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Exploitation plan

Abstract. **A description on how LIAISON partners will exploit the final results of the project is provided.**

We have sorted out two classes of results: (i) based, laying on the research stage and the individual contribution of each involved partner; (ii) composed, that is the final results for the LIAISON turn key system to offer added value services (tracking, messaging, location functionalities, etc).

The exploitation of the results of LIAISON by the project members is twofold: (i) promotion of the concept and of the general results, and (ii) the exploitation of the products and services.
After identifying the exploitable results of each partner involved in the LIAISON project, we provide the exploitation strategy of the consortium; to do that we have used the models proposed by the Business Plan document D050 to envisage a big company (*virtual enterprise*), composed by the collaboration of all the partners, which is able to optimise the exploitation role of each partner and commercialise the LIAISON system in all its components.
Through a number of activities LIAISON consortium will strengthen its high connection to a number of major European projects and collaborations with other industrial companies. Further, a consistent importance will be given to the contribution and development of new standards and regulations in the LBS sector.

I. Introduction

In the framework of the LIAISON project the exploitable results during the last years of the project as well as after the project and the role of the partners in this task have been analysed .

We have sorted out two classes of results: (i) based, laying on the research stage and the individual contribution of each involved partner, (ii) composed, that is the final results for the LIAISON turn key system to offer added value services (tracking, messaging, location functionalities, etc).

The exploitation of the results of LIAISON by the project members is twofold: (i) promotion of the concept and of the general results, and (ii) the exploitation of the products and services. In particular, we can divide the organizations that participated in LIAISON on one side partners that have real exploitation of the products or services as core business, on the other, academic partners that can exploit their own results only by patents and royalties.

II. EXPLOITABLE RESULTS

Analysing the work within LIAISON, we have sorted out two major categories for the exploitable results:

- **Based exploitable results**: this class regroups all the individual product/service sorted out by research and development activity;
- **Composed exploitable results**: in this second category, we have identified a final list of exploitable results built starting from the based class and finalized to the LIAISON turn-key system.

II.I BASED EXPLOITABLE RESULT

This categories collects all the base component outgoing from the research and development phase.

Based on the current status of LIAISON research stage, the exploitable result list is the following:

- New indoor localisation technique
- Indoor/outdoor high sensitive localization
- New GIS visualisation application
- Customised billing service
- Customised profiling
- New GIS application
- New indoor map formats
- Sensor emergency assistance
- Heterogeneous network LBS architecture
- New optimisation algorithm for ad-Hoc configuration

II.II COMPOSED EXPLOITABLE RESULT

This category represents the exploitable results for the LIAISON turn-key system. We can divided it in four main classes:

- LIAISON mobile device
  - Navigation
  - Tracking
  - Messaging
  - GIS Block

- Location block
- Service layer

- Location server
- LBS Platform
- RCC

III. EXPLOITATION BY INDUSTRIAL AND SME PARTNERS

III.I AAS Strategy of exploitation

AAS strategy is to address different markets:

- Target 1. Telecommunication Operators: AAS sells Location Server offering location management and Assisted GPS data procurement over GSM/GPRS/UMTS network.
- Target 2. Professional markets (maintenance, utilities, security…).

III.II. FTRD Strategy of exploitation

FTRD will use the studies carried out in the LIAISON framework in order to propose to its customers a positioning service based on the WiFi technology. This service will be introduced in the professional market first (hospitals, etc.).
Hybridisation with other sensors contained in the mobile terminal will be used to enhance the quality of the positioning. Some inertial navigation sensors start being introduced in mobile phones and, combining them with the WiFi technology, will increase the accuracy.

III.III ENTEOS Strategy of exploitation

Enteos exploitation results from Liaison Project: LMT platform. At the end of the Liaison project Enteos will reuse the LMT platform to develop a family of products for the LBS market.

They foreseen at least two potential market segments for the usage of LMT:

1. professional users working under "normal" condition (i.e. lonely workers)
2. professional users working under extreme or severe conditions (i.e. fire-brigade, police...).

Considering the market perspectives, reasonable price and products cost (even if some of the costs are not yet defined, like other partners deliverable parts and relevant fees) we can safely estimate up to 10.000 devices to be sold in the first two years of deployment.

III.IV GEOCONCEPT Strategy of exploitation

GeoConcept strategy on the LBS sector will be the commercial deployment of GIS software components for any type of services which need performances and accuracies to display and interact with maps.
GeoConcept exploitation strategy of the LIAISON results includes the following points:

- Setting the best technical requirements to deploy a commercial LBS GIS component platform (client and server).
- Considering new platforms of development (like mobile terminal) for supporting LBS architecture.
- Benchmarking LBS Client and Server platform.
- Identifying Business Model issues related to LBS services and contents

III.V MAGDALENE Strategy of exploitation

TETRA is currently deployed globally by many Public Safety (Police, Fire & Ambulance), Transportation and Utility companies. With special regards to Public Safety using TETRA as a bearer service, personal location and vehicle location are becoming more than a mandatory requirement from a health and safety point of view as well as to maintain and improve operational efficiency.
Personal location relies heavily on the use of GPS and although this technology is being more and more deployed it is subject to performance limitations i.e. time to first fix, location accuracy and availability issues i.e. urban canyon and indoor use.

Assuming that performance improvements can be realized with LIAISON, many of the issues with GPS today can be improved whilst still using TETRA and its limited data capabilities.
3D enhancements regarding user interfaces can be equally exploited especially in the “indoor” scenarios.

III.VI MGIS Strategy of exploitation

MGIS supplies software components to application developers. Mobile GIS will develop the visualization software components to allow 3D models in the “3D-4D Modelling Services” task to be embedded in other applications. MGIS shall deliver a module portable to LMTs and uploadable on the RCC workstation.

MobileGIS will create simulation capable 3D models of buildings and other structures that integrate with the 2D road network and other content i.e. PoIs.

III.VII NAVTEQ Strategy of exploitation

They will define the cost-effective methodology to enable efficient site mapping. Research will be done to find the most efficient way of using existing data to

map a site, minimizing the work on site, which is highly costly.
The work will include the definition of a test site and preparation of an integrated test site map database, combining a traditional shape 2D centreline road map database with navigable 3D maps of objects. Specific issues to be studied are indoor navigation model and integration of outdoor with indoor models. NAVTEQ will provide a complete site database for the Italian test site including the road network and building footprint.

III.VII VODAFONE Strategy of exploitation

Vodafone's exploitation strategy on the LBS sector will be the commercial deployment of services.
Vodafone exploitation strategy of the LIAISON project results include the following:

- Specification of the roadmap in terms of network architecture towards the commercial deployment of LBS applications.
- Investigation on the integration issues regarding the introduction of Location Based Services over the existing Service Layer.
- Exploring the mobile terminal's requirements for supporting LBS in comparison with the existing and future terminals.
- Identifying Business Model issues related to LBS services and content delivery combined with LBS.
- Explore new market opportunities based on professional users of LBS (e.g. ToD, Fire Brigade).

III.IX TPZ Strategy of exploitation

Telespazio is interested in the LBS service provisioning in particular in the LIAISON context for the emergency assistance as well as route guidance application. Those new capabilities will be integrated in the "Infomobility Service Platform", a framework already existing and working in the LBS market sector.
The addressed market is that related to National and European professional/institutional users (like Fire Brigade, Police, Emergency workers and so on).

The short-term strategy should concentrate on carrying out a market validation activity with preferred customers while the mid term strategy will consist in related services provision at European as well as worldwide potential markets.

IV. EXPLOITATION BY ACADEMIC PARTNERS

IV.I EPFL Strategy of exploitation

EPFL will use the results from LIAISON as follows:

- Transfer of technology to industry.
- Sharing of knowledge in scientific networks.
- Sharing of results with user communities.

IV.II UoA Strategy of exploitation

UoA may supply the CAB and Profile management SW modules for 3rd and 4th generation systems to operators and service providers through the UoA framework for industry collaboration (encompassing spin-offs, subcontracting activities, contracts for long-term collaborations).

UoA foresees collaboration with operators and service providers for the customisation and product development of CAB and Profile Management solutions for Location based services developed in LIAISON.

IV.II UPC Strategy of exploitation

UPC will use the results obtained in the research phase as follows:

- transfer of technology to operators, service providers and manufacturers in Spain.
- inclusion of the knowledge acquired and last advances on WLAN location in the several Master courses in which UPC participates.
- Sharing of knowledge in scientific networks.

V. BUSINESS MODELS

In the preview sections we have identified the exploitable results of each partner involved in the LIAISON project. In this section we will provide exploitation strategy of the consortium, to do that we have used the models proposed by the Business Plan D050 document to sketch a big company (*virtual enterprise*), composed by the collaboration of all the partners, which is able to optimize the exploitation role of each partner and commercialise the LIAISON system in all its component.

The models proposed by D050 document are:

- *The Network operator centric model*
- *The Service/content aggregator centric model*
- *The Service/content aggregator centric model*

The Network operator centric model plans that the subscriber has to come into agreement with an operator, which is responsible to provide its customers with telecommunication and value added services

offered by any of the involved players. In this model the network operator incorporates the service/content aggregator role and is also responsible for collecting charging information and generates a single bill for all charges incurred.
Service aggregation is fulfilled by the Network Operator

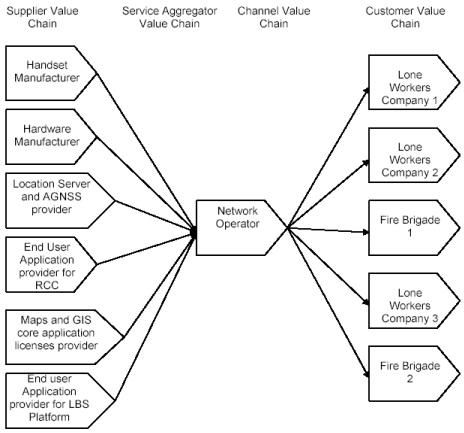

Figure 1: Network operator centric model

The Service/content aggregator centric model:
On the base of this model the service/content aggregator is responsible for provision to its subscribers with its advanced services (lookup service, terminal capabilities negotiation, etc.) and access to content and services offered by independent providers. The subscriber contracts with the service/content aggregator and with a network provider but for service execution the service/content aggregator defines the prices, collects the charging information and charges the subscriber for the transport part as well as for the service and content parts. Another option would be the network operator to charge separately the subscriber for the transport part but this is not compatible with the One-stop billing requirement. The apportioning of revenues between the network provider, the service/content provider and the service/content aggregator is performed by the previous based on their commercial agreements.

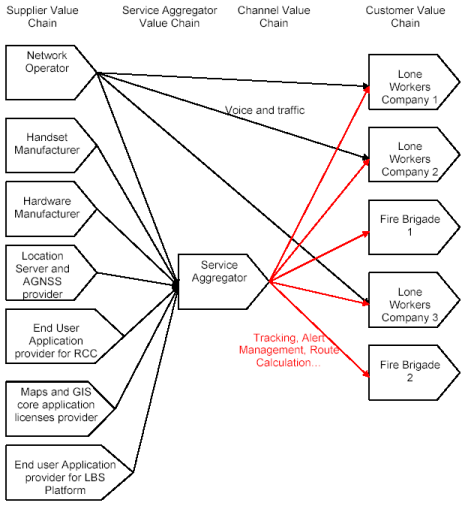

Figure 2: The Service/content aggregator centric model

The Service/content provider centric model comes directly into agreement with a network provider for delivering its content and services. This model is similar with the service/content aggregator centric model but in this case the service/content provider takes up the service/content aggregator role. Taking into consideration the difficulties introduced by the billing process in case of the usage based charging model and the necessity of a subscription with each service/content provider, this model can be adopted only in parallel with another one in case of the most popular services.

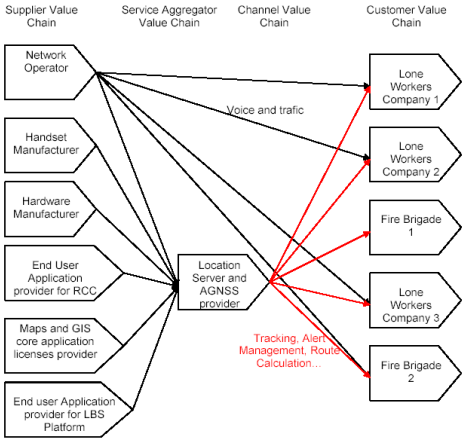

Figure 3: Service/content provider centric model

VI. TEST CASES APPLICABILITY

In the following sub-sections we will explain which is the test cases applicability of the business models and we will propose some examples of hypothetic 'big company', composed by the collaboration of all the partner, that is able to commercialise the results of the LIAISON project.

We will analyse two environments of application for the LIAISON system: indoor and outdoor localisation.

VI.I NETWORK OPERATOR CENTRIC MODEL

Applied to LIAISON context, the Network Operator Centric Business Model would mean a unique actor faced to the subscriber. The network operator role would be to:

- provision of LIAISON handsets to subscribers;
- operation of multi-technical networks (GSM, GPRS, satellite, Wi-Fi, radio…);
- ensure the service delivery (rent or buy location servers, LBS Platform, band..);
- charge and bill the final subscriber for service usage and service availability.

An application of this model for the indoor localization is represented in the following figure:

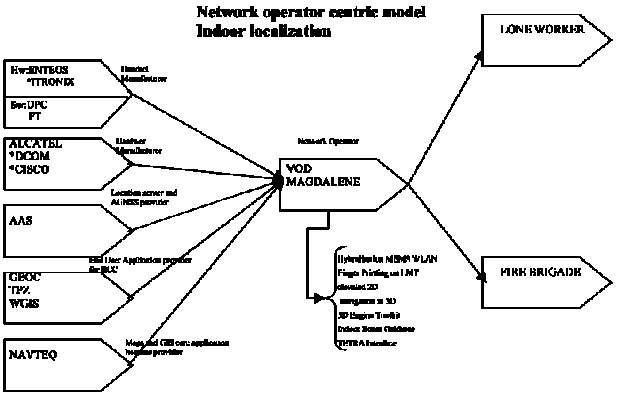

Figure 4: indoor localisation with NOCM

* We have identified also the possible partner that could be involved in the LIAISON project.

This model is characterized by simplicity for subscriber, and cheap solution but the needed capacity of the centric protagonist to aggregate, produce and sell services and content could create some problems, in fact:

- big critical size requires small customers to be provided with standard solutions (risk if customers are too different from studied cases (TDF or Italian fire brigades)
- big size means fewer actors, means less competition in the market (oligopolistic market vs. full competition).

VI.II SERVICE CONTENT AGGREGATOR CENTRIC MODEL

The Service aggregator in LIAISON market would be in charge of:

- collecting maps for location and route calculation requests,
- coordinating location information between the LBS Platform, Location server owner, Network operator (for cell id),
- sending information to subscriber and user
- potentially ensuring for the subscriber the role of outsourced remote control centre, providing operators and intervention capacities linked to security and information system.

In this model the lone worker company is subscribed to a service/content aggregator in order to provide its employees advanced services and valuable content. Definitely, the company should have subscription with the service/content aggregator and with a network operator but for service execution the service/content aggregator defines the prices, collects the charging information and charges the lone worker company for the transport part as well as for the service and content parts.

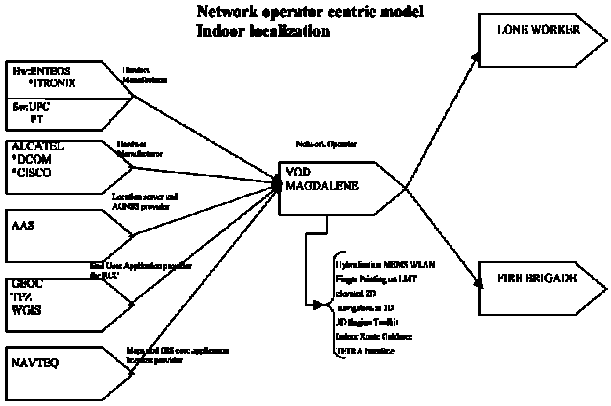

Figure 5: *outdoor localisation with SCACM*

This is a solution all inclusive that means simplicity for subscribers. The centric operator doesn't need to be big sized as in the network operator centric system and the centric aggregator can deal with several NO.
The weaknesses are due to the fact that this model creates one more level in LIAISON value chain system that means increased prices.

VI.III SERVICE CONTENT PROVIDER CENTRIC MODEL

This model could apply only on some especially popular services and in parallel with one of the previous subscription models. The lone worker company has a subscription with a service/content provider, which incorporates the roles of service/content aggregator and billing and payment provider.

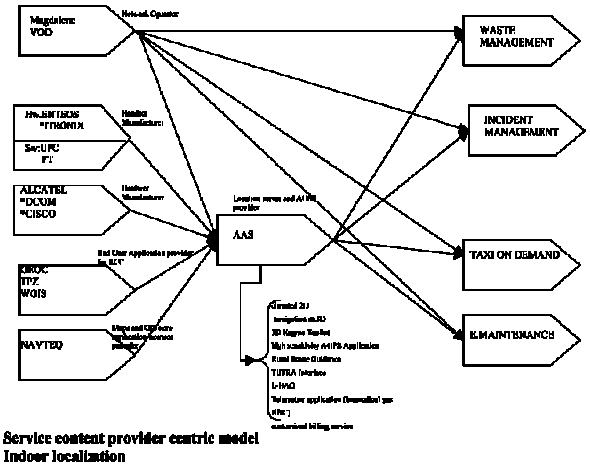

Figure6: indoor localisation with SCPCM

This model is characterized by:

- Big sized subscribers that have the capacity of treat or re-treat services provided (LBS data…)
- One less level in the value chain (less revenue sharing means cheaper solution or more profitable business)
- Intervention of smaller market player (increased competition)
- Dealing of Service Provider with several Network Operators (larger amount of potential customers)

The service content provider centric model is not an all inclusive solution and needs a choice on the dominant service.

VII. CONCLUSIONS AND FUTURE PLANS

Through a number of activities, described below, LIAISON consortium will strengthen its high connection to a number of major European projects and collaborations with other industrial companies. Further, a consistent importance will be given to the contribution and development of new standards and regulations in the LBS sector.

The following actions will be taken to ensure as global as possible usage of LIAISON solution:

- *Creation of the awareness of the LIAISON tools in world wide LBS market segment*: the technology and products developed within LIAISON project address a new added value services for professional workers. It's a strong pre-requisite to create the awareness about the existence of this new market segment and its benefits. The objective is on the one hand to convince the user communities inside the consortium to explore and adopt the new capabilities; on the other hand to make pragmatic technology followers aware of this new domain and products. The consortium to achieve this goal, will make use of its international marketing and distribution channels. Through the participation to major exhibitions and workshop in the LBS sector events and other direct marketing activities as well as indirect marketing, many users communities will be aware about the technology and its benefits.

- *Collaboration with other 6th Framework projects*: LIAISON is already collaborating mainly with the ISTHAR project but also with Airnet, Network4Value, LEGAL-IST, GST, AGILE, EUROPCOM, ASK-IT and SCORE projects. Interaction and synergies were and will be taken in place in order to investigate whether we are able to satisfy the needs of the user communities of these projects. LIAISON endeavours not to duplicate or reproduce other technologies developed in Europe or elsewhere, but to develop common interfaces and eventually improve tools and services developed everywhere in the context of 6th Framework.

- *Collaboration with governmental bodies*: the great advantages concerning safety offered by the LIAISON technology are worth to be presented to some Governmental bodies, both at political level, in order to get interest and good impact on future regulations, and among some operative forces like Civil Protection, Fire Brigade, Police. For these reasons the communication will be addressed to the following representative Target Groups: Ministries of Internal Affairs, Telecommunication, Research, Environment, Defence of the various countries involved in the project; among these, some offices/departments related to Security, Emergency, Civil Protection, TLC, Scientific Innovation, Defence for the different countries will be properly selected. The same for Central bodies like federal associations, mobile workers organizations. EU Parliament and Lobbyists are also included in this Target Group.

- *Collaboration with external industrial companies*: particular attention is and will be given to the partnership with industrial companies external to the consortium but leader in its own market segment. In this way the result sorted out from LIAISON activity will be exploit directly using already existing market channels. As an example, it has been reached a commercial agreement with Draeger company, leader in the safety and emergency sector, with the scope to exploit the new telemetric emergency assistance application in the safety market sector.

- *Two workshops organization*: two workshops will be organised by LIAISON. The first workshop is foreseen next 27th September 2006 and will be taken place in Athens. The second will be at the end of the beta phase, in May 2007. The aim of these exploitation activities is both scientific and commercial which will allow users and interested public to experiment directly the LIAISON technology. Dedicated sessions will be about LBS market and in particular about potential commercialisation of LIAISON exploitable results.

- *Contribution to standards*: a number of different standards related to location technologies exist today. LIAISON is collaborating with OMA, TETRA, Open GIS, WLAN and UWB standardisation groups in order to contribute with potential opportunities to some relevant standardisation bodies. Due to the large number of standardisation groups that are concerned and that are investigated, recommendations are presented to cover and answers concerns related to the overall architecture recommended for LIAISON, interfaces, protocols, privacy, positioning methods, terminal durability and interoperability aspects.

- *Contribution to regulation*: concerning the regulation part one important finding resides in the announcement of support of eCall capability for all vehicles from 2009 (2010 Models). This has significance for the LIAISON project as a number of the identified scenarios within the project will utilize vehicles that have been manufactured within the European Union. Clear if vehicles will have these devices fitted as standard from 2009 this will affect the communication mediums that could be available for those scenarios requiring eCall. Concerning emergency devices no specific regulation exists like those being developed by LIAISON. The main reason for this is that such standards can be defined end enforced for specific applications only when devices are consolidated and available. Specific (or "vertical") norms may be specified for specific applications (e.g. garages, heat generators, subways…) at country or regional level. Sometimes, special regulations are applied to complete systems ("special systems"), like emergency devices. Currently, this is not the case for Indoor Emergency Communications & LBS Systems, therefore, only general regulations have to be taken into account for the development of the LIAISON devices and systems. The knowledge developed during the design and testing will then represent the basis for a proposal of a standard in such applications. In the other hand, this early phase of the deployment of Location Based Services is developing into a rather "regulation-free" environment. Notwithstanding, some regulations exist and several future concerns can be easily guessed from now. Provided that such social worries could bring to specific and restrictive regulations, it is necessary to clearly identify the major concerns so as to anticipate and – if possible - modify such regulations.

- *Adoption of standards*: the aim of this task is to aggregate the existing standards and regulations in order to extrapolate their near future development so as to release consolidated recommendations for making the necessary technological choices for the LIAISON solution design as meaningful and coherent as possible in close coordination with LBS regulation frameworks. Even though the LIAISON solution is specifically focused on customised emergency services for workers communities, the perspective is to cover much larger field of view over the regulation framework. This is the only way to assure the usability of the related advanced location technologies in a larger mass market framework.

VIII. REFERENCES

Annex I - "Description of Work"
D050 Business Model Issue 2
D099 Exploitation Plan