Success and Growing Use of Geo Data asks for Integrated Information Supply

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Key words: key registers; integrated information; use; 3D; address

SUMMARY
Buildings and addresses, the nationwide Dutch register BAG, is a successful dataset, combining geo-location and administrative references. BAG-data supply started in 2011, and has now over 3 billion requests in a year and use is growing.
Success through (among others): User influence, Viewer, Quality focus

How can we address the growing use? And facilitate government and companies to easier solve social issues with geo-data, ranging from real estate and healthcare to energy and infrastructure.
Two main directions for development:
1 Central availability: Actual data, easily and guaranteed available from a central facility that is prepared for growing use.
2 Coherent data: Provide (geo)data as a coherent set of 3D objects with administrative data.

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1. BUILDINGS AND ADDRESSES, THE NATIONWIDE DUTCH REGISTER BAG

1.1 The dataset

The Key register Addresses and Buildings (Basisregistratie Adressen en Gebouwen, BAG) is the authentic dataset with all addresses and builidngs in the Netherlands. The BAG contains data like year of construction, surface, purpose and location on the map. People, companies and applications use the BAG more and more.
Municipalities are responsible for capturing and maintaining the data in the BAG including the quality. All municipalities provide the data to the Central facility. Kadaster, the Cadastre, Land Registry and Mapping Agency of the Netherlands maintains the central facility and provides the data to the various users.

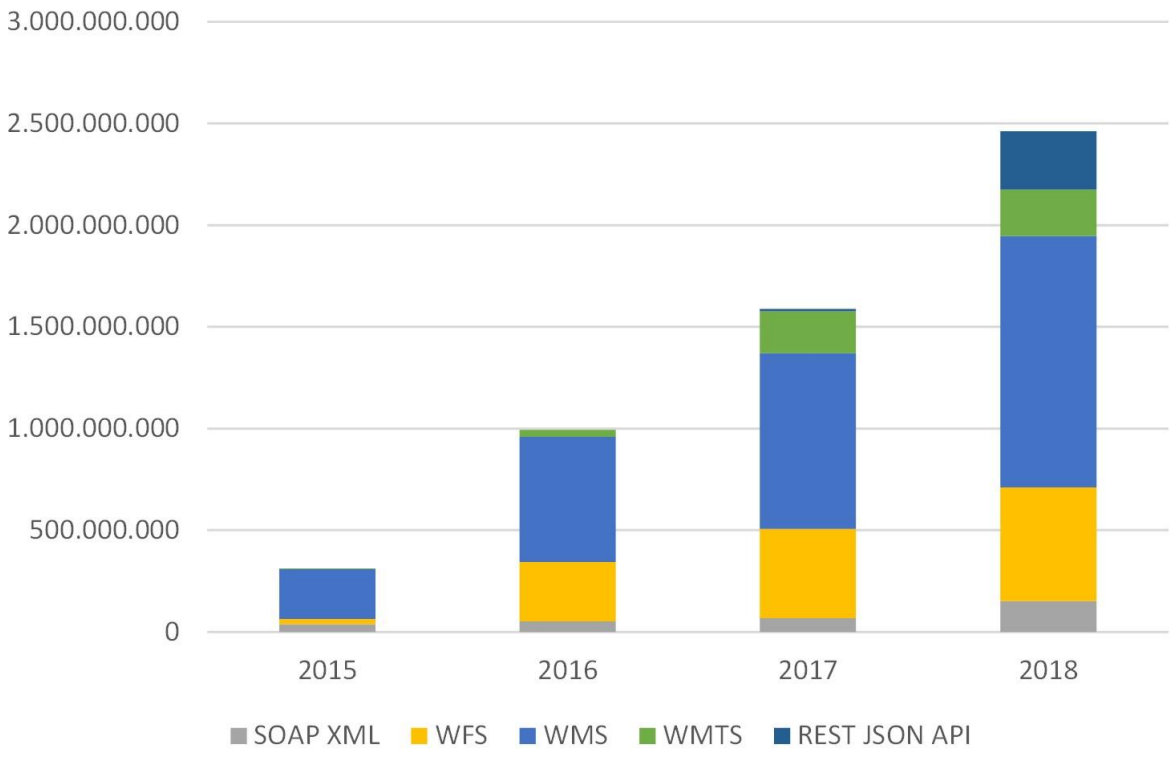
1.2 The beginning

In 2011 the BAG was still a new dataset. Soon government and private parties discovered the ease of use of a nationwide, uniform, complete dataset with addresses, main features and geo-locations. Today the national spatial data infrastructure cannot be imagined without the BAG. Besides governmental bodies, like the tax institute, that use the BAG addresses, the BAG dater are also used e.g. by navigation software.

2. HOW DID THE DATASET BECOME SUCCESSFUL?

2.1 Success

From 0 in 2011 to over 3 billion requests in 2019, from the central source alone.
After the BAG law came into force, the BAG datamodel and content was frozen, in order to build a stable basis. And this has paid off. When the Audit Dienst Rijk evaluated the law in 2014, it concluded: The BAG is well on its way to become a register of addresses and buildings for all. (Auditdienst Rijk, 2014) By continuous development and updating the law we are able to turn the BAG into something marvellous. And this shows by the growing use and customer satisfaction.



2.2 User Influence

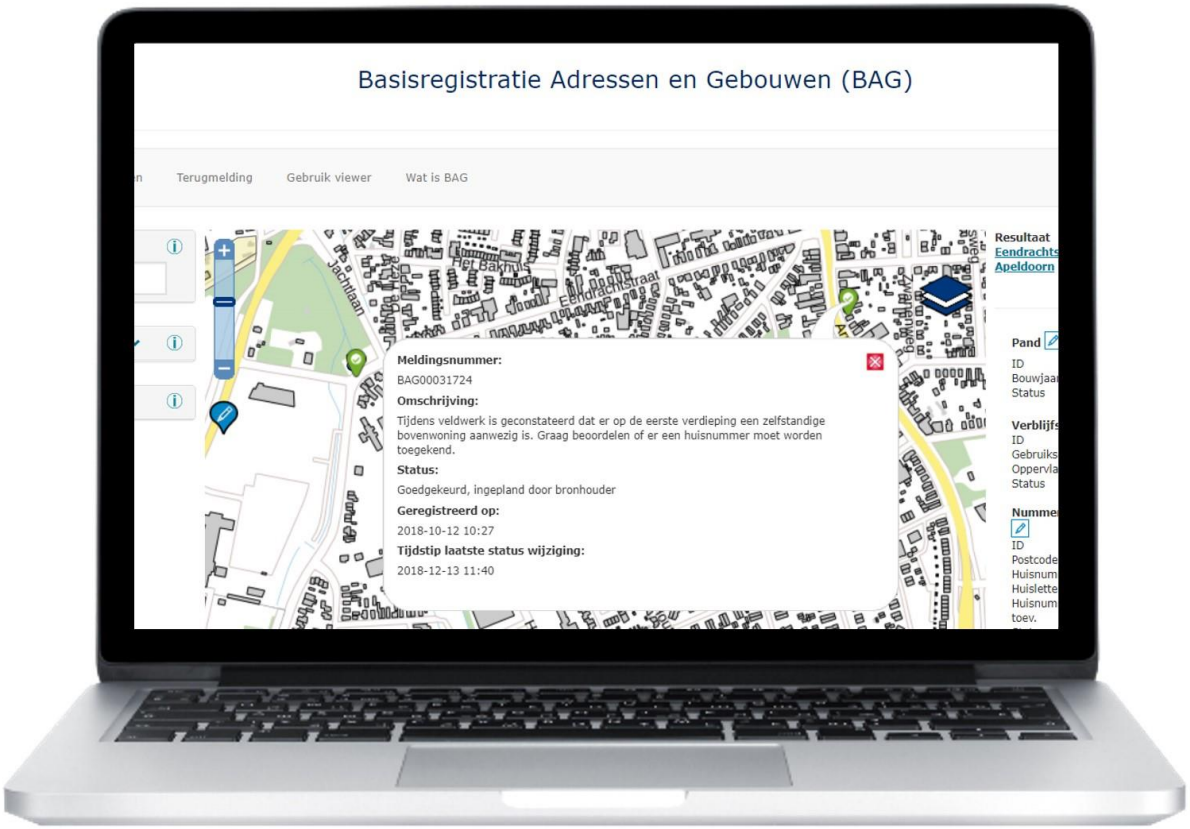
Harmonised national datasets derived from local datasets require a governance framework that respect and balance the national and local stakeholder interests in initiatives. The Netherlands may be considered to be a good practice example for national address data. The country has a well-established physical addressing system represented in a single national address dataset, the BAG. Through regular user surveys and coordination with the BAG Users and BAG Suppliers Committees, their input is channelled via Kadaster to the respective committees where strategic and tactical decisions are taken. Additionally, users influence the BAG through the Kadaster's help desk, which is contacted by about 700 users each month, half of these from municipalities. Frequent and recurring help desk issues and requests are also channelled to the respective committees. (Coetzee, 2018)

Since 2014 every 2 years a BAG user satisfaction survey is held, the most recent study was held in 2018. An important aspect of the survey is to give an insight in the customer satisfaction of BAG use. The average note users gave the BAG grew from 7,2 out of 10 in 2015 to 7.4 in 2018. 555 respondents took part in the survey. The users also gave suggestions for improving the BAG, for example on quality and content of the dataset. (Statisfact, 2018)

The suggestions are weighed and prioritized by the strategic council BAG BAO (Source holders and users).

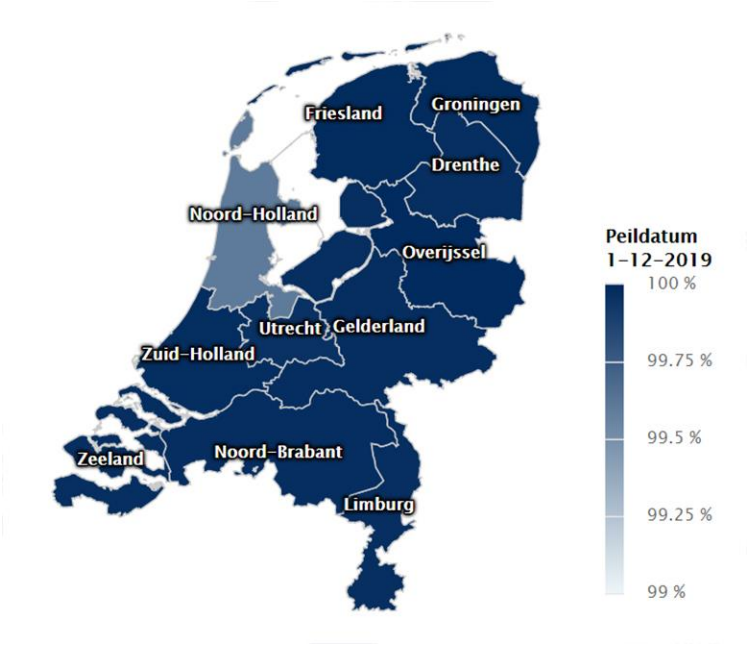
2.3 Viewer

By introducing the BAG Viewer (bagviewer.kadaster.nl) the BAG was shown to the public. Easily accessible, visible and open for all users.
The BAG Viewer shows the BAG data, both administrative information and on the map. And it shows feedback signals from users.
Since 2017 the user feedback loop can be started in the BAG Viewer. Giving feedback signals has become easy. This shows in the number of feedback signals (6.700 in 2016 to 11.500 in 2018). The feedback signals are visible for all users and they can follow the feedback loop. Municipalities use these signals to improve the BAG quality.



2.4 Quality focus

The quality regime set up was modernised and implemented with the revised law, that came into force in 2018. The municipalities are responsible for the BAG quality and organising quality management within their organisation. Together with the source holders the Ministry of Interior and Kingdom Relations (BZK, the supervisor) has introduced an instrument for self evaluation\. Kadaster, coimmisioned by BZK, monitors the BAG quality by means of a Quality Dashboard, and supports municipalities to improve the BAG quality.
The quality dashboard on the website gives insight in the BAG quality, and shows the monthly monitoring checks. (https://zakelijk.kadaster.nl/bag-kwaliteitszorg)



3. CONTINUOUS DEVELOPMENT

3.1 Development directions

Since 2011 the BAG has matured and is now a heavily used dataset. More and more information about addresses and buildings is linked to this information-base. How can we keep the success of this comprehensive dataset and yet enable further usability of the data?
How can we address the growing use? And facilitate government and companies to easier solve social issues with geo-data, ranging from real estate and healthcare to energy and infrastructure. Intense and growing use makes users familiar with the data and possibilities. Users request for further development, both regarding data and ways to obtain the data.
We have identified two main directions for development:

1 Central availability: Actual data, easily and guaranteed available from a central facility that is prepared for growing use.
2 Coherent data: Provide (geo)data as a coherent set of 3D objects with administrative data.

3.1 Central availability

The first main direction in development is central availability, this refers to actual data, easily and guaranteed available from a central facility that is prepared for growing use.
In 2011 the dataset was nationwide implemented, and available via the central facility. Supplying the data was originally organised by a minimum of options based on valid standards. Standards and techniques develop rapidly. As the BAG provides both administrative and spatial data, the standards used should be aligned with several types of users. We are seeing closer convergence to the webservice standards for administrative data and for spatial data.

More and more user-groups discover the benefits of using the standardised, nationwide consistent dataset. Users often discover the BAG by using the BAG Viewer. And as the increasing number of requests shows, use via applications is also growing. We adjust our infrastructure and architecture to be prepared for further scaling.
Via the central facility users have access to actual data that is easily available. The central facility OGC services and APIs were used 3 billion times in 2019.

3.2 Coherent data

The second main direction for development is about providing (geo)data as a coherent set of 3D objects with administrative data. The BAG dataset was defined and stayed the same for the first 10 years. The BAG provides the connection between spatial and administrative data. The BAG is one of the 10 key registers in the Netherlands. A big part of the system of key registers, has a spatial component. The BAG provides the connection between the registers. These key registers are captured and maintained by different source holders and are used by thousands of users in society (government, companies, citizens). The spatial data key registers are now sort of independent "data islands". The day to day practise asks for more coherence between the key registers.
This will stimulate more efficient capturing and better and integrated use. The Dutch Digital Agenda states that integrated development is necessary to be able to address social issues (energy transition, climate change, housing problems). (Odijk, M., 2019)
The BAG user satisfaction survey also shows that users asks for more integrated data, both 2D and 3D.
Showing the combined geodata in a 3D viewer (Digital Twin) will help users to find and use the data. And will help us better understand what problems users encounter. What aspects need quality improvement. How do users want to receive the information to make it available for e.g. analyses and healthcare policies.

4. CONCLUSION

The Dutch register BAG has become a successful dataset, containing all Dutch buildings and addresses. By organising user influence and putting the customer needs first, usage has grown enormously since it came nationwide available in 2011. Establishing a stable base with good quality, and providing easy access were key to this success.
Source holders and users have incorporated the BAG in their day to day activities. To facilitate government and companies now and in the future to easier solve social issues with geo-data, continuous development is needed both regarding data and ways to obtain the data. Therefore development strategies will need to focus on complete, accurate coherent 3D data, that is centrally and easy available with more and more connected information.

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BIOGRAPHICAL NOTES

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