Smart Assessor: Keep Calm and Manage your Data Quality

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ABSTRACT

It is obvious that data has a great influence on the quality of the outcome of the valuation process, the assessed values. Data of poor quality will automatically lead to poor quality valuations. Keeping the data quality up-to-date is not that simple. For instance because of the fact that geographical information (most information used for valuations is geographical information) tends to change frequently.

A second reason why it can be difficult to adequately manage the quality of data is caused by the fact that real estate markets are continuously changing. In changing markets, other characteristics can become more or less important. If, for instance, sustainability measures, such as solar panels, are becoming more important it is the duty of the assessor to detect this when he performs the market analysis. Subsequently it is his responsibility to find ways to systematically collect this data and to include it in the valuation model. In addition, when all this is done, it is the assessors' job to keep the data up-to-date.

In the Netherlands we have a decentralized system where all (355) municipalities are responsible for the annual assessment of more than 9 million real estate properties. The Netherlands Council for Real Estate Assessment (NCREA) is the oversight agency that is responsible for the quality control. At this moment, we consider it as one of our main tasks to make municipalities aware of the fact that they have to keep their data up-to-date. In other words, they have to manage the accuracy, completeness and timeliness of the registered object characteristics and they have to make sure that the right characteristics are registered.

Key Words: Data quality, Real estate assessment, Property tax. Valuation

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1.   INTRODUCTION

As is the case in most industries, the assessment industry in the Netherlands is characterized by ever more availability of data. This data is used in a wide variety of processes in the assessment industry. However, more data does not always mean better data. Data should be carefully maintained and updated throughout time to be considered good quality data. Mass appraisal methods are very much reliant of good quality data to generate explainable results. This explainability of the results is subsequently important to build and keep the trust of the taxpayer.

This paper will focus on which data sources are used in the Netherlands with regards to the assessment industry. Furthermore, this paper will address the importance to examine and improve quality of the data.

In The Netherlands, all real estate is assessed annually for levying taxes and other government purposes. The assessed value is no tax in itself; however, it serves as a tax base for various local and national taxes. Real estate owners receive an official notification of the assessed value of all their real estate properties annually. The 355 municipalities are fully responsible for the valuation process. For this valuation, they make use of three types of information sources. These are:

1. Information from the system of base registers (such as the Cadaster, the Register of Persons (Inhabitants) and the Base Register Addresses and Buildings);

2. Information from systems for advertising the supply of real estate properties on the market;

3. Information municipalities specifically collect for mass valuation.

Before we look at the data used for the mass valuation of all real estate properties, we first give an overview of the system of real estate taxation in the Netherlands and the other parts of the system for annual valuation and assessment based on the special Act for Real Estate Assessment. This system determines the high quality demands for the appraisal results and therefore for the quality of data.

Parts of this paper are also published in Kathmann and Kuijper (2006; 2015; 2016) and in Hermans, Kathmann and Kuijper (2020).

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Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

1.2 The Netherlands

With roughly 17.5 million inhabitants and an area of 41.543 km², the Netherlands is a densely populated country located in Western Europe. The Netherlands has three layers of government: the central government, the regional (provincial) government and the local government:

- The central government consist of the administration, departments and advisory committees. The current cabinet has 16 ministers for 12 departments.
- The decentralized government consist of 12 provinces, which form the regional government, and 21 polder boards and 355 municipalities. The municipalities and the polderboards are both types of local governments and spread the whole country. The figures 1 until 4 show the distribution of the governments.
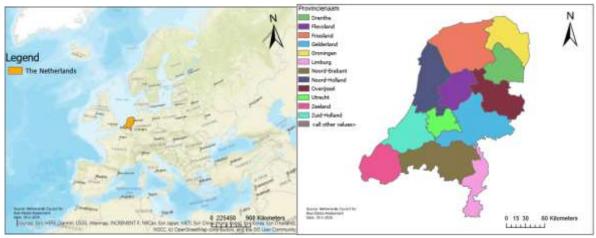

Figure 1. Location of the Netherlands
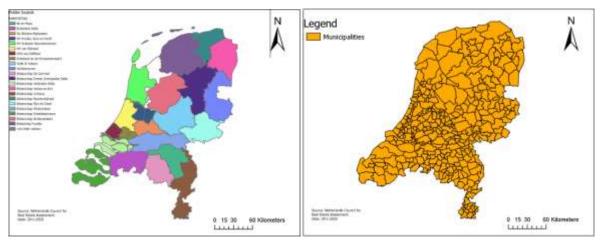

Figure 2. Provinces of the Netherlands

Figure 3. Polderboards in the Netherlands Figure 4. Municipalities in the Netherlands

Both the central, regional and the local government have the authority to levy taxes and in doing so the central and both local governments make use, among other things, of the value of real estate properties for these taxes. Up until 1995, the various authorities were individually

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Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

responsible for the assessment of the real estate property values for their taxes. These various authorities applied several methods and definitions. This had different values as a result.

1.3 Property taxes in the Netherlands in numbers

In 2018, approximately 10.7 billion euro has been levied in real estate taxes. As stated in the introduction, the assessed value is not a tax in itself; however, it does serve as a tax base for both local and national taxes. The table below lists the approximate levied taxes for 2018 sorted by type of tax.

Table 1: Levied taxes, based on the assessed value (all amounts are in millions)

	2014	2015	2016	2017	2018
Municipal property tax	€ 3500	€ 3600	€ 3700	€ 3800	€ 3950
Property tax polderboards	€ 600	€ 650	€ 660	€ 675	€ 725
Assessed value as a part of the income tax	€ 2450	€ 2500	€ 2550	€ 2650	€ 2650
Assessed value as a part of the wealth tax	€ 1000	€ 1000	€ 1000	€ 1000	€ 1000
Assessed value as a part of the inheritance tax	€ 650	€ 650	€ 650	€ 650	€ 650
Landlord tax	€ 1100	€ 1400	€ 1600	€ 1700	€ 1700
Total	€ 9300	€ 9800	€ 10.160	€ 10.475	€ 10.675

1.4 The valuation process in The Netherlands

On January 1st, 1995, the Special Act for Real Estate Assessment (in Dutch: Wet WOZ) was initiated. This law had the purpose to establish legislation for the definition and documentation of real estate property values for various taxes. The Special Act for Real Estate Assessment aims to realize the following purposes: efficiency, clarity, quality and uniformity. Initially the Special Act for Real Estate Assessment determined that all municipalities had to assess the value of all real estate properties every four years and that it was mandatory for other government organizations to use these assessed values for their taxation purposes. Therefore, the law got rid of the differing values of the years before 1995. As of 2007, an annual appraisal has been introduced. This annual appraisal and assessment is done with the value reference date set one year prior to the year of use. The Council for Real Estate Assessment is an independent government organization that supervises and monitors the quality of real estate property assessment.

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Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

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Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

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Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

In 2006, it was decided to make the WOZ-registration (Registration of assessed values) part of the System of Base Registers that is being developed within the Dutch government. In doing so, the municipal registration of assessed values became a part of the public sector information system, which now consists of 11 base registrations that are connected with each other. This decision also had consequences for the work procedures underlying the maintenance of public sector information. These work procedures are increasingly being connected with one another. There are, for example, base registers available about the cadastral situation (ownership), the registered persons (inhabitants) and about businesses. These registers have been there traditionally, but have been modernized in recent years and have been implemented in the System of Base Registers as mentioned above, of which the registration of assessed values is an integral part.

Finally, a digital infrastructure has been developed in The Netherlands of which central and local governments are obliged to make use when designing their digital service towards citizens and businesses. Government organizations are using this digital infrastructure to improve their data exchange and to offer their digital services in a reliable and safe manner. For instance with this digital infrastructure each inhabitant in the Netherlands has a safe digital letterbox to receive (confidential) letters of any government agency. Given the specialized character of the mass appraisal, process an important part of the work is not done by "regular appraisers" but by specialists in the field of defining and optimizing models (statistics and econometrics) and specialists in the field of accurate data management.

1.5 The Netherlands Council for Real Estate Assessment

The Netherlands Council for Real Estate Assessment is an independent organization that supervises and monitors valuation in the context of the Special Act for Real Estate Assessment. If municipalities do not meet the minimum quality standards as set by the organization, it is initially the municipal council, which will be held accountable. If the necessary improvements are not being realized, the Minister of Finance may, in extreme cases, decide to have this Act executed by another party instead of by the municipality. The Netherlands Council for Real Estate Assessment wants to improve the trust in the execution of the Special Act for Real Estate Assessment, among other goals, by:

- Promoting that the object characteristics used in the "WOZ-valuations" are building blocks within the coherent governmental object registration;
- Realize that the municipalities, as a part of the valuation process, are making use from available data (open data), in particular with regard to location of properties.

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Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

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Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

2. INFORMATION FROM THE SYSTEM OF BASE REGISTERS

In The Netherlands, a number of registers have been formally designated as a base register. In these registers, certain important data about citizens, businesses and institutions have been recorded in a centralized manner. These registers are primarily intended for official use by government agencies on central level and decentralized level (municipalities) etc. However, some of these registers are also available for public use. This system should deliver "authentic data" of such a high quality that the government could use this information for its work without any further investigation. One of the most important concepts behind this idea is the mandatory feedback. At the moment, the user of data from a base register doubts the reliability of the data he may deviate from this data, only if the doubt about the reliability of the data has been reported back to the organization that is responsible for the data within that base register. The data will be given a notation and the administrator will then investigate the correctness of the data. In this way, a self-cleansing system is being created.

One of the base registers that is essential for mass valuation in relation to the Special Act for Real Estate Assessment is the Base Register Cadaster. The ownership situation of all parcels is recorded in this register. Because of the legal system in the Netherlands, the Cadaster gives complete information on the ownership of all properties. Therefore, the Base Register Cadaster is the most important source of information to set up the list of properties to be assessed (tax list).

Figure 5. Parts of the base registration system directly linked to real estate assessment.

In addition the market data (sale price), in case of a sale, is also included in this Base Register Cadaster. Therefore, the Cadaster is also an important source of market data. The Base

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Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

Register Addresses and Buildings is being used to identify buildings and associated primary object characteristics, such as size (usable floor area) and building year.

Smart Assessor: Keep Calm and Manage Your Data Quality (11054)
Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

The information derived from the system of base registers is very important for appraisal, assessment and taxation of real estate. Nevertheless, for all categories the information is not complete. For setting op the complete list of properties to be valued, the cadastral information is not adequate. Because of the Act of Real Estate Assessment, the demarcation of a property to be appraised is not only determined by ownership, but also by use. Not only the owner of a property pays property tax, but also the user of the property. For making a correct demarcation of properties and a complete list of properties municipalities also, have to make inventories of the self-contained units with separate users.

The Base Register Cadaster has complete and accurate information on sale prices for residential properties as well as for non-residential properties. However, despite the completeness of sales prices, this register does not present all market data available. For instance for commercial real estate like office space and shops also rent prices are needed. In addition, for a market analysis of sales we not only need information on the successful transfers, but also on properties on the market for a shorter or longer term, that have not been sold yet. Moreover, for an accurate appraisal of a property more object characteristics are needed than only size (usable floor area) and building year.

The collection of the data that is mentioned above is central in the next paragraphs.

Smart Assessor: Keep Calm and Manage Your Data Quality (11054)
Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

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Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

3.   INFORMATION FROM SYSTEMS FOR ADVERTISING THE SUPPLY OF REAL ESTATE PROPERTIES ON THE MARKET
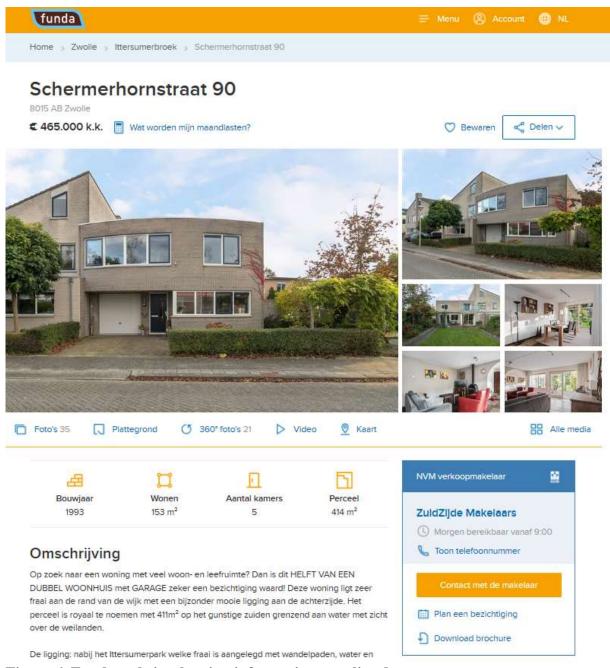

Figure 6. Funda website showing information on a listed property.

One of the most used websites to list properties that are on the market is Funda. The website contains valuable data of the properties along with pictures. These pictures allow to look inside and to update data on maintenance of the property.

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Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

Figure 7. IWOZ showing information on a listed property.

The information in Funda is of great use for the valuation. However as soon the property is sold, the information given by Funda is not longer available for the appraisal industry. For that reason the municipalities in the Netherlands have created a shared service centre that operates the iWOZ system. iWOZ copies the data from Funda for later use in the appraisal process and enriches this data with data from the system of base registers, with some some statistical key-figures and with results of automatic text analysis on the text of the advertisement.

For privacy reasons the iWOZ system may only be used by municipal organizations responsible for the formal assessment of real estate.

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Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

4. INFORMATION MUNICIPALITIES SPECIFICALLY COLLECT FOR MASS VALUATION

Appraisers often say that the value of real estate is depending on location, location and location. In the same manner of speech, we can say that the mass appraisal of real estate is depending on data quality, data quality and data quality. Many automated systems for mass appraisal are available with different types of modeling. In the Netherlands not only, multiple regression types of models are used, but also other types more directly using sales comparison. Good models and experienced and well-trained mass appraiser specialist are needed for the yearly mass appraisal, but we have experienced that the most important aspect for successful mass appraisal results is the quality of data. In mass appraisal, the outcome of the appraisal for a specific property is entirely depending on the object characteristics registered. In the Netherlands, we have a system in which we combine the use of data characteristics available in formal registers (the formal system of base registers) and the collecting of data especially for the mass appraisal.

The Base Register of Buildings only registers the building year and the size (usable floor area) of the main building. The rest of the information important for model-based valuation must be collected by the municipality. This could be, for example, the type of the building, the size of different parts of the building (for instance shopping space versus storage space or an old part of the building versus a newly built enlargement), annexes to the building or information that provides insight into the maintenance condition or in the quality of an object. In addition, some market data must be collected by the municipalities themselves, such as rental prices of non-residential properties, because the rental transactions are not registered in contrast to the sales of real property.

For the collecting, updating and quality control of object characteristics in the Netherlands a distinction is made between primary characteristics and secondary characteristics. This distinction is not related to the importance but to the way, the object characteristics can be changed. Primary object characteristics can only be changed by building activities. As primary object characteristics used in the appraisal models in the Netherlands, we can mention:

- type of property
- number and type of annexes (for instance garage space)
- size of the land plot
- size of the (main) building and of the annexes
- building year of the (main) building and of the annexes
- information on building year and size for different parts of the (main) building

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Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

Secondary object characteristics are the characteristics that can change without building activities, for instance because of time, but also because of preferences of buyers. The secondary object characteristics registered and updated for the annual appraisal in the Netherlands are:

- maintenance condition of the property (sometimes with a distinction between maintenance condition of the structure and outside of the building on the one hand and the maintenance condition of the interior on the other hand)
- quality of the property (sometimes with a distinction between quality of materials used for the building on the one hand and the level to which the property meets for instance actual wishes for residential facilities of property owners and potential buyers, like quality of kitchen facilities)
- the location of the property related to services available in the neighborhood en potential nuisance caused by properties or infrastructure in de direct surroundings).

For collecting, checking and updating information municipalities increasingly make use of the knowledge of stakeholders, for example by sending out information forms or by asking stakeholders to provide information through interactive websites. It turns out those asking stakeholders to help updating object characteristics is not only an efficient way to improve data quality, but also improves the trust these stakeholders have in the quality of the data and the quality of the assessed values.

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Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

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Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

5. MAINTAINING THE RIGHTNESS OF OBJECT CHARACTERISTICS

The Netherlands Council for Real Estate Assessment formulates quality standards and guidelines to which the assessment process must comply. These requirements relate to the products (the valuations), the underlying work procedures and to the internal management of these work procedures. In addition, the Netherlands Council for Real Estate Assessment reviews whether municipalities, the organizations who are responsible for the assessments, meet these quality standards and guidelines.

Whatever the source of the object characteristics (base registers or collected for the mass appraisal); the appraiser is responsible for a good system of quality control. For this quality control in the Netherlands, we use a procedure in which as much of experiences during market analysis and the handling of complaints (appeals) are used to estimate to quality of data.

Using the protocol the appraiser can make an estimation for which percentage of the properties the object characteristics in the registration need improvements. Using this information the appraiser can measure whether the activities for updating object characteristics are effective or whether an extra project for improving data quality is needed.

Smart Assessor: Keep Calm and Manage Your Data Quality (11054)
Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

6. CONCLUDING REMARKS

• Good object characteristics are essential for an accurate mass appraisal of real estate property. Quality of object characteristics is more often a problem than the quality of the systems used.

• To register object characteristics in a proper way and use them in a CAMA system, it is important to have uniform definitions and instructions for measuring (for instance usable floor area) or assessing (for instance quality of a property) object characteristics.

• Uniform definitions for the characteristics record are always important. It does not matter whether there is a central or decentralized appraisal. Because if there is a centralized appraisal decentralized sources of data can be used and the other way around.

• For primary object characteristics such as size and building year the setting of uniform definitions and standards is relatively simple. For the secondary object characteristics such as quality of the building, maintenance condition or location definitions are much harder to set out and use.

• Sharing information with other government and non-government organizations makes the appraisal process more efficient. This also applies for the use of "big data" from the internet especially data about the real estate market.

• It is recommended that before starting the appraisal an assessment is made of the quality of the registration of the object characteristics to be used for the appraisal. If the quality is inadequate, improvement measures must be taken before starting the analysis and the building of valuation models within the CAMA system.

Smart Assessor: Keep Calm and Manage Your Data Quality (11054)
Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021

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Marco Kuijper RO, Ruud Kathmann and Luc Hermans (Netherlands)

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Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021