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Solutions For Encouraging Spatial Data Producers to Co-Operate in Harmonizing National Topographic Data

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National Land Survey (NLS) has developed digital services that aim to advance harmonization of spatial data in Finland. The Geospatial Platform started during 2017 and it consists of a number of digital services to support the national SDI in Finland. One of the main goals of the platform is to encourage data producers to adopt common conceptual models defined in the project in collaboration with various stakeholders. Data quality is an important component in harmonizing national spatial data because while having a multi-producer environment reduces overlapping work, it also means that all of the data producers have their own methods of producing their data which again makes national data regionally different in terms of quality.

This paper highlights answering to a number of challenges faced in involving data producers in the effort of making national spatial data harmonized, i.e. interoperable in Finland. New development ideas, the Quality Rule Catalog and Quality Map are presented. To advance the national SDI, it is very important to utilize various communicational methods along with developing technical solutions to meet the user needs. Common solutions, definitions and services are required to make it certain that data producers have the capability to deliver high quality interoperable data to the national supply. That is why I believe that it is important to develop both the technical things as well as methods to listen and to involve key stakeholders in the development work.

Data producers import their data using the Data Upload Service which allows integrating spatial data in various schemas and formats to the Geospatial Platform and importing them to the national database. Data Upload Service transforms interoperable data to a data model following common conceptual models.

QualityGuard is an automated spatial data quality solution that evaluates data quality of all data that are imported to the national database. It has been in trial use for over a year now. Users which are primarily municipalities and regions at the moment receive a logical consistency report describing which of the imported features conflict with quality rules regarding the theme of the imported data. Quality rules are meant to reveal issues that are not logically consistent with the common conceptual models.

A central challenge is to motivate municipalities and regions to try the services and provide feedback on them during their beta phase so that they could be developed to reach the user needs to a higher degree before entering production. Communicating a clear and reachable vision is imperative in motivating data producers to participate in the effort. Bombastic headlines will certainly bring attention to the cause across the board but claiming the promises and making them reality is an entirely different challenge that requires expertise in many fields.

A promising path to success seems to be a combination of creating co-operation by working intensively with key stakeholders and delivering high-quality digital services that meet the user needs as well as possible. Motivated or not, data producers may not necessarily have the means to do anything regardless of how excited they would be about the vision. Developing the data to be nationally interoperable and making the methods for data collection to be less error-prone requires work, GIS professionals and money. This also requires building commitment among the municipal policy makers.

Implementation work of the demonstration services of data importation service and QualityGuard has had a rather sluggish start. This is due to various reasons and the problem field is diverse. Currently there are 40 user organizations that have been granted access the Geospatial Platform. Most of these are municipalities and regional alliances interested in importing their data. Regional alliances maintain and deliver regional plans using a common data model. Having a common data model makes it effortless to integrate these services to their data production process. Municipalities deliver building data but in this case the data production methods are different for each data producer. This leads to building data being different for each producer, making it more awkward to integrate with the data and to reach for national interoperability. Larger municipalities have more resources and often have their own GIS department but smaller municipalities may have outsourced all of their GIS work if there even is any relevant spatial data available.

Understanding and supporting the users in adopting the services has a big role in the implementation work. Data producers need individual support in adopting and using the services. Geospatial Platform has answered to this need by establishing a number of supporting activities. Implementation support team is responsible for taking care of the data producer once they have applied for access rights to QualityGuard and to the Data Upload Service until the data can be successfully imported to the Geospatial Platform services. This requires granting access and creating configurations for the data to be imported and dealing with any issues until successful runs have been made.

The data producer’s capability to integrate their data will be evaluated with technical personnel before implementation. In case of issues or worries about the services or the data, they can contact the support using email or telephone. NLS also arranges promoting sessions (skype meetings and face to face meetings) with municipalities where the data producers can discuss about integrating their data with experts. Communicating actively with the data producers has an essential role in developing the support services and also the applications because it is an excellent method of reaching a sufficient understanding of the users needs and their problems. However, communication is not enough to support the user in this task and there should be a good repository of online support material available.

Data Quality Catalog is an online collection of quality rules added with detailed instructions and guiding visuals on how to fix the data. A basic version of the Catalog containing just the quality rule definitions will be online this fall to be evaluated by users of the Geospatial Platform services. The fully featured version has been recognized to hold great value and the development is expected to begin next year. It is meant to deliver assistance on a platter to the users trying to understand and find ways how to fix their data relying on the quality information provided by QualityGuard's error dataset. Having an online repository of quality rules is an essential resource that makes fixing quality issues easier and greatly reduces the need to guide data producers individually. In many

cases it can completely eliminate the need to contact the Geospatial Platform support organization and this is again very beneficial because there is always a threshold in reaching for help.

One of the ideas that we are planning to implement to support the users, Quality Map is a web map that visualizes data quality across the nation. Visualizing data quality across the nation on a web map could also be very useful for implementation work but also for the end users of the data. Making things visible would display which data producers are delivering their data and putting an effort in improving and developing their data towards national interoperability. This would bring data quality transparent to the ecosystem and hopefully make data producers to compete with each other in developing their data. On the other hand, end users could see if the data is available and interoperable across administrative region borders, which would improve usability of the data by helping users decide whether or not the data is suitable for their use case.

Harmonizing national topographic data is a big effort which requires common rules, models and processes regarding the data, building motivation and commitment among the data producers as well as implementing high quality digital services that meet the user needs. We believe that resorting to legislation is far from being the only way to reach commitment and hope to see the rise of an innovative spatial data ecosystem around interoperable data in Finland.