How to increase the usage of an NSDI from 1 billion hits to 10 billion hits in 5 years

Dorus KRUSE and Jasper ROES, The Netherlands

Key words: Cadastre, Digital cadastre, e-Governance, Geoinformation/GI, Hydrography, Land management, Professional practice, Real estate development, Reference systems, Spatial planning, standards

SUMMARY

Better cooperation between the Public Sector and Private companies has led to a huge success of the Dutch NSDI called PDOK (Public Services on the Map). An increasing number of hits from 1 billion in 2014 to 10 billion in 2018 resulted in an upgrade of the infrastructure, a new method of user communications and data supply.

PDOK is a central distribution platform used for deploying datasets with a spatial component (geo datasets) and making them available as webservices, geographical information files, API's and Linked Data. These geo datasets are supplied by government and other public administrations. They are guaranteed to be up-to-date, reliable and for free. More than 400 webservices, download files, API's and Linked Datasets are available at the moment. A webservice makes it possible for every user to view the geographical data in any available internet browser. These webservices are used by municipalities and other public agencies, businesses, schools and citizens. This can be a GIS expert searching for datasets, services or other geo-information. PDOK is also available for the policy maker who wants to consult a map or for the Geo-IT developer who needs geo information to develop a website or an application. Since 2016 PDOK delivers some of their data also as high quality linked open data and API's. By doing this, the public open data provided by PDOK can be used more easily by web developers who don't have a geo background. By offering datasets through PDOK, the Dutch government is stimulating innovation and the (re-)use of geo-information and promoting Public and Private Partnership. In this paper we will describe the success factors for the increase of the number of hits. We will focus on the governmental structure, how the data is used, how this influences future usage and how innovation stimulates the growth and importance of PDOK. The solution PDOK is easily extendable to fit an increase of data and usage. The usage of the webservices has been increased by 600 % in last 4 years, and an even higher increase is expected. In 2018 the PDOK usage increased to 10 billion hits, by far the most used Dutch geo platform.

How to increase the usage of an NSDI from 1 billion hits to 10 billion hits in 5 years

Dorus KRUSE and Jasper ROES, The Netherlands

1. INTRODUCTION

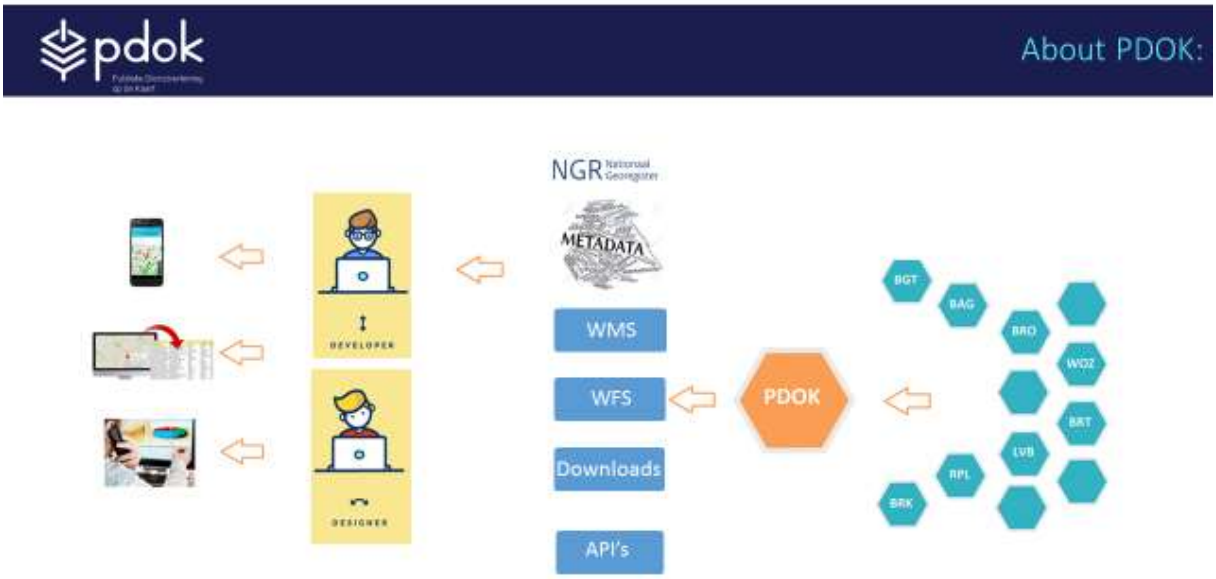
The start of the INSPIRE directive in 2007 had an impact on the Netherlands national legislation, which had to be revised in order to meet new international standards surrounding environmental policies. The Dutch Cadastre, was among the early relevant stakeholders, who wanted to develop a central platform only once, that could be used by many, and therefore decreasing the costs. This meant also increasing and efficiently sharing of quite rare knowledge. The "Public Services On the Map" (PDOK) was born. PDOK is a collaboration of the Kadaster, Dutch Ministry of Internal Affairs, Dutch Ministry of Economic Affairs, Dutch Ministry of Environment and Water and Geonovum. Geonovum is a governmental body that develops standards and helps to better exploit governmental geographic information.
By supplying PDOK with their geo datasets, public administrations comply with Dutch and European policies for providing geospatial data from the government. Every public administration that is responable for geo datasets has to make their data available. PDOK is an available platform, but it is not a mandatory one. However, as of late 2018 almost all administrations have joined PDOK.

2. THE INFRASTRUCTURE

The PDOK organisation consists of three parts.

1. The functional and technical management is executed by Kadaster Netherlands. It is responsible for delivering the PDOK IT distribution platform and the web- and download services and for supporting the users by providing a Customer Contact Center and managing the PDOK community.
2. The Steering Board is responsible for the control and consists of representatives of all partner organisations. They monitor the quality of service and are responsible for the long term development of PDOK.
3. There is also a Customer Panel, which represents the users of PDOK and acts as a sounding board for customer satisfaction. PDOK is fully open source based and each developed functionality is shared with the community.

PDOK is not only using open source software (Postgress, Geonetwork, Geoserver, Geowebcache), PDOK is also a co-developers of these tools and active member of the regarding communities. PDOK is based on a service oriented architecture (SOA). This enables PDOK not only to deliver the actual datasets, but also the metadata and web-services, needed in the production processes of its users. To enable and improve the re-use of components and resources, standardization is the rule. In all cases, standards of the Open Geospatial Consortium (OGC) for web services, W3C standards for Linked Data and API's and ISO have been implemented.

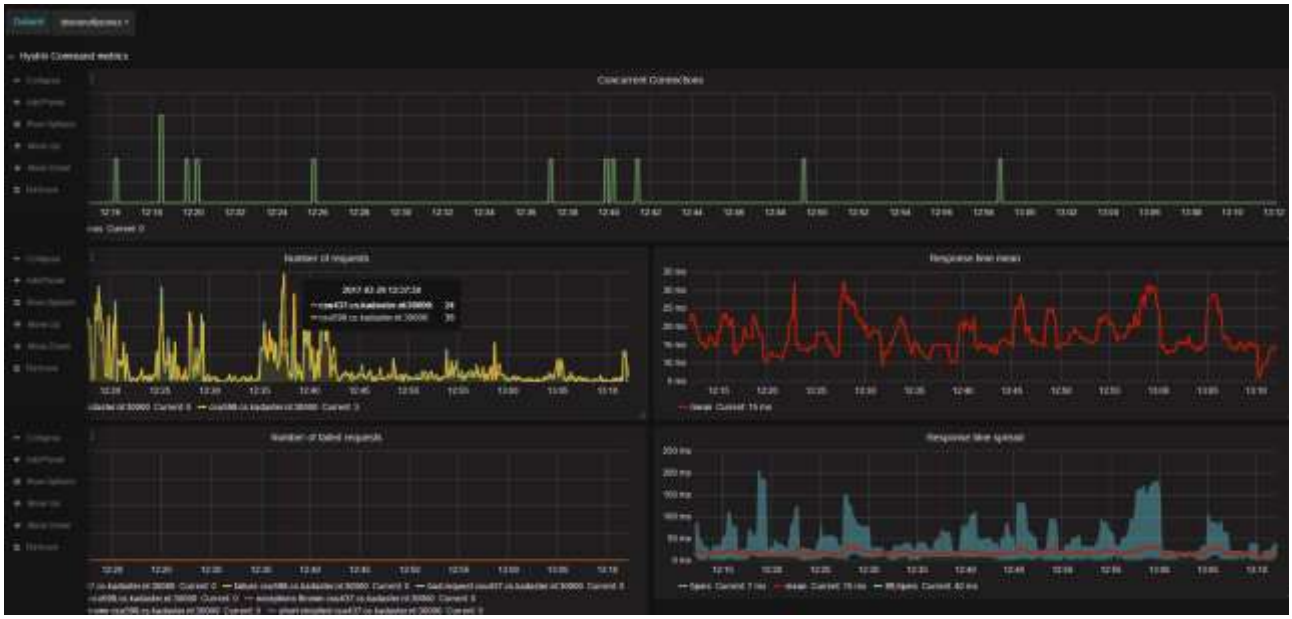


The main components are:

- A metadata portal, www.nationaalgeoregister.nl, developed to search, find and deliver metadata about all available spatial datasets and services in the Netherlands. This portal also serves as the INSPIRE metadata catalogue and discovery service.
- A central access layer to control the usage of the datasets and services.
- Webservices, complying with international standards of OGC and ISO, enabling interoperable use of the available information. Currently Web Mapping Service (WMS), Web Feature Service (WFS),Web Map Tile Service (WMTS) and Vectortiles are available, while Web Coverage Service is being developed.
- A geocoding service, based on the Open Location Services Interface Standard of OGC.
- Techniques and tooling to extract, transform and load data in the PDOK environment.
- A Geodatastore to upload and download geo open data for free.
- An open source Viewer to get an impression of a dataset's content and to combine layers.
- PDOK Map to support easy map creating for a user with existing open data of PDOK.
- DotWebStack, the open source tool that manages the deployment and communication of the Linked Data and the clients.
- Triple store, the database where all the triples of the Linked data is stored.
- ETL component to extract, transform and load data of multiple sources (XML, relational databases, but also excell and HTML text) into triples.

2.1 The challenges

The solution PDOK is easily extendable. The usage of the webservices has been increased by 600 % in last 4 years, and more increase is expected. The infrastructure is fully scalable, so a temporarily increase of usage can be simply managed by a temporarily increase of the network's capacity, Virtual Machines and databases can be added or removed within hours. The usage is constantly monitored by the ICT team.



The increase in usage however requires the PDOK infrastructure again to upgrade itself. Now PDOK is moving towards the Cloud for full flexibility to increase servers when peak usage is occurring. The ongoing investments in infrastructure and resources is also leading to new challenges regarding Governance and Budgets. PDOK used to be funded by the data providers, but the increase of usage by especially not paying partners and private companies is now challenging this Finance model. In 2019 discussions about budget financing from Ministry of Internal Affairs and including PDOK in the National Digital Infrastructure are taking place. This should lead to a fundamental budget structure and a guarantee for the future of PDOK.

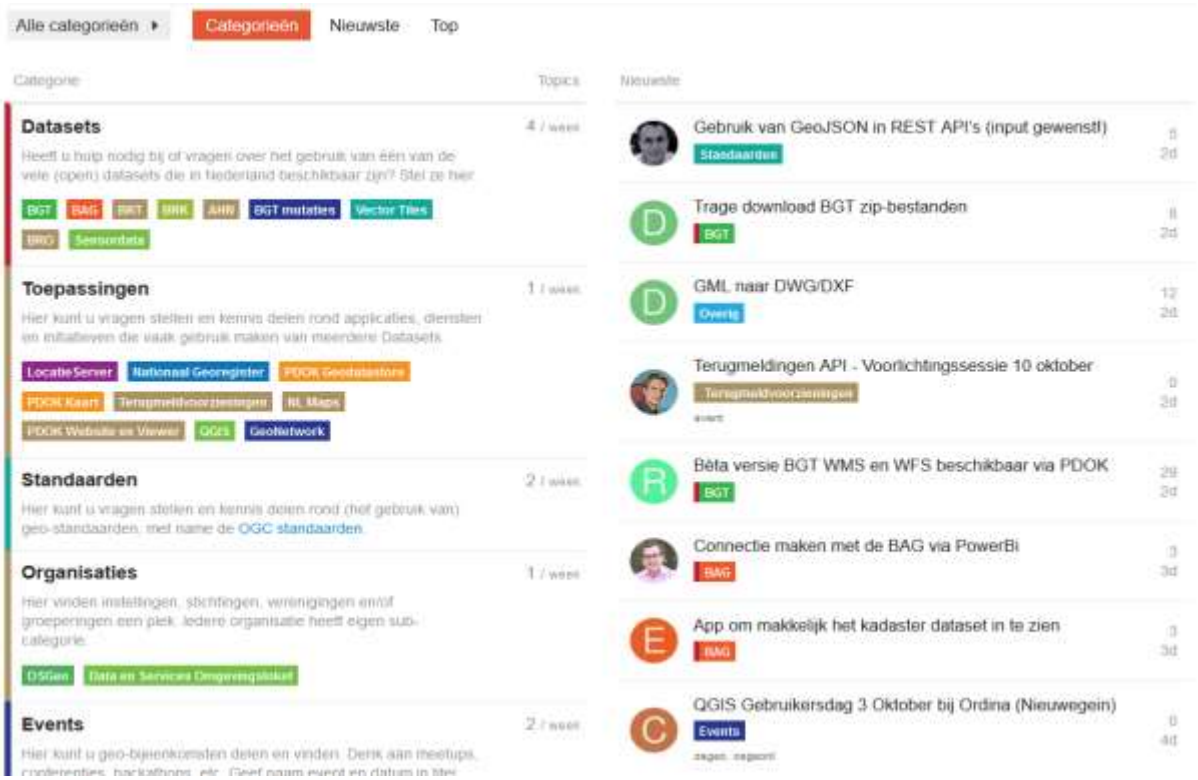
2.2 How the initiative was received by the users or participants

PDOK is used by municipalities and other public agencies, businesses, schools and citizens. For instance a GIS expert searching for datasets, services or other geo-information. PDOK is also available for the policy maker who wants to consult a map or for the Geo-IT developer who needs geo information to develop a website or an application. In 2018 the PDOK usage increased to more than 10 billion hits, by far the most used Dutch geo platform.
Since 2016 PDOK delivers some of their data also as high quality linked open data and API's. By doing this, the public open data provided by PDOK can be used more easily by web

developers who don't have a geo background. And therefore PDOK highly stimulates use and re-use of governmental data in the Netherlands.
The solution of PDOK is of course used by the official partners of PDOK to deploy their geo data via the PDOK platform, but other partners are re-using this platform as well, like the body of all 24 Waterboards, ProRail (rail infrastructure), Chambre of Commerce, Central Statistics Unit, The National Geology Center and the body of the Provinces of The Netherlands. Those public administrations are using PDOK and have the benefits of not having to develop their own infrastructure.

2.3 The learning outcomes

The main goal of PDOK was to stimulate the usage of the free open data. This has been a huge success. But the fact that all data is open data and usage is anonymous also meant that knowing who the user is, was more complicated. To face this issue, the PDOK organisation started to create an active community around PDOK. This includes a forum, for which PDOK contracted high level skilled users and professional to make sure that every question was answered correctly and within a short period of time.



PDOK also created an application where users could ask for feature requests and users could vote which request was most wanted. A special budget was reserved for developing these most voted requests.

2.4 Plans to further develop the initiative

PDOK is constantly further developing itself. Now 3D data is deployed and 3D viewers are developed. Also sensor data from Government sensors are shared with the public real time, so environmental data from municipalities can be used in applications.

Crowd sourcing is also been used by PDOK to further involve the users and improve the quality of the data and maps. Users can report errors in our maps providing feedback on the map itself. Earlier feedback and status of actions undertaken are visible on-line.

3. CONCLUSIONS

PDOK is a huge success. The prove of that is the increase in the number of datasets provided to the public, now 155, the number of web services provided, now 415 and especially the increase in usage, now more than 11 billion hits already. This is all the result of a better cooperation between the Public Sector and Private companies. The consequences of this increase in usage has also made it necessary to upgrade the infrastructure, introduce a new method of user communications and provide modern ways of data supply.
PDOK is now also deploying linked data and API's, which leads to even more usage, because new clients are using the data now as well, like the web developer.

REFERENCES

Kruse, D., 2018, Case history of 7 Billion hits in 2017 on the Dutch NSDI called PDOK (Public Services on the Map), Apeldoorn, Kadaster.

BIOGRAPHICAL NOTES

Dorus Kruse is a Geo manager at Netherlands Cadastre with over fifteen years of experience in project- and product management. Dorus is currently managing the Geo products of the Dutch Cadastre like the Key Register Topography (BRT), Register Aerial photography (LVBM), Register Cables and Pipelines (Klic), Quality management Addresses and Building (BAG) and the Geodetic Infrastructure.

CONTACTS

Dorus Kruse
The Netherlands' Cadaster, Land Registry and Mapping Agency (Kadaster)
Hofstraat 110
Apeldoorn
NETHERLANDS
Tel. +31652481987
Email: dorus.kruse@kadaster.nl
Web site: https://www.kadaster.nl