

**ELBA***IST-2001-36530**3G European Location Based Advertising*www.e-lba.com

Public Mid-term Report

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Université de Toulouse-Le-Mirail, Hervé Consultants, Tologar Ltd. T/A Hero

New Partners: Map&Guide GmbH, Openwave



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1 Scope of Report

The scope of the ELBA midterm report is to give a comprehensive and understandable overview on the ELBA project.

2 Overview on Location Based Advertising and ELBA

2.1 LOCATION BASED ADVERTISING (LBA)

In the late 1980s and early 1990s, a revolution in telemarketing, direct mail, and electronic mail permitted easier selection of target customers and the capability to send and receive a direct response. Database marketing applications sifted through mass populations to find potential customers. Now multiple channels could generate their own potential customer lists for marketing. Market share (daily product sales), not the lifetime value of the relationship, measured the success of this business strategy. Target marketing improved results over mass marketing, but it clogged customers' mailboxes. The ability to create targeted outbound messages was diluted by companies' tendencies to over-communicate. The final analysis is that target marketing is expensive, ineffective, and irritating to the customer. In this case, loyalty and retention cancel each other out, because it's hard to retain annoyed customers. In the mid-1990s, the publication of Peppers and Rogers' "The One to One Future: Building Relationships One Customer at a Time" became the catalyst for one-to-one marketing. It also spurred the realisation that not all customers are equally valuable to companies, which pushed the industry to become more knowledgeable about their customers. The equation "loyalty plus retention equals value" increased the urgency to obtain more customer information, analyse and build intelligence out of that data, and make it actionable.

The following ingredients are the main driver for wireless advertising:

Technology

- Wireless broadband
- Handset devices for multimedia applications

Advertising Business

- Brand , product and services communication across all media
- Return on ad spending

Market

- Mobile Internet penetration
- Personalisation
- Intrusiveness

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Those ingredients form the basis for the wireless advertising opportunity. The figure below illustrates, that there is a clear market potential, but it has to be determined how this potential can be addressed.

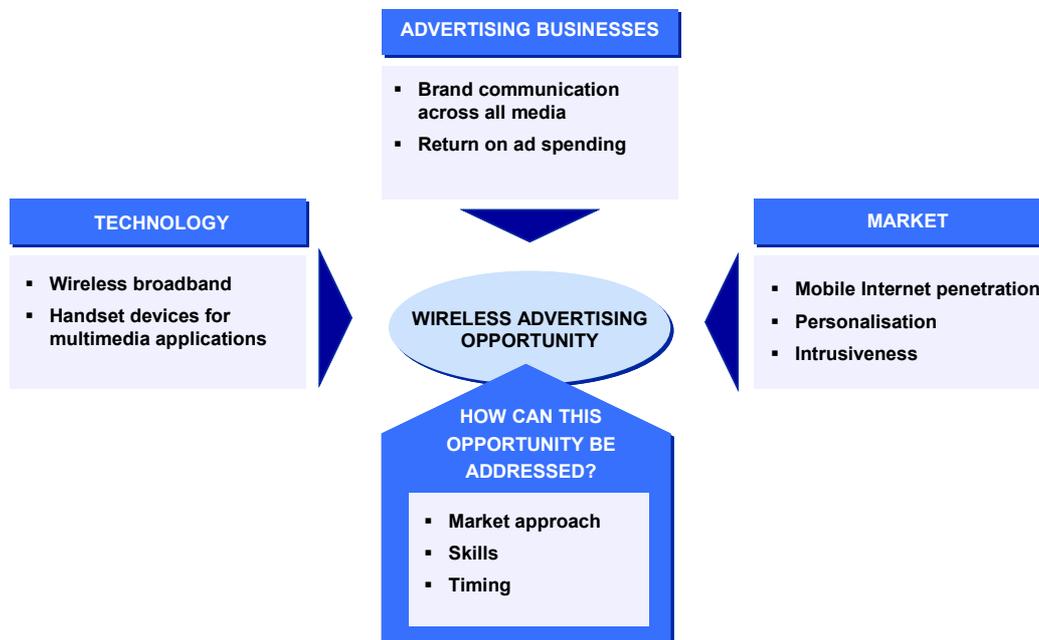


Figure 1: Wireless advertising opportunity

The emergence of innovative technologies is obviously a driving factor in today's communications markets. Technology has led to globalisation, new market opportunities, and increased competition for domestic futures exchanges from foreign exchanges and from over-the-counter markets.

Technology has helped lower the barriers of entry for new services by effectively lowering start-up costs. Changes are still rapid in the technology sector generating tremendous opportunities for growth. Even after the economic slowdown in the worldwide economy in parallel with the burst of the IT bubble, the impact of technology on Europe will still be significant in the future.

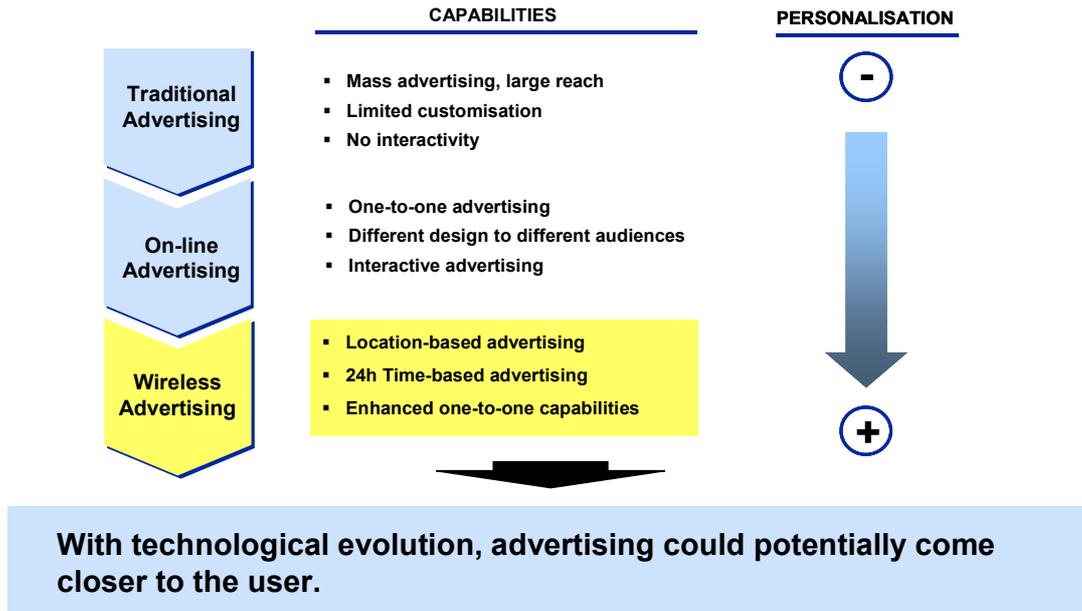
Following the emergence of the New Economy, technology is now an indispensable part of any transfer of data or information around the globe. At the same time must any meaningful long-term marketing relationship in the mobile space take into account the relevance to the end-user. Permission-based marketing campaigns must allow for cultural and geographical nuances, including a traditional resistance to "push" services. In a global culture increasingly saturated by media of all kinds, the most powerful messages can be communicated through implicit trust and exchange of value. Carriers' core billing relationships with subscribers are an incredibly valuable asset that holds great potential for growing mutually profitable relationships well into the future.

If a marketing message is personalised and delivered at a point of impulse, in a context where payment is convenient and secure, there might be a tremendous market opportunity. The key for the

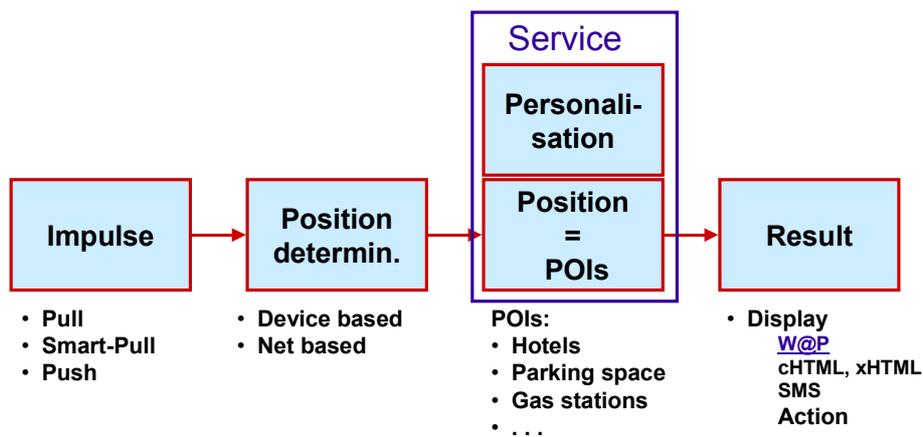
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players in the value chain (carriers, technology providers and ad agencies) looking to capitalise on the mobile channel is to remember that subscribers can disengage and embrace competitors' products/services at any particular instant of inconvenience or abuse. Mobile marketing must cater to subscribers' individual preferences and lifestyles; it holds the promise to deliver compelling value for the coveted one-to-one relationship.

Advertising has to change. Consumers are moving to digital media and personalization, whether it be a digital VCR or customised portal, and this is changing the relationship between advertisers and consumers. In that context, the fact that Nokia believes there will be more mobile terminals assessing the Internet than PCs by 2002 becomes significant. Researcher Cahners In-Stat estimates that there will be more than 1.87 billion mobile subscribers globally by 2004.



With the emergence of mobile business and location detection technologies, a new type of marketing communication is possible: Mobile advertisement based on the actual position of the users. Location Based Services (LBS) are services that exploit knowledge about where an information device user is located.



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Figure 2: Principle of location based advertising

While wireless advertising enables additional revenue stream, content is still the key. End-users do opt-in because the service provides useful information, not only because it is free of charge. Users shall receive content that is relevant to them and advertising brings additional value for the service. Fortunately from advertisers point of view there is a thin line between advertisement and plain information. Over 90% of all participants in a recent IDC study on "consumer tolerance of advertising in emerging media" say they'd be very interested in advertising if it were based on a pre-submitted user profile that ensured ads are relevant to them. 60% percent of Swedish consumers said the same in a study conducted by mobile phone maker Ericsson. The obvious benefits for the user of location based advertisements and services are value added information, increased convenience as well as saving money and time. Information becomes possible anywhere at anytime for everybody. Based on predefined user profiles there is the possibility to push or pull the advertising content.

Push (or "server-push") is the delivery of information that is initiated by the information server rather than by the information user or client, as it usually is. That means, the user gets the information without directly requesting it. To prevent being overwhelmed with information he has once to give an agreement to the information server, that he is interested in receiving push-information. Usually he can edit his profile and define fields of interests, so that he only receives information he is interested in. Using Pull-service instead, the user only gets the information when he explicitly requests it.

2.2 ELBA project

The ELBA (European Location Based Advertising) project aims at developing and validating an innovative approach (including content aggregation and technology integration) for location based advertising.

The project will allow for the demonstration of wireless advertising in three international use case scenarios. ELBA addresses the take-up gap. The consortium intends to jointly develop and test, in a European environment, an innovative 2.5-3G service (location based advertising, which is a subset of location based services) and to validate key issues between different players, technologies and content providers.

2.2.1 ELBA technologies

The ELBA system is built on a multi-tier architecture (middleware) with several application servers. ELBA interfaces with the Web and mobile networks and provides both physical and logical secured access systems, operating system protection, encoding, filtering, authentication features and operational tracking. The main role of the middleware is to provide a host of functional software modules to enable a straight-forward deployment procedure of location based services. Service provisioning and network integration aspects play a key role in this process.

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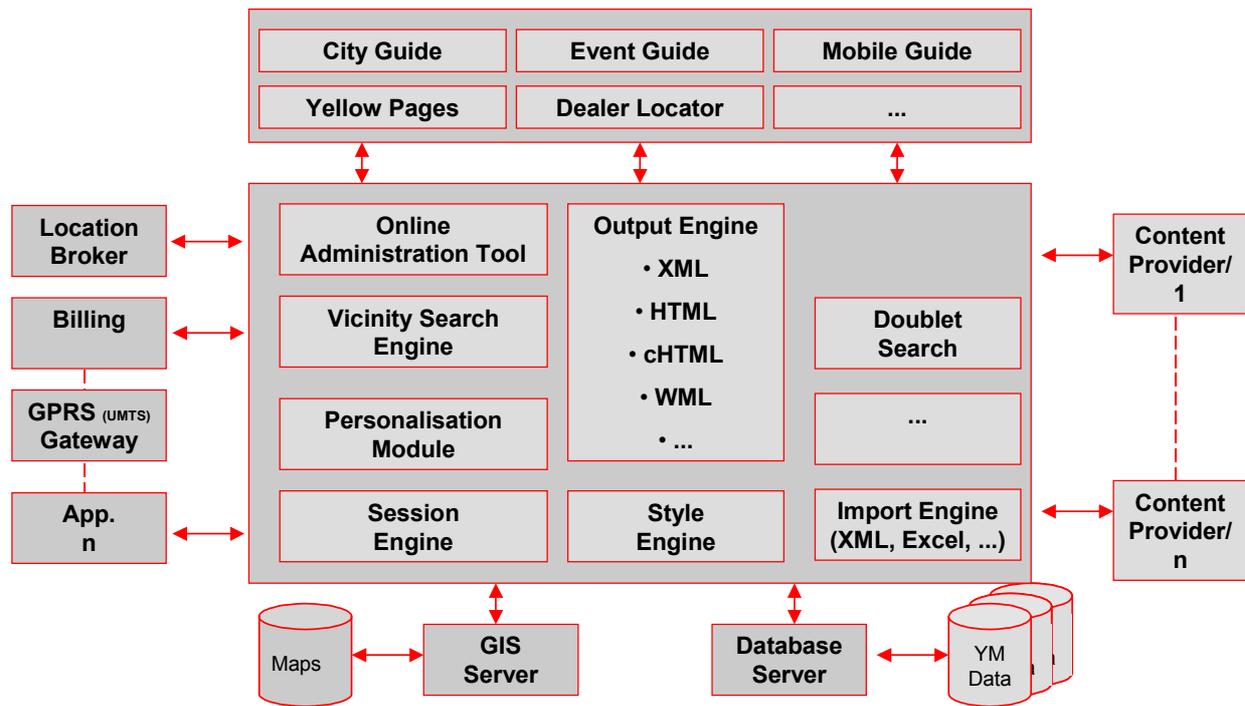


Figure 3: ELBA middleware

2.2.2 Real-life scenarios of ELBA

ELBA aims at contributing to the rapid take-up of mobile technologies, solutions and services in the area of “location based advertising”. The objective of the project is to integrate different solutions and services in an innovative 2.5-3G service. The ELBA project aims at developing and validating an innovative approach for location based advertising. The project will allow for the demonstration of wireless advertising in three international use case scenarios.

2.2.2.1 Push advertising in public transport

Location Based Advertising on integrated displays in public transport systems has great potential. The passengers are normally bored when they ride with a public transport system (metro, bus, tram etc.) so they are open to general interest information and location based advertising (push approach). Therefore they will receive messages during their ride, mostly they get value-added information e.g. on events, special activities, opening hours of museums timetables, delays, city-activities etc. Example: When the public transport system passes an electronics store on the display of the high resolution screen special offers and saving of the store are displayed. At the next exit you have the chance to get out of the public transport system and go to the interesting store.

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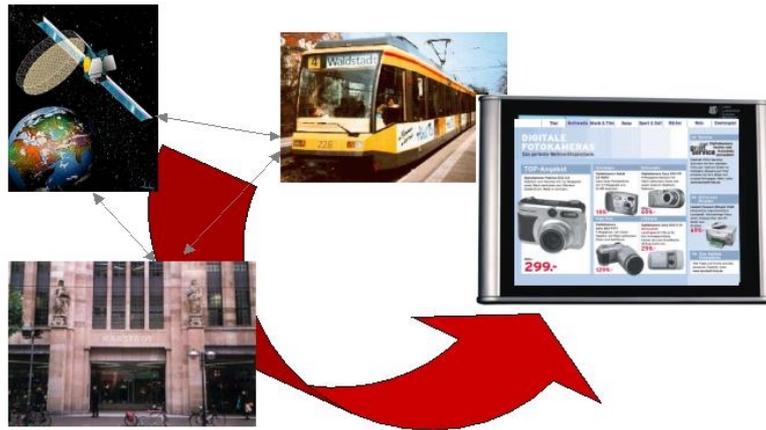


Figure 4: Advertising on high resolution screen in public transport

The infotainment system (IS) consists of a terminal with two screens affixed side by side. One screen displays passenger information as line, destination, next stop and interconnections, date, time and vehicle status. And the other one displays additional information like location based advertising, actual news, videos or maps with the actual vehicle position displayed.

The advertisements displayed in the light train can be of different types:

- Text
- Pictures
- Videos
- A combination of text, pictures or videos with audio
- Any combination of the above

The duration how long they will be displayed belongs to the type of advertisement. Certainly a video is displayed as long as it is, e.g. 30 seconds or so. A text message or a picture is displayed a certain time that can be adjusted by the content manager.

The appearance of the advertisements is depending on the actual position, driving direction, speed and the next station. For example you will get information where to go after getting off the train at the next station (e.g. to reach the restaurant, theatre, ...). The on board computer (OBC) in the light train is connected to the infotainment system (IS), composing of a terminal with two screens. One screen will display passenger information (next station, etc.) and the other one advertisements and sponsored services. The shown advertisements can be pictures, text, sounds and even video clips. For location detection OBC is used, because the OBC contains the direction, speed and the knowledge of the next station and so on.

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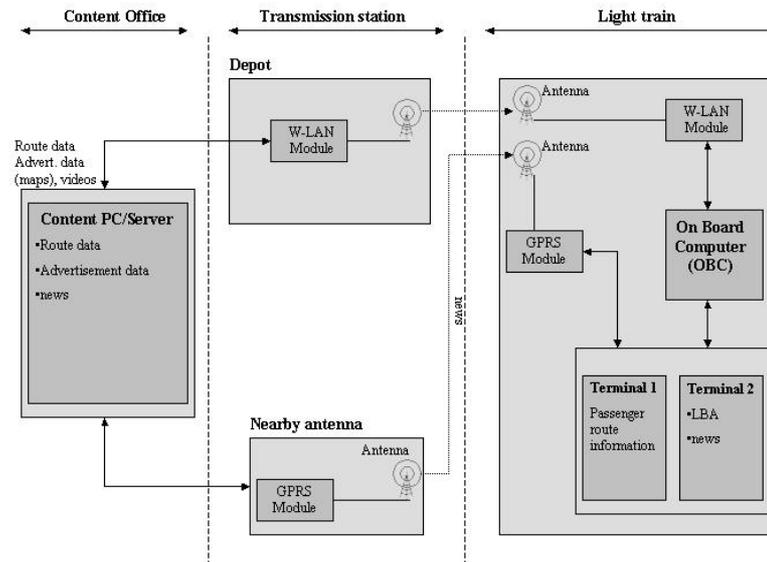


Figure 5: System architecture for push advertising in public transport

There are two ways to update the content: The main part will be transferred over night via a wireless LAN connection to the Content-Server. Small updates for ad hoc messages (e.g.: „still some tickets available for the theatre this evening, get 20% off“) by day during the ride occur via GPRS e.g. every hour. The updates are dependent on the track of the train, because each track passes other places and shops, and, in result of this, needs other advertisements and information for the passengers.

The advertisements can be activated in the train by different parameters. There are the following possibilities: Light train track, Stations (starting station and end station), Time, Date, Meter distance from the starting station or by a combination of the above.

The content is created in a content management system (CMS) by an administrator or the content partners themselves, who are selling the ads. Via login, they can edit, update and delete their advertisement content and define where and at which time (e.g. only for lunch time between 11am and 2pm) their ads should be displayed.

2.2.2.2 Pull advertising on mobile devices

Within the ELBA project Location Based Advertising on mobile devices will be basically a pull-service, that means, only if the end user is interested to receive advertising information or looks for specific information. Therefore it is important to define the level of permission a user/device has granted to the content site to receive advertising messages from them.

The basic scenario is: En route in the city, the user seeks the closest drugstore or maybe a good Italian restaurant. The user gives the service provider the indication that he looks for a special good and receives either out of the yellowpages/directory content the desired information or gets according to the interest offers on special savings in the concerned area. Opt-in possibilities will allow device users who are strolling in a shopping mall or urban area, for example, to signal their readiness for local offers. Carriers or content providers could offer lower subscription rates for

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those who accept ads. Users willing to accept ads on their mobile devices will receive either push information (they get a advertising message with savings offerings) or pull information (users can request information e.g. yellowpages etc.).

The demonstration of the ELBA use case will take place in Grenoble, France. It is about a general information system for the town and not only suited to tourists. It combines the yellowpages with an event-calendar, so that everyone has access to a huge variety of information and services, e.g. sightseeing highlights, next pharmacies, hotels, information about an object, routing, mapping etc., with multiple devices: PDAs or smart phones. Also possible is a push-scenario. That means, if a person enters a zone, he gets information and ads, e.g. enters a city and gets information about events, hotels, restaurants, or gets coupons by SMS/MMS for a store (depending on the users profile) when entering downtown.



Figure 6: Example, Location Based Advertising as Pull-Service

When a tourist is on tour and wants to get information about something special, e.g. a church (searching, reading/watching the info about the object), or wants to get information about where is what (next pharmacy, restaurant, hotel, bar, cash point/machine,...) he uses a mobile device for vicinity search, maps, routing and information about objects. He will get a result list with additional advertisements of several different kind of types:

- Search system result list advertisement (context sensitive, banner)
- Search system result list advertisement (location based, entry/banner)
- Search system result list advertisement (location based, entry/banner and combined with a coupon that could be sent by SMS to the mobile device after filling out a form)
- General location based advertisement by SMS, activated by entering or leaving special areas (general info, coupons, etc.)

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By category: With the functionality of the vicinity search the user can search in the yellowpages for the next restaurant and can take a look in the menu (if the restaurant has an advertisement), the next hotel (booking information), pharmacy and so on.

By keyword: With the functionality of the vicinity search the user can search in the yellowpages for the next addresses that has to do something with the keyword he enters. E.g. the user searches for skiing outfit and enter ski or snowboard as keyword, the user would get all addresses that either have the keyword in the name or have entered the keyword as searchword (if they have an advertisement in the yellowpages). So perhaps sportshops, shopping center and others would appear in the result list, if they have those words as keywords.

Automatical positioning / manual positioning: To start the search the position of the user must be known. If the user agrees with getting the position of him automatically by locating him then the actual position of the user would be taken for the search. If the user does not want that the positioning is done automatically or may be the system doesn't work sometimes, it is possible to put in manual the actual position/address. This address will be geocoded and used for the vicinity search.

To search directly for an information of a company or church or anything else, you can use the yellowpages as well. In this case the user already knows the company or POI and only wants to know something about it, e.g. the telephone number, how to get there or just to take a look at the menu of today. For this it is possible to type in the name of the company and optional the location and the search will be started and the user will get the information of the company.

- Keyword search: There is no geographic search with this option. The system will only search for the name or keyword that has to be put in by the user.
- Vicinity search with keyword: The name and the location have to be typed in and the system does a geographical search to find the wanted company information.

The user has a personalization interface which is web based, the usage is provided via web and mobile. He can login with his personal account, that he has got from his registration process. With this functionality he has the possibility to define his personal yellowpages/directory. He can do this by the following functionalities:

- favourite branches: He can save his favourite branches for faster searching and more comfort
- favourite addresses: The user can save his favourite addresses for his own yellowpages. With this he has a address book which is always automatically updated, if the yellowpages will be updated.

Furthermore he can choose his SMS/MMS advertisement preferences. For example, the user can activate push-advertisement if he wants to receive SMS when entering zones (passive tracking), and define categories of interest to receive advertisements and coupons only in his fields of interest.

Supported devices are high-end devices like PDAs (=personal digital assistant) and smartphones with GPRS. PDAs are small mobile hand-held devices that provide computing and information storage and retrieval capabilities. They have a small keyboard and a coloured display. General Packet Radio Services (GPRS) is a packet-based wireless communication service that promises data

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rates from 56 up to 114 Kbps. The higher data rates will allow users interact with multimedia Web sites and similar applications using mobile handheld devices as well as notebook computers. GPRS is based on Global System for Mobile (GSM) communication and will complement existing services such circuit-switched cellular phone connections and the Short Message Service (SMS).

2.2.2.3 Context sensitive advertising in warehouses

According to recent studies, targeted and context-sensitive advertisements delivered to wireless devices make a lot of sense. The best opportunities in opt-in m-commerce deals. A world where a visitor to Dublin receives a message alerting him his favourite neck ties are on sale at the local department store is addressed in the ELBA project. Opt-in offers allow the audience to set limits on dates, the number of offers, and the companies that send them. In addition to notifying users of sales and events, marketers could also sponsor content to delivered to wireless devices, much in the same way they sponsor Web content. A brokerage firm could sponsor stock quotes delivered to a PDA, for example, and let users open an account with a text link.

Context sensitive advertising will be tested in warehouses (test area: Dublin, Ireland). Users, which are in a mall, receive according to their current position special offers on goods that are related to the goods in the area they are at that moment. As a basic technology Bluetooth networks will be used. Proximity applications, like context sensitive advertising, in which Bluetooth devices are automatically connected when they come within range, will be crucial. Retail kiosks, pay phones, and other public access points will support proximity services.

Scenario: The context sensitive advertising allows for an enhanced shopping experience by creating a seamless link between customers and retailers. Customers have a personal identification system on their device, allowing retailers administrative access to their shopping preferences, to interact with and better serve them. While passing a storefront, shoppers will be impressed by an interactive displaying motion video and static content advertisements custom-tailored to their interests and mobile device. Retailers will have information at their fingertips that allowing them to tailor their product line and marketing strategies to the exact desires of the shopper, exceeding current methods of obtaining shopper preference information.

- **Newsletter** (context sensitive via the profile): The registered users can choose the option to receive newsletters and signalise that they are willing to participate in the advertisement information that will be sent to the users by SMS/MMS depending on their profile. The user is able to adjust his preferences via a web based administration tool with which he can adjust things like the frequency he wants to get information or the topics of the information. The advertisements are sent e.g. daily, weekly or when new stock arrived, always context sensitive via the profile.
- **Push Advertisement** (context sensitive and location based): Coming near the store the user gets SMS/MMS advertisements depending on his profile. This could also be a coupon for e.g. wrangler trousers, information about new stock or something like that.
- **Pull Advertisement** in the virtual warehouse (context sensitive): Walking through the store the user can browse at every time through the virtual store with his mobile device to find the best fitting clothes to every article in the virtual warehouse.

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The system consists of a content server with an interface for user/profile and newsletter administration (create, edit, delete, upload). The server is connected to the trigger engine and the virtual store. The trigger engine sends the newsletters and the MMS (using a MMS-gateway) to the users, depending on their profiles.

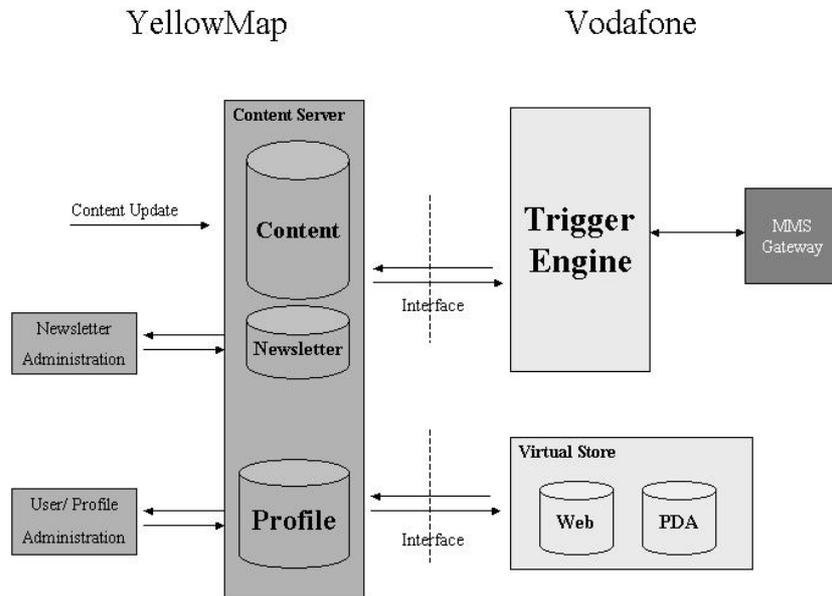


Figure 7: System architecture for context sensitive advertising in warehouses

When a user comes in range, he will be logged in and identified automatically by the network. Then he receives some advertisements depending on his profile he can update on the web. The systems acts the following way:

- The user comes near the warehouse
- The system recognizes that there is a bluetooth device and tries to find out who it is and if the device has the permission to link with the system.
- The near by agent checks the permissions and the users profiles and checks if there is an action to do like sending a newsletter or an advertisement.
- If there is something to do the near by agent fires the trigger engine to do something. The area agent collects the data and user information and initiates the sending of the SMS/MMS to the mobile device.

2.3 Business Case

Ovum predicts that by 2005 mobile advertising will be worth more than \$16 billion and will comprise 20 percent of the overall Internet advertising spend. Meanwhile, Jupiter says 2005 will bring only \$700 million of wireless advertising revenue, though the company expects the number of Web-enabled cellular handsets to reach a 95 million in 2004.

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With the advent of all new media, advertising and sponsorship has always played a part. It took radio 20 years to find a profitable business model. Years after the mass-market embrace of the Internet, companies are still struggling with the collapse of the online advertising market and the collective expectation of goods and services "for free". Wireless carriers need to take steps today to prepare for the proliferation of mobile advertising, because it will inevitably play a significant sponsorship role in the financing of mobile data services. Mobile marketing must cater to subscribers' individual preferences and lifestyles; it holds the promise to deliver compelling value for the coveted one-to-one relationship. This emphasis on the personal relationship with the subscriber is crucial; time-conscious and event-driven campaigns can drive sales of myriad products and services. Context is key and with the advent of location-based technology, the opportunity to drive offline purchases at a given point in time becomes palpable. Again, the emphasis should center on delivering value to each individual subscriber. Digital coupons can facilitate the institution of the impulse buy; pre-selected and relevant coupons may very well opt-in for long-term loyalty programs. Instant feedback on marketing messages becomes an extremely valuable asset. Today, the mobile channel is radically altering communications across multiple sections of society, with far-reaching implications for an emerging global culture, which is being fashioned largely by an emergent youth market. That is the point, where ELBA comes into the picture.

Advertising that changes based on a user's location (LBA – Location Based Advertising) has been one of the much-talked-about capabilities of the wireless Internet, the idea being that an advertiser could reach a customer when he was most likely to buy. The advertising will be directed toward phone and PDA (personal digital assistant) users or passengers in public transport. "Wireless advertising makes the most sense when delivered contextually through media on a geo-targeted basis. Opt-in possibilities could allow device users who are strolling in a shopping mall or urban area, for example, to signal their readiness for local offers.

ELBA targets clearly a business case. Mobile advertising will represent an excellent and unique opportunity for one-to-one marketing. Mobile devices which will be both location and context-aware will help promoters to reach consumers at the right time in the right place, creating an opportunity for immediate reaction, purchase or contact. Users of mobile devices will access personally relevant marketing information. For example, they will be able to define in their personal profiles what type of information they receive. Thus a movie fan could receive information of coming film releases once a week, check the trailers and consequently book tickets for the theatre.

Nearly all respondents to several surveys on mobile marketing agreed that wireless advertising has a great business potential. Nearly nine out of ten (86 percent) respondents agreed there should be a tradeoff for accepting ads on their mobile devices, according to the study, which conducted by HPI Research Group. HPI interviewed more than 3,300 people across 11 global markets during June 2001 for the study. The markets were Brazil, Denmark, Germany, Italy, Japan, Korea, Singapore, Spain, Sweden, Britain, and the United States. The study found that the core mobile phone market (ages 16 to 45) is receptive to experiencing mobile marketing in the form of a received SMS sales message. When asked about receiving an electronic coupon to be reimbursed at a nearby shop, 88 percent stated that they would be receptive to this sort of marketing. Nearly one-third (31 percent) expressed more enthusiasm by stating they would actually welcome such marketing. The study identified four key factors as being important to consumers' acceptance: choice -- being able to decide whether or not to receive messages; control - being able to bypass sale messages easily;

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customisation - being able to filter the types of messages received; and mutual benefit -- getting something back in return, a reduction in the cost of services for example. The study dealt with consumers who had expressed interest in mobile visual entertainment. Of these, more than three-quarters (76 percent) would find it acceptable if the programs they viewed were punctuated with very short ads. In fact, 51 percent of the respondents said that they would not see advertising as an intrusion if it were presented to them in the same way as on television. Once wireless bandwidth increases, this will be a viable way for mobile ads to be delivered.

HPI's finding echo a report by Cahners In-Stat Group, which also found that there must be a clear benefit to end users from mobile advertising. The report, "Mobile Advertising: Not as Bad as You Think", revealed that consumers first thoughts are to reject mobile advertising. In fact, 64 percent of In-Stat's Wireless Internet Panel respondents do not warmly embrace the concept of mobile advertising. However, responses from the same participants improve when mention is made of special offers or discounts that allow them to opt in. Just as sales drive consumers to stores, special savings will lure consumers in, and will make the whole process of receiving mobile ads more palatable to users.

There is another train of thought in the wireless world that believes mobile advertising is the wrong approach to take, and that charging for mobile content, or a business model that combines paid content with advertising, will reap more immediate rewards. Research by Ovum predicts that global revenues from advertising on wireless devices will stay below \$1 billion until early 2004 and will only take off from 2006 onwards. But Ovum found that companies will be more likely to succeed in the wireless sector if they charge for content. A business model that hinges on paid content typically shares the content fees with the content provider and combines this with secondary revenue streams such as transactions and wireless marketing. The information would be delivered in a personalized, location sensitive fashion to any device. Ovum also recommends that service providers offer a mixture of paid for and free content from the start. This immediately helps to instil a sense of value in the consumers' eyes -- a clear message is sent that content is worth paying for. This also means companies will earn revenues from day one. A mixed content model offers basic services for free while a charge is levied for the more desirable, valuable premium content.

According to Jupiter MMXI, European consumers will spend €3.3 billion for content on their mobile phones by 2006, compared to €1.7 billion for content on their PCs. Mobile phones offer a much better billing platform than the PC. In 2001, €590 million was spent by Europeans for content on their mobile phones, such as ring tones, logos, sports scores and stock prices. This is almost twice the €252 million spent on the PC.

2.3.1.1 Barriers

There are still many barriers to the adoption of mobile advertising. These will be overcome but it will take two to three years for the market to become significant.

- **Spam**

One of the biggest dangers is the industry shooting itself in the foot. Gray of Asylum makes the point that the advertising industry has the opportunity to miss out on mobile by poor execution and poorly thought-out practices. Probably the most famous example of mobile advertising is the Plugout.com advert. An advert for their services was transmitted without

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warning to 10,000 AT&T Mobile subscribers. This was a clear example of spamming, and did clear damage to the industry. Other examples include Sprint PCS admitting it displayed users mobile numbers when they visited WAP sites. Encouragingly, the Wireless Advertising Association (WAA) has produced guidelines that require mobile adverts to have been clearly permitted by the subscriber, and to clearly identify the sender.

- **Cultural Issues**

A wider issue is cultural resistance to mobile advertising. For example, a March 2003 poll by BusinessWeek showed 89% of respondents did not feel comfortable with companies that merge their online browsing habits with identifying information. There are three answers: they are not typical of generation wireless, they will change their minds when they see the value, and they will get used to it. Cultural issues, as well as privacy and regulatory issues, do vary widely by country, particularly in Europe. This will mean that the usage of mobile advertising will vary, and slightly different models will be adapted in different markets.

Just as it is with desktop Internet advertising, the collection of data that makes targeting possible is bound to raise red flags with consumers concerned about their privacy. While the Internet advertising industry has been struggling with the issue of consumer privacy since its inception, it is a foreign subject to wireless companies who have dealt mainly in voice data transfer until recently. It is crucial for the wireless industry to have security and privacy policies. The wireless industry has not paid enough attention to privacy.

Content distribution is the key issue in the wireless industry at the moment, according to several studies, and once that has been resolved, advertising and marketing will be the next step. As with all advertising, wireless ads will have to show some demonstrable benefit to consumers in order to be accepted, and that's why wireless marketing is geared toward utility and distribution, not brand building.

- **Limitations in mobile infrastructure and handsets**

Another barrier will be limitations in mobile infrastructure and handsets. These will include slow deployment of 3G infrastructures, deficiencies in mobile browsers, a shortage and high cost of 3G and GPRS handsets, high power consumption required from handsets plus a number of others. One of the effects of these issues, and the very high costs associated with 3G, will mean that it will initially be targeted at business, and not residential, customers. 3G is not a necessity for mobile advertising, but will allow a much higher functionality.

Moreover the positioning technologies are not yet adequately available. E.g. GPS (Global Positioning System) solutions still need a lot of battery power and a user must carry a lot of spare batteries in order to operate a Location Based Service (i.e. Location Based Advertising). Other net-based positioning technologies like even one of the most sophisticated as E-OTD (Enhanced Observed Time Difference) could be quite inaccurate. In some cases they have an inaccuracy of several kilometres.

- **Control**

The final barrier is the mobile industry itself. Mobile operators, handset manufacturers, systems integrators and startups are all desperate not to be sidelined by any applications,

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including mobile advertising. Mobile operators have created walled gardens to try and retain control over the mobile Internet experience. There will be immense pressure to create open platforms in the mobile industry. Operators with walled gardens are already starting to change this approach, faced by customer and regulatory pressure.

2.4 Conclusion

Although the basic technologies for location based services and especially for location based advertising are available there is still a long way to go. Issues regarding a harmonised and favourable legislation, interoperability and data exchange between service providers and mainly content collection are hardly solved. Within the next years the battle starts really with special emphasis on market dominance, business models, user acceptance, usability etc.

As with any new technology infrastructure, the first step is to establish industry standards. In one move to standardise creative elements across wireless media, the Wireless Advertising Association (WAA) recently released specifications for two types of SMS messaging over GSM networks. The WAA has established voluntary definitions for many of the terms used in mobile media transactions, most critically "impressions" exact specifications of which have so far eluded the more developed Web advertising industry. With the advent of new transport technologies, protocols and devices, the WAA is working to ensure that the same consistency of delivery expected through conventional technology mediums (like radio, TV and PC) are achieved through mobile phones and PDAs.

Advertising is an important step along the way, but if it is done without permission or is irrelevant, it makes meaningful dialogue with consumers virtually impossible.

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