

Digital building permit application: a feasibility study for a shared services solution in The Netherlands

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Realizing complete digital intake and processing of building permit applications has been a long time challenge for many governments. Especially the processing of digital drawings and plans constitutes a major obstacle. In 2004 legal barriers to communicate digitally between government and applicants have disappeared in the Netherlands. A group of local governments used the momentum to study the feasibility of a large scale introduction of the intake of digital building permit applications by using a shared services concept. The feasibility study contained technical, economical, juridical and demand site feasibility aspects. This paper reports especially on the demand site feasibility. The paper is meant to present a case study about the readiness of both applicants and local governments in the Netherlands to deal with building permit applications in a digital way.

1. Building permits in The Netherlands

In many countries the guaranteeing of the safety, health, and durability of the constructed environment is a traditional government task. In The Netherlands the issuing of building permits is delegated to local governments. Each of the 483 Dutch municipalities has its own building permit department. Together these departments process over 120,000 building permits each year. The local departments check whether the submitted design meets the local zoning requirements and whether the construction meets the technical and environmental requirements on safety, durability, and health. Additionally, an independent committee of professionals judges whether the design fits into the existing buildings and landscape from an aesthetical point of view¹. Permits will only be granted if the proposed design passes all three tests. Applicants have to pay a fee to the building permit departments for having their application checked. The size of the fee depends on the total estimated building costs.

There are also substantial hidden costs for the applicant. Each submission has to be accompanied by a sizeable set of prescribed plans, drawings, and calculations – in six fold. An average application file can easily consist of more than sixty plans, drawings, and calculations. In most cases, envelopes won't do and the paper files are delivered at the departments counter in boxes. The extra costs for the applicant, due to extensive bureaucratic requirements, can amount up to € 10,000 per application. The current structure of working procedures in the application chain involves several inefficient conversions from paper to digital files and vice versa. Most professional applicants design everything in CAD-software, while an increasing number of municipalities are scanning their permit files and store them into digital accessible databases. Only at the transfer moments between applicants and governments the applications, and all appendixes are converted to paper, forcing all parties to deal with unnecessary and expansive bureaucracy. A fully digital procedure seems to be an obvious improvement for both applicants and local governments. At the beginning of 2004 however no single Dutch municipality offered the possibility to file a complete electronic application. Three important causes can be mentioned. First, for individual departments the number of submitted permits is too small to justify the substantial investments in a digital counterⁱⁱ. Secondly, the building permit inspectors are used to work with drawings on a 1:100 scale. Monitors can only show a small part of the entire map. Thirdly, until January 1 2004 application forms had to be signed by hand which effectively prevent the use of fully digital applicationsⁱⁱⁱ.

2. The shared service concept for building permits

The City of Rotterdam has by far the biggest building permit department in The Netherlands. Rotterdam has recently decided to digitize its application procedure. Yet even in the case of Rotterdam, the volume of permits would not be sufficient to justify investment costs^{iv}. The department therefore suggested establishing a shared service digital counter for the intake of building permits, to share investment costs. Somewhere in The Netherlands a hosting service organization (a.k.a. 'the central server') would be set up to receive digital applications. The front office module that facilitates the actual intake of the digital building permit applications can be integrated in the interface of websites of local governments – the applicant does not notice his application is actually being processed at the central server. When the central server receives an application a notification is sent to the relevant local department. The responsible permit inspector can access the complete application file on the central server relying only on his web browser and internet connection. Another functionality of the software is to add notes and corrections to the drawings. Working from different locations specialists can add comments to their own dedicated layers. Setting up the central server involves substantial fixed costs^v. If a sufficient number of municipalities join the concept, the costs per application can become economical. Assuming a certain critical total of applications, the business model can be solely built on a variable base (pay per application). Investments by single municipalities in advance would not be necessary. The business model is especially appealing to small municipalities which can hardly afford to maintain a basic website.

Due to the modular design of the central server concept, municipalities can use the service at different levels, ranging from simple intake services to advanced semi-automated processing of permits. At the basic level, the central server just receives and forwards the application to the local government. Subsequently, the server could host the files during the entire application procedure. At a third level, the server also has (web based) workflow functionalities. At the fourth and final level, services facilitate advanced ways of supervising building applications, such as automatic checks of drawings on technical requirements and generation of risk profiles based on aggregate statistical analysis. The City of Rotterdam interested several building permit departments of other major cities to conduct a feasibility study and to build a proof of concept. Additional support was obtained from two federal departments, the Ministry of Spatial Planning & Housing, and the Ministry of Interior Affairs.

3. Results from the market research

During the feasibility study a rough business plan for the central server concept was drawn up. Based on desk research and expert panels, investment costs and operating costs were estimated. To map the potential demand, two market surveys^{vi} were conducted, one aimed at professional applicants^{vii} and one at local building permit departments. To get a feel for the weight of administrative burden applicants were asked to the amount of time and money they spend on the current application procedure. On average it takes them about forty (extra) hours for each application. Average total costs per application are between €1,000 and €1,500 – excluding the application fee. Costs were strongly related to the estimates of the total time of the additional activities.

Table 1. Time and Money Spent by Applicants per Item and Correlations of Cost Items with Total Time of Additional Activities (n=134)

<i>TIME (hours)</i>	<i>Ex ante consultation</i>	<i>Printing</i>	<i>Ex post consultation</i>	<i>Other</i>	<i>Total (arithmetic)</i>	<i>Total (est. applicant)</i>
	9.7h	7.2h	7.9h	17.0h	41.8h	40.0h
<i>COSTS (€)</i>		<i>Labor</i>	<i>Out of Pocket</i>	<i>Out-sourcing</i>	<i>Total (arithmetic)</i>	<i>Total (est. applicant)</i>
<i>Weighted averages</i>		€ 764	€ 272	€ 675(*)	€ 1326	€ 764
<i>Correlation with Total Time of Activities</i>		.781(**)	.578(**)	.318(**)		

* 43% outsourced the application, for the remaining 57% score for this item is zero.

** Pearson correlations: significant at the 0.01 level (2-tailed).

Digitization has made much more headway among applications than among municipalities. While almost 60% of the contractors and architects already work fully digital, only 6% of the municipalities indicated to be ready for the digital processing of applications.

Table 2 –Degree of Digitization for Professional Applications and Municipalities

<i>Degree of Digitization (%)</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>
Professional applicants	18%	23%	59%
Municipalities	76%	18%	6%

The striking difference in degree of digitization is to some extent reflected in the potential willingness to make use of the new service. While 44% of the applicants indicate to make immediately use of the service, less than 20% of the municipalities will do so. Simultaneously, 6% of the applicants has no interest at all in the service, against 19% for the municipalities.

Table 3 –Potential Interest in a Shared Service for Building Permits (% of population)

	<i>Not interested</i>	<i>No price increases</i>	<i>Proven added value</i>	<i>Immediately interested</i>	<i>Digitized on under own control</i>
Applicants	6%	29%	21%	44%	n/a
Municipalities	19%	35%	24%	19%	4%

Applicants expect considerable savings from the new services. Average total savings are estimated at € 521, the arithmetic total of the sub items is again higher (€ 680).. Not surprisingly, the price respondents are willing to pay for the new services is related to total expected savings but the correlation is much weaker than expected^{viii}. The distribution for expected savings for municipalities collapses into two groups. Almost half of the municipalities (48%) do not expect any savings from the new service, scores for the remaining 52% differ widely. Average total annual savings are about € 12.000 but there are a significant number of municipalities (7,6%) which expect to save more than € 50.000 a year. The willingness to contribute in the costs is more or less equal between applicants and the municipalities. There is a sizeable group which does not want to pay anything, a large group (MASS) which is willing to spend a modest amount per application, and smaller group (NICHE) which is willing to pay much more. The high prices in the NICHE market more than compensate for the relatively low number of potential users. However when the entrance strategy is aimed at this particular group the MASS market will probably never be opened up. The other way around NICHE users are of course willing to pay the much lower MASS prices. When combining revenues from applicants and municipalities both MASS and NICHE markets have sufficient volume to recoup the investment. In the case of municipalities, at first glance there is just a weak correlation between size and willingness to pay. This is however mainly due to the disturbing influence of the relatively low scores of the second-biggest category (50-100,000 inhabitants). Both expected savings and accepted maximum price per application are more than three times the average for the biggest municipalities in the sample (>100,000 inhabitants).

Table 4 –Expected Annual Savings, Accepted Maximum Price per Application, Amount Transferred to Applicants (€)

	<i>Expected annual savings</i>	<i>Maximum costs per application</i>	<i>Contribution applicant per application</i>
Biggest municipalities	€ 33,382	€ 263	€ 24
Average	€ 10,926	€ 83	€ 31

4. Reflections on the results

Improvements in the virtual front office are much easier and more visible than improvements in the back office. Many e-Government programs have therefore started at the front office. This has also been reflected in conceptual classification schemes which usually run from simple to advanced web services, only to arrive at back office integration in the fuzzy final ‘transformation’ phase. Concepts such as one stop portals and full electronic services – usually referring to the ability to pay for public services online – are seen as important stepping stones in the route to electronic perfection. The market results indicate that users are not interested in electronic services as such. They just want (in the right order) more transparent, easier, faster, safer, and cheaper services. The professional applicants put relatively little weight on unique identification and found electronic payments irrelevant altogether. The increasing demand for quality improvements in traditional services is the primary drive to develop online services, and not the other way around. The e-government development is about to reach limits when solutions do not transcend the boundaries of a single government organization. The social problem at hand and its adjoining service delivery chain should be central, not the individual organization^{ix}. The shared service concept is somewhere in between the traditional single organization based service and the future seamless integration centered on a specific social problem. Shared services transcend individual organizations but are still built on traditional segregated services. The initial push from single to multiple organizations is mainly driven by financial considerations. The subsequent pull from problem oriented services is mainly driven by striving for quality improvements. Somewhat ironically, in this particular case (but may be in general) those that are technological most advanced seem to realize the future potential of shared services the least. Problem (demand) oriented services are only possible when information is shared with third parties outside the traditional (supply driven) service shaft (e.g., the information gathered by building permit departments might be of live-saving importance to fire brigades). Municipalities regard the possibility to share information with third parties as one of the most important improvements of the shared building permit service yet they are the least advanced from a technological point of view. Professional applicants seem to regard the possibility to share information as a threat rather than a strategic possibility. They still seem to be stuck in the traditional competitive mode. In other words, those, who can, do not see it and those who cannot, do see it. The picture should be modified for the biggest municipalities. They are

technically the most advanced and seem to be the most interested in the shared service concept. Given the presumed economic advantages of increases to scale we expected that small municipalities, with their limited budgets, would be the most interested in the shared services concept. However, they are not interested in the service, neither in its presumed economic benefits in the short run nor in its strategic benefits in the long run. From a (national) policy perspective this gives an additional rationale for aiming at the NICHE strategy, next to the business economics motive. The distribution of the potential interest in the new service (Table 3) seems to follow the classical concept of the acceptance categories in the product life cycle of innovations neatly^x. A small group of innovators and early adopters (biggest municipalities) is willing to take the risk, while a majority (MASS) intends to wait and see how the early adopters get along. While starting at the NICHE end one should already keep MASS in mind. The new service – and its strategic potential – will only be taken up by the next lowest category if the market price is not set too high. In this particular business case this might compel the federal government to subsidize the (relatively high) initial investments. It also points at the importance to constantly strive for vigorous cost reductions during the roll-out of the new service.

ⁱ The aesthetics committee ('welstandscommissie') is probably a typical Dutch institute. It is the committee which decides what is good and bad taste.

ⁱⁱ Even the biggest building departments (in the major Dutch cities) do not receive more than 2,000 to 3,000 permits a year.

ⁱⁱⁱ As from January 1, 2004 complete digital communication between government and applications is legally allowed if both parties agree upon it in advance (Wet elektronisch berichtenverkeer april 17, 2003 (*Law on Electronic Administrative Messages Exchange*)).

^{iv} The intake of building permits is not a high volume service. On average, professional applicants file about fourteen permits a year, in five different municipalities. The average total number of permits processed by Dutch municipalities is about 780 a year, with a peak in the 250-500 range.

^v First estimates for the initial investments arrive at about € 3.3 million, operating costs (annual base) are in the range of € 1.0 – € 1.6 million.

^{vi} The questionnaire was both available on paper and on the Internet. 134 professional applicants and 118 local building permit departments responded to the survey. The survey was complemented with several panel discussions to gain additional qualitative information about the interview results.

^{vii} Only professional applicants (project developers, architects, contractors) were approached. Individual citizens usually rely on professional applicants (contractor or architect) to process the application.

^{viii} Pearson correlation of 0.219 (significant at the 0.01 level, two-tailed).

^{ix} Zuurmond, A. (2003), *The Neglected State: A plea for a Copernican shift in public administration*, inaugural speech at University of Leiden.

^x Rogers, E.M. (1962), *Diffusion of Innovations*, New York: The Free Press.