

# **Kadaster-on-line: An Award Winning Internet-portal**

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**Key words:** e-government, internet, registry information, cadastre

## **SUMMARY**

### **Kadaster-on-line**

Kadaster promotes legal certainty in transactions involving registered properties. Kadaster compiles data about registered properties and records this in public registers and cadastral maps. By making this information available to the public, Kadaster provides clarity about the ownership of registered properties and related characteristics.

As a professional and market-focussed organisation, Kadaster is keen to continue developing into a central organisation for real estate and geo-information. The spearhead in this regard is to increase the accessibility and availability of our information, which is why we developed Kadaster-on-line. Some 45,000 users among 12,000 clients use Kadaster-on-line to consult up-to-date real estate information that is crucial for their own work processes. Kadaster-on-line offers clients (including notaries, real estate agencies, local councils and construction companies) greater convenience and accessibility. Clients can access their information far quicker and cheaper. Every day more than 60,000 products are provided via Kadaster-on-line. Kadaster-on-line was introduced in 2001 and is accessible via subscription or directly via the internet.

### **On-line Products**

On-line products was introduced in the autumn of 2003 and is a public version of Kadaster-on-line that can be accessed by anyone without the need for a subscription. On-line products is intended primarily for private individuals and comprises three basic products. These products can only be paid for electronically and are only provided on-line. In 2005 some 1,400,000 on-line products were provided on a monthly basis.

### **Additions**

Two important additions since the introduction of Kadaster-on-line are:

- • Automated data traffic: This enables clients to incorporate land-registry information into their own applications automatically.
- • Eulis: Within a European context, several countries are working together to make land-registry information internationally accessible.

# **Kadaster-on-line: an award winning solution**

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## **1. INTRODUCTION**

### **1.1 Specific Problem**

The land registry, cadastre and mapping agency of the Netherlands: Kadaster, had from the late eighties a stand-alone software application that clients could use to look up real estate information. Interactive access was provided by a host browser (3270 terminal emulation) on the IBM Mainframe via a proprietary network. Approximately 6,000 clients, civil-law notaries and real estate agents in particular, subscribed to this network. Commercial as well as technical arguments can be provided as to why it was desirable to phase out the Kadaster network.

The Kadaster network was implemented in April 1996 and provided 173,238 products at its peak (July 2001). At that moment the Kadaster network had 5,953 subscribers.

### **1.2 General Background**

#### *Commercial arguments:*

More and more of Kadaster's clients are turning to Internet technology. They want their applications to be integrated as much as possible with those of Kadaster. The Kadaster network was unsuitable for this purpose, which led to dissatisfaction amongst clients. Clients were asking for new products that we were unable to provide. They considered the Kadaster network extremely old-fashioned and felt that Kadaster was not fulfilling their wishes. The Kadaster network was insufficiently flexible to introduce new products onto the market with ease. Kadaster was therefore unable to respond adequately to market demands. There was a risk that third parties would assume Kadaster's role as an information provider. Due to the technology that was used and the knowledge users need, the Kadaster network imposed limits on the number of clients that could be approached and the products that were to be delivered. The use of new technology makes it possible to serve more clients and deliver more diverse products. There was also a risk that third parties would get there before Kadaster could, enabling them to claim a share of the market.

#### *Technical arguments:*

The Kadaster network experienced stability and reliability problems. It was also expected that the supplier of VAX/VMS, the platform on which the Kadaster network was built, would gradually stop providing support. Furthermore, the technical procedure involved was slow. Users had to establish a connection to order products and then create another connection to retrieve the products via their own mailbox. The connections did not always work. Availability and accessibility were also not optimal: the standalone software was installed at clients by an intermediary and also required maintenance. With regard to newer versions, the

aforementioned intermediary had to visit all clients to install these. In the meantime, the use of Internet technologies in the world around us was increasing and Kadaster started focussing on making real estate information available via the Internet: Kadaster-on-line.

### **1.3 Policy Context and Strategy**

Kadaster bases its strategy on a number of objectives. One of these objectives is 'greater and better attention to the wishes of our clients'. Information and communication technology makes it increasingly easier to provide access to real estate information in a way that suits the client. This is why Kadaster-on-line was one of the tools developed by Kadaster.

With Kadaster-on-line, Kadaster wanted to demonstrate that progress had been made in the availability and accessibility of real estate information, for the benefit of its clients as well as for the organisation's right to exist. This corresponds with the vision of the Dutch government, which states that governments and other public organisations in particular must make their products and services available via the Internet. The primary objective of the Dutch government, as laid down in the programme entitled 'Another Government', is that 65 % of services provided by government bodies will be available via the Internet by 2007. For Kadaster, this also meant that products and services could be provided at lower costs. Since Kadaster is a non-profit organisation, it was possible to make information provided via the Internet cheaper for clients. The provision of services via the Internet was stimulated in turn.

Kadaster-on-line also had to be automated and integrated with the work processes of Kadaster where possible. That required, amongst other things, a link to the sales and marketing information system. Insight into the (buying) behaviour of clients had to be acquired.

One of the objectives of Kadaster-on-line was to continue developing and professionalizing it in order to meet clients' wishes as much as possible. One of the first extensions that were expected related to the individual, non-professional client (the private client/citizen).

Another development would occur at European level. The disappearance of borders has also resulted in a need for information about real estate outside the Netherlands. Initially, there was only a demand for real estate information about properties just outside this country's borders, but later on this also extended to properties in the rest of Europe, such as the holiday destinations of Spain and France.

## **2. SOLUTIONS**

### **2.1 Specific Objectives**

Kadaster-on-line works on the basis of Internet technology. All products can be saved for further processing. All e-mail documents are provided in PDF format. Within the system, users can click further quickly and continue searching for or selecting products with ease. The user convenience of Kadaster-on-line has therefore been greatly improved in comparison

to the Kadaster network. A number of changes have also been implemented within the products themselves.

The expectation was that the use of standard products for communication between various business systems would produce diverse benefits with regard to development, exploitation and management in comparison with the current situation. Kadaster-on-line had to use the client, subscription and product range registration of the CRM system (SAP). The information used to compile a product is extracted from our data systems. Information about delivery is passed onto the CRM system and invoicing then occurs within SAP. Subscribers can also use Kadaster-on-line to enter orders for particular products that cannot be delivered immediately, which are passed onto the CRM system for manual processing in the regions. Finally, subscribers are given the opportunity to view an invoice specification online in the SAP system.

Concrete objectives were formulated at the start of the process:

- increase the accessibility of information from Kadaster for existing and new clients
- increase the ease of use of information from Kadaster
- switch to standard technologies for the client on his desktop
- save costs by phasing out external networks and sharing the existing portal system and by discontinuing support for software created specifically for the client's computer (the terminal emulation of the Kadaster network)
- create a basis whereby existing and new products can be interactively provided via existing and new channels to existing and new clients over the coming years

## **2.2 Implementation**

Basically, the approach comprised the following components.

### *Client survey*

An in-depth survey of the specific requirements and wishes of clients was carried out. This survey was conducted during various sessions with client groups and provided a clear picture of what the new system had to be able to provide in terms of user friendliness and functionality. The result of this coordination is a document featuring the objectives that have to be met.

The Business Case process was next, in which the person responsible for policy first determines the use, necessity and urgency in an application for a business case. After this application has been approved, the writing process for the business case itself starts. In this business case, the person responsible for policy and the ICT department agree on and approve what has to be delivered. The global system concept was also described.

The project was then created, in which the business case was worked out in greater detail. This included a more detailed definition of the proposed solution in relation to all business processes. A description of information and risk analyses was also provided. The global system concept was worked out in detail. The technical development and construction of a

prototype as well as the construction of the system itself was also taken care of. This was a time-consuming and complex phase.

The prototype was geared to internal use as well as to clients. It served as a working model and was used to verify whether clients would ultimately appreciate what had been requested. After various improvements aimed at harmonising the prototype, the project built Kadaster-on-line and all accompanying interfaces. All of this was developed and built within the internal organization.

After the construction phase, various testing phases were organised (a functional test, which measures whether the system works correctly and is complete with respect to the specified functionalities, an acceptance test, a pre-production test, implementation tests, etc). Kadaster-on-line was then rolled out during a pilot involving 15 clients. In the meantime, training courses have been developed for clients and Kadaster employees.

A comprehensive communication plan was written for the internal and external introduction and focussed on the environment (stakeholders), external and internal clients. The rollout was then planned.

At the time of the introduction of Kadaster-on-line, it was communicated that the old system, Kadaster network, would be phased out within one and a half years. This provided clients with sufficient time to switch over to Kadaster-on-line.

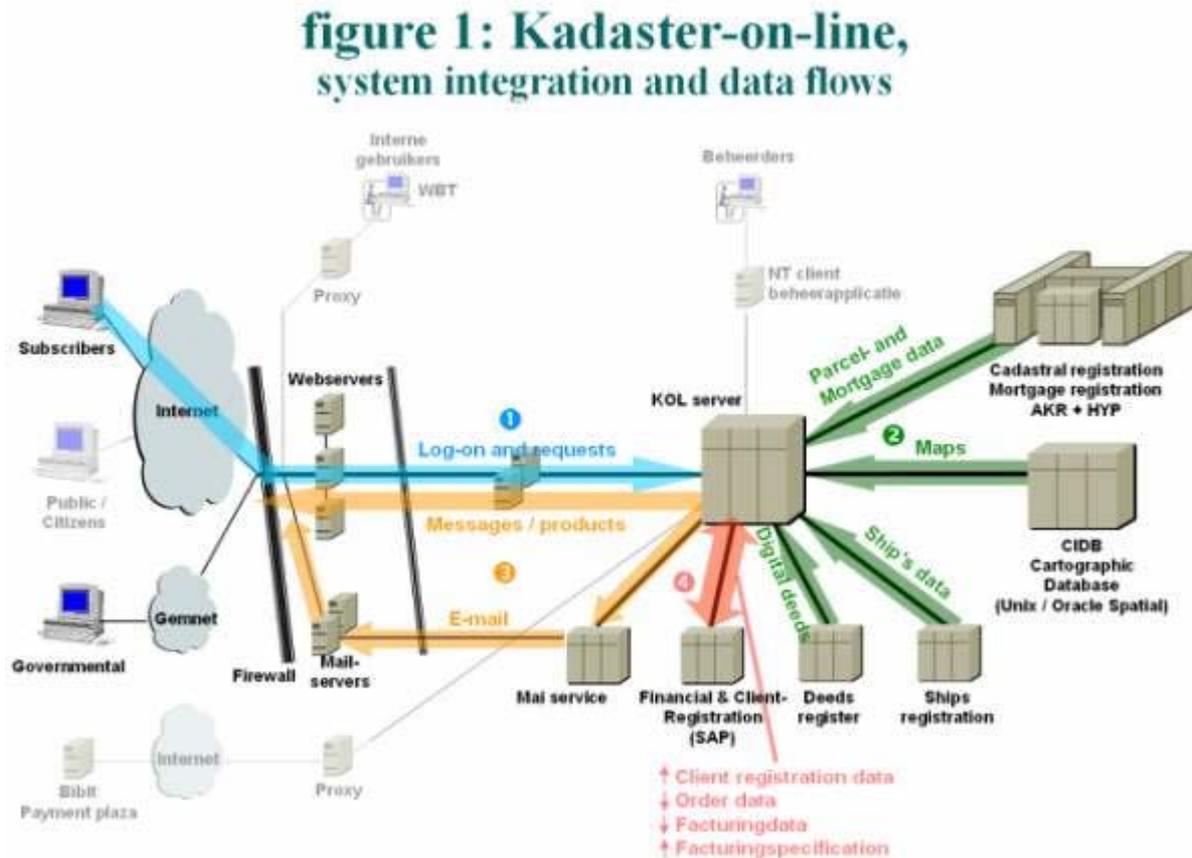
During the construction phase of Kadaster-on-line, a business case process was already started for the second phase. This entailed, amongst other things, making it possible for non-subscribers to consult certain products from Kadaster-on-line via the public Internet but also via direct electronic payment. This component is an important addition and also forms part of this application. The name of this component is 'on-line products'. Other components of the second phase included the introduction of new digital products and new search options (zooming in via the cadastral map).

All of these phases were discussed extensively in the business case and in the plan of approach containing detailed analyses of business processes and internal procedures. A comprehensive transition scenario, including a communication plan, was also created. Throughout the entire process, a great deal of emphasis was placed on development (construction) and relationships with other systems. The underlying technology is highly complex but is only described here in brief in view of the uniqueness of the. Implementation required as much time as construction.

The cost of the development of the system amounted to about 5 million euros, where additional costs for hardware is not included. About a quarter of the budget was spend for the internet portal itself. Reconstruction of legacy systems and SAP-implementation accounted for another 25%. The rest was spend for business analysis and design and implementation (training, roll out, manual, design of procedures, etc).

## 2.3 Impact

Kadaster-on-line provides access to various databases; 30 contain administrative cadastral data and 15 others contain cartographic cadastral data. Those databases are spread over 18 computers and locations. These data are used to compile information products that are essential for the legal certainty of real estate transactions.



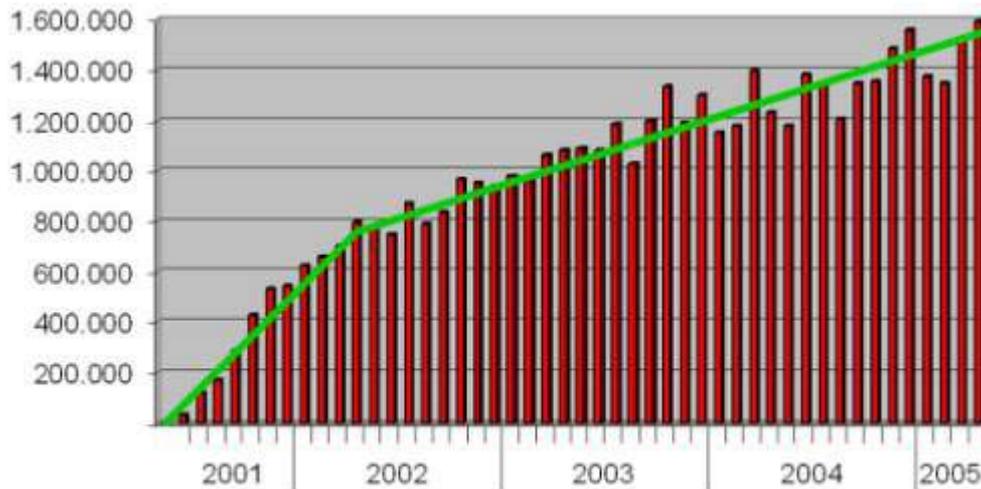
Via screens displayed in a browser, Kadaster-on-line allows clients to make a selection of the cadastral registration and then delivers the requested information in the form of HTML, XML or PDF messages in the browser or PDF messages via e-mail.

Via Kadaster-on-line, interactive access to the information products of Kadaster as well as e-mail (outgoing) is supported on the basis of de facto Internet standards. The use of standard products for communication between various business systems provides benefits in terms of development, exploitation and management in comparison with the former situation. Clients can use standard Internet browsers to obtain interactive access and order products.

Kadaster-on-line is the success story of Kadaster. Since its arrival, subscriber numbers have increased significantly among new client groups in particular. The number of products that can be requested online has also increased considerably. Kadaster-on-line grows 15% every

year in a stabile market. Kadaster-on-line is scaleable as the usage volume increases. Clients who use Kadaster-on-line pay a lower fee than those who order products via e-mail, fax or post.

**figure 2: Number of orders Kadaster-on-line per month**



Since the introduction of Kadaster-on-line in 2001, Kadaster has continued to innovate the application.

The most important innovations for clients are:

- Increase in the number of products that can be requested directly.
- Increase in the number of registrations that are made available (ships and aircraft)
- Search options for a property have been expanded with a search option via the map.

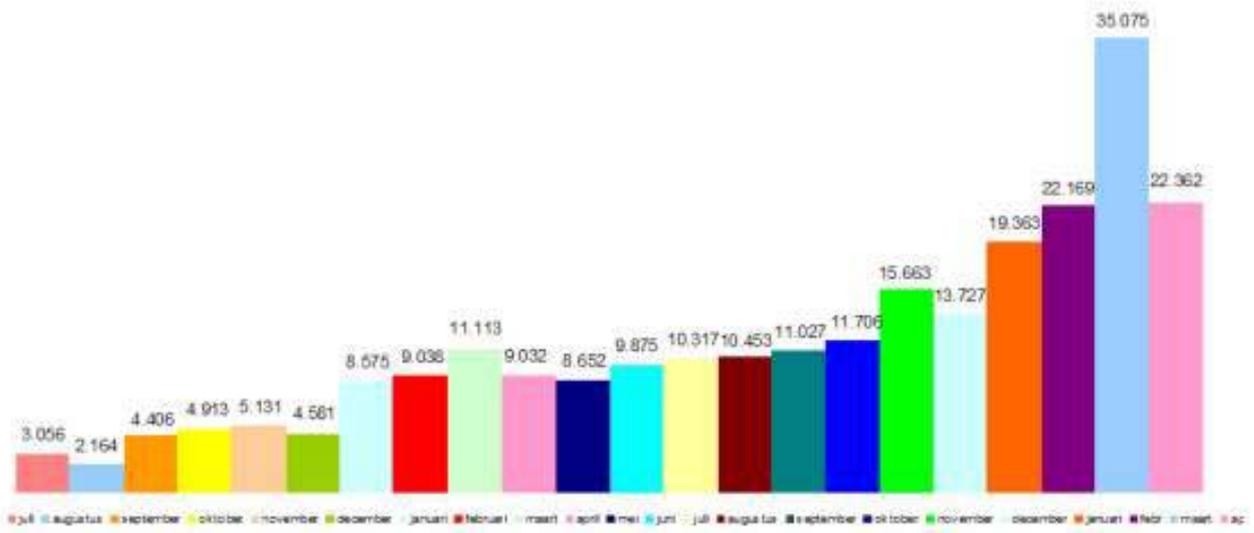
Property numbers on the cadastral map contain hyperlinks so that a client has a direct link from the cartographic information to the order screen of the related administrative information.

On-line products is a variant of Kadaster-on-line specially created for private individuals. They can order three information products without prior subscription. On-line products is accessible via the website of Kadaster. Payment always occurs by credit card.

Automated data traffic is an addition to interactive requests. Automated data traffic allows cadastral information products to be incorporated into clients' systems automatically. Local councils use this application to supplement their own website for citizens with cadastral information. Real estate agents used automated data traffic to incorporate cadastral information directly into a valuation report for a home. Automated data traffic works on the basis of XML.

Eulis is a joint initiative between European countries that makes cadastral information from a number of countries accessible via one portal. A foreign real estate agent who enters the Eulis can obtain information about real estate in the Netherlands.

figure 3: Number of orders On line products per month



The introduction of Kadaster-on-line has had the following effects:

- greater client satisfaction
  - 2001: 6.3 (old system)
  - 2004: 7.4 (Kadaster-on-line)
- greater familiarity within the commercial and private sector
- greater accessibility
- greater delivery speed
- lower internal costs

## 2.4 Relevance of the Case for Other Administrations

The technical approach is highly individual. The manner in which our databases are set up and linked to one another is specific. The construction-related aspects of Kadaster-on-line are therefore not generic and are impossible to copy one by one for use by other parties.

The integration of the front system with the back office has a very positive effect on the efficiency and uniformity of the work. This experience can be relevant for others.

This does not apply to the consultation of information in 'on-line products'. To this end, it is necessary to give a brief outline on how 'on-line products' is put together from a functional perspective. On-line products is accessible to everyone via [www.kadaster.nl](http://www.kadaster.nl). No subscription is required therefore. Users launch the application. Technically, this application works the

same way as Kadaster-on-line. Users select a property (via address or postal code) and the products they wish to receive. Three different products are available.

In the meantime, the system checks whether these products can be compiled. Occasionally a certain product is temporarily unavailable due to system maintenance. The system also actually ensures that the products are ready to be sent immediately.

After this check (which takes a few seconds) the client is notified as to which products are ready and can then continue onto the payment module.

The client can choose from various payment methods, including credit cards but also a type of prepaid card. Payment processing is contracted out to a payment plaza, but this goes unnoticed by the client. After payment (this takes a few seconds) the client receives his products on screen in PDF format. The products and payments are booked directly in the CRM system. However, no client details are recorded. The client can buy anonymous.

This functionality offers a raft of benefits:

*For Kadaster:*

Delivery via the browser ensures that the likelihood of incorrect product deliveries remains extremely small. Delivery via e-mail, for example, has many more drawbacks. The client may have entered a wrong e-mail address or his e-mail box may be full. As a result, products are delivered incorrectly or even not at all even though the client has already paid. In that case, the client will contact the Client Service Department, thereby placing pressure on the organisation.

Everything occurs automatically throughout the entire process. Searching for the product, compiling the product, financial handling, delivery to the client and recording in the Sales and Marketing Information System. With the exception of dealing with questions and complaints, there are no further activities for the internal organisation.

Payment certainty: the client has to pay first and only receives his product afterwards. Kadaster does not have to perform any further financial completion activities in this regard (no need, for example, to initiate collection procedures and send demands for payment. These are generally also very costly procedures, especially in relation to the average amount of a bill (€ 4).

Since the products are compiled before payment occurs, the situation never arises whereby the client pays for a product that cannot be delivered (compiled). Consequently, no complaints are received in this regard.

*For the client:*

Anonymous consultation; no need to leave a name or e-mail address anywhere.

Great availability: accessibility via all computers equipped with an Internet connection. The client no longer has to visit one of the fifteen offices of Kadaster in the country.

Linking option, at local councils for example. This allows local councils to sell their clients compiled products that also require cadastral information. An example is an application for a building permit.

Other organisations that wish to make information available online can copy this functionality with ease.

### **3. RESULTS**

#### **3.1 Service Use**

##### **3.1.1 Citizen-centred Service: On-line Products**

The good availability of cadastral information ensures that more and more people search for another home independently, i.e. without using a real estate agent. Kadaster provides them with details about the owner, the latest selling price and the particulars of the property.

People around the world can request real estate information about properties in the Netherlands via [www.kadaster.nl](http://www.kadaster.nl). An unexpected aid in an important process. The local council determines the value of a home every three years. This value is important for the level of municipal taxes, amongst other things, that owners have to determine.

One of the products from ‘on-line products’ is the purchase price overview. This is an overview of all homes that have been sold in a particular postal code area. It features the homes, with their addresses, sale date, selling price and surface area. Many homeowners have used this product when objecting to the level of the home value determined by the local council. This product is a sought-after alternative. The other alternative is to call in a valuation surveyor who will draw up an official valuation report for the individual home. The main difference is the price: an official valuation report costs hundreds of euros while a purchase price overview from Kadaster only costs € 1.99 per postal code.

The ‘on-line products’ are cheaper than the products via other media like post, fax and desk.

According to the client satisfaction survey in 2004, 90% of the clients of on-line products are satisfied with the clear description of the products, the possibilities of payment and the navigation.

##### **3.1.2 Business-centred Service: Kadaster-on-line**

###### *Chain-integration*

Various players play a role in the chain of real estate transactions. A private individual who wants to buy a home often turns to a real estate agent for advice. The actual transaction occurs with the civil-law notary, after which the contract of sale and mortgage deed, if applicable, are registered with Kadaster. If a new property boundary has to be measured as a result of this purchase, Kadaster will also take care of this. At various moments during this purchasing process, the private individual, the real estate agent and the civil-law notary will require cadastral information about the property in question. Kadaster developed Kadaster-

on-line in order to provide professional clients with up-to-date information that provides legal certainty.

Professional clients can subscribe to Kadaster-on-line, which is accessible via the Internet. The client can personally determine how many employees may use Kadaster-on-line. Every employee has an own user code and can use any computer with access to the Internet to log onto Kadaster-on-line. The user code enables the client to see which employee requested which products. The client can view the invoice specification online. It is also possible to track the status of a requested product that cannot be delivered immediately, e.g. a deeds study.

For the professional client, Kadaster-on-line is a single portal for information about real estate that provides legal certainty. Information is requested 100% digitally, delivered 95% digitally and invoicing occurs automatically. Accessibility to the cadastral register and the speed of delivery have increased substantially. The results of a government e-award in the Netherlands in 2003 are that Kadaster is the second best.

### 3.1.3 Sharing/cross-cutting Service: Eulis

Within Europe, several land registry offices have set up a joint initiative to make their information available internationally. Kadaster, the Dutch land registry office, is one of the parties that have participated in Eulis from the outset. Eulis makes it easy to obtain information about real estate abroad. Dutch real estate agents and financial organisations can use Eulis, which is a component within Kadaster-on-line, to request information about real estate in one of the other participating countries. Eulis directs clients abroad to a special section in Kadaster-on-line where all of the information is displayed in English. Participating countries have agreed on the information that is shown, the concepts that are used and applicable service levels. Eulis became operational in July 2006.

### 3.1.4 Intermediated Service: Automated Data Traffic

An increasing number of local councils want to provide e-services to their citizens. They wish to make their services and products available via the Internet. For some of these services, it is essential to provide cadastral information or to include it within the own product. When applying for a building permit, for example, it is necessary to indicate the current plot number and it is useful to have an insight into the cadastral map. Kadaster developed automated data traffic for this client request; a virtual variant of Kadaster-on-line. The local council's computer submits a question to Kadaster-on-line and receives an answer. The local council can then display this answer or part of it on its own website wherever it wishes to do so. This data traffic is exchanged on the basis of XML. Automated data traffic has been operational since January 2005.

A download service within Kadaster-on-line is an innovation that has been rolled out. Until recently, government authorities received monthly cadastral information files on CD or DVD. From May 2005 onwards it became possible to download these information files. Via

Kadaster-on-line, the client is directed to a separate section in which Kadaster places the files for that client. The client automatically receives an e-mail when the file is ready to be downloaded.

## **4. LEARNING POINTS AND CONCLUSIONS**

### **4.1 General Learning Experiences**

Learning experiences have been extremely positive. The thorough approach (see question b2.2) in particular has done clients and us a great deal of good. Only a few problems have occurred. The drawback, though, was that the entire process took a very long time, but clients have finally been provided with a highly stable and reliable system that is completely to their satisfaction.

It is important to continue innovating. Clients make ever-increasing demands. Before we introduce a new product or new service, we start with a pilot. Although new functionality can be tested thoroughly, small flaws often appear during production. Such problems are resolved during the pilot.

Another important point is the performance of the system. Some 90% of the requested information has to be delivered within 2.5 seconds. We measure performance with the help of a virtual client who requests a product every 10 minutes. The performance of this virtual client is measured constantly.

Kadaster-on-line is open seven days a week, 18 hours a day.

### **4.2 General Learning Experiences in relation to ‘On-line Products’**

On-line products is an important example of one of the five spearheads of Kadaster's vision of the future, namely ‘greater focus on the citizen’. However, creating a transaction application does not fulfil that strategic objective. In order to actually realise this objective, Kadaster would have to take a good look at the role that we want to give this client in the organisation and our objectives with respect to this client group. Now we have merely developed an application to serve the client properly, but this is something else than making this client the ‘focus of attention’.

In the meantime, we have personally identified the following points of improvement that are related to government readiness:

use the target group as a point of departure and formulate objectives. Allow (in this case) on-line products to be one of the objectives but not the objective in itself as was the case now realise that you are broaching a new client group, and that this client group asks other questions, is more critical towards the organisation and more frequently requests a refund in the event of a complaint. The internal processes of Kadaster are geared towards this. A concrete example is the opening hours of Kadaster. Kadaster-on-line (and therefore on-line products too since these are technically alike) is opened on workdays. These opening hours are tailored to professional clients. Private clients, however, have a completely different wish.

They require real estate information in the evening and on Saturdays and Sundays. These are the moments when they familiarise themselves with the housing market and request cadastral information. That is why we recently extended our opening hours.

With 'on-line products', Kadaster has not made the client the focus of attention, but has examined the possibilities for a new client group (citizens) on the basis of the existing professional solution (Kadaster-on-line). Citizens, incidentally, were involved in the specific project, but their input related mainly to the look & feel of the application.

## **BIBLIOGRAPHY**

**Mr. Wouters** gained his MSc in Agricultural Sciences at Wageningen University (Netherlands) in 1982. After his study he worked 5 years for the FAO, where he had assignments in watershed management and forestry projects in Africa and Asia. In the Netherlands he worked over 10 years in IT-projects. From 1996 he joined the Kadaster and was responsible for large and complex IT-projects. His last project dealt with the renewal of major parts of the land registration system. In april 2006 he became regional manager for Kadaster International, where his role he is responsible for the regions Central and Eastern Europe, and Asia.

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