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D2.1.3 ANNUAL REPORT FROM STAKEHOLDER MANAGEMENT

Revision no. 08

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08		Cristina Marullo Nicola Del Sarto Alberto Di Minin Andrea Piccaluga	SSSA	Final version for submission, based on internal reviewers' feedback

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EXECUTIVE SUMMARY

SDI4Apps aims at bridging the gap between the top-down managed world of INSPIRE, Copernicus and GEOSS and the bottom-up mobile world of voluntary initiatives and thousands of micro SMEs and individuals developing applications based on GI, by adapting and integrating experience from previous projects and initiatives to build a cloud based framework with open API for data integration, easy access and provision for further reuse.

The solution has been validated through six pilot applications focused on easy access to data, tourism, open sensor networks, land use mapping, education and ecosystem services evaluation:

- Easy data access
- Open Smart Tourist Data
- Open Sensors Network
- Open Land Use Map
- Open INSPIRE 4 Youth
- Ecosystem Services Evaluation

The project is strongly based on cooperation on data sharing and technological developments with other initiatives funded by the European Union. The purpose is to increase the exploitation opportunities for open geographic information, facilitate market entry for new companies and to develop innovative services based on open geographic data.

In January 2016 a new Memorandum of Understanding (MoU) was signed among FOODIE, OTN, SDI4Apps and ECIM in order to link three spatial data themes with related technologies for data management: transport network, land use and point of interests.

Indeed, data management represents a majority of all the effort spent in the project. The purpose of the new MoU is to set a cooperation management of the transport network, land use and points of interest datasets as shared open data resources for the benefit of all the projects.

At the end of the third year from the project start-up, this final report provides an overview of the SDI4Apps Stakeholder management activities across the technical evolution of the entire project, and focuses on the "social" transition towards changing configurations of involved stakeholders (SDI4Apps Communities).

Accordingly, the evolution of internal stakeholders' roles, competences, interactions and level of actual and future commitment across the three years is provided in the first part of the report, while the second part will deal with the external stakeholders' communities and the outcomes of the SDI4Apps community building activities. Finally, 8 descriptive use cases of the main project outcomes (e.g. pilots, tools, services) are reported.

Keywords: Stakeholder Management, Communities, Commitment.

1 INTRODUCTION

SDI4Apps is a multi-stakeholder project, where 18 partners (public and private organizations) from 9 different countries that provide complementary expertise (both technical and non-technical), have been cooperating for three years in order to build a cloud-based framework with open API for spatial data integration and to populate this ecosystem with six different pilot applications.

In the first year of the project the consortium focused its efforts on creating a technological environment through data integration, pilot applications development and infrastructure deployment activities. Throughout the following two years the consortium increasingly focused on the deployment of the Open SDI4Apps Platform and on the engagement of external communities through dissemination activities and support for external developers. A business modelling activity was performed in order to guarantee the platform's operational sustainability over time.

The success of the SDI4Apps initiative is strongly dependent on the interplay between the internal stakeholders and the external communities of data providers, software developers and pilots/platform users. The final outputs of the project (tools, services, pilot applications) aim at populating the platform with third-parties' applications extending the reach and the scope of the project and proposing multiple use-cases of the platform.

The second work package of the SDI4Apps project (WP2) was centered on Community building and Social Validation. It unfolded along the 36 months' duration of the project and it dealt with the complexity of building the multi-stakeholder community from an internal and from an external point of view. In particular, WP2 was aimed at finding viable solutions to engage the consortium and fostering an active participation of the community members through the definition of a proper methodology to assess the validation of the platform and continuous support with valuable feedbacks to the community of local stakeholders.

Within this work package, the Stakeholders Management tasks followed the "technical" evolution of the SDI4Apps pilots/platform development during the three years of activity and the "social" corresponding transition towards changing configurations of involved stakeholders (SDI4Apps Communities, Table 1).

Year	Technical activities	(overlapping) Configurations of Stakeholders	Stakeholder Management Milestones
I	Data integration and infrastructure development	SDI4Apps Local Stakeholders Community	Mapping local stakeholders and their interactions
II	Definition of the Open SDI4Apps platform	SDI4Apps Community Space	Mapping internal/external stakeholders in each pilot
III	Dissemination & support for external developers	SDI4Apps online and offline stakeholders communities	Mapping external stakeholders involved in the platform

Table 1: Overview of the SDI4Apps Stakeholder Management activities

More in detail, the community building work of SDI4Apps unfolded in two iterative cycles.

The first one, initiated at the project's start-up, gathered the core SDI4Apps community around the shared objective of providing the initial state-of-the-art baseline and user requirements. D2.1.1 (March, 2015) provided a first map of the internal ("local") SDI4Apps stakeholders roles and described the nature and the dynamics of their interactions, gathering information from the Consortium members.

The second cycle of the community building work implied the definition of use scenarios in parallel with the technical development of the open SDI4Apps platform with the aim of shaping the SDI4Apps community space. Accordingly, in the second year of the project evolution the SDI4Apps Community Building activities progressively began to involve external communities (users, groups of users, external stakeholders) in order

to reach critical mass and foster the development of the initiative. The second annual report from Stakeholder Management (D2.1.2., March, 2016) focused on the transition from the SDI4Apps local Stakeholders Community to the SDI4Apps Community Space, according to the technical transition from data integration and infrastructure development to the definition of the open SDI4Apps platform. In Year 2, Stakeholder Management assessment provided also baseline information about perception of possible SDI4Apps business model cases from the perspectives of internal and external communities, thus creating a social validation framework for D8.5.1. (Initial version of business model).

In Y3 Stakeholder Management activities directly involved the external stakeholders' communities. The objective of Stakeholder Management assessment was that of aligning the interest of the internal/external stakeholders' communities and setting coherent scenarios for platform reliability, usability and sustainability over time. The goal of this third report (D2.1.3; March 2017) is therefore to map the SDI4Apps online and offline stakeholders' communities, in parallel with the advanced development of the open SDI4Apps platform and with the implementation of dissemination activities and support for external development. We first performed the assessment of the final configuration of the SDI4Apps internal community of stakeholders and the evolution of their interactions across the whole project (Y1-Y3) was accurately mapped.

Then, the focus of Stakeholder Management assessment in Y3 shifted to the SDI4Apps external stakeholders' communities, in order to map the type and the degree of involvement of the external communities with the main outcomes of the project. We aimed at understanding the role played by different stakeholders in having access to and interacting with the main results of the project, as well as the main issues connected to the use of Open Data that different stakeholders would like SDI4Apps to support.

This task was strictly connected to social validation methodology (T2.2), internal validation (T2.3), external validation (T2.4) tasks and, outside WP2, to business modeling task (T8.6). The outcomes of D2.1.3 will be also used for adjustment and improvement of the SDI4Apps platform exploitation.

2 SDI4APPS STAKEHOLDER MANAGEMENT ASSESSMENT

Stakeholder Management refers to a permanent monitoring activity of the SDI4Apps Communities throughout the evolution of the project's configuration, in order to map the main set of Stakeholders involved in each phase and to provide the project management with relevant information about the evolution plan and the possible future scenarios.

To this aim, a specific and permanent monitoring activity was implemented during the three years of the project.

This activity had three main objectives:

1. To draw attention to the changing configurations of SDI4Apps stakeholders' communities as a result of the project technical evolution, and highlight the critical issues emerging in the community building activity;
2. To provide evidence of the composition and commitment of the involved internal and external communities in order to understand the role played by different stakeholders in developing, having access to and interacting with the main results of the project;
3. To provide relevant feedback inside WP2 and outside WP2 for project management, risk management and business model planning.

We punctually observed the evolution of the local stakeholders community from Y1 to Y3 through periodical CAWI surveys and the use of a dedicated software platform[1].

More in detail, we focused on:

- The evolution of the internal stakeholders' roles and tasks;
- The evolution of networking and collaboration activities;
- The evolution of stakeholders' commitment in the SDI4Apps project
- The degree of consensus among partners on SDI4Apps exploitation opportunities

In Y3 the SDI4Apps stakeholder management assessment was sustained by a second monitoring activity aimed at providing a final map of the evolving configurations of the SDI4Apps external stakeholders communities. More in detail, we went further in the exploration of the SDI4Apps Community space in order to validate the use scenarios shaped in the first two years of the project[2].

In other words, our milestones were:

1) Map the external stakeholders involved in the SDI4Apps Community space, as the result of the community building activities performed in Y1 and Y2;

2) Validate the internal scenarios built in Y1 and Y2 by gathering information on the nature, the role and the degree of involvement of the SDI4Apps online and offline Stakeholders Communities.

3) Assess the validation of the main outcomes of the project (SDI4Apps tools, spatial data services and pilots) with valuable feedbacks from different communities of external stakeholders

The external stakeholder management assessment focused on:

- SDI4Apps external stakeholders' profiles;
- Engagement with the SDI4Apps Platform
- Evaluation of:
  - tools of the SDI4Apps platform;

[1] www.surveymonkey.com
[2] See D2.1.1 and D2.1.2

- spatial data services;
- piloted services;

The survey was launched on December 2016 and ended in February 2017.

Data from the survey were complemented with 8 use cases of the platform tools, spatial data services and pilot applications (see Annex).

3 EVOLUTION OF THE SDI4APPS INTERNAL STAKEHOLDERS COMMUNITY

During the second and the third years of activities the technical evolution of the SDI4Apps project moved from data integration and infrastructure development, to the definition of the open SDI4Apps platform. As a result, a corresponding "social" evolution in the internal stakeholders' community showed major changes in the configuration of roles and interactions with respect to Y1 and Y2[3].

From an internal perspective, the types of interaction evolved from being mostly dyadic connections between partners holding specialized expertise to real networking activities, focused on the definition and optimization of the SDI4Apps open platform tools and spatial data services.

Figure 1 provides an updated map showing the main changes in the configurations of the SDI4Apps internal stakeholder community occurring from Y1 to Y3.

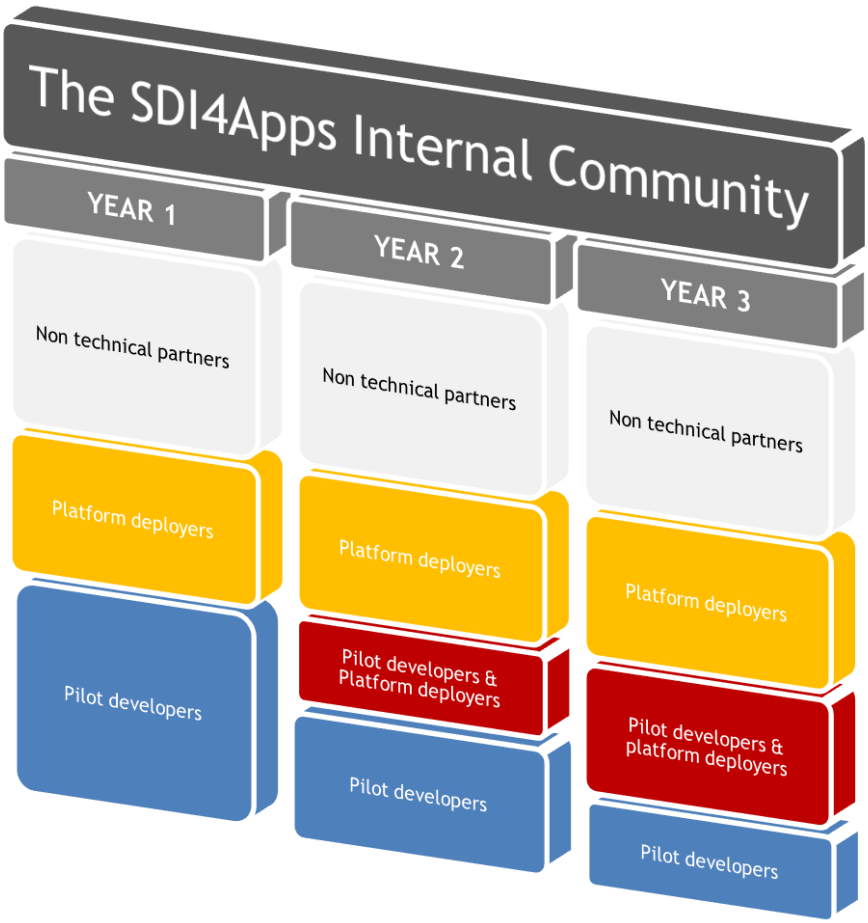


Figure 1: Evolution of the SDI4Apps internal stakeholders map

With regard to Y1 map, showing a "core" community of internal partners playing distinct roles and mainly concentrating on specialized activities (e.g. data integration for pilot developers and infrastructure

[3] All data were made comparable in order to provide complete and valuable information on the evolution of Stakeholders configurations, roles, degree of commitment and consensus across the topics.

development for platform deployers) the internal stakeholders' maps in Y2 and Y3 maps show an intensification of networking activities and an increasing overlapping across the partners' roles. Up to this point, the development of the platform services required an increasing interaction between developers of piloted services and infrastructure deployers.

As a result of the evolution of the technical requirements of the project itself, we observe for example a higher number of partners performing Pilot and Platform integration activities. However, and as reported in the sections below, all the 18 SDI4Apps partners played transversal roles in the project, according to personal competencies and to the level of engagement in the project (e.g. consultants and non-technical partners actively participating in pilot development; pilot developers playing active roles in business model definition).

For reporting purposes, and in order to ensure continuity with the results of Stakeholder Management Assessment in the previous years, in the next sections we will differentiate partners according to their main roles. In particular, we will distinguish partners with technical competences (pilot developers and platform deployers), from partners with non-technical competences (acting as data providers and/or consultants).

3.1 Evolution of partners' engagement

Figure 2 describes the evolution of SDI4Apps internal stakeholders' engagement across the formal tasks from Y1 to Y3. Each bar represents the share of partners performing activities in each of the eight WPs and regardless of their formal role (e.g. as task leaders, partners or "collaborators" from other WPs).

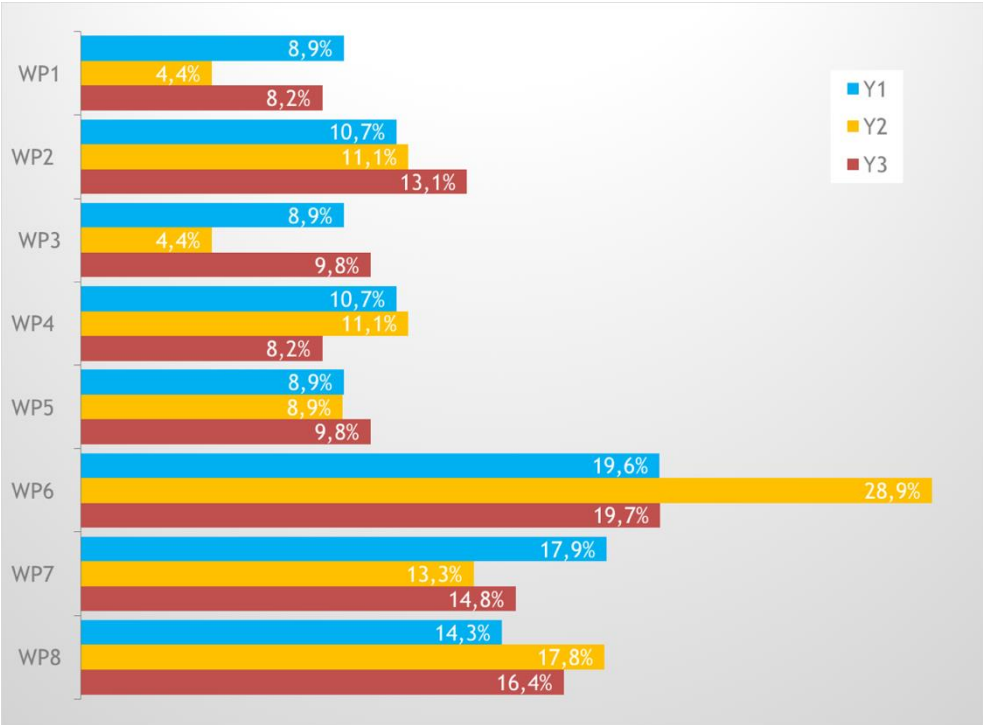


Figure 2: Evolution of partners' engagement across WPs
(% of partners involved in each WP)

As expected, the mix of activities across WPs changed during the three years.

Y2 marked the transition from the local stakeholders' community towards the SDI4Apps community space. With respect to Y1, the progressive involvement of external data providers and app developers through dissemination and direct external stakeholder engagement activities (i.e. hackathons and sprint codes) implied a departure from basic functionalities development activities (WP3) and an increasing engagement towards extended functionality development (WP4) and Implementation of Internal Pilot Applications (WP6). In parallel, non-technical activities were mostly concentrating on community building and social validation and dissemination and business planning (WP8).

In Y3 we observe a further sharp increase in the partners' degree of engagement on Coordination and Management activities (WP1), Community Building and Social Validation (WP2), extended functionalities development and Support to External Developers (WP7). with an increasing share of pilot developers involved (Figure 3). Non-significant differences are reported with regard to the two previous years in terms of relative activities between pilot developers, platform deployers and non-technical partners across WPs.

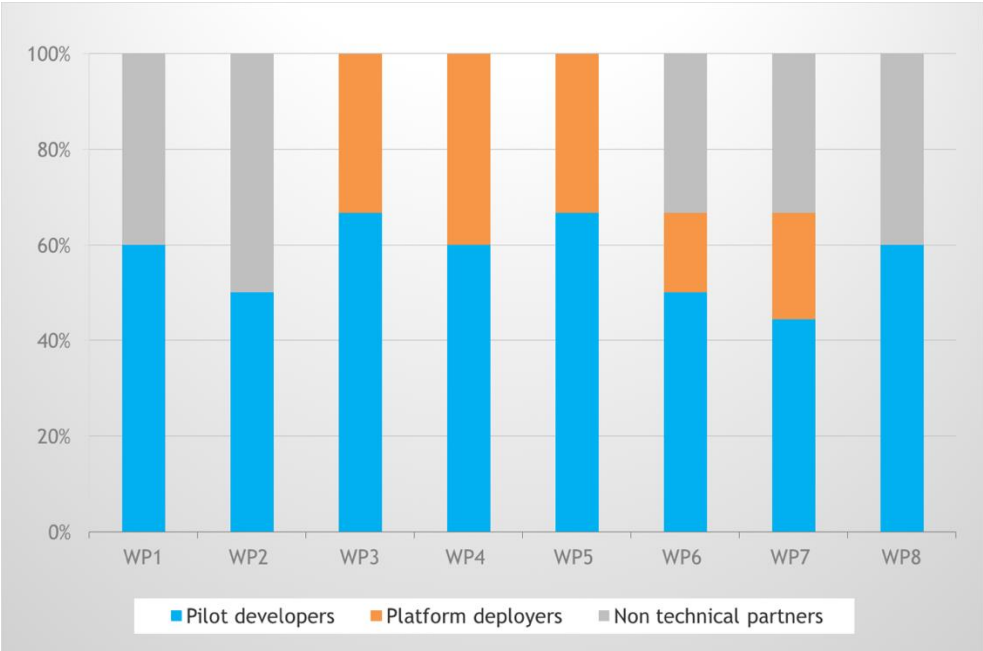


Figure 3: Roles of partners across WPs
(% of partners involved in each WP according to their main role)

3.2 Collaboration and networking

In order to assess the type and intensity of networking activities in the SDI4Apps internal stakeholders' community, we mapped the perceived intensity of internal and external collaboration (co-working) among partners and compared it to the formal distribution of tasks (WPs).

Consistently with the stakeholder management methodology adopted in Y1 and Y2 the degree of collaboration was measured across three dimensions:

- **Internal collaboration** as the intensity of information flows and networking among partners involved in the same WP;
- **Collaboration with PC** as the intensity of information flows to/from the Project Coordinator;

- **External collaboration** as the intensity of information flows and networking among partners and other members of the Consortium working in different WPs.

The evaluation was based on a Likert scale ranging from 1 (null collaboration) to 5 (very high collaboration). Figure 4 reports the evolution of partners' collaboration in the three years of the SDI4Apps project.

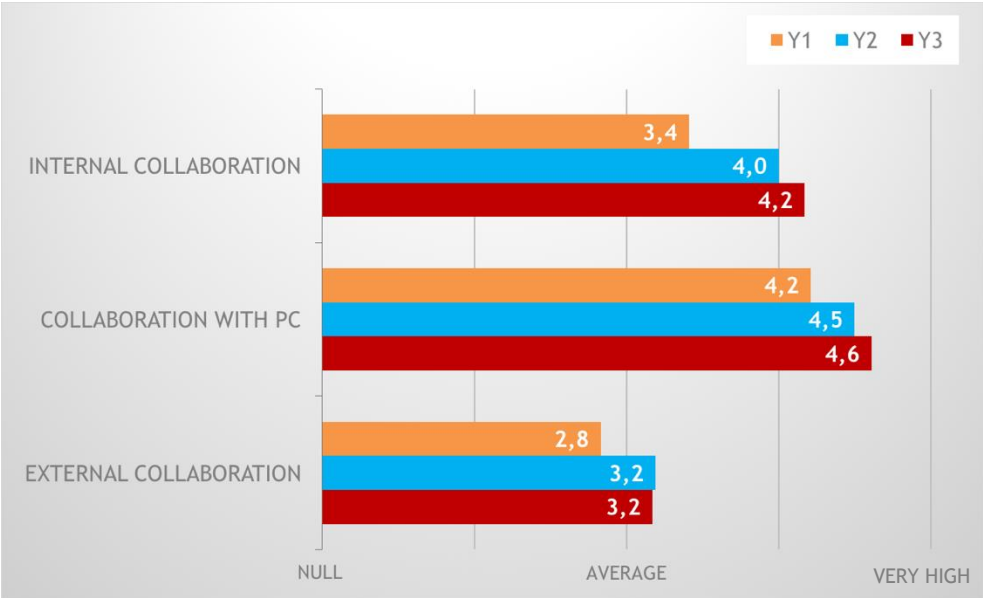


Figure 4: Evolution of partners' collaboration over time
(mean values)

The perceived degree of internal collaboration - collaboration among the partners involved in the same WP(s) and between the partners and the project coordinator- further increased in Y3 while, on the contrary, the degree of external collaboration -collaboration among partners and other member of the consortium working in different WPs- was stable. From one side, this evidence represents the result of an improvement of the degree of collaboration between pilot developers and platform deployers on WP3 and WP5. From another side, following data integration and testing activities in Y2, in which the maximum degree of external collaboration was achieved, the evolution of partners' interactions followed a concentration path inside WPs, following the need to strengthen the coordination community building and social validation activities in the last year of the project evolution.

Figure 5 reports the perceived intensity of external collaboration according to partner's roles. With respect to Y1 and Y2 it seems to confirm that in Y3 pilot developers consolidated their centrality in the project. Contrarily to expectations, platform deployers still perceive a very low intensity of external collaboration with respect to other categories of partners.

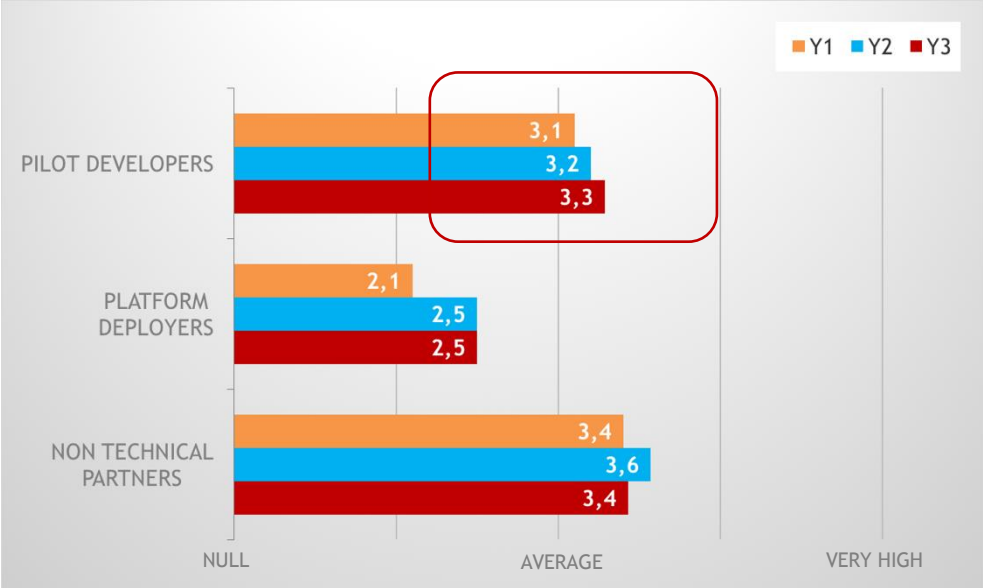


Figure 5: Evolution of partners' collaboration across WPs according to their main role *(mean values)*

Figure 6 shows the result of the analysis of the intensity of partners' interactions and networking activities.

The analysis was performed consistently across the three years of project evolution, allowing us to compare the results and consistently analyse the direction and the strength of interactions among partners. To this purpose, partners were grouped by roles, and the mean values of ties according to the direction and the intensity are reported.

The evolution of partners' networking activities shows a progressive intensification in ties across partners. More in detail, we observe a further intensification in ties among technical partners (in particular, pilot developers and platform deployers) and among technical and non-technical partners (in particular, between platform deployers and non-technical partners):

The consistent growth reported in the strength of ties linking non-technical partners and platform developers, can be interpreted as the result of the transition from exploratory –mainly technical- activities related to the platform development (Y1) to exploitative activities (Y2 and Y3) involving also external communities and requiring a mix of different competences (technological and market competences). As we can see from the three picture there is an increase in the overall interaction during the three years, and this result is positive for the whole community involved in the project.

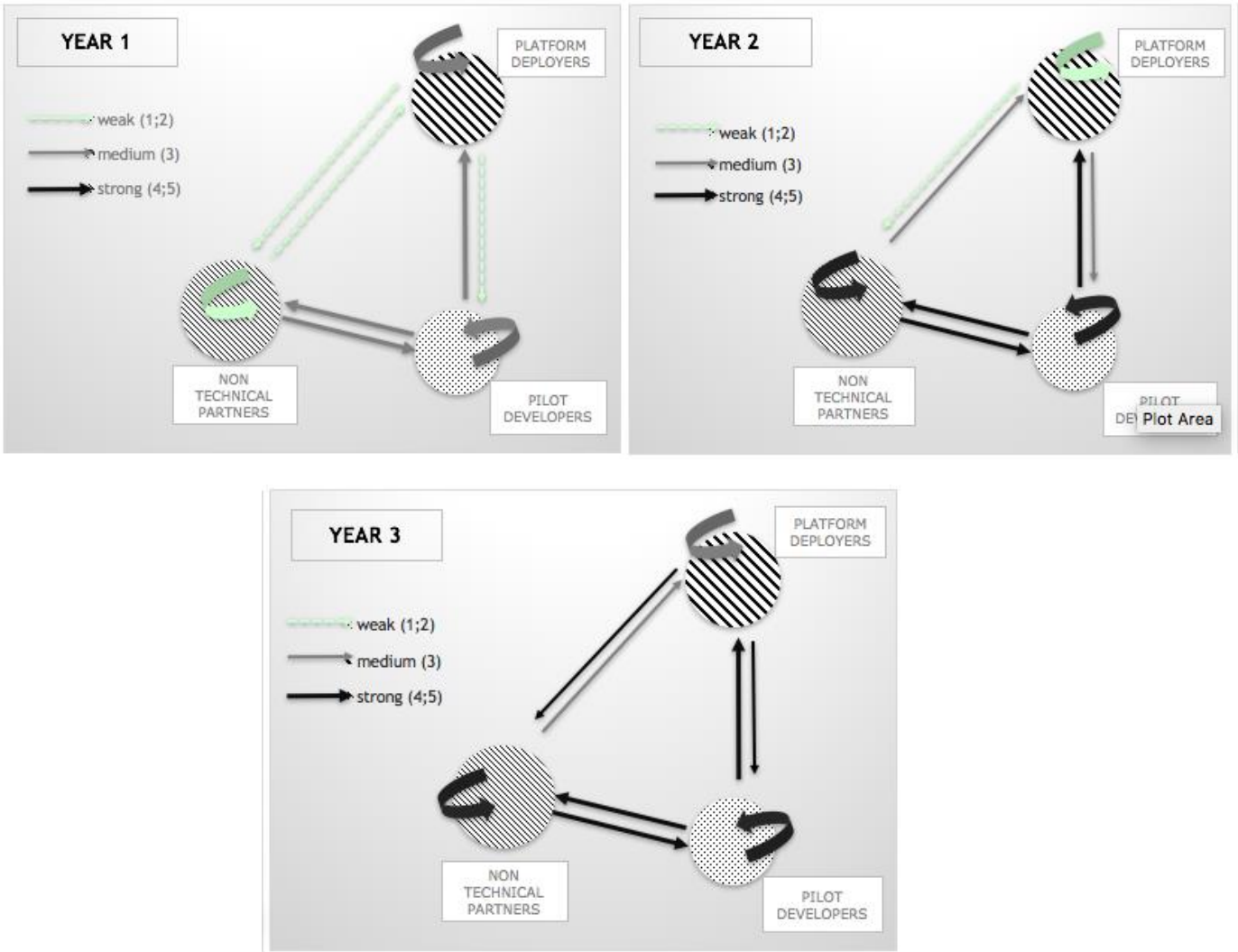


Figure 6: Interaction and networking across the project evolution
(mean values of ties among partners according to the direction)

3.3 SDI4Apps Internal Stakeholders commitment

This section highlights the evolution of partners' involvement in the project across the three years of execution, and the degree of interest in guaranteeing the SDI4Apps platform sustainability over time. The SDI4Apps Internal Stakeholder commitment monitoring activities provided very useful knowledge for project management in the three years of execution, in particular from s risk management perspective.

Partners were asked to evaluate their actual and future commitment to the SDI4Apps project and sustainability of its results according to a Likert Scale ranging from 1 (null) to 5 (very high).

For reporting purposes, we defined:

Actual commitment - the degree of actual involvement, measured in terms of time spent in doing activities, personal effort and general interest in the SDI4Apps project.

Future commitment - the degree of personal interest to guarantee the SDI4Apps platform success and sustainability after the end of the project.

Overall commitment - as the average value of actual and future commitment of the local community in the project.

Further, we compared the results over time (Figure 7).

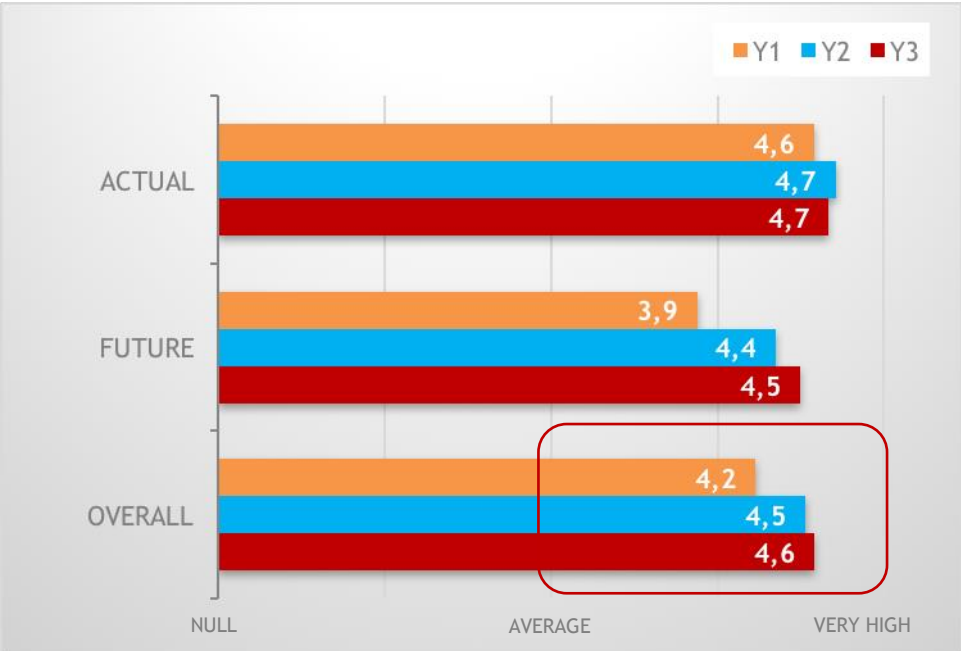


Figure 7: Evolution of Internal Stakeholders commitment in the SDI4Apps project
(mean values)

Following the path of the previous two years, a further increase in the overall commitment of the internal stakeholders' community in the project is observed. This increase is primarily related to a further increase in the degree of future commitment (the pledge to guarantee the platform sustainability over time) from an average value (3.9) in Y1 to a very high value (4.6) in Y3.

Across time, we had observed an intense involvement of the SDI4Apps local community in activities related to the project execution, thus perceiving a very high degree of actual commitment in the project already in Y1 and Y2. Therefore, and as expected, no relevant increase in the level of internal commitment is observed in Y3.

In Y2 partners have managed the transition from the SDI4Apps internal community to the SDI4Apps Community Space, according to the technical transition from data integration and infrastructure development to the definition and testing of the SDI4Apps platform. In Y3, the shift towards dissemination and support activities for external developers and the involvement of online and offline Stakeholders Communities (involved in the platform) produced a sharp increase in the degree of actual and future involvement of platform deployers (Figure 8). As expected, pilot developers and platform deployers appear as the most involved groups in year three (the average scores are 5 and 4.8 respectively) as a result of the coordinating efforts in WP4 WP5 WP6.

As a result of the evolution in the internal stakeholders' map in terms of roles, pilot developers represent in Y3 the pivotal group of actors in the project. Expectedly, they show the highest degree of actual and future commitment in guarantying actual activities and, overall, the platform sustainability over time.

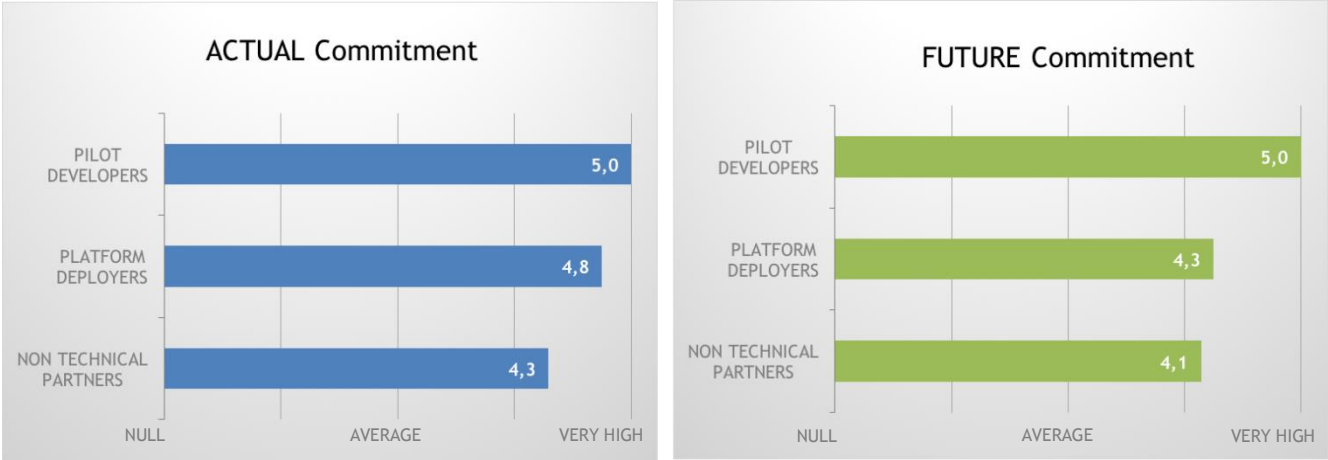


Figure 8: Actual and future commitment in the SDI4Apps project
(mean values)

We furthermore asked partners to report their perception of the project evolution from Y2 to Y3 in a scale ranging from 1 (no enhancements) to 5 (strong enhancements), and compared the scores with those observed in Y2. With respect to Y2, project and pilot applications dissemination somehow "replaced" the activities related to technological development of SDI4Apps pilots at the first position in terms of importance, as a result of the natural technical evolution of the project.

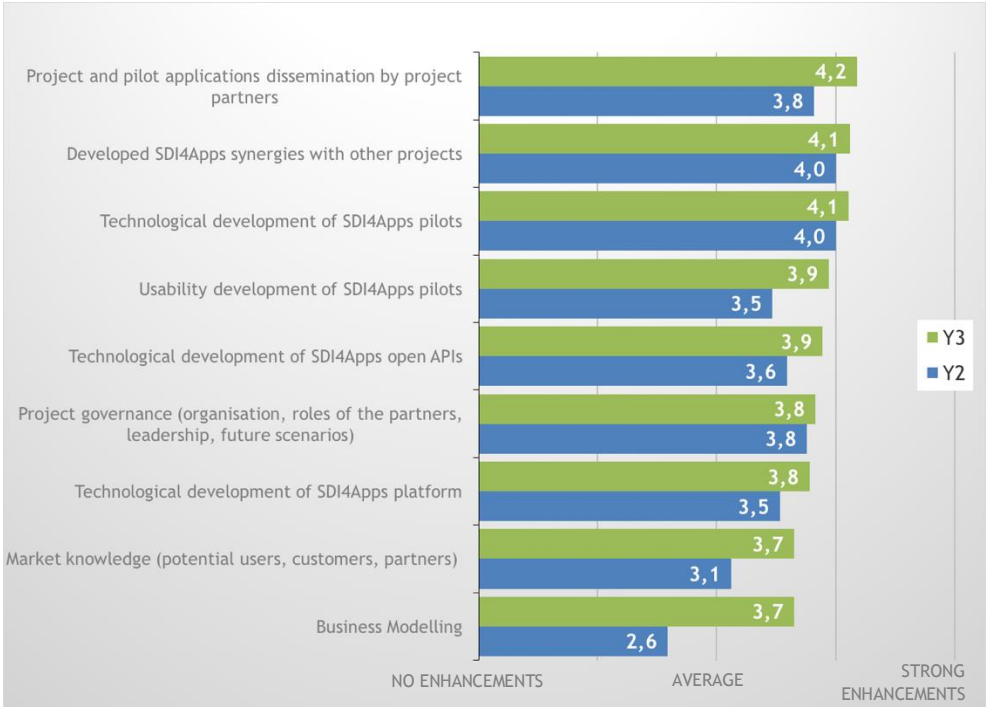


Figure 9: Partners' perception of the project evolution over time
(mean values)

Partners perceive dissemination activities and developed synergies with other projects as the most successful tasks to be accomplished, but still at an average level of development. A sharp increase is also observed in

technological development and usability development of the SDI4apps pilots, and in the usability development of the SDI4apps open APIs.

However, there's clear evidence of the fact that partners perceive the lack of important market knowledge for the external exploitation of the SDI4Apps platform tools and services. In spite of the increase of partners' perception on the advancement of business model activities, this task remains at the least positions.

This is a strong signal of the fact that local stakeholders did not feel sufficiently involved in the definition of the SDI4Apps Business Model.

4 DEFINITION OF THE SDI4APPS COMMUNITY SPACE

This section reports the results of the partners' efforts in the engagement of external communities in the SDI4Apps project[4].

First, we examine the degree of connection and overlap between the SDI4Apps internal stakeholders' community and the external online communities involved in the project. Therefore, we provide a first overview of the transition from the definition of the Open SDI4Apps platform/SDI4Apps Community Space to dissemination and support to external developers/SDI4Apps external online and offline communities (Y2 and Y3 respectively).

Second, we report the final results of partners' efforts in the identification of the SDI4Apps community space, according to two dimensions:

1) Types of external stakeholders' communities
2) External stakeholders' roles

On these two dimensions, and in respect to previous years, we provide further details for the single pilot applications.

Figure 10 shows the perceived degree of connection between the SDI4Apps "local" community and other external communities (consortia) involved in EU programs (in terms of degree of interaction, shared outputs and complementarities).

First of all, we highlight the high degree of overlap between the SDI4Apps FOODIE and OTN communities, as a result of the MoU signed in Y2 in order to link three spatial data themes with related technologies for data management: transport network, land use and point of interests for the benefit of all the projects[5]. SDI4Apps, FOODIE and OTN are projects from the same funding programme and aim at similar objectives, focusing on standardisation of open geodata based on INSPIRE. This is also the reason why the reported interaction with the INSPIRE community is so strong (4.2). Similarly, in the Open Land Use Map, SDI4Apps partners use data from the Copernicus programme including Urban Atlas, Corine Land Cover; so there is a strong perceived interest of the Copernicus community in the SDI4Apps results (3.8). Moreover, SDI4Apps is based on the results from Plan4business (3.7). Finally, there was a strong cooperation in time between the SDI4Apps consortium and the Smart Open Data project (4.1), in terms of data and information sharing (joint workshops, exchange of experience and reuse of mutually results).

[4] The information reported in this section has been validated through the external stakeholder management survey; results are reported in section 5.

[5] More in detail, partners from SDI4Apps participated also in FOODIE and OTN; not ECIM though, which makes the perceived degree of connection basically smaller.

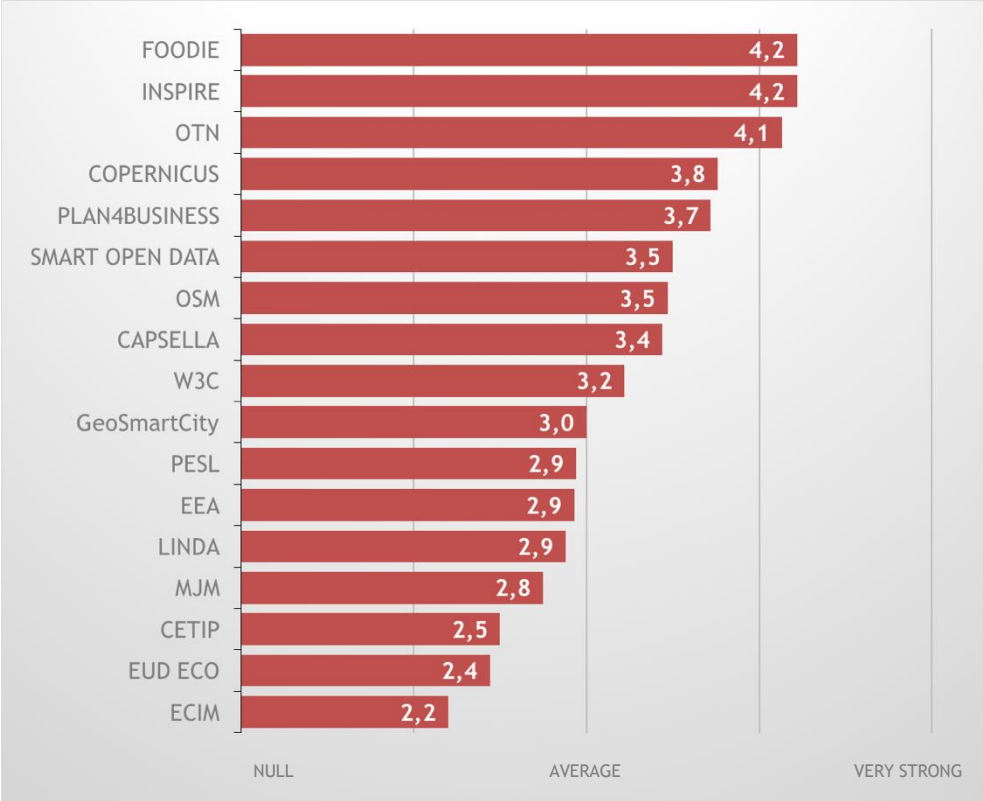


Figure 10: Partners' perception of the SDI4Apps consortium connection to external communities *(mean values)*

Finally, SDI4Apps is also strongly based on OSM (SPOI, OLU, OTM data products) (3.5). There was a collaboration with Capsella (3.4), especially at the MedHackathon and with W3C (3.2) on the Linked Data standards and GeoDCAT metadata application profile.

4.1 SDI4Apps internal and external communities intersection

During the three years of the project evolution we performed a constant monitoring of the opportunities that, according to partners, could be explored and exploited through the SDI4Apps project.

In particular, in the first two years, the SDI4Apps Stakeholder Management activities have been developing:

- Pilot use scenarios and platform sustainability scenarios - Y1
- Identification of external stakeholders' categories (partners, customer, users) for each pilot application and role played in the SDI4Apps Community space – Y2-

The aim of Stakeholder Management activities in Y3 is to develop the final identification of online and offline communities of external stakeholders involved in the SDI4Apps Community space. In this section we report the results of process of identification of such communities from an internal stakeholders' perspective. We further provide evidence of validation of these data in section 5, reporting the results of the SDI4Apps external stakeholder management assessment.

Based on the outputs of stakeholder management activities in Y1 and Y2 we categorised the main external online and offline communities involved in the SDI4Apps community space according to two dimensions:

1) Types of communities:
- Academia
- Public Sector
- Private sector (SMEs and clusters)
- Private sectors (LEs)
- NGOs
- Individual citizens

2) Potential role (type of connection with Open Data)
- Data provider
- End User
- Operational decision maker
- Funder
- App service developer

In order to gather a detailed overview, we adopted a bottom up approach and built the overall assessment of the SDI4Apps Community space based on single pilots' evaluations.

In Figure 11 results of partners' perception of the SDI4Apps Community Space are reported.

The first consideration is the high variety in the types of external communities that are expected to act as data providers (Academia, Public sector, Large enterprises, NGOs are the most cited categories) and end users (Academia, NGOs, individual citizens).

These first results largely reflect the open nature of the SDI4Apps. Since the beginning of the project partners' consensus on the SDI4Apps exploitation opportunities converged towards a service-based approach providing shared value to multiple sectors.

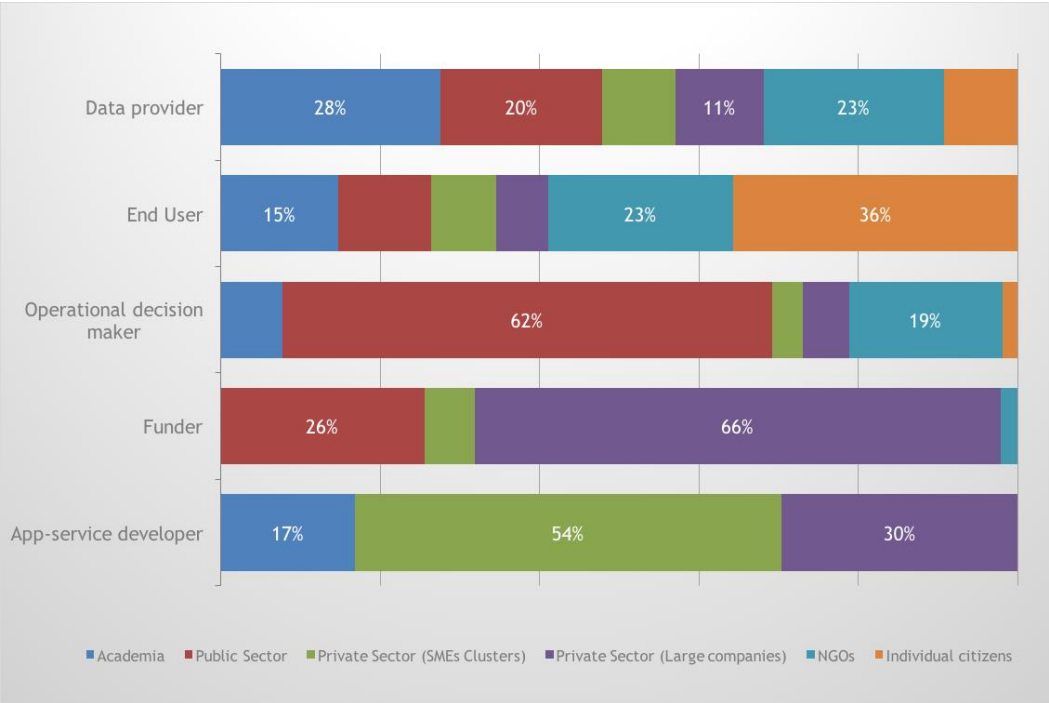


Figure 11: Partners' perception of the SDI4Apps community space
(overall distribution according to different types of communities and potential role)

Moreover, and in line with the plans for further maintenance and development of the platform and the open APIs adopted in Y2 (to be transferred to an association/consortium agreement at the end of the project), the SDI4Apps partners expect the public sector and, in minor part, the NGOs to assume coordination functions among data providers and end users of the SDI4Apps platform, mostly acting as operational decision makers.

For what concerns the private sector, distinct roles are expected for the communities of Large Companies (as funders) and SMEs/clusters (as app/service developers). The role of Individual citizens is largely referred to the role of end users.

The second important consideration is that the actual framework does not explain which type of synergies could be developed among the different communities around the platform.

For example, internal partners put an emphasis on Academia and the private sector (small and large companies) as communities of stakeholders playing the role of app-service developers through the platform services and tools. These two communities might therefore represent, in partners' perception, the main groups of actual "customers" of the platform. However, such evidence has to be framed in a value creation perspective. This is why the considerations emerging from these first results represent relevant issues for the further definition and development of the business model.

In this perspective, and in order to provide relevant feedback for the development of other tasks –such as social validation methodology (T2.2), internal validation (T2.3), external validation (T2.4) and, outside WP2, business modeling (T8.6)- we provide a map of the SDI4apps external communities for each of the 6 pilots (Figure 12).

	Data provider	End User	Operational decision maker	Funder	App-service developer
Academia	PILOT 1 PILOT2 PILOT5 PILOT6	PILOT4 PILOT5	PILOT5		PILOT3
Public Sector	PILOT2 PILOT4 PILOT5	PILOT1 PILOT3	ALL PILOTS	PILOT1	
Private Sector (SMEs Clusters)	PILOT1 PILOT3 PILOT5	PILOT1	PILOT3 PILOT4	PILOT6	ALL PILOTS
Private Sector (Large companies)	PILOT1 PILOT3 PILOT4	PILOT1 PILOT4	PILOT1 PILOT2 PILOT3	ALL PILOTS	PILOT4 PILOT5 PILOT6
NGOs	PILOT1 PILOT3 PILOT4	ALL PILOTS	PILOT2 PILOT6	PILOT1	
Individual citizens	PILOT1 PILOT2	LL PILOTS	PILOT1		

Figure 12: Partners' perception of pilot positioning in the SDI4Apps community space
(based on percentage relationships between different types of communities and potential role for each pilot)

5 SDI4Apps External Stakeholders Engagement

The second cycle of the community building work in SDI4Apps focused on the transition from the internal ("local" stakeholders) community to the SDI4Apps community space aimed at definition of use scenarios of the open SDI4Apps platform through the active involvement of external stakeholders' communities in Y3.

5.1 SDI4Apps External Stakeholders Profiles

An updated map of the SDI4Apps Community space is a crucial element for successful technology exploitation, business modeling and project sustainability.

SDI4Apps platform and pilots' scalability is the essential condition to provide shared value among internal and external stakeholders. One of the main objectives in Y2 has been to reach a critical mass of partners involved in sharing data for further reuse in new apps development; dissemination activities like workshops, hackathons and code camps were identified as a priority way to reach this target. In Y3 Stakeholder Management assessment directly involved different communities of external stakeholders[6].

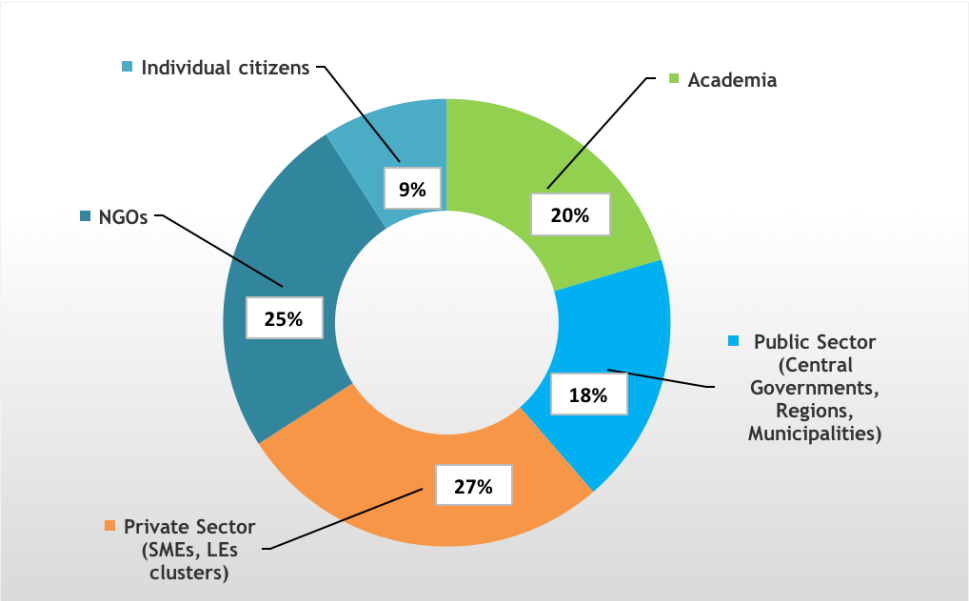


Figure 13: SDI4Apps external stakeholders' community map

(% of answers)

The SDI4Apps external stakeholders' community map (Figure 13) shows a balanced composition among 4 types of actors: Private sector (SMEs, Large companies, clusters 27%), NGOs (25%), Academia (20%) and the Public sector (Central Governments, regions, municipalities, 18%), while the involvement of individual citizens was quite lower, representing only the 9% of the sample.

Along with this first map of the SDI4Apps external stakeholders' community, we report some characteristics of the actors involved. In particular, we were interested in assessing the external stakeholders' profiles, based on previous experience, familiarity and degree of involvement with open data.

[6] The SDI4Apps External Stakeholder Management survey was run from December 2016 to February 2017. In order to involve a wide range of stakeholders in the SDI4Apps community space, the survey was also delivered to all the participants to dissemination activities like workshops, hackathons and code camps. The survey got 45 total responses.

Figure 14 shows the characteristics of the SDI4Apps external stakeholders as related to their involvement in European programs. As expected, a big majority of the external stakeholders involved in the SDI4Apps project are operating in EU consortia (61%).

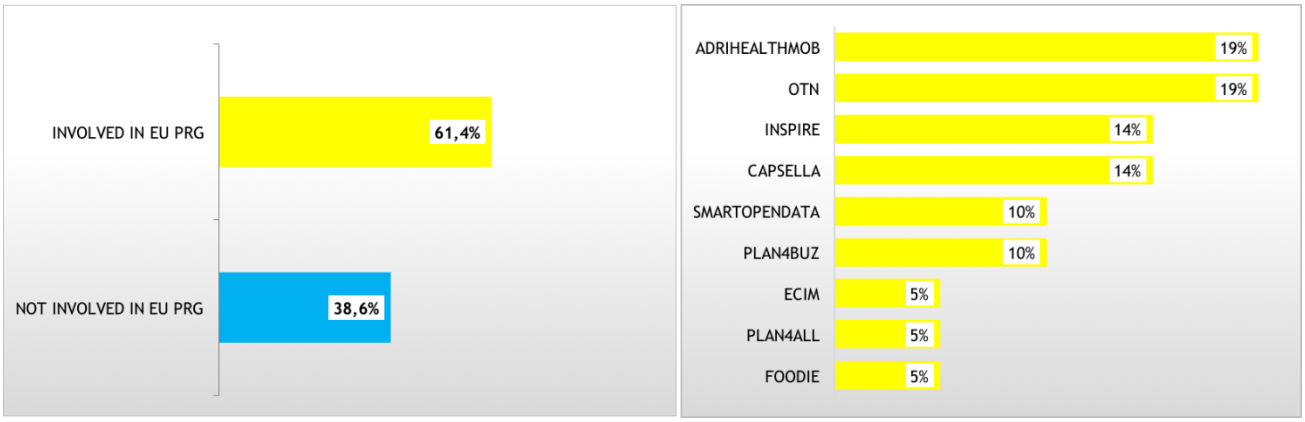


Figure 14: Characteristics of the SDI4Apps external stakeholders' community - Involvement in EU programs
(% of answers)

In figure 15 we report the degree of experience in using open data across different types of external stakeholders' communities. Although the reported scores are based on self-evaluations, we spot an above-average level of experience in using open data among actors involved in the SDI4Apps project, being only Academia and the Public sector communities still below the average.

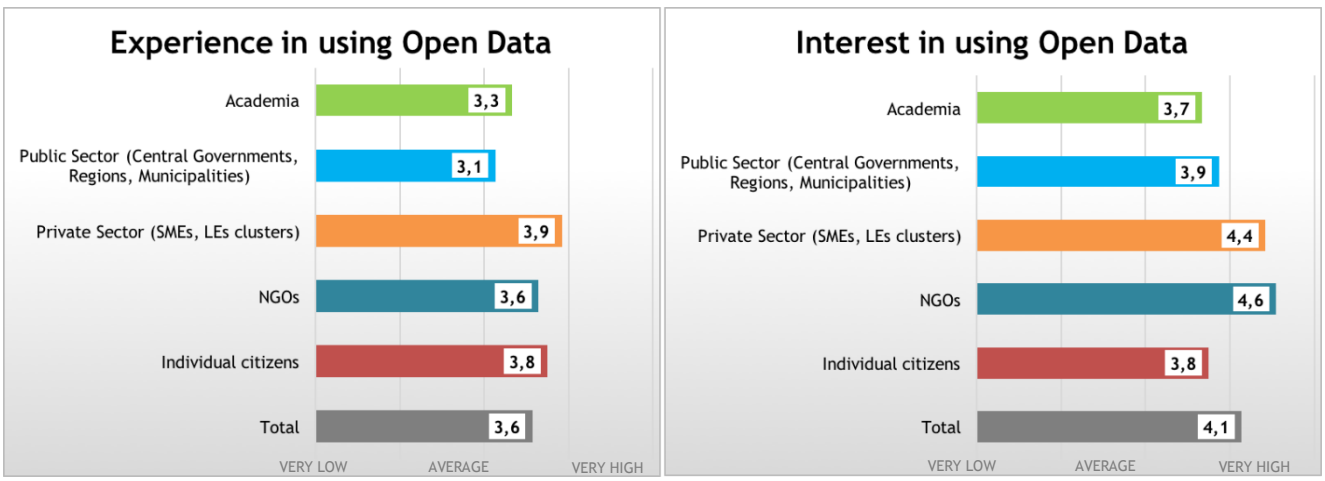


Figure 15: Characteristics of the SDI4Apps external stakeholders' community – Experience and interest in using Open Data
(% of answers)

Nevertheless, the overall degree of interest in using open data is high (4.1 over 5), showing that the topic is increasingly gaining momentum. NGOs and the private sector (SMEs and Large enterprises) confirm their centrality in the SDI4Apps community space, showing the highest scores in terms of interest (4.6 and 4.4 over 5 respectively).

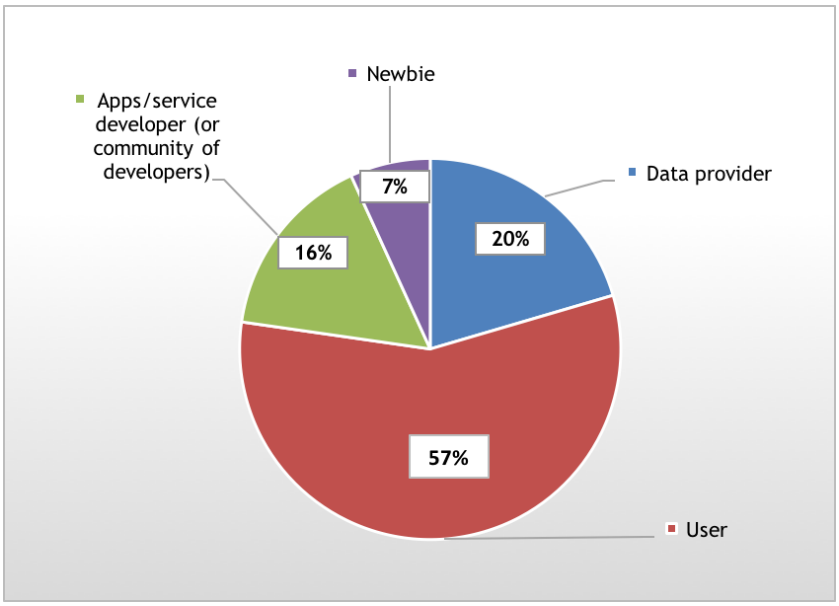


Figure 16: Characteristics of the SDI4Apps external stakeholders' community – Main connection with Open Data
(% of answers)

Figure 16 further shows that, regardless to the community they belong to, the majority of external stakeholders in the sample relate to open data as end users (57% of actors in the sample). Smaller (but balanced) portions of stakeholders are rather connected to open data as Apps/service developers and data providers (16% and 20% respectively). Only the 7% of stakeholders in the sample reported themselves as "Newbies" in the relationship with Open Data. Figure 17 further disentangles the characteristics of the external stakeholders' community in terms of experience and interest in using open data. Also in this perspective, data providers, end users and app/service developers report the highest levels of interest in using open data.

The information reported in this section confirms the use scenarios set for SDI4Apps in Y1 and Y2. In the next paragraph we evaluate the level of engagement of the three external communities in the SDI4Apps community space.

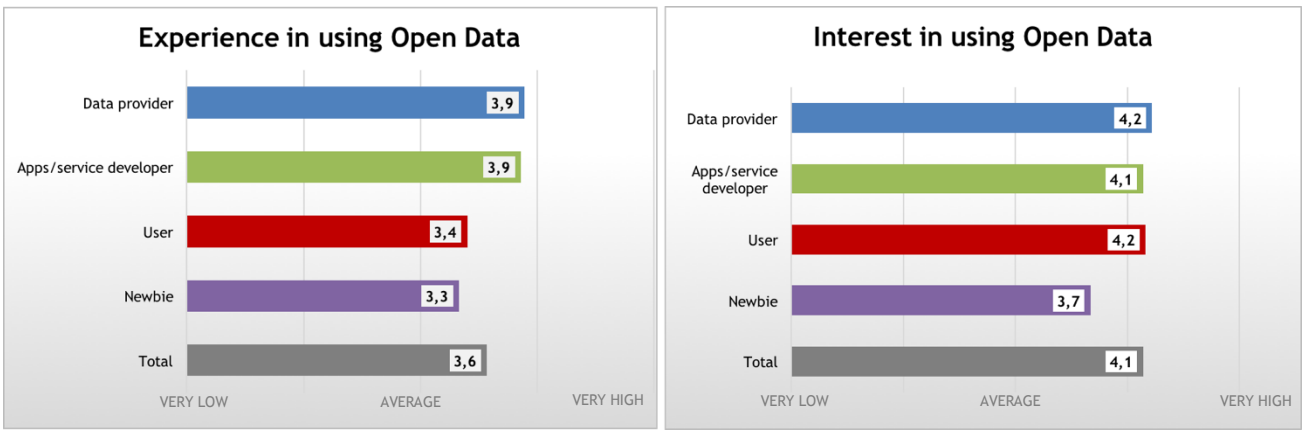


Figure 17: Characteristics of the SDI4Apps external stakeholders' community – Experience and interest in using Open Data
(% of answers)

5.2 Engagement with the SDI4Apps Platform

In this section asked the external stakeholders to provide an assessment of the main outcomes of the SDI4Apps project. External stakeholders were asked to provide an evaluation of three types of outcomes:

1) Tools of the SDI4Apps platform

2) Spatial data services

3) Pilot applications demonstrating the innovative features of the platform and serving as a space for validation and testing.

Information gathered from external evaluation will be useful for the adjustment/improvement of the above mentioned components.

5.2.1 Tools of the SDI4Apps platform

First of all, external stakeholders were asked to assess which of the tools actually provided by the SDI4Apps platform would be relevant for their needs.

We listed all the provided tools (SDI4Apps OpenAPI Customer Web Services, SDI4Apps SW platform, Javascript library based on the SDI4Apps OpenAPI GIS server platform,SDI4Apps cloud platform) and we asked to external partners to evaluate them on the basis of a Likert scale ranging from “Not relevant” (1) to “very relevant” (5). Results are reported in Figure 18 below[7].

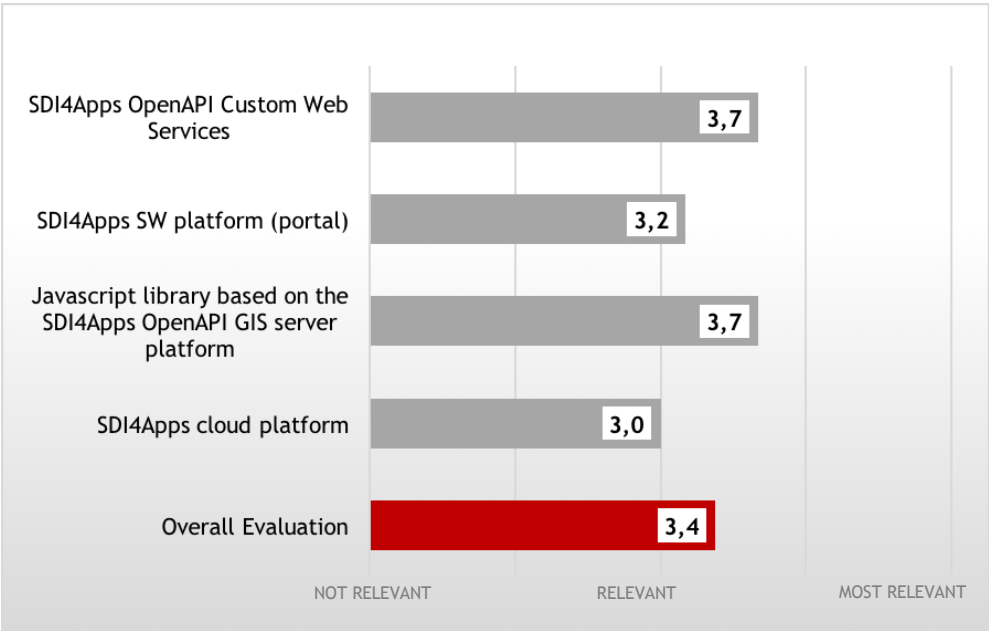


Figure 18: Evaluation of the SDI4Apps platform tools
(mean values)

[7] Due to the small number of answers collected on this item, we here provide some general considerations about the overall evaluation of external communities in terms of relevance of the SDI4Apps tools.

The overall evaluation score of the SDI4Apps platform tools is slightly above the value of 3 (relevant), with (expected) higher values for the OpenAPI Customer Web Services and Javascript library based on the SDI4Apps OpenAPI GIS server platform.

5.2.2. Spatial Data Services

Similarly, Figure 19 reports the evaluation of the SDI4Apps spatial data services, in terms of relevance for the needs of different communities of external stakeholders. The overall evaluation of spatial data services maintains the average value of 3.4.

Search service, analytics and modeling service, routing service, data management service and web map service show a higher value with respect to the average. On the contrary, customer data service and extended storage services are not relevant sources of value for the external stakeholders.

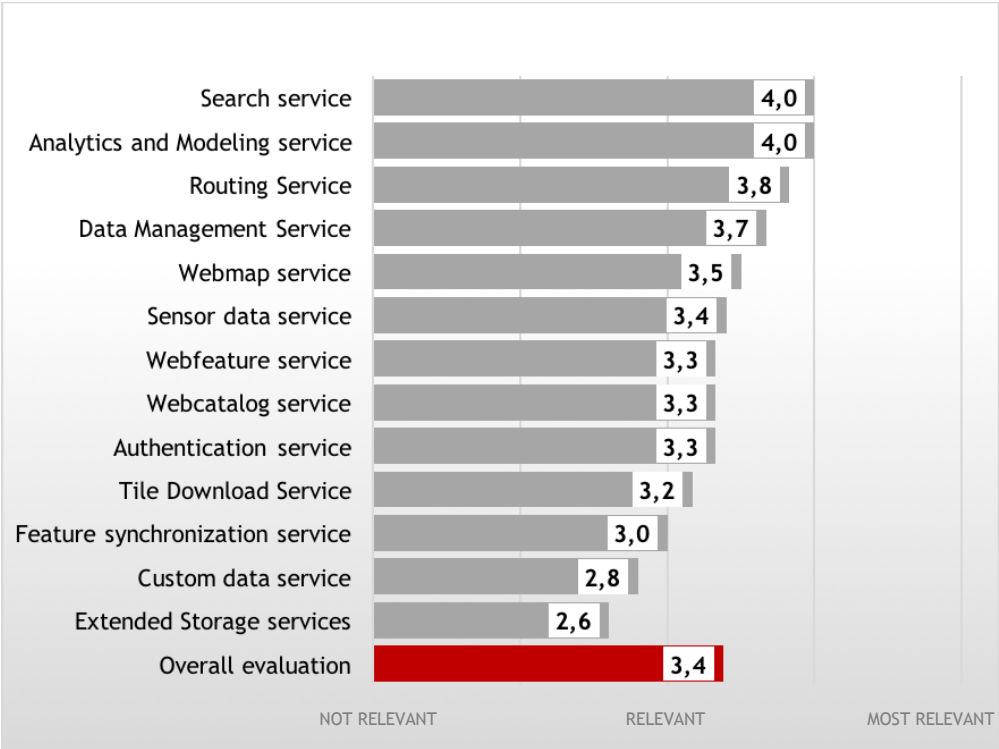


Figure 19: Evaluation of the SDI4Apps Spatial Data services
(mean values)

These results provide insights for further developments of the SDI4Apps business model (investing in the external exploitation of those services representing sources of value creation for the external community /maintaining a constant (incremental) improvement of the services evaluated as less beneficial).

5.2.3 Pilot applications

Figure 20 reports the external evaluation of the six pilot applications supporting the development of the SDI4Apps platform, serving as a space for validation and testing. The overall evaluation of the six pilots is slightly above the average value observed for the SDI4Apps platform tools and spatial services (3.5).

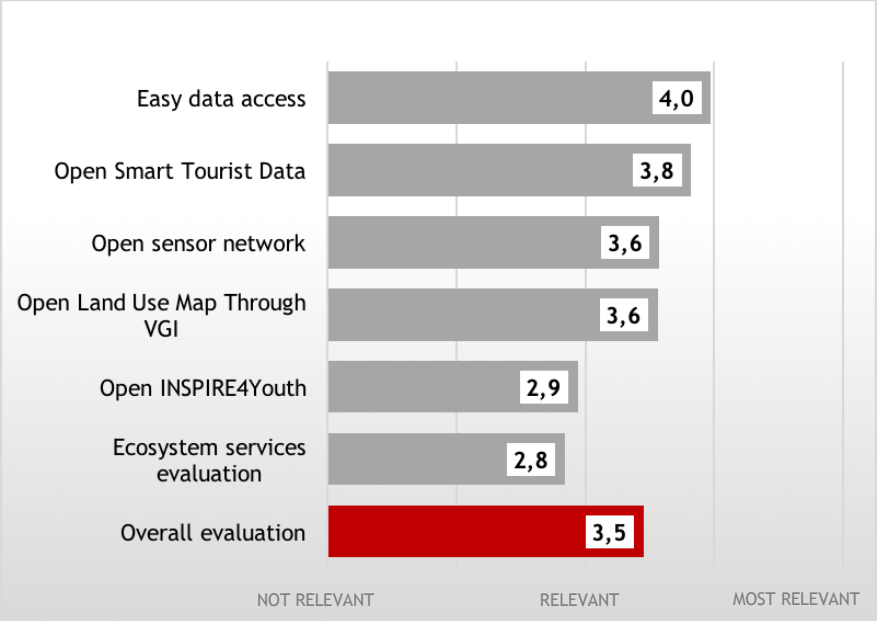


Figure 20: Evaluation of the SDI4Apps pilot applications
(mean values)

We observe high variability in the evaluation scores of the six pilot applications, probably depending on the composition of the sample of respondents.

Easy data access and Open smart tourist data are, for example, the two pilots in which the composition of external communities of data providers (Public sector) app developers (SMEs and clusters) and end users (public bodies, citizens) better reflects our sample of respondents. For those pilots, external stakeholders' communities were clearly identified in Y2 and community engagement activities have been pursued during Y3 (e.g. the ETIS service stakeholder survey in T6.1).

Regardless from the lower evaluation score, we spot a high potential in terms of relevance for the public sector and the NGOs for Open INSPIRE for Youth and Ecosystem Services Evaluation pilots. The overall evaluation score could therefore have been influenced by a less focused definition of specific communities of customers (app developers) and end users to engage with.

More in general, we find that those pilots involving communities of users in the private sector were better enabled to develop proper community engagement activities. In contrast, pilots more focused on the public sector and NGOs as the main external stakeholders' communities show a weaker tie with the SDI4Apps community space as a whole.

Further details on single pilots' evaluations with regard to the main external stakeholders involved are reported in Figure 21.

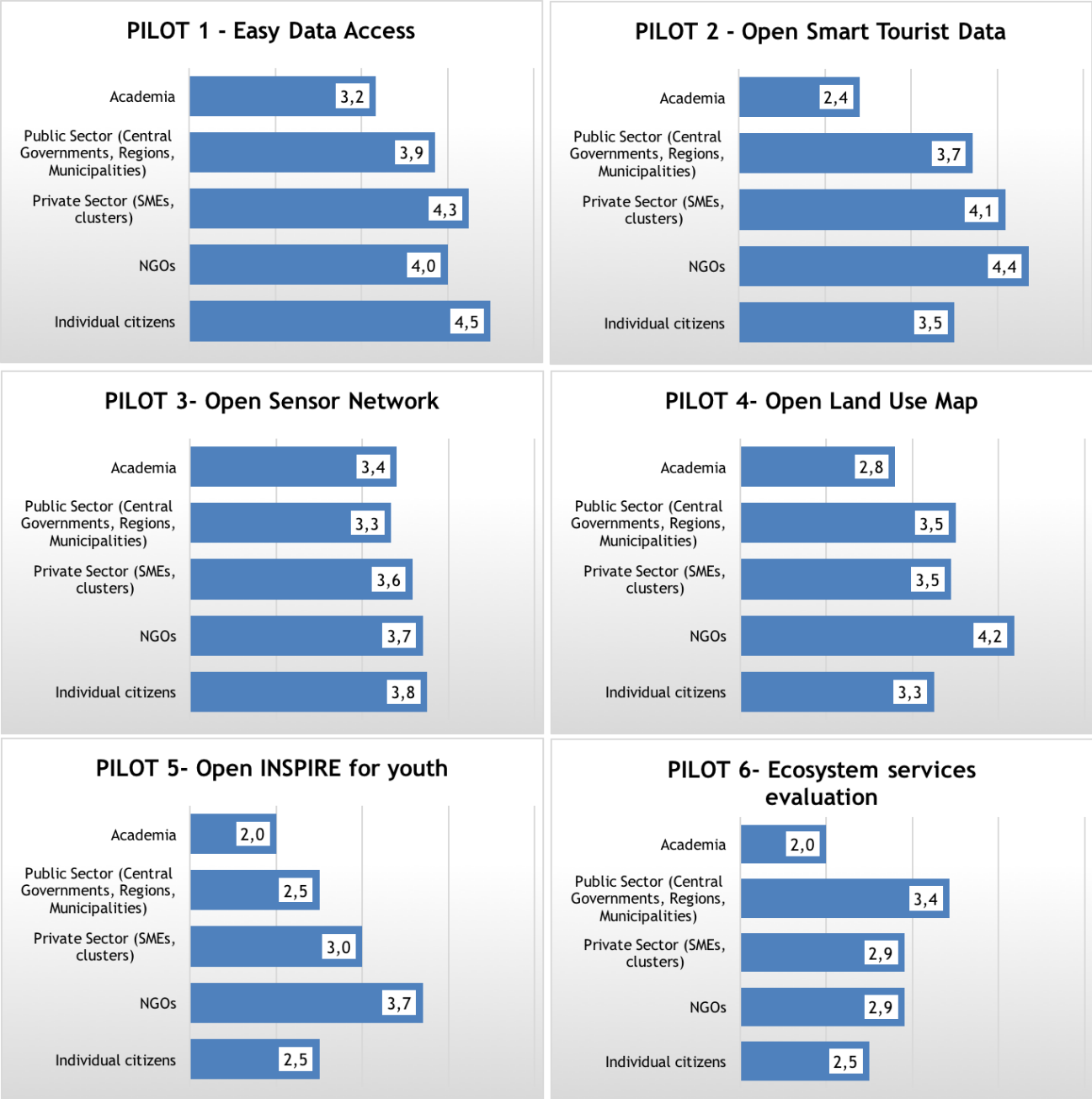


Figure 21: Evaluation of the SDI4Apps pilot applications by different communities of external stakeholders *(mean values)*

5.2.4 Overall evaluation

Synthesis figures on the overall evaluation of the SDI4Apps tools, spatial data services and pilot applications are reported in Figure 22.

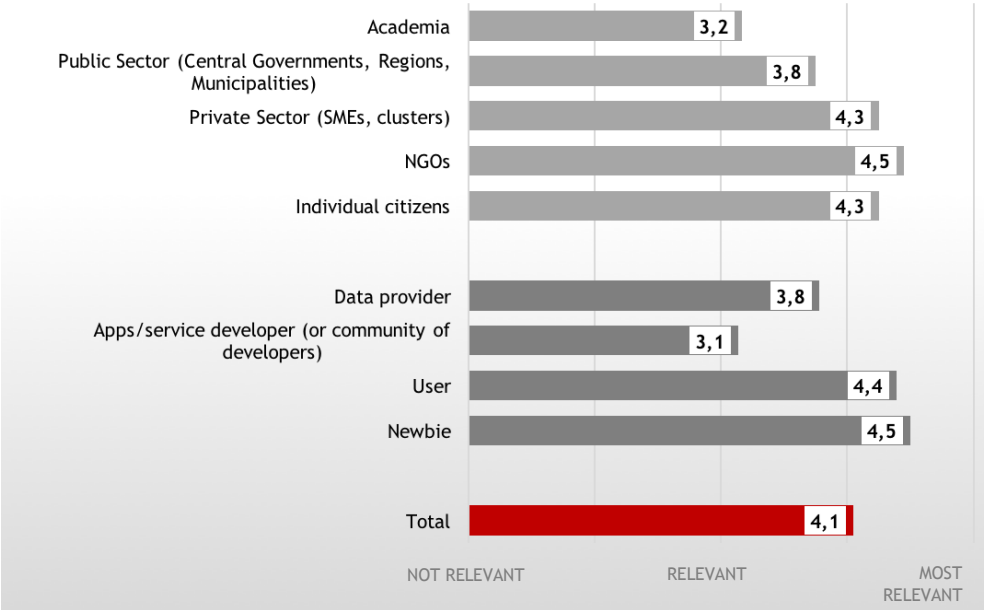


Figure 22: Overall evaluation of the SDI4Apps tools, spatial data services and pilot applications *(mean values)*

The overall evaluation of the SDI4Apps project outcomes is certainly positive.

The SDI4Apps project, as a whole, is actually considered as a source of value for the needs of involved SMEs, clusters, NGOs and individual citizens, while an increased effort is required to improve the engagement with Academia and the Public sector.

At the same time, results show clearly that those activities aimed at engaging external communities of apps/service developers deserve more attention. From one side, the SDI4Apps platform is attracting the interest of data providers, users and people experiencing the use of open data for the first time; from another side, and in the perspective of a future sustainability of the project, business modelling activities should focus more on value creation mechanisms for apps/service developers, as the community with the highest degrees of experience and interest in the use of open data.

CONCLUSIONS

The goal of Stakeholder Management was to provide an overview of community building activities in the SDI4Apps project. Stakeholder Management activities followed the technical evolution of the SDI4Apps pilots/platform development during the three years of activity and provided a constant monitoring of the "social" corresponding transition towards changing configurations of involved stakeholders

More in detail, the community building work of SDI4Apps unfolded in two iterative cycles.

The first cycle, in Y1, gathered the core SDI4Apps community around the shared objective of providing the initial state-of-the-art baseline and user requirements. The second cycle of the community building work implied the definition of use scenarios in parallel with the technical development of the open SDI4Apps platform (Y2) with the aim of shaping the SDI4Apps community space. At the end of this second cycle, in Y3 the community building work focused on the engagement of online and offline external stakeholders' communities.

In its first part, D2.1.3 traces the evolution of the SDI4Apps local stakeholders' community.

First of all, it provides an updated map of the development of collaboration and networking activities across different groups of internal stakeholders.

The internal SDI4Apps community of partners is extremely heterogeneous, with two distinct competencies groups (technical and non-technical) and different sub-roles (pilot developers, platform deployers, consultants and project coordinator) constantly evolving in time. We spot an evolution from dyadic interactions between specialized partners towards networking activities in which technical partners played two or more sub-roles at a time. The complexity of the network has been tightening as soon as the project was evolving from the initial phase of research activities (data integration and infrastructure development, technical definition of the SDI4Apps platform) towards exploitation, dissemination and support to external developers. Nevertheless, we spotted an ever increasing internal collaboration among partners with different competencies.

In the third year, results show that the SDI4Apps community increasingly and actively collaborated in pilot development and platform deployment activities. Platform deployers increasingly gained centrality over time. Pilot developers confirmed their pivotal role in the project, in terms of actual involvement and future commitment.

Overall, the degree of commitment of the local stakeholders' community was strong and constantly rising. As we show in the second part of this report, partners' constant effort in the definition of the SDI4Apps community space allowed the engagement of external communities as data providers, app developers and end users.

Also, Stakeholder Management activities provided relevant feedbacks to risk management and business model tasks. In the final part of D2.1.3 we report the major difficulties encountered during this process and the elements emerging as weakness points, therefore requiring room for improvement.

ANNEX 1 – SDI4APPS USE CASES

Plan4all (reuse of all project results)

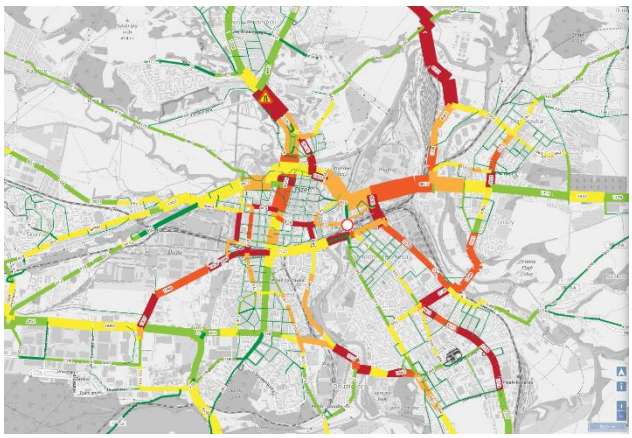
Author: Thomas Mildorf - UWB (CZ)

UWB is a founder of the Plan4all association. Plan4all is a non-profit association sustaining project results and open data related to spatial and environmental planning. The association was set up during the FP7 project Plan4business (2012-2014) that developed an open data platform for aggregation, management and analysis of spatial planning information. This platform is now managed by the Plan4all association, which makes sure that data are easily accessible for reuse, data are maintained and further enhanced. The Plan4all association has got currently 25 members.
The results of the SDI4Apps project are being transferred to the Plan4all association including the open datasets: i) Open Land Use Map, ii) Smart Points of Interest, and iii) Open Transport Map. This gives an opportunity for further development by the Plan4all members and exploitation by any organisation.

Traffic volumes (reuse of the Open Transport Map)

Author: Thomas Mildorf - UWB (CZ)

SDI4Apps is jointly working with the OpenTransportNet project on the creation and maintenance of the Open Transport Map (OTM), a routable transport map based on OpenStreetMap and other national, regional or local data sources, compliant with the INSPIRE Data Specifications on Transport Network. A key advancement of this dataset is the ability to calculate road traffic volumes based on demographic data. This feature is available for the entire Europe and is a great opportunity for traffic management.
An example of a real world analysis is under the process in Pilsen in the Czech Republic (http://opentransportnet.eu/web/guest/pilsen-traffic-volumes). The City of Pilsen expressed its interest in this application due to extensive road closures in next coming years. The application will be now further developed for Pilsen and hopefully for other cities or regions under the umbrella of the Plan4all association.



Open Data in Education

Author: Thomas Mildorf - UWB (CZ)

All open data developed during the project are being used by students and researchers of the university. It's a great source of open data with pan-European coverage, suitable for pan-European, national and regional analysis. Open Land Use Map is a valuable source especially for students in the spatial planning programme as it provides unique seamless source of land use/land cover information. Open data are exploited for semester projects and master and PhD theses as well as for other research projects, e.g. DataBio – Data Driven Bioeconomy.

Easy Data Access Pilot Use Cases

Author: John O'Flaherty - MAC (IE)

For the "Easy Access" Pilot MAC worked with the Burren National GeoPark in Ireland. Social Validation/Co-design meetings and discussions with the GeoPark stakeholder groups (as per the SDI4Apps social validation methodology) identified that "Tourism for Conservation" was their main concern that could be addressed.

MAC used the SDI4Apps Enablers and Cloud-based scalable platform, and open data, to develop the following services to help sustainable tourism in the Park and beyond.

1. European Tourism Indicator System (ETIS)

ETIS is a new EU standard, that is a local community led process for monitoring, managing, and enhancing the sustainability of a tourism destination. SDI4Apps enables streamlining and enhancing the current manual system by transforming it into a webservice and multiple easy-access Apps for the various stakeholders involved, including:

i. Public bodies – National Parks Wildlife Service (NPWS)
ii. Experts – Researchers and management in the Burren GeoPark, GeoParks Network.
iii. Enterprises, Companies and SMEs – Burren GeoPark
iv. Citizens – visitors to the Burren National Park

The ETIS service dashboard was developed and made available at www.ETISapp.eu. While each of the stakeholders survey Apps are at (a) Visitors www.ETISapp.eu/visitorsurvey.html, (b) Residents www.ETISapp.eu/residentsurvey.html and (c) Enterprises www.ETISapp.eu/enterprizesurvey.html

ETIS is the first implementation of the standard that the EU hopes will be used Europe-wide for all Sustainable Destinations.

2. Ground Truthing Tourism Sites Services

SDI4Apps enables services to GroundTruth tourism sites, empowering visitors and people interested in their local heritage and tourist sites to seek out and ground truth such sites. Ground truthing is the Crowdsourcing process of gathering data in the field, to either complement or dispute remotely collected data. This is mobilising a very motivated community of stakeholders, including

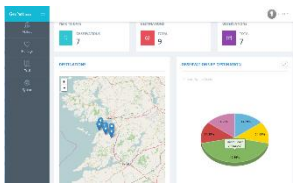
i. Public bodies – Heritage Council, National Monuments Service, Irish Government Department of Arts, Heritage and the Gaeltacht
ii. Experts – Field Monuments Advisors and Researchers and management in the Burren GeoPark, GeoParks Network
iii. Enterprises, Companies and SMEs – Farmers.
iv. Citizens – visitors and people interested in their local heritage and tourism sites.

A. Heritage Sites Reporting at www.GroundTruthing.eu

For Heritage Council Field Officers, visitors and people interested in their local heritage, to seek out and ground truth Protected Monument sites

b. The Ground-Truthing Service is changing how the Monument Field Officers operate in Ireland.
c. If the experience with Crowdsourced Ground Truthing proves positive – the Irish Heritage Council plan to integrate it into their National Monuments Service and dataset.

B. GeoPark Management Portal at http://groundtruthing.cloudapp.net



For the Burren Management Team (and other GeoParks subsequently) to better manage their Park by , providing:

i. **Site Monitoring**
   - Reporting the status of each site for the Burren GeoPark Management Team

ii. **Visitor Observation**
   - Reporting on visitors to each site for the Burren Management Team.

iii. **Walking Trail Monitoring**
   - Reporting on several points along a walking trail between sites

Each of these services will be sustained, funded and extended after the SDI4Apps ends by the public agencies involved, particularly targeting GeoParks globally. Their market potential is extensive. As an innovative SME, MAC plans to exploit the services by:

- Partnership with funding organizations – public/private fees for the Easy Access services.
- Selling professional services – such as training, technical support, consultancy etc.
- Dual-licensing – for additional specific value-added features.

Open INSPIRE4Youth Pilot Use Cases

Author: Pavel Vondráček - Úhlava, o. p. s. (CZ)

1. Regional school system

The application will serve as a complementary device for improvement of the students´ knowledge of the regional places of interest in the Pošumaví region. The students can verify their knowledge in the quiz – questions to particular points of interest (SPOI). The application will also help teachers to get acquainted in detail with individual points of interest in the region and they could also extend the information according to their knowledge and personal experience. All primary and secondary schools in the region will be informed by electronic mail when the application will start up.
This fact will result to:

- better knowledge of the region where the students live
- improvement of the belonging with the region
- improvement of the topographical knowledge of the students while working with the maps

2. **Tourism industry**

In the region concerning this project is the tourist destination Prácheňsko a Pošumaví z.s. This destination will use the application for promotion of tourist places of interest. Information about this application will be available both in the tourist information centres and also in the regional electronic information sources of tourist industry. All concerned municipalities and important businessmen will be informed when the application will start up.
This fact will result to:

- popularization of less known places of interest
- planning of the trips for the incoming tourists
- get acquainted with the points of interest (SPOI) for those who plan to visit the region

3. **Local residents**

Local residents can, with the help of the application, extend their knowledge of the points of interest (SPOI) in their surroundings. It is also supposed that they will share their knowledge with others and complement the information in the application. In the region is widened the education of the seniors (U3V), that is in small towns organized by the Czech university of Life Sciences by electronic form through the internet. According to our experiences, the seniors will be the key target group besides the students. Decreased mobility of the seniors limit them to visit some places included in the application.
This fact will result to:

- improvement of the belonging with the region
- better knowledge of the region
- dialogue between generations in connection with point 1

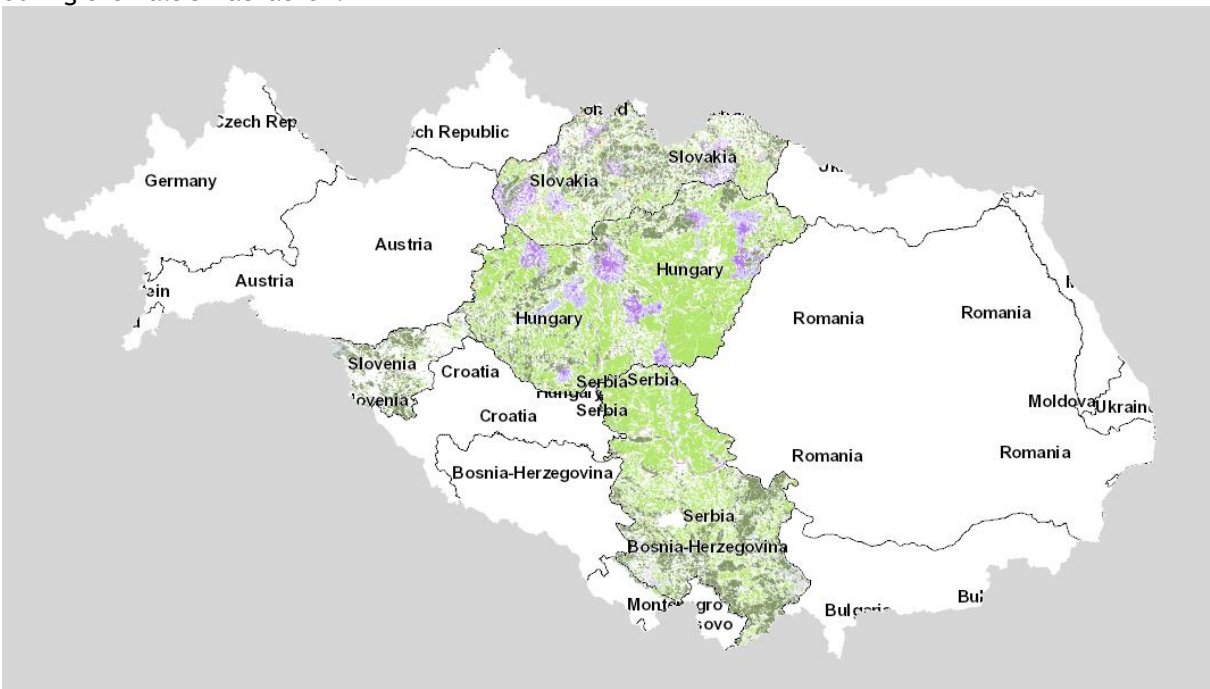
Danube Open Land Use Map (re-use of SDI4Apps CZ & LV Open Land Use Map)

Authors: Martin Tuchyňa – SAZP; Tomáš Kliment, Csaba Sidor,- e-Pro; Zuzana Okániková, - Pronatur (SK)

Based on experience and results achieved with the development of the Open Land Use Map in Czech[8] republic and Latvia[9] additional development of the Open Land Use Map datasets took place in countries with the connection to the Danube river as well as Danube reference data and services infrastructure (DRDSI[10]) project, led by European Commission, Joint Research Centre. Based on this Danube Open Land Use Map[11] has been prepared and made available also for Slovakia[12], Hungary[13], Serbia[14] and Slovenia[15]. Many of these countries are facing to limited land use data access and availability of such information can help on national level as well as from the cross border perspective. Where possible alignment with INSPIRE

[8] http://sdi4apps.eu/open_land_use/
[9] http://sdi4apps.eu/open_land_use_lv/
[10] http://drdsi.jrc.ec.europa.eu/
[11] http://skpilot-viewer.virt.ics.muni.cz/maps/356/embed
[12] http://app.hslayers.org/open_land_use_sk/
[13] http://skpilot-viewer.virt.ics.muni.cz/layers/olu%3Alu_elu_object_hu
[14] http://skpilot-viewer.virt.ics.muni.cz/layers/olu%3Alu_elu_object_rs
[15] http://skpilot-viewer.virt.ics.muni.cz/layers/olu%3Alu_elu_object_si

harmonisation requirements and recommendations took place. Significant contribution has been achieved during the Baltic Hackathon.

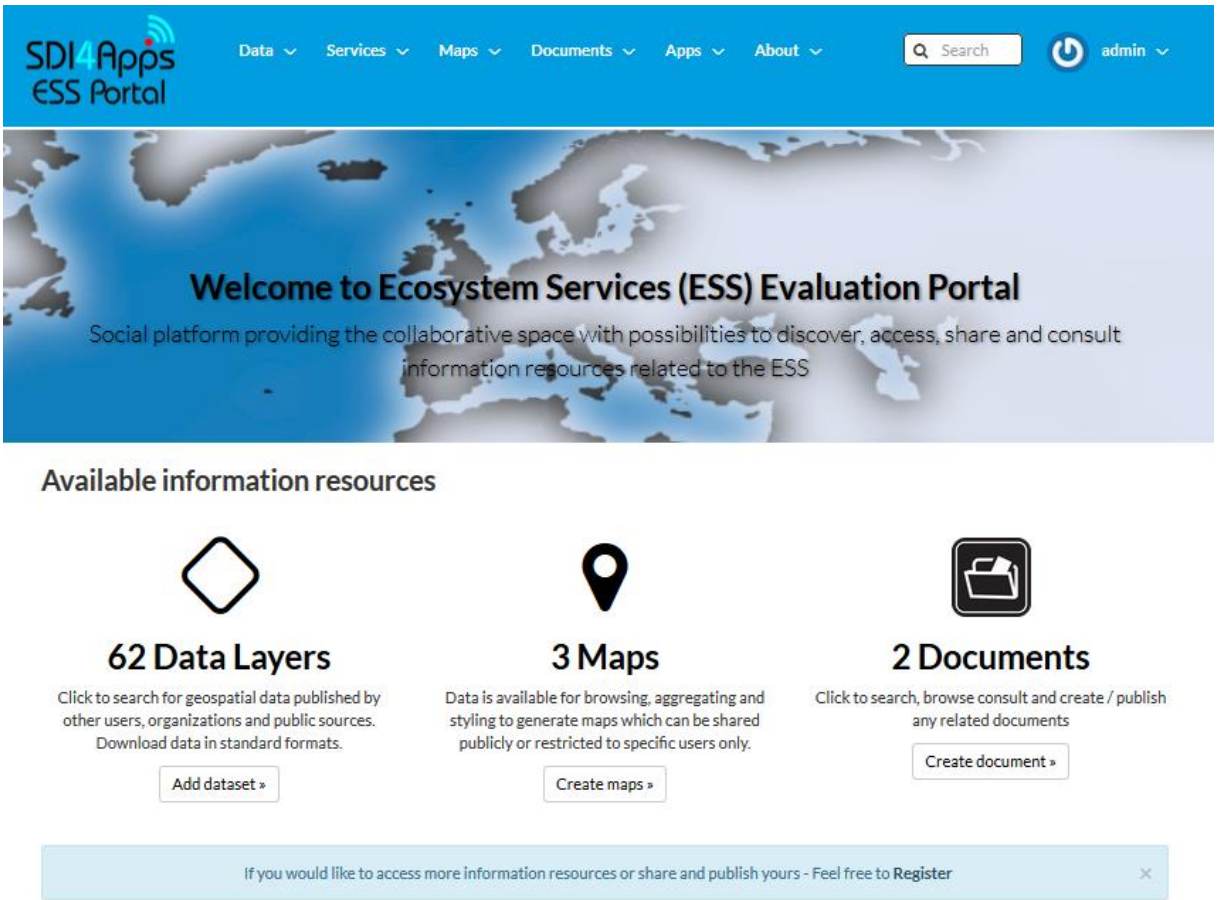


Ecosystem services evaluation (reuse of SDI4Apps data and platform components)

Authors: Martin Tuchyňa – SAZP; Tomáš Kliment, Csaba Sidor,- e-Pro; Zuzana Okániková, - Pronatur (SK)

In order to support the members of the MAES SK Working group involved in the activity of the Ecosystem assessment process in Slovakia[16], which aims to contribute to fulfilment of the Action 5 of the EU Biodiversity Strategy to 2020[17] set of SDI4Apps datasets and platform components have been re-used in order to develop and maintain EcoSystem Services Portal (ESS Portal) within the pilot 6 of the project.
In addition to the Open Land Use Map datasets, Smart Points Of Interest have been reused via machine readable Sparql application programming interface (API) as well as Open Transport Map[18] from the Open Transport Net project[19]. From technology perspective, ESS Portal reused the generic enablers made available via CERIT-SC Cloud infrastructure[20] as well as relevant specific enablers (Postgres XL, HS Layers NG, OpenLayers and Geoserver). Set of specific APIs have been also deployed in order to stimulate further re-use of the pilot outcomes (Web map service, web feature service and catalogue service).

[16] https://www.minzp.sk/files/oblasti/ochrana-prirody-a-krajiny/ekosystemove-sluzby/rybanic-ppt-eea-sopatk-22-10-2014.pdf
[17] http://biodiversity.europa.eu/maes
[18] http://skpilot-viewer.virt.ics.muni.cz/ol3/eng/map-dev.html
[19] http://opentransportnet.eu/
[20] https://www.cerit-sc.cz/cs/



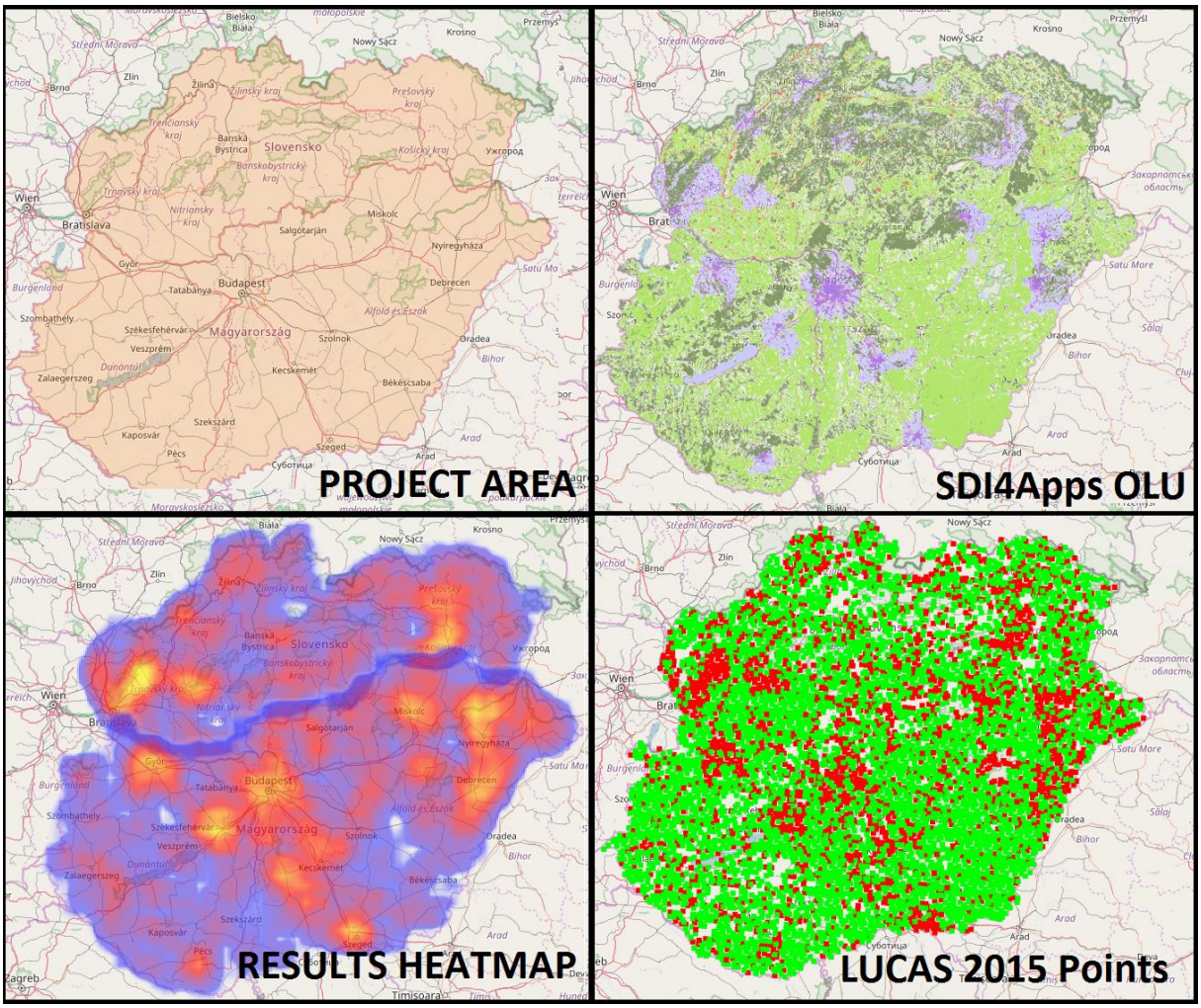
SDI4Apps Open Land Use Quality Viewer (reuse of the SDI4Apps data and platform components)

Authors: Martin Tuchyňa – SAZP; Tomáš Kliment, Csaba Sidor,- e-Pro; Zuzana Okániková, - Pronatur (SK)

Datasets developed using the SDI4Apps Open Land Use Map methodology[21] provides significant contribution to the European spatial data infrastructure and land use data users. Although the data are calculated from the open resources available within the boundaries determined by available dataset geometry, e.g. Cadastral Parcels, Administrative Units, etc., the methodology did not propose any thematic quality verification based on e.g. in field data observations. With this in mind, a set of experts defined an idea to prepare a project focused on quality verification using Eurostat Lucas measurement data from 2015 and visualise the results in a web application during the DanubeHack 2.0 event[22]. This idea developed into SDI4Apps Open Land Use Quality Viewer project[23]. Based on the final visualizations, users can see, where the open land use information encoded using INSPIRE Hilucs code list and based on available datasets (Urban Atlas, OSM Land use, Corine Land Cover) is in line with the a value determined by Eurostat Lucas data including the areas with the possible errors. Results were made available as point feature type and visualized using heatmap

[21] http://sdi4apps.eu/2016/03/sk-inspire-open-land-use-map/
[22] http://danubehack.eu/
[23] https://github.com/danubehack/sdi4apps-olu-quality-viewer

function. Project has reused SDI4Apps data and some platform components and provided valuable cross border use case application executing the validation on the data from Slovakia and Hungary.



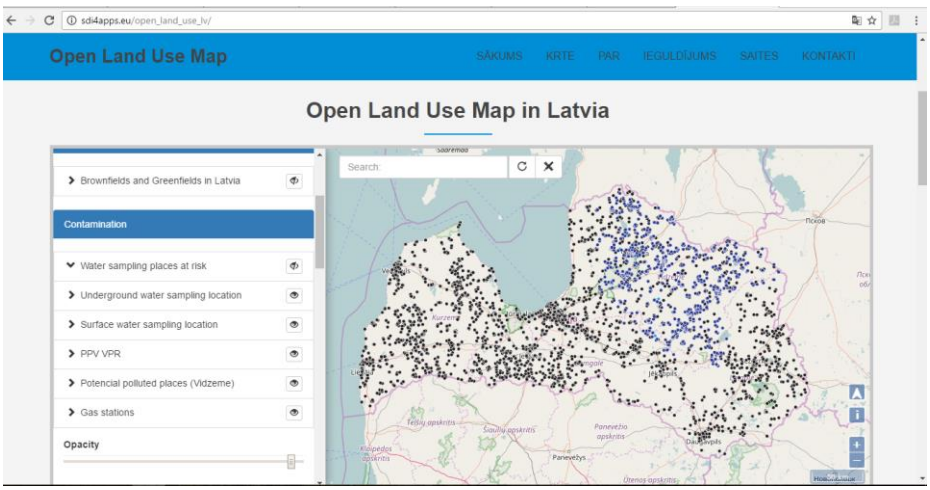
SDI4Apps use cases and stakeholder involvement in Vidzeme

Author: Kristaps Ročāns – VIDZEME PLANNING REGION (LV)

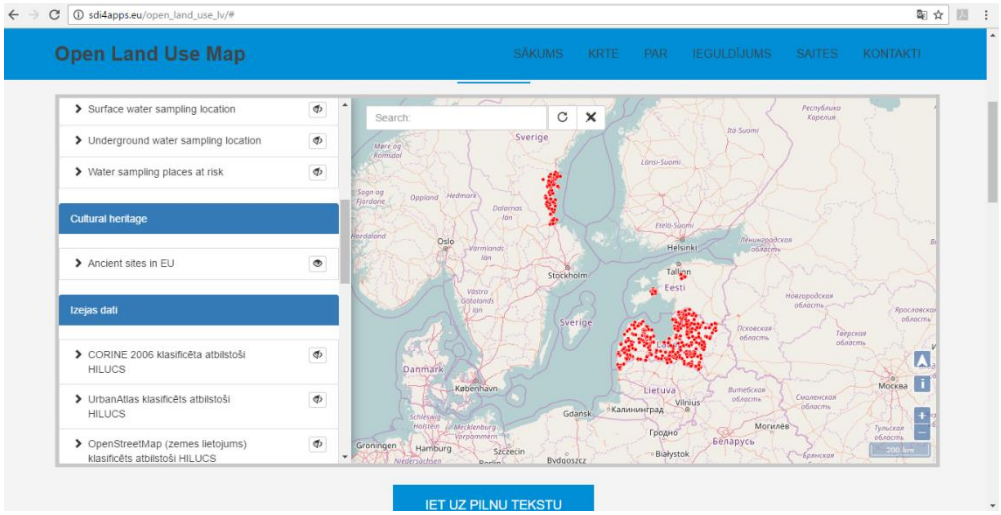
Open Land Use through VGI (OLU) and Smart Points of Interest pilots (SPOI):
Vidzeme Planning Region (VPR) supplied linked open data and information on various brownfield areas and points of contamination or being at risk of contamination in Latvia and Vidzeme Planning Region, such as data:

- Water sampling places at risk;
- Underground water sampling locations;
- Surface water sampling locations;
- Potentially polluted places/objects;
- Gas stations

All point based data have been integrated in the OLU: http://sdi4apps.eu/open_land_use_lv/

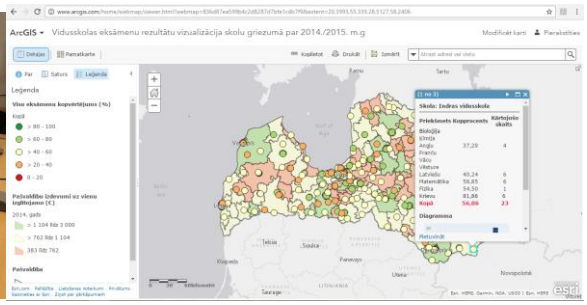


VPR also supplied open data base on ancient cult sites in Latvia, Estonia and Sweden – a nature or cultural objects/sacred (in many cases) protected sites. This database was integrated in OLU, but can also be used in SPOI.

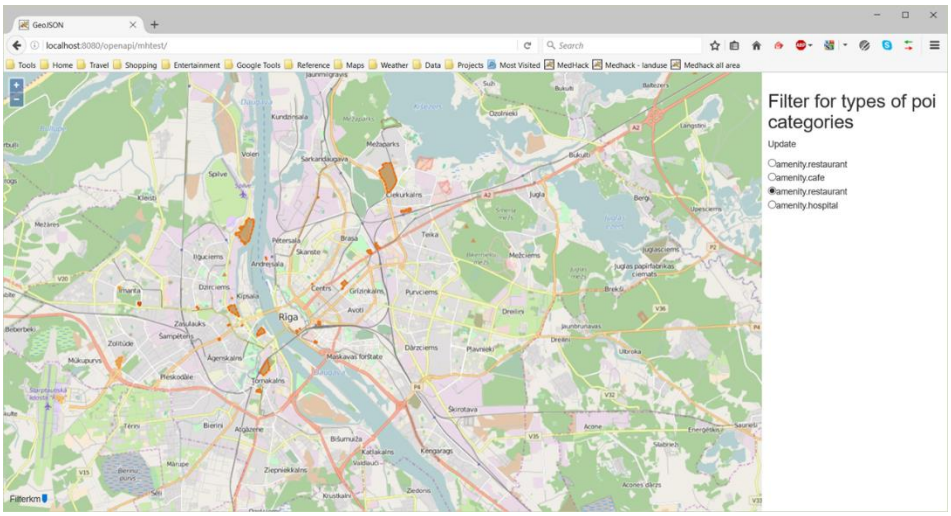


Hackaton results – further usability of open spatial data solutions

- In Patras hackathon VPR together with WBU co-developed a spatial open data based education analysis tool, which used public data on schools in Latvia and their performance (exam results, used resources etc.). The education analysis data toll was further developed and used as a part of research and analysis work on education service improvement, conducted by the Latvian Association of Local and Regional Governments (LALRG). The tool was presented in the LALRG Committee on education and culture. The research results and tool is available here: https://blis.lps.lv/lv/publikacijas/petijumi/191-centralizeto-eksamenu-rezultatu-analize-par-2014-2015-macibu-gadu



Another tool demo version was developed together with AVINET – a service of brownfield classification and relevance mapping, based on brownfield proximity to various POI's, time and distances to objects – developed integrating SPOI and OLU database data. Tested on Latvia data. The further development of usability, added services and replicability to other regions can be developed and has a potential for further use.



User engagement and social validation

A joint meeting VPR, BOSC, CCSS was held with researchers from Institute of Agricultural resources and economics in Vidzeme. Institute received information on use cases and available open data based services for agriculture resources analysis and management (http://www.arei.lv/en/) , based on results of Foodie project, Ecosystem services, OLU, Open Sensor network pilot. There was an interest from the institute to use sensors and collect data in their crop selection fields, and use more GIS based services. A further work with the institute will proceed after the project. Institute is also a base for Latvian high added value and healthy food cluster, which means that close connection to Latvian food industry as a potential future user, can be established.

VPR organized a cycle of three local workshops in Vidzeme for Tourism specialists from Vidzeme region Municipalities and tourism info-centers, which are a key stakeholders for regional tourism promotion, introducing them with various Open data based use cases and tools for tourism development, promoting SDI4apps platform, SPOI and OLU services.

An international SDI4Apps stakeholder conference was also organized in the region on December 08.2016., which included speakers from SDI4apps partner countries, Latvian national level ministries, agencies, institutes and organizations provided presentation on various open data use cases in the areas of agriculture, land use management, spatial development planning, tourism, nature preservation, transport management, tourism. Attendees were representatives from national level public organizations, academia, students, tourism specialists and SME's. More than 50 people attended conference, which was first such level open-data related conference in the region.

https://redmine.ccss.cz/projects/sdi4apps/wiki/2016_12_08_Stakeholder_conference_Vidzeme

The Conference was praised by the Latvian Open Technology Association – for organizing conference and for involvement in SDI4Apps project, VPR received a certificate of recognition in the award ceremony during the high-level international conference "Open Technology for Growth" in Riga, Latvia on February 2017, which featured new solutions and trends in open data usage in Latvia and other European countries.

https://redmine.ccss.cz/projects/sdi4apps/wiki/2017_02_02__LATA_Conference-Open_Technologies_for_Growth_Riga

Further use:

VPR is dedicated to join Plan4all association, and use developed tools and databases in SDI4Apps in future projects and initiatives and keep informing regional municipalities about available services, as well as upload any future prepared open data to the platform.

Currently a joint entrepreneurship and investment environment web-portal for Vidzeme planning region is being developed. An integral part of the web-portal will be Map based service "Invest in Vidzeme" – a map based tool, where data on brownfield areas and objects (with related information) from all regional municipalities will be available. The web-portal is planned to be launched during 2017. All generated brownfield and investment object open data could be integrated in SDI4Apps platform, and other services (such as SPOI and OLU object data) could be integrated in "Invest in Vidzeme" tool in the future.

REFERENCES

Archer P., Dekkers M., Goedertier S., Loutas N. (2013) "Study on business models for Linked Open Government Data" EU Commission ISA programme

O'Flaherty J., O'Reilly C, Keane E. ,Koskova I., Fryml J, Charvat K., Tuchyna M., Marullo C., Mildorf T., Cerba O. (2014) D2.2 "Social Validation Methodology" Copyright © 2014, SDI4Apps Consortium.

Di Minin, A. Marullo, C. Paraboschi, A. Piccaluga A. O'Flaherty, J. (2015) D2.1.1."Annual Report from Stakeholder Management" Copyright © 2015, SDI4Apps Consortium.

Marullo, C. Di Minin, A. Piccaluga A., Del Sarto, N. (2016) D2.1.2."Annual Report from Stakeholder Management" Copyright © 2016, SDI4Apps Consortium.