E- Governmental Value Chain Models

– E-government from a business (modelling) perspective –

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Abstract

This paper considers electronic governmental activities from a business perspective resulting in a so-called governmental value chain model. This model aims to support practitioners for better understanding and realisation of joint organisational and information system innovations in the public sector. It consists of a legislative, administrative and juridical function embracing three fields of legislative governance, administrative (resource) management and governmental service delivery management. Each field is structured after a strategic-constitutional, tactical-intermediation and operational-retail level. This model is an effort to transfer business concepts to Electronic Government in the public sector. Basically, governmental activities will be considered as a value chain linking the "trading" partners like citizens, administrative agencies and constitutional institutions.

Keywords
Electronic government, Electronic business, business models, electronic democracy, organisational and information system innovation

1. Introduction

Governments are challenged to innovate their traditional structures into new electronic structures responding on new technical and societal challenges. This chapter defines the E-government innovation concept from a business perspective and introduces reference models as an important tool in E-government innovation process.

1.1. Background

Many administrative services and systems -a characteristic product of the government- are developed. This application domain has some distinctive features. Traunmüller and Lenk [9] are stating that the public administration domain is characterised by a legal frame of growing density of regulations and a complex tissue of internal and external cooperation of acting entities. Therefore the conditions for innovation in the public sector seem to be rather different than the private sector. However new societal challenges in the 90's like emancipation of citizens, institutional competition between countries and European regions are asking for structural changes in transaction patterns between citizens and their governmental agencies and institutions. From the citizen's point of view, new requirements to public administration emerged like one-stop services and seamless government (innovation pull). Emergent ICT technology like TCP/IP protocol for email, file transfer (FTP) and hypertext (WWW) are enlarging the range and reach of information exchange between actors (Keen) [5]. They are enabling quite new transaction patterns between public offices and their citizens (technology push). By consequence, at one side, bureaucratic governmental organisations have to be reengineered and internally broken up in small self-containing flexible units in order to respond to the service needs of their citizens. On the other side, they have to be externally integrated in interdependent networks coordinated by public–private governance.

1.2. E-government: an innovation challenge

In this paper, Electronic government (EG), considered from a business perspective will be defined as:

The application of information and communication technology (ICT) to improve, transform and/or redefine any form of resource and information exchange (transacting and contracting) between involved actors like companies and governmental agencies and their customers, suppliers or other partners by developing and maintaining dedicated inter-organisational systems, virtual

organisational arrangements and (inter) national institutional arrangements.

Basically, the central issue of EG is applying ICT in governmental activities that citizen's and governmental agencies and institutions do when they exchange information or ideas, in order to improve existing and/or redefine public administration services (by introducing new digital products and services and their underlying business models). ICT is used in a broad sense of information resource configurations referring to ICT handling techniques (storage, processing, transport, capturing and presentation) of data including text, sound and visual images and knowledge. It is an "intermediate" technology, enabling electronic interaction between actors

EG can be considered as an ICT based innovation, which has already been discussed in general as a development process for many years. The literature can be classified in stage-based process, transformation and organisational behaviour based approaches. The stage based process approaches are rooted in IS development theory (Davis and Olson) [2] in business reengineering and innovation theory (Davenport) [3], in technology transfer and organisational learning theory (Ang et al.) [1]. The transformation based approaches are considering the innovation as a conversion process that transforms inputs (like physical resources and technology, human resources, knowledge, organisational arrangements, culture and needs) into output.
The IS development and business reengineering theory are more oriented on the "hard ware" transformations like hardware and software development, while the knowledge transfer and organisation learning theory are strongly focussed on the "org ware" transformations like human resources, knowledge, organisational arrangements and culture. Finally, the more organisational behaviour based approaches are highlighting a number of critical roles which have to be practised by interacting stakeholders or partners involved in (ICT based) innovation processes (Roberts and Fusfeld) [8]; Konsynski and Mc Farlan, [6].

1.3. Reference models and their role in EG innovation

In the process of innovation, we distinct two approaches of modelling. On the one side, methodology based modelling approaches (like Davenport) [3] in his reengineering approach) are focussing on process guidelines prescribing how an innovation process has to be executed. These approaches are dominated by a "procedural" rationality defining step by step how an innovation process has to be executed. On the other side, typology-based modelling approaches (like Hammer, 1990) are focussing on output guidelines prescribing the outcome of an innovation process by presenting new design principles and/or future blueprints. These approaches are based on "substantive" rationality defining typologies how the future innovated system has to be shaped. Reference models are playing a central role in these typology-based approaches. These models are representing and relating types of objectsystem situations with types of IS domain situations. They are helpful in the communication between involved actors and therefore in the analysis and design processes and are supporting the diagnosis of the existing (ist) situation and the design of the future (soll) situation by prescribing what type of information systems are required for what types of business or value activities.

To conclude, from a business point of view, EG innovation can be characterised as a process of interaction between involved internal and external social entities and especially between suppliers of interactive ICT capabilities and (representatives of) users with information and communication needs. In this process, reference models can be very helpful in the communication and knowledge transfer between the involved social entities

1.4. Aim and structure paper

This paper aims to introduce some business concepts in EG for supporting practitioners in a better understanding and realisation of EG considered as a joint organisational and information systems innovations in the public sector. Therefore a so-called governmental value chain model is developed. This model can be considered as a reference model. Basically, reference models are bringing the various involved stakeholders more on speaking terms in their innovation efforts. Chapter 2 presents a transfer of the business model concept to the public sector based on a short review in literature. Chapter 3 gives an outline of a basic governmental model and an elaboration and illustration of this model for the field of service delivery management and especially for the public tax office in The Netherlands. Finally chapter 4 presents some conclusions and final remarks.

2. The concept of business model(ling)

Based on a short literature review, the business model concept is defined and outlined. This concept is transferred to the public sector.

2.1. Business model concept in literature

Business models are a very often mentioned, but not a well defined concept in literature. There is a lot of variety in interpretation of this concept. We will synthesise our business model concept on a selected review of literature (Porter [7], Timmer [10], Wand, Carson and Hui [11], Gordijn, Akkermans and van Vliet [4]).

Porter [7] and Gordijn et al. [4] are stressing that the core of any business model is a value activity, performed by actors aiming at producing and exchanging material and immaterial resources (value). Porter stresses the strong relation between strategy and what he calls an activity or business map of a company. This map shows the strategic themes and their strongly related value activities. In developing activity maps companies have to make trade-offs between activities.
Wand et al. [11] are stating that a business model reflects the core business of an organisation from the perspective of its main function – products and services that it provide to its customers. It captures at a very high strategic level, how organisations behave, independent of the actual organisational structure and implementation of business processes. For this reason, they belief a business model is usually very stable even under major changes to structure and operations of the business. It will only change if the basic nature of the products and services changes. In their perspective a business should be used to drive the evolution of information systems and guide the re-use of existing components
Finally, Timmer [10] defines a business model as an architecture for a product, service and information flows including various actors and their roles.

To conclude, a business model is an overall architecture reflecting the core business of an organisation (network) expressed by strategic theme's (rooted in the strategic positioning) and their underlying value activities in the field of marketing and sales, operations, sourcing and organisational and human competence management.

2.2. Transferring the concept of business model(ling) to the public sector

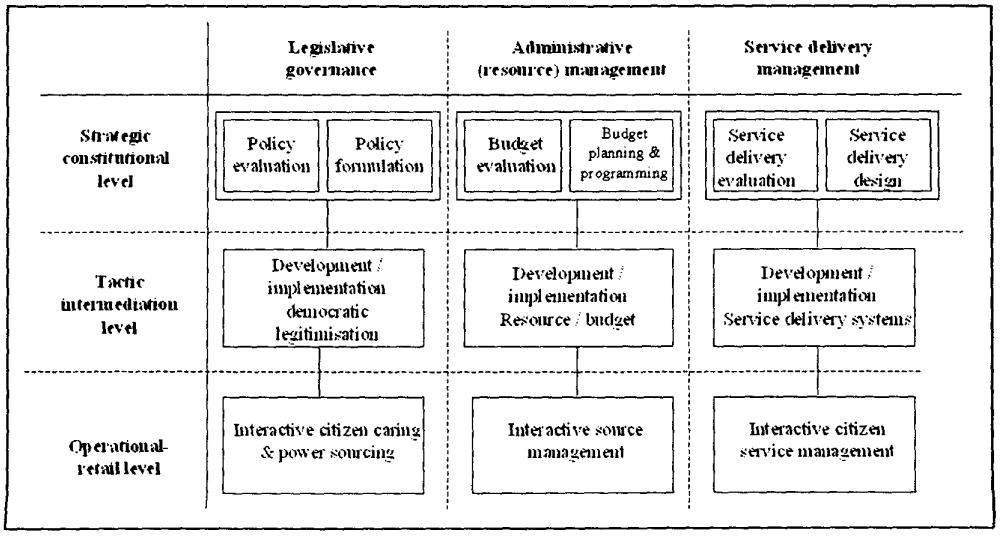
The definition of the core business of the public sector depends on a huge variety of political views on the basic task of the public sector. However, in general terms we will define the core public business as shaping the society. This basic task is classically structured after the legislative, executive and legal power. The focus in this paper will be on the legislative and executive power. In the legislative sector, the strategic theme's (rooted in the governmental strategic positioning) are discussed and defined on a strategic level in -for example- a political programme, a financial plan and a service action plan for the next three to five years. This overall programme has to be realised in the executive sector by value activities or processes. In analogy to private business models we distinct two management fields: the primary activities and the support or administrative resource activities. The field of service delivery management embraces the primary activities and the field of administrative resource management consists of the support activities. In fact, the activities of these two fields can be compared with the already mentioned *primary value activities* marketing and sales and operations and the *support activities* sourcing and organisational and human resource delivery.

3. The governmental value chain model

The business model concept is transferred to the public sector. The first result is a basic governmental model, which is elaborated in a more detailed governmental value chain model for the Dutch governmental tax office.

3.1. Basic governmental model

This model – consisting of a legislative, administrative and juridical function – will be elaborated in the governmental basic model embracing three governmental management fields of legislative governance, administrative (resource)



management and service delivery management. Each field is structured after a strategic-constitutional, tactical-intermediation and operational-retail level (Figure 1).

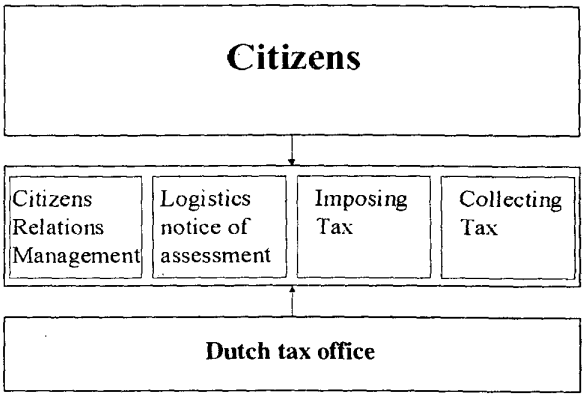
The field of legislative governance embraces the constitutional institutions like the government, parlement and their relations to the citizens. In this field the fast growing interactive ICT capabilities are enabling systems like electronic democracy, electronic election and discussions. They are enabling a new system of direct democracy compared to the traditional ways, based on the indirect representative systems. Basically, the development of E-government systems requires rethinking of the existing (representative) democratic forms.

The field of administrative management is involved in the public resource allocation especially in planning, programming and budgetting the resources for the public sector. In this field the fast growing ICT interactive capabilities are a trigger from re-engineering of administrative management in the public sector. New managerial control concepts based on downsizing and empowerment are enabling flatter administrative structures eliminating many existing hierarchical governmental layers. Development of E-government systems in this field demands rethinking of the existing vertical and hierarchical oriented administrative structures.

Finally, in the field of service delivery management, new interactive ICT capabilities like front/back office systems and service component-based development are streamlining the governmental service delivery chain by eliminating many bureaucratic "rituals" in the interaction between governmental agencies and their citizens. The integration of information systems is enabling user friendly, one stop shopping concept of public services.
E-government systems in this field are asking a complete reengineering of the existing governmental service delivery chain and their systems.

3.2. Elaboration of the basic model in a governmental tax value chain model

The basic model will be elaborated for the field of service delivery management and especially for the Dutch tax office activities and their information systems. Basically these activities will be considered from an interorganisational point of view. The governmental tax value chain model is relating too the target groups of different tax services. Based on the transaction cycle we distinct four basic service process types in the interactive citizen service management: citizens relation management, assessment logistics, imposing tax and collecting tax. (figure 2). The Dutch tax office policy is to integrate their administration with the tax payers administration by using internet.



On development level, the Dutch tax office started with component based development. Based on an application component based infrastructure, customised governmental value chains will be assembled for all types of Dutch tax office services (like income tax, company tax real estate tax and customs). This assembling process is supported by a specific developed reference model consisting of typology of services and processes (representing the object system domain) and a typology of application components and ICT systems components (representing the ICT domain). The typology of service processes is an elaboration of the four basic service types, depicted in figure 2. Examples of ICT system components are basic algorithms (for the calculation of the imposed tax), basic registration, mass processing elements and routing and allocating caseload.
In the process of modelling we distinct four steps:

1. defining the strategic theme's for the Dutch public tax services in the future. Examples are citizen friendly, as much as possible outsourcing activities to the private sector and transparent compliance;
2. designing the future service processes required for a service line by using the reference model representing the service process types and the identified strategic theme's (specification object system);
3. translating the IS services required for the outlined future service processes;
4. designing the future application components and their ICT systems components in order to fulfill the defined IS services by using the reference model representing the applicating components types and ICT system component types (specification ICT domain).

In fact, the identified strategic themes in the modelling process are referring to the strategic level in our field of service delivery management.

4. Conclusions and final remarks

Our basic conclusion is, that it is fruitful to consider EG from a business modelling perspective. There can be made some specific conclusions.

1. The transfer of the business model concept to governmental value chain models for public sector seems to be fruitful in the radical redesign of EG innovations. This concept can be helpful for involved social entities to define the strategic themes and design the related critical governmental activities and their underlying ICT activities.
2. Our governmental value chain model is based on the assumption that governmental activities can be considered as a retail value chain linking the "trading" parties, citizens, administrative agencies and constitutional institutions. It could be interesting for a more in depth exploration of the impact of EG on the public sector, to translate concepts like intermediation, disintermediation and re-intermediation to the governmental retail value chain.

To make a final remark, it could be interesting to elaborate the business concept for EG in the field of legislative governance and administrative (resource) management. Perhaps after 5 years, a new concept ECR is incorporated in EG with the meaning Efficient Citizen Response!

References

[1] Ang, K.T., J.Y.L. Thong and C.S. Yap, 1997, "IT implementation through the lens of organizational learning: a case study of insuror", *Proceedings of the 18th International Conference on Information Systems*, Atlanta, Georgia, December

[2] Davis, G. and M.H. Olson, 1985, *Management Information System*,Mc Graw Hill, New York

[3] Davenport, T.H. 1997, "Process innovation re-engineering work through information technology", *Harvard Business School Press*, Boston Mass.

[4] Gordijn, J., Akkermans, H. and H. van Vliet, 2000, "Value Based Requirements Creation for Electronic Commerce Applications", *Proceedings of the Hawaii International Conference On System Sciences*, Hawaii, January 4-7

[5] Keen, P.G.M., 1991, "Shaping the future", *Harvard business press*, Boston

[6] Konsynski, B.R. and F.W. McFarlan, "Information Partnerships: shared data, shared scale", *Harvard Business Review*, 1990, p. 114-120

[7] Porter, M.E., "What is strategy?", *Harvard Business Review*, 1996, nov-dec

[8] Roberts, E.B. and A.R. Fusfeld, "Staffing the innovative technology-based organization", *Sloan Management Review*, 1981, pp. 19-34

[9] Traunmüller, R. and K. Lenk, "Innovating Government - A Challenge for E-Commerce", *Proceedings of the 2nd International Conference IeC'99*, Manchester, 1999, November 1-3, p.253-261

[10] Timmer, "Business models for Electronic markets", *Electronic Markets*, 1998, vol. 8 no. 2

[11] Wand, Y., Woo, C. and S. Hui, 1999, "Developing Business models to Support information System Evolution", *Ninth Workshop on Information Technologies and systems*, December 11-12, p.137-142