life by the mass-market. In addition, direct contact with end-users can provide the service provider with valuable information from a real operating environment and enable the development of key information provision/customer relationships. This information can be used to generate more valued, tailored, usable and accepted services that are accessed via more sophisticated devices in the future.

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