



ISHTAR Project

LBS R&D Findings and Recommendations for FP7

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Objectives

The main objective of the ISHTAR SSA project is to contribute towards the harmonisation of

- Technologies
- Services / Applications
- Standardisation Efforts

in the field of Location Based Services (LBS).

Moreover, the project aims at facilitating and promoting the exploitation of existing and emerging relevant expertise and practices.



Consortium



WP4: Road-mapping and development of R&D strategy



□ Objectives:

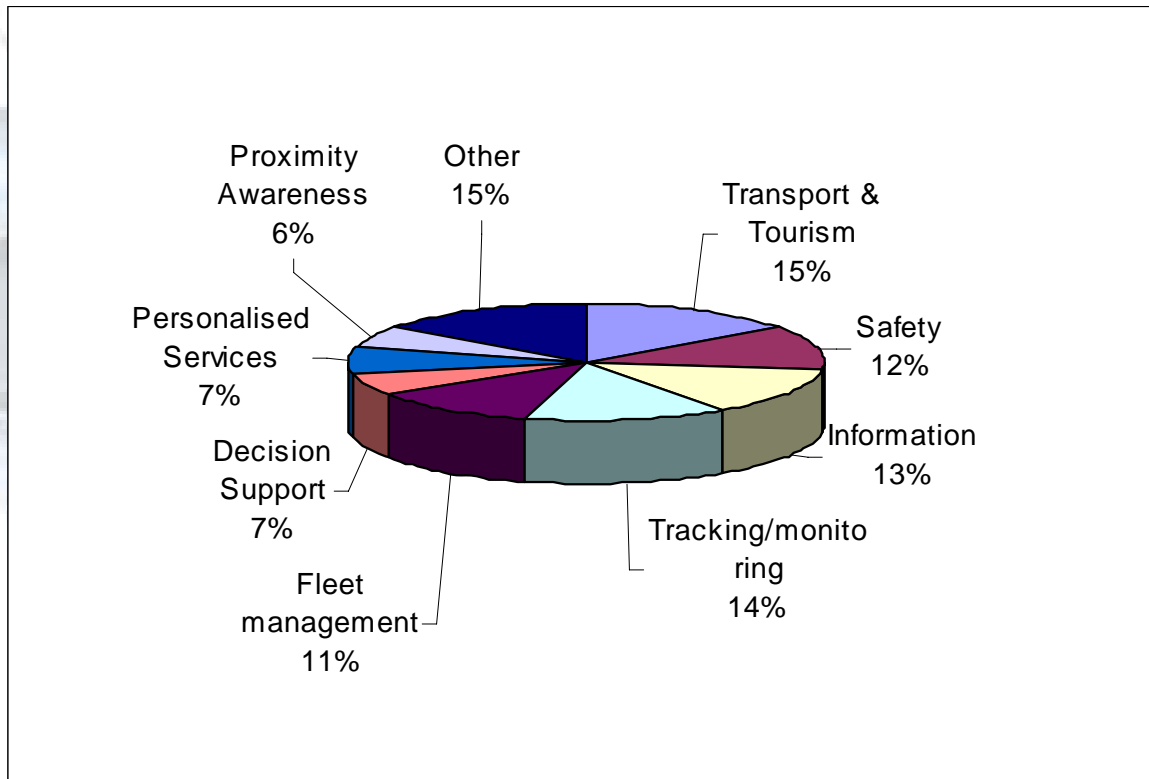
- Perform an extensive survey on SoA technologies related to LBS
- Analyse most promising issues requiring further R&D
- Analyse and evaluate the trends and potentials on representative number of research topics of industrial interest
- Produce the ISHTAR LBS R&D Strategy and Roadmap

European LBS R&D Activities

Application domains	Identified Projects	Projects per telecommunications network that R&D activities relate to	Identified Projects
1. Transport & Tourism	HIGHWAY, MAPPED, VERT, ISMAEL, IM@GINE-IT, SCORE, RFWT&R	1. GSM	POMPEI, EU-Domain, MobileIN, SCORE, RFWT&R, LIAISON
2. Billing			
3. Safety	HIGHWAY, POMPEI, ISMAEL, SHARE, SCORE, RFWT&R, LIAISON	2. GPRS	POMPEI, MAPPED, VERT, IM@GINE-IT, MobileIN, SCORE, RFWT&R, LIAISON
4. Information	POMPEI, VERT, IM@GINE-IT, SHARE, MobileIN, SCORE	3. UMTS	HIGHWAY, POMPEI, IM@GINE-IT, SHARE, LIAISON
5. Tracking, monitoring	POMPEI, VERT, ISMAEL, EU-Domain, SCORE, LIAISON	4. CDMA	POMPEI
6. Fleet management	VERT, ISMAEL, SHARE, SCORE, RFWT&R, LIAISON	5. EDGE	
7. Proximity awareness	POMPEI, MobileIN	6. Broadband/DAB/S-DAB	POMPEI
8. Personalised Services	IM@GINE-IT, MobileIN	7. Internet	POMPEI, MAPPED, VERT, IM@GINE-IT, MobileIN, WIN, SCORE, RFWT&R
9. Decision support	POMPEI, ISMAEL, EU-Domain, SHARE, LIAISON	8. WLAN	POMPEI, IM@GINE-IT, SHARE, MobileIN
10. Ambient Intelligence	EU-Domain, MobileIN	9. Fixed Telephony	MobileIN
11. Health Services	EU-Domain	10. Short-range wireless (UWB, Bluetooth etc)	POMPEI, EU-Domain
12. Elderly & Disabled	MAPPED	11. Satellite	VERT
13. Emergency Services		12. TETRA	LIAISON
14. Maintenance	EU-Domain, LIAISON	13. LAN	ISMAEL
15. Air Traffic Management			

European LBS R&D Activities

□ R&D Activities per LBS Application Domain



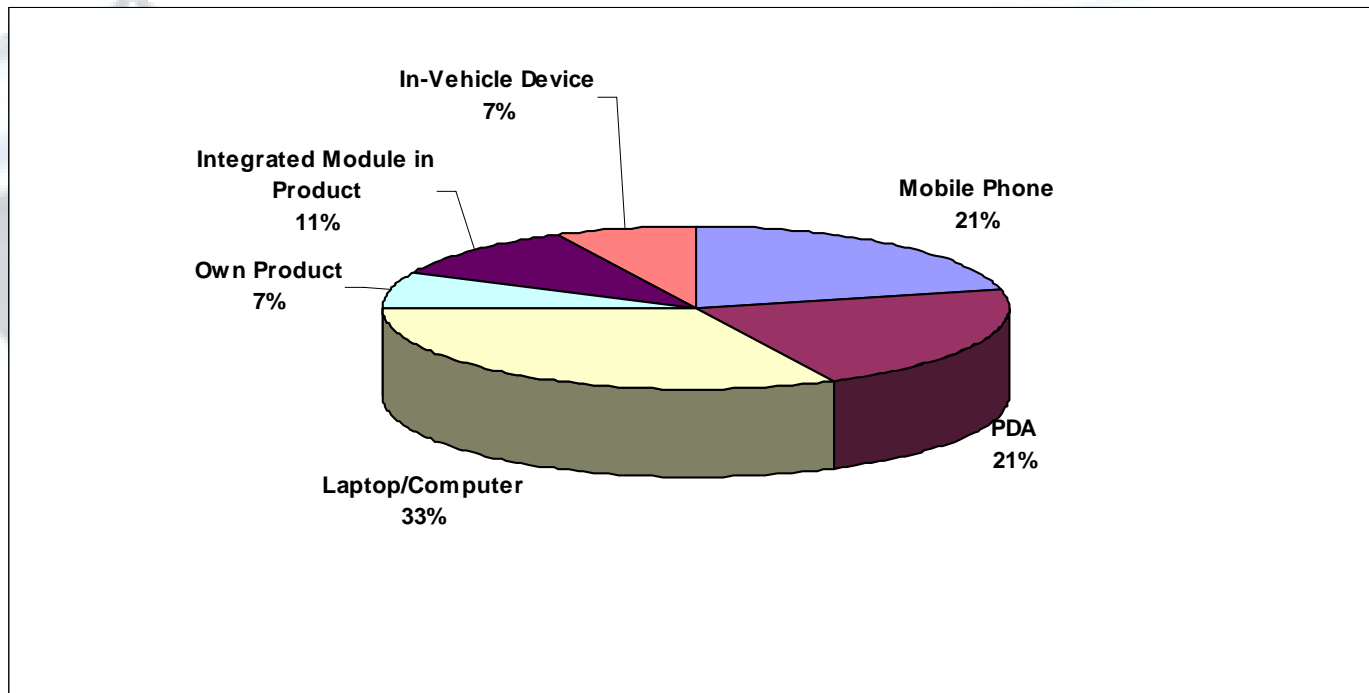
Competing Location Techniques

	Outdoor Cellbased			Outdoor GPS based			Indoor			
	Cell ID Cell ID ++	Uplink ToA	EOTD	GPS	A-GPS	Enhanced A-GPS	WiFi	WiFi Finger Printing	MEMS	Enhanced A-GPS
Accuracy										
Network related costs										
Time to first Fix										

Legend: very good good average poor bad

European LBS R&D Activities

- Terminal Equipment for LBS services provision utilised in EU R&D activities

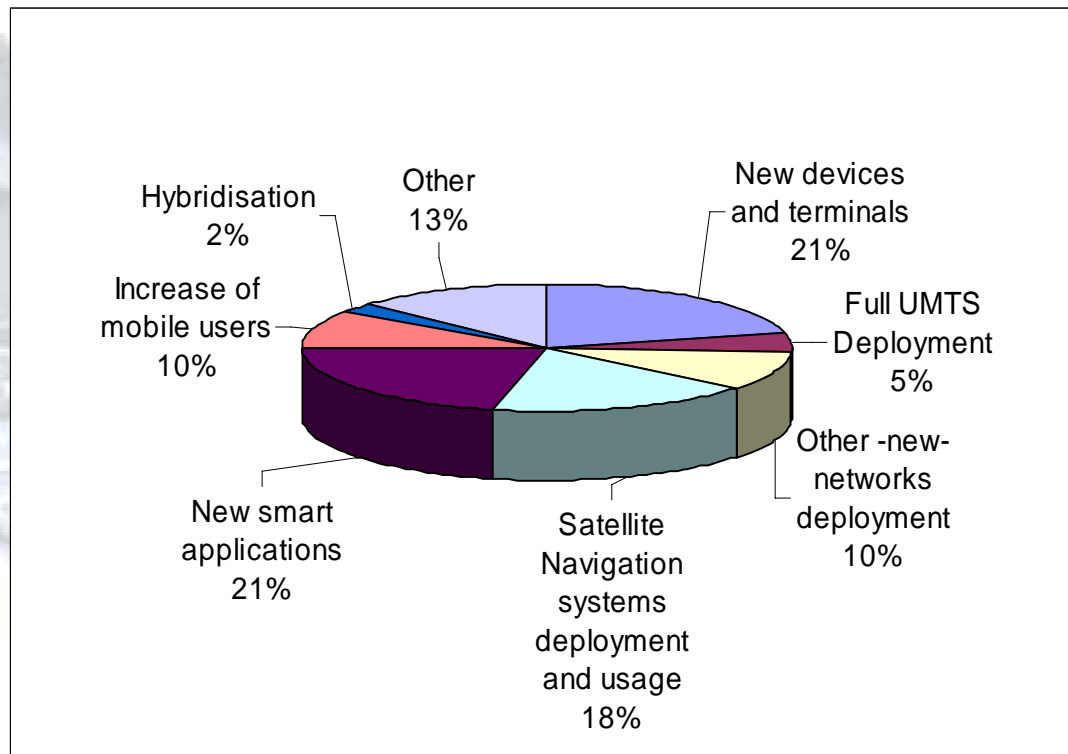


Barriers to LBS deployment

- Low Accuracy
 - Current technology only tens of metres to a few hundred metres – except emerging A-GPS devices (<10m)
- Privacy Issues
 - Fear of tracking, control, misuse of information
 - Need for strong user authorisation and feedback to user of positioning information
- Mobile devices with limited capabilities
 - Few handsets with advanced location capabilities
 - Usability issues with handset (screen size, data inputs,...)
- Interoperability between Telcos
 - No simple way of exchange of location information (contractual issues between Telcos)
- Roll-out costs for operators
- Complexity of LBS value chain, low coordination of LBS players

WP4 Results

□ Top LBS Future Market Drivers



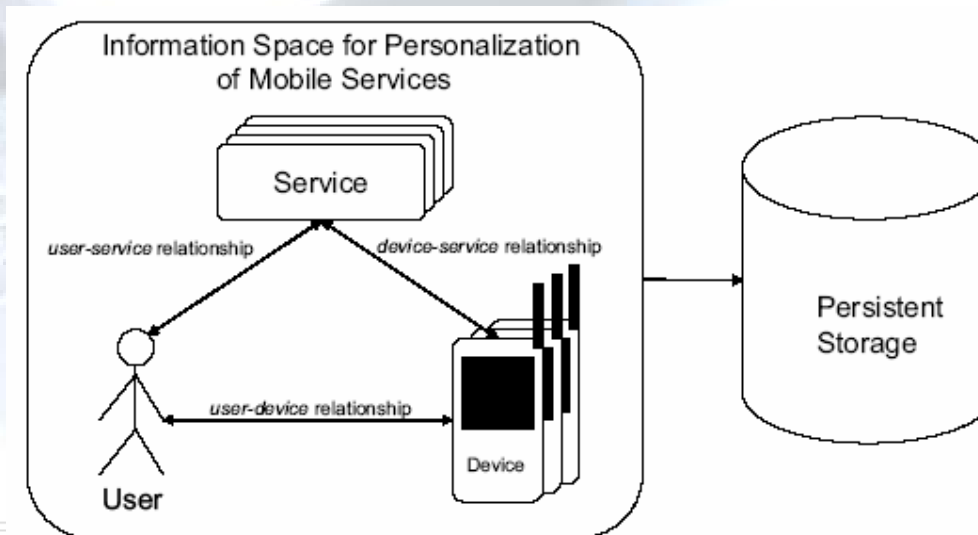
WP4: Identified Research Issues - Findings

- Research Issues for FP7
 - Personalisation
 - Content Availability & Quality
 - Content Adaptation
 - Continuous Location Provision (service availability)
- Other Issues:
 - Interoperability (roaming, services)
 - Mobile Devices (few integrated solutions)
 - Customer Usability (ease of use)
 - Privacy & Security (user awareness)

not to be considered for FP7 from a technological point of view

Personalisation

- “Personalisation of a service means that mechanisms exist to allow a user U to adapt, or produce, a service A to fit user U 's particular needs, and that after such personalisation, all subsequent service rendering by service A towards user U is changed accordingly.”



Personalisation

- Most wireless services are still built in an “one-size-fits-all” manner
- Service Personalisation \neq Service Parameterisation
- Recommendations for further research:
 - Service Creation API's (e.g. OMA)
 - User Profiles (3GPP GUP et al.)
 - Language Ontologies (W3C OWL/RDF,...)
 - Service Platforms (e.g. OSGi Service Platform)

Content Availability

Content Quality

- Quality of Map Content builds upon
 - Availability – Exhaustiveness - Correctness
- Map Quality is defined by
 - ISO 14825, ISO 19113, ISO 19114, ISO 19133
 - ISO/CD TS 19138
- Open Issues:
 - More Content to be offered by interfacing heterogeneous databases
 - Direct integration of content offered by public authorities into map providers database
 - More specialised content, e.g. enlarge map outside road network for pedestrian use

Content Adaptation

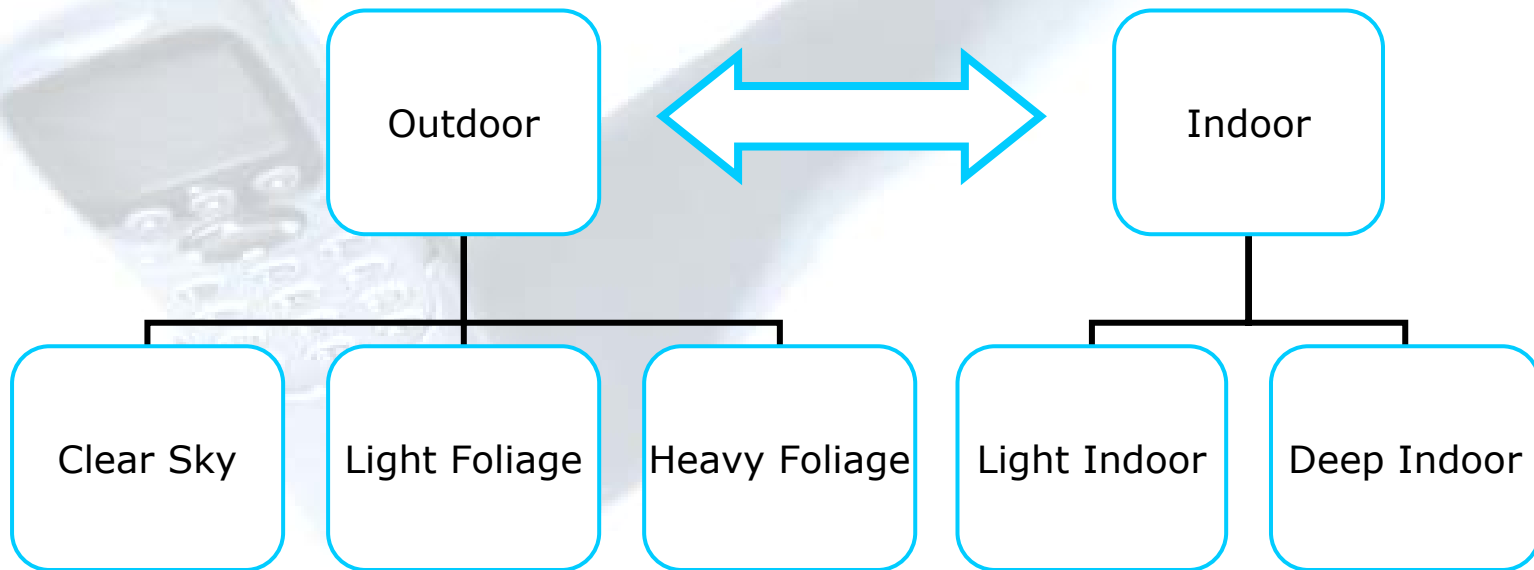
- Adaptation is the process of selecting, generating or modifying content (text, images, audio and video) to suit the user's computing environment and usage context
- Adaptation can be done by
 - Client
 - Proxy
 - Server Side (XML, XSLT)

Content Adaptation

- Research is necessary:
 - Architectural issues
 - Transcoding issues
 - Content categorisation
 - Device related issues
 - User modelling
 - Quality issues

Continuous Location Provision

- Continuous location provision consists in being able to provide the location of a mobile User wherever the User might be



Continuous Location Provision

□ Open Issues

- Wifi Fingerprinting
Comparison of signal strengths received from different Access points -> needs a-priori maps of the location
- Wifi/UWB Triangulation
based on triangulation techniques using Wifi or UWB signals. Issues: short range of signals, need to know location of Access points in advance. UWB is not fully standardised
- MEMS (Micro Electro Mechanical Systems)
high component costs, suffers from degradation of performances in time due to integration algorithms, still R&D

A white mobile phone is shown in a three-quarter view, tilted upwards. It has a small screen at the top and a keypad below. A long antenna extends from the top. The phone is set against a light blue background with a soft shadow cast to its right.

Questions?