

# Older users' requirements for Location Based Services and Mobile Phones

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**Abstract.** It is important that studies are carried out to enable developers of new products and services to take into consideration the requirements of the older population as well as the younger and work towards an inclusive design. This paper presents two studies carried out to determine the attitudes and requirements of older users towards location based services (LBS) and their needs for mobile phone functions and features in general. The implications and benefits for developers of future products and services by taking an inclusive design approach are briefly discussed.

Technological advances are occurring at a more rapid pace than ever before and have allowed the development of evermore sophisticated and ubiquitous products and services. In order for technology and services to be successful, they need to be embraced by the population. An example of this is the mobile phone. Location based services (LBS) are services in which the location of a person or an object is used to shape or focus the application or service (Duri 2001). LBS will account for over 40% of operators' mobile data services revenues in 2007, according to a new report from ARC Group<sup>1</sup>.

It is apparent that people in modern day society are living longer compared to their predecessors. This is leading to an increased number of "Third Agers" (people 55 years and over). Coleman (2001) estimated that by the year 2020 almost half the adult population in the UK will over 50 years of age. If products and services do not include this age group in their development process then market exploitation will be adversely affected. Meeting the requirements of the older and younger age groups can be achieved by taking an inclusive design approach. Hardie and Plaice (1991) defined inclusive design as "an approach to creating environments and products that are usable by all people to the greatest extent possible". A question that needs answering is whether the developers of products and services taken the rapidly growing older population into consideration? This paper tries to help address this need.

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<sup>1</sup> ARC Group Press Release, LONDON, 19 August 2002 <http://www.arcgroup.com/index.html>

## **1 A Study on User Requirements and Attitudes for LBS**

LBS have yet to penetrate the consumer market to a great extent and are still being developed. One might say that until recently they were driven primarily by technological developments, so a user centered approach needs to be taken. This short study aimed to explore views, thoughts and attitudes of potential users towards LBS. Requirements, preferred applications, advantages and disadvantages for LBS were identified from the potential user's perspective.

### **1.1 Scenario Development**

In order to present a practical example of the use of LBS to the participants, short scenarios were constructed. The scenarios were based on the current and possible future applications of LBS. The scenarios were constructed after attending an industry seminar organized by HELIOS Technology UK<sup>2</sup> that included delegates from the major stakeholders in LBS. In total five future scenarios were constructed. These are summarized below:

- Scenario 1: "Finding your nearest" – traveling to another city and using LBS to locate a cash point to pay for the taxi fare and using the LBS to locate a taxi rank.
- Scenario 2: "Traveling to a destination" – Organizing a trip to a theme park. Finding out train times and alternative transport using LBS. Also identifying a route to the theme park using LBS.
- Scenario 3: "Meeting up" – Locating the whereabouts of friend using LBS on a night out. Finding a route to get to them using a LBS.
- Scenario 4: "Virtual Messaging" – Leaving and receiving spatially tagged messages to and from friends.
- Scenario 5: "Shopping" – Using LBS to locate products. Receiving special promotional offer through LBS.

### **1.2 Focus Groups**

The participants were split into four groups: "younger males" and "younger females" (20 –25 yrs old), "older males" and "older females" (55 yrs and above). In total four focus groups were conducted with six participants in each focus group. The participants voted for the discussion of three out of the possible five scenarios in each focus group session.

### **1.3 User requirements**

Requirements for LBS were extracted from the discussions within each of the scenarios and categorized into primary, secondary or tertiary requirements according to their importance displayed within the discussions. The general requirements of the older participants are displayed in table 1. Scenarios 1, 2, 3 and 5 were discussed.

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<sup>2</sup> Seminar titled "Migrating from Ideas to Income" organized by HELIOS Technology in London, UK. (November 2001)

**Table 1.** Summary of older users' requirements for LBS categorized into primary secondary and tertiary requirements. (Numbers indicate which scenarios the requirements were mentioned in)

<b>Primary</b>	<b>Secondary</b>	<b>Tertiary</b>
Reliability of information 1,2,3,5	Alternative routes/options <sup>1,2</sup>	Flight Bookings <sup>2</sup>
Personalization of LBS services <sup>5</sup>	Zoom in/out of display <sup>1,3,5</sup>	Receipt printing facility <sup>2</sup>
Integration into mobile phone <sup>1,2,3,5</sup>	Large Screen <sup>1,2,3,5</sup>	Color Screen <sup>1,2,3,5</sup>
Accuracy of information 1,2,3,5	Usable abroad <sup>2,5</sup>	Guide book facility abroad <sup>2</sup>
Low cost of LBS service 1,2,3,5	Information about charges for use of LBS service <sup>1,2,3,5</sup>	Specific information about facilities <sup>1,2,5</sup>
Ease of use of LBS device & LBS service <sup>1,2,3,5</sup>	Translation facility <sup>2,5</sup>	
Up to date information 1,2,3,5	Comparison of different prices of external services <sup>2</sup>	
Maps for routes <sup>1,3</sup>	Check Stock in shops <sup>5</sup>	
Landmarks for places <sup>1,2,3</sup>	Print Facility <sup>1,2,3,5</sup>	
Directions to places <sup>1,2,3</sup>	Ability to locate lost people <sup>3</sup>	
Access of location information for police <sup>2</sup>	Reserve products in shops <sup>5</sup>	
Location inside building <sup>5</sup>	Security of different places 1,2	

It is important to note that the requirements from both the older and younger age group had similarities (i.e. LBS should be reliable, integrated into mobile phones and up to date) and differences (i.e. older users required the text on the screens to be clear and easier to read whilst the younger age group wanted a more interactive service). This may be due to the difference in prior experience with new services between older and younger users. Younger users' were more technologically aware therefore had more experience with the possible advantages and disadvantages of new services.

#### **1.4 Group Attitude Ratings**

A group attitude rating (GAR) was given to each of the focus groups for each of the scenarios discussed. The averages of the attitude ratings allow comparison of the acceptance levels of different groups for using LBS within different scenarios. It is interesting to note the contrasting attitudes towards LBS between the older and younger females within the shopping scenario discussion. The older females viewed LBS as a service that would facilitate and enhance their shopping activities whereas the younger females viewed LBS as a hindrance to their social interaction. Overall the older age groups (male and female) had a more positive attitude towards LBS

compared to their younger counterparts (male and female). This is an assuring result for the developers of LBS and adds to the case of including the older age groups in the development of new services and products. The older users were comparing LBS to mobile phones and strongly suggested that LBS access should be integrated into the mobile phone. Therefore considering the mobile phone needs of older users was thought to be important.

## 2 Older users and mobile phones

Interviews were carried out with a group of 17 users between the ages of 47 and 79 including 10 males and 7 females. They were generally inexperienced with mobile phones. Users were asked consider the situation where they were purchasing a new mobile phone. They were asked to choose from, and rank, a range of 12 features (printed on cards) divided into 3 categories: usability/ergonomic features, phone functions, and advanced services. The mean rank of each factor is shown below (12=high, 1=low):

**Table 2.** Mean rankings of required phone features

Feature required	Category	Mean rank
Easy menus	Usability/ergonomics	10.2
Large screen text	Usability/ergonomics	8.6
Small/compact	Usability/ergonomics	7.9
Large buttons	Usability/ergonomics	7.7
Information services	Advanced services	5.4
Voice dialing	Functions	5.1
Photo messaging	Advanced services	4.7
Handling calls intelligently	Advanced services	4.3
Radio	Functions	2.3
Phone shopping	Advanced services	2.2
Ring tones	Functions	1.7
Play games	Functions	1

Interestingly the four usability/ergonomic factors occupy the top four positions in the list. The list shows that there is significant interest in an information service through the phone. There was also some interest in photo-messaging and handling calls in helpful ways. However the idea of shopping through the phone received limited support. Many preferred to view the real products before buying and also enjoyed the social aspects of going to shop for, say, groceries on a weekly basis.

The results show that the users were prepared to accept the integration of a range of services into the mobile phone, provided those services meet their needs and are of interest to them. Location-based services through the phone might thus be accepted by older users provided those services meet their needs.

Participants were asked which were the most important factors in learning how to use their mobile phone. Being shown by a friend or relative was the most important factor closely followed by use of the handbook. Exploring on one's own was fairly important. Only one person stated that a shop demonstration had been useful, and no one had received telephone support from the supplier. It will be important then for

future location-based services to be very intuitive and additional support may be required for the users especially the older age groups.

Regarding method of payment, 14 out of the 17 users wanted their phone on a 'pay as you go' basis, only 2 wanted a contract. It is thus in the interest of phone companies to make the 'pay as you go' option attractive in terms of cost and services available, as this seems the preferred basis for the older user group in the UK.

### **3 Implications of older users on design**

The Mobile industry is moving into a new phase as 3G networks are starting in many countries. The new terminals have so many features that learning how to use them may be too much for many users e.g. older people. Furthermore, if older people cannot see the benefits or added value of the device and new mobile services provided, they are not ready to invest money into them.

The requirements and needs of older users need to be clarified in order to develop mobile services which are adopted by all possible 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. Simple and easy-to-use access methods with services provided by mature technology and with straight forward billing may be the key to familiarize LBS and mobile services to older age groups.

Many people may have the perception that older users' have more demanding requirements that conflict with the requirements of their younger counterparts (i.e. large screen compared to small compact phone). This may be true to an extent for both LBS and mobile phones but as displayed by the first study there are many similarities that should be exploited. In addition to this, including the older age groups at a development stage of a new product or service will help identify minor alterations that may make the product or service more usable by not only the older age group but the population in general.

### **References**

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