How to asess and showcase the impact of open spatial information? A case study

¿Cómo evaluar y mostrar el impacto de la información espacial abierta? Un caso de estudio

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Abstract

Some of the most frequent concerns related to Spatial Data Infrastructures and open spatial data are: "What is the impact of my spatial web services?" and "What is the impact of the open spatial data we provide?" EU countries, regions and municipalities have invested significant amount of money in creating their Spatial Data Infrastructures and spatial services. Public organisations that have opened their spatial data sets expect that open data are used extensively for the benefit of their local societies and businesses. Until now the impact of geospatial services has been usually reported as showing statistics about the number of services, number of requests sent to the services and number of downloads of spatial data from an SDI. These indicators are relatively easy to gather, but they do not describe the entire impact of data, so that more advanced analyses are needed.

In this presentation we describe a new methodology for impact assessment of open spatial data. The case-study here analyses the impact of Finnish Environment Institute's (SYKE) open spatial information. The indicators were defined based on the strategic goals of SYKE and data for the indicators were collected automatically from SYKE's services providing environmental information such as web maps, spatial web services and download services. Data sources used were Google Analytics, log files and Spatineo Platform. All indicators and their values were visualized on a dashboard so that decision makers, product owners and developers of services could easily get a shared situational awareness of the impact of environmental information.

Resumen

Algunas de las preocupaciones más frecuentes relacionadas con las Infraestructuras de Datos Espaciales y los datos espaciales abiertos son: ¿Cuál es el impacto de mis servicios geoespaciales? Y ¿Cuál es el impacto de los datos espaciales abiertos que proporcionamos? Países, regiones y municipios de la UE han invertido una cantidad significativa de dinero en la creación de sus infraestructuras de datos espaciales y sus servicios espaciales. Las organizaciones públicas que han abierto sus conjuntos de datos espaciales esperan que los datos abiertos se utilicen ampliamente para el beneficio de sus sociedades y negocios locales. Hasta ahora, se ha informado el impacto de los servicios geoespaciales en general por medio de estadísticas sobre la cantidad de servicios, la cantidad de solicitudes enviadas a los servicios y la cantidad de descargas de datos espaciales desde una IDE. Estos indicadores son relativamente fáciles de recopilar, pero no describen el impacto total de los datos, por lo que se necesitan análisis más avanzados.

En este estudio de caso describimos una nueva metodología para la evaluación de impacto de datos espaciales abiertos. El estudio de caso aquí analiza el impacto de la información espacial abierta del Instituto Finlandés del Medio Ambiente (SYKE). Los indicadores se definieron en función de los objetivos estratégicos de SYKE y los datos de los indicadores se recopilaron automáticamente de los servicios de SYKE que proporcionan información ambiental como mapas web, servicios geoespaciales y servicios de descarga. Las fuentes de datos utilizadas fueron Google Analytics, archivos de log y la plataforma Spatineo. Todos los indicadores y sus valores se visualizaron en un tablero de indicadores para que los tomadores de decisiones, los propietarios de productos y los desarrolladores de servicios pudieran obtener fácilmente una conciencia situacional compartida del impacto de la información ambiental.

Palabras clave: Impact Assessment, open data, KPIs, meters, automation, dashboards.

Keywords: Evaluación de impacto, datos abiertos, KPI, automatización, panel.

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1. INTRODUCTION

Some of the most frequent concerns related to Spatial Data Infrastructures and open spatial data are: "What is the impact of my spatial web services?" and "What is the impact of the open spatial data we provide?" EU countries, regions and municipalities have invested significant amount of money in creating their Spatial Data Infrastructures and spatial services. Public organisations that have opened their spatial data sets expect that open data are used extensively for the benefit of their local societies and businesses. Until now, the impact of geospatial services has been usually reported as showing statistics about the number of services, number of requests sent to the services and number of downloads of spatial data from an SDI. These indicators are relatively easy to gather, but they do not describe the entire impact of data, so that more advanced analyses are needed.

In this article we describe a new methodology for impact assessment of open spatial data. The case-study here analyses the impact of Finnish Environment Institute's (SYKE) open spatial information. The indicators were defined based on the strategic goals of SYKE and data for the indicators were collected automatically from SYKE's services providing environmental information such as web maps, spatial web services and download services. Data sources used were, for instance, Google Analytics, log files from spatial services and other sources and the Spatineo platform. All indicators and its values were visualized on dashboards, so that decision makers, product owners and developers of the services could easily get a shared situational awareness of the impact of the environmental information provided.

2. METHODOLOGY

The methodology showed how indicators such as 'How actively citizens are contributing to monitoring, observing and producing of data on nature?' and 'Who are the specific users of data on built environment?' were derived, how the collected data for indicators was analysed and what other interesting results the dashboard could show. Also, recommendations for improvements such as how to increase the awareness of users about the available services and how to develop the technical infrastructure overall, so that all essential data for the indicators that should be collected were listed. Using the dashboard produced, SYKE can now track their progress with regards to their own strategic goals and provide clear and up-to-date metrics to help identifying development areas and show their success.

It is important to mention that SYKE has decided to have all their data open already in 2008. Nowadays SYKE provides over 6600 spatial datasets, around 80 web services (41 WMS, 5 WFS and 31 INSPIRE services), several web map applications, satellite observations

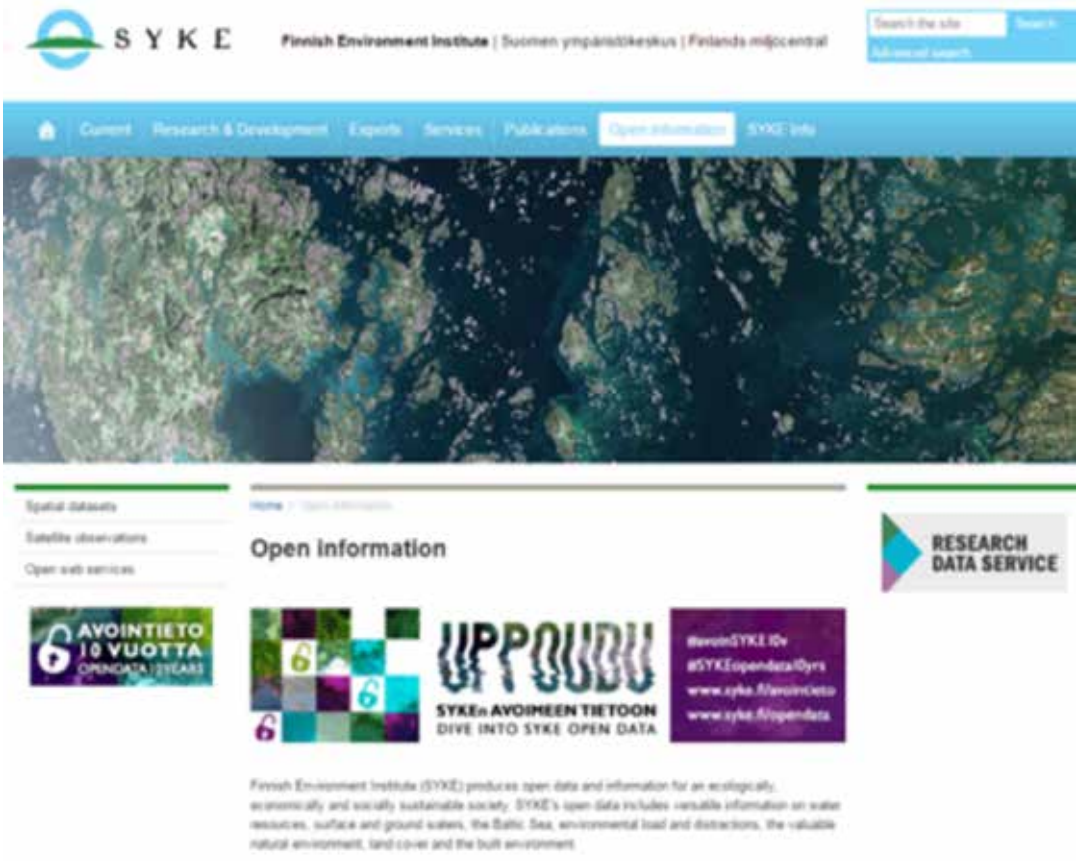

Figure 1. Page of SYKE (Finnish Environment Institute)

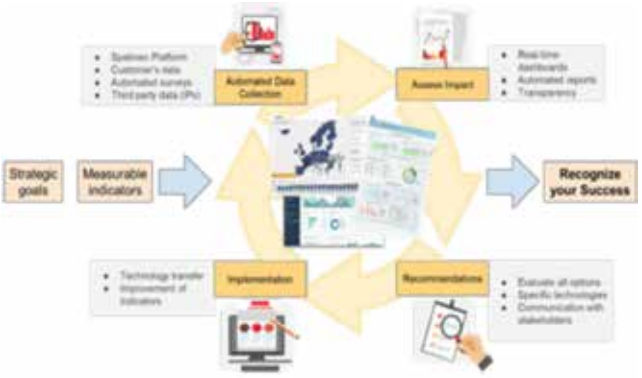

Figure 2. A method has been developed to define impact indicators, automate data collection for indicators, analyze the data, show the impact on a dashboard and give recommendations for further development

and other environmental information systems. Along the years, SYKE has been analyzing the utilization of its spatial web services and realized the usage of open data has been increasing year after year. You may find more info at www.syke.fi/openinformation

The starting milestone in the project is the definition of what indicators will be used for the assessment, and they are typically derived from strategic goals regarding spatial data that the organization has. The method of Spatineo Impact (Picture 2) includes 4 major steps that we will describe in more detail here below.

1. Automated Data Collection: We use several data sources to compile the information. One is the Spatineo platform (including Spatineo Monitor and Directory) that already collects information about performance, availability and usage analytics of spatial web services. We also can make use of customer´s own data, collected via different forms like existing internal tools, automation of harvesting and maintenance of catalogues, etc. Automated surveys to *consumers* of the information can also be elaborated and utilized. Third party data is another source that was included, like the identification of IP addresses (according to GDPR) to determine the profile of the users based on logs provided by the organization that offers the open data.

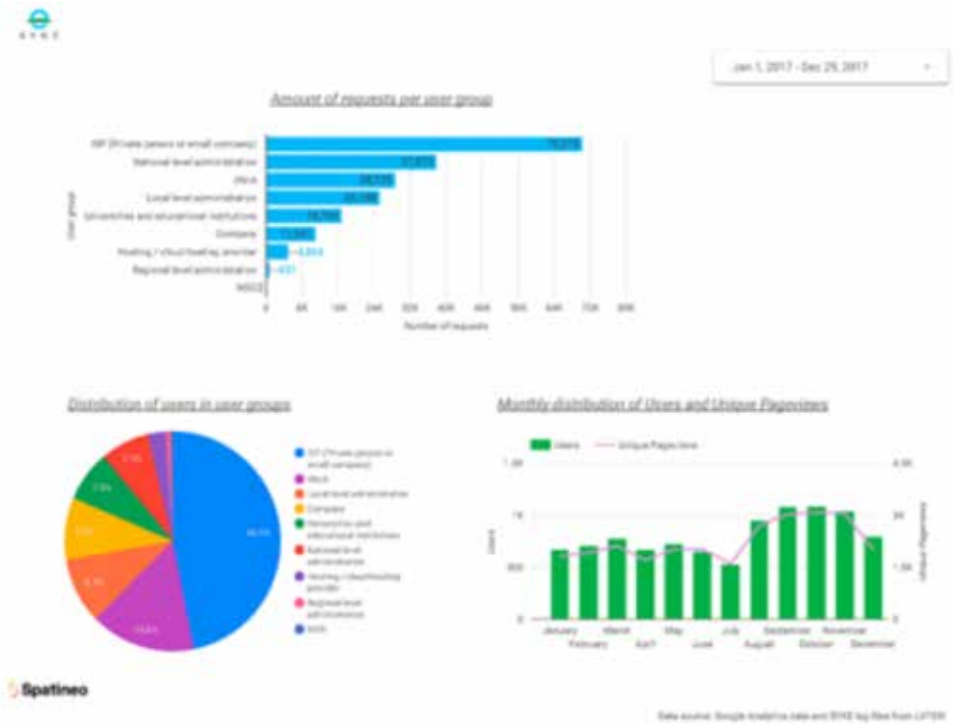

Figure 3. Users of built environment datasets

Figure 4. Activeness of citizens contributing with environmental info

2. Assess Impact: Using the pre-defined indicators, the collected data is then analyzed and visualized in dashboards (Figure 3). As the information from these dashboards can also be made available, organisations are able to increase their transparency towards the users of the data and public.

3. Recommendations: The method allows to evaluate different options to support the organization in reaching its goals with the right choice of tools and solutions. This step also includes communication with

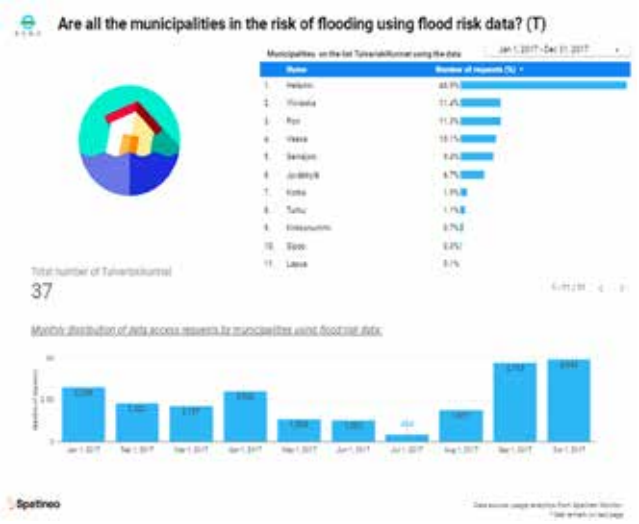

Figure 5. Use of flood risk data

stakeholders.

4. Implementation: This step includes technology transfer and actions that lead to the improvement of the indicators, which were pre-defined aligned with the strategy and even before the beginning of the study itself.

SYKE has a channel to report environmental conditions, nature observations, etc. It was important for SYKE to measure how actively citizens were contributing and what type of information was being reported about what type of data (Picture 4). This way they could plan for more (or less) powerful infrastructure regarding the different datasets, e.g.

Another area that was "investigated" during the SYKE study was to define to what extent some of the information provided was reaching the aimed audience. As an example, Finland has a sea shoreline of total 46 thousand kilometers and SYKE publishes information about the risk of flood of the potential affected areas in the entire country. But, was this information reaching the cities and municipalities that should be aware of such risks? (Picture 5) That is one of the common aspects of climate change these days and one of the goals from SYKE is to help the decrease of the vulnerability of cities with respect to climate change. In summary, the study showed that most of the big cities were indeed making good use of the related data, but some municipalities hadn´t made use of the flood risk information from the analyses yet.

3. CONCLUSIONS

Until now the success of a Spatial Data Infrastructure has mainly been assessed by criteria such as number of spatial web services and spatial data themes as well as number of requests sent to the services. Now, a method and service exist to better analyze the impact of SDIs. So several different aspects may part of the impact assessment that they are not automatically retrieved without experts (both from customer side and Spatineo) getting involved to discuss based on this approach. Knowing and analyzing the use of data, give organizations the possibility to improve the user experience further, and find ways for the economical and societal benefits to be recognized.

About the authors

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