

The role of old, historical, knowledge in a modern Cadastre

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SUMMARY

At the start of my working period, almost 47 years ago, all was analogue, map and administration/registration. Nowadays everything is digital. But, in the Netherlands, made by a conversion. That means that the quality is known of the digital data and that is different from original digital data. How can old, historical knowledge help the next generation (and how to transfer it). I see this as a kind of Fit-for-purpose.

In the last quarter of the existence of the Dutch Cadastre everything changed. The first 150 year we worked analogue, the last 50 years of half a decade we started to work in a digital way.

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1. Introduction

In 1974 I started working at the Cadastre. Just finished my secondary school. At that moment I preferred to start working instead of another study. Almost 50 years later it was a good decision.

At that moment I learned to mutate our cadastral map physically and on an analogue way. For this moment important to know that the maps were on scale 1:500, 1:1000 and 1:2500. In this paper I want to write about five subjects: What does it mean?

2. What means looking to the maps in the seventies?

The most of the maps were on paper, 70 by 100 centimeters. Put away hanging. Some papers were on plastic, we called that white opaque or on a kind of aluminum with paper. The last two kinds were dimensionally stable. In the Netherlands our maps were so called island maps. That means that the parcels were complete imaged on one map. Other system is so called window maps, where the whole paper is covered with parcels, those on the edge are covered on

two maps

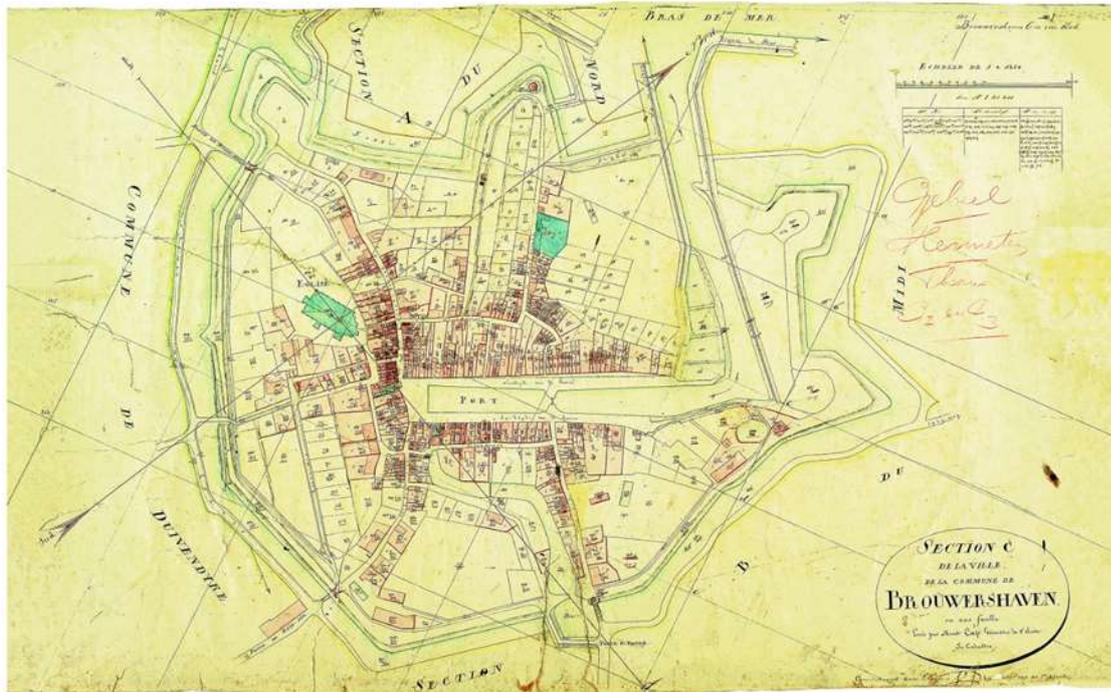


Illustration of a original cadastral map of 1832

Updating the map was based on measurements in the field. The old boundary was taken away and the new one signed on the map. Imagine that we draw the line with a size of 0.18 mm. That means that on a map on scale 1:2500 in the field this line is 45 centimetres wide. That is the accuracy of the map.

3. What has happened during the digitization?

Each map is digitized. After digitizing the maps it had to be transferred to our national grid, “Stelsel van Rijksdriehoeksmeting” (RD), a system of triangular measurements. The new large scale topographic map, GBKN, is used with the transfer to the RD. Intermediate result is

a digital map for each analogue map. Every boundary is digital in the quality of an analogue map.

National Geodetic Reference Network

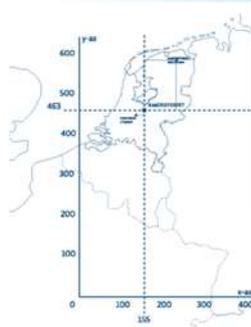


Illustration of our National grid

The next step is to make one seamless cadastral map of the Netherlands. That means that we used a programme to calculate two different digital boundaries to one combined boundary. For example the east boundary of a parcel on map A is the same border as the west border of map B. In the seamless map it must be the same boundary. That means that the quality of a border is a mix (or a generated average) of the quality of both, at that moment not a great problem. Because there was a need of a digital cadastral map of the Netherlands. The idea was later to improve the quality. And I think that later is nowadays. Result after this second step is a seamless cadastral map of the whole Netherlands.

example: map-border correction

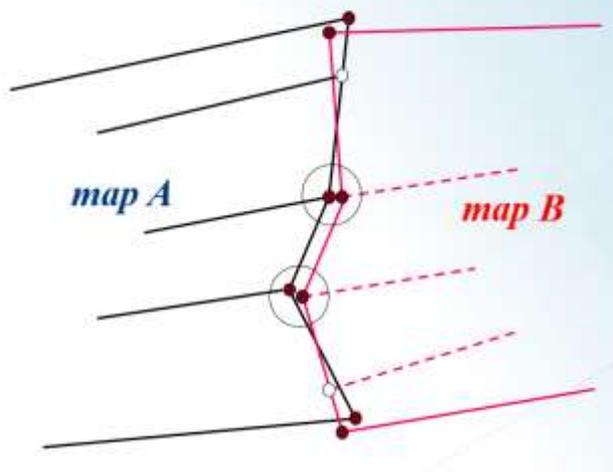


Illustration of two neighbour maps

Then we have one step to go. An unique step in the Netherlands. For other countries I can't speak. In the Netherlands we had with several clients an agreement to tune the large scale topographic map with the cadastral map. That means briefly that we look, on the moment of this conversion, if there's a topographic line within the quality framework of the cadastral boundary that originated from the first two steps. If the answer is YES, then we decided to use the same coordinates for both lines, one set in the cadastral map and the other same set of coordinates in the topographic map. We named that tuning our map.

The result of this conversion is a digital cadastral map with the quality of the analogue one. And that is nowadays the biggest challenge.

When we started with the digital map we had a system for showing the quality. So every user could see what the quality is of the data in the map. We had a P, for the precision of a point in the map, a I for the accuracy of the point in the field. And the third a B for the degree of control. But this was not stable and robust during daily updates of the map. There are two reasons: the first problem is based on the fact that we measure points in the field but we keep that quality at the intersections of the lines in the map. The second was that qualified a new measured point as good but independently we place that point for example in the digitized map. So after some years our clients thought that they got better data than actually. They made decisions based on the wrong data quality. Therefore we skipped that and we only said that the quality is based on digitized data. Besides we have the original measurements. So the map shows the position of a parcel, and our field documents contains the position of a boundary.

We digitized more than 35.000 island mapsheets, scale 1:500 till 1:5.000, to a digital, complete national coverage, seamless mapdatabase.

We communicate that the deviation is 20 / 40 cm in urban / rural areas, reason: just cartographic use. The relative precision, in terrain, is more important than absolute accuracy in the map. Boundaries are adjusted to topographic base map as a reference.

4. What is the situation nowadays?

We have a digital cadastral map with the accuracy of an analogue map. Our updating system is based on this situation. My generation knows what to do.

But my generation is going retired in some years. So our knowledge must be transferred to our new young colleagues.

The knowledge of the black box cadastral map is disappearing.

5. What is the reaction of the market, our clients?

A majority of our clients expects a digital quality of our digital cadastral map. In my words: they believe in the holiness of the coordinate. While the most important is the place of the boundary in the field. Not on the map.

So our target is to find a way of transfer our, the old generation and system, knowledge to the next generation and new system. But during this transformation our shop is not closed but open for our clients. That is a great challenge. We started too late? I don't know. But we must find a way so we can say against our clients, owners of parcels with rights, we didn't change your rights and parcels, we only introduce a new way of showing your old parcels and rights. That process starts with thinking outside frames. And that is in my opinion a good way to connect old with young. We have to think about new ways of collecting and registering our rights. Fit-for-purpose is the new theme. Not only for new registrations but also for the more old countries. In this the Netherlands.

6. What could be the future?

The challenge for us as geodesists is how we can make the disclaimer of combinations of files in relation to reality concrete. So without the knowledge of how it was made, but only based on what we have now. We know that a textual disclaimer does not work. So what other ways can we come up with to make clear in use what something in the digital cadastral map represents.

And then I come to my topic.

On the one hand, you can imagine that we will do even more to make this knowledge transfer happen. So that we ensure that my generation is, as it were, drained with the knowledge that we have gained in more than 40 years of work experience. The downside of this story is that we keep thinking in the old way of working. In my case we have therefore only still a half year. Then I hope to retire.

On the other hand, we can start thinking about a different way of storing data. Perhaps a completely different way of registering. Why still measure cadastral boundaries? We can certainly consider that the border itself knows that it is a border by measuring the border with GPS in the terrain in an authorized way by parties. Think about a kind of a chip on the tipping points of the border, placed in the field by mutual consent of the parties. That chip can then send out a signal that it is in place and thus make its location known. And the system can recognize when its moving after parties both agreed because one of the parties doesn't agree afterwards with its place. I see this as a vision development and for me no longer important in the last months of still working in the cadastral environment. But it could be an idea for the next generation. Several questions must be answered, but I think it could be possible to do this.

So on the other side. How do I secure knowledge from the past to the future. It looks that it may no longer be necessary, but it will still be necessary for a long time to explain the past. Because all the information in our archive is still the truth for parties. And we need that to be able to indicate, for example, the place where a cadastral boundary has arisen. In the Netherlands we call this 'border reconstruction'.

For years we have been saying within Kadaster that knowledge transfer is necessary. Because there is an outflow coming. It is now in full swing. We now literally come to the conclusion that a great deal of necessary knowledge is released. That walking out is entirely justified, because after more than 40 years of work, the beacons can be changed on that point.

How do you get this knowledge secured in the next generation? No question so difficult whether we as geodesics can get to work with it. If I then look at us, Kadaster, with a fieldwork archive of almost 200 years with still applicable boundaries with their measurement data obtained at the time, the challenge is how do I get that information in a new guise?

I want to challenge you, younger colleague, to think the next months a vision about the future. How can we together make a step forwards.

After 47 years of working at the Cadastre it became a great part of my live. So I like it and I am involved how it goes further.

I am not worried about how it comes, but I love after that time the Cadastre almost like my family.

REFERENCES

BIOGRAPHICAL NOTES

Born in 1955

Working since 1974 at the Cadastre in several functions, cartographer, surveyerm adviser, procesmanager

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