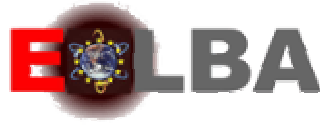


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Project acronym: ELBA

Project full title: European Location Based Advertising

<h1><i>Deliverable 8.1</i></h1>

Packaged Business Model Report

Project coordinator: YellowMap AG, Germany

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 Map & Guide GmbH
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Glossary

2,5G	2,5G is a synonym for GPRS (General Packet Radio System). As GPRS is seen as mobile communication standard on the way from GSM (which is second generation mobile communication standard 2G) to UMTS (which is third generation mobile communication standard 3G), it was also called „2,5G“.
3G	Third Generation of Mobile Communication Technology: Third generation mobile device technology, expected to become more prominent in the market between 2003 and 2005. 3G technology promises enhanced reliability and quality, improved data transmission speeds, and improved bandwidth (including the possibility of delivering multimedia applications).
A-GPS	Assisted GPS
Address	A location consisting of a street address, like " Wilhelm-Schickard-Str., 12 76131 Karlsruhe"
Cell	Map unit or uniform subsection of the earth that makes up Cell Storage
Cell-ID	Cell Identification
CDMA	Code Division Multiple Access : Most wide spread mobile communication standard in the USA
CEO	Chief Executive Officer
CMS	Content Management System
CPS	Cambridge Positioning Systems
Destination	The end point on a route.
DNS	Domain Name Server
End Point	The termination location on a route. Sometimes called destination.
ELBA	European Location Based Advertising
E-OTD	Enhanced Observed Time Difference
Geocode	A process to derive the location of (or closest link to) a point on a map, given, for example, an address, cross street, city, or zip code.
Geographic Database	A database that includes both coordinate (graphic) and attribute (non-graphic) information. This data is displayed as points, lines and polygons.
Georeference	To establish the relationship between two-dimensional coordinates on a planar map and known real world, three-dimensional coordinates.
GIS	Geographic Information System: A spatial database management system designed for the capture, storage, analysis and display of geographical data

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	for the purposes of decision-making and research.
GPRS	General Packet Radio Service
GPS	Global Positioning System: A satellite-based navigation system allowing the determination of the geodetic coordinates (i.e. longitude, latitude and height) of a point on the earth's surface with a high degree of accuracy, given a suitable ground-based GPS receiver. The network of satellites is owned by the U.S. Department of Defense and as such, the accuracy of the signal used to be intentionally degraded for non-U.S.-military users.
GSM	Global System for Mobile Communications: A digital mobile telephone system that is predominant in Europe. Introduced in 1991 using 2G technology, GSM uses narrowband Time Division Multiple Access (TDMA). There are four different GSM operating bands (mobile devices transmit in the lower frequency sub-band and base stations transmit in the higher frequency sub-band).
FTP	File Transfer Protocol
Image Mapping	Rendering graphic representations of maps to various degrees of specificity via zoom-in/zoom-out, in a timely manner.
HTML	Hypertext Markup Language: The original markup language of the World Wide Web. HTML uses element tags and attributes to define hypertext links and the structure, layout, and appearance of a web document.
IP	Internet Protocol
LAN	Local Area Network
LBS	Location Based Services: A family of services aimed at providing information to a mobile device that is specific to the user's location. LBS categories include: location-based information (for example, finding a restaurant), location-sensitive billing, emergency services (such as Enhanced 911, or E911), and tracking.
M-Commerce	Mobile Commerce
MMS	Multimedia Messaging Service
OEM	Original Equipment Manufacturer
PC	Personal Computer
PCS	Personal Communications Service
PDA	Personal Digital Assistant
POI	Point of Interest: A point feature typically known by other than its address. A hotel is an example of a POI. The Transamerica building is an example of a point of interest. POIs are grouped by type into categories; "restaurants" is an example of a category.

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POI category	Points of interest are grouped by type into categories; "restaurants" is an example of a category.
POI type	Same as POI category.
Raster data	Spatial or map data that is divided into discrete units. Contrasts with vector data.
Reverse Geocode	A process to derive the location of (or closest link to) a point on a map, given a (longitude, latitude) pair.
RFID	Radio Frequency Identification
Route	A series of connected links from a start point (or source) to an end point (or destination).
Routing	Providing travel guidance on how to get from point to point given a starting point and a destination point.
SMS	Short Message Service
TDMA	Time-division multiple access: A communications technique that uses a common channel (multipoint or broadcast) for communications among multiple users by allocating unique time slots to different users
UMTS	Universal Mobile Telecommunication System: A third-generation (3G) broadband, packet-based technology offering transmission of data at 2 Mbps.
USB	Universal Serial Bus
USP	Unique Selling Proposition
U-TDOA	Uplink Time Difference of Arrival
Virtual Map	Map unit identified by a location-dependent ID, database vendor, timestamp and layer type (road, polygon, administrative, zip code, and text).
WAN	Wide Area Network
WAP	Wireless Application Protocol: A specification authored by Ericsson, Motorola, Nokia, and Unwired Planet (now Openwave) for accessing information via a variety of wireless devices, including mobile phones, pagers, and Personal Digital Assistants (PDAs).
WLAN	Wireless Local Area Network: A network for mobile devices which can connect via a wireless (radio frequency, or RF) connection. The Institute of Electrical and Electronics Engineers (IEEE) 802.11 standard specifies the technologies for wireless LANs.
XML	Extensible Markup Language: XML allows you to place structured data in a text file. A cousin of the Hyper Text Markup Language (HTML), an XML document contains data independent of the presentation (unlike

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	HTML, which contains tags specifically for presentation purposes).
Zoom Level	Also called map scale, this is the relationship between the size of the displayed map and the corresponding size of the real world.

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1 Introduction

The objective of this document is to structure the exploitation activities of the ELBA project results. The report is considered as a basis for discussion and contribution for all partners. Comments and improvement suggestions are always welcome.

The consortium plans to publish essential parts of the report as public document. Therefore, it is mandatory to conceal discriminating information. It is not advisable to reveal all business opportunities in such report. Moreover it is not possible to provide all meaningful information, such as financial forecasts for each use case or other revenue details. Several partners had also reservations to provide such business-critical data. Nevertheless, the ELBA consortium intends to provide helpful information and input for the wider European audience.

The structure of the report is based on the suggested model of the reviewer Pekka Eloranta, however the dissemination content of the ELBA project is of rather limited importance for a business plan. Therefore, only the combination of D9.2 Dissemination and use plan and D8.1 Packaged Business Model Report contains all information as advised by Mr. Eloranta.

To enable interested readers to read the deliverables of the ELBA project independently from each other, some sections are the same as in other deliverables. Our intention is to provide the reader in each deliverable with all necessary information to understand the whole background of the deliverable. To achieve this, it is unavoidable to repeat several sections from other deliverables, especially those sections which give a general overview.

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2 Executive Summary

The purpose of this document is to provide an overview of LBA (Location Based Advertising), thus to investigate the feasibility of this innovative kind of advertisement. In doing so, the nature of LBA will be described to reveal its potential as well as its risks. Furthermore, an examination of possible success factors will assist the development of LBA as a new business opportunity. The objective is to capture possible business models based on the proceedings and findings of the ELBA project. Due to the highly different nature of the use cases, a business model is needed that embodies a generic approach. The idea is to establish a model which can be mapped to different scenarios with varying conditions while still remaining a meaningful and pragmatic solution. Thus, the examination of possible business models for LBA contributes to the efforts of the European industry to exploit LBA as an innovative and promising advertisement approach. Therefore, this document is to be understood as to support European companies which endeavour to participate in this field of business.

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3 Objectives

The purpose of this document is to provide a comprehensive overview of LBA, thus to investigate the feasibility of this innovative kind of advertisement. In doing so, the nature of LBA will be thoroughly described to reveal its potential as well as its risks. Furthermore, a detailed examination of possible success factors will assist the development of LBA as a new business opportunity. The objective is to capture possible business models based on the proceedings of the ELBA project. Due to the highly different nature of the use cases, a business model is needed that embodies a generic approach. The idea is to establish a model which can be mapped to different scenarios with varying conditions while still remaining a meaningful and pragmatic solution. Thus, the examination of possible business models for LBA contributes to the efforts of the European industry to exploit LBA as an innovative and promising advertisement approach.

The sub-objectives comprise of:

- market research on business models
- specification of the potential user benefits
- identification of market needs
- quantification of operational costs, and identification of potential source of income
- definition of the contribution and compensation needs of the service providers
- formulate a solid business model approach

Although LBA has become a much-talked-about topic meanwhile, it is surprising that there is no theoretical work which solely focuses on this subject. The idea of using location as a trigger for the delivery of advertisement has been frequently brought up in articles and studies, however, not necessarily referred to as LBA, and in most of the cases it is just mentioned along the way as one aspect of Mobile Marketing among others. Many industry experts acclaim this kind of advertisement approach, even though many of them doubt the feasibility of it. The consumers' reluctance to embrace an additional advertisement channel, especially on their personal mobile handsets, has raised concerns if LBA will ever be commercially viable. Based on the ELBA findings, this document will analyse the feasibility of LBA and make suggestions on possible business models.

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4 Definitions

Location-based services

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.

Ovum defines mobile location services as: “*network-based services that integrate a derived estimate of a mobile device's location or position with other information so as to provide added value to the user.*”

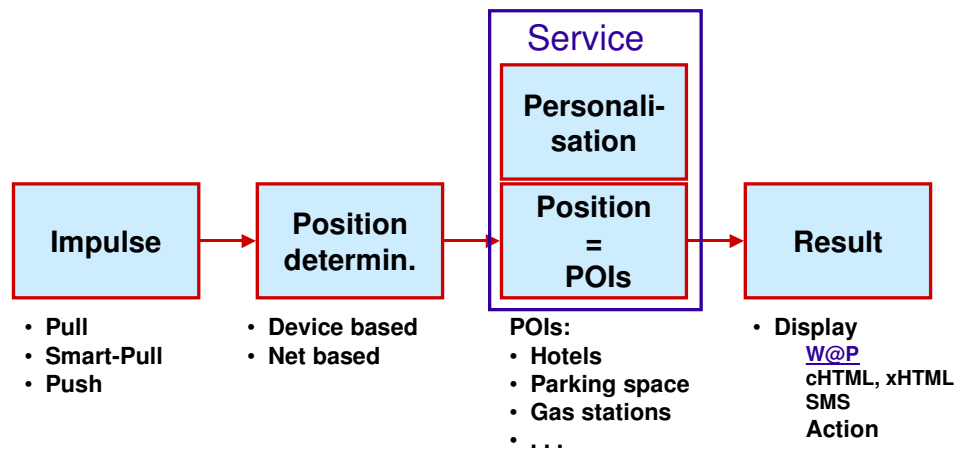


Figure 4.1: Principle of location based services

Source: Amberg

Although location services are a relatively new development, they address an age-old problem. The requirement to know where things are, where they are in relation to other things, and where we and other people are in relation to them, is a fundamental human need. It has been a driver for a great proportion of human intellectual activity since the beginning of civilisation. The existence of so many products aimed at meeting this need, from maps and street directories to compasses, chronometers and GPS receivers, is testimony to both the persistence of the requirement and its economic value. Several social, demographic and economic trends have all made the requirement for timely location-specific information more pressing, including:

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- more frequent (and longer-distance) travel for both work and leisure
- more complexity in travel arrangements
- more congestion in travel networks
- more rapidly changing urban environments.

There is an inherent synergy between the mobile communications industry and the location opportunity. Knowing where mobile devices are (at least to the level of granularity needed to route calls) is one of the core technical competencies of every mobile network operator. It is possible to build upon this competence, and upon the technical infrastructure used to provide it, to offer greater functionality to end users. Location is also closely aligned with the benefits of mobile communications as perceived by users. Many mobile calls are essentially location updates ('I'm just arriving at the station now') or requests for updates ('Are you near to the client?'). Still more users buy mobiles as a personal security product – this is principally the ability to let someone else (usually emergency services or roadside assistance) know where the user is. Products and services that address the user's need to let others know their location (or that of designated mobiles) are to some extent pre-qualified for success.

Mobile operators' interest in location services is relatively new. This is because location technology is proving itself to be the 'missing piece' in a jigsaw puzzle that is only just being formed.

Location services can be delivered via a voice interface. But the nature of the content of such services naturally favours a graphical or menu-based presentation. As long as mobile networks and devices remain predominantly voice-oriented, location services will be more difficult and less attractive to deploy.

The advent of new more efficient data bearers, of standards and protocols for data services and presentation on mobile devices, and improvements in the capability of the devices themselves, has made it easier for developers to prepare location-based applications.

The ability to derive the position of a mobile device (and by implication, its user) is in itself of limited value. Location capability becomes a mobile location service when it is integrated into an application.

Despite the enormous interest that mobile location services have attracted, the list of applications suggested is rather short. According to Ovum most applications can be categorised into five main groups:

- tracking – monitoring the location of people or objects on an almost continuous basis
- regulatory-driven positioning applications – using location information to meet regulatory requirements that might not otherwise be met
- location based information – providing information to mobile users specific to the area where they are currently located
- location-sensitive call routing – handling calls and other traffic according to the location of the user

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- location-sensitive charging and billing – pricing calls according to the location of the user.

Amberg suggests the following categorisation of Location Based Services.

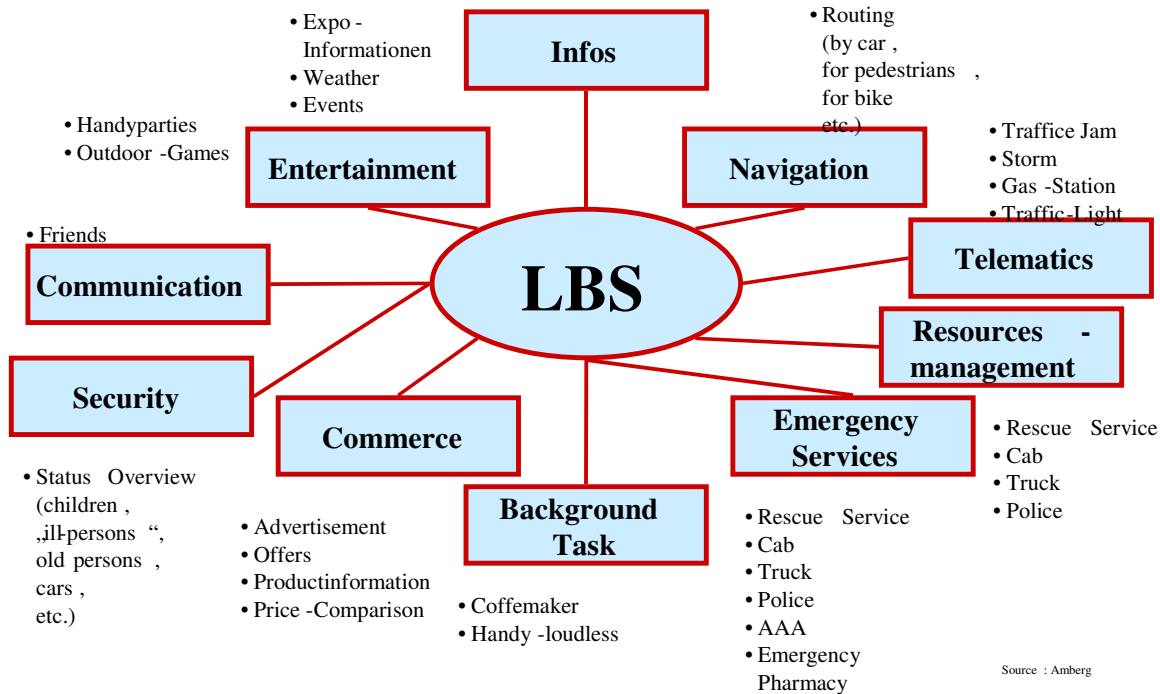


Figure 4.2: Potential LBS Services

Source: Amberg

Location Based Advertising

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

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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 communication across all media
- Return on ad spending

Market:

- Mobile Internet penetration
- Personalisation
- Intrusiveness

These 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.

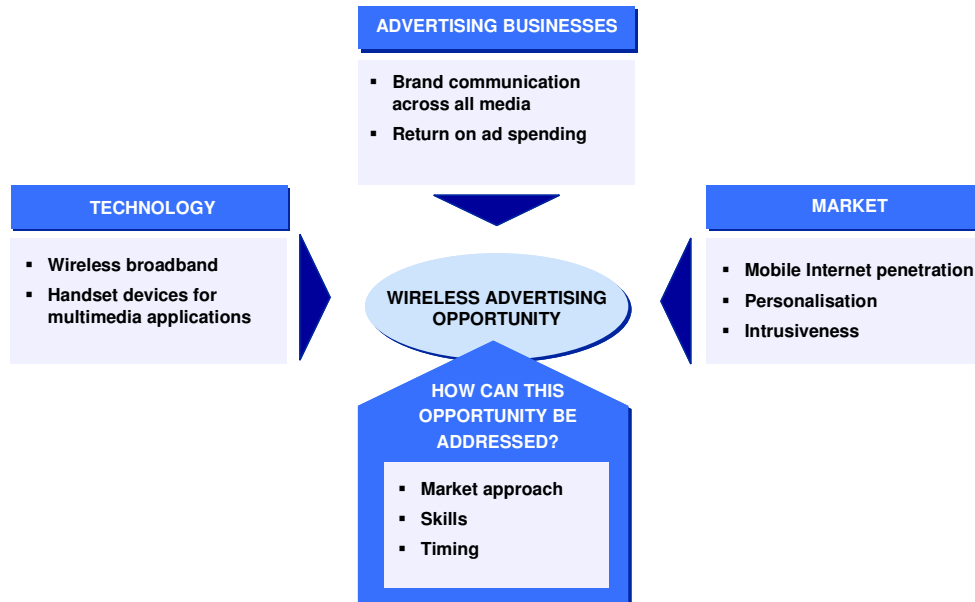


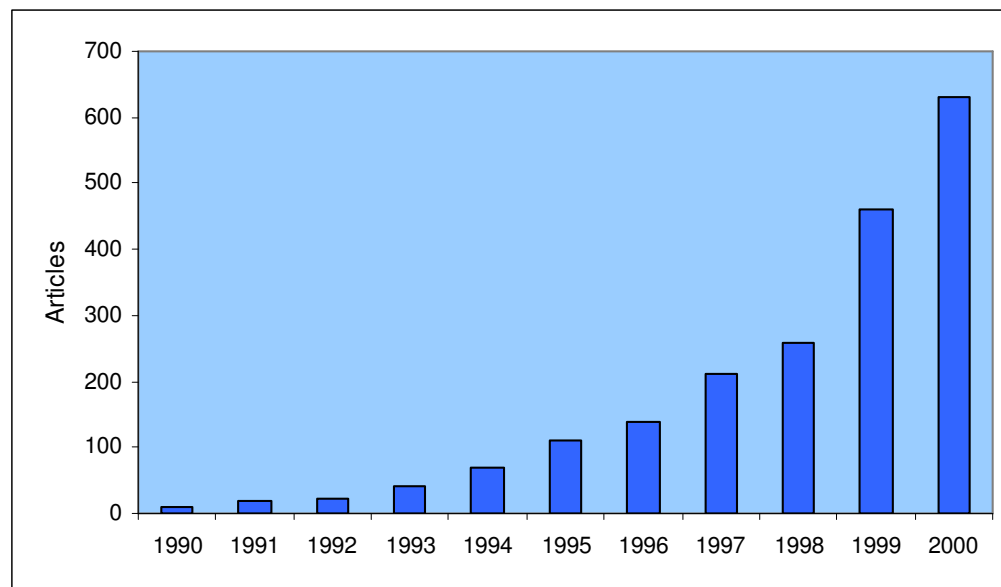
Figure 4.3: Wireless advertising opportunity

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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.

Business model

The terminology “business model” is becoming increasingly popular nowadays to describe existing business opportunities. Especially since the internet has emerged in mainstream market, it has become some sort of buzzword, one however which is not always consistently defined in the literature. Stähler¹ found out that in 1990 business model as a notion was merely used in seven articles of the ABI/Inform database mainly in computer science literature, whereas in 1995 it was contained in 106 articles, amongst them also business journals like “Business Week”. The diffusion of that term is based on the commercial activities in the internet. Companies of the internet use it to distinguish themselves from traditional companies and so to explain their unique position on the market. It was hard to define new business approaches with old conventional measures and many business modelling mechanisms that are available today² have to be analysed whether they are suitable and sufficient enough to describe the mobile world. Thus it is obvious that the definition of the business model highly depends on the type of business it should describe.



¹ Stähler, P. (2001): „Merkmale von Geschäftsmodellen in der digitalen Ökonomie“

² e.g. ARIS, CIMOSA, GERAM, GRAI-GIM, IETF, ODP, PERA, PROMET, TINA

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Figure 4.4: Increasing popularity of the terminology “business model”

Source: Stähler (2001)

There are plenty of definitions of a business model that can be found in the literature. Some of them are highly theoretical whereas others are close to best-practice examples on the market. Some of them refer to the traditional business and others to the “new economy”, the internet in particular. Although they might strongly differ from each other in some cases, they do not necessarily have to be contradictory but can even be complementary instead. In the following a few selected definitions are presented with accentuation by the author.

Selz³

“[...] business model is understood to be an architecture for the product, service and information flows, which includes a description of the various economic agents and their roles. Furthermore, a business model describes the potential benefits for the various agents and provides a description of the potential revenue flow.”

Amit & Zott⁴

“A business model is the architectural configuration of the components of transactions designed to exploit business opportunities. [...] A transaction component refers to (1) the specific information, service, or product that is exchanged and/or (2) the parties that engage in the exchange. [...] The architectural configuration depicts and characterizes the linkages among the components of transactions and describes their sequencing.”

Hamel⁵

“Business model is simply a business concept that has been put into practice. A business concept comprises four major components: Core Strategy, Strategic Resources, Customer Interface, Value Network. [...] Elements of the core strategy include business mission, product/market scope, and basis for differentiation. Strategic resources include core competencies, strategic assets, and core processes. [...] Intermediating between a company’s core strategy and its strategic resources is a bridge component I’ll call configuration. Configuration refers to the unique way in which competencies, assets, and processes are combined and interrelated in support of a particular strategy. [...] Customer interface has four elements: fulfillment and support, information and insight, relationship dynamics, and

³ Selz, D. (1999): “Value Webs: Emerging forms of fluid and flexible organizations – Thinking, organizing, communicating, and delivering value on the internet”

⁴ Amit, R.; Zott, C. (2000): „Value drivers of e-Commerce Business Models”

⁵ Hamel, G. (2000): „Leading the Revolution”

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pricing structure. [...] Intermediating between the core strategy and the customer interface is another bridge component – the particular bundle of benefits that is actually being offered to the customer. [...] The value network [...] surrounds the firm, and which complements and amplifies the firm’s own resources. [...] Intermediating between a company’s strategic resources and its value network are the firm’s boundaries. This bridge component refers to the decisions that have been made about what the firm does and what it contracts out to the value network. There are four factors to consider in determining the wealth potential of any business concept: [...] efficient [...] unique [...] fit of the elements of the business concept [...] profit boosters.”

LBS Business Models

There is no single dominant business model for mobile location services. The category of location services covers a variety of different applications aimed at different types of customer, with only an underlying orientation towards geography as a unifying factor. There is not much agreement between players as to what will be the overall structure of business relationships within the sector or as to how, why and in which direction money flows between entities in the value chain. There appears to be many intermediaries seeking a share of revenues that are yet to emerge. Moreover, there is a lack of consistency even within individual players. Companies that decry a particular source of revenue as impractical or unacceptable to customers one day, are sometimes found to have based their business plans on it the next. More commonly, companies will keep all their options open by pursuing more than one strategy, or will at least offer more than one payment model for products or services. For example, location gateway suppliers may offer one-off sales or sale and operation packages, as well as a combination of (or choice of) one-off licensing fees, scale-related payments, payments per access, and/or revenue sharing. Although this can be confusing for mobile network operators, it should not be too surprising. After all, there are few stable models for content-based services as a whole in either fixed or mobile Internet markets. Even mobile network service business models have undergone rapid change during 1998– 2000, with mobile operators experiencing the rapid growth of prepaid subscription, the decline of traditional airtime resellers and the emergence of virtual mobile network operators.

Sources of revenues

Three main revenue models have been proposed:

- payment by the end user
- payment by a third party – usually referred to as ‘advertising’, but this also includes a wide range of sponsorship and transaction share models
- a no-payment model, in which services are provided free to end users by the network operator (or other service provider) in the hope of obtaining other benefits.

Payment by end users

Payment by the end user includes:

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- subscription – for example, where the end user pays a monthly fee for a child-tracking service
- premium usage fees – for example, where the end user pays a per-usage fee for obtaining local information, such as the weather
- airtime-only usage fees – for example, where the end user pays only for the airtime used when obtaining local information.

Payment by a third party

Payment by a third party includes:

- advertising – for example, an advertiser pays a mobile operator to deliver targeted messages to a sub-set of users
- premium placement (or ‘slotting’) – for example, a restaurant chain pays to ensure that its outlets are presented first when a mobile user requests a list of available local restaurants
- sponsorship – for example, a company pays for information to be available to end users, and in return has its name or brand associated with the information by the application developer
- coupons and vouchers – for example, an agency arranges for a mobile operator to send a message that can act as a discount voucher to a subset of users (perhaps those within a certain geographical area) and then pays the operator a fee for each coupon redeemed
- transaction fees – for example, the mobile operator receives a fee for e-commerce or other transactions that have occurred as the result of a location-based information service.

Operators are reluctant to embrace third-party payment. This is driven by lack of experience, and by a recognition that they do not have the skill sets needed to succeed in advertising. They are also convinced that users will not be very tolerant of ‘push’ advertising. Early experiments with advertising delivered by cell broadcast, which could support many of the features proposed for some location-based systems, appear to bear out this concern. Operators are also aware that some early concepts for location-based advertising involving profiling of individual subscribers and tracking their movements, while superficially seductive, were technically unfeasible. Application developers and vendors that advocate third-party payment now place much greater emphasis on ‘permission’ and ‘pull’ advertising. Business models usually include, as a minimum, a requirement for users to consent to receive advertising, for which they may receive tariff reductions, discounts or loyalty points. More sophisticated proposals include provision for users to control their profile, perhaps allowing them to pull locally relevant advertisements and coupons to their terminal using a menu.

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No payment

Free provision by the network operator, in the hope of obtaining indirect benefits, rather than direct revenues, is frequently proposed in discussions of mobile location services. Indirect benefits discussed include:

- differentiation – customers are attracted to a mobile network operator because of the portfolio of location-based services it offers
- churn reduction – customers are less likely to change their network provider because of the portfolio of location-based services available. This has specifically been raised in connection with the ‘find a friend’ class of tracking services, where customers will be less likely to defect because such services will not work in groups where the users belong to different networks
- increased roaming revenues – inbound roamers to a country will choose one network over its competitors because of the location-based services it offers
- increased market penetration – the ability to offer location-specific billing enables an operator to target new customer segments, including fixed-line substitution or wireless campus and office solutions.

Generic business models

For an area of mobile service with relatively few implementations, there are a surprisingly high number of business models in operation or proposed.

There is no generic business model for mobile location services. Business models for location services differ according to which entities are responsible for five key roles:

- measurement of position
- carriage of position measurement information
- storage and management of position measurement information
- creation and running of applications
- sourcing of content used in applications.

Most proposed models fall into two broad categories:

- operator-centric models, in which the mobile network operator has a central role in the flow of location information and location service revenues
- ‘bypass’ models, in which the mobile network operators’ role is reduced to the provision of basic carriage of position information, and where the revenue flows for the location service reflect this.

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5 Business Cases

Location Based Services Business Case

Despite worldwide growth, mobile phone service operators had a tough time in 2002, with many of them incurring debts from licensing and deploying 3G networks as income from mobile data services failed to materialise as swiftly as expected. However, the climate in 2003 appears to be improving: there are signs in a growing number of countries that the use of mobile data applications is growing, and many operators are earning considerable revenues from technologies such as the Short Message Service (SMS) and Wireless Application Protocol (WAP). On average, European operators now earn up to 10% of their average revenue per user (ARPU) from text messages and other data services. One of major data revenue generators in 2002 was wireless entertainment - applications such as games, ring tones, and other value added SMS-based services. Operators hope that wireless entertainment will help attract mainstream consumers to more advanced voice and data services. Early adopters of these new entertainment services are already moving towards other new data applications, such as wireless web browsing, email access, and location-based services.

One particularly important industry shift over the past year has been from SMS to the greater use and deployment of Multimedia Messaging Services (MMS). Operators, especially those based in Europe and Asia, have started to market commercial MMS with a view to securing even higher revenue streams, attracting new customers and retaining existing subscribers. There is an urgent need by most operators in advanced markets to increase ARPU from data services, thus offsetting declining voice revenues. To say that there is a lot riding on the success of MMS is a huge understatement. It is the first service for 2.5 and 3G data networks to be aimed at the mass market, and mobile operators in particular are hoping that this new technology will justify their considerable financial outlays in packet-based network infrastructure and third-generation licences. The success of MMS will enable operators to revitalise their service offerings and so pave the way for the long-anticipated next generation of growth.

The marketing of MMS and other advanced services such as smart messaging and camera phones has led to a shift in advertising communications. Two key themes are emerging: Enhancing Lifestyle. In the past, advertising focused on the need to become mobile and get connected - basically, to 'get a life'. Now marketers are moving a stage forward and addressing the quality of that life. Constant Connectivity. Consumers were initially overwhelmed or exasperated by mobile phone advertisements offering total and constant connectivity to work, family and the outside world. Now advertisements are emphasising the ability of mobile technology to better organise your life. This move stems in part from the growing popularity of personal digital assistants (PDAs), which have begun to enter mobile phone territory - thus threatening the market share of dominant players. The response of service providers has been to offer services that allow for prioritising, selectivity and greater user control.

The first wave of marketing of advanced services was generally considered to be full of technical terminology but failed to communicate the full value of 3G services to potential

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customers through careful branding. Moreover, there is now a danger that the advertisers are now underselling the technology so as not to repeat previous failures. The ad spots contained in this report represent some of the best attempts at marketing new service offerings. They also represent a number of misfired campaigns showing how difficult life can be in this new environment. The emphasis in all the case studies is on lifestyle: several reflect the degree to which this reinvention of mobile brands has gone, with name changes that better reflect the introduction of a holistic, lifestyle approach.

In the area of mobile commerce (M-commerce) different market research companies project quite different revenue sums. The following table gives an overview on different well known reports.

M-Commerce Projections	
Company	2004 Revenue Projection (in billions)
Ovum, Inc.	\$19.2
Merrill Lynch	\$20.0
Jupiter	\$1.7
Herschel Shosteeck Associates	\$0.7
Myers Reports	\$4.74
Average	\$9.27

Figure 5.1: M- Commerce Projections

(Source: Myers Mediaenomics)

Ovum predicts the following figures for the Location Based Services market. Especially Location Based Advertising will gain the highest revenue shares within the next few years.

- By 2006 mobile location services will generate more than \$20 billion

Mobile location service connections worldwide will rise from 2 million in 2001 to 565 million in 2006. This represents 29% of all mobile connections.

- For operators, the ‘gems’ of mobile telephony will be somewhere else

In 2006, mobile operators will generate revenues in excess of \$780 billion, but mobile location services revenues will account for only \$8 billion (1%) of this total.

- Most services will involve micro-payments from a large number of customers

Overall, the average revenue per user (ARPU) of mobile location services is low, with the exception of niche services such as fleet management. The ARPU for mobile location services

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will decrease substantially from 2001 to 2006, but as these services will become commodities once they achieve high penetration, higher revenues can be expected.

- Location-enabled mobile e-commerce will overtake other services by 2005

Until 2004, tracking information and call routing together will constitute the bulk of mobile location services, together generating revenues of \$4.7 billion in 2004. However, in 2005 the contribution from mobile e-commerce and advertising will reach \$8 billion, greater than the sum for information, tracking and call routing services (\$5.8 billion).

Information services will form the biggest proportion of the total revenues until 2004. From 2005, mobile e-commerce powered by location will contribute a larger percentage of total revenues than information services, and by 2006 even mobile advertising enabled by location will be greater than information services.

- Location-enabled mobile e-commerce transactions will be worth \$9.8 billion by 2006

As shown in the following figure, \$4.5 billion will be spent on advertising over mobile terminals using location as a trigger. Location services revenues will level off, with the market for information services decreasing to \$2.5 billion. Tracking services will stabilise at \$2.1 billion and call routing will be worth \$450 million.

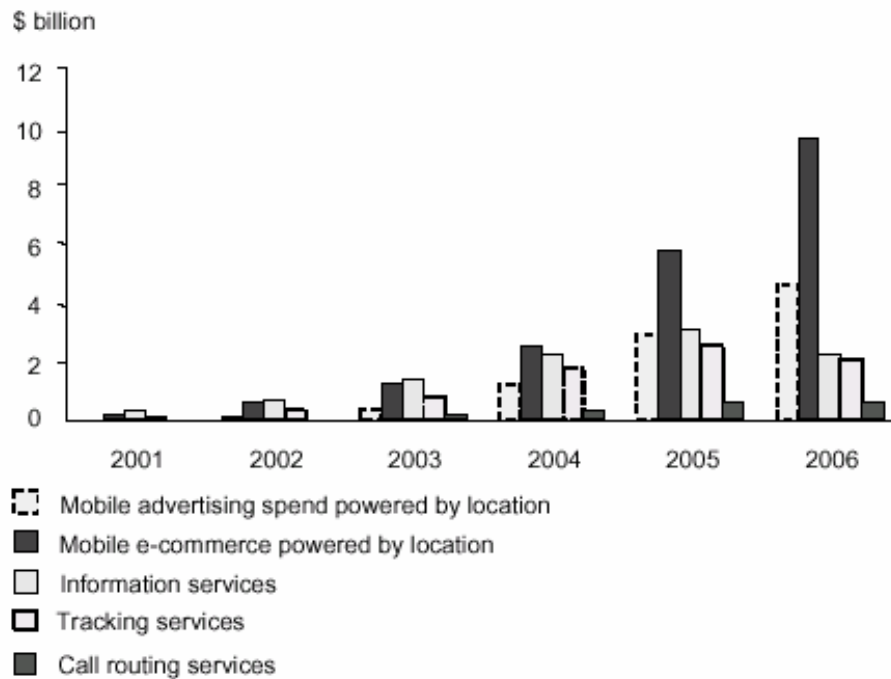


Figure 5.2: Revenue Forecast of Location Based Services

Source: Ovum (2000)

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Cambridge Positioning Systems released in October 2003 a survey⁶, where they state that mobile operators are forecasting major growth in revenues from high accuracy location-based services to almost \$12bn by 2005 – but only if low cost mass market enabling technologies are in place to drive the market.

Overall, operators forecast average annual revenues of \$12 per subscriber from location-based services in 2005 – growing to \$35 by 2008 - according to an in-depth operator survey by Cambridge Positioning Systems (CPS).

The main research findings of the Cambridge Positioning Systems survey were:

- demand for sub-100m high accuracy solutions is growing as operators seek to differentiate their service offerings in saturating markets – with operators now pushing for trials of new location technologies
- likewise, new market entrants are looking to high accuracy LBS as an immediate marketing advantage in the fight for customers
- however, while high accuracy location solutions will be the catalyst for location-based services, deployment costs must be extremely cost-effective if they are to kick-start mass-market LBS adoption
- Cell-ID based services have proved disappointing in terms of application innovation and consumer take-up
- corporate vehicle, fleet and workforce management will help drive early usage of high accuracy services in the corporate and SME market
- the major consumer market driver will be information services, with rapid growth predicted for personal and child safety services
- mobile gaming and m-coupons, cited as a strong growth areas in industry reports, will remain niche markets with slower than expected growth
- continued strong interest in high accuracy solutions – providing they have cost effective mass market deployment capability
- operators see high accuracy as a key service differentiator
- high-accuracy location technology choices have yet to be made
- a slowdown in market demand for Cell-ID systems
- lack of dependable, repeatable accuracy within Cell-ID holding back location based service customer acceptance and take-up
- A-GPS is facing growing industry concerns about location time to fix and yield

⁶ Cambridge Positioning Systems completed in Fall 2003 a series of workshops with leading operators from all over the world to explore current and future location-based service strategies. Collectively, the operators served over 30 per cent of the global GSM subscriber market.

- fundamentally, that a combination of complementary technologies may be required to deliver accuracy in every environment

The survey also highlighted a wide range of issues and challenges the LBS industry must face. In particular, operators were very candid about their Cell-ID experiences. Low cost deployment was a major determinant in service rollout – but there remain significant levels of disappointment about customer take-up of services.

The key message was that the lack of dependable, repeatable high accuracy underpinning service deployment was deterring both innovative applications and customer usage. Concerns were also expressed about whether A-GPS could ever be a mass-market solution – with clear issues concerning yield and delay .

Location-based services (LBS) will account for over 40% of operators' mobile data services revenues in 2007 according to a new report “Location Based Services - Worldwide Market Analysis & Strategic Outlook 2002 – 2007” from ARC Group. Growing from just over \$1 billion worldwide in 2002, LBS will contribute increasing amounts to mobile operators' revenues over the next five years. The leading location-based consumer service will be infotainment which includes 'where's my nearest' and 'friend finder' services, along with news, sports results, weather, traffic, proximity and community services. These are currently the most widely deployed services and this trend is likely to continue. Navigation, tracking and entertainment LBS follow as the next most popular consumer services. The new report states that the consumer market will generate far more revenue for operators than business and enterprise, although location-based business services such as field force and logistics will still contribute an estimated \$15 billion worldwide in 2007. However, tough economic conditions have contributed to a cautious approach by operators in deploying LBS.

Operators, especially in Europe and Asia, are starting to deploy commercial LBS with a view to secure growth that will help stabilise ARPU and offset declining voice revenues. Location-based services (LBS) present an opportunity to reduce churn and increase customer loyalty through the delivery of personalised services offering a source of differentiation in a competitive market. However in order to reach profitable mass-market levels, there are a number of critical success factors that must first be implemented. Privacy, interoperability and roaming, M-commerce security and unwanted advertising are issues that need to be resolved before operator LBS deployments can grow significantly. There has been much debate over the ideal technology migration path, however no one positioning technology can satisfy all the service and end-user requirements with each technology involving a trade off between accuracy, cost, deployment time and service availability. Mobile positioning systems and location middleware platforms have also come under scrutiny. These platforms allow multiple access support and personalised content provisioning across multiple devices according to the end-user's location context. However, given the variety of technologies, systems and platforms available, it is necessary that location services are made available and attractive to end users over robust, scalable, open and standards compliant positioning technology architectures. Organisations such as the Location Interoperability Forum⁷, established by

⁷ LIF has meanwhile ceased its operations and has consolidated with the Open Mobile Alliance (OMA) by the end of 2002.

Motorola, Nokia and Ericsson in autumn 2000, are working towards developing the standards and framework necessary to ensure services roaming and open system architectures capable of interfacing with application protocols and location techniques.

The ARC report also analyses implementation issues and market entry strategies. It has been demonstrated that initial services can be launched using Cell-ID and to benefit from first-mover advantage. Companies should enter the market as soon as possible. However it is important to ensure that the positioning platform adopted is scalable and can be migrated through standards compliant architecture to take advantage of the increased bandwidth and higher accuracy that will accompany the deployment of 3G networks. Consequently, at this early stage of development the focus should be on deploying user-friendly applications that familiarise end users with location services and build a subscriber base for future, more profitable services. Partnerships between ASPs, content providers, operators, positioning technology players, application developers, middleware and GIS vendors, and other third parties - will play a decisive role in building the location value chain and ensuring the ultimate success of the location services market.

In the following figures some key findings of the report “Location Based Services - Worldwide Market Analysis & Strategic Outlook 2002 – 2007” from the ARC Group are highlighted.

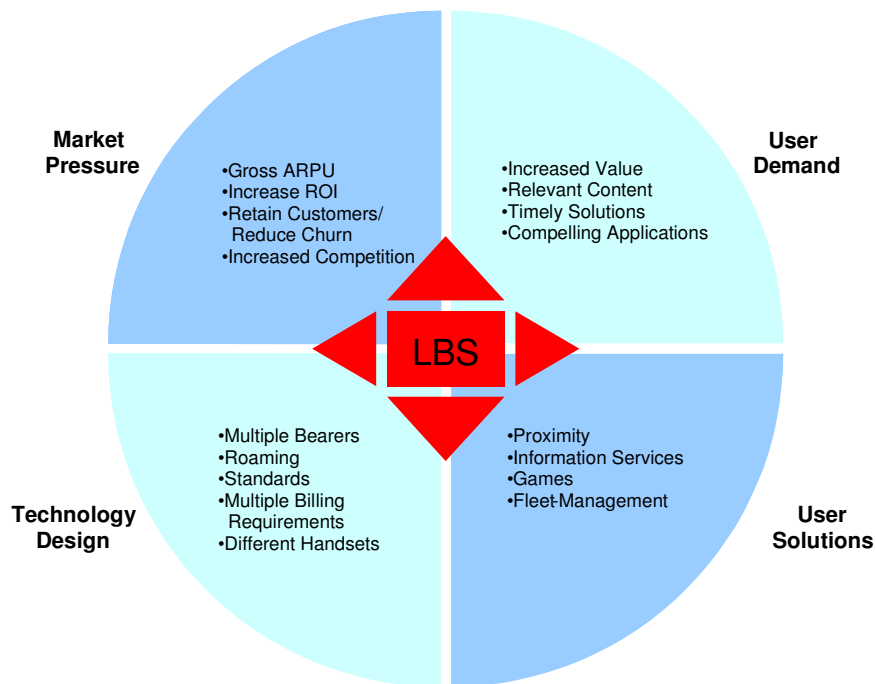


Figure 5.3: Drivers for LBS

Source: ARC Group

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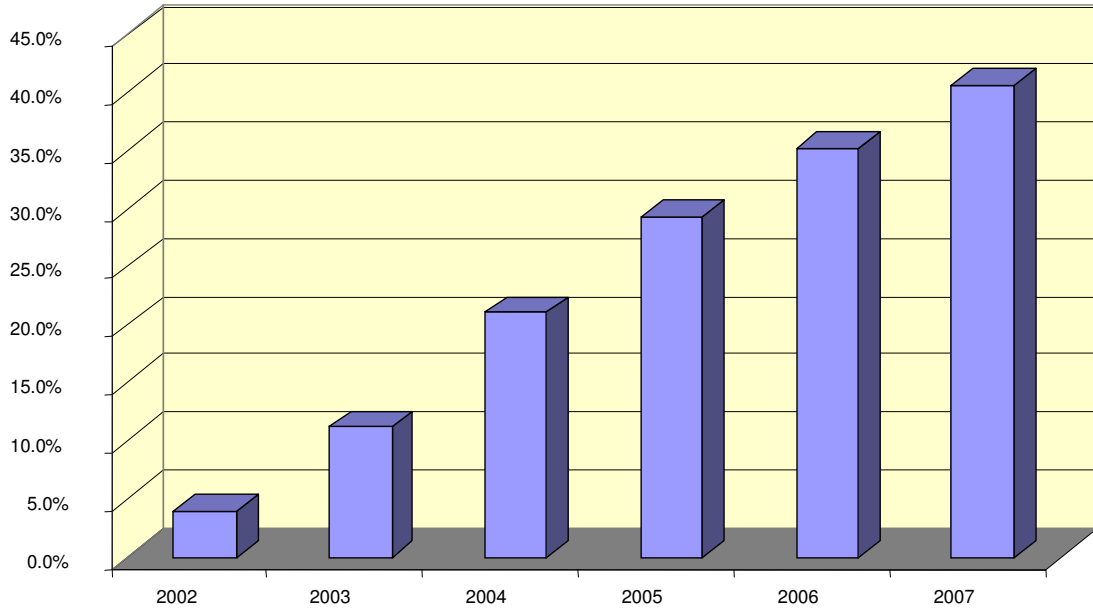


Figure 5.4: LBS as % of Operator Revenue 2002 – 2007

Source: ARC Group

On the other side, there are also some rather negative or more cautious. Instat's report on the future of LBS examines the future of LBS and reveals that its highly unlikely that carriers will break-even on their investments for at least another decade.

The market for Location-based services exists, however, recent findings from In- Stat/MDR reveals that its not the "killer-app" that it was once touted as. The report collected input from numerous presentations made by operators from around the globe. It was quite evident when hearing about revenue generating prospects for European operators that LBS was not the solution. LBS enablers or solutions were barely evident. Location-centric applications, games, and data are part of the big picture, however, don't wait for LBS to become the next killer-app.

Even though the total addressable market for offering location based services (LBS) will be large through 2006, the actual potential of that market will actually be quite small. The basic findings of the In-Stat/MDR report are:

- In Japan, where there are often no street names or addresses except on main roads, there is a high demand for location-based services.
- In Western Europe, where some less precise location- based services are now available, less than 1% of revenue for location providers comes from mobile users.

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- The revenue opportunity for wireless carriers for location-based services is expected to grow from \$5 million in 2002 to more than \$167 million in 2006. Revenues will grow through the adoption of various services, especially of those that are non-intrusive and are initiated by the user.
- The total addressable market of location-enabled subscribers by 2006 will top 1.3 billion subscribers. However, in earlier years of In-Stat/MDR's forecast (2003/2004) when network based solutions are less precise, the addressable market will actually be much less, comprising, primarily, GPS enabled subscribers, which will make up 14% and 26% of the total wireless subscriber base.

Location Based Advertising Business Case

Mobile advertising (m-advertising) revenues, which most market research firms forecast as making up the largest share of M-commerce revenue, vary widely in different studies.

M-Advertising Projections	
Company	2005 Revenue Projection (in billions)
Jupiter	\$2.1
The Yankee Group	\$6.0
The Kelsey Group	\$6.8
Myers Reports	\$2.6
Average	\$4.4

Figure 5.5: M-Advertising Projections

(Source: Myers Mediaenomics)

Myers Reports suggests that m-advertising will make up 1% of total media spending, which equates to \$2.6 billion, on average a sum of about \$4.4 billion is mentioned.

Very optimistically 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.

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

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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. 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. 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.

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6 The value chain

LBS Value Chain

Within the mobile location industry, there are five main groups of entities:

- location measurement technology vendors
- location server and gateway vendors
- location application developers
- location infrastructure vendors
- content suppliers.

The five groups interact and overlap with each other; they supply each other and other players in the mobile industry, including infrastructure and handset manufacturers, network operators, portals and systems integrators. This is not the only possible way of representing the market. Indeed, discussions with various players about its structure recall the picture of ‘the New Yorker’s view of the world’, in which most of the detail is represented by the area between a few urban avenues, and the world outside New York is represented as a rather undifferentiated collection of faraway and small places. In much the same way, the various players in the mobile location market make careful distinction between themselves and other players in the same sector, and tend to lump together players with other roles.

The mobile location services market includes a wide range of players and stakeholders, each with different skill sets and interests. The main players are shown in the following figure.

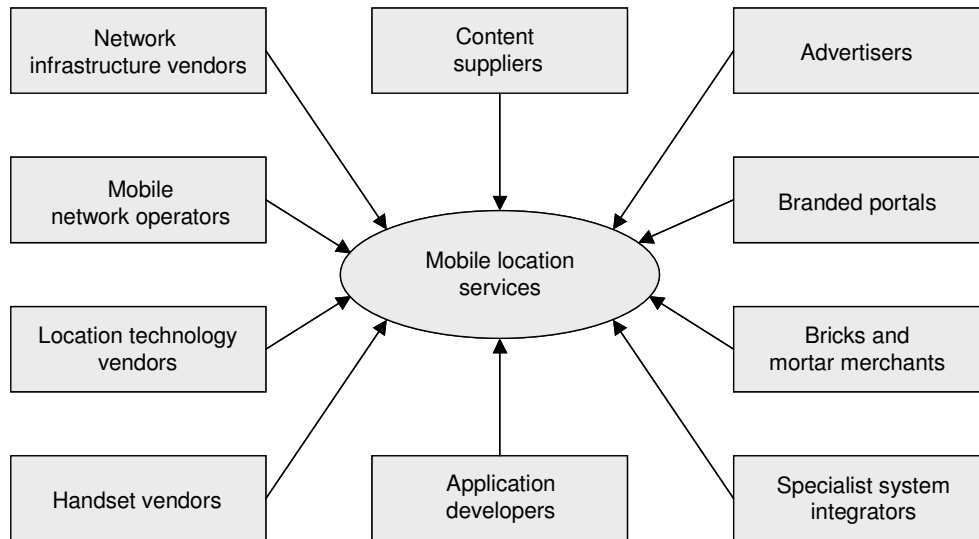


Figure 6.1: Players in the mobile location services market

Source: Ovum (2000)

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According to the Ovum-Study “Mobile Location Services” the most important players in the value chain can be described as follows.

Mobile network operators

Mobile network operators have much to gain from the deployment of mobile location services. At the very least, it should stimulate more data traffic on their networks, and perhaps more voice traffic too. At best it may help them to regain the loyalty of their customers by offering them indispensable services and by binding them into network-based communities through ‘find a friend’ services.

It may enable network operators to differentiate themselves from each other, but also from virtual network operators and enhanced service providers, who may be unable to offer such services because they do not own their own radio infrastructure. It may also allow them to target valuable fixed-network customers and traffic too.

In general, network operators stand to gain from the rapid deployment of location services. The longer the mobile industry waits, the more the potential substitutes for network-based services will nibble away at the edges of the market. But the many unresolved questions regarding technology and the business model mean that operators also have much to lose by deploying too early – particularly if they end up adopting an approach that subsequently turns out to be a loser.

Handset manufacturers

Mobile device manufacturers stand to gain from the opportunity to make and sell a new generation of products that incorporate location capability. This is particularly important for the market leaders, who must constantly seek new areas of differentiation in the face of commodity suppliers of voice-centric and basic devices.

Device-based solutions, where the position determination is carried out by functionality within the mobile, might appear to offer them the greatest opportunity, although it also carries the risk of having to pay royalties or licence fees if the manufacturer has no control over the winning technology. Device-based approaches also offer the possibility of the handset manufacturer (rather than the network operator) being able to offer the location services themselves.

However, even network-based methods offer opportunities for the handset manufacturers. Location-based services will stimulate the market for smartphones and other high-end products. Users will require devices with more functionality, especially in displays, if they are to make full use of location services.

Benefon introduced in early 2001 the first mobile phone, where a GPS-chip was integrated in the handset. According to Nokia, GPS will be a standard feature rather soon.

Network infrastructure vendors

If the industry decides to adopt network-based approaches to positioning, the infrastructure vendors will be responsible for implementing the solution and integrating it with other network equipment. Few of the network-oriented specialist position technologies have large-scale manufacturing capabilities; even where they are able to secure OEM manufacturing,

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network operators will continue to seek ‘one-stop shop’ arrangements with their preferred infrastructure vendors. Infrastructure vendors therefore constitute an important channel to market for the positioning technology vendors. Although several of the major infrastructure vendors (including, Lucent, Motorola and Nokia) are developing their own positioning technology systems and other location infrastructure elements (such as Ericsson’s Mobile Positioning Centre), most stand to be winners whichever technology solutions ultimately emerge as successful.

Application developers

Application developers are a crucial part of the location services industry, and arguably the tier that adds most value to the location services distribution chain. There are many opportunities for innovation and the creation of value. Many applications are more or less agnostic on positioning technology, and developers have a lot to gain whichever solutions are adopted. Like the positioning technology players, the application developer companies tend to be small and ‘fleet of foot’, but they also tend to be precariously financed. Until the market is under way, they cannot achieve sustainable revenue streams. Even then, their value depends on which kinds of business model and revenue-sharing arrangements are adopted.

Content suppliers

Most mobile location service applications will depend on the quality of their content for their success. “Content” is called the king. Updating dynamic content is likely to be even more challenging; we tolerate incomplete or wrong transport information from the transport companies themselves partly because it is free, and partly because they have a monopoly. Paid-for services, and perhaps sponsored services too, are unlikely to enjoy the same level of tolerance. Owners of the historic store of geo-coded information (map and guide vendors, for example) are an obvious source of application content. So too are owners of ‘old media’ content, which could easily be restructured for geo-coding – for example, listings magazines or estate agents’ databases. However, for some content developers and owners, mobile location services are both an important new channel to market and a potential source of competition. Getting the right deal for providing access to existing content is likely to be crucial for them, but since no-one yet knows the real value of the content, the first of such deals may be hard to negotiate.

Branded portals

Independent and operator-owned wireless portals are primarily concerned with making the user’s experience of their sites as personal as possible. The ability of location to add context and relevance to generic content is therefore seen as very important. Moreover, allowing the user to filter content by location increases the probability that the user will further respond to retrieved information, either by requesting further information or by initiating a transaction. This has the effect of extending the session, and thereby making the portal site more ‘sticky’. Specialist systems integrators can benefit from the rollout of network-based location services because it allows them to expand the portfolio of services that they can offer to clients. Many small to medium-sized companies could benefit from location technology, perhaps to track their delivery vans or their mobile workforces. Until now though, the benefits have more or less been restricted to companies that were prepared to at least manage and perhaps also

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develop in-house operations systems. Such a task would be outside the competence and interests of a medium-sized plumbing firm or small social services department. Location capability embedded into public mobile networks, open APIs available to developers, and the possibility of web-based user interfaces turn this on its head.

Advertisers

Location service is a powerful new channel for advertisers and the merchants for whom they provide service. Mobile Internet advertising is only in its infancy, and there are many issues to be addressed before it becomes a significant destination for advertising revenues. However, location capability offers some help on some of these issues. At the very least, it offers advertisers some control over the context in which their advertisements are displayed and seen – analogous to the kinds of control that they have over advertisements using traditional media. Some application developers (but not as many network operators and advertisers) have been enthusiastic about location-based ‘push’ advertising. Others have suggested permission-based or ‘pull’ advertising as the way forward. Still others are focusing on sponsorship of free location-based information services, or premium placement within such services. Small-scale local merchants are generally low advertising spenders, but retail chains with multiple branches, and especially food outlets, are a more likely prospect. At present, such merchants must spend massively to acquire multiple premises within a relatively small area in order to maintain their grip on passing trade. If location-based advertising via a mobile network were able to enable even a marginal saving here, the effect on the bottom line would be significant.

LBA Value Chain

Before analysing possible business models, it is necessary to define the actors which are likely to participate, their specific role in the LBA business as well as to understand their motivations. Although this paper states all the important players of the LBA value chain, in some business cases there might be some additional entities mentioned. This is based on the nature of a model, such as a business model, to make statements which are as precise as possible but also keep the description as abstract as possible.

Until today there is no value chain which explicitly refers to LBA in the literature. Therefore an approach was chosen that is based on various value chains from different authors for M-Commerce and LBS, out of which eight core players have evolved that are expected to have a significant impact on the development of LBA.

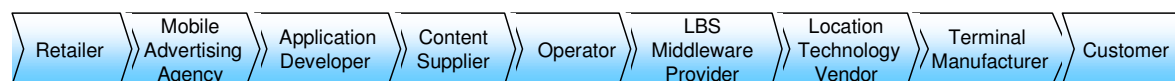


Figure 6.2: LBA value chain

The LBA value chain has two distinct entities, which are the retailer at the beginning and the customer at the end. In between several other links exist that provide the hardware, software as well as the know how to enable LBA. Although most of the players that are expected to

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exploit LBA derive from the LBS industry and the LBS market has slowly started to evolve already, it is still hard to distinguish the participants from each other according to their stated expertise. The LBA market is still blurred in respect to actors involved and their contributions. But not only the immaturity causes this confusion. Another reason is based on the economical background of the last few years when there has been some sort of hype about how location can increase the value of various services and even generates new ones . This trend has been intensified since the Telcos have to carry an enormous financial burden on their shoulders due to the consolidation of the telecommunication sector.

The Retailer

The retailer is the first link of the value chain and the initiator of LBA activities. It is typically a store or a shopping centre that triggers the LBA process by promoting its sales to the customers. But also restaurants, coffee shops, cinemas or other market participants can adopt the role of a retailer.

In recent years a high number of online shops have emerged on the internet of which some exclusively use the world wide web to sell their products. There is no doubt about it that the internet makes a lot of business processes more efficient which is one fundamental reason for its success. However, LBA can offer the chance for retailers to regain some ground lost to internet-only sellers. The local bookstore, for example, can surely attract some passers-by by sending an appealing ad message on their mobile devices and lure them to come in. Otherwise they maybe would not even have realised the existence of that bookstore in times of Amazon and other online sellers. This example shows that local shops are certainly not determined to lose out to their competitors in the digital world. They just have to recollect the advantages they have compared to the internet, e.g. the fact that there is no latency period between purchase and delivery. Furthermore, the customer can really feel, touch and in some cases try on or taste the item of desire. All these aspects are competitive advantages that, however, are useless if the potential customers do not enter the store. Within this context LBA can help to draw attention to the store.

Small local shops can benefit from LBA as this type of advertisement can increase the consumers' awareness of the shop even if it is in a side street, not visible at first sight or lacks a well-known brand. In addition to this, LBA makes it possible for the little shops to advertise in a small and manageable area. Most of the other advertisement media have a higher coverage with corresponding higher costs, unaffordable for the small budget of the shop.

But LBA can also help to improve the shopping experience in city centres. Shops along the main shopping street have found themselves put under pressure since the big company chains have intensified their strategy to settle branches on the outskirts. Those branches offer their products at lower prices due to lower lease costs and the power of mass. Besides that, they can be reached by car in a convenient way and offer sufficient parking lots. With their enormous marketing budgets the big chains can afford to carry out huge advertising campaigns to lure customers away from the city centres. So if the shops in the central districts learn to effectively use LBA, they can make their location more attractive and keep the customers, maybe even retrieve those lost in the competition. But on the other hand, the big chains can

also benefit from LBA because if it can “enable even a marginal saving [...], the effect on the bottom line would be significant”⁸.

The Mobile Advertising Agency

Although LBS are still in an infancy stage of development, some companies have emerged on the market, positioning themselves as a solution provider for mobile advertising. They offer cross-media⁹ marketing campaigns which do not necessarily use location as a trigger. Nevertheless, a convergence towards LBA is very likely and seems to be a matter of time.

The mobile advertising agency is a new market entity that cannot be described as a traditional advertisement firm as such, due to its technological know-how, but it is not a pure technology provider either, as it also tackles other tasks that go beyond technology, like creative work. The combination of both enables this entity to position itself as a unique player in the value chain that is specialised in the field of mobile advertising. A typical mobile advertising agency establishes a contact to advertisers, takes care of them, sets up a media plan for the campaign, does the creative work, approaches the target group and provides the technology. Although it is a full service provider, the agency does not necessarily take on all tasks, this depends on the involvement¹⁰ and the volume of the deal. Sometimes it can be the lead agency, at other times it might only provide its expertise to the campaign. Its position as the sole explicit provider of mobile advertising holds a strategic advantage: potential advertisers will intuitively contact the mobile advertising agency instead of other entities along the value chain.

Due to legal restrictions in respect to the need of an explicit opt-in of the users, the mobile advertising agency plays a central part as in most of the cases it has built up a database of users which have given their permission to receive ads, and therefore can be exploited in a campaign. This database is especially worthy when it comes to LBA in a push modus. There is no other entity on the market that has a pool of users that can be utilised for advertising purposes. Some companies like the telco surely have a wide customer base, however without an opt-in for advertisement messages on the mobile device. Another task of the mobile advertising agency consists of the selection of ad recipients based on the requirements of its customer. According to the definition of the target group either opted-in users of the own database will be involved or not opted-in ones will be approached through cross marketing¹¹ activities.

Most of the mobile advertising agencies have been existing for a couple of years already. Throughout this time they have successfully built up a relationship to the users and gained experience considering the user habits as well as the execution of mobile advertising

⁸ See Ovum (2000), p. 40

⁹ E.g. through the combination of mobile phone and television.

¹⁰ Involvement means whether the mobile advertising agency is the lead agency or has to arrange with other advertisement companies.

¹¹ E.g. advertisement on food packages incite the consumers to respond via mobile phone.

campaigns. This expertise makes them predestined for LBA and puts them in a good position to play a dominant part in the LBA business. Mobile advertising agencies will probably try to expand their database to emphasize their claim. This strategy will be successful as long as the legal framework insists on an explicit opt-in and as long as the mobile operators or some other actors cannot establish a pool of opted-in users themselves.

The Application Developer

The application developer is the decisive link in the value chain that enables the modification of a location-based service towards location-based advertisement. The application developer is probably the entity that adds the highest proportion of value to LBS. Mobile Marketing is expected to be pushed by application developers, less likely by operators.¹² Therefore, its part is crucial when it comes to offer appealing advertisement approaches to the users. The role of the application developer is expected to grow as technology progresses, especially with the rollout of 3G, multimedia advertisement possibilities will be taken to the next level. New and better ways to integrate advertisement content into applications can significantly increase user acceptance.

Troubled by the burden of the 3G expenditures, mobile operators have been constantly searching for the killer application, which is probably the most popular buzzword in the M-Commerce industry nowadays. Mobile operators hope that the breakthrough application can generate a high revenue stream to minimize their payback period. They have been quite reluctant so far about providing their interfaces for third party application developers to exploit. However, it seems that they start to realise the importance and necessity of this step. Opening up for third party application developers will lead to a higher variety of available applications. This again will be beneficial for LBA.

The Content Supplier

Content suppliers play an important role in the quest to establish LBA. Only if the content is interesting and contains obvious benefits, users will open up to this new advertisement approach. Even if all the other links play well together, but the content quality is not high enough to convince the user, then LBA will fail to enter the market successfully and least of all become a mainstream success.

A close-up inspection of the content supplier reveals two distinct assignments that can be defined.

Content provision

Many industry experts suggest to bring big names into the game, like Walt Disney, CNN or Reuters, to draw attention and imply a high quality standard, thus to boost acceptance. A well-known brand name can certainly have a positive impact on the perception of LBA. However, the primary focus of this strategy rather lies on the provision of information than on the advertisement itself. A typical usage scenario could be the request of a user for a piece of

¹² Cf. Baskerville (2002)

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information, such as finding the next free car park. Then based on his position he will receive the requested information in which an advertisement message is embedded (e.g. “*The next free car park is on Broadway between 3rd and 4th Avenue. Shop in the 'Disney Store' next to it and get free parking.*”). So a big name as the content provider might be helpful but not necessarily essential. Content from other less-known sources in addition to the advertisement may be sufficient, as long as it is interesting enough for the users. Even the wooing shop can act as a content provider when it has appealing offerings for the users. The added value of the advertisement itself, like a high discount, can substitute any content and still be welcomed by the user.¹³ But in most cases, typical sources for content are media companies, such as newspaper and magazine publishers, TV and radio stations, internet portals or entertainment companies. LBA and LBS can be an opportunity and a threat to traditional content providers at the same time. It is expected that the digital content provision, especially over the internet¹⁴, will win over the conventional one, thus the exploitation of the mobile device can help the traditional content sources to migrate to the digital business world and assure viability.

Content aggregation

The content aggregator repackages available data for distribution to wireless devices. He aggregates content from different sources and combines them to an appealing package. Especially in the finance sector this approach is very popular, e.g. combine company information with stock info and business news.

Thus, the content supplier has to tackle several tasks that can be stated as:

- collection of content

Two different types of content can be distinguished. Static content describes information that does not change or at least very slowly, e.g. street names, whereas dynamic content belongs to the time-sensitive sort of information, e.g. weather forecast, special sales offers.
- bundling of content

Some information may not be appealing enough for the users if solely provided, but, if combined with other information, they may generate more value and become more interesting for the users.

¹³ This approach however has to face a restrictive legal framework which is very sensitive about the sending of pure advertisement messages.

¹⁴ The big disadvantage of the internet, however, lies in the attitude of the users who expect content to be available for free.

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- make content location-sensitive

To generate added value for the content, it has to be associated with a specific geographical area, this leads to so-called geo-coded content.

- formatting of content

This step is necessary to put the restrictions of a mobile device into consideration.

A big challenge for the content supplier lies in the update of dynamic content. Inappropriate information will certainly not be tolerated by the users, especially when it is liable to pay. This also applies to the advertisement itself. Special offers that are highly up-to-date are expected to be more attractive than general advertisement. So at the bottom line, the more appealing the offering of a shop is, the less it depends on additional content.

The Operator

The operator is the entity that provides the basic infrastructure for LBA, like the mobile communication network, the wireless local area network or systems embedded in public transportation. The operator's infrastructure is the backbone technology that facilitates and enables the exploitation of LBA. That is the reason why the operator is an essential player in any LBA business cases.

A typical representative of this category, and probably the strongest in respect to technological and monetary aspects, is the mobile network operator. Its big advantage is the maturity of 2G which is sufficient for LBA at the early stage, the nationwide coverage as well as the high penetration of 2G+ handsets. With these prerequisites it has a very good chance to gain a high stake in the LBA market. Since the mobile operators have to carry an enormous financial burden on their shoulders due to the UMTS licences and the consolidation of the telecommunication sector, they welcome new applications that have the potential to establish new sources of revenues. LBA can be interesting for them because M-Commerce generally creates higher revenues than the sheer increase in call minutes, especially in times where minute prices keep on falling¹⁵. Industry experts predict that mobile tariffs will decrease and assimilate those of fixed telephony in just a few years, thus the mobile operators have to continuously offer new services to their users if they want to successfully address the problem of decreasing ARPU.

Even if the mobile operator is reluctant to actively participate in the advertising business, activities of others will create enough additional traffic for him to benefit from LBA in the second stage. The mobile operator has the potential to become the most dominant player in the LBA value chain. This assumption is based on the fact that it provides the basic technology, i.e. the network in which LBA is exploited, and of which the other entities highly

¹⁵ According to RegTP (2003) the German market has experienced a market price decrease for call minutes by 2.5% between 2001 and 2002.

depend on. Moreover, the mobile operator has a big customer base with comprehensive customer data, such as demographics, calling patterns and a detailed profile. According to EMC, a market research specialist for the telecom market, the top five mobile operators purely measured by the number of their subscribers are China Mobile with 123 million subscribers, followed by Vodafone with 100 million and T-Mobile, China Unicom and NTT DoCoMo¹⁶. Besides that, the mobile operator is the key possessor of the information about the geographic position of a subscriber, which is the essential requirement for LBA. Through the established billing system, commercial transactions are made easier and especially more convenient and transparent for the user. Furthermore, the mobile operator can take advantage of the billing relationship by offering incentives to its users, like a lower monthly subscription fee, if users are willing to accept ads on their personal mobile devices. The power of the mobile operator is also based on its strategic valuable position as the prime handset supplier to the consumer. *“Generally, customers do not shop for a particular service provider or network operator, but rather for the handset brand.”*¹⁷

An altered version of the mobile network operator is the “mobile virtual network operator” (MVNO) which uses the network infrastructure (base station subsystem BSS) of the mobile operator, but acts like a “real” one¹⁸. It is able to offer an own unique prefix number, and thus to be perceived as a common mobile operator by the users.

Mobile operators are expected to dominate the mobile industry for better or worse. According to RegTP (2003), mobile companies’ cumulative revenue totalled €23.7 bn. in 2002, with the mobile operator holding the highest stake of €18.4 bn. But they find themselves in an awkward situation where they want to control customer relationship without having enough innovative applications in the pipeline.

The second category of operators are the providers of local systems such as wireless local area networks, a technology that has experienced a tremendous growth in importance over recent years. As WLAN works in the licence-free ISM band at 2.4 GHz, practically anybody can set up a WLAN. This, however, is also the reason for interoperability problems between different solutions. Most of the hot spots on the market today are at places of high traffic, like hotel lobbies, airports etc. The biggest disadvantage of WLAN is its geographical limitation which makes it hard to exploit LBA nationwide. But on the other hand hot spots are located at places which are tremendously interesting for LBA. The operator of a hot spot can benefit from LBA in two different ways. First, it offers another channel of revenue to cover the costs spent on the WLAN technology. And second, this additional revenue stream can lift the operator into a position where he is able to cut down WLAN usage prices for his customers and therefore rises awareness, affinity and in the last instance loyalty.

¹⁶ Hallet, T.: “Which is the biggest mobile operator in the world?”. <www.emc-database.com> 09/2002 (call date 09/13/2003)

¹⁷ See Durlacher Research (2000), p. 17

¹⁸ E.g. Virgin Mobile is the most famous, but not the only, example of a MVNO. It runs on One2One’s network in the UK.

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Besides the mobile network operator and the provider of WLAN hot spots, there is another segment that can take advantage of LBA. The public transport system offers a perfect environment for advertisement. This segment is often not considered in the LBA discussion¹⁹, although it offers enormous advantages. It is state-of-the-art that public transport systems with a fixed route, such as a metro or a tram, have an onboard computer (OBC) which allows it to measure the distance between to stops and thus to determine the location of the vehicle. This possibility to generate location data can be exploited to offer LBA. Passengers of public transport systems, like train, tram or bus, are often bored while taking the ride, and the time they spent in the tram is considered rather as a waste. So in this case it is beneficial to the operator of the public transport system to integrate monitors on which LBA can be displayed, showing commercials of shops along the route. The displayed programme, however, does not have to solely consist of advertisement. The right mixture between ads and interesting content will gain the highest passenger attention. The integration of information about upcoming events, latest news, weather forecast etc. will avoid the circumstance of annoying the passenger. LBA in a public transport system is less intrusive than on personal mobile devices and is therefore very likely to be successful. In this case, the operator of the system can generate an additional revenue stream through advertisement, while at the same time the passenger benefits from a system that makes their ride more enjoyable, possibly even at a lower ticket price.

The LBS Middleware Provider

The LBS middleware provider is the key to turn M-Commerce applications into Location Based Services. It is the entity which combines mobile applications with the value-adding aspect of location through the usage of a Geographic Information System (GIS) and the matching of pure location data with corresponding information. Without it, LBA would not be able to differentiate itself from common conventional advertising media. Figure 6.3 illustrates an example of a middleware provided by YellowMap AG.

¹⁹ The author has made this experience in almost every case of expert interview he has done.

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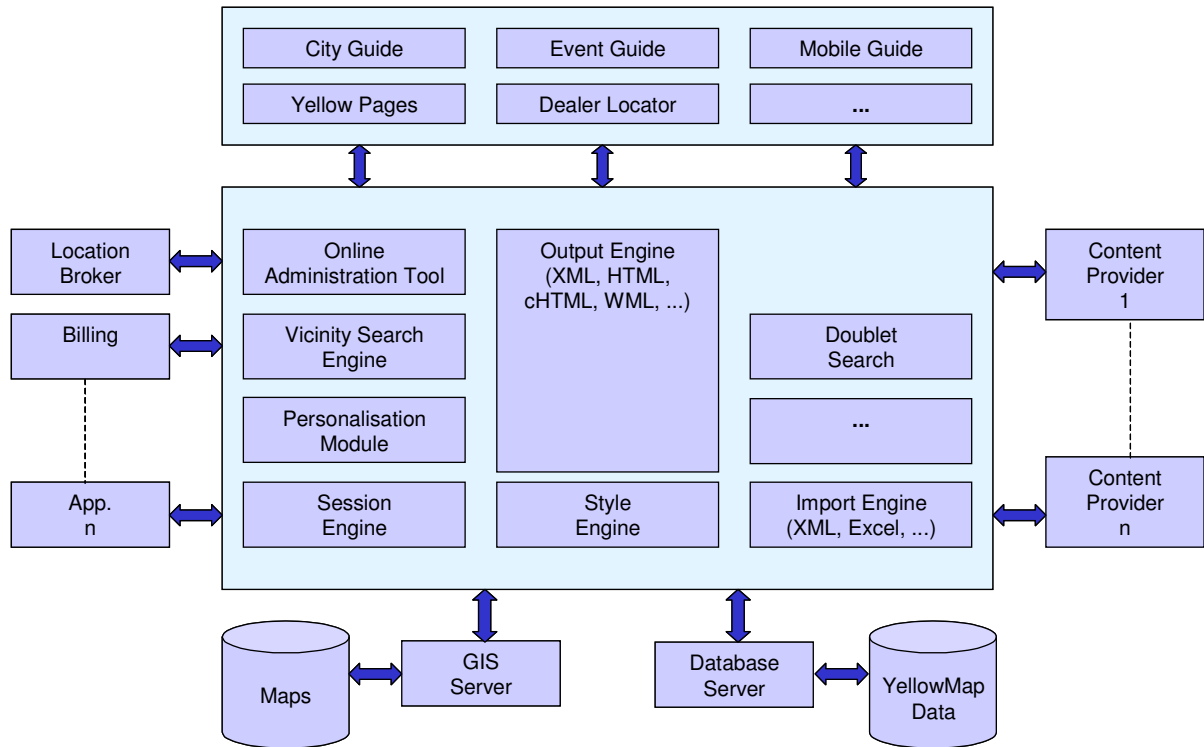


Figure 6.3: Middleware of YellowMap

The middleware is a software that converts the information of different software types. It can cover a wide range of software and mediates between an application programme and an operating system, a network or database management system. It manages the interaction between disparate applications across the heterogeneous computing platforms and provides the application programming interface (API).

The Location Technology Vendor

The power of localisation is considered as a decisive criteria when it comes to offer LBS and LBA in particular. Among the most obvious beneficiaries are the providers of such a technology. The biggest challenge this industry has to face is the high number of different technology approaches existing on the market, each with its own significant advantage. This makes it hard for the other market participants to choose a technology. After all, it could be the wrong pick in terms of choosing a solution that will never be fully established on the market. A typical localisation technology system consists of measurement systems to define the user position, a location server that obtains, stores and manages the position information, as well as a location gateway as the interface between the server and other network elements, like billing and application systems.

Due to its importance the location technology vendor is in a situation out of which it can come off as the big winner but also as the big loser. This totally depends on the market development

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and the emergence of a standard. This is not to say, that only one solution will win. It is likely to encounter a scenario where two or three localisation technologies can coexist. A number exceeding that is not very likely and not very healthy for the location industry either. It would slow down the exploitation of the profitable mass market. Companies that lose in this race, and especially those whose primary asset lies in the intellectual property associated with the company specific localisation technology will “become close to worthless overnight”²⁰.

Location technology vendors are relatively small companies, in most cases with less than 100 staff members. As some of them are wholly-owned subsidiaries of larger companies, this can have an impact on the configuration of the business model as well as on the revenue streams.

The Terminal Manufacturer

The terminal manufacturer can be the producer of any kind of terminal that can be utilised for the execution of LBA, such as cell phones, smartphones, PDAs or notebooks. Even manufacturers of public displays or monitors can be relevant, e.g. LBA advertisement in public transport systems. It can be observed that the borders between mobile phones, PDAs and other electronic devices begin to blur.²¹

The importance of a terminal lies in its significant role as an interface between the human and the technological sphere. According to the fact that advertising has a lot to do with emotions and the perception of the advertisement by the users, the capability of a terminal can determine the success of an advertisement message. The display technology, in particular, is of high importance, and with each technological improvement in the display technology, presentation possibilities for LBA will be enhanced.

Handset manufacturers are often regarded as the bottleneck of the M-Commerce value chain. In the case of the WAP introduction, for instance, the consumers had to wait quite a time until the first devices were available on the market. Today’s top five mobile phone manufacturers on the world market are Nokia (35%), Motorola (15.5%), Samsung (11.5%), Siemens (9%) and LG Electronics (5.8%) / SonyEricsson (5.5%). In total, over 130 mill. mobile phones were shipped in third quarter of 2003. The three biggest PDA vendors worldwide in 2003 were Palm (38%), Hewlett-Packard (15.3%) and Sony (11%).²²

The mobile device has evolved to a personal item with a high value for its owners. Even more, the mobile device is increasingly becoming a fashion accessory²³, especially among the young generation. This means that the terminal manufacturer can expect higher sales due to

²⁰ See Ovum (2000), p. 37

²¹ E.g. Motorola’s new handset A920 is equipped with A-GPS and functionalities of a video camera, PDA, MP3 player and gaming capabilities.

²² <www4.gartner.com>

²³ Siemens, for instance, adapts to this trend by setting up a unique fashion phone line called “Xelibri”. These handsets emphasize the fashion aspect rather than technological advancements. There are even negotiations for selling these products at supermarkets. Refer to <www.xelibri.de> for detailed information.

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the shorter consumption time. But on the other hand, the terminal manufacturers are forced to keep up a shorter innovation cycle²⁴

Aware of this fact, the terminal manufacturers try to directly approach the users. By granting a subsidy to the subscribers, the mobile operator basically determines the turn-over cycle of the terminal manufacturer, e.g. through a 24-month contract. Thus, it is understandable that the terminal manufacturer would like to see less dominance of the mobile operator. An example for this expected market development can be seen in the establishment of the “Club Nokia” branches by Nokia. These shops enable the owners of Nokia phones to get information and services concerning their phones. This approach is to establish a direct customer relationship.

The importance of mobile devices will increase in the future, especially when localisation technology can be integrated into the handsets. This will decrease the power of the mobile operator as the traditional owner of the user position and could enable the terminal manufacturers to offer LBS to the customers by themselves.

The User

The users are positioned at the end of the LBA value chain since they are the target group for this innovative advertisement approach. Although the technical and the economical feasibility of LBA have a tremendous impact on its development, the key success factor to determine the future of LBA remains the user acceptance. Therefore, the industry has to put a lot of effort into convincing the users about this new and innovative advertisement approach. In doing so, the industry has to consider the fact that consumers are naturally averse to advertisement, especially with today’s overflow of information and bad experiences from the internet. The usage of mobile handsets for LBA raises the problem that users perceive this form of advertisement as an intrusion into privacy. Thus the usage of the mobile handset as a personal device states a chance and risk at the same time.

To overcome this problem, the industry needs to be capable to offer appealing incentives to the users, such as monetary compensations. As each consumer segment has its own demands, the provision of incentives is to be tailored to the requirements of each specific group. One-size-fits-all solutions will not be successful to attract a wide range of LBA users. According to a Jupiter survey, 36% of consumers are willing to accept advertising on their mobile devices if they are granted subsidised content and access, 35% prefer subsidised devices, whereas 46% of all users state that no form of compensation can persuade them to accept mobile advertisement. Incentives might be helpful to convince the users to accept LBA at the beginning, but it is the quality of the advertisement that can retain them in the long run. Thus LBA has to be highly appealing with an obvious added value for the users. In the quest to convince the users, the following three “A’s” have to be pursued.

²⁴ Cf. Durlacher Research (2000), p. 17

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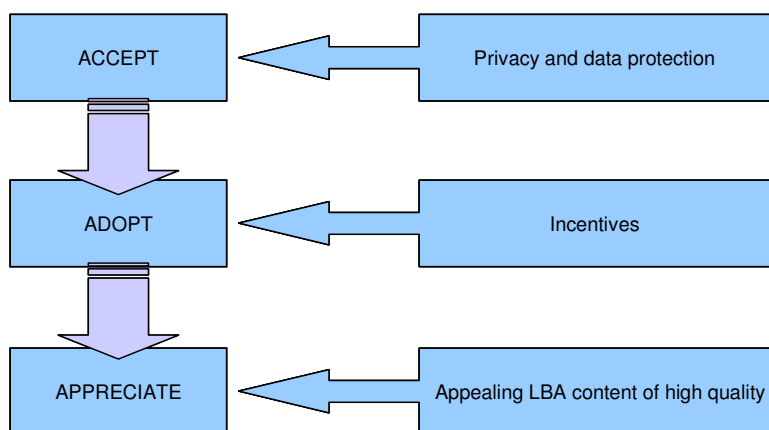


Figure 6.4: The three A's of customer conviction

The first step on the way to successfully convincing the users of LBA is to overcome their concerns and make them accept this new form of advertisement. This can only be achieved if the industry commits itself to rules regarding the protection of user privacy and user data. But also the government can contribute to this success by creating a legal framework which tackles these topics. If LBA messages are combined with appealing incentives, the users approve of receiving them on their mobile devices. The industry has to make sure that LBA contents are of high quality if it wants to turn LBA into a well-appreciated service for the users in order to achieve customer retention.

The group of 18 to 36 year-old people are definitely the most attractive segment for advertisement²⁵ due to their buying power and their propensity to consume. However, the other consumer segments embody tremendous potential for LBA as well. Especially teenagers have drawn the attention of the mobile industry in recent years. It seems that a new lucrative segment has been detected, which may also embrace this type of advertisement. However, LBA will have difficulties to approach those under 18 based on the fact that push LBA requires the explicit opt-in of the users. But this legal requirement cannot be fulfilled by underage persons, and parents are not likely to opt in for a service which is questionable and uncertain in respect to the risks it holds for the youngsters, such as influence for excessive consumption.

²⁵ Cf. Durlacher (2000)

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7 ELBA

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.

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.

Use Case 1: LBA in public transport in Karlsruhe, Germany

Passengers of public transport systems like metro, bus or tram are usually bored while taking the ride. Based on this experience monitors have been installed in a public tram showing commercials of shops along the tram route. Advertisement of proximate shops will be displayed while the tram passes them. This way the passenger has the chance to get off the tram at the next stop in case he is interested in the offer made.

This push-service is based on the On Board Computer System in the light train which is connected to the infotainment system, 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, and even video clips.

To ensure the attractiveness of those monitors not only commercials are shown but also value-added information like news, events, city activities, opening hours of museums, delays etc. Without the mixture of information and advertisement the passenger surely will be bored soon. So far the trial has experienced a positive feedback and has been very well accepted by the passengers.

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Figure 7.1: Use Case 1 – LBA in public transport systems

Use Case 2: LBA on mobile devices in Grenoble, France

Location Based Advertising on mobile devices will basically be a pull-service, that means that only if the user is interested, he will receive advertised or sponsored information upon request.

En route in the city, the user might seek for the closest drugstore or maybe a good Italian restaurant. Therefore he sends a note to his provider with the indication that he is looking for a special good. Shortly he will receive the requested information either out of the yellow pages or he gets offers on special savings in the concerned area according to his interest.

This trial is particularly useful for tourists when they are on tour and want to get information about something special, e.g. some point of interests or the surrounding area they are in. They might want to know about the object they are standing in front of or where the next restaurant, hotel, ATM etc. is. In these cases they might use their mobile devices for vicinity search, maps, routing and information about objects.

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Figure 7.2: Use Case 2 – LBA on mobile devices

Use Case 3: LBA in department stores in Dublin, Ireland

Context Sensitive Advertising will be tested in warehouses, malls or supermarkets. Users in a mall receive according to their current position special offers on goods which are related to the area they are in at that moment. In this use case interoperability issues between LAN (WLAN, Bluetooth etc.) and WAN (2.5 – 3G) are of high importance. As a basic technology Bluetooth networks will be used.

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 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.

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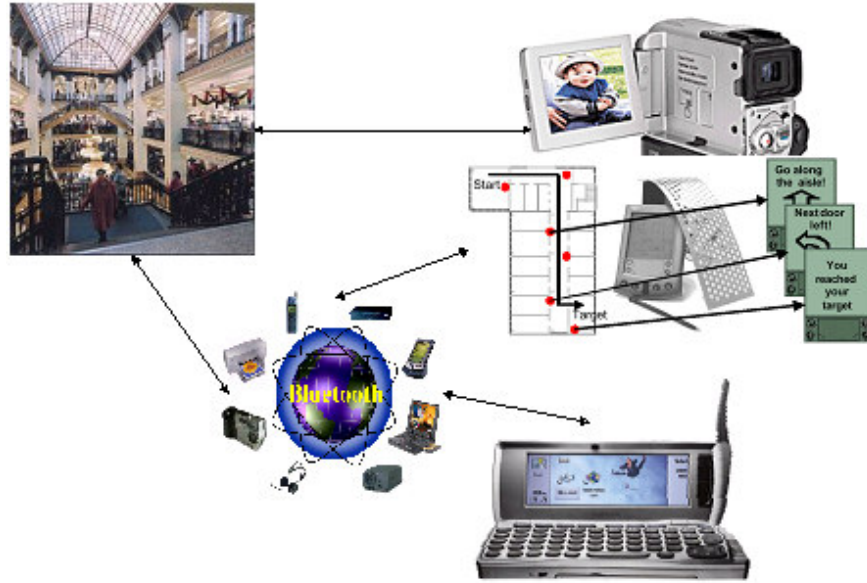


Figure 7.3: Use Case 3 – LBA in department stores

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8 ELBA specific business models

Business Model Design

A business model can generally be categorized through three different criteria. First, it is the basic distinction between the usage of a nationwide mobile communication network and the usage of a local system, like a WLAN hot spot or a public transport system. Second, the type of terminal that is used to enable the display of LBA has to be considered, i.e. to define whether it is a private mobile handset or a public terminal. This, in particular, has an impact on the degree of personalisation of the advertisement approach, and hence determines how appealing and relevant advertisement messages can be generated. Third, it has to be cautiously examined if the advertisement message is to be delivered to the users through a push or a pull mode. Each of the three basic component that describe a business model for LBA consists of two parameters which are defined as follows:

- Operating system = {mobile communication network, local system}
- Type of terminal = {private terminal, public terminal}
- Approach mode = {push, pull}

Based on the number of criteria and characteristics there are eight different possibilities of arrangements. In the following, these arrangements will be referred to as the “basic constellation” or just “constellation” of the business models. Although three criteria might seem to be insufficient to provide an exhaustive image of the business reality, it is however generic enough to describe the encountered business cases. Furthermore, other relevant aspects, besides the basic constellation, are considered for a more precise description of the business models, such as:

- Expected advertisement perception by the users: averse vs. affine
- Peculiarities, such as dominant players
- User owner
- Incentives for the users
- Source of payment
- Special target groups
- Revenue stream
- Typical applications

These additional aspects are also necessary to distinguish those business models that belong to the same constellation but occur in different shapes.

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The entities

Based on the value chain introduced in chapter 6, the actors are represented by the following units within the business models. Each unit corresponds to one player of the LBA value chain.

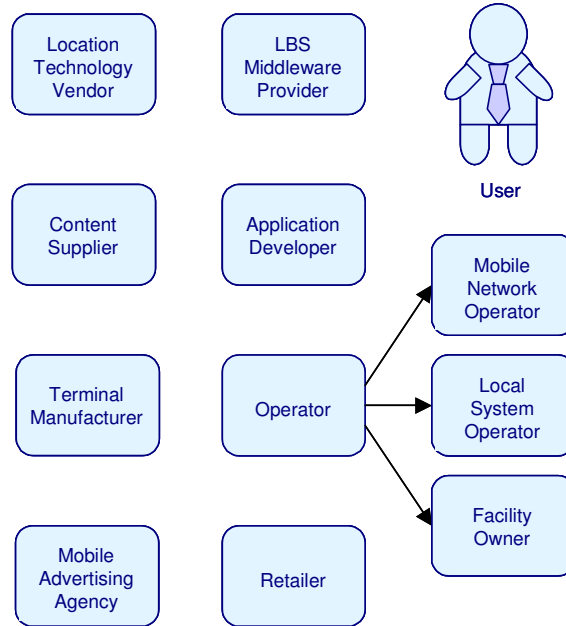


Figure 8.1: The business model units

To meet the demanding requirements of the different business models, the operator is specified as either a mobile network operator, a local system operator or a facility owner, depending on the case. The last entity describes a group which solely provides the environment in which LBA can be exploited. It is not necessarily the operator of the LBA system.

The relations

This work attempts to create business models which are intuitively understandable at first glance. This particularly refers to the description of relations between participating entities. Most of the approaches in literature use arrows to describe the relations between the participating entities of the business model. However, the usage of the arrows is done in a very unstructured and often meaningless way, thus making it impossible for the readers to capture any information at first sight.

Although this work also uses arrows to describe the relations, the fundamental difference lies in the structured usage, in which the shape of the arrow as well as the direction of the spearhead contribute to the meaning of the relation, as illustrated in Figure 8.2.

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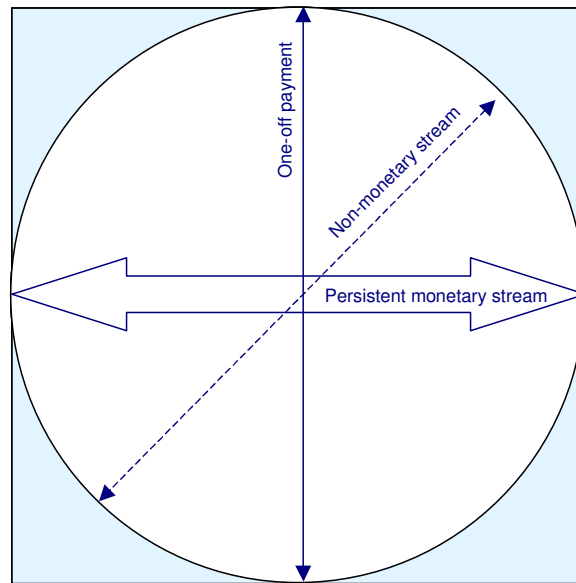


Figure 8.2: The meaning of arrows

The arrows can be clearly distinguished by their shape as well as their direction. Horizontal arrows describe persistent revenue streams, such as monthly fees, revenue sharing etc., whereas vertical arrows represent one-off payments. Diagonal arrows indicate non-monetary streams, like the flow of information.

Note:

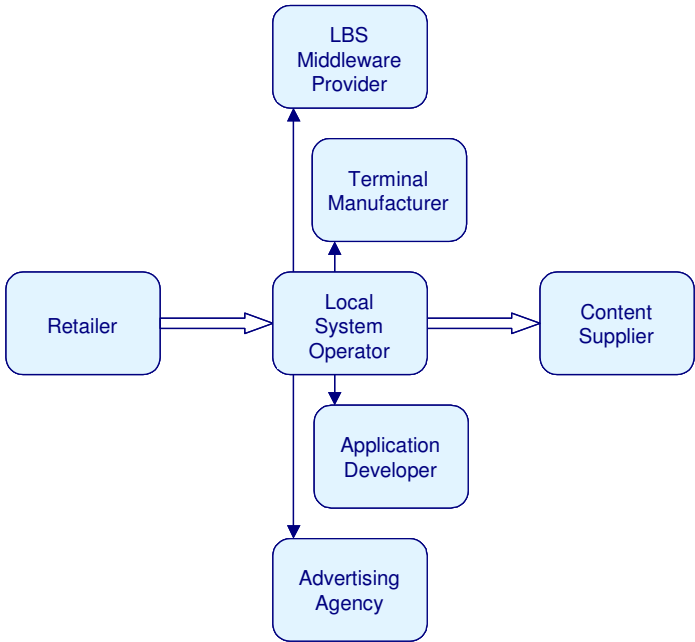
This document does not explicitly state purchasing cash flows from consumers to retailers. The spending for consumption is implicitly assumed.

ELBA Use Case 1

The expected ad perception is affine because passengers of mobile transport systems are usually bored while taking their ride. The implementation of an infotainment system, i.e. show a mixture of information and advertisement content, is much welcomed by the passengers as an entertainment source for the boring and time wasting ride. The infotainment system is perceived as a service rather than an advertisement medium. Thus, this approach is expected to have a very positive response.

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(UC1-a)	
Operating system	Local system
Type of terminals	Public terminal
Approach mode	Push



- Expected ad perception: affinity
- Local system operator-centric
- Local system operator is operator of public transport systems
- Retailers are stores along a route
- Content is very important
- User owner: local system operator
- Incentives for the user: information and entertainment
- Source of payment: retailer
- Target group: passengers
- Revenue stream: retailer → local system operator → content supplier
- Typical application: infotainment system in public transport systems
- Advertisement approach at a perfect situation (time and space)

This scenario is applicable to the operator of a public transport system as the local system operator of LBA. A retailer is typically a store along a transport route whose advertisement is

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shown whenever the metro or the tram reaches its vicinity, giving the passenger the chance to get off at the next station.

Being the centre of this model the public transport system offers retailers the possibility to do LBA within what is called an infotainment system, i.e. a system that does not solely display advertisement but also usable and interesting information to the passenger (e.g. news, upcoming events). In order to establish such a system, high quality content is required, and therefore purchased by the local system operator. As a decisive link, the content supplier participates in the persistent revenue flow. The operator also has to purchase monitors to display the advertisement, applications to run on the displays, and a middleware to match the commercial content to the transport network. Sometimes the required monitors do not have to be purchased solely for the purpose of LBA but are built in already. In some cases an advertising agency might be involved as well, either employed by the local system operator or, more likely, directly by the retailer. Advertising agencies are basically traditional advertisement firms who primarily do the creative work. They are not necessarily an essential part of this model in respect to its location-based nature.

This kind of LBA approach is expected to reach a high acceptance status by the passengers based on the fact that it is perceived as an information channel rather than an advertisement channel. It is considered as an expansion of service offered by the public transport system. It is very effective in terms of delivering ads within a time frame in which the passenger is bored and pleased to be entertained. Besides that, public transport systems, like trams, are usually passing urban areas with a high density of stores, such as the city centre. It can be assumed that a high stake of the people that take the tram to the city centre is about to go for shopping. Thus, LBA is exposed to them at a time when they are most likely to consume and spend money anyway.

Although this scenario is a typical transport system scenario, it can also apply to fixed wide screens, which are mostly implemented at crowded spots in big cities, e.g. the Time Square in New York or Causeway Bay in Hong Kong. These screens can show commercials of proximate stores. Their location sensitivity, however, only refers to a very limited area, and thus their attractiveness based on the small number of possible advertisers is very low. In this case LBA is associated with its definition in the wider sense.

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(UC1-b)	
Operating system	Local system
Type of terminals	Public terminal
Approach mode	Push
<pre> graph LR Retailer --> LSO[Local System Operator] LSO --> AA[Advertising Agency] AA --> CS[Content Supplier] LSO --> LMP[LBS Middleware Provider] LSO --> TM[Terminal Manufacturer] AA --> AD[Application Developer] </pre>	
<ul style="list-style-type: none"> • Expected ad perception: affinity • Balance of power between local system operator and advertising agency • Local system operator is operator of public transport systems • Retailers are stores along a route • Content is very important • User owner: local system operator • Incentives for the user: information and entertainment • Source of payment: retailer • Target group: passengers • Revenue stream: retailer → local system operator → advertising agency → content supplier • Typical application: infotainment system in public transport systems • Advertisement approach at a perfect situation (time and space) 	

This scenario is applicable to the operator of a public transport system as the local system operator of LBA. A retailer is typically a shop or a store along a transport route whose advertisement is shown whenever the metro or the tram reaches its vicinity, giving the passenger the chance to get off at the next station to reach it.

This model has two main players: the local system operator and the advertising agency. The operator provides the technical background for LBA in transport systems as well as the

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facility itself. The advertising agency does not necessarily have to be an advertisement firm, but it is rather an entity that offers LBA as a service, for instance, a company specialised on providing LBA for public transport systems. It therefore receives payments from the public transport system which again gets paid by the retailer. Alternatively, the retailer pays the advertising agency which then again pays the public transport system.

With the possibility to do LBA in a public transport system, the retailer has a chance to promote his products and services within what is called an infotainment system, i.e. a system that does not solely display advertisement but also usable and interesting information to the passenger (e.g. news, latest events). In order to establish such a system, high quality content is required. As a decisive link, the content supplier participates in the persistent revenue flow. Additionally monitors to display the advertisement, applications to run on the displays, and a middleware to match the commercial content to the transport network have to be purchased through one-off payments. Sometimes the required monitors do not have to be purchased solely for the purpose of LBA but are built-in already.

This kind of LBA approach is expected to reach a high acceptance status by the passengers based on the fact that it is perceived as an information channel rather than an advertisement channel. It is considered as an expansion of service offered by the public transport system. It is very effective in terms of delivering ads within a time frame in which the passenger is bored and pleased to be entertained. Besides that, public transport systems, like trams, are usually passing urban areas with a high density of stores, such as the city centre. It can be assumed that a high stake of the people that take the tram to the city centre is about to go for shopping. Thus, LBA is exposed to them at a time when they are most likely to consume and spend money anyway.

Although this scenario is a typical transport system scenario, it can also apply to fixed wide screens, which are mostly implemented at crowded spots in big cities, e.g. the Time Square in New York or Causeway Bay in Hong Kong. These screens can show commercials of proximate stores. Their location sensitivity, however, only refers to a very limited area, and thus their attractiveness based on the small number of possible advertisers is very low. In this case LBA is associated with its definition in the wider sense.

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(UC1-c)	
Operating system	Local system
Type of terminals	Public terminal
Approach mode	Push
<pre> graph TD Retailer --> LSO[Local System Operator] ContentSupplier[Content Supplier] --> LSO LSO --> AA[Advertising Agency] AA --> AD[Application Developer] AA --> TM[Terminal Manufacturer] AD --> LBSMP[LBS Middleware Provider] TM --> LBSMP </pre>	
<ul style="list-style-type: none"> • Expected ad perception: affinity • Advertising agency sells LBA service as a one-off product package • Local system operator is operator of public transport systems • Retailers are stores along a route • Content is very important • User owner: local system operator • Incentives for the user: information and entertainment • Source of payment: retailer • Target group: passengers • Revenue stream: retailer → local system operator → content supplier • Typical application: infotainment system in public transport systems • Advertisement approach at a perfect situation (time and space) 	

This scenario is applicable to the operator of a public transport system as the local system operator of LBA. A retailer is typically a shop or a store along a transport route whose advertisement is shown whenever the metro or the tram reaches its vicinity, giving the passenger the chance to get off at the next station to reach it.

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The advertising agency does not necessarily have to be an advertisement firm, but it is rather a company specialised on providing LBA for public transport systems as a solution out of one hand, i.e. hardware and software. This enables interested transport systems to quickly implement an infotainment system with integrated LBA possibilities. Once the transport system has acquired that solution as a one-off payment, the only thing it additionally needs to run the solution is content. As a decisive link, the content supplier participates in the persistent revenue flow.

With the possibility to do LBA in a public transport system, the retailer has a chance to promote his products and services within what is called an infotainment system, i.e. a system that does not solely display advertisement but also usable and interesting information to the passenger (e.g. news, latest events). This kind of LBA approach is expected to reach a high acceptance status by the passengers based on the fact that it is perceived as an information channel rather than an advertisement channel. It is considered as an expansion of service offered by the public transport system. It is very effective in terms of delivering ads within a time frame in which the passenger is bored and pleased to be entertained. Besides that, public transport systems, like trams, are usually passing urban areas with a high density of stores, such as the city centre. It can be assumed that a high stake of the people that take the tram to the city centre is about to go for shopping. Thus, LBA is exposed to them at a time when they are most likely to consume and spend money anyway.

Although this scenario is a typical transport system scenario, it can also apply to fixed wide screens, which are mostly implemented at crowded spots in big cities, e.g. the Time Square in New York or Causeway Bay in Hong Kong. These screens can show commercials of proximate stores. Their location sensitivity, however, only refers to a very limited area, and thus their attractiveness based on the small number of possible advertisers is very low. In this case LBA is associated with its definition in the wider sense.

ELBA Use Case 2

User affinity towards LBA is based on the fact that LBA will only be received upon an explicit service request by the users. Services can be information services, routing and navigation services or even explicit LBA requests. LBA can either be an integrated part of the information or explicitly stated as a sponsorship. In all cases, however, the users feel like being in total control of the service they demand and the LBA delivery associated with it. Their freedom to choose puts them into a positive mood towards LBA.

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(UC2-a)	
Operating system	Mobile communication network
Type of terminals	Private terminal
Approach mode	Pull
<pre> graph TD Retailer[Retailer] --> MNO[Mobile Network Operator] User((User)) --> MNO MNO --> LTV[Location Technology Vendor] MNO --> LMP[LBS Middleware Provider] MNO --> CS[Content Supplier] MNO --> AD[Application Developer] </pre>	
<ul style="list-style-type: none"> • Expected ad perception: affinity • Mobile network operator-centric • User owner: mobile network operator • Incentives: LBA as part of service • Source of payment: user and retailer • Target group: tourists • Revenue stream: user + retailer → mobile network operator → content supplier • Typical applications: tourist guide, find-the-nearest 	

In this mobile network operator-centric model the mobile operator is the sole linkage between all players, in particular it is the mediator between the two ends of the value chain. Therefore it receives payments from both the user as well as the retailer.

LBA as part of a pull service, e.g. POI requests, is liable to pay by the user on the one side, and from the retailer who uses this advertisement medium on the other side. As LBA is based on the user's subscription to the mobile operator, the big advantage lies in the established billing relationship between the two entities. This is a decisive criteria for LBS as it enables the charge of so-called micro payments, i.e. payments with a very low monetary value. Application developers, middleware providers and location technology vendors receive one-off payments from the mobile operator whereas the content supplier as an integral part

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participates in the persistent revenue stream. The role of the content supplier is a very significant one due to the fact that the user normally subscribes to a service based on its appealing content.

It is also imaginable to have an additional entity between user and mobile network operator, such as a travel agency. In this case the service is primarily focusing on tourists as users. The tourist then is not directly subscribed to the mobile operator but to the travel agency which acts as the service provider, i.e. through leasing of the appropriate mobile handset or just the SIM card. A similar case that has been put into practice is the m-ToGuide project by the Information Society Technologies (IST) Fifth Framework Programme of the European Commission .

Another typical application refers to one of the most popular Location Based Services which is known under the service label “find-the-nearest”. LBA can be combined with this service, thus to obtain a more appealing appearance.

The big disadvantage of this business model consists in its operator-centric construction. The most dominant actor can shape the development path of LBA, always solely focusing on his own interest, and therefore not necessarily for the sake of LBA itself. The mobile network operator is expected to inhibit any possible entrance of players that might endanger its position and force it to cede some of its LBA market share. However, it is questionable if the mobile operator is able to tackle all tasks alone, especially as LBA does not belong to the core business and it barely has any experience on this field. Furthermore does the direct customer management of every single retailer seem to be exceeding the resources of the mobile network operator. Apart from that this model only applies to LBA within the same mobile communication network. It seem to be infeasible to exploit LBA independently from the specific network because no operator will share the access to sensitive information of its own customers with any competitor. Without the interoperability, however, the development and growth of LBA will be dampened.

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(UC2-b)	
Operating system	Mobile communication network
Type of terminals	Private terminal
Approach mode	Pull
<pre> graph LR User((User)) --> Retailer[Retailer] Retailer --> MNO[Mobile Network Operator] MNO --> CS[Content Supplier] MNO --> AD[Application Developer] MNO --> MA[Mobile Advertising Agency] MNO --> LBS[LBS Middleware Provider] LBS --> LTV[Location Technology Vendor] </pre>	
<ul style="list-style-type: none"> • Expected ad perception: affinity • Mobile network operator-centric • User owner: retailer • Incentives for the user: guaranteed minimum discount and coupons from retailer • Source of payment: user • Target group: shoppers • Revenue stream: user → retailer → mobile network operator → content supplier 	

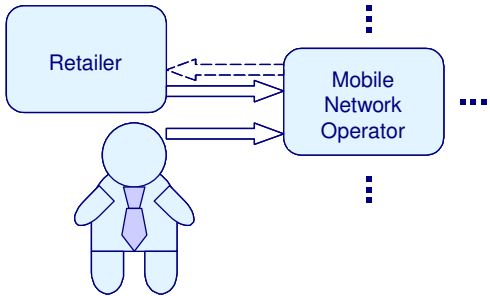
The user is a customer of the retailer and as such he is subscribed to a service which is liable to pay, e.g. through quarterly payments to the retailer. The users' benefit is a guaranteed minimum discount on all or at least selected items of the retailer, thus the subscription fee has to equal some sort of monetary compensation if the users should be convinced. Additionally, the users may get coupons on special products as well.

Although the user is subscribed to a mobile network operator, his relationship in respect to LBA is solely referred to the retailer. The actual LBA service, however, is provided by the mobile network operator. Thus, the retailer has to pay the operator for the usage of its service. This will most likely be based on the number of the retailer's subscribers, the number of messages sent or simply through a fixed basic fee. The costs for this pull service is fully

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covered by the retailer, i.e. the users do not have to pay anything but the subscription fee (flat rate).

Another payment model could look like this : whenever the users make a pull request they have to pay a premium charge to their mobile network provider. A certain percentage of this



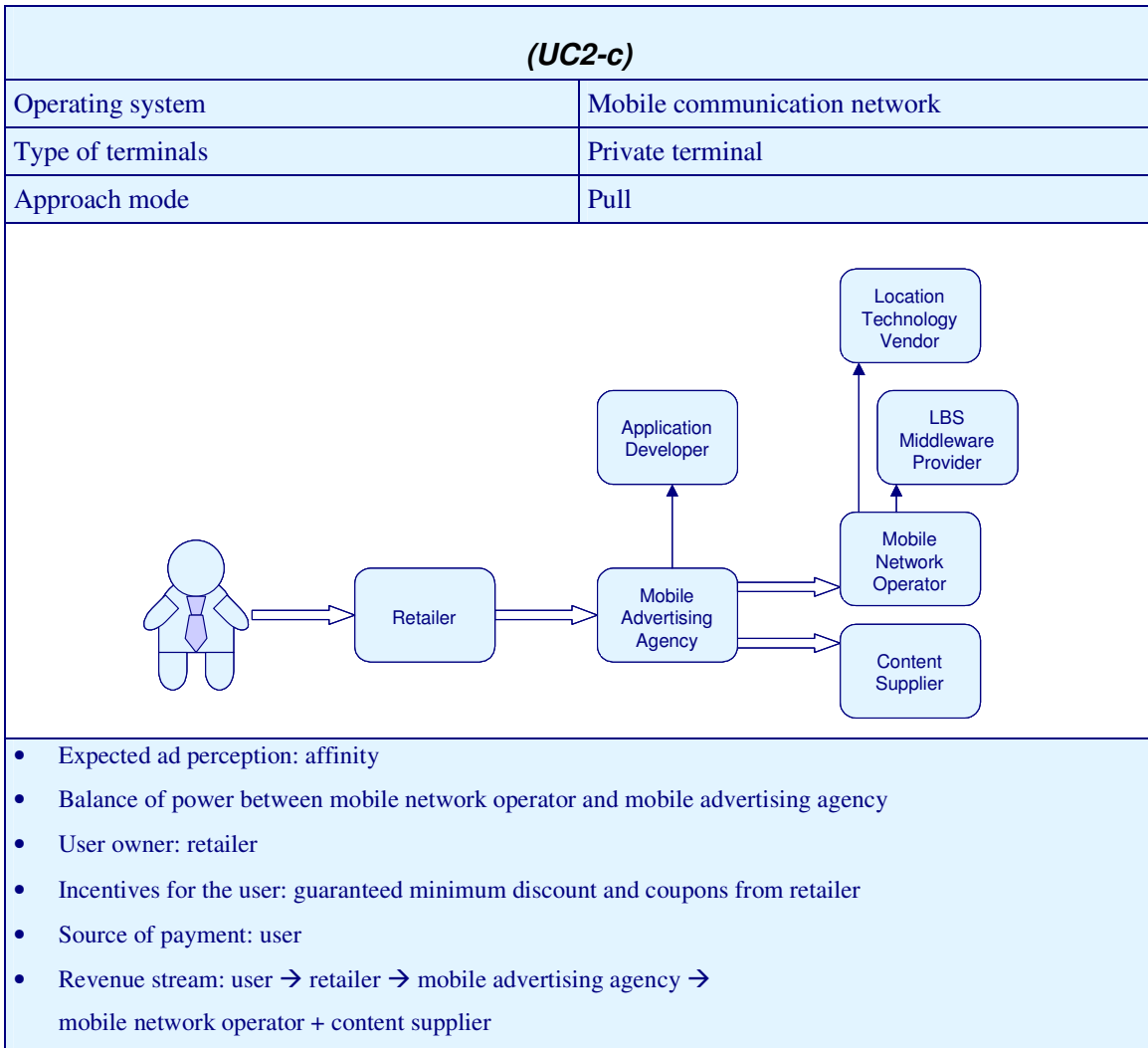
payment will then be granted to the retailer as a credit entry, thus it will subtracted from the costs the retailer has to pay for its LBA promotion which is exercised by the mobile operator. The big advantage of this approach is the stimulation of the retailers to offer appealing conditions to their customers, as the more users request the service of a certain retailer the more credits that retailer can get.

The disadvantage, however, is the lack of interoperability of the different mobile networks. A retailer cannot be expected to pay all operators on the market just to make sure that all of its customers have access to this service.

Application developers, middleware providers and location technology vendors receive one-off payments from the mobile operator whereas the content supplier participates in the persistent revenue stream. In the case that the mobile operator might not be able to handle all tasks itself, an alternative approach could consist of the outsourcing of subtasks to a mobile advertising agency, e.g. the creative work. It is also possible to consult the mobile advertising agency as an expert due to their experienced gained within this field. The provision of know-how by the agencies is already a quite often encountered approach nowadays. This scenario describes a case typically for big shopping chains with a well-known label and a high customer base, e.g. Karstadt in Germany, Galeries Lafayette in France or Sears in the USA. Otherwise the costs for the implementation of LBA would be too high and hence not reasonable for small stores. Besides, a small shop on its own is just not able to make offers which are appealing enough to convince the users. It can however increase its attractiveness by establishing a partnership with other shops.

The big disadvantage of this business model consists in its operator-centric construction. The most dominant actor can shape the development path of LBA, always solely focusing on his own interest, and therefore not necessarily for the sake of LBA itself. The mobile network operator is expected to inhibit any possible entrance of players that might endanger its position and force it to cede some of its LBA market share. However, it is questionable if the mobile operator is able to tackle all tasks alone, especially as LBA does not belong to the core business and it barely has any experience on this field. Furthermore does the direct customer management of every single retailer seem to be exceeding the resources of the mobile network operator. Apart from that this model only applies to LBA within the same mobile communication network. It seems to be infeasible to exploit LBA independently from the specific network because no operator will share the access to sensitive information of its own customers with any competitor. Without the interoperability, however, the development and growth of LBA will be dampened.

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Being the establisher of the customer relationship to the users, the retailer receives payments from its subscribed customers through subscription fees, such as quarterly or annual payments. In return the users can benefit from a guaranteed minimum discount on all or at least selected items of the retailer. Additionally, the users may get coupons on special products as well. The basic idea behind this approach is to convince the users by giving them some sort of monetary compensation to equal their subscription fee. The costs for this pull service are fully covered by the retailer, i.e. the users do not have to pay anything but the subscription fee (flat rate).

Although the user is subscribed to a mobile network operator, his relationship in respect to LBA is solely referred to the retailer which, however, has to acquire the actual LBA service by itself, either from a mobile advertising agency or directly from the mobile network

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operator. The costs will most likely be based on the number of the retailer's subscribers, the number of messages sent or simply through a fixed basic fee.

LBA is offered by two entities together. The mobile network operator is providing the technology whereas the mobile advertising agency is responsible for applications and content. For the retailer the service provider can either be the mobile network provider who again subcontracts the mobile advertising agency, or the mobile advertising agency with the mobile operator as subcontractor. In both cases all three entities participate in the persistent revenue stream.

The involvement of a mobile advertising agency holds the advantage in having an expert in the field of Mobile Marketing that is able to handle all the retailer requests. Due to the mobile operator's limited resources the direct customer management of every single retailer is just not possible. Apart from that, LBA would only be deployed within the same mobile communication network. A retailer cannot be expected to pay all operators on the market just to make sure that all of its customers have access to this service. The exploitation of LBA independently from the specific network, however, seems to be infeasible because no operator will share the access to sensitive information of its own customers with any competitor. Without the interoperability, however, the development and growth of LBA will be dampened, the attractiveness of it as a advertising channel reduced, and the retailers might challenge its effectiveness.

This scenario describes a case typically for big shopping chains with a well-known label and a high customer base, e.g. Karstadt in Germany, Galeries Lafayette in France or Sears in the USA. Otherwise the costs for the implementation of LBA would be too high and hence not reasonable for small stores. Besides, a small shop on its own is just not able to make offers which are appealing enough to convince the users. It can however increase its attractiveness by establishing a partnership with other shops.

ELBA Use Case 3

The expected positive LBA perception by the users is based on the fact that the users can opt-in for shops which they know and appreciate. Besides, the users do not have to fear of being tracked to whole time because they only are located whenever they enter a local system, such as a WLAN hot spot around a shopping centre, and in this case it is very likely that the users are actually about to go for shopping (context sensitivity aspect). During this time the reception of advertising messages is not considered to be intrusive. Unlike in the case of the mobile communication network, in which the users are afraid of being constantly tracked and based on that, receive ads at any possible place, no matter if wanted or not, the usage of local systems makes it possible for them to choose a certain location or store where they want to accept ads. The number of possible places where the users can be located is therefore limited, hence their concerns reduced which again leads to a more affine attitude towards LBA.

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(UC3-a)	
Operating system	Local system
Type of terminals	Private terminal
Approach mode	Push
<pre> graph TD User((User)) -.-> Retailer[Retailer] Retailer <--> LSO[Local System Operator] LSO --> LBS[LBS Middleware Provider] LSO --> CS[Content Supplier] LSO --> AD[Application Developer] </pre>	
<ul style="list-style-type: none"> • Expected ad perception: affinity • Local system operator-centric • Retailer is likely to be the local system operator • Diversification of advertisement is limited to the product portfolio of local system operator • User owner: retailer • Incentives for the user: informative advertisement, discounts and coupons from retailer • Source of payment: retailer • User grants opt-in and personal data • Target group: shoppers • Especially interesting for large shopping malls or big brand store chains, as well as city centres • Revenue stream: retailer → local system operator → content supplier 	

This scenario is typical for the exploitation of LBA in big shopping centres and well-known department store chains or at other highly frequented shopping areas like the city centre. It is very likely that the customers are hard to convince at launch as they are reluctant to accept ads on their mobile devices. Hence, the retailer has to make really appealing offers to its customers in order to convince them, e.g. high discount on selected items. LBA is to be promoted as a service that keeps the customer up-to-date about the latest articles and special sales and avoid the perception of it as being solely an additional marketing channel. It is obviously easier for well-known stores to convince their customers to register to the LBA

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service than less known shops. This is based on the brand awareness of the shop and the high level of reliability associated with it. Furthermore, this service is more appealing if it is applicable to more than just one location. This business case is comparable to that of the storecards that have been offered by an increasing number of chains, e.g. Karstadt, Breuninger, Kaufhof etc. in Germany. If the retailer succeeds in convincing the customers, it will, in return, receive precious information about their habits, their likes and dislikes and other relevant data that enables a tailored advertisement approach, which eventually, means to reduce ineffective advertisement costs and increase sales at the same time. It is expected that the customers will not pay for this service but just provide their personal data at the utmost.

Since the two main goals of a merchant has always been to fully understand the customers' needs and based on that to retain them, LBA offers a new opportunity to achieve those goals through establishing a customer profile pool which makes it easier for the retailer to retain customers by serving their needs.

The underlying technology is very likely to be WLAN, possibly in combination with Bluetooth, and is provided by the local system operator with the purchase of the required elements middleware, application and content, in case additional content is needed. The most valuable content, however, remains the information offered by the retailer, like information about new items in stock or special offerings combined with coupons. The operator of a local system can either be the owner of the facility in which multiple shops are located or a single store itself if it is big enough to run it profitably.

Although big stores have the best chances to exploit this business case, it is also possible for small shops to successfully participate in the long run, especially with decreasing WLAN prices. However, small shops should join a strategic network in order to reach a critical mass of users and to be attractive enough for the customers.

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(UC3-b)	
Operating system	Local system
Type of terminals	Private terminal
Approach mode	Push
<pre> graph TD Retailer --> LSO[Local System Operator] LSO --> LBS[LBS Middleware Provider] LSO --> CS[Content Supplier] LSO --> AD[Application Developer] User((User)) -.-> LSO </pre>	
<ul style="list-style-type: none"> • Expected ad perception: affinity • Local system operator-centric • Local system operator is not the retailer but rather an entity with multiple local systems • Great diversification of advertisement • Existing or quick build up of a critical mass exceeding user database • User owner: local system operator • Incentives for the user: informative advertisement and coupons from retailer, as well as free information subscription and possible discount from mobile operator • Source of payment: retailer • User grants opt-in and personal data • Target group: shoppers • Revenue stream: retailer → local system operator → content supplier 	

In this case the local system operator is not the retailer, instead, it can either be the owner of the facility where the retailer is located or another entity with nationwide presence, e.g. a telco or mobile network operator that wants to expand its WLAN product portfolio. The role of the retailer consists in the provision of sales content for which it receives a one-off payment at the beginning as an incentive to participate. At the same time it has to share every single sale with the operator of the local system whenever a purchase has been triggered by an LBA message.

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A prerequisite to make this model work is the ability to distinguish whether a customer's purchase is based on such an advertising message or not. A possible approach to solve this problem is to send coupons with bar codes to the users which grant a discount upon redemption at the cashier.

The customer relationship is managed by the local system operator. Mobile operators have a big advantage as they have a high number of subscribers and therefore a huge potential user base. To reduce its dependency on relevant sales content the local system operator can also buy additional content which might be useful and interesting for the users. This has a positive impact on the perception of LBA, as the touch of being solely an advertisement channel is shifting to being an information channel. Thus, the customer is more likely to opt-in for advertisement on their mobile device and to provide personal data for profiling. The user can benefit from this LBA approach in two different ways. First, he receives interesting sale offerings from the shops he likes (through his profile), and second, he can additionally benefit from useful information which the local system operator has purchased from the content provider. In case the mobile operator is the operator of the local system, the user can even get monetary incentives like discounted monthly fee or free call minutes.

The advantage of this scenario compared to (LS-Private-Push-I) is the quick establishment of a large user database. Hence, this approach is also interesting for smaller shops whose customer base is too small for the deployment of LBA on their own. With every participating shop the local system operator enriches its portfolio and therefore makes this service more attractive to the user who is able to choose between a wide range of different product ads.

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9 Success Factors and Barriers

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 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 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

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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, 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.

Positioning accuracy

The importance of positioning accuracy varies according to the application and the implementation details. Relatively few applications require high levels of accuracy, and applications that are superficially similar require different levels of accuracy, because the users or the context will differ. Vendors, particularly vendors of position measurement technology, have emphasised the importance of accuracy. This is not surprising, given what they have to sell, and how they seek to differentiate themselves from each other.

Claims about the importance of accuracy are usually associated with performance claims about the vendor's own solution relative to those of its competitors – but they are also associated with highly negative assessments of the accuracy of Cell ID solutions. In particular, these assessments regularly fail to distinguish between 'pure' Cell ID, in which accuracy is necessarily constrained by the size of the cell, and enhanced Cell ID, in which network measurement data can compensate for this to some extent. We believe that Cell ID constitutes a viable platform on which to launch a variety of applications. However, Cell ID cannot be used to support consumer-oriented tracking solutions, or those applications required by regulators (or are likely to be so soon). The following table shows according to Ovum the different levels of accuracy needed for the various applications.

Application	Level of accuracy	Notes
Information		
Finding	Low	The nearest target may not be the best. Applications may work better by returning several 'nearby' options
Directions	High	Accuracy needed for realtime turn-by-turn directions – but orientation and speed of update are equally important

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In the absence of these, accuracy is less important – map-delivery services only need to cover origin and destination

News	Low	Most local information (weather and traffic) applies over a wide area
Advertising	Medium to high	Location-triggered push advertising needs to be closely tied to precise positioning

Tracking

Fleet management	Low to medium	Most implementations can be based on coarse granularity (such as near to depot). Implementations closely tied to just-in-time logistics systems need greater accuracy
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Asset tracking	Low, medium and high	For many assets, contextual information can supplement position measurement information (for example, a railway car is always on a railway line)
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Tracking inside needs high accuracy

Remote workforce management	Low to medium	Most implementations can be based on coarse granularity (near to next customer/next job).
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Security applications (lone worker safety) need high accuracy

Child tracking, personal safety and medical monitoring	High	Accuracy to tens of metres is needed to meet customer expectations, especially in urban areas
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Stolen vehicle recovery	High	Accuracy to tens of metres is needed to meet customer expectations, especially in urban areas
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E-911 and car emergency-response systems	High	Accuracy to tens of metres is needed to meet customer expectations, especially in urban area
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‘Find a friend’	Medium	Finding a friend means knowing that they are in the same neighbourhood – not determining their position to the nearest ten metres
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Location-sensitive call routing	Low to medium	Local taxi firms, pizza restaurants etc are those in the same neighbourhood
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Location-sensitive charging and billing	High	Depends on granularity of tariff zones and ability of customer care systems to tolerate anomalies
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Challenges

Many Platforms	<ul style="list-style-type: none"> • 2G: GSM, CDMA, TDMA • 2½ G: GPRS • 3G
Multiple Devices	<ul style="list-style-type: none"> • Multiple devices: SMS, WAP, PDA's, Palm Pilots, iMode phones • Devices were designed for other uses
Slow Access Speeds	<ul style="list-style-type: none"> • Wireless device access speeds are limited • Comparison with faster PC based online access experience
Lack of Standards	<ul style="list-style-type: none"> • No creative standards: color, fonts, graphics, etc. • No common measurement standards • Wireless Advertising Association developing standards
Creative Limitations	<ul style="list-style-type: none"> • Screen dimensions vary for all products • Minimal graphic capability • Constraints on size and length of advertisements
Privacy and Security	<ul style="list-style-type: none"> • Consumer concern over potential hackers • Possible misuse of personal information • Location tracking perceived as an invasion of privacy

Success Factors

Enable Purchase Behavior	<ul style="list-style-type: none"> • Consumers can use a new channel to purchase products and services • Travel reservations, theater tickets, etc.
Reinforce Brand Awareness	<ul style="list-style-type: none"> • Engaging users in polls, games, or trivia activities to establish brand awareness • Use well known tag lines to reinforce brand
Provide Time-Sensitive Information	<ul style="list-style-type: none"> • Stock quotes, sports updates, and news alerts • Notification of "limited time only" promotions • Up to the minute flight information
Subscribe or Register for Activities	<ul style="list-style-type: none"> • Customers can subscribe to newsletters • Register for sweepstakes • Request that information be sent to them
Redeem Coupons and Incentives	<ul style="list-style-type: none"> • Show coupons, gift certificates, or incentives at point of purchase • Ensure all offline sites are aware of the process

- Wireless devices are considered to be more "personal" than other communications equipment

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- Customers do not necessarily expect to receive advertisements through their wireless devices
- Perception that consumer pays for information (i.e., ads) received through the wireless device
- Unsolicited advertisements are unacceptable
- Can't refuse ads because it is unclear who sent them
- Wireless communications must be relevant, personalized, timely, and targeted

Measures to handle challenges

Clearly Identify Goals and Metrics	<ul style="list-style-type: none"> • Identify new customers and retain existing customers • Increase sales • Brand awareness
Ask Permission	<ul style="list-style-type: none"> • Get customer consent to receive advertisements • Tell recipients how to "opt out" or unsubscribe
Recognize Challenges	<ul style="list-style-type: none"> • Network platforms, multiple devices, slow speeds, lack of standards, creative limitations, etc. • <u>Do not</u> use challenges as a scapegoat
Develop Personalized Messages	<ul style="list-style-type: none"> • Unique message based on customer information • Location, time, context, event driven • One-to-one marketing
Ensure the Campaign Fits the Device	<ul style="list-style-type: none"> • Make calls or hear audio messages on phones • Small keypads • Stylus use on PDA's

Measures to put success factors into effect

Test Individual Ad Components	<ul style="list-style-type: none"> • Message • Tone • Offer
Track Results	<ul style="list-style-type: none"> • Benefit from immediate results • Monitor incoming responses and suggestions • Modify campaign as appropriate
Prepare for Responses	<ul style="list-style-type: none"> • Back end support and infrastructure in place • Ensure offline retail locations are in the loop • Incoming questions, negative responses, unsubscribe
Integrate into Online & Offline Activities	<ul style="list-style-type: none"> • Use wireless ads to drive online usage • Remind customers to return to Web site or offline store
Do not Abuse Wireless Ads	<ul style="list-style-type: none"> • Respect privacy of customers • Avoid spam at all costs

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Summary

This chapter is dedicated to conclude the essence of previous thoughts and findings. Moreover, it makes suggestions on issues which are relevant to be further examined in descending projects and researches.

Strategy for the market entry

Although some authors suggest to include the strategy for the market entry as a part of the business model, this document takes another approach. The strategy of how to enter the market is certainly a decisive aspect when setting up a business. But it loses its significance after the market entry. A business model, however, is to be understood as a guideline for establishing and maintaining the business over a long period, basically over the whole life cycle of a business. For instance, a company which has been successfully providing a certain product or service for several years does not care about how to enter the market but rather how to maintain and expand its market share.

Even if LBA shows a high potential, interested entities have to consider that it may take some time until mass market demand finally emerges. This raises the question about the right time for LBA providers to enter the market. If this happens too early, they will be coexisting with an ignorant market where no brand can be established and money spent on promotion is a waste. But if they are tardy, they might lose to competitors that have already established own brands in the market.

Thus, LBA providers can choose between two different ways to enter the market. One possibility is to enter and grow with the market. While there is no demand from the mass market, this strategy suggests that LBA providers should focus on the small segment of innovative and pioneering customers. This way it is possible to test LBA and gain experience for its mainstream rollout once the mass market has started to request for this service. The alternative approach is based on the assumption that there is already a latent demand on the market. This potential can be exploited through marketing activities which target at educating consumers with the goal of convincing them. Unlike the first strategy of growing from a niche market to a mass market, this one suggests to actually create the mass market.

In consideration of the fact that LBA still has to struggle with unsolved problems, which however are fundamental, the first strategy appears to be more suitable. Since LBA is a new form of advertisement and one that is perceived as intrusive, the co-evolution strategy to grow with the market constitutes a more decent, and therefore more promising, approach.

While entering the market, there are certain aspects which have to be considered if LBA is to be successful. LBA is expected to reach higher acceptance if it is not promoted as another advertisement channel to the users, but rather as a useful service which can be beneficial to them. It is essential to convince the users of the advantages of LBA. Therefore, highly appealing incentives have to be offered to the users. The types of incentive vary according to the users' individual profiles. LBA will fail if the industry tries to push it on the market at all

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costs without considering the users' needs. A more promising approach is to integrate LBA into cross-media marketing campaigns at the early stage. This way LBA is introduced to the market in a less aggressive way and gives the users the chance to get accustomed to this new form of advertisement. Another decent way is to merge LBA with some sort of LBS such as "routing", "find-the-nearest" or other services. Thus, LBA is not perceived as another pure advertisement approach, but rather as part of the useful information which the users have requested. Furthermore, the industry can cautiously observe the market to gain experience for further moves. Within this context, it is easier to introduce less intrusive business cases first, such as LBA in a pull mode, rather than difficult ones, like push LBA. This will increase user acceptance in the long run, and only then LBA will have a chance to reach the mass market.

Respectively ELBA, it is hard to directly compare the three use cases to each other since they are of different nature and represent very diverse business opportunities. Furthermore, it is not possible to make any predictions on revenues for each use case of the ELBA project. However, UC1 has experienced very positive feedback not only from project participants and industry experts, but most importantly from the passengers. Hence, it obviously holds a tremendous potential which can be exploited. The UC1-a scenario is the most probable one to be encountered. The main advantage is the operator-centric nature which makes the deployment of LBA in public transport systems much easier since there are no friction losses due to cooperation problems with other entities. In the long run, when LBA in public transport systems has become an established business application, the scenarios which involve advertising firms (UC1-b and UC1-c) are expected to stand a chance as well.

UC2 highly profits from its conception as a pull service. Users are expected to be more willing to accept advertisement on their mobile device only if they have explicitly requested a service. UC2-a describes a tourist information service which on the one hand is very useful, but on the other hand, this business primarily addresses the very tight customer segment of tourists. UC2-b and UC2-c describe mainstream business opportunities in which shoppers may receive well-appreciated coupons. But since this pull service is liable to pay, this scenario is only likely in the long run after LBA has established itself on the market as a useful service for the consumers. If so, UC2-b in which the mobile network operator provides LBA solutions-out-of-one-hand is more likely than UC2-c where the service provider is a mobile advertising agency. This scenario is less likely since mobile advertising firms primarily focus on large campaigns due to economies of scale. It will only have a chance to be encountered for big shopping malls, or whole store chains where economies of scope can be realised, and make it more appealing for mobile advertising agencies to engage in this field.

UC3 suffers from the problematic circumstance that it is designed as a push service to the users' mobile handsets. Users are hard to be convinced to receive advertising messages on a device which is regarded as very personal. Despite the advantage for the users to subscribe to their favourite shops and benefit from possible discounts, the intrusive character of this LBA approach makes it very hard to deploy this business case.

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Conclusion

The comprehensive analysis of this document has shown the potential of LBA as well as proved its feasibility. The comparison of LBA on mobile devices to other means of advertisement has revealed its superiority in many aspects. Industry experts have certified that this new form of advertisement will stimulate the mobile services market. It has a good chance to establish itself on the mobile market, regardless of how the development path may look like.

However, there are still a lot of obstacles which may put the breakthrough of this business opportunity in jeopardy. The greatest challenge consists in the categorical aversion of the users to receive advertisement on their personal devices. The only way to overcome this challenge is if the industry commits itself to always handle privacy and data protection at highest priority. Security issues are not to be underestimated since the LBA market is very sensitive. One single case of misuse may be enough to doom this business. Within this context, the role of the government must not solely comprise of the protection of its citizens by restricting advertisement possibilities, but rather lies in creating a reliable and accurate framework which considers the consumers' concerns on the one hand and meet the industry's interests on the other hand.

Although operators are likely to play the most important role in the LBA value chain, it is essential for them to establish partnerships with other actors to provide stable LBA services of high quality. After all, a value chain is just as strong as its weakest link. The integration of third parties can therefore be very beneficial to all participants. This opening can lead to new business opportunities for the involved parties and can also increase network usage as well as higher revenues for the mobile operators. Due to their predominance, the mobile operators have an enormous influence on the shape of the LBA industry. Hence, it is expected to encounter many operator-centric business models.

Since LBA is still in its early stage, promising and solid business models are needed to pave the way for LBA to flourish on the market. The most promising approach to do so is to first establish business models which are more likely to be accepted by the users.

The intensifying exploitation of LBS is very beneficial to LBA since the technological foundation of both services are quite similar. This means that LBA does not have to make additional investments in certain fields, like localisation technology or middleware, and may therefore avoid the burden of high initial spending. Moreover, with LBA the LBS expenses can even be faster amortised.

High accuracy in localisation certainly improves the performance of LBA. At this early stage, however, current accuracies are good enough for a satisfying deployment of LBA. The provision of the highest possible accuracy at the very beginning means high initial costs with uncertain results. Therefore, it is better to develop and adapt simultaneously with the evolving market. The prime focus of all efforts should move towards convincing the users, rather than to offer high technology at low value. With increasing acceptance of LBA, the user demand for more precise LBA will grow automatically as its implementation will.

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It is hard to predict whether there will be a mass market for LBA or not. This highly depends on how successful the mobile industry is in convincing the consumers. If the added value of LBA is high enough to attract the users, LBA will certainly not be confined to a niche market but rather become a mainstream approach. Studies and surveys have proven that a high stake of users can be convinced through the provision of appealing incentives. Although incentives are helpful to attract users at the beginning, the industry has to guarantee LBA in a high quality in order to retain them.

This work concludes that LBA will become an important application and a dominant form of one-to-one marketing once larger parts of the consumers have stopped to perceive this new advertisement approach as intrusive and begin to embrace it. LBA may well be encountered under another term, as well as contain CRM elements.

Suggestions for further approaches

The comprehensive examination of LBA and the possible business models deriving from it have shown some success factors, but have also brought up possible risks and decisive aspects which have to be put into consideration. It is necessary to follow up these aspects since they have an impact on the development of LBA. The industry will gain more experience after the first commercial deployment of LBA. In particular, it is enlightening to take a closer look at the best-practice cooperation models between the actors since they have an influence on the revenue-sharing model and hence directly mould the shape of the business model. Furthermore, the changes in the legal framework are of high importance and need to be cautiously taken into account while exploiting LBA. It is expected that a set of laws concerning relevant aspects for one-to-one marketing will be passed in the future.

ELBA allows to gain experience of a business which is still at the beginning of its evolution. The next step would be to analyse how this experience can be put it into practice. It should always be kept in mind that the project does not or just partly have to struggle with the problem to convince consumers to participate. This, however, is the most decisive criteria for the success of LBA. Hence, a detailed examination of how consumers can be convinced seems to be indispensable.

It is expected that traditional advertising firms will increase their effort to defend against the new form of advertising provided by the mobile marketing agencies. Since marketing budgets of big companies are shifting towards the new medium, the advertising firms find themselves in a struggle to remain their predominance within the lucrative field of advertisement. It is interesting to follow up this competition as the reaction of the advertising firms will have an impact on the shape of the business models for mobile marketing and LBA.

This report was aimed to provide a generic approach for business models and form a good foundation for the implementation of LBA on the market. The success of those business

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models which are set up based on this suggestion has to be measured to indicate the applicability of the generic solution. Although this work tries to put all relevant aspects into consideration, possible uncalculated problems may occur which can complicate the establishment of these business models on the market. In this case the revision of the specific model should be necessary to adapt to the changed environment. It has to be cautiously examined how the co-operations between the project partners so far can be commercialised through maintaining these relationships beyond ELBA duration. After the introduction of the first commercial LBA services, the market will show which of the various business cases is the most successful one, and which business models constitute the dominant solutions. In doing so, this report can contribute to the success of this effort by providing a solid foundation through making helpful suggestions.

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