A European Community of SMEs built on Environmental Digital Content and Languages

D4.3: smeSpire Business Model Report

Work package	WP4 - TRANSFER
Task	T4.3: smeSpire Business Model
Deliverable number	D4.3
Dissemination level	PU
Version/Status	1.1/Final
Deliverable Author(s)	Umberto Di Staso (FG), Giacomo Martirano (EPSIT)
Contributor(s)	
Due date	30/04/2014
Actual delivery date	23/05/2014

This project
is funded by the European Union
under the grant n. 296307

This project
is funded by the European Union
under the grant n. 296307

1 Document change log

Version	Date	Changed by	Changed Sections	Changes made
0.1	08.04.2014	Umberto Di Staso (FG)	All	Document Created
0.2	09.04.2014	Umberto Di Staso (FG)	Section 5	Content Updated
0.3	10.04.2014	Umberto Di Staso (FG)	Section 5	Content Updated
0.4	17.04.2014	Umberto Di Staso (FG)	Annex A	Added Annex A
0.5	18.04.2014	Umberto Di Staso (FG)	Introduction, Section 5, Annex A	Content reviewed
1.0	21.05.2014	Giacomo Martirano (EPSIT)	Section 4, 6	Content added
1.1	23.05.2014	Giacomo Martirano (EPSIT)	Section 3, 4, 6	Content reviewed

This project
is funded by the European Union
under the grant n. 296307

2 Acronyms and abbreviations

Abbreviation	Name
ASA	Average Speed to Answer
BM	Business Model
BPC	Best Practice Catalogue
CIP	Community Initiatives Program
DoW	Document of Work
EC	European Commission
EU	European Union
GIS	Geographic Information System
ICT	Information and Communication Technology
INSPIRE	Infrastructure for Spatial Information in Europe
ISA	Interoperability Solutions for European Public Administrations
LMO	Legally Mandate Organisation
PSP	Policy Support Program
SDI	Spatial Data Infrastructure
SLA	Service Level Agreement
SLO	Service Level Objective
SME	Small and Medium Enterprise
TAT	Turn Around Time
TED	Tenders Electronic Daily
TSF	Time Service Factor
WP	Work Package

3 Introduction

This deliverable contains two main sections:

- Section 4, in which a Business Model canvas is proposed and the different components analyzed in the subsections 4.x, with different level of detail.
- Section 5, containing guidelines for the definition of a SLA for all the geo-ICT Small and Medium Enterprises involved in the business of web service provider, not only INSPIRE-related but, in general, related to any type of Spatial Data Infrastructure. In Annex A a practical example of how the main parts of the SLA have to be filled-in by the involved Parties is provided.

It's to be pointed out that the most reliable information needed to analyze some of the business model components has been provided by the deliverable "D1.3 – Final study (on the Geo-ICT sector in Europe) report".

4 The smeSpire Business Model

4.1 The business model canvas

According to the definition that "A business model describes the rationale of how an organization creates, delivers and captures value", in the smeSpire project a Business Model canvas is proposed, aiming at offering to already established and new geo-ICT SMEs a structured approach to build their business model, enabling them to convert technological innovation which is inside the INSPIRE implementation process into economic value.

A Business model canvas (from www.businessmodelgeneration.com) has been identified as working tool and its 9 building blocks (or components) are shown in the Figure 1 and analyzed, with different level of detail, in the following subsections.

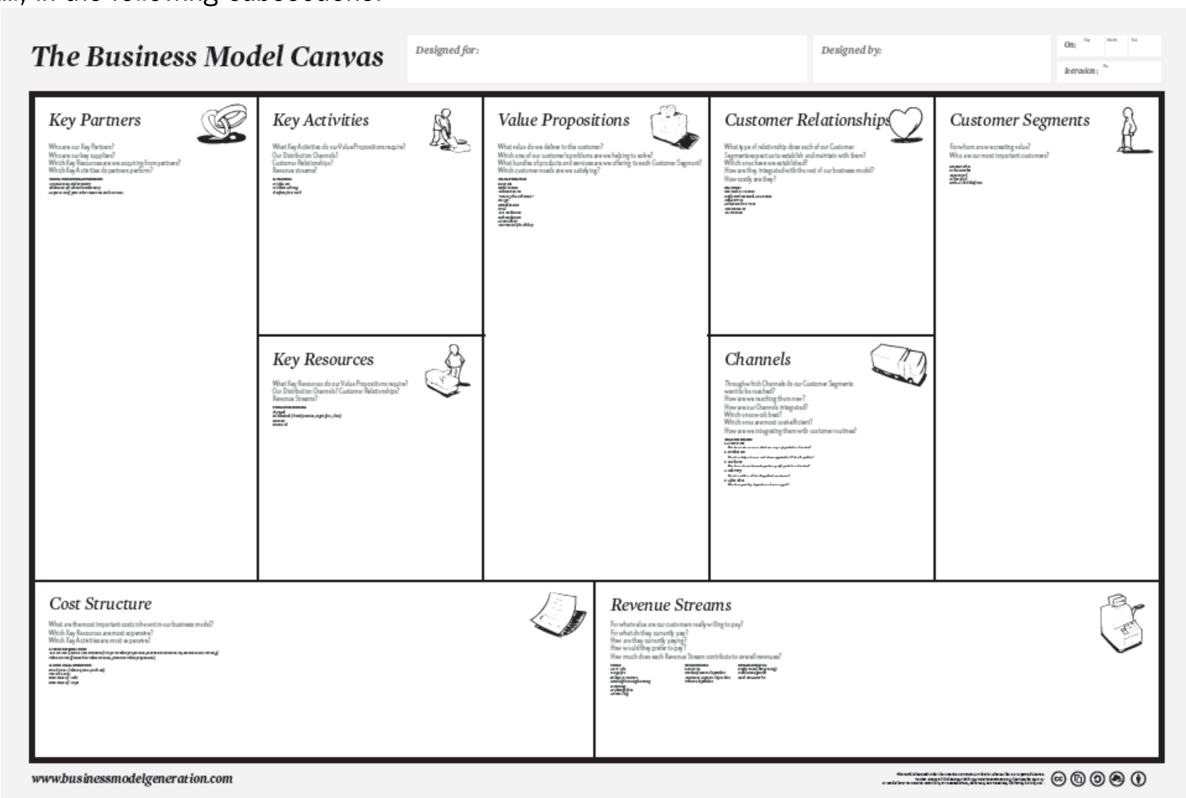
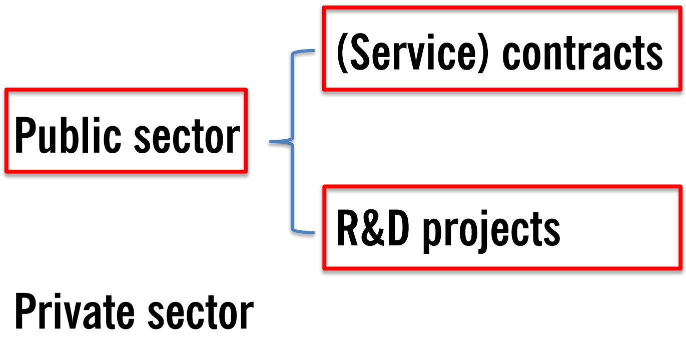


Figure 1 – The Business Model canvas and its 9 building blocks

This project is funded by the European Union under the grant n. 296307

4.2 Revenue streams

Initial work in relation to the definition of a Business Model has been based on the study and analysis of the public funds put at disposal of the European geo-ICT sector.This activity fits in the context of a deep market research to gather information about the current role and perspectives of Small and Medium Enterprises in the framework of EU financial instruments and initiatives.
In this respect, the Business Model component “Revenue Streams” has been analyzed, in order to reply to the question “Where does the money come from?”
Two sub-streams have been identified and analysed: the public sector money used to award Service contracts and the budget allocated by European Commission to fund R&D projects.



4.2.1 Service Contracts

The data source was the TED database (European public procurement journal Tenders Electronic Daily), where information about service contracts above 200.000 € is mandatorily published and below this threshold is optionally published.

The following query parameters have been used to retrieve the required information:

- Type of documents: award contract notice
- Keywords (within the whole documentation): INSPIRE, SDI, Geoportal, GIS

From a methodological point of view, each record (contract) returned by the query was manually inspected and analyzed, sometimes having the necessity to go into the details of the free text contract description, in order to ensure the relevance of the data retrieved with the scope of the analysis (for instance, thanks to this manual inspection, few records reporting contracts awarded to a company whose name was “INSPIRE” but whose field of activity was building construction, and initially retrieved by the query, have been filtered out).

At the end of this analysis, the search extended to the 7 years period 2007-2013 resulted in 621 contracts awarded for a total value of 627 M€.

In the following table 1 and figures 2, 3 and 4 the number, the total value and the average value of contracts per country are shown respectively.

For the case of Poland, it’s to be highlighted that in the TED are published contracts of any value, even well below the threshold of 200.000 €.

This project
is funded by the European Union
under the grant n. 296307

Country	N° of Contracts	Total value of contracts (€)	Average value of contracts (M€)
AT	2	€ 749.922	€ 0,4
BE	11	€ 4.133.698	€ 0,4
BG	6	€ 2.826.016	€ 0,5
CH	2	€ 6.114.686	€ 3,1
CY	2	€ 706.760	€ 0,4
CZ	26	€ 7.699.176	€ 0,3
DE	27	€ 19.584.602	€ 0,7
DK	13	€ 15.169.711	€ 1,2
EE	5	€ 1.070.389	€ 0,2
ES	12	€ 31.004.409	€ 2,6
FR	21	€ 3.932.278	€ 0,2
GR	4	€ 2.591.861	€ 0,6
HR	2	€ 308.949	€ 0,2
HU	1	€ 483.804	€ 0,5
IE	12	€ 5.921.400	€ 0,5
IT	36	€ 32.703.241	€ 0,9
LT	49	€ 9.675.076	€ 0,2
LU	6	€ 16.628.780	€ 2,8
MT	2	€ 360.000	€ 0,2
NL	1	€ 205.000	€ 0,2
NO	3	€ 782.371	€ 0,3
PL	307	€ 203.949.103	€ 0,7
RO	23	€ 24.080.186	€ 1,0
RS	1	€ 247.400	€ 0,2
SE	1	€ 208.926	€ 0,2
SI	5	€ 4.634.698	€ 0,9
SK	24	€ 47.382.470	€ 2,0
UK	17	€ 183.713.091	€ 10,8
	621	€ 626.868.002	

Table 1 – Information on contracts per country

This project
is funded by the European Union
under the grant n. 296307

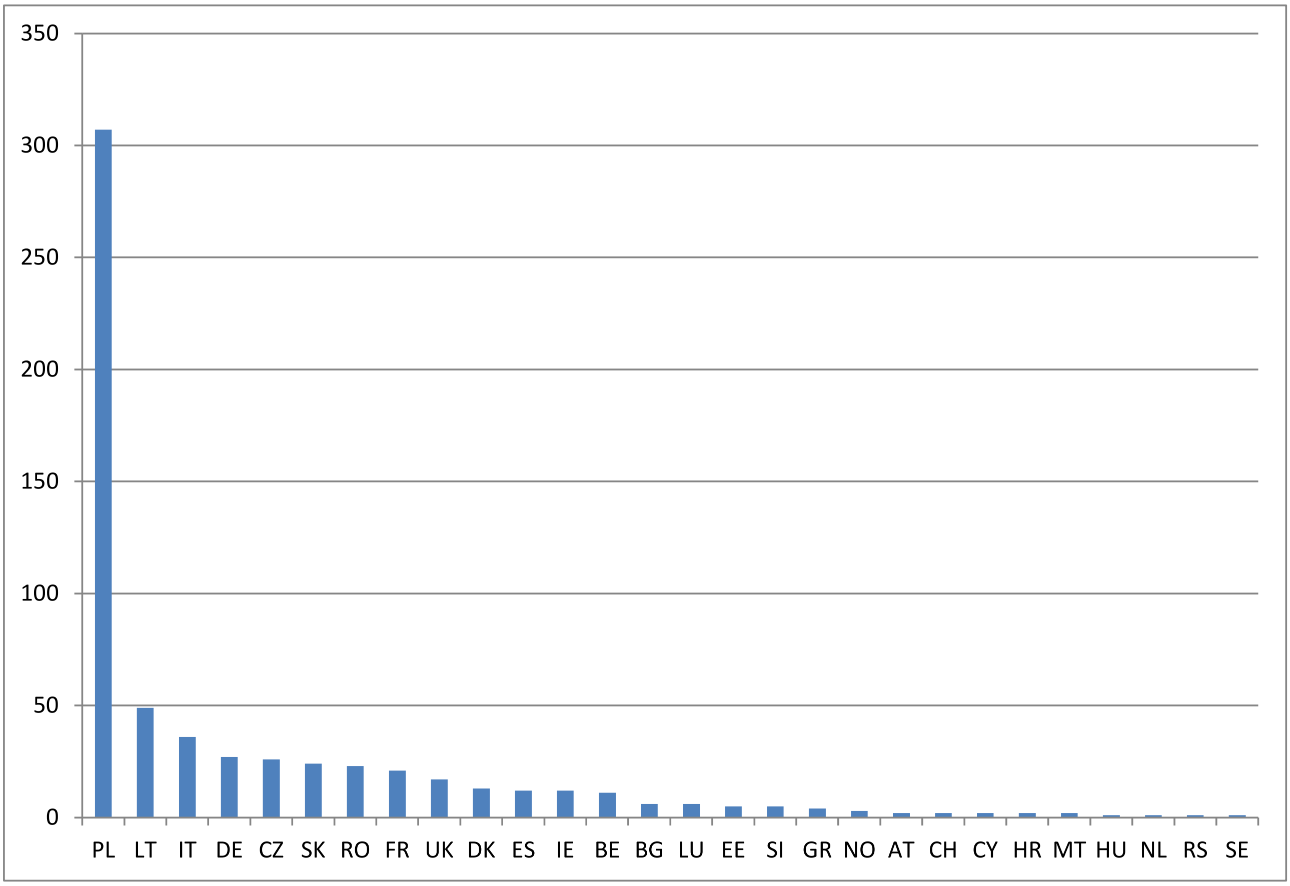


Figure 2 – Number of contracts per country

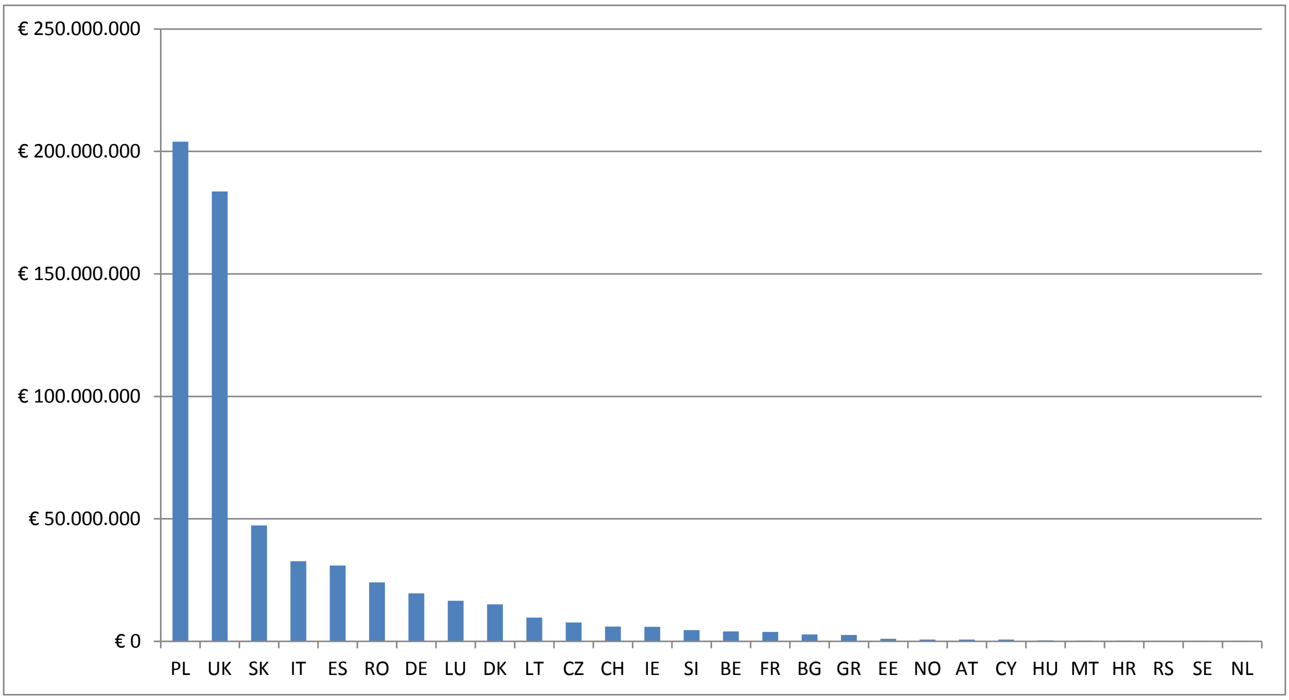


Figure 3 – Total value of contracts per country (€)

This project
is funded by the European Union
under the grant n. 296307

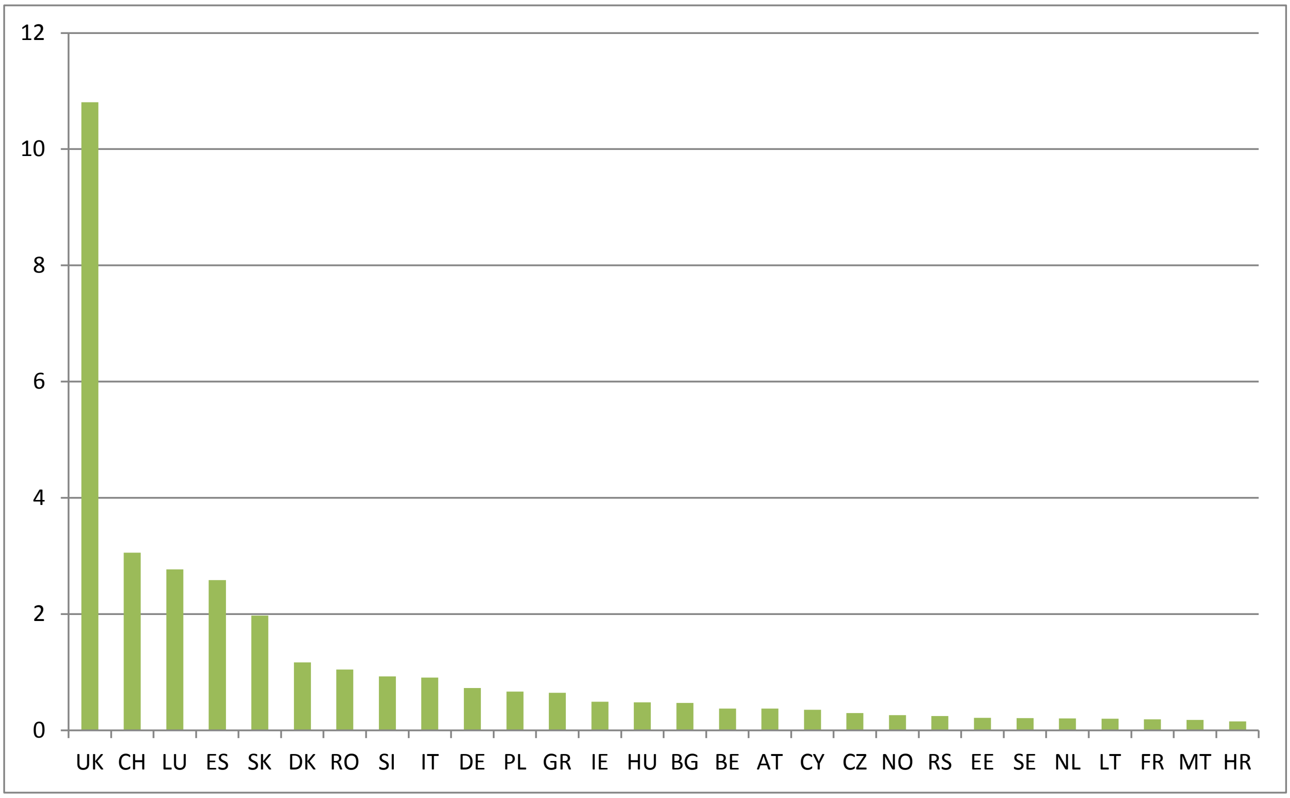


Figure 4 – Average value of contracts per country (M€)

In the figure 5 it is shown the temporal trend of the total yearly value of geo-ICT contracts, highlighting the steep increase in the last two years, even though with a decrease from 2012 to 2013.

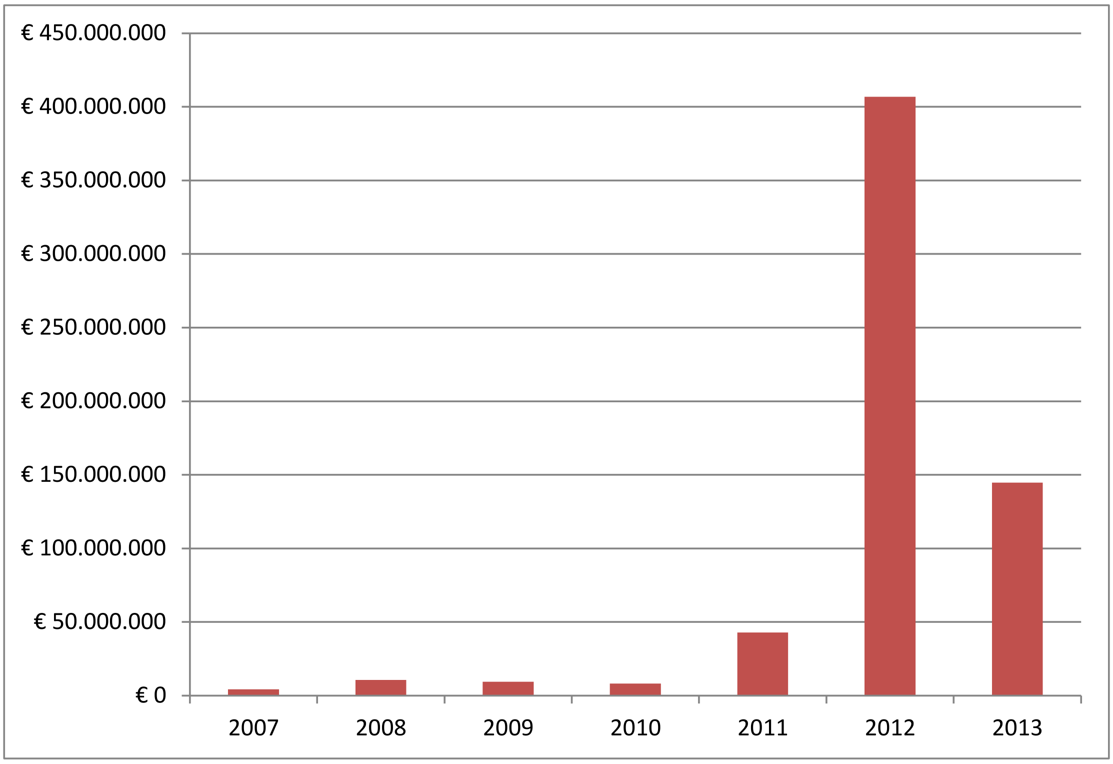


Figure 4 – Temporal trend of geo-ICT contracts

This project is funded by the European Union under the grant n. 296307

Despite the detailed qualitative analysis made on the results of the queries performed, in terms of accuracy of the quantitative information provided in this subsection, it's to be mentioned that it is not assessable the weight of the small contracts, i.e. below the threshold of 200.000 €, which makes optional their publication on the TED (in our case published only by Poland).
The accuracy of the search from a semantic point of view was quite high, because the selected keywords were searched in the full text of the award contract notice.

4.2.2 R&D projects

In this case the data source was the CORDIS database.

The following query parameters have been used to retrieve the required information:

- Keywords: INSPIRE, SDI, GIS, SEIS, GMES

Also in this case each record (project) returned by the query was manually inspected and analyzed, sometimes having the necessity to visit the link of the project website, in order to ensure the relevance of the project with the scope of the analysis.

At the end of this analysis, the search extended to the 12 years period 2002-2013 and restricted to projects funded under 5th, 6th and 7th Framework Programs, resulted in 144 contracts awarded for a total budget of 521 M€ and a total EC funding of 397 M€.

Even though each record contains all the partners belonging to the awarded consortium, in this analysis only the funds given to the coordinator have been analyzed, because the funding breakdown per partner was not available.

In the following figures 5, 6 and 7 and table 2 the number of projects and the total EC funding per coordinating country, as absolute number and as percentage, are shown respectively.

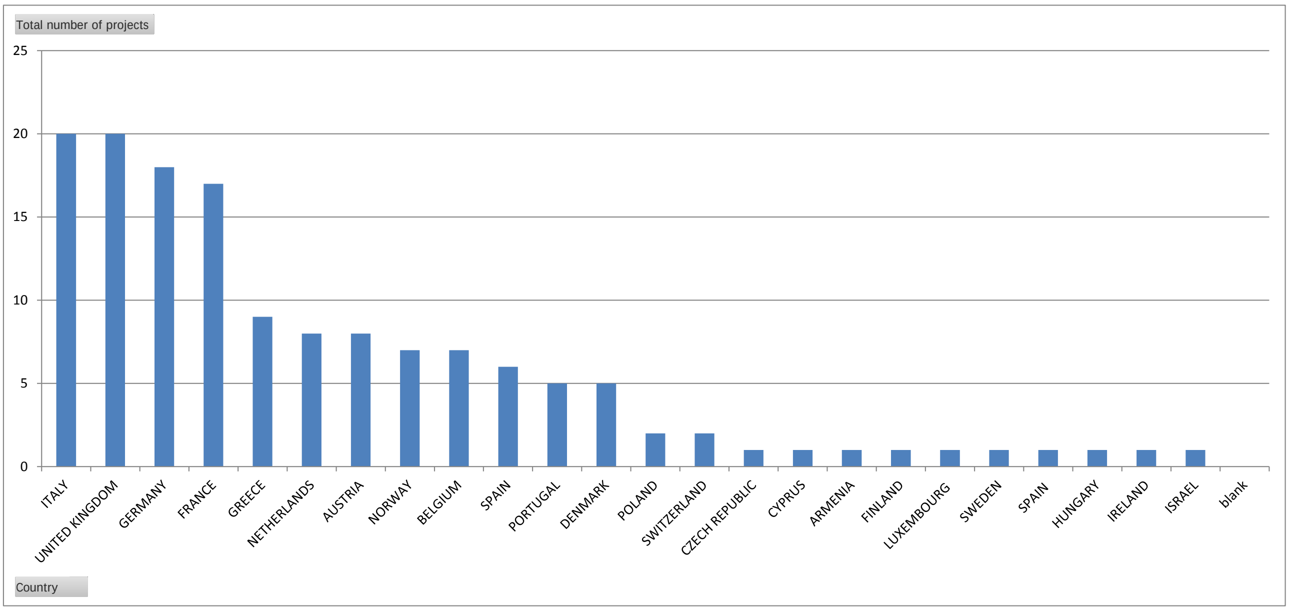


Figure 5 – Number of projects per coordinating country

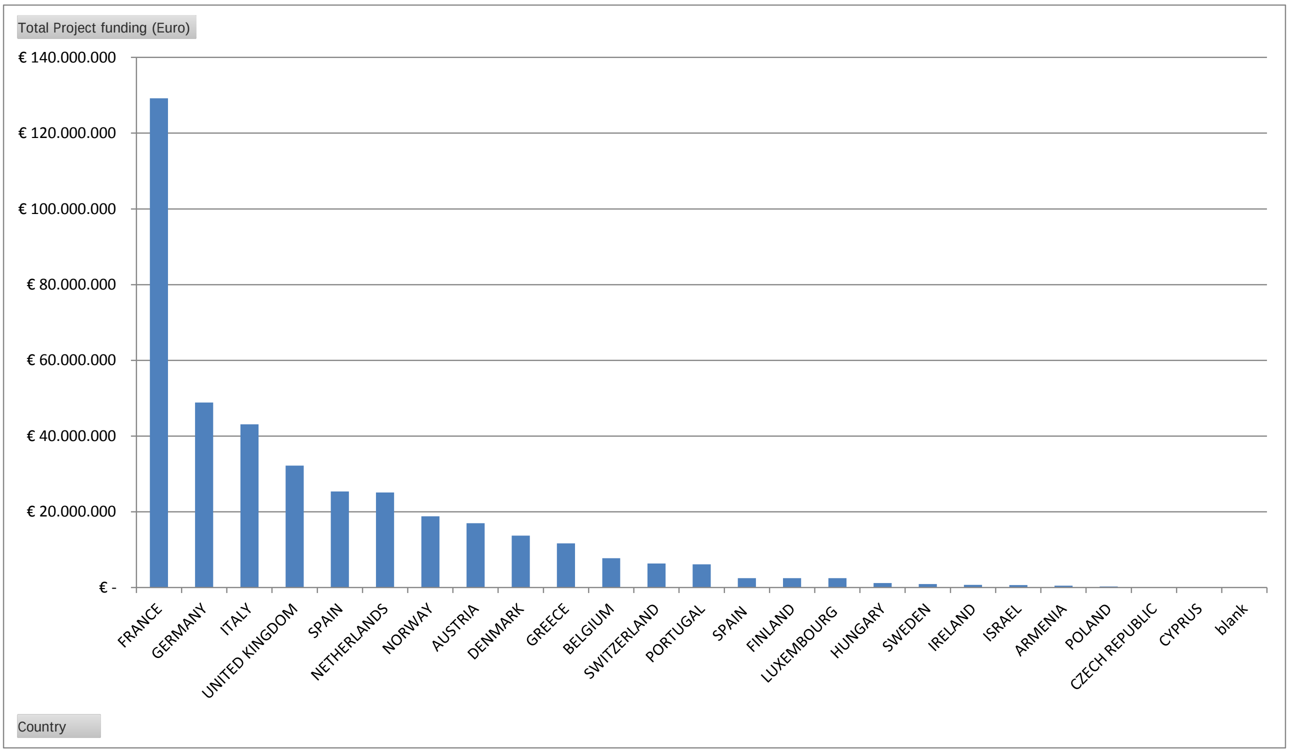


Figure 6 – Total EC funding per coordinating country

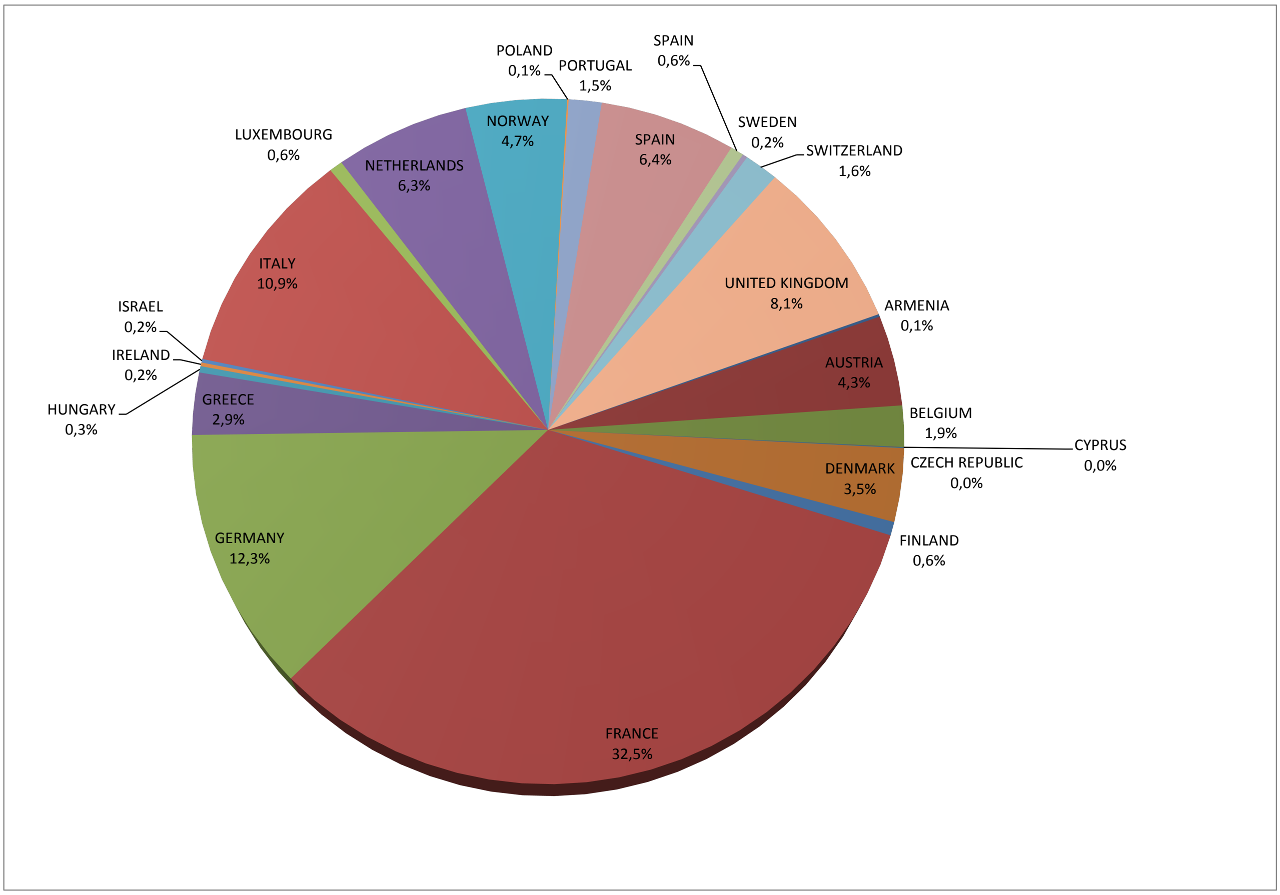


Figure 7 – Distribution of EC funding per coordinating country

This project is funded by the European Union under the grant n. 296307

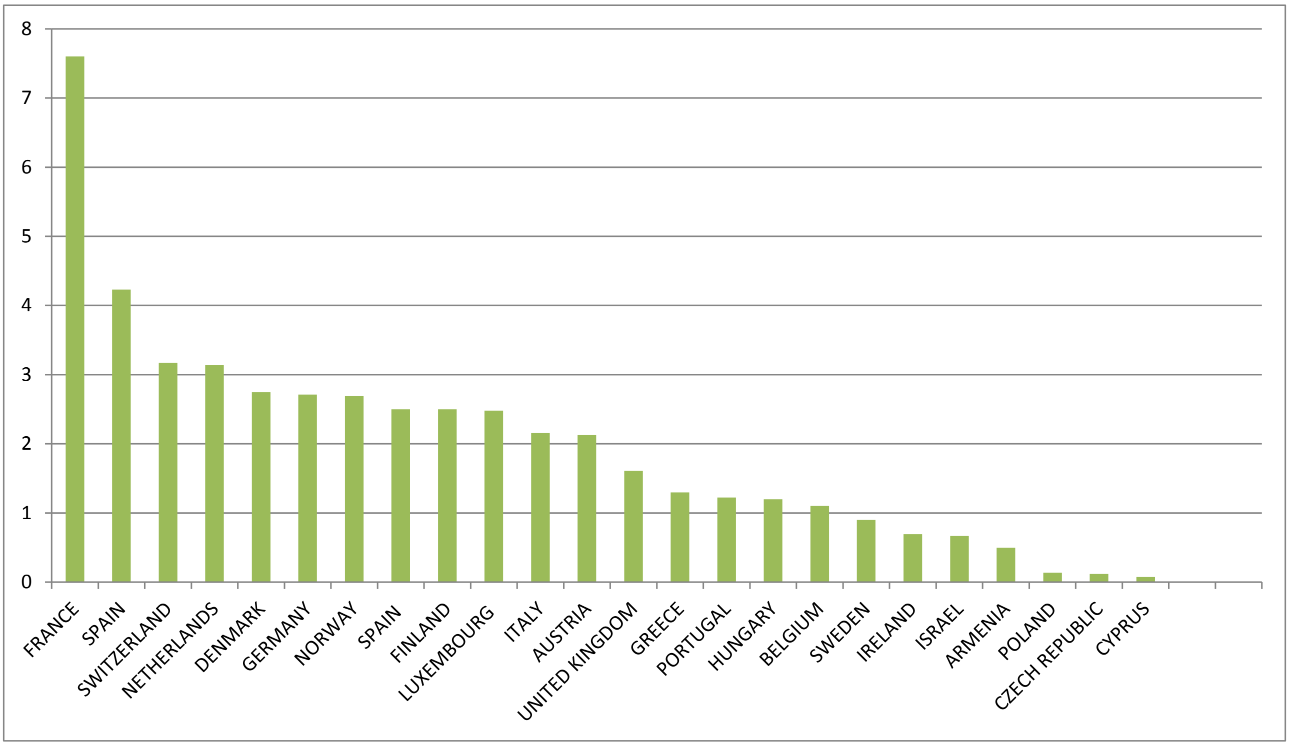


Figure 8 – Average EC funding per project per coordinating country (M€)

Country	Number of projects	Total EC funding (€)	Average EC funding per project (M€)
As coordinator			
ARMENIA	1	€ 499.957	€ 0,5
AUSTRIA	8	€ 17.015.266	€ 2,1
BELGIUM	7	€ 7.728.274	€ 1,1
CYPRUS	1	€ 75.000	€ 0,1
CZECH REPUBLIC	1	€ 120.000	€ 0,1
DENMARK	5	€ 13.720.212	€ 2,7
FINLAND	1	€ 2.499.560	€ 2,5
FRANCE	17	€ 129.228.776	€ 7,6
GERMANY	18	€ 48.860.319	€ 2,7
GREECE	9	€ 11.668.959	€ 1,3
HUNGARY	1	€ 1.199.551	€ 1,2
IRELAND	1	€ 693.508	€ 0,7
ISRAEL	1	€ 670.000	€ 0,7
ITALY	20	€ 43.117.161	€ 2,2
LUXEMBOURG	1	€ 2.481.395	€ 2,5
NETHERLANDS	8	€ 25.110.571	€ 3,1
NORWAY	7	€ 18.821.102	€ 2,7
POLAND	2	€ 272.600	€ 0,1
PORTUGAL	5	€ 6.125.870	€ 1,2
SPAIN	6	€ 25.379.487	€ 4,2
SPAIN	1	€ 2.499.997	€ 2,5
SWEDEN	1	€ 900.000	€ 0,9
SWITZERLAND	2	€ 6.342.574	€ 3,2
UNITED KINGDOM	20	€ 32.210.140	€ 1,6
	144	€ 397.240.279	

Table 2 – Information on R&D projects per coordinating country

This project
is funded by the European Union
under the grant n. 296307

Despite the detailed qualitative analysis made on the results of the queries performed, in terms of accuracy of the quantitative information provided in this subsection, it's to be mentioned that it is not assessable the weight of the other programs different from 5FP, 6FP and 7FP (e.g. CIP like econtentplus, ICT-PSP).
The accuracy of the search from a semantic point of view was slightly lower than in the TED, because the selected keywords were searched in the title and in the descriptive text of the project inserted in the CORDIS, which not always provide a comprehensive description of the project.

4.3 Customer segments

The most reliable information relevant to this component has been taken from the section 4.2.1 "Markets and customers" of the deliverable "D1.3 – Final study (on the Geo-ICT sector in Europe) report", which is completely reported here.

The market level of Geo-ICT companies is mainly sub-national, with almost half of the companies surveyed (46%) indicating their primary market is local, and their secondary market (41%) is national (see figure 9).
182 companies out of the 299 surveyed (61%) are already doing business with other EU countries, mainly as their secondary (79) or tertiary markets (78%).
Extra-EU market is primary only for 14 companies (5%), while 24 is consider it their secondary market (9%) and 50 (30%) consider it a tertiary market.

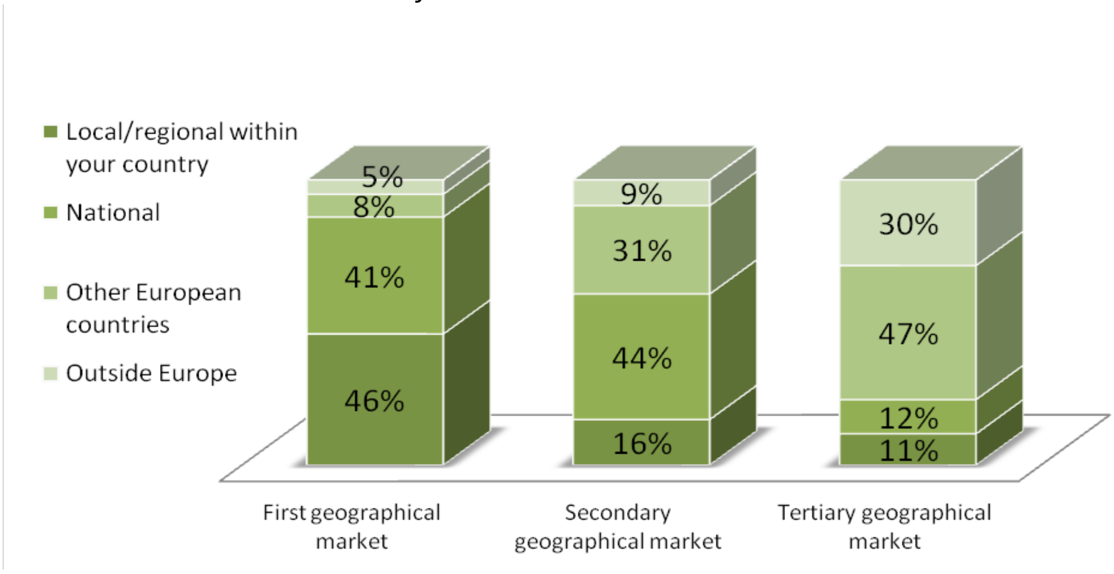


Figure 9 – Geographical markets of Geo-ICT companies

The public sector is the principal customer for Geo-ICT SMEs representing more than half of the business, for 63% of the companies, and between 20% and 49% of the revenue of a further 21% (see figure 10).
The high dependency of Geo-ICT companies on the public sector is a crucial finding of the study, also considering the so-called "*vendor lock-in*"[1] problem: according to a recent Communication of the European Commission (European Commission, 2013c) 16% of procurements is by brand names.

[1] Also known as "*proprietary lock-in*" or "*customer lock-in*", "vendor lock-in happens when customers are made dependent on a specific vendor for products or services, and they are not able to switch to another solution

This project is funded by the European Union under the grant n. 296307

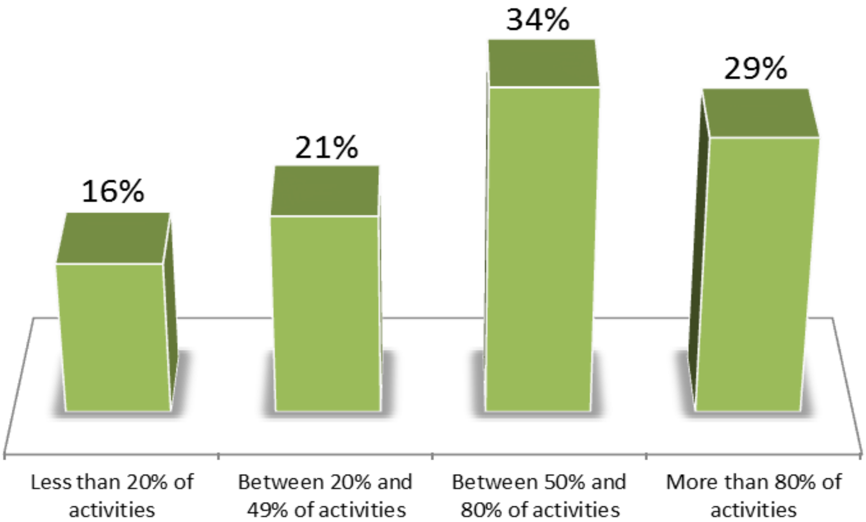


Figure 10 – Public Sector as main customer of Geo-ICT companies

For the large majority of Geo-ICT SMEs (85%) customers are public authorities within the Member State (see figure 11), covering both national and local administrations.

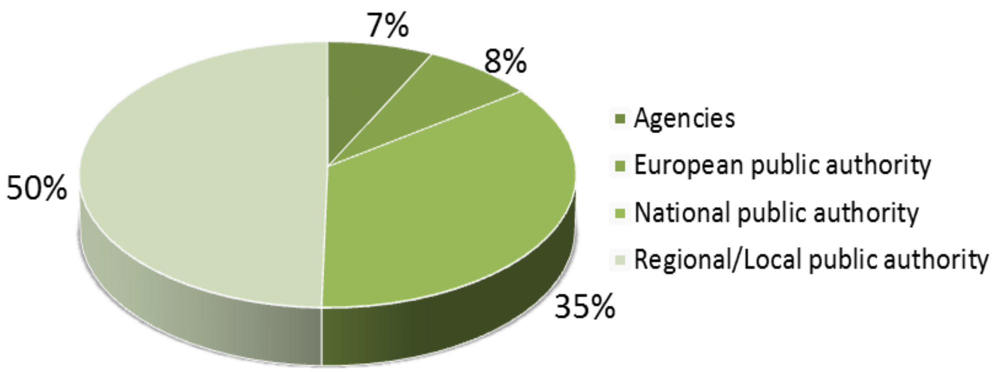


Figure 11 – Type of Public Sector involved as customer

The survey found that public sector customers come from different domains: agriculture, cadastre, environmental monitoring, spatial planning, and transport. Private customers are mainly from building and infrastructure, real estate, telecoms, utilities.
SMEs are engaged through "call for tenders" as well as direct contracts, often for licenses and maintenance: frequently procurements are also managed by private companies on behalf of governments. A significant finding is the considerable use of sub-contracts often involving high-specialized 'micro' companies, with IT or domain skills.
Of course this value varies depending on the size of the company, its market and the type of (geospatial) activities provided.

As a concluding remark, Geo-ICT SMEs are generally involved in markets within their own Member State. The degree of involvement in wider EU business increases with the size of the company. The customer

without substantial costs. European public authorities are estimated to be spending unnecessarily some €1,1billion per year as a result of the restricted number of bidders caused by the reference to brand names.

This project is funded by the European Union under the grant n. 296307

base is significantly skewed to the public sector, covering both local and national public authorities. This is a significant finding from the study. As well as direct contracts, Geo-ICT SMEs are often involved in sub-contracting depending on the degree of specialization of their skills.

4.4 Key activities

Also for this component, the most reliable information has been taken from the deliverable D1.3, in particular from the section 4.2.3 "Geospatial activities", 4.2.4 "Standards and competencies" and 4.3. "INSPIRE and the Private Sector". An excerpt is reported here.

More than half of the companies analyzed base their core business on some "geospatial activities", meaning that more than 80% of their annual turnover comes from products or services strictly related to geographic information; only 30% of them have their business based on different activities, sometimes related to generic IT support or to specific consultancy domains (see figure 12).

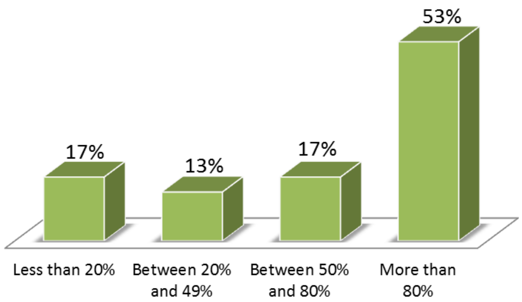


Figure 12 – Turnover from geospatial activities

The "geospatial activities" covered by the smeSpire study were further defined based on the categories described by Castelein W.T. et al. (2010, p.71) and other studies.
These were expanded to consider other activities closer to ICT, like the development and the customization of GI/SDI software components (see figure 13).

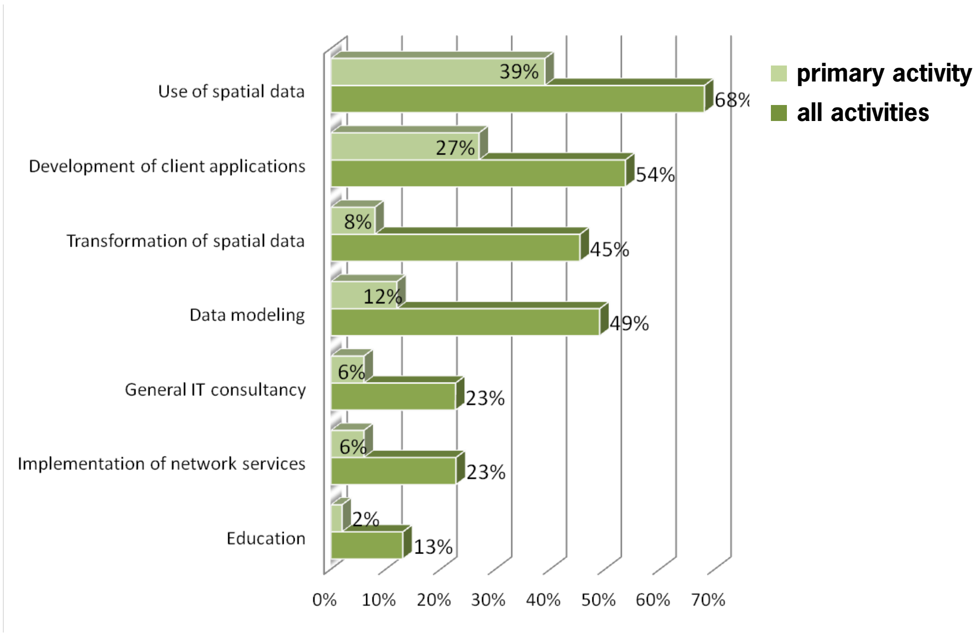


Figure 13 – Geospatial activities

This project is funded by the European Union under the grant n. 296307

It is worth of mention that 86% of the principal activities of Geo-ICT SMEs falls within only 4 categories, with 39% declaring themselves 'users' of spatial data, 27% working in the development of client applications and 20% involved in data modelling and/or transforming.
These findings are reflected throughout the whole activity set (primary, secondary and tertiary)[2] undertaken by companies. The majority (68%) are using data across the span of their activities: the implementation of network services is rather weak (23%) compared to the development of client software (54%), data modelling (49%) and data transformation (45%).
This reflects a pattern of business which combines a range of activities: measuring, collecting and storing geodata together with creating added value services above the data stored or GIS software delivery together with processing, editing and analysing data. In some cases the principal activities are related to data exploitation: they do not actually produce data. In other cases they complete the entire data cycle from creation/collection to exploitation and dissemination, as well as services and development of applications.
Sometimes one activity dominates the others, but their different combination makes company A different from company B.

In terms of ICT competencies, a relatively high percentage of companies indicated themselves to be competent or very competent in Open Source Software (57%) together with the competence about Service Oriented Architecture (48%).

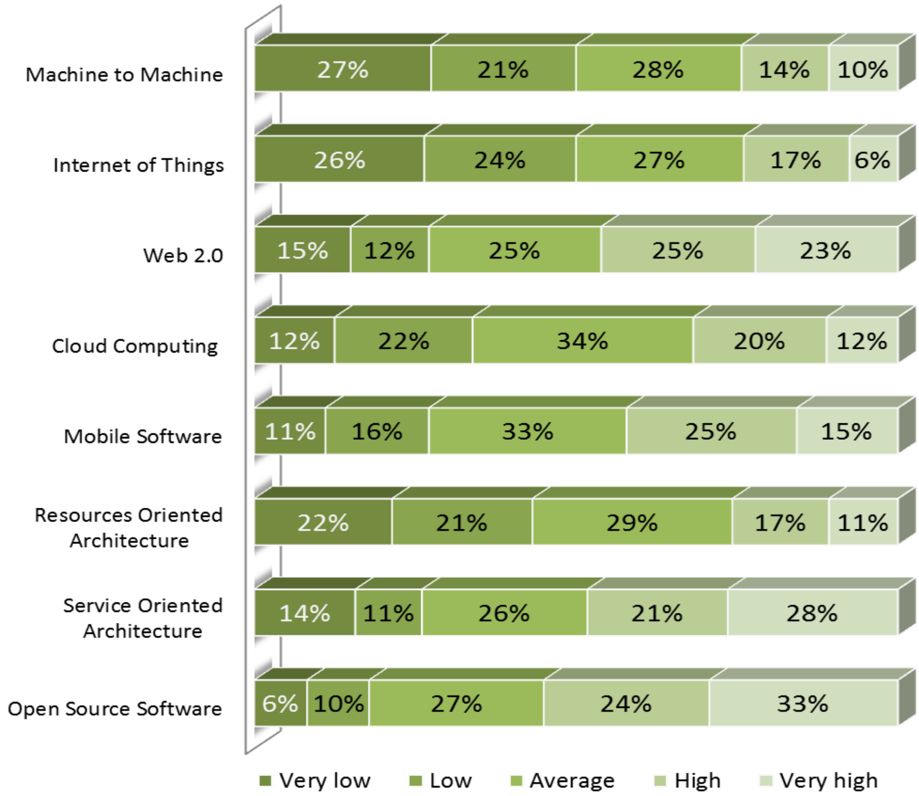


Figure 14 – Familiarity with ICT segments

[2] In the smeSpire survey, the question about "geospatial activities" was structured as "ranking type", to allow respondents to select up to three options and rank them in order of importance. From the point of view of respondents, the activities ranked as "rank 1" are the most important.

This project is funded by the European Union under the grant n. 296307

This reflects the increasing importance of Open Source Software across Europe.

In terms of awareness of and involvement in INSPIRE by the private sector, general awareness of INSPIRE is good, with 69% of the Geo-ICT companies aware of INSPIRE as an overall concept. However, a significant finding is that 31% have no knowledge of INSPIRE at all.
Although the knowledge of general objectives and principles of INSPIRE is generally high, the more detailed regulations about "Data" and "Network services" are less known (see figure 15 and table 3).

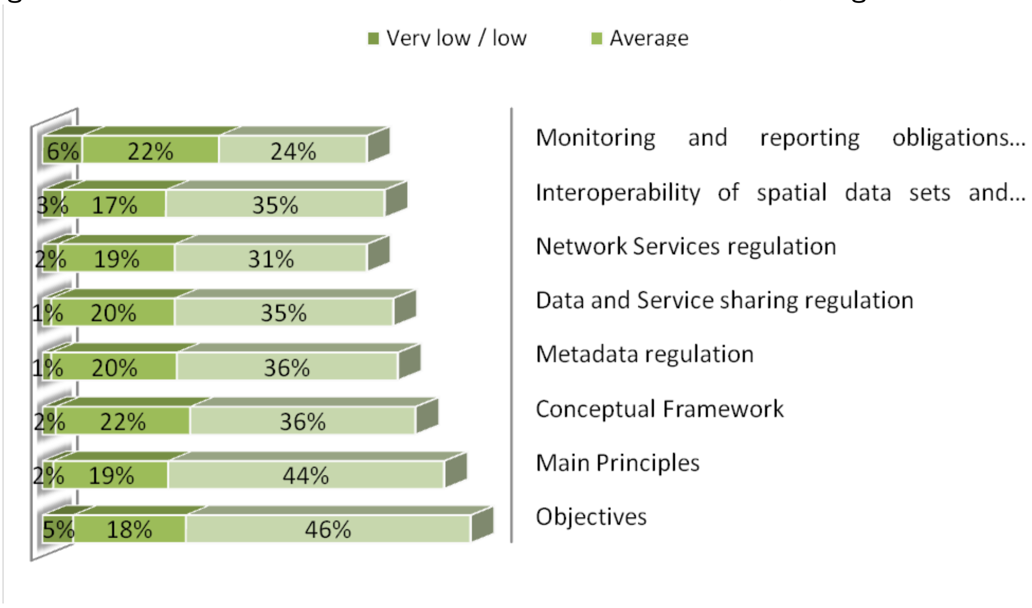


Figure 15 – Knowledge of INSPIRE[3]

This is also reflected by the facts that (only) 34% of the respondents are somehow involved in INSPIRE activities, and only 15% are actively involved in EU INSPIRE groups.

Experts in INSPIRE Working Groups	5%
Members of SDICs	10%
Contractors to Public Authorities implementing INSPIRE	19%

Table 3 – How Geo-ICT SMEs are involved in INSPIRE

One third of Geo-ICT companies surveyed (102) have been involved in some EU co-funded initiatives, 69 in one project, 21 in two projects, and 12 in 3 or more projects: this indicates that Geo-ICT companies are quite capable of obtaining funds from existing public measures, even if the budget received is still low compared to the budget received by Large Enterprises[4].
The majority of these companies (65%) worked in the 7th Framework Programme (FP7), while another 31% in the European Regional Development Fund (ERF), 23% in LIFE+ and only 18% in Competitiveness and Innovation Programme (CIP).

[3] These percentages are only considering the cases of companies aware of INSPIRE: companies that replied "Not aware" in the survey were not asked this question.
[4] According to the open dataset of ICT research projects funded under FP7 in the period 2007-2011, only 14% of the overall EC budget was received by SMEs, while 21% went to Large Enterprises (European Commission, 2013e)

Among the companies involved in such projects, 81 provided information about the annual amount of co-funded budget received: 28% of them declared that was less than €10,000, 38% were between €10,000 and €100,000 and 34% more than €100,000.

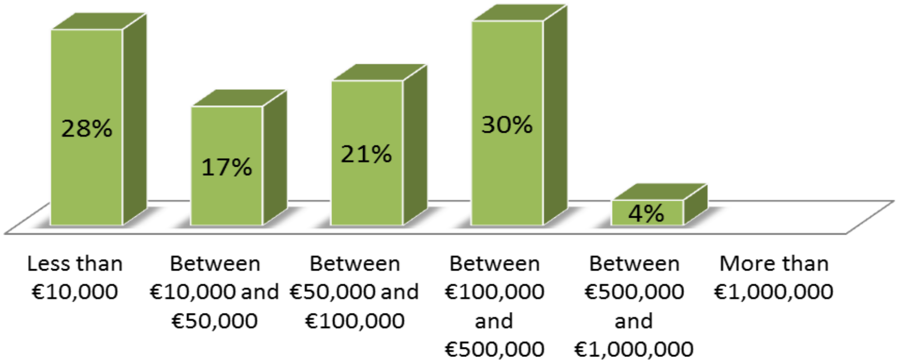


Figure 16 – EU co-funded annual budget

In terms of involvement in INSPIRE, in general, the SMEs that are involved with INSPIRE consider their competencies cover the whole range of activities, though there is a slight bias towards metadata and view services, probably because public authorities are actively involved in these areas (see figure 17).

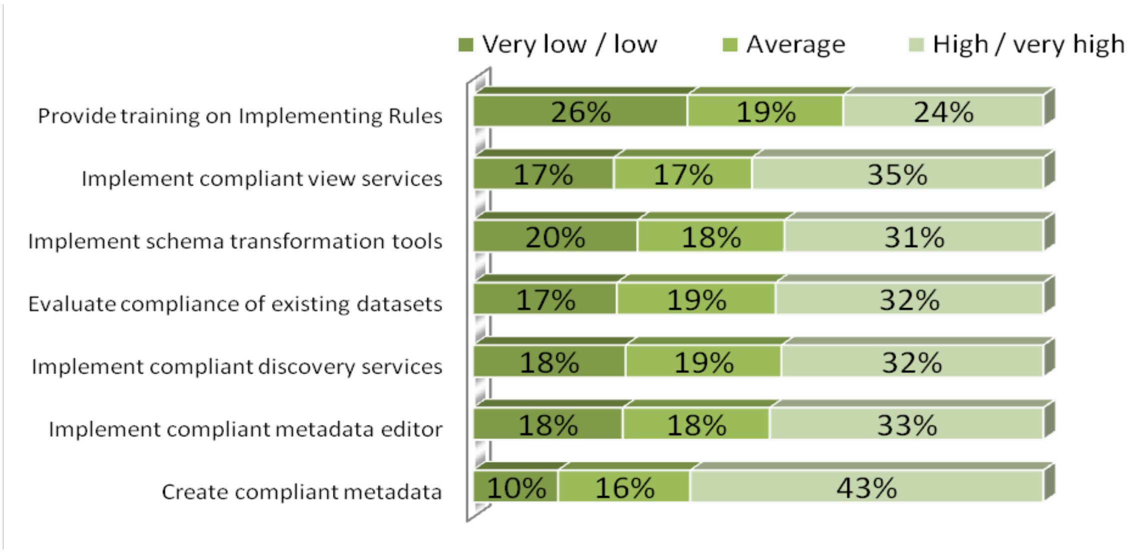


Figure 17 – INSPIRE competencies[5]

This is reflected in the actual development work carried out by the companies involved in INSPIRE (see figure 18). Two thirds of activity is in the data modelling, metadata and view services area.
Companies are mainly involved in development of view services and data modelling (both 26%) and metadata catalogue (21%); lowest involvement is on schema transformation (9.6%).

[5] These percentages are only considering the cases of companies aware of INSPIRE: those companies that replied "Not aware" in the survey were not asked this question.

This project is funded by the European Union under the grant n. 296307

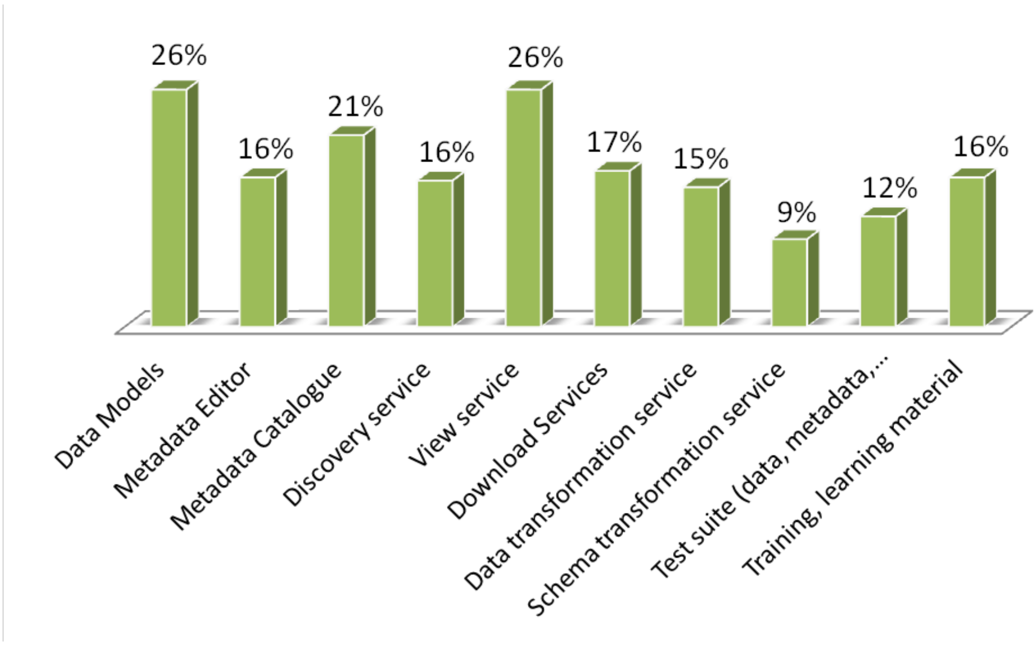


Figure 18 – INSPIRE developments

In terms of a more content-based or thematic-domain-based involvement, the Geo-ICT SMEs involved in INSPIRE cover a wide range of INSPIRE data themes. Presumably this reflects the priorities of the public administrations they deal with (see table 4).

Theme	Percentage of respondents
Land use	57%
Cadastral Parcels	50%
Co-ordinate reference systems	50%
Land cover	47%
Buildings	46%
Orthoimagery	45%
Elevation	44%
Transport networks	43%
Addresses	42%
Utilities and government services	42%

Table 4 – Main data themes of interest for Geo-ICT SMEs

4.5 Key partners

Due to factors like:

- the high level of fragmentation of the supply side,
- the high level of specialization of many suppliers, in similar as well as in different fields,
- the high level of complexity of many technological solutions to be implemented,
- the high level of integration of services required by the customers,
- the high level of financial and technical capacities required by the contracting authorities,

forms of partnership, permanent or temporary, structured or unstructured, among different small players of the geospatial ecosystem is becoming an enabling factor for them, despite an intrinsic initial low attitude to cooperate.

Affiliation with professional associations is also considered a benefit: from the section 4.2.4 of the deliverable D1.3, more than a quarter of companies are involved in sectorial/geographic associations at national level: this underlines the importance of National Geographical Associations for the Geo-ICT private sector, although there are many differences depending on the country considered.

4.6 Key resources

Skilled human resources are the key resources.
Software technologies, particularly those based on open-source solutions, are very powerful.
Insufficient broadband connectivity can become a big barrier in many countries, because it could hamper the quality of services on which most of the upcoming Service Level Agreements will be based.
Financial resources can play a less important role, particularly if forms of partnership can be established among different providers.

4.7 Channels and customer relationships

All the five channel phases listed in the canvas:

1. Awareness: How do we raise awareness about our company's products and services?
2. Evaluation: How do we help customers evaluate our organization's Value Proposition?
3. Purchase: How do we allow customers to purchase specific products and services?
4. Delivery: How do we deliver a Value Proposition to customers?
5. After sales: How do we provide post-purchase customer support?

are perceived as equally highly important.
Dedicated communication campaigns mainly addressed to the Public Sector, in order to increase the awareness of the legally binding deadlines set by the INSPIRE Directive, can assume a strategic value.
Particular attention should be paid to ensure that the target groups of these campaigns understand the technological and organizational complexity of the activities to be done, in order to allocate the proper resources, human and financial.
During the delivery phase and the after sales phase, particular attention should be paid to guide the customers to a successful use of the products/services provided.

4.8 Value proposition

Independently from different formalizations, most of the value propositions are substantially related to a practical and easy way to implement INSPIRE.
In more detail, depending on the complexity of the customer's organization, INSPIRE implementations refer to one or more of the following business processes:

- harmonization of spatial datasets (including transformation and validation);
- harmonization of metadata (of datasets and services);
- deployment of network services to allow data interoperability;
- monitoring and reporting.

It frequently happens that more general implementations, e.g. development of geoportals, include all the above mentioned processes and therefore a more comprehensive value proposition is formulated by the suppliers.
Other type of value propositions are more focused on a specific software technology, enabling one or more of the above mentioned processes.

This project
is funded by the European Union
under the grant n. 296307

4.9 Cost structure

Probably this is the most complex component to analyze, because it depends on several factors, which can't be easily assessed for the heterogeneous geospatial ecosystem.
However, among the two extreme options:

- Cost Driven (leanest cost structure, low price value proposition, maximum automation, extensive outsourcing),
- Value Driven (focused on value creation, premium value proposition),

the second one seems more viable, due to a limited possibility to automate some of the processes listed in the previous sub-section, particularly those related to initial phases of INSPIRE implementations dealing with data transformation and set-up of system architectures enabling the initial deployment of network services. And these initial phases are the most likely to generate market opportunities in the short and medium term.

This project
is funded by the European Union
under the grant n. 296307

5 The smeSpire SLA (Service Level Agreement)

5.1 Introduction

The objective of this section is to offer a preliminary version of guidelines for the definition of a SLA for all the geo-ICT Small and Medium Enterprises involved in the business of web service provider, not only INSPIRE-related but, in general, related to any type of Spatial Data Infrastructure.
In Annex A a practical example of how the main parts of the SLA have to be filled-in by the involved Parties is provided.

5.2 Purpose

The purpose of this section is to provide guidelines for the definition of the performance criteria to be included in the Network Services, as defined by the INSPIRE Directive.
The Service Level Agreement, SLA, is a contract between Parties, specified in section 5.3, that specifies what services the Network Services provider will provide and the minimum QoS indicators, specified in section 5.6, that the Services Provider has to satisfy for its services.

This documents is based on the official **INSPIRE Network Services Performance Guidelines**, available at http://inspire.ec.europa.eu/reports/ImplementingRules/network/Network_Services_Performance_Guidelines_%20v1.0.pdf.

This document is organized as follow:

- Section 5.2 – Purpose: describing the reasons behind the creation of the SLA.
- Section 5.3 – Parties: describe the parties involved in the SLA and their respective roles (provider and consumer).
- Section 5.4 – Validity Period: defines the period of time that the SLA will cover. This is delimited by start time and end time of the term.
- Section 5.5 – Scope: defines the services covered in the agreement.
- Section 5.6 – Service Level Objectives: the levels of service that both the users and the service providers agree on, and usually include a set of service level indicators, like availability, performance and reliability. Each aspect of the service level, such as availability, will have a target level to achieve.
- Section 5.7 – Penalties: defines what happens in case the service provider under-performs and is unable to meet the objectives in the SLA. If the agreement is with an external service provider, the option of terminating the contract in light of unacceptable service levels should be built in.

5.3 Parties

In this chapter, the parties involved and their respective roles in this Service Level Agreement will be identified:

- ____, hereinafter referred to as '**Network Service Provider**';
- ____, hereinafter referred to as the '**User/Customer**'.

This project is funded by the European Union under the grant n. 296307

Roles:

- Role of the **Network Service Provider**: ____
- Role of the **User / Customer**: ____

Additional Notes:
____

5.4 Validity Period

The Validity period defines the temporal time period covered by the Service Level Agreement reported in this document.

Each involved part shall ensure to fulfil all the terms reported in this contract for the following time period.

Start-Date	
End-Date	

Penalties for un-compliant part will be defined in Chapter 9.

Additional Notes:
____

5.5 Scope

The aim of this section is to define the services involved and considered in the Service Level Agreement. In the next Chapter, the Quality of Service protocol, applied to each web service reported in this section, will be applied.

The following table will be used to fill in all the services involved, describing for each one:

- Name: name of the service (e.g. Download Service)
- Service Type: type of the service (e.g. WFS 2.0)
- Description: a verbose description of the reported service.

This project is funded by the European Union under the grant n. 296307

Service Name	Service Type	Description

Additional Notes:

____
____
____
____
____

5.6 Service-Level Objectives

A service level objective (SLO) is a key element of a service level agreement (SLA) between a service provider and a customer. SLOs are agreed as a means of measuring the performance of the Service Provider and are outlined as a way of avoiding disputes between the two parties based on misunderstanding.

There is often confusion in the use of SLA and SLO. The SLA is the entire agreement that specifies what service is to be provided. SLOs are specific measurable characteristics of the SLA such as availability, throughput, frequency, response time, or quality.

The SLO may be composed of one or more quality-of-service measurements that are combined to produce the SLO achievement value. As an example, an availability SLO may depend on multiple components, each of which may have a QOS availability measurement. The combination of Quality of Service (QOS) measures into an SLO achievement value will depend on the nature and architecture of the service.

Quality of Service Attribute for INSPIRE Network Services
Performance
Reliability
Capacity
Availability
Security
Regulatory
Interoperability

5.6.1 Performance

The performance of a web service represents how fast a service request can be completed. There are several parameters to take into consideration that are reported in the following.

<u>Throughput</u>

Throughput, also called TSF, is the number of web service requests served in a given time interval.

This project is funded by the European Union under the grant n. 296307

Response Time
Response time, also called ASA, is the time required to complete a web service request.

Latency
Latency is the turn around time, TAT, between sending a request and receiving the response.

Execution Time
Execution time is the time taken by a web service to process its sequence of activities.

Transaction Time
Transaction time represents the time that passes while the web service is completing one complete transaction. This transaction time may depend on the definition of web service transaction.

Parameters	Estimated Value
Throughput	
Response Time	
Latency	
Execution Time	
Transaction Time	

5.6.2 Reliability

Reliability represents the ability of a web service to perform its required functions under stated conditions for a specified time interval. The reliability is the overall measure of a web service to maintain its service quality.

Parameters	Estimated Value
Reliability	

5.6.3 Capacity

Capacity is the limit of the number of simultaneous requests which should be provided with guaranteed performance.

Parameters	Estimated Value
Capacity	

5.6.4 Availability

The web service should be ready for immediate consumption. This availability is the probability (percentage) that the system is up.

Parameters	Estimated Value
Availability	

This project is funded by the European Union under the grant n. 296307

5.6.5 Security

Security is the quality aspect of the Web service of providing confidentiality and non-repudiation by authenticating the parties involved, encrypting messages, and providing access control.

Security can be assesses through a set of different characteristics:

Authentication
Users (or other services) who can access service and data should be authenticated (if required).

Authorization
Users (or other services) should be authorised so that they only can access the protected services (if required).

Confidentiality
Data should be treated properly so that only authorised users (or other services) can access or modify the data (if required).

Accountability
The supplier can be hold accountable for their services.

Traceability and Auditability
It should be possible to trace the history of a service when a request was serviced.

Data Encryption
Data should be encrypted (if required).

Non-Repudiation
A user cannot deny requesting a service or data after the fact.

Parameters	**Estimated Value**
Authentication	
Authorization	
Confidentiality	
Accountability	
Traceability and Auditability	
Data Encryption	
Non-Repudiation	

Additional Notes:

This project is funded by the European Union under the grant n. 296307

5.7 Penalties

Penalties define what happens in case the service provider under-performs and is unable to meet the objectives in the SLA. If the agreement is with an external service provider, the option of terminating the contract in light of unacceptable service levels should be built in.

This project
is funded by the European Union
under the grant n. 296307

6 Conclusions

A Business Model canvas has been proposed, aiming at offering to already established and new geo-ICT SMEs a structured approach to build their own business model, enabling them to convert technological innovation which is inside the INSPIRE implementation process into economic value. The different components of the business model have been analyzed, with different level of detail, in the subsections 4.x, aware that, due to the heterogeneity of the Geo-ICT SMEs, it is not viable to define a unique business model.

In order to provide the Geo-ICT SMEs with an additional support complementary to the analysis provided in section 4 about how to effectively use the tool represented by the proposed business model canvas, a further attempt aiming at providing a more structured approach to identify the business model best fitting in delivering products/services by the Geo-ICT SMEs can be provided by an insight into the different business models known as "*aaS":

- DaaS (Data as a Service)[6],
- SaaS (Software as a Service)[7],
- PaaS (Platform as a Service)[8],
- IaaS (Infrastructure as a Service)[9],
- any combination of any of them,

which are extensively applied by pure ICT-based service providers.

Such an insight can be particularly useful to better identify the factors underlying the cost structure and to analyze their relationships, which play a key-role during the definition of the pricing policies and associated models.

Probably a combination of the above listed business models could best fit in delivering products/services in the Geo-ICT sector, giving life to an "InspireaaS" business model, which, starting from a detialed characterization of the business processes related to INSPIRE implementations, could allow the Geo-ICT SMEs to balance in the most profitable way the different business model components analyzed in this report.

Last but not least, guidelines have been provided for the definition of a SLA for all the geo-ICT Small and Medium Enterprises involved in the business of web service provider, not only INSPIRE-related but, in general, related to any type of Spatial Data Infrastructure. In Annex A a practical example of how the main parts of the SLA have to be filled-in by the involved Parties has provided.

[6] http://en.wikipedia.org/wiki/Data_as_a_service
[7] http://en.wikipedia.org/wiki/Software_as_a_service
[8] http://en.wikipedia.org/wiki/Platform_as_a_service
[9] http://en.wikipedia.org/wiki/Infrastructure_as_a_service#Infrastructure_as_a_service_.28IaaS.29

This project is funded by the European Union under the grant n. 296307

Annex A

The aim of this Annex is to offer to the reader of the Service Level Agreement described in this document an example of how the main parts of the contract have to be filled-in by the involved Parties.

Parties

- Generic Geo-ICT SME, [address] [legal entity info], hereinafter referred to as '**Network Service Provider**';
- Generic Customer, [address] [legal entity info], hereinafter referred to as the '**User/Customer**'.

Roles:

- Role of the **Network Service Provider**:
  The role Network Service Provider identified in this contract is to offer its own infrastructure and services reported in the "Scope" section in order to satisfy the Service-level Objectives defined for the Customer.
- Role of the **User / Customer**:
  The role of the User/Customer identified in this contract is to fulfil all the economical aspect to the Network Service provider in according to the

Validity Period

Start-Date	01/01/2015
End-Date	01/01/2016

Scope

Service Name	Service Type	Description
INSPIRE View Service	INSPIRE Network Service	http://inspire.ec.europa.eu/documents/Network_Services/TechnicalGuidance_ViewServices_v3.11.pdf
INSPIRE Download Service	INSPIRE Network Service	http://inspire.ec.europa.eu/documents/Network_Services/Technical_Guidance_Download_Services_v3.1.pdf

Service-level Objectives

Performance

Parameters	Estimated Value
Throughput	10/s
Response Time	<100ms
Latency	1/s
Execution Time	<1s
Transaction Time	<1s

Reliability

Parameters	Estimated Value
Reliability	>99.99%

This project is funded by the European Union under the grant n. 296307

Capacity

Parameters	Estimated Value
Capacity	20/s

Availability

Parameters	Estimated Value
Availability	>99%

Security

Parameters	Estimated Value
Authentication	Not required
Authorization	Not required
Confidentiality	Not required
Accountability	Required
Traceability and Auditability	Required
Data Encryption	Not required
Non-Repudiation	Required

This project
is funded by the European Union
under the grant n. 296307