NORA'S
strategy supplement

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BOUW MEE AAN BETERE DIENSTVERLENING

ten basic principles

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...are provided with the service they need.

...can find that service easily.

...have easy access to the service.

...experience uniformity in service provision and in the use of standard solutions.

...are offered related services as a package.

...have access to information relevant to them.

...are not confronted with unnecessary questions.

...can rely on information not to be misused.

...can rely on service providers adhering to arrangements.

...can provide input about the service provisioning.

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Introduction

NORA (which is the acronym used for the Dutch Government Reference Architecture, Nederlandse Overheid Referentie Architectuur) is a description of the principles underlying the design and linkage of the information systems used by the Dutch government. NORA's Strategy Supplement lays the basis for this.

NORA's definition

The Dutch Cabinet has endorsed NORA as the standard to be used throughout the public sector. NORA contains common basic principles that relate to the provision of all public services.

'Service' in this context includes all activities by or through which service providers carry out public tasks.

The term Architecture as used in NORA refers to common basic principles that will be used in designing systems (conceptual, logical or technical). The design of systems is included in the NORA concept only in as far as it is relevant from an interoperability point of view. All possible interpretations of the word Architecture (e.g. involving organisation, information-design, system-design, network-design, etc.) are therefore included in this document from that single point of view.
All other points of view leading to Architecture artefacts are subject of study and definition in other relevant documents of the public sector.

Target group and objective

NORA's Strategy Supplement was written primarily for executives of organisations that carry out public tasks and services, in particular for the owners of IT policy portfolios. The Supplement is also of importance for anyone who is involved in the government's information policies, including information managers, members of steering groups, programme managers, project managers, architects, auditors, policy officials and advisors.
The Strategy Supplement aims to explain what NORA is, why NORA is important, how NORA should be used and also

what, in general terms, the broad outline of NORA's principles implicates. On the basis of this information, the reader can determine how NORA should be used within his or her own organisation.

The Strategy Supplement lays the foundation for the practical application of NORA. Details will be elaborated in separate documents for the use of the relevant specialists.

contents

The Strategy Supplement includes the following chapters:
1. NORA - in brief: the whys and for-whats of NORA. This section can be read as a separate entity if you only wish to become acquainted with its main points.
2. Using architecture as a governance tool: how NORA can be used as a management tool.
3. Definition of concepts: a description of the main concepts used in NORA; the concept of 'interoperability' is explained here in more detail.
4. Basic principles: the ten basic principles used in and by NORA to achieve interoperability. These principles can be used as the basis of an assessment framework within your own organisation.
5. Building blocks: a description of the principle standard building blocks that are available for implementing interoperability.

the development of NORA

The Strategy Supplement was developed by the ICTU programme RENOIR [1] in collaboration with the Standardization Forum [Bureau Forum Standaardisatie] under the overall supervision of a group of experts in the field. Following public consultations, the Supplement was endorsed by the State Secretary for the Interior and Kingdom Relations [Binnenlandse Zaken en Koninkrijksrelaties] at the recommendation of the Standardization Council [College Standaardisatie].

NORA 1.0 (2006) and NORA 2.0 (2007) were published as stand-alone documents. From NORA 3.0, however, NORA comprises a number of separate but linked documents. The Strategy Supplement is one such document. It replaces chapters 1 through 3 of NORA 2.0. In terms of content, the Supplement ties in with NORA 2.0 although the text has been rewritten in response to a call for a more compact NORA aimed at management executives rather than architects. The choices made in this Supplement, the way of working and the changes in comparison to NORA 2.0 are explained in detail in a separate section. The basic principles of the Strategy Supplement will be elaborated later in a number of other Supplements.

Until that time, the principles derived from NORA 2.0 will be used to complement the basic principles underlying NORA 3.0.

The insights on which NORA is based are subject to constant change and adaptation. The same applies to the ever-changing demands made on the government by citizens and businesses, in the light of new social and technological developments. Within government itself there are also many issues that are still being investigated, debated and decided. NORA is a catalyst in this process, and findings and outcomes will be presented in specialist NORA documents as they arise. In short: NORA is a dynamic product that is unlikely ever to be finalised.

The process for the development of NORA has been described in the NORA Charter. Anyone who wishes to keep abreast of NORA developments, or would like to contribute to the project, is encouraged to contact us. This Strategy Supplement provides the developers of the specialist NORA documents with the framework within which they operate.

1. NORA - in brief

Dutch citizens and businesses alike expect the public sector to function properly and provide adequate service. To achieve this, cooperation between the various government organisations and agencies is absolutely essential as it allows them to harmonise their processes and make use of each other's data. The 'Nederlandse Overheid Referentie Architectuur' - referred to by the acronym NORA and set up to support this cooperation - is the Dutch Government's reference architecture.

NORA's status
The Cabinet has endorsed NORA as the standard to be used throughout the public sector [2][3]. Documents in which this status is reflected, include the agreement concerning the National Services Implementation Programme and e-government (NUP), already approved at various executive levels [4], and the model architecture for government services known as MARIJ (taken as an acronym from Model Architectuur RIJksdienst) which is intended to serve as reference architecture for ICT projects in the governmental domain [3].

A properly functioning public sector

Dutch citizens and businesses alike expect the public sector to function properly and provide service. They want a public sector [5]:

- that provides answers to questions of the public; that offers state-of-the-art service to citizens and to the business sector, and that is available 24 hours a day, seven days a week;
- that does not require information that is already available and reduces the administrative burden it must necessarily impose upon its citizens and businesses to the lowest possible level;
- that cannot be fooled: that is known to act decisively against | fraud and that enforces legislation, regulations, licences and suchlike;
- that knows what it is talking about: that obviously builds and implements its policies on a sound basis of knowledge and access to information;
- that can be relied on: that stands for legal certainty and legal equality;

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- that costs no more than necessary: that demonstrates that it can carry out its tasks efficiently due to a sound organisation and modern resources.

Managerial challenges

Many societal issues demand intensive cooperation between government agencies. Take, for example, the different departments involved in the processing of licences and permits, or the coordinated approach of schools, welfare services and police in the case of delinquent teenagers. Intensive cooperation of this kind is only really possible when there is interoperability between government agencies, that is to say that they should be capable of sharing and exchanging information with each other, with citizens and with businesses in an effective and efficient manner.

The Cabinet states that interoperability increases the effectiveness and flexibility of public administration. It sees the concept as an "essential precondition for the future-proof development of services and applications that are possible with, or made possible by, IT in the broadest possible sense" [6].

When individual organisations start working together, they will encounter each other's systems and processes but also possible confusion of ideas, cultural differences, and conflicts of interest. Such issues can only be resolved by making arrangements about the definition of concepts, the way in which data will be processed, the infrastructure to be used, etc. As the number of parties involved increases, bilateral arrangements soon become practically impossible.

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Definition of interoperability
Interoperability is the ability of organisations (and their underlying processes and systems) to share information with their environment in an effective and efficient manner. In the context of NORA, interoperability concerns the sharing of information between a public sector organisation on the one hand and citizens, businesses and other public sector organisations on the other hand, irrespective of the type of information and the way in which it is shared. Interoperability concerns information processing, but also touches on operational management and the technical facilities required.

working with NORA

NORA provides a framework that simplifies the process of making inter-organisation agreements and, in some cases, it will render such arrangements unnecessary. NORA is a checklist of generally accepted basic principles for the design of processes and systems with interoperability in mind. Organisations and bodies that work with NORA choose to align themselves to a number of widely shared principles and the accompanying conceptual framework. This makes it easier for them to make arrangements with other organisations and bodies that operate according to the same principles.

In practice it will be difficult to conform to all these principles at the maximum level. What matters most is that public sector organisations support and commit to the principle of cooperation, and fulfil the principles wherever possible. In doing so, these organisations will be embarking on a growth curve in maturity, one in which NORA provides the signposting.

costs and benefits

Cooperation demands an investment in terms of time and
money. Quite often, the costs initially outstrip the benefits.
Moreover, the costs are not always shared equally among the
departments concerned, and the benefits can not always be
expressed in monetary terms. Nonetheless, the benefits can
be substantial (for both individual departments and the public
sector as a whole):
• savings by making use of generic solutions and avoiding
  double work;
• improved quality, for instance by making use of
  unambiguous, reliable information;
• ensuring the cohesion between developments within and
  outside the own organisation;
• standardization. This improves flexibility, as the
  organisation is better able to cooperate with other bodies,
  citizens and businesses.

The use of NORA will increase the effectiveness of
investments by coordinating and harmonising the efforts of
the various departments and bodies. Although working with
NORA will call for an initial investment (in the acquisition
of know-how and the appraisal of plans), the costs will be
modest in comparison to the costs of implementing the

actual plans. The insights that are acquired from the appraisal of plans will lead to substantial savings. Adjustments in early stages will prevent costly rectification at later stage and will help manage and contain the risks involved.

what is NORA based on?

NORA is based on existing government policies (both national and European) and on the instruments that have been developed in the context of those policies, such as laws, regulations, parliamentary documents, administrative agreements and the results of previous government programmes. NORA accesses these resources with due regard for mutual relationships and places them in the context of interoperability. The underlying policy principles may not always be directly applicable and, in such cases, NORA will effect a transformation. In doing this, NORA's actions will be based on insights shared by the professionals who are responsible for implementing the policies.

ten basic principles

NORA contains ten basic principles that relate to the provision of services. 'Service' in this context includes all activities by or through which service providers carry out public tasks. The underlying principle is that the clients (citizens, businesses and other public sector bodies) take centre stage in the service relationship.
Citizens, businesses and public sector bodies (the clients)
...are provided with the service they need.
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...can provide input about the service provisioning.

2.using architecture as a management instrument

NORA is a management tool. It is the responsibility of policy makers to formulate a policy concerning how the instrument should be used. This chapter addresses the use and application of NORA.

management tool

Executives and senior managers can use NORA as a checklist of principles through which to assess planned changes. The sharing of information with citizens, businesses and/or public sector organisations is an important aspect of such plans. The changes might concern the development or modification of processes and systems, formulating legislation and regulations, the recalibration of a set of tasks, a merger of departments or agencies, etc. NORA can be consulted in all such circumstances, from the first moment a change is considered, through the formulation of the assignment and the concrete requirements which the proposal must fulfil, to the tendering, the development, the implementation and the maintenance of the result.

NORA does not include the mechanics of the steering process as such. This makes it possible to use NORA in combination with various governance models and management methods. The only assumption made is that the process will follow the familiar 'plan-do-check-act' cycle [7]. Within this cycle, NORA is relevant at the 'plan' stage, where the planned results are validated and appraised. Subsequently, the governance process ensures that the approved plans are actually implemented.

guidance

NORA is not a blueprint that can be used out of the box in a rigid way. Rather it is a checklist of quality characteristic. These quality characteristics - in the form of design principles - are translated into quality standards - in the form of appropriate and relevant design decisions.

Using the checklist helps ensure that the most important choices are considered at the right time and at the right place. NORA also includes best practices to assist the decision-making process. These will be continuously supplemented on the basis of new experiences.

scope

NORA is relevant to the performance of any public task by an organisation from either the public or the private sector. In this context, NORA is only concerned with the 'information' aspect, with due regard for the principle of subsidiarity. In other words, it is concerned only with those issues that necessitate government-wide agreements so as to ensure efficient and effective information sharing. Within NORA, this is covered by the concept of 'interoperability' (see page 7 for a definition of this term). For that reason, NORA is also referred to as the Dutch Interoperability Framework.

status

Some of the principles of NORA are based on existing legislation and judicial rulings. In all other cases, there is no jurisprudence relating to compliance or non-compliance with the principles.

It is not deemed fitting to enact legislation for all principles, as this would disrupt the administrative relationships and impinge on the autonomy of the organisations in question.

NORA is intended as a tool to improve the cooperation between organisations; cooperation presupposes that the participants themselves bear the responsibility for making the necessary arrangements.

The management of each individual organisation will determine how NORA is to be used, will make resources available and will monitor implementation. Opting for NORA signifies that an organisation agrees with the principles and is committed to working actively towards implementing those principles in practice.

Roles

A number of separate roles can be distinguished in the use and further development of NORA.

Ministry of the Interior and Kingdom Relations
The Ministry of the Interior and Kingdom Relations [Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, BZK] is NORA's owner/principal. In that capacity, the Ministry uses NORA as the compass by which it can ensure a properly functioning public administration. As time goes on, other organisations in the public sector that implement BZK policies will find themselves confronted with NORA more and more explicitly.

cabinet policy
The Cabinet endorsed NORA, and the architecture for government services - known by the acronym MARIJ - which is derived from NORA, to be the reference architecture for ICT projects in the government domain [3]. In context of the National Services and e-Government Implementation Programme (NUP), the government, municipalities, provincial authorities and water boards have agreed that all projects must be aligned with NORA [4].

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Representative executive

The representative executive is the builder of bridges between organisations. This person (the male pronoun will be used for convenience, without intending any discrimination) is active within various cooperative alliances for advice, consultation, coordination or management. He makes reciprocal agreements to use NORA as a guiding principle and advises others to do so as well. Where necessary, the representative executive will take the initiative to develop a domain architecture (which describes the information management system in use for a specific part of the government) and ensures that a control structure is put in place with a broad enough mandate to administer supra-organisational projects.

standardization council

One important source of advice for the government is the Standardization Council (co-developer of this NORA Strategy Supplement). This Council consists of top-ranking civil servants from various public sector organisations who are involved in the development and implementation of policies. The Council is assisted by the Standardization Forum, which includes representatives of the government, the business community and academia. The Standardization Council is using NORA as the interoperability framework for the Dutch government and recommends its use as a standard throughout the public sector.

Chief executive

The chief executive of any individual organisation takes on the role of sponsor, commits to abiding by NORA principles and uses them as the point of departure for his own organisation.

The chief executive endorses the general directives and ensures that these are followed consistently. He supports the application of NORA's way of thinking and makes the necessary resources available to this end. If necessary, he takes the decision to develop an organisation-specific architecture. Finally, he makes choices and decisions involving any issues that arise as a result of using NORA.

Manager

He ensures that sufficient know-how and skills are in place for the implementation of NORA. This primarily concerns the system architects, but will also concern other staff who are incidentally involved with NORA, such as managers, project managers and auditors. The manager updates the methodology and the processes, so that all concerned are aware of who takes the decisions and in what way cooperation with other organisations is put into effect. He oversees the testing of plans in view of NORA's principles and ensures that changes actually take place in accordance with the plans. Where necessary, the manager will put possible choices before the relevant responsible executives.

Architect

The architect is both advisor and designer. He is fully familiar with NORA in all respects. He implements NORA's principles and translates them to suit specific situations. He is responsible for updating the architectures (i.e. principles and design) of the organisation on the basis of relevant elements from NORA. He assesses plans on the basis of the NORA's principles. Where necessary, he will put possible choices before the relevant responsible management. He makes a contribution to the development of NORA and to the various domain architectures.

3. conceptual framework

One of NORA's functions is to develop a common conceptual framework. This chapter addresses a number of the basic concepts. Consensus concerning the meaning of these concepts is crucial, as they determine the meaning and scope of NORA itself.

NORA uses broad definitions for key concepts such as 'interoperability', 'information' and 'service'. As a result, the implications of the basic principles are far-reaching. The broad definitions allow ample scope for interpretation and this scope underlines the guiding character of the basic principles.

INTEROPERABILITY

Interoperability is the ability of organisations (and their underlying processes and systems) to share information with their environment in an effective and efficient manner.

In the context of NORA, interoperability concerns the sharing of information between a public sector organisation on the one hand and citizens, businesses and other public sector organisations on the other hand, irrespective of the type of information and the way in which it is shared.

Types of information
There are many types of information that can be shared within the public sector. A number of examples (not restrictive):
- information about persons, organisations and objects (buildings, vehicles, etc.);
- information as part of any stage of any process, such as a completed request for a permit, an order or a complaint;
- information that the government produces as a consequence of processes, such as policy documents, legislation, investigations, licences and permits;
- information about how the public sector operates, such as service descriptions, conditions for supply or provision, and reports.

Aspects of interoperability

Interoperability primarily concerns information processing, but also has impact on operational management and the technical facilities required.

- Business processes: the production and use of information. What information is available? How is it used? What services does it facilitate? Which organisational components are involved? Who is responsible for it? How are arrangements made? How quickly are replies received? Which work processes are involved? Etc.
- Information processing: the information itself. This concerns the meaning (semantics), quality, form (on paper, electronic, etc.), availability, manageability and sustainability, message traffic, choice of channel, administration, sources, flows, etc.
- Technical facilities: resources and equipment. Which systems are in use? How is information stored? What network facilities are needed? How has technical operation and maintenance been arranged? Etc.

A more detailed analysis of the concept 'interoperability' and its role within the Dutch public sector can be found in 'Towards a Dutch Interoperability Framework. Recommendations to the Standardization Forum' [5].

SERVICE

A service is a specific contribution provided by a person or organisation (the service provider) in response to a need in its user environment (as expressed by the consumer).

Within the public sector domain, the term 'service' is often used to describe a particular type of contribution, such as issuing a passport. In the context of NORA, however, the term has a wider meaning: a service includes everything a public sector organisation can deliver for a user. A user can be a citizen, a business or another public sector organisation.

The term 'service' is pivotal in the context of NORA, because information sharing characteristically ensues from a request for or the provision of a service. For the outside world, services represent the 'conspicuous' public sector (as opposed to the internal organisation, its processes and systems). But even from the inside, services are often central to the public tasks carried out by and within the public sector. This makes the term 'service' an ideal starting point when formulating the preconditions that interoperability imposes on public sector organisations. These preconditions have been translated into NORA principles.

NORA PRINCIPLE

A NORA principle is a criterion that a service (as provided by a public sector organisation) is expected to fulfil in order to improve the interoperability of that service.

Principles impose constraints when designing services (and their underlying processes and systems). In so doing, they also set guidelines or standards for the development of services. With a few exceptions, a principle is applicable - irrespective of the nature of the service - for every service provider, for every user, for all forms of information and for all methods of information sharing.

Although the implications of a principle can have consequences at all levels of the operation of an organisation, its motivation will always be based on the ability to share information with others, upholding the principle of subsidiarity in the process.

The NORA principles are particularly important for inter-organisational services, but even services that are only required by internal users (such as HRM administration), are advised to use these principles. They serve to strengthen internal management and, as a consequence (albeit indirectly), to improve service provision to third parties.

In practice: speedier handling of sea freight at the port

A container ship with a cargo of fruit and vegetables is approaching Rotterdam. In the current situation, the carrier must await the arrival of the ship before he can complete the paperwork. To do so, the carrier may need to send information to the customs authorities [Douane], the Food and Consumer Product Safety Authority [Voedsel- en Warenautoriteit], the Plant Biological Service [Plantenziektekundige dienst], and the Ministry of Economic Affairs [Ministerie van Economische Zaken], all in different forms and via different systems. This is circuitous and takes a great deal of time.

In the future, the carrier will be able to send information about the ship and its cargo to the Portbase in advance of the ship's arrival at the port. The Portbase system will then send a single message containing all necessary information to all the agencies and departments concerned. As a consequence, the carrier will only need to deal with a single government agency. Cargo handling will be streamlined while all the agencies and departments concerned will receive the information they need. This does mean, however, that all those agencies and departments need to be linked up with the international customs data model.

CONFORMITY TO NORA

NORA conformity indicates the degree to which a service (including the underlying processes and systems) can be seen to fulfil the NORA principles, either at present or, in the case of a planned service, on implementation.

NORA conformity also applies to organisations, departments, chains, etc., and in such cases the concept covers all the services that fall within the scope of such bodies. Tests have been developed to verify conformity to NORA. The aim of a NORA test is the timely detection of any bottlenecks with regard to interoperability that might arise in a particular context.

NORA test
A NORA test comprises the following elements:
- description of the tested service (or process, system, organisation, chain, etc.);
- description of the context of the test;
- description of the way in which the test was carried out;
- selection of the principles that are applicable to and relevant for the context;
- for each selected principle: have the criteria of the principle been fulfilled? Where possible, ensure that this appraisal is objectively verifiable. In some cases, principles allow scope for interpretation, making a subjective appraisal inescapable;
- if the criteria of the selected principle have not, or not fully, been fulfilled: on what grounds does the service provider deem this acceptable? Considerations could, for example, relate to legislative, technical or financial constraints;
- summary of the actual and potential bottlenecks that came to light in the course of the test.

ARCHITECTURE

In the public and private sector a common definition of Architecture is: An architecture is a formal description of a complex whole, and of the principles that are applicable to the development of that whole and all its components.

This definition includes both the principles that are applicable to the design and the final design as such. In this chapter the word architecture is consistently used as the combination of principles used and the final design.

NORA covers common principles and the final design from an interoperability point-of-view.
The complex whole has substantially more point-of-views than interoperability alone.
The 'whole' as such can be an organisation or a chain, or equally a single information system or a network, etc. An architecture is used as an instrument through which to steer a project when steering the individual components alone would not lead to the desired result.

When the whole is even more complex (such as 'the public sector'), a single architecture will not be sufficient; it will be necessary to create a set of coherent architectures, each at a different organisational level (municipal, government services, etc.).

NORA usually cannot be used directly to develop a service in a specific context, for example within a municipal authority. Domain architectures are used to describe the architecture used in specific parts of the public sector. Examples of such domains are sectors (such as work & income, criminal justice and juvenile care) and administrative layers (such as the municipalities and the provinces). Domain architectures pad out the NORA principles without actually forming part of them.

It is also customary for larger scale projects to have an architecture that describes the intended project result. What is known as a 'project start architecture' is drawn up in the early stages of the project [9]. This is a translation of the architecture at the next highest level to project-specific parameters.

GEMMA

GEMMA stands for Municipal Model Architecture (taken from the Dutch name: GEMeentelijk Model Architectuur). GEMMA is the common reference architecture for municipal authorities and consists of architecture models, principles and a cohesive set of solutions, knowledge documents and standards. With these, GEMMA assists municipal authorities, at both the conceptual and hands-on stage, with the design of processes, information delivery and data exchange. The authorities and their suppliers need these standards to harmonize the processes and data used in the chain of collaboration and in service provision [10].

MARIJ

MARIJ stands for Model Architecture for Government Services (taken from the Dutch name: Model Architectuur RIJksdienst). MARIJ is a set of agreements concerning the design of government services, designed to ensure a solid and cohesive basis for such services. The architecture sets standards and defines specifications, setting out the direction in which products and services, processes, organisations, information flows and ICT will be developed [11].

4. Basic principles

NORA's ten basic principles describe the most important desired characteristics of public services, as seen from the perspective of the user (the 'what'). The principles make no statement about the way in which these characteristics should be realised or achieved (the 'how').

The basic principles are taken from a number of important existing sources, including: the vision memo 'Better Public Sector Services' [Visie Betere Dienstverlening Overheid] [12], the National Services and e-Government Implementation Programme [Nationaal Uitvoeringsprogramma Dienstverlening en e-overheid] [4], the ICT Agenda 2008-2011 [13], the Netherlands Open Contact Action Plan [actieplan Nederland Open in Verbinding] [6], the e-Citizen Charter [BurgerServiceCode] [14], the European Interoperability Framework [15], decisions taken by the Standardization Council [16], the government's own plans to modernise its working methods [Actieprogramma Andere Overheid] [17] and to improve the efficiency and accessibility of its data [Informatie op Orde] [18].

The ten basic principles are primarily intended to provide a roadmap and leave scope for interpretation. Specialist NORA documents will be used to translate these basic principles into guidelines and best practices.

PROACTIVE

Users will be provided with the service they need.

The service provider will take the initiative to notify the user whenever other information is available that could be of importance to the user. Services will be brought to the attention of the user at the moment the user might need them. Any changes in the progress of processes and registered information will be reported. Services will be provided automatically wherever possible, but the user will always stay in control.

Motivation

A service will be more useful to the user if he does not himself need to keep track of when a next step needs to be taken. Moreover, this will prevent the occurrence of undesirable situations that ensue because the user has not responded in time.

Rationale

Providing services to citizens on a demand-driven and proactive basis is an important governmental spearhead (as evidenced by the Electronic Government Action Programme [actieprogramma Elektronische Overheid] and the cabinet's response to the recommendations made by the Committee on ICT and the Public Sector) [19]. The ICT Agenda 2008-2011 also designates the user as the central factor in the digital service society [13]. The subtitle chosen for the NUP [4], 'Citizens and businesses first' [Burger en bedrijf centraal], underlines this principle, as do articles 4 and 5 of the Dutch e-Citizen Charter [14] ('Personalised Information' and 'Convenient Services').

Implications

An important precondition is that service providers 'know' their users and integrate information from other organisations into that knowledge. Proactivity demands that service provision processes be redesigned from the perspective of the user. It is by no means a given that services are always initiated by a request from a user. A public sector organisation can also take the initiative.
If no input is required from the user, the process can even be completed unilaterally.

FINDABILITY

Users can easily find a required service.
If users are looking for particular services, they will be able to find them in the places where they expect to find them. For this purpose, relevant information will be registered at search locations with which the user is familiar. If the user happens to select the 'wrong' service provider, he will still be assisted (under the 'no wrong door' principle). If necessary, the service provider will refer him to one or more other service providers.

Motivation

Many users do not know where or how they can obtain a service. Quite often, they are not even aware that such a service exists. This inability to find an appropriate service is inconvenient for users. Services that cannot be found are simply not used. That is the reason why service providers must help users find the required service.

Rationale

The Government Information (Public Access) Act [Wet openbaarheid van bestuur] [20] imposes the obligation on administrative bodies to provide information about policies, including their preparation and implementation, at their own initiative. This aim to improve findability has been set out in various policy documents, including the memo 'Towards accessible government information' [Naar toegankelijkheid van overheidsinformatie] [21] and the memo on the efficiency and accessibility of its data [Informatie op Orde] [18]. The e-Citizen Charter [14] also subscribes to this principle, as shown in article 2 under the heading Transparent Public Sector.

Implications

Public sector organisations need to know what information users normally look for and where they look. Such information can then be registered at the search locations with which the user is familiar (search engines, portals, catalogues, registers, etc.). The service itself will also be equipped with the necessary search facilities. If it is necessary to refer the user elsewhere, the service provider must also be aware of the other locations where the service(s) can be found.

example

The Products & Services Catalogue provides an overview of public services; it is accessible via all channels. In addition, Overheid.nl contains an overview of all legislation and regulations, official publications and announcements. Users can, of course, also make use of a search engine.

ACCESSIBILITY

Users have easy access to the service.
Service providers attune their accessibility to the methods preferred by the users. This concerns the selection of communication channels, the times at which contact is possible, and the user-friendliness of the methods of communication.

Internet is the preferred channel for communications, because it makes it possible for both individuals (via websites, e-mail, etc.) and for systems (via electronic messages) to make contact at any time of the day or night. Nonetheless, there will always be users who cannot or do not wish to make use of internet, perhaps because of some disability, or lack of skills, or because they do not have an internet connection. A service must also be available for them as well.

Motivation
An accessible service will be better used and will not exclude any group of users.

Rationale
The Online Administrative Business Act [Wet elektronisch bestuurlijk verkeer] [22] states that conventional, paper-based communications may not be supplanted by electronic communications. One of the principles upheld by the Act is that the citizen may decide in which form communications will be effected, and that it is not permitted to deal with certain matters solely by electronic means unless all parties concerned have given their consent. In line with that principle, the vision memo 'Better Public Sector Services' [Visie Betere Dienstverlening Overheid] [12] establishes that all channels should be open and available. Citizens, businesses and organisations decide for themselves which communication channel they wish to use to contact public sector or government bodies. Article 1 of the e-Citizen Charter [14] (Choice of Channel) points out the importance of the demand-driven use of communication channels.

Implications
Research still needs to be done to establish the target group's demography, and how the various groups of users actually use some particular service (user research). On the basis of the findings, decisions can be made as to which communication channels will be used and in which way.

This could mean that multiple communication channels need to be used (internet and telephone, for example), possibly via multiple portals (using different websites for different target groups, for example). In such cases, it will not be possible to serve all users according to their wishes. The preferences of users will have to be weighed against the costs and benefits of he various channels and portals, always respecting the condition that no user may be excluded.

If multiple channels and portals are offered, there must be a guarantee that the results of the service provision will be independent of the chosen channel and the chosen portal, even if these are intermixed. Regardless of whether a question is received by post, e-mail or telephone, the answer should be the same.

UNIFORMITY

Users experience uniformity in service provision through the use of standard solutions.

Using generic solutions, which are widely applied within the public sector, certain elements of one service can be harmonised with corresponding elements in other services. This can be achieved, for example, by using shared processes and systems (shared services) or by applying open standards to provider-specific processes and systems; both will have the same standardising effect.

Motivation
Standardization and the ensuing uniformity will mean that users become familiar with a uniform way of working. As a result, the service will become easier for them to use (and therefore cheaper). Moreover, the re-use of standard solutions often has benefits in terms of costs for the service provider.

Rationale
It is mandatory for public sector organisations to use open standards [6]. The open standards designated by the

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Standardization Council are subject to a 'comply or explain' regime [23]. In the National Services and e-Government Implementation Programme [4], the various management layers have agreed about the use of the basic infrastructure. The Personal Public Service Number (General Provisions) Act [Wet algemene bepalingen burgerservicenummer] [24] arranges the use of the citizen service number [burgerservicenummer] as a standard identification number. The Online Administrative Business Act [22] determines that an administrative body can impose further demands on the use of electronic communications.

Implications
Public sector organisations do not develop their own processes, systems and technologies when these are already available. They must keep abreast of standard solutions, both currently available and planned, so they can take these solutions into account when drawing up their own plans. The chapter entitled 'Building blocks' contains an overview of the most important standard solutions that service providers may use.

Next, the usable elements will have to be integrated into the provider's own organisation. Standard solutions are not always a perfect fit, of course. Willingness to accept compromises is, therefore, a necessity. If a standard solution is not yet available, organisations can make sure their own solutions are suitable for use by others. They can do this, for example, by collaborating on development and by making their solutions available either as open source or as open standards. This is the way new standard solutions will be delivered.

examples
Individual citizens can use a DigiD to log in to the websites of various public sector organisations using a unique user name and password.
Use of the citizen service number contributes to the efficient and reliable exchange of personal data.
For the purposes of electronic messaging, public sector organisations internally use the standards defined in the Dutch government's service bus protocol.

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PACKAGES

Users are offered related services as a package.

When services, or their component parts, are closely related as seen from the user's perspective - they are offered to users as a package. The user gets the impression that they are just one single service. For this purpose, service providers must make agreements with each other, which may mean that background processes - or some parts of them - are also integrated, although this will not always be the case.

Motivation
It saves the user a great deal of time if the services that he expects as a service package, are in fact found together in one place and as a combination.

Rationale
The National Services and e-Government Implementation Programme [4] and the e-Citizen Charter [14] both support this principle, the latter in article 4 entitled Personalised Information.

Implications
First and foremost it is important to know how users make use of the service and how they associate the service with other services.

On the basis of those findings, services providers can start collaborating. They will need to determine how they will package their services. In the case of the issue of combined licences or permits, for example, matters such as documentation and enforcement must be arranged. Will the issuing body carry out these tasks alone, or will the collaborating organisations each carry them out in a decentralised fashion? Whichever solution is chosen, there will be a need for intensive collaboration and harmonisation between the organisations involved.

Packages can be created in several different ways. For example, by the design of portals (web page, call centre, desk, etc. with a referral function) around important events (so-called 'life events' such as moving, renovating a house, a birth, etc.), themes (such as the status of all current processes together), target groups (students, OAPs, etc.) or individuals (personal web page).

Each of these portals still refers users to individual services but that could be avoided by fully or partially integrating the services. In this further reaching form of packaging, websites and forms or even entire procedures could be combined.

example

Anyone who wants to build a house can be confronted with a multitude of permits and regulations. There are different regulations for residential property, for space and for the environment, each with their own municipal officers, criteria, procedures, time scales, fees and supervisory bodies. The licences are often issued by quite separate public sector organisations. This is inconvenient, time-consuming and expensive. Moreover, it can lead to contradictory decisions. The Environmental Permits (General Provisions) Act brings an improvement to this situation by clustering all the various components into a single environmental permit. The contact point for applicants is the local authority. Behind the scenes, the various public sector organisations consider the application from their own perspective (Can those trees be cut down? Does it fit in with the zoning plan? Is that driveway in the correct place?), but they coordinate their activities in order to provide the applicant with a single decision.

TRANSPARENT

Users have access to information relevant to them.

Before, during and after the service is provided, the service provider gives the user information about the result, the process and the information used. This information includes general information about the actual service and specific data about the user himself. It is particularly important to provide information about the significance (semantics) of the information used, about the status of the service process and also about the information on the user that is being registered.

Motivation
Users want to know where they stand. It is therefore essential for them to have insight into the service process. Transparency also makes it easier to do business with public sector organisations and to harmonise services between public sector organisations.

Rationale
The Online Administrative Business Act [22] determines that the administrative body should make it known if electronic communication channels are available for use. The Government Information (Public Access) Act makes provisions for the perusal of certain government documents [20]. The Personal Public Service Number (General Provisions) Act [24] provides that an overview must be available showing how the citizen service number is used and giving insight into the various users and into the personal data that can be registered and shared with other users. The National Services and e-Government Implementation Programme [4] advocates a reduction of the administrative burden; one way to do this is to make it easy to track and trace the course of transactions. Transparency of ways of working is also one of the quality requirements of the e-Citizen Charter [14].

Implications

It must first be decided what information is relevant to users. To this end, reliable and durable information will be made available to anyone who wishes to make use of it. Such information might be:

• a description of the service;
• conditions of supply or delivery;
• what information is being used;
• the significance of the information used;
• what the way of working is;
• how the process of service provision is progressing;
• how results (particularly decisions) come about.

example

After they receive a property tax assessment, owners of premises can visit the property tax desk at the town hall and ask to see the valuation report. They will then have access to Land Registry data, zoning maps and photos and can point out any errors in such information, so that immediate steps can be taken. The result of this transparency is that fewer objections are received, with more adequate argumentations.

A private home-owner wants to create a driveway giving access from his premises to the public road. At the town hall, he receives information about the licences and permits he needs a quotation for the alterations to that part of the public road and a summary of the procedures, timescale and costs involved. After he submits his application, the home-owner is kept informed about the acceptance of his request, the further procedures, the planning schedule and how he can keep abreast of progress.

REDUNDANCY

Users are not confronted with redundant questions.

The service provider uses information that is already known, to the service provider or to other service providers, and makes information available to other service providers. Procedures and regulations are simple, so that users need only provide a minimum of new information.

Motivation

Limiting the demand for information reduces the administrative burden. For the user, unnecessary requests for information are a waste of time and only cause irritation; moreover they increase the risk of errors in the information ultimately provided.

Rationale

The principle of 'collect once, use many times' is an important spearhead of policy for the Dutch government [12]. The creation of a series of key registers has been an important consequence of this policy [25]. In the declaration of intent entitled 'e-Government means better services, less administration' [26], municipal and provincial authorities, water boards and the national government have committed to improving services for citizens and businesses, and to achieving the planned reduction of the administrative burden through the use of ICT-based solutions. The 'Single Request for Data on Work & Income Act' [Wet eenmalige gegevensuitvraag werk en inkomen] [27] states that each piece of information that the partners in the work and income chain need to carry out their work may only be collected from the individual concerned once. The principle of once-only collection of data is also embedded in the Environmental Permits (General Provisions) Act [Wet algemene bepalingen omgevingsrecht] [28].

Implications

Prevention is better than cure. Firstly, public sector organisations need to simplify their rules, procedures, forms, etc. as much as possible so that the need to ask for information can be reduced.

Secondly, they need to know which elements of the necessary information are already available to other such organisations, and under whose responsibility such information falls. Subsequently, the information managers can draw up agreements about the sharing of information and decide which technical facilities need to be arranged so as to make sharing possible. Finally, forms can be adapted so that information that is already known can readily be filled in.

Conversely, the service provider will need to share his information with any other service provider that wishes to make use of it (insofar as this is permissible). Procedures and documentation must be developed, and technical and other facilities put in place, for this purpose. As others are also dependent on this information, the highest standards of quality, management and durability need to be met.

CONFIDENTIALITY

Users can rely on the information not being misused. The service provider guarantees that information is available to authorised persons only and will be solely used for the purpose for which it was collected.

This principle applies not only to information about private individuals, but also to information about businesses and the government itself. Such information may be misused as company data that might serve as the basis for investment decisions could be of interest to competitors, and information about government premises could be of interest to terrorists.

Motivation
Confidentiality is an essential characteristic of the relationship between a user and a service provider. It is only when users feel secure, that they will be willing to use a service and provide the required - possibly confidential - information.

Rationale

The General Administrative Law Act [Algemene wet bestuursrecht] [29] obliges public sector organisations to maintain the confidentiality of data. The Personal Data Protection Act [Wet bescherming persoonsgegevens] [30] obliges public sector organisations to use personal data only for well-defined, clearly demarcated and justified purposes, and sets a number of due care criteria (e.g. personal data must be processed in accordance with the law and in a proper and careful manner). The Government Information (Public Access) Act [20] also provides that a request for information can be rejected on grounds such as respect for privacy or to avoid the possibility of disproportionate preference or prejudice.

Implications

Measures are to be taken to ensure that no unauthorised use is made of information. Premises and systems must be made secure against unauthorised access and malafide software. Measures must also be taken to ensure that employees do not have access to information that is not intended for them. Transaction logging makes it possible to check whether there has been any breach of confidentiality.

example

The government has taken measures to prevent a doctor accessing information about his patient in an electronic patient record without the consent of the patient.

RELIABILITY

Users can rely on the service provider adhering to the arrangements.

Both the availability and the quality of services conform to predetermined standards. For example, any information provided must be correct, authentic, up-to-date and complete. Processes are designed in such a way as to guarantee this conformity, and the quality level is actively monitored.

Motivation

If services are to be convenient to the user, they must be reliable. Links in any chain of services need to be able to rely on that fact, because the quality of their own services often depends on such reliability to a certain degree. If there are recurrent failures to meet standards, users will become irritated, start to complain and ultimately abandon the service.

Rationale

The quality aspects that apply to information can be found in the legislation regulating the key registers and in the Online Administrative Business Act [22]. This principle is also embedded in the e-Citizen Charter's article on Accountability and Benchmarking [14].

Implications

Public sector organisations investigate what level of quality is deemed adequate by the users. This level of quality is then designated as a standard and made known to all concerned. Processes are subsequently designed that will uphold this standard and the results actually achieved are reported. Where quality can be variable, an indication will be given - along with the information - of the current quality level (for example, when the information was last verified).

example

In the case of building permits, there is a six or twelve-week period in which a decision must be taken; the time scale depends on the nature of the permit in question. As long as certain requirements have been met, the permit will be granted after that time by operation of law.

OPEN TO FEEDBACK

Users can provide input about the service.

Users can submit corrections, complaints, etc. to the service provider, either on request or on their own initiative. The service provider can use this input to improve the quality of the service. In this way, users have the opportunity to constructively promote their own interests.

Motivation
Users expect that their government listens to them, is open to criticism and that it is seen to be acting on that basis as well. Being open to feedback and input is an essential precondition for boosting mutual confidence. It also encourages participation and self-reliance.

Rationale
The General Administrative Law Act [29] sets the minimum requirements that an administrative body's internal complaints procedure must fulfil. The e-Citizen Charter [14] states (in the article entitled 'Considerate administration'), that the government and public sector organisations use feedback information to improve their products and procedures. In the vision memo 'Better Public Sector Services' [Visie Betere Dienstverlening Overheid], the cabinet has indicated that it will measure public appreciation of the government's services on a regular basis [26]. This will bring bottlenecks and problems to light and allow improvements to be carried through.

Implications
Input from users will be collected and analysed systematically. Effective indicators are user complaints, requests for the correction of data, and suggestions for improvements to services. The service provider can also take the initiative to ascertain how users experience the services provided. System-generated messages and user statistics can also be used as a form of direct or indirect input. Procedures must be set up to provide users who submit

input or feedback with a timely and appropriate response. Management processes must be designed so that planning and control strategies can make allowance for the input of users.

example

The Customer Contact Centre of UWV, the Dutch employee insurance agency, has approx. 1.3 million 'customers' and receives over 25,000 phone calls a day. The CCC is able to provide the caller with an answer to his query during the first phone call in over 90 percent of cases. Nearly 75 percent of the users say that they are satisfied or well satisfied about the way in which they were helped. This result is possible thanks to an international management model especially designed for CCCs, known as the Customer Operations Performance Center (COPC). The COPC measures the quality and the performance of the CCC. One of the preconditions for certification, for example, is that the CCC analyses incoming phone calls and, on the basis of the findings, is able to make an inventory of the aspects that are the most frequent causes of customer complaints, and then seeks a structural solution for the underlying problems.

5.Building Blocks

NORA assumes that service providers design their services in a modular way. This chapter describes a number of important building blocks that have a positive effect on interoperability.
Rationale
The following sources have been used to create the summary below:
• Legislation. Compulsory; this is especially relevant and applicable to the key registers [31].
• Open standards. The Standardization Council's list [23] of 'comply or explain' standards, drawn up at the request of the government.
• The basic e-Government infrastructure. Drawn up by the national government, provincial and municipal authorities and the water boards and presented in the National Services and e-Government Implementation Programme (NUP) [4].
• Building blocks managed by the Dutch digital government service Logius [32]. Further information (also in English) can be found on www.logius.nl/producten.

This document sets out to provide a brief explanation and description of the building blocks. Further details of the building blocks and the way in which they are being applied can be found in specialised NORA documents.

Basic architecture for public sector organisations

NORA assumes that the work processes within any public sector organisation will approximate the overview given in Figure 1 below.
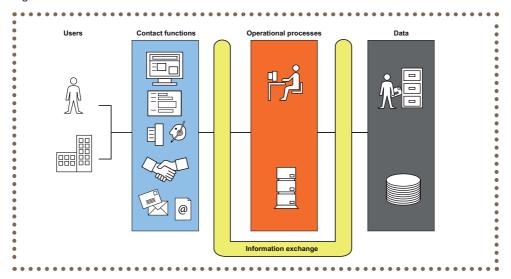
Figure 1: Basic architecture for public sector organisations

Users of services contact a public sector organisation by means of one or more contact functions (shown in blue). To facilitate the exchange of information (shown in yellow), the contact function is linked to the operational processes (shown in orange) and to the processing and the management of information (shown in grey). The symbols used here are those commonly used in diagrams of NORA and other government architectures.

overview of standard building blocks

Figure 2 illustrates the building blocks of the basic architecture for individual public sector organisations. These are the links that ensure that the work processes of different organisations are interconnected. The various links will be described briefly below, but further information can be found in the e-Government Routeplanner [33]. The Routeplanner also includes other instruments that can play a signification role in achieving and maintaining interoperability. The various NORA supplements look at the use of the building blocks in more detail.

Figure 2: Overview of building blocks

contact functions

The building blocks that public sector organisations use to support or facilitate their contact with citizens, businesses or other public sector organisations.
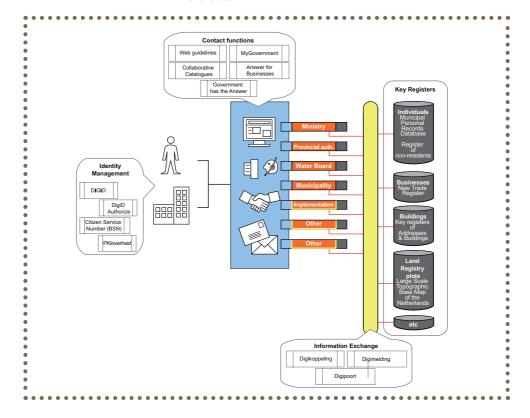
Web guidelines

Information on websites which meet the web guidelines [34] is accessible to everyone, irrespective of the software or hardware used. For building websites, there are internationally recognized agreements in the form of web standards. The Dutch government has combined these standards in the web guidelines quality model. This model comprises 125 quality criteria required to improve government websites which are accessible to all users.

Cooperating catalogues

This NUP building block [35] ensures that users can find information, even when searching on the website of another government level not involved in the subject they are looking for. Users no longer face a 'closed door' but will be forwarded to the relevant services desk. This means that citizens and businesses can quickly and easily access information about products and services they need on the websites of participating governments.

Answer for Businesses

This portal is available to all businesses looking for up-to-date and relevant government information, e.g. about laws and regulations, permits and government grants. The object of Answer for businesses [36] is to improve online provision of services by the government to businesses and reduce the administrative burden through request-based presentation of information and services.

MyGovernment

This facility is a personal and secure web environment in which citizens can handle their affairs and exchange information with all levels of government, wherever and whenever they wish to do so, and as quickly and

economically as possible. This concerns e.g. filing a tax return, applying for a social security benefit, or a building/tree-felling permit. Connection to the MyGovernment [37] website implies for government authorities that their services can be easily located and that it will become easier for them to send messages to specific groups of citizens, e.g. residents of a particular neighbourhood.

Answer
Several government authorities are working together to set up a service provision concept [38], a multichannel desk that citizens and businesses can contact for answers to almost all questions they may have; a client contact centre (KCC). In the NUP it has been agreed that all municipalities with a population of 100,000 or over will set up a KCC connected to the 14+ dialling code. It has also been agreed that information on products of provinces and water boards will be made available to the municipal client contact centres.

Identity management

Identity management concerns all facilities used in the administration of users and - on the basis of that administration - in regulating their access to electronic and other services.

DigiD
DigiD [39] is the digital authentication system for the government and public service providers. DigiD ensures that you can conduct reliable business with citizens through your website. If someone logs on to your website using his DigiD, DigiD will feed the Citizens Service Number back to you. Using this number, you are able to find out from your own administration or in the Local Council Personal Records Database who you are dealing with and which information you already have about a particular person.

DigiD Authorize

DigiD Authorize [40] gives citizens the opportunity to designate an individual to look after their interests online. Individual citizens sometimes want another person or a business relation to act on their behalf as their representative. Citizens can apply for an authorization code for a specific online service. They give this code to their representative. After activating the authorization the representative can access the specific service on behalf of the citizen with his own DigiD (digital identity).

Citizen Service Number

The citizen service number (BSN) [41] is a citizen's personal number for contacts with the authorities. This unique number helps, for example, to avoid cases of mistaken identity. Everyone registering with a municipality for the first time is assigned a BSN. Newly-born children are also assigned a BSN on the registration of their birth. The BSN offers citizens and the authorities benefits: it simplifies contacts with the municipality and other government agencies and organisations

PKIoverheid

An electronic certificate from PKIoverheid [42] guarantees the reliability of the exchange of information by e-mail and the Internet, and identifies whether that information comes from the government, citizens or businesses. Thanks to the certificate, the recipient knows for certain from whom the information has originated. Additionally, with a certificate from PKIoverheid, a legally valid electronic signature can be placed and confidential information can be encoded.

key registers

To do its work properly, the government needs access to data that is stored in over 30,000 different systems. Key registers [43] ensure that this information is available in a simpler and less fragmented form. The essence of the key registers is to have one location in which to store all the information that belongs together. Ultimately these individual key registers will function as a single, cohesive whole: the key register system. This system will ensure that all relevant data and information from all relevant registers is directly available to help answer any question or resolve any problem. The principle of using key registers has been embedded in legislation, and their use is compulsory for public sector organisations.

The Municipal Personal Records Database
Everyone must notify the municipality of a birth, change of address or death. The authorities need correct information about the country's citizens, for example when issuing a passport, identity card or driving licence, determining who may vote in an election, paying social benefits and collecting municipal taxes. However, the records are also used by others: organisations such as the Netherlands Tax and Custom Administration, benefits agencies and pension funds also use your personal details to tailor their decisions closely to your situation. The Municipal Personal Records Database [44] has been in existence since 1 October 1994.

Register of non-residents
The register of non-residents [45] records some basic data on non-residents in a single register. Together with the municipal personal records database, the register of non-residents will form the Key Register of Natural Persons. More then 2 million people have a relationship with the Dutch government but do not actually reside in the Netherlands, at least not permanently. Just think of a German tourist who owns a house in Friesland, or a Dutchman who is enjoying retirement in a house on the Spanish coast. These people have relationships with various Dutch public sector organisations, and each of these organisations has its own register of non-

residents, but for different purposes. The register of non-residents collates all this information.

Key Register New Trade Register
The Key Trade Register [46] includes data on enterprises and legal entities, i.e. sole proprietorships, partnerships, companies and branches, foundations, associations and public/government organisations. The New Trade Register will facilitate better services to businesses. They will only need to provide their information once to the Chamber of Commerce, which maintains the New Trade Register. Public sector organisations can consult the trade register and do not need to repeatedly ask businesses for information that has already been provided.

Key Registers of Addresses and Buildings
The Key Register of Addresses lists all towns, street names and house numbers. The Key Register of Buildings contains data on buildings, premises (semi) permanent locations and moorings. These are municipal registers, jointly known as Key Registers of Addresses and Buildings (BAG) [47]. All data is made available centrally trough a national system managed by the Dutch Land Registry Office.

Key Registers Cadastre and Topography
The Key Register Cadastre [48] consists of the cadastral registration -the official registration of all property-related information- and the cadastral maps. The Key Register Topography consists of digital topographic maps at various scales, its core being TOP10NL, a digital topographic map file of the Netherlands.

Large Scale Topographic Base Map of the Netherlands
The large scale standard map of the Netherlands [49] is a digital topographical map with minimal standardised content and standardised precision, showing the principal topography of the terrain (buildings, roads, waterways). The scale used varies from approx. 1:500 to 1:5,000. The map is suitable for a variety of uses, and users can overlay their own information if they wish.

Key Register of Vehicles

The Key Register of Vehicles [50] includes data on all Dutch registered vehicles and their owners. RDW, the Centre for Vehicle Technology and Information, provides information to citizens and businesses on the basis of the recorded data. The register has national coverage, and is accessible for public sector organisations such as the police and the Tax Office.

Key Register Income

The Key Register of Income [51] contains accurate income data on approx. thirteen million Dutch citizens. This is the aggregate taxable income received. If the aggregate income is not calculated, the taxable wage income earned during the last calendar year is used.

Key Register of Real Estate Value

The Key Register of Real Estate Value [52] includes details of the assessed value of all real property. To make these values practically useful, supplementary information such as the valuation date, the designation of the real estate and the name of the person who received the valuation assessment is also recorded.

Key Register for the Subsurface

The Key Register for the Subsurface [53] contains data from geological, geophysical and soil scientific surveys, soil maps, geological maps and models, as well as information regarding subsurface infrastructure and licences for natural resources. The aim is to make all public data regarding the subsurface easily accessible. Archaeological information and data about the environmental quality of the subsurface may be added to the register at a later date.

Electronic information exchange

The reliable and efficient exchange of information between public sector organisations is one of the most important cornerstones of interoperability. A number of generic solutions are used to support this exchange.

Digikoppeling
Digikoppeling [54] is the government's "internal postman". Digikoppeling comprises a set of standards for electronic messaging between government organizations. If you implement these standards in your own software, you can easily exchange digital messages with fellow government organizations. This is done through the connectivity of Diginetwerk, the Internet or a different type of connection. Digikoppeling is an NUP (National Implementation Programme for Service Provision and e-Government) building block.

Digimelding
Data contained in basic registries has to be as reliable as possible. If an official suspects that specific data contained within a basic registry is incorrect, he has to be able to register that suspicion. That can be done using Digimelding [55]. Digimelding is a central point for registering potential inaccuracies in basic registries. By using Digimelding, the registered incident will arrive at the correct government body or bodies. The official will then receive a message about the outcome of his registered incident. Digimelding is an NUP building block.

The System Catalogue
Users of basic registries - such as authorities - have to know precisely which data they are dealing with. The System Catalogue [56] is an online catalogue that describes the structure of the basic registries system and the definitions of types of objects, data and messages. With that information, users are able to easily take data from the basic registry or registries and apply this to their own work processes.

The definitions in the System Catalogue have been taken from the various basic registries. The System Catalogue is a basic NUP tool.

Government Transaction Portal
The government transaction portal [57] is a communication channel with the government and public sector that can be used by businesses. Each business or organisation that is connected to the portal can exchange digital information with the government. This may be useful for businesses that have to provide information to government bodies or departments on a regular basis. The government transaction portal ensures that the information is directed to the correct recipient and that the information sent by a public sector organisation will be delivered to the correct business.

Public Sector Interconnectivity
The public sector interconnectivity [58] protocol creates links between the individual networks of public sector organisations so as to create a single virtual network for the entire government domain. In many situations this renders it unnecessary to install separate network facilities for individual applications. A virtual network of this kind also facilitates the secure and effective exchange of information between the public sector organisations.

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Appendix II: Reference list

Unfortunately, the references in this list are merely websites and documents in Dutch. However, as parts of this supplement have been derived from these references, they will be mentioned in this English translation. Several websites do provide information in English as well.

[1]   Website RENOIR. http://www.e-overheid.nl/sites/renoir
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