2009 Location Based Services Market Map

FirstPartner

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Introduction
Welcome to the FirstPartner Location Based Services (LBS) Market Map providing an overview of the LBS solution market and ecosystem players.

The major LBS market sector dynamics are shown below:

Location Based Services (LBS)
Number of subscribers to handset hosted LBS increased in 2008 to over 18 million (surpassing 36.4 million units in Q1 09, a 12.7% increase from Q1 08.) North America accounted for just over two thirds of the total market (ABI Research)

- Mobile location based networking sites are forecast to achieve 82 million subscriptions worldwide by 2013 (ABI research)

A variety of market models are evolving to establish service value from the commoditisation of map data:

- Free advertising funded navigation solutions released by Bouygues (France), Das Oertlich and Telegate (Germany)
- Connected service subscription based revenue for PNDs such as TomTom "LIVE"
- Ford Sync embedded solution offering traffic, directions and information for 3 years free
- Average US LBS mobile application price / month was $9.23 compared to range of $3.82 to $5.41 for consumer downloadable applications in 2007 (Nielsen Mobile)

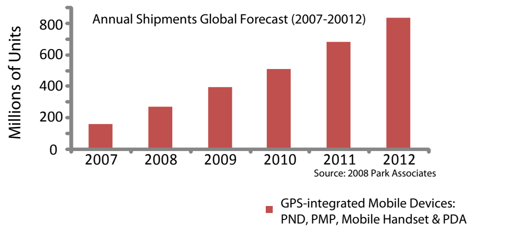
Platform Trends
Whilst growth in PND shipments is forecast to slow, GPS equipped Smartphone shipments are forecast to provide a major contribution to LBS equipped platforms.

Handset Navigation:
- Global shipments of GPS enabled GSM/WCDMA handsets rose by 178.6% in 2008 to 78 million units. Growth is forecast at 46.5% CAGR to reach 770 million units in 2014. Europe will account for 270 million handsets (Berg Insight). Contributing features include:
  - Open source mobile operating systems (Linux, Android)
  - On board GPS capabilities with large touch screens

In Dash Navigation:
- 12% of new cars will ship with embedded telematics by 2010 with safety and security features such as emergency calling (eCall) and breakdown assistance (bCall) as the most popular LBS applications (ABI Research).
- TomTom and Renault have co-designed a sub €500 fully integrated navigation solution 'Carminat TomTom' using TeleAtlas mapping
- Co-marketing agreements for OEM automotive projects such as Garmin and Panasonic Automotive Systems

Personal Navigation Devices (PND):
- Global PND shipments will stagnate at 39 million units in 2009, with Asia Pacific the only growth market (ABI Research)
- Global PND shipments are forecast to peak at 56 million units in 2012 (Berg Insight)
- USA accounted for 52% of worldwide PND shipments in Q4 2008 (Canalys)
- European PND unit sales dropped 3.8% and average selling price dropped 26.7% to €170 in Q4 2008 (GfK)

GPS-Integrated Mobile Devices



Acquisitions
The 2 dominant global mapping suppliers have been acquired by service providers:
- Nokia acquired NAVTEQ for US$8.1 billion in 2007
- TomTom acquired TeleAtlas for €2.9 billion in 2008

The LBS market has seen recent strategic acquisitions:
- Garmin acquired wireless location based services provider Digital Cyclone Inc (DCI) for US$45 million in 2007
- TCS acquired LBS infrastructure, middleware and applications supplier LocationLogic (formerly part of Autodesk) for US$15 million in 2009
- Vodafone acquired Wayfinder in 2008 for SKr 239 million

Regulation
USA network deployment of positioning information capabilities has been driven by FCC regulation requiring operators to be able to provide subscribers' location data for safety applications (E-911 directive).
- Different location determination technologies have been required to meet the indoor location fix requirements.

User privacy requirements are fragmented:
- Informed opt-in consent for LBS services required by both Japan (Personal Data Protection Law 2003) and EU (Article 9 of EU directive 2002/58/EC)
- USA currently self regulatory by CTIA (Consumer Code) and some state level regulations

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Customers

Mobile Socialisers – The typical mobile socialiser wants to know the current location of their friends, with recommendations and guidance to attractions such as restaurants, clubs and events.

Regular Explorers – Regular explorers want to combine navigation with access to reviews and recommendations, points of interest and local search to gain information on the new location

Cautious Travellers – The cautious traveller wants the security of knowing where they are going through access to route navigation and current information.

Commuters – Commuters are time limited and as such want rapid access to accurate transport information, including traffic information and public transport data.

Business – Need solutions to deliver efficiency and optimal costs. Tracking of employees and assets to achieve safety & security compliance.

Government & Public Sector – Administrations can use LBS for location dependent tolling, traffic management, emergency response and other civil measurement applications.

The focus of this LBS Market Map is the ecosystem around individual or small group purchasing behaviour. These customer segments are included as they can demonstrate this purchasing behaviour.

Distribution

Handset – Key manufacturers bundling navigation software and/or maps to increase handset sales and to create stickiness with consumers. Clear shift from being just box (hardware) sellers.
Nokia – Nokia Maps; Samsung – Route 66; HTC – TomTom

Mobile Operators – Premium LBS services are being offered by mobile network operators to stimulate ARPU by bundling location based services such as navigation service plans and social networking applications
Vodafone – Find&Go; Verizon – VZ Navigator; AT&T – Telenav

PND Vendors – PND vendors offer devices which can be installed into consumers' vehicles and are platforms for delivery of value based services. PND vendors are offering mobile solutions which can be downloaded or integrated with mobile phones.
TomTom; Navigon; Garmin

Internet – The Internet is the most widely used consumer channel for navigation and mapping services and applications. Maps are increasingly supplemented with value added route planning, PoI and Traffic information.
Via Michelin; TomTom; Google

Apps Store – An estimated $150m (£107m) in sales were generated through Apps stores last year increasing to $800m (£573m) in 2009 (Piper Jaffray). Other manufacturers and network operators are now trying to replicate this success.
Apple – App Store; Android – Market; Nokia – Ovi

Retail – This is the traditional channel of distribution. Software & Maps can be purchased on memory cards, CD or DVD for mobile devices. PNDs are also available for sale.
Carphone Warehouse; Carrefour; Media Markt

Services

Navigation – Navigation is evolving from a complete software and hardware bundled solution, to a software focus allowing GPS enabled mobile phones and devices to be used as PNDs.
Nokia: TomTom, Nokia, Wayfinder, appello, iGO, Maporama

POI & Recommendations – Points of Interest combines geocoded location with basic information (addresses, phone numbers) and is usually free. POI creates a more compelling experience when combined with recommendations.
GeoSpot: Rummble, Geospot, Skobbler

Travel – The attractive enhanced functionality of adding physical information to travel guides has lead to a number of creative solutions being developed by start up companies.
DOPPLR: ViaMichelin, Dopplr, London Tube Station

Local Search – Local search is a dynamic service using live database directories to search attractions, with the enhancement of results automatically being filtered based upon the user's physical location.
Vicinity: BT, ActiveGuru, T+1 Solutions, My Place, Vicinity, Taxi4me

Social Networking – Location awareness combined with mobility differentiates social networking by allowing users to track their friends, connect with them and share location orientated content and experiences.
Google: Google, Loopt, Gypsii, Latitude

Entertainment – Games incorporating user's location, event guides providing only localised events and photo sharing liked to geodata makes services and applications more compelling.
PLUNDR: Plundr, Spoonfed, Locr

Advertising & Marketing – Messages are delivered directly to the user's mobile device dependent up on their location. Advertising and marketing collateral can be sent to the target customers at the right time and in the right place.
Mobgeo, Alcatel Lucent/1020 Placecast, Nokia

Telematics & Tracking – Mobile assets such as vehicles and equipment can be tracked. Modern advances mean many GPS enabled mobile platforms can become tracking devices through the download of the appropriate software.
WebTech Wireless: iBus, WebTech Wireless, Airbiquity

Monetisation

Subscription – Regular automated payments taken for access to premium services, notably turn by turn navigation.

Pay By Use – The premium product is usually distributed free of charge, with charges being made per use.

Service Bundling – Offering Location Based Services along side another service (such as mobile calls) with joint billing.

Advertising – Advertisers subsidise the cost of a service or product in exchange for brand exposure.

Upgrades – Users actively agree to purchase enhancements or updated content such as maps.

Applications

Mobile Navigation – Vendors offering Navigation products to Mobile Network Operators, Handset Vendors and Directly to Consumers.
Apello; Networks in Motion; Route 66; Telmap; TomTom; Wayfinder (Vodafone)

Software Houses – Software development and software consulting services offered by larger organisations
Presselite – London Tube; Spiceloop – MapsBuddy; Fullpower – MotionX GPS; ActiveGuru – Vicinity; Area/Code – Plundr; Clo Software – Traffic

Technology Providers – Provide technology solutions which simplify development of offerings such as turn-by-turn voice navigation, location tracking, and advertising enabled services.
Spime – Location Technology; Skyhook – Location Software; Artilium – Telco Software; Curl – Enterprise Technology; Jackbe – Enterprise Software

Platforms

Laptops: Acer, Asus, Dell, Fujitsu Siemens, HP, Lenovo, Sony, Toshiba

PNDs: TomTom, Garmin, Magellan, Mio, Netropa, Nokia, Motorola, Samsung

Netbooks: Acer, Asus, HP, Medion, MSU, OLPC, Samsung

PDAs: Sharp, Psion, Ectaco, Casio, Datalogic, Palm, Socket, Opticon

Mobile Handsets: Apple, HTC, LG, Garmin, Nokia, RIM, Samsung, SonyEricsson

Smartphones: Apple, Asus, HP, Nokia, Palm, Samsung, SonyEricsson, LG

GPS Chipsets: Broadcom, Atheros, TI, Atheros, SiGE, eRide, Qualcomm, Meditek, CSR, SiRF (CSR), Infineon, U-blox

Voice Technologies: SVox, Nuance, AT&T, Cepstral, NeoSpeech, Get TTS

Content

Static Content – Information which does not get updated frequently. Generally free as part of overall service.
ATMs; Hospitals; Cinemas; Restaurants; Parking; Petrol Stations
DasÖrtliche; Yellow Pages

Dynamic Content – Fee based or advertising funded information which gets updated frequently
Fuel Prices; Weather; Event Information; Traffic information; Restaurant ratings; Booking information
INRIX; FORECA

Location Database – A location database passively tracks your location. Unlike a 'Location Directory', process is automatic.
GPS; Skyhook Wireless; Loki; MSN Direct

Payment Facilitators
Payments for LBS services can be processed according to the available subscriber access method, value and subscriber requirement lead time.

Carrier Billing – Billing of purchases direct to an existing subscriber account (vodafone, verizon)

Payment Processors – Payment clearing networks with direct customer relationship (MasterCard, VISA)

Payment Networks – Secure mobile payment processing as a gateway to financial institutions (LUUP)

Location Directories & APIs
An application programming interface (API) is a set of routines, data structures, object classes and/or protocols provided by libraries and/or operating system services in order to support the building of applications. Location APIs provide best estimate of the user's position using a number of sources.

OVI, brightkite, Xtify, fire eagle, Spime, Google Code

Examples of APIs: Map tile rendering; Aerial imagery rendering; Vector map streaming; Routing/Dynamic routing; Vector map streaming

Digital Imaging
Satellite and aerial digital images add richness to consumer mapping and navigation services and are essential for many commercial applications.

DigitalGlobe; Google

Digital Maps
Digital map data is key content for navigation services and some other location based services. The consumer digital maps market is controlled by a duopoly, Navteq and TeleAtlas who are owned by Nokia and TomTom respectively, and provide worldwide road based mapping. Smaller suppliers exist and thrive within niche or remote markets.

Commercial Maps: NAVTEQ, Tele Atlas

Open Source: Open Street Map, opencellid

Specialists: AND, Intermap, Navionics

Possible LBS Platform players: NOKIA NAVTEQ; TOMTOM Tele Atlas; deCarta & a 'specialist'

LBS Platforms
Existing digital mapping database suppliers will transition to delivering live LBS content to independent Application Developers via service delivery platform API's. New LBS service revenue streams are created, along with a rich ecosystem of 3rd party Application Developers exploiting their specific sector expertise.

Location information

Technology

Technology	
Cell ID	Network based, recognises location by nearest cell
Cell ID++	Akin to Cell ID, smaller cell radius for greater accuracy
E-OTD	Network based, triangulation calculated by receivers
GPS	Handset based, uses relative satellite information
AGPS	Hybrid, uses both GPS and network information
Wix Triangulation	Not widely used, similar in nature to E-OTD
Standalone GPS	GPS operation within a single purpose
Bluetooth	Recognises location by movement through cells
WLAN Triangulation	Not widely used, similar in nature to E-OTD
E A-GPS	Combining GPS, Network and Galileo satellite info.

Mobile: Cell ID; Cell ID++; E-OTD; GPS/ A-GPS; E A-GPS

Fixed and Mobile: WiMAX Triangulation; Standalone GPS; Blue Tooth; WLAN Triangulation

Accuracy – Outdoor | Tailored for indoor

Network Infrastructure
Following the rollout required to by emergency services compliance such as E911 requirements, the rollout of commercial LBS offers new opportunities for cellular location technologies either as assistance or as a fallback option for GPS. The companies below provide solutions in the form of Mobile Location Centres, Position Determining Equipment and Location Enabling Servers.

Ericsson; TCS; NSN; Redknee; Openwave; Polaris Wireless; Andrews; TruePosition; Autodesk

Industry Bodies and Legistlation

- (USA) Federal Trade Commission – USA
- European Commission – European Union
- CTIA: International Association for the Wireless Communication Industry – USA
- FCC: Federal Communications Commission – USA
- Ministry of Internal Affairs and Communications – Japan
- ITU: International Telecoms Union – International
- eadis: European Automotive Digital Innovation Studio – European Union
- National Regulations – By country
- Self Regulation – By company