Location Based Advertising

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ABSTRACT

Location-based services (LBS) are services that exploit knowledge about where a mobile device user is located. For example, the user of a mobile smart phone could be shown ads specific to the region the user is travelling in. Location-based services exploit any of several technologies for knowing where a network user is geographically located. Allied Business Intelligence estimates that the LBS industry will account for more than 40 billion € in revenue by 2006 in Europe. Most telecommunications carriers plan to pursue either network- or handset-based location fixing technologies in their networks. The technology to pinpoint a mobile phone's location is available today and is of significant commercial value to businesses that want to target their customers via mobile phones.

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.

Figure 1: Examples of Location Based Advertising

STATE OF THE ART WIRELESS MARKETING

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 + 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.

With the emergence of mobile business and localisation technologies, a new type of marketing communication is possible: Mobile advertisement with localisation of the users.
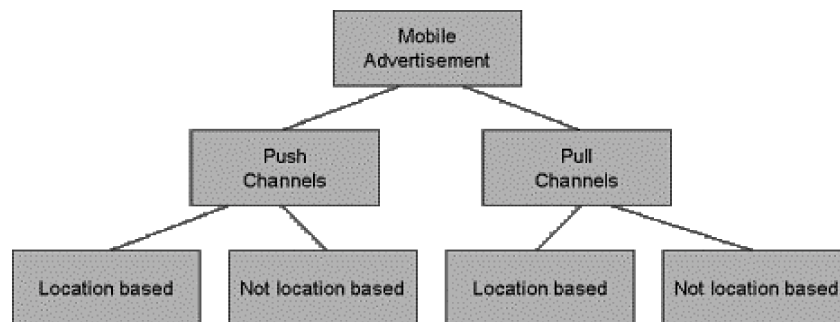

Figure 2: Types of mobile advertisement

Push-Channel - Market Overview

Currently there are no significant push-applications on the market which make use of handset localisation. Pilot projects are run during computer exhibitions using the cell broadcast capability of the GSM network. Also some network operators promote their services by SMS to users from roaming partners when they first enter their network. However we expect the present players (of non location based push advertisement) to enrich their offering by making use of localisation of the user. The location information could become one of the most relevant parameters within the profile for the mobile one-to-one advertisement message. Important players in the European market of non location based push advertisement are: 12SNAP, C-ComOne, Mind Matics.

Pull-Channels - Market Overview

In the European market the pull-side is dominated by the mobile portals of the network operators plus some start-ups (the majority started as WAP-portals). Since WAP did not generate the desired revenue some operators recently downscaled their services to SMS-Gateways. In the SMS market we also find niche players like Beamgate. First campaigns also employ voice portals, which allow for another level of interaction and include sound elements. Still, by now there is no known campaign of this kind which makes use of localisation. The vast majority of advertisements, e.g. shop finders, represent a real value to the user and are perceived as information services rather than advertisements. Here is a discussion where a pure information service ends and advertisement starts. Content examples of players in the mobile portal market are: Vodafone with Shop-Finder (gas stations, supermarkets), Viag Interkom (Genion) with Shop-Finder(Pharmacies, medical assistance, banks, teller machines, bars,

pubs, discotheques, cafes, restaurants, hotels, emergency services, supermarkets, taxi, gas stations) and Yellow-Pages, T-Motion- Hotel-Finder- Restaurant-Finder

DEMONSTRATION

Case 1 – High resolution screen in public transport

Location Based Advertising on integrated displays in public transport systems have great potential. The passengers are normally bored when they ride with a public transport system (metro, bus, tram etc.) so they are to open general interest information and location based advertising (push approach). Therefore they will 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.

Figure 3: Location Based PushAdvertising in public transport

Example: When the public transport system passes a sports shop on the display of the high resolution screen special offers and saving of the sports shop are displayed. At the next exit you have the chance to get out of the public transport system and go to the interesting shop. At the beginning of the trial for localisation the GPS system will be used (no disadvantages to integrate it into the high resolution screen of the public transport system and the costs per GPS unit are compared to the screen relatively low; later on the more advanced positioning technologies of the telecom providers will replace the GPS system).

Case 2 – Location Based Advertising on mobile devices

Location Based Advertising on mobile devices will be basically be 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.

Figure 4: Location Based Pull Advertising on mobile devices

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 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 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.).

TECHNOLOGY OVERVIEW

The system is built on a multitier architecture (middleware) with several application servers. The system 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.

Following are the main features and components of the system.

- Privacy Management & Access Control

Privacy Management asserts that subscriber's data and location is concealed from other applications and from other subscribers using a sandbox model.

Access Control manages the access of applications to network resources and subscriber information using policy based authorisation mechanisms.

- Billing

Collects and generates billing SDRs, based on the actual usage of services or applications.

- Provisioning

Manages the registration and provisioning of services and applications to users. The middleware provisioning can be integrated with a service provider's provisioning systems.

- Network and Resource Management

Monitoring and reporting on activity status and compliance to the host network management system. Monitors and guards the usage of the operator's resources (GMLC, SMSC…) by the different applications.

- Location Broker

Allows applications to obtain the location of the user utilizing various positioning methods and technologies, such as Cell ID, Enhanced Cell ID, GMLC, GPS - depending on availability with mobile service provider. The Location Broker enables to take into consideration various application parameters such as preferred resolution, cost, push/pull capabilities and others.

- GIS (Geographic Information System)

Enables applications to use the following capabilities of the system:
- · Display Maps in various formats
- · Geo-coding to convert map coordinates to streets, towns and addresses
- · Directions – to provide the recommended routing between two locations on a map
- · Land marks – to present the major land marks in the coverage area

- Subscriber Profiles

A repository that holds mobile subscriber personal information and preferences.

This information allows applications to tailor the services they provide to the specific needs and preferences of mobile subscribers. Options will include profiling functionality, utilising usage pattern information, to enable advanced pro-active services.

- Rule engine

Allows contracting intelligent rules for specific applications and services. The Rules module compares events by applying predefined rules. The logic on which decisions are made can be "if-then" or heuristic.

- STK (SIM Tool Kit)

Enables the deployment of SIM card applets for advanced interactive applications.

Features include, dynamic menu downloading, Cell-ID location retrieval, and more, all protected and highly secured.

- API – Application Programming Interface

The middleware components can be using one of the following two methods:

J2EE Beans – The system introduces a J2EE complaint interface using Java Beans. Application developers can use their application server of choice to host application

XML/HTTP - Using standard XML commands that encapsulate all internal and external functionality, thus providing one simple, consistent and network-independent way to quickly develop and deploy Location-Based Applications.

- SDK – Software Development Kit

The middleware Framework SDK contains a number of technical resources aimed at helping developers build interoperable solutions in the Location Based Services industry. Specifically, the SDK contains technical papers, applications, and components, including source code, that illustrate the

integration capabilities that are possible using the middleware Framework in association with a Markup Language Business Message Specifications.

The SDK allows seamless integration of applications and services with the middleware system. As the number of services and applications grows, more features and services become available for the new applications. The SDK is supported by a fully functional, mini-configuration, server, providing offline testing of the application.

- Middleware Adapters

Adapters serve as interfaces between the middleware platform and host network resources such as SMS centers, Costumer Care and Billing systems, WAP gateways and network management systems. Each adapter can be configured to interface with equipment of various manufacturers, and perform multiple actions simultaneously. Several mainstream network systems can be included.

- Location servers (GMLC, etc.)
- WAP Gateway
- SMSC
- Billing
- Provisioning
- Network Management System

- GPRS & 3G

The middleware is designed to comply and integrate with next generation networks by supporting a number of leading industry standards such as Location Interoperabilty Forum MLP (LIF TS 101) and the proposed 3GPP Le interface.

- High Reliability and Redundancy

The middleware platform is designed as high reliability, high redundancy network nodes featuring independent distributed process architecture, allowing for maximum scalability, fault tolerance, load balancing, and optimal performance. The platform relies on TCP/IP topology for network connectivity, which eases considerably the integration process.

- Security

The middleware Platform ensures data security by implementing communication through HTTPS (SSL). The Cellebrity application framework servers are protected behind an integrated Firewall that, in addition to blocking unauthorized connections, handles "denial of service" and other 'hacker' type attacks.
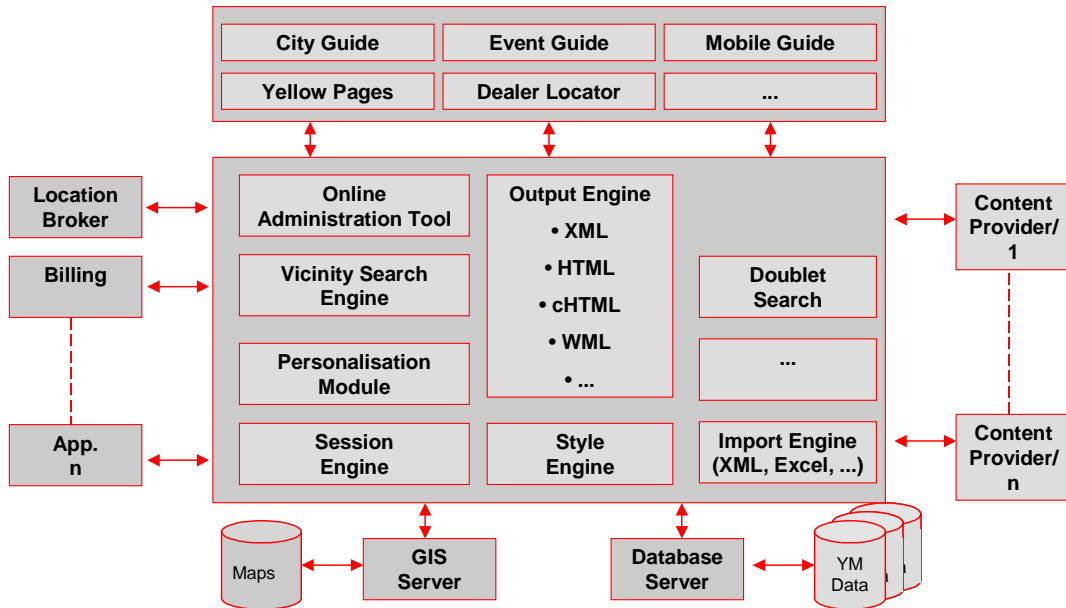
Figure 5: Model of LBA-architecture

CV PRESENTER:

Dr. Bernhard Kölmel is co-ordinating international research and strategic development at YellowMap AG. Before he joined YellowMap he was head of the departments Technology Transfer and Business Management at the IT research center (FZI) in Karlsruhe. Dr. Kölmel is advisor to the minister of economics (CEC research), he works as external expert for the European Commission. Dr. Kölmel was project coordinator of more than 20 large international projects. Dr. Kölmel is author of several papers regarding location based services. His main research topic is concerned with business models for the emerging mobile commerce area.