Huerta, Schade, Granell (Eds): Connecting a Digital Europe through Location and Place. Proceedings of the AGILE'2014 International Conference on Geographic Information Science, Castellón, June, 3-6, 2014. ISBN: 978-90-816960-4-3

# Exploring the market potential for geo-ICT companies in relation to INSPIRE

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**Abstract**

The implementation of INSPIRE can bring new and interesting business opportunities to European geo-ICT companies. Until now, little information has been available on the participation of geo-ICT companies in the implementation of INSPIRE. This paper seeks to explore the market potential for geo-ICT companies in relation to INSPIRE, presenting the results of a large-scale survey among geo-ICT companies in Europe. The paper shows that the majority of geo-ICT companies in Europe is not actively involved in the implementation of INSPIRE. Having knowledge and understanding of the technical details of INSPIRE seems to be a key requirement for companies to get involved in INSPIRE. Companies that fulfil this requirement and have supported public authorities in implementing INSPIRE, have experienced an impact of INSPIRE on their innovative performance.
*Keywords*: INSPIRE, geo-ICT sector, impact of INSPIRE, innovation

## 1 Introduction

The INSPIRE Directive establishes an Infrastructure for Spatial Information in Europe to support Community environmental policies, and policies or activities which may have an impact on the environment [4]. INSPIRE is based on the creation, operation and maintenance of infrastructures for spatial information established and operated by the 28 Member States of the European Union plus Switzerland, Norway and Iceland, addressing 34 spatial data themes related to environmental applications.

Making data available, according to INSPIRE standards, requires specific skill sets that sometimes are difficult to find in public authorities. The management of this content represents an opportunity for enterprises active in this sector, and small and medium-sized enterprises (SMEs) in particular. Offering their services and products, geo-ICT companies and SMEs can help governments in the implementation of the requirements imposed by INSPIRE. It is expected that the technical skills and organizational flexibility of SMEs can effectively support the various institutions and stakeholders directly involved in the various commitments related to the implementation of INSPIRE. Due to legal requirements, the INSPIRE implementation can become the entry-point for crucial business opportunities, opening new or reinforcing existing perspectives.

In order to explore the market potential for geo-ICT companies in relation to INSPIRE and to define the obstacles for geo-ICT companies to enter this market, insight is needed in the characteristics, knowledge and activities of geo-ICT companies in Europe, especially related to the implementation of INSPIRE. In the context of the European smeSpire project a large-scale survey was organised among geo-ICT companies in Europe. Making use of the results of this survey, this paperthis paper analyses in detail the involvement of the European geo-ICT sector in INSPIRE in order to provide some valuable recommendations on how the participation of the geo-ICT sector in Europe to INSPIRE can be promoted and stimulated.

## 2 The geo-ICT sector in Europe

Little information and data is available on the overall European geo-ICT sector. However, some studies focus on the geo-ICT sector in one single Member State. Castelein W.T. et al made an analysis of the Dutch Geo-ICT sector in 2008. Their analysis showed that in that year, the Dutch private Geo-ICT sector had a turnover of € 900 million from geo-information products and services to which 9977 employees contributed [2]. The private sector was responsible for 66% of the total "geo" workforce and 64% of the overall geo-information economic value. Geo-ICT accounted for 3.64% of the total number of ICT employees and 1.04% of the overall number of ICT companies. The most important domain of the private geo-ICT sector, with a total turnover of € 297 million, was measuring, collecting and storing geographic data.

For several years, AGORIA, the Belgian federation for the technology industry, has assessed the Geo-ICT sector in Belgium [1]. Most recent figures show the Belgian geo-ICT sector comprises approximately 60 companies, generating a total annual turnover of more than € 335 million, and offering jobs to an estimated 1850 employees. The UK Location Market Survey 2012 provides an assessment of both the current size and future directions of the UK Market for Location Information Products and Services [3, 5]. The estimate for location related software, professional services, data and hardware in 2012 is €1.49 billion. The authors also predict continued growth at a modest 1 to 2% in real terms over the following 3 years.

Information on the size of the German geo-ICT sector has been provided by MICUS [6]. In the year 2000 the market volume amounted to €1 billion, and by 2007 this had increased by 51% to just over €1.5 billion. According to the report, the geo-business market can be classified into three main sectors: navigation and mobile services, planning and documentation systems and geo-marketing. Notably, in the navigation sector the volume of sales more than doubled between 2000 and 2007, from €350 million to €728 million.

When comparing and generalizing the results of these studies, it should be noticed that there is no generally agreed definition of the term 'geo-ICT sector' and most existing studies and policy documents use their own definition. Castelein et al state that "the geo-information sector works with location specific (x,y,z) information or services". Within the, four areas of activity can be identified: 1) measuring, collecting and storing of data about geo-objects; 2) processing, editing, modelling, analyzing and managing that data; 3) presenting, producing and distributing the data; and 4) advising, educating, researching and communicating about processes and use of geo-information products and services [2]. According to AGORIA the geo-ICT sector deals with information related to geographical location by providing solutions in the area of the Geographical Information Systems (GIS) which are designed to gather, store, process, analyze, manage, organize, present and diffuse all types of geographical data [1]. ConsultingWhere refers to "economic activities where geographic information is the main driver of the application, service or system component" [3]. Some of the existing definitions include a clear reference to the ICT sector, highlighting that the ICT sector is frequently considered a main reference sector for private companies dealing with geographic information and geomatics. In the context of this paper, the (private) geo-ICT sector was defined as all companies directly or indirectly involved in the creation and publishing of spatial data and/or in more traditional GIS/geo-location based activities.

## 3 Methodology

In order to explore the market potential for geo-ICT companies in relation to INSPIRE, this paper addresses the following three research questions: *1) To what extent do European geo-ICT have knowledge and awareness of INSPIRE? 2) How are European geo-ICT companies currently involved in the implementation of INSPIRE? & 3) Does INSPIRE have an impact on the innovative performance of geo-ICT companies in Europe?* In order to better understand the geo-ICT sector in Europe and its involvement in INSPIRE, a large scale survey among geo-ICT companies in Europe was organized between November 2012 and August 2013. The aim of this survey was to gain insight in the characteristics, the activities and the skills and knowledge of geo-ICT companies in Europe. The survey questionnaire consisted of three main parts and included more than 30 questions. The first part of the survey focused on the general characteristics of geo-ICT companies in Europe. In this part, information was collected on the location of the company, the year of foundation, the number of employees, the geospatial activities of the company, etc. The second part of the survey deals with the knowledge and skills of companies related to geo-ICT and INSPIRE. Here, information was collected on the awareness about INSPIRE, the knowledge on INSPIRE and the execution of INSPIRE-related activities in the organization. The third part of the survey was dedicated to the impact of INSPIRE on the organization, with specific attention to the issue of innovation.

All project partners of the smeSpire project were involved in distributing the survey, and inviting geo-ICT companies to participate. In some countries the INSPIRE contact points and the national GI-association supported the distribution of the survey. The survey was completed by 299 geo-ICT companies. In terms of workforce, almost all participating geo-ICT companies fall within the category of 'small and medium-sized enterprises'. 59.4% of the participating companies were even 'micro enterprises', with less than 10 employees. As 31.5% of the companies were 'small' (between 10 and 50 employees), only few medium-sized (between 50 and 250 employees) or large companies were involved in the study. Also in terms of the annual turnover, almost all participating geo-ICT companies were 'micro', having a turnover of less than €1million per annum. 24% of the involved companies had an annual turnover between €1million and €10million, in 3% of the companies the annual turnover was even higher than €10million.

Besides the number of employees and the annual turnover also other background information was collected on the characteristics of the companies. 90% of the companies were created between 1988 and 2008, of which 34% during the 1990s and nearly 12% after 2000. More than 15% of the companies that participated in the survey were part of a larger group. 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. The public sector is the principal customer for European geo-ICT companies representing more than half of the business for 63% of the companies. For the large majority of companies (85%) customers are mainly public authorities within their own country, covering both national and local administrations. 32% of the companies were involved in one or more EU co-funded projects in 2011. More than half of the companies analyzed indicated their core business were geospatial activities, meaning that more than 80% of their annual turnover comes from products or services strictly related to geographic information. 39% of the companies considered themselves primarily as 'users' of spatial data, in 27% of the companies the primary activity was the development of client applications. 20% of the companies

were primarily involved in data modelling and/or the transformation of spatial data.

# 4 Results

## 4.1 Awareness and knowledge of INSPIRE

Of the participating companies, 69% indicated to be aware of the INSPIRE Directive. This means that INSPIRE is not known by 31% of the companies. In addition to the general awareness of INSPIRE, also the knowledge about different aspects of INSPIRE was measured. However, only companies that were aware of INSPIRE, were asked to report on their knowledge of different INSPIRE aspects. As can be seen from table 1, the general aspects of the Directive are well known, but companies are less familiar with the more detailed technical aspects.

Almost half of the geo-ICT companies in Europe that are aware of INSPIRE indicated to have high or even very high knowledge of the general objectives (46%) and the main principles of INSPIRE (44%). Knowledge on the conceptual framework, metadata regulation, data and service sharing regulation and interoperability of data and services regulation was relatively lower, and especially the regulations on network services regulation and on the monitoring and reporting obligations were less known.

Table 1 Knowledge on different aspects of INSPIRE

| | (Very) low | Medium | (Very) high |
|---|---|---|---|
| Objectives of INSPIRE | 36% | 18% | 46% |
| Main principles | 37% | 19% | 44% |
| Conceptual framework | 42% | 22% | 36% |
| Metadata regulation | 44% | 20% | 36% |
| Data and Service Sharing regulation | 45% | 20% | 35% |
| Network services regulations | 50% | 19% | 31% |
| Interoperability of data and services regulations | 48% | 17% | 35% |
| Monitoring & reporting obligations regulation | 54% | 22% | 24% |

## 4.2 Involvement in INSPIRE

Only 34% of the participating geo-ICT companies were somehow involved in INSPIRE activities. Most of these companies were involved in INSPIRE working as a contractor for public authorities implementing INSPIRE (20%). Few companies were involved in the development and implementation of INSPIRE as a member of a Spatial Data Interest Community of INSPIRE (10%) or as an expert within one of the Thematic Working Groups (5%).

With regard to the INSPIRE activities that were performed or the INSPIRE components that were developed, the geo-ICT companies were mainly involved in data modelling (26%), the development of view services (26%) and the implementation of metadata catalogues (21%). Activities in which the current involvement of INSPIRE was still low, were setting up test suites (12%), and performing schema transformations (9%).

An explanation of the relatively low involvement of geo-ICT companies in INSPIRE implementation can be found in the fact that many companies consider themselves as 'spatial data users'. This means these companies are not directly involved in the implementation of INSPIRE, but will rather make use of the data and services provided by INSPIRE. The relevance of INSPIRE to many of these companies is demonstrated in the INSPIRE data themes, and the extent to which the activities of geo-ICT companies are related to these themes.

Table 2 shows the main INSPIRE data themes to which the activities of European geo-ICT companies are related. The most interesting data themes for these companies are land use (57%), cadastral parcels (50%), co-ordinate reference systems (50%), land cover (47%) and buildings (46%). Many of the INSPIRE data themes thus are relevant to a relatively large group of geo-ICT companies in Europe.

Table 2 Relevance of INSPIRE data themes

| | Companies active in theme |
|---|---|
| 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% |

## 4.3 Impact of INSPIRE

The last part of the survey focused on the impact and innovative potential of INSPIRE to geo-ICT companies. Companies were asked to report which changes already occurred in their organization due to the INSPIRE Directive and which changes they expected to occur in the near future. It can be seen from the data in table 3 that INSPIRE already had an impact on many geo-ICT companies, and this impact is expected to increase in the following years. The current impact of INSPIRE is mainly related to the introduction of new or significantly improved products and services (42%) and the introduction of new or improved methods of producing (33%). In the future, the responding companies also expected to see an impact in the emerging of new customer markets (72%), in addition to the introduction of new or improved products and services (74%).

Table 3 Occurred and expected changes due to INSPIRE

| | Occurred changes | Expected changes |
|---|---|---|
| New or improved products/services | 42% | 74% |
| New or improved methods of producing | 33% | 67% |
| New customer groups/geographic markets | 31% | 72% |
| Product/service delivery in less time or lower cost | 28% | 66% |

### 4.4 Discussion

The results of the study reported in this paper provide insight in the meaning of INSPIRE for the geo-ICT companies in Europe. One of the most interesting findings of this study was that almost one in three geo-ICT companies in Europe is not aware of INSPIRE. Companies that are aware of INSPIRE have good knowledge of the general objectives and principles of INSPIRE, while the more technical details of INSPIRE are less known. Based on these findings, the geo-ICT companies can be divided into three equal groups: a group of companies that is not aware of INSPIRE, a group of companies that knows the general aspects of INSPIRE and a group of companies that has more advanced knowledge on INSPIRE. It is especially the latter group that is directly involved in the implementation of INSPIRE, mainly working as a contractor for public authorities. The other two groups are currently standing on the side lines while public administrations are implementing INSPIRE.

As one might expect, it is the group of companies that is actively involved in the implementation of INSPIRE that also has experienced the impact of INSPIRE on their innovative performance. The most common change caused by INSPIRE is the delivery of new products and services by companies. However, until now, the majority of European geo-ICT companies did not experience any impact of INSPIRE on their own activities. Looking at it from the positive side, it can be noticed that most of the companies expect to see an impact of INSPIRE in the near future. As many of the European geo-ICT companies primarily are data users, there is a great expectation that INSPIRE will contribute to growth in the future by making data and services available to businesses and allowing them to create added value services.

## 5 Conclusions

This paper has investigated the involvement of European Geo-ICT companies in the implementation of INSPIRE. The results presented in this paper show that a relatively small group of geo-ICT companies in Europe is actively involved in the implementation of INSPIRE. These companies have more than basic knowledge and competences on different aspects of INSPIRE. Due to their active participation in INSPIRE, they are able to turn the INSPIRE European Directive into business opportunities for their company, leading to growth and innovation. However, many European geo-ICT companies currently are not engaged in the implementation of INSPIRE. Some of these companies are even not aware of INSPIRE.

Changing this situation requires commitment and efforts of both geo-ICT companies and public organizations. Geo-ICT companies need to build up a critical mass on INSPIRE, focused on real needs and requirements of public administrations. Companies should also get more involved in INSPIRE debates, and reflect and communicate about how they can help administration in fulfilling the requirements of INSPIRE. For public administrations, the challenge is not only to take advantage of the knowledge and competences of private companies for the implementation of INSPIRE, but especially to provide companies the opportunity and stimulate them to create add value products and services on INSPIRE data and services.

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