# Developments towards the modular, infrastructural organization

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## *Introduction*

Governments are in constant transformation. Government organizations, just as any other organization, need to adapt to changes in the environment. Since the environment of government organizations, society, is in constant flux, government organizations continuously need to change as well. Changes in society are very diverse. Citizens change their expectations towards governments. Some argue that citizens, nourished by increased service delivery of businesses, expect increased quality of service delivery from governments. Moreover, citizens become more individualistic and assertive, which increases the pressure on governments to satisfy their wishes (OECD 2005). The political landscape in which government organizations operate is changing. The 1980's and early 1990's showed a trend towards the retreat of the state and increased self-government by private corporations, as well as increased attention for business-like operations of governments organizations under the term of New Public Management (e.g. Osborne & Gaebler 1992). Nowadays, a shift back towards more government intervention is apparent, which causes extra pressures on government organizations to live up to the expectations. Technological developments, such as the introduction of the Internet and ICT, cause enormous shifts in society. At the same time, these developments enable new organizational models, that may enable government organizations to live up to the pressure.

This paper studies the latest transformations of government organizations. Since it is unfeasible to study all transformations, a selection must be made. The paper focuses on the question: how are government operations organized? Focus is on structural elements in the organization of government operations. An essential development in this area is the focus on the value chains of government. "A chain maps the vertical sequence of events leading to the delivery, consumption, and maintenance of a particular good and service" (Sturgeon 2000). The events that make up for the value chains are mostly executed by various organizations. Hammer (2001) argues that, caused by the introduction of new technologies like ICT and the Internet, organizations' strategic focus is on their position in the value chain. Bekkers and Homburg (2005) argues that organizations use these technologies to adjust the borders between their organization and other organizations in the value chain. By optimizing value chains performance instead of the performance of individual organizations, the best results for society can be achieved (Hammer 2001). In this paper, transformations in the value chains of governments are subject of discussion.

## *Methodology*

The research conducted to answer this question includes a number of steps. First, a literature review was conducted to identify the main trends in academic thinking about organization structures. Literature from strategic management and e-government provided insight in the main developments in organization structures. Second, these trends were developed into a number of hypotheses on what the transformed organization structure of government organizations may look like. Third, these hypotheses were tested in the social security sectors of Belgium and the Netherlands. The test provided insight in the extent to which the developments from the literature are present in the practice of government organizations.

## *Organizational transformation: the modular organization*

### Organizations focus on their core competences

Organizations used to develop their strategy by analysing their environment for changes and deciding how they could best react. Based on an analysis of its competitors and buyer and supplier power, an organization was able to decide on it's desired position in the market and on the actions necessary to achieve this position (Porter 1980). In the '90s, this practice changed. Organizations started to acknowledge that they were unique and that this uniqueness needed to be central in the process of strategy formulation. To operationalize the uniqueness of an organization, the term core competences was introduced.

Core competences are those combinations of production skills and technologies that distinguish organizations from other organizations. "Core competences are the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technology" (Prahalad & Hamel 1990). Because of the specific combination of competences available in an organization, this organization can outperform its competitors in producing certain products. According to Prahalad and Hamel, core competencies have to pass three tests. "First, a core competence provides potential access to a wide variety of markets. […] Second, a core competence should make a significant contribution to the perceived customer benefits of the end product. […] Finally, a core competence should be difficult for competitors to imitate".

The notion of core competences provides an essential insight for the strategy formulation of an organization. Organizations should strive to make optimal use of their core competences. This has two implications. First, organizations should produce as much different products or services as possible using their core competences. By enlarging the portfolio of products and services they produce, organizations can optimize the use of their core competences. Second, organizations should search for possibilities for selling their core products. Focussing on core competences means that organizations mostly produce half-products, that have to be processed further by other organizations. Organizations should produce those half-products that are useful for many other organizations. This way, they can maximize the take-off of their core products, and therefore the use of their core competences.

### Organizations outsource any activities not connected to their core competences

Organizations that focus on their core competences, stop performing activities that do not make use of their core competences. Since these activities are often essential for producing products and services that have value for the customers, organizations outsource these activities to other organizations. Organizations outsource more and more activities to other

organizations that are specialized in performing these activities. Organizations specialize in certain activities, leading to vertical disintegration at the level of the production chain (Sturgeon 2000; Wynstra 2006).

Outsourcing “represents the fundamental decision to reject the internalization of an activity” (Gilley and Rasheed 2000). Outsourcing leads to an increased importance of the suppliers of an organization. To optimize the result of outsourcing, organizations take a number of steps (Monczka 2004). First, organizations develop a purchasing strategy in which they decide what the requirements for the activities are. Second, they search the best suppliers for the activities they need. Third, they establish appropriate strategic alliances with these suppliers. Fourth, they integrate these suppliers into their business processes. Fifth, they manage and develop their relationship with these suppliers. Finally, they manage the costs across the supply chain.

## Organizations create shared service centres for common processes

Next to outsourcing non-core activities, organizations start analysing their business process and the business processes of other organizations. Especially government organizations realise that parts of their business processes are common for various organizations. These may be called common business processes. Common business processes are business processes that (1) are executed in various organizations and (2) have similar goals and outputs (Meesters & Jörg 2005). These business processes offer opportunities, by organizing them centrally, to increase efficiency and quality. A number of possibilities are identifies to achieve this. Organizations can create knowledge centres, may create referential models or may implement shared information systems. However, the most far-reaching (and therefore probably resulting in the most fundamental improvements) is the centralization of the common business process in one organizational entity. When there is no organizational entity in the value chain with the necessary competencies, a new organizational entity, a shared service centre, needs to be created.

Korsten defines a shared service centre as “a result-oriented inter-organizational cooperation, optionally concentrated in one organizational entity, that has the tasks of offering services in the area of a certain supportive function or in the area of policy development or execution to individual partner-organizations, based on a contract” (Korsten 2005). Essential differences with traditional staff departments are (1) that a shared service centre has integral responsibility for the products (or services) that it delivers, (2) that beforehand agreement is reached on the characteristics of these products and services (e.g. the quality and the price) and (3) that the shared service centre offers its services to a number of different partner-organizations. Shared service centres may be created for all sorts of business processes, front office as well as back office processes, primary as well as secondary processes (Meesters & Jörg 2005; Strikwerda 2006).

## On a sector level, this results in a modular organization.

The trends mentioned above, the focus on core competences, the outsourcing of non-core activities to specialized organizations and the creation of shared service centres, lead to the creation of networks. These networks consist of relatively small, specialized organizational entities that focus on a small number of activities that depend on their core competences. Together, these organizational entities form value chains, in which they produce products or services. Cooperation between the organizational entities is essential for the production of these products and services. Organizations operate in various value chains: their activities may be used for the production of various services or products.

The resulting organization structure is that of the “modular organization” (Strikwerda 2006). Modularization is concept that came from engineering information systems and was introduced in organization theory in the automobile industry. “Modularity is a general systems concept: it is a continuum describing the degree to which a system’s components can be separated and recombined, and it refers both to the tightness of coupling between components and the degree to which the ‘rules’ of the systems architecture enable (or prohibit) the mixing and matching of components” (Brüggemeier et. al. 2006). The modular organization is made up of organizational modules. An organizational module is “an isolated set of activities that knows a certain degree of alternative use within the architecture of products, services and creation processes, of which the output can be contracted and the performance can be judged financially” (Strikwerda 2006). Organizational modules may be derivates of the traditional organizations, or may be newly created shared service centres. In this modular organization, we see “[organizational] modules that cooperate in constantly changing configurations to increase the performance of an organization, in term of higher efficiency and more differentiation in products and services” (Strikwerda 2006).

Brüggemeier et. Al. (2006) identify three elements in modularisation: “[1] The module as unit that may be limited, distinguished and combined, [2] the connections between these modules and [3] the directions that enable the combination of different modules”. This has a number of implications for modular organizations, in which the organizational entities are the “modules”. First, the products of the organizational entities, in fact the sub-products of the value chains, must be clearly defined. Second, a process of making combinations of sub-products is necessary. This process is called “orchestration”, searching for the right combination of sub-products needed to produce a certain end-product. Third, there must be a “set of rules” that enables the (re-)combination of the sub-products into various end-products.

Several authors argue that the modular organization outperforms traditional organizational models. Some of the advantages are:

- The ability of organizational entities “to increase managerial attention and resource allocation to those tasks that it does best and to rely on management teams in other organizations to oversee tasks at which the outsourcing firm is at a relative disadvantage” (Gilley and Rasheed, 2000);
- The creation of economies of scale (Opheij & Willems 2004);
- Working for customers enhance the motivation of employees and forces organizational units to work business-like (Opheij & Willems 2004);
- The possibility of mass-customization: producing customized end-products, based on standard sub-products and therefore at acceptable costs (Strikwerda 2006);
- Innovation of sub-products is possible, without the need for changes to the entire value chain;
- Easily adaptable organizational boundaries and activities (Strikwerda 2006).

## *Informational transformation: Infrastructure*

Essential for the functioning of a modular organization is that the activities of the organizational entities are attuned. The output of one organizational entity has to be processed by the next organizational entity, so the second organizational entity has to be able to use the output of the first. In other words: activities of the organizational entities should be interoperable. "Interoperability means the ability of information and communication technology (ICT) systems and of the business processes they support to exchange data and to enable the sharing of information and knowledge." (European Commission 2004; in Kubicek & Cimander 2005). To achieve this interoperability, a common infrastructure is necessary.

The infrastructure consists of a number of rules that all organizational units abide to and that ensures that organizational entities activities are attuned.

The term infrastructure encompasses more than just an information infrastructure. The infrastructure refers to “democratic routines, financial routines, personnel routines and informational routines [as well as] juridicial definitions” (Zuurmond 2003). At each level, a limited set of rules has to be agreed upon to ensure interoperability. The infrastructure ensures interoperability between the organizations and thereby enables organizational entities to cooperate in constantly changing combinations, depending on what societal issues need to be resolved. Zuurmond (1994; 2003) calls this organization the “infrastructural organization”, or as a variation on Weber’s bureaucracy, the “infocracy”.

One of the elements of the infrastructure is the information infrastructure. This information infrastructure consists of a number of layers. The process layer describes the business processes of the organizational entities and the interfaces between them. The functional layer describes which functionalities ICT offers for the use in the business processes of organizations. The data layer describes how data used in these functionalities are defined, processed and stored. The IT infrastructure layer describes the technical issues of linking computer systems and services. Finally, the IT organization layer describes which organizational entity is competent for information management in the modular organization. This organization should be able to ensure that all organizational entities apply the rules of the infrastructure.

## *Business process transformation*

In the modular, infrastructural organization, business processes are redesigned. Business process redesign is essential in creating a super-efficient organization (Hammer 2001a). A number of transformations at business process level can be identified. Hammer (2001) argued that organizations should redesign business processes across organizational borders. New technologies like ICT and the Internet offer various opportunities to achieve this goal. ICT-infrastructures shared by multiple organizations offer the opportunity to automate business processes across various organizations (Zuurmond & Meesters 2005). Since government processes often consist of information-processing activities, automated workflow across organizations may be achieved by linking information systems.

Len and Traunmüller (2006) observe another transformation in business processes. They argue that business processes can be divided into sub-processes or process modules. The division of business processes in process modules enables the automation of parts of business processes and the execution of parts of business process by different organizations. This modularization of business processes also offers the opportunity of creating common business processes, which was discussed earlier.

Some elements of different business processes may be common. These common elements, or common process modules, may be centralized (Meesters & Jörg 2005). These common process modules may range from common registration processes, creating shared databases, to common front office processes.

## *Practice*

The theoretical framework presented above was used to analyse the social security sector in a number of European countries. Since this research is still in progress, only two case studies

are presented here; the social security sectors of The Netherlands and Belgium. Table 1 presents the results of the case studies.

| Trend | The Netherlands | Belgium |
|---|---|---|
| Core competences | No | No |
| Outsourcing | Some | Some |
| Shared Service Centres | Yes | Yes |
| Modularisation | No | No |
| Infrastructure | Yes | Yes |
| Business Process Redesign | No | Yes |

**Table 1: Transformational trends in The Netherlands and Belgium**

In the social security sector of Belgium and The Netherlands, there is no attention for the core competences of organizations. In The Netherlands, an extensive reorganization operation was launched in 2002. In the policy plan for this reorganization, tasks were appointed to organizations, without any mentioning of the competences of these organizations. The same goes for the policy plan for 2006-2008 for the Belgian social security. The strategy documents of the main organizations in the sector (The Netherlands: CWI, UWV and the social service of a large municipality, Belgium: FOD, RVA, social service of a large municipality) show the same picture. In some documents some attention is paid to what activities the organizations want to perform, but no attention is paid to the competences that these organizations have to justify these choices.

In the sectoral policy plans and organizational strategies in the social security sectors of The Netherlands, there is some attention for outsourcing. Terms like “chain-integration”, “chain-cooperation” and “chain-informatization” are used many times. However, these terms seem nothing more than buzz-words: phrases like “we need more cooperation with our chain-partners” are not developed further into policies on how to cooperate or how to develop the relation with the chain-partners. In Belgium, the situation is not much better. Suppliers are identified and sometimes the organizations have explicitly chosen to outsource some activities. The RSZ for example has outsourced the automated processing of applications to an external organization. However, such situations seem to be the result of the historical development of institutions, instead of the result of deliberate decision-making processes.

Shared service centers seem to be popular in Belgium as well as in The Netherlands. Organizations in the Dutch social security sector make use of the services of BKWI (Office for chain-informatization in employment and income) and the Inlichtingenbureau (intelligence office). BKWI offers services for the informatization of the sector. An example is the SUWI-net, which enables organizations to look into each others databases. The Inlichtingenbureau offers services to municipalities, for example a legitimacy check on social benefits. However, in The Netherlands, no analysis of common business processes is made in the sectoral policy plans. ECORYS (2005) found many duplications in the business processes of social security organizations. In Belgium several common business processes have been identified and common solutions have been created. The Belgian Crossroadbank, a shared service centre for the social security sector has identified and developed solutions for various business processes. Moreover, the Crossroadbank is responsible for the maintenance of the information infrastructure of the sector.

These findings above do not predict a lot of modularisation in both the Belgian and the Dutch social security sector. This prediction appears to be right when elements of modularisation are sought in both sectors. In both sectors, there is no product architecture, in which the products of the sector and their interdependencies are displayed. There are no product architectures, in which the main directions to which the products have to apply and the rules for the connections between products are identified. These rules would enable the re-combination of sub-products into end-products. The Belgian sector shows a little movement towards modularization: in this sector the role of orchestration is covered by the Crossroadbank and its ICT-infrastructure. In the Netherlands, this role is not covered.

For modularisation to work, an infrastructure is needed. Interestingly, both sectors have developed an information-infrastructure. These infrastructures consist of a functional architecture, a data architecture and a technical infrastructure. In The Netherlands, the infrastructure is managed by BKWI. The so-called SuWi-architecture consists of a service- and process architecture, an information architecture, a process-support architecture and a technical infrastructure. However, the infrastructure is in the development stage, it is not finalised yet (ECORYS 2005; UWV 2006). In Belgium, the infrastructure is managed by the Crossroadbank. The infrastructure consists of common IT systems, common registries, common business processes and rules for IT systems and data-usage and –storage.

Belgium shows the most sophisticated business process redesign. All processes studied in Belgium use the common components, such as the common registers and the ID chipcard, of the information-infrastructure. Based on these common components, shared front offices were created and back office processes were automated across organizational boundaries. In The Netherlands, the limited availability of common business processes withheld organizations from transforming their business processes this way.

## *Debate*

In the paragraph above, a study of two sectors on their way to modernisation was presented. Question is whether the theoretical image of the modern, transformed organization is in fact the organizational model that sectors develop into. And if it is, how far are the studied sectors in their development?

The Belgian and Dutch social security sector at first sight show a similar picture. Both social security sectors have developed an information-infrastructure. The Belgian infrastructure is far more mature than the Dutch infrastructure. When it comes to transforming the organization structure of the social security sector, The Netherlands and Belgium have only set the first steps. Outsourcing is gaining increasing attention in The Netherlands and Belgium, but the procurement strategies are not really profound. Shared service centres have gained some popularity. In both countries, shared service centres have been created for ICT and information management, although the competences of the shared service centres differ. In transforming interorganizational business processes, the Belgians show much more sophistication. Based on an interorganizational infrastructure consisting of common business processes and common IT components, the Belgians have created shared front offices and automated case-handling in the back office. The Dutch did not succeed in this until now.

These signals seem to provide some evidence for a movement towards more vertical specialization in the value chains of the social security sector and the creation of modular, infrastructural organizations. However, this model has not been achieved in Belgium as well as in The Netherlands. It seems that the countries have started with developing an

information-infrastructure, before changing the organization structures of the sector. This may be a sign of a technology bias in the reforms in the sector. Reforms start by creating technical infrastructures and leave the existing autonomy of organizations in the sector unaffected.

The Belgians show another route towards the modular, infrastructural organization. Based on the shared infrastructure, interorganizational business processes have been redesigned. The design of the new business processes shows characteristics of modularization: business processes are divided into process modules and common solutions were developed for common process modules. Redesigning business processes using common components leads to modularization at business process level. In the near future, this may lead to the modularization of the organization structure as well.

The image of the modular organization, supported by an information-infrastructure, shows some potential for describing the transformation of sectors of government organizations. The social security sectors of Belgium and The Netherlands show some movement towards the model of the modular, infrastructural organization. Infrastructures are developed, shared service centres are created and outsourcing becomes a familiar strategy. The model of the modular, infrastructural organization, that encompasses all these developments, is useful in predicting what the resulting organizational model will be. However, for the model to be really useful, some operationalization is needed. For each aspect of the model (core competences, shared service centres, etc.) a growth model could be developed, which enables to assess at what level of development organizations are.

## *Conclusion*

This paper aims at developing more insight in the image of the modern, transformed government organization of the 21st century. The resulting image was that of the modular, infrastructural organization. This organizational model consists of diverse organizational entities that focus on their core competences. Activities that do not depend on their core competences are outsourced to other organizational entities. Outsourcing activities is an explicit part of the strategies of the organizational entities and the organizational entities pay extensive attention to their relationship with their suppliers. Organizational entities create shared service centres for common business processes to avoid the duplication of work. In the network that is developed as a result of these trends, an orchestrating organizational entity or information system is created. This organizational entity is responsible for creating combinations of organizational entities that together form value chains for the development of products and services for society. An infrastructure, including an information-infrastructure, is developed to connect the organizational entities.

This theoretical image of a modern, transformed government organization seems to be useful in explaining the transformational trends in government sectors. The Belgian and the Dutch social security sectors show some of the developments drawn above. However, the development of real modular, infrastructural organizations seems to be a step to far for now. Both sectors have not succeeded in developing real orchestrating organizational entities. Evidence presented in this paper shows however that they may eventually succeed and that we may witness the development of real modular, infrastructural organizations in the social security sector in a couple of years.

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