REAL LIFE SCENARIOS OF LOCATION BASED ADVERTISING

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ABSTRACT

This paper presents the basic technologies and content aggregations for specific applications of location based advertising. Apart from that it demonstrates in three real life use case scenarios the implementation of push, pull and context-sensitive location based advertising. The technology is being developed under the FP5 project ELBA and applied to three different areas: push advertising, pull advertising and context sensitive advertising.

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 sales statistics), not the lifetime value of the customer, 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 in its early days was expensive, ineffective, and irritating to the customer. In this case, loyalty and retention cancel each other out, because it is hard to retain annoyed customers. In the mid-1990s, the publication of Peppers and Rogers' "The One to One Future: Building Business Relationships One Customer at a Time" became the catalyst for one-to-one marketing. It also spurred the realization 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, analyze and build intelligence out of that data, and make it actionable.

With the emergence of mobile business and location detection technologies, a new type of marketing communication became 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.

Figure 1: Principle of location based advertising
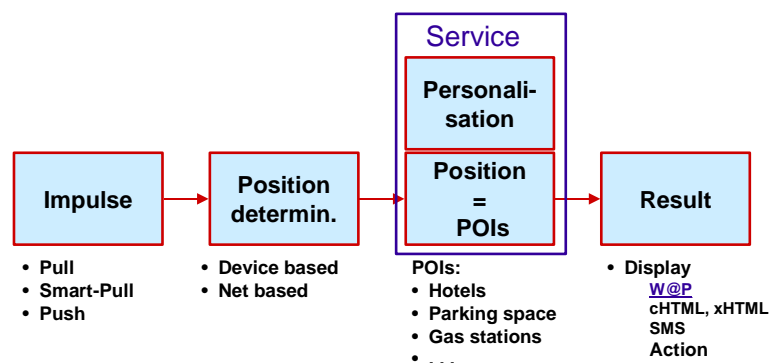
While wireless advertising enables additional revenue stream, content is still the key. End-users do opt-in because the service provides useful information, not only because it is free of charge. Users shall receive content that is relevant to them and advertising brings additional value for the service. Fortunately from advertisers point of view there is a thin line between advertisement and plain information. Over 90% of 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. Sixty 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 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 them. To prevent being overfed with information he has to agree to the information server, that he is interested in receiving push-information by creating a specific profile. 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 explicit requests it.

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.

2.1 ELBA technologies

The ELBA system is built on a multitier 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.

Figure 2: ELBA middleware
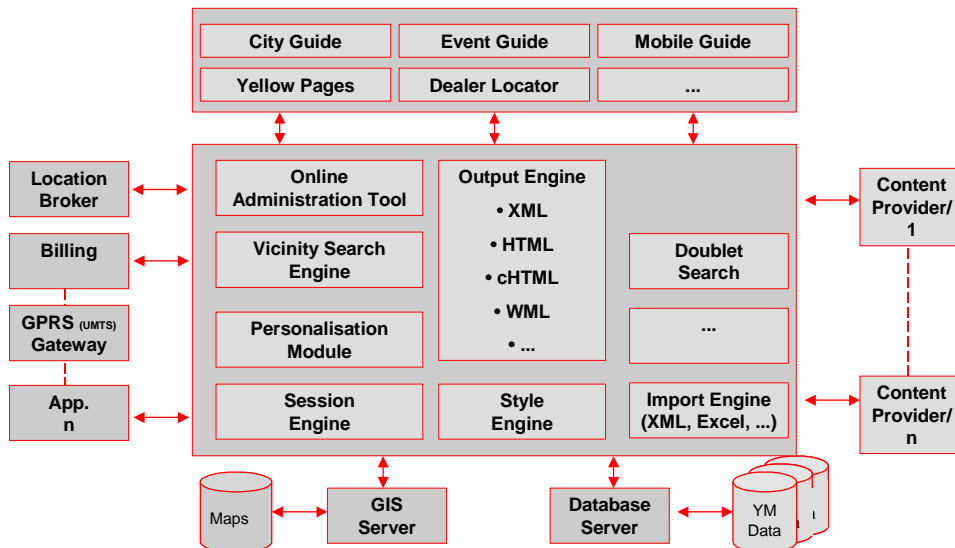
2.2 Real-life scenarios of ELBA

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 directly to the store to check the service/ product and buy it directly .

Figure 3: Advertising on high resolution screen in public transport
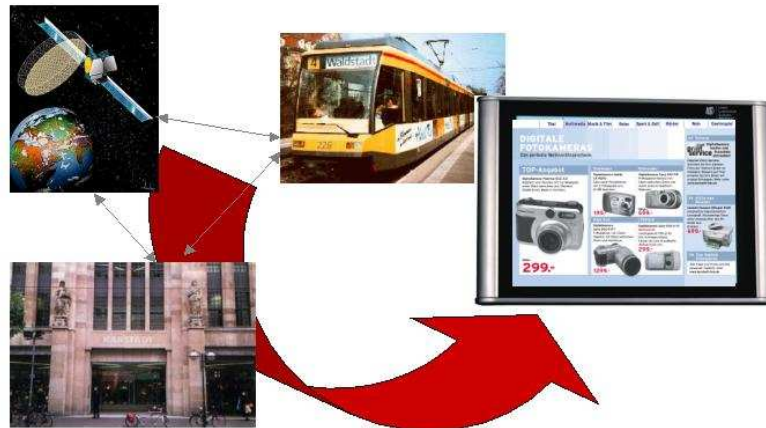
The information is displayed by an infotainment system (IS) is situated in the middle of a light train so that a majority of the passengers can take advantage of the value added information. The system consists of a terminal with two screens affixed side by side. One screen displays passenger information 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.

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 the video is. A text message or a picture is displayed a certain time that can be adjusted by the content manager.

The appearance of the advertisements will depend 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). For location detection OBC is used, because the OBC contains the direction, speed and the knowledge of the next station and so on.

Figure 4: System architecture for push advertising in public transport
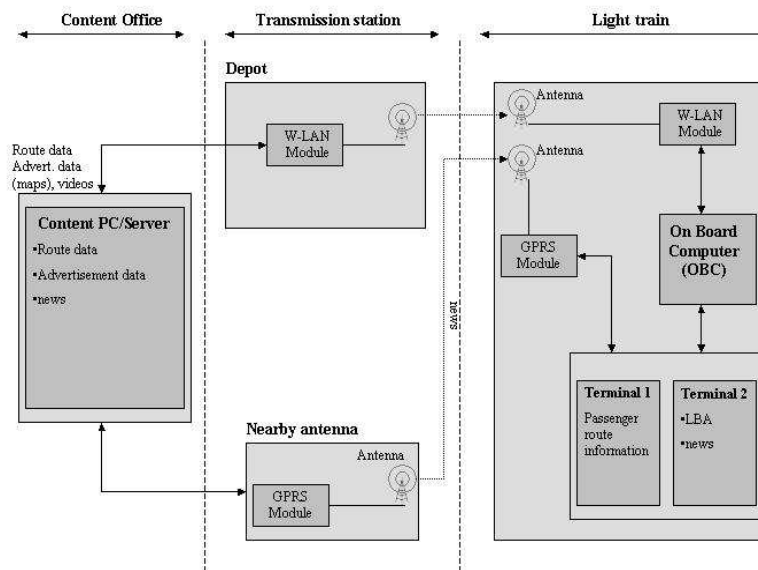
There are two ways to update the content: The main part will be transferred over night via a wireless LAN connection to the Content-Server. Small updates for ad hoc messages (e.g.: „still some tickets available for the theatre this evening, get 20% off") by day during the ride occur via GPRS e.g. every hour. The updates depend 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 sell 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.

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 or service and receives the desired information either out of directory services or gets information on special savings in the concerned area. Opt-in possibilities will allow device users who stroll 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 those who accept ads. Users willing to accept ads on their mobile devices will receive either push information (they get an advertising message with savings offerings) or pull information (users can request information e.g. yellowpages etc.).

The demonstration of this ELBA use case takes place in Grenoble, France. It is about a general information system for citizens and tourists. It combines the yellowpages (or better a directory) 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. More precisely this would be a smart push service.

Figure 5: Example, Location Based Advertising as Pull-Service

Whenever 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.)

By category: With the functionality of the vicinity search the user can search in a directory 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 searchparameter (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.

Automatic 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 manually 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. He can do this by the following functionalities:

- favorite branches: He can save his favorite branches for faster searching and more comfort

- favorite addresses: The user can save his favorite 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 colored display. General Packet Radio Services (GPRS) is a packet-based wireless communication service that promises data rates from 56 up to 114 Kbps. The higher data rates allow users to 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).

Context sensitive advertising in warehouses

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 signalize 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.

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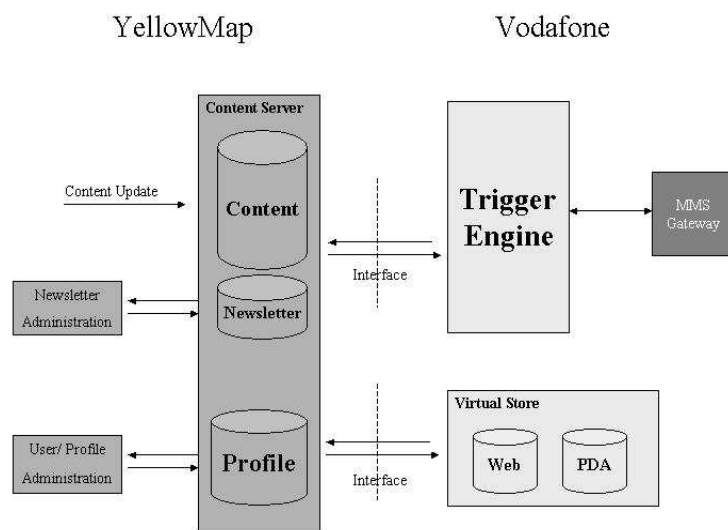
When a user comes in range, he will be logged in and identified automatically by the network. Then he receives some advertisements depending on his profile he can update on the web. The systems acts the following way:

- The user comes near the warehouse

- The system recognizes that there is a bluetooth device an 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.

3. 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 harmonized and favorable 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.

4. REFERENCES

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5. ACKNOWLEDGEMENT