

# “Integrated” and “Transcendent” E-government: Keys for Analyzing Organizational Structure and Governance

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## ABSTRACT

As e-government enters the “transformation” phase, public authorities face major challenges in terms of governance and leadership. The present article consolidates prior research related to organizational structure and governance, and provides an analytical framework intended to guide empirical enquiry and to orient action. We argue that our understanding is enhanced by distinguishing an “integration” stage and a “transcendence” stage of e-government maturity. While the former is accompanied by a profusion of inter-organizational arrangements, the latter’s distinctive feature are inter-personal networks. In order to appraise the implications of these organizational structures, we identify the main reasons behind their growing importance, analyze the ways they create value, and lay the foundations of a normative approach for the choice of governance structures.

## Categories and Subject Descriptors

K.4.1 [Computers and Society]: Public Policy Issues;  
K.4.3 [Computers and Society]: Organizational Impacts;  
K.5.2 [Legal Aspects of Computing]: Governmental Issues;  
K.6.0 [Management of Computing and Information Systems]: General – Economics.

## General Terms

Management, Economics, Theory.

## Keywords

E-government, Maturity Model, Business Models, Organizational Networks, Transaction Costs, Collective Action Problems, Governance.

## 1. INTRODUCTION

In our role as action researchers and experimental researchers in the context of e-government, we increasingly observe radical changes in the organizational landscape, as e-government fully enters the “transformation” stage. These changes are putting public authorities before major challenges in terms of governance and leadership. Thus, the present article is part of a larger effort to come to grips with the issues arising in the context of an emerging



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new public order. Its primary focus is on consolidating existing knowledge related to organizational structure and governance, and on providing an analytical framework which can guide empirical enquiry and orient action.

E-government maturity models [3, 26] vary in focus and with regard to the number of distinct stages, but they tend to show a similar pattern: Two initial stages which may be termed “web presence / interaction” and “transaction” are followed by a third stage generally referred to as “integration” or “transformation”. While the first two stages are primarily associated with a technology jump, leaving organizational structures largely unchanged, the third stage involves a culture leap and deep organizational change [26]. Only a few models include stages occurring after “integration” / “transformation” [12, 3], which points to the fact that the characteristics of succeeding stages are still poorly understood. Key concepts mentioned with regard to these future stages are political participation, passive user participation (consisting in leveraging information on user-behavior or user-preferences to improve services for users) as well as user empowerment. Developments in the private sector suggest additional concepts to be taken into account, such as user innovation and peer production [29, 35]. The bottom line of all these concepts is that inter-personal networks are tapped into to provide value with regard to production (or decision) processes. For the purpose of this paper we shall refer to this fourth stage of e-government as the “transcendence” stage.

While the concept of *integration* points to the fact that previously unrelated or uncoordinated activities are being coordinated or merged, resulting in a *transformation* of public sector organizations (in form of value-chain integration, separation of back and front office, service-oriented business architectures, etc. [3, 15]), the concept of *transcendence* refers to a further transformation process resulting in processes of value creation cutting not only through the boundaries of individual organizations, but also through the boundaries of the organizational sphere as such, by tapping into the value creating activities of inter-personal networks. These observations suggest that we need to focus our analysis on inter-organizational settings (epitomized for example by cross-agency or cross-sector collaborations) for the “integration”-stage, and on inter-personal networks for the “transcendence”-stage of e-government maturity (for an illustration see figure 1 in section 4).

The present paper deals with the implications these transformation processes have for the organizational structure of the public sector and points to governance issues arising in the context of e-government at the “integration” and at the “transcendence” stage. The goal is to sketch out an analytical framework and point to previous research and theoretical approaches, in order to provide the

basis for systematic descriptive analysis and to lay the theoretical foundations for a normative approach. The resulting framework may contribute to guiding further scientific enquiry and to helping practitioners in different positions within public sector organizations or organizations partnering with the public sector to orient their actions.

## 1.1 Structure of the paper

The paper is structured as follows: Section 2 provides a short overview of the theoretical foundations of the analytical framework; section 3 deals with the rationales behind inter-organizational arrangements and goal-directed inter-personal networks; section 4 takes a closer look at how inter-organizational arrangements and inter-personal networks create value; section 5 tackles the question of why the network mode of governance is presently gaining in importance; and the concluding section contains a short discussion of the relevance of the explanatory framework.

## 2. THEORETICAL FOUNDATIONS

The paper draws on insights from various fields of study; the concepts most prominently referred to are derived from *Contingency Theory*, *New Institutional Economics*, *Transaction Cost Theory*, the *Business Model Approach*, and *General Systems Theory*.

### 2.1.1 Contingency Theory

According to *Contingency Theory* [14] organizations need to adapt to their environment in order to ensure the performance necessary for their survival. Changes in the environment therefore call for changes in the organizational structure, which can generally be understood as an interplay between differentiation and integration: On one hand, organizations tend to differentiate themselves into functional divisions in order to adapt to their environment. On the other hand, organizations have to integrate their various parts in order to maintain the necessary unity of effort [4]. Postulating that both under-differentiation and over-fragmentation of organizations would result in suboptimal performance, *Contingency Theory* provides a basis for analyzing the rationales behind inter-organizational arrangements.

### 2.1.2 New Institutional Economics and Transaction Cost Theory

*New Institutional Economics* analyzes the determinants of institutions by the tools of economic theory, focusing primarily on governance and the institutional environment. *Transaction Cost Theory* takes the transactions between economic actors as the basic units of analysis, considering governance as an effort to craft order to mitigate conflict and realize mutual gains [39]. Concerning the development of e-government, we can argue that advances in the field of ICT give way not only to potential increases in efficiency with regard to transactions in existing settings, but also to opportunities to connect organizations and people in novel ways by making cross-boundary communication easier and cheaper. We would therefore expect that advances in the field of ICT accelerate the dynamics of organizational differentiation and integration and give way to new forms of cooperation. This is reflected in the “integration” and “transcendent” stages of e-government maturity.

Integration may take the form of hierarchical integration, of market integration – or, in the face of hierarchy failures and mar-

ket failures, the form of network integration [21]. As the increasing momentum behind cross-agency partnerships and inter-jurisdictional networks during the last two decades suggests, the network mode of governance is on the rise [16, 20, 32]. The profusion of such inter-organizational arrangements may therefore be seen as one of the main corollaries of the “integration” stage of e-government.

Additionally, the increasing importance of the network mode of governance is reflected by the growing role of user communities and peer group innovation in value creation [29, 35].

### 2.1.3 Business Model Approach

There is no universal definition of the “business model” concept (see [18] for a synopsis of various definitions). Generally speaking, a “business model” helps conceptualizing and understanding how an organization or an organizational network creates value. As such, it can serve as a tool for analysis, support the creation of shared vision, and facilitate the diffusion of organizational innovation [cf. 18]. The *Business Model Approach* conceives of organizations or organizational networks as systems of value-creation and value-distribution. According to Timmers [31], business models provide information on product, service and information flows, they describe the various business actors and their roles as well as their potential benefits, and they identify the sources of revenues associated with the particular business model. Thus, a business model focuses on describing the elements and relationships that outline how an organization creates, disseminates and appropriates value. For the purpose of the present paper we focus on three aspects or “building blocks” of business models: the creation of value, the mobilization of resources, and governance structures. We thereby focus not only on organizations, but also on inter-organizational arrangements as well as inter-personal networks as *loci* of value creation.

### 2.1.4 General Systems Theory

*General Systems Theory* describes various types of systems (inorganic, organic, organizational) using a uniform language with the objective of identifying fundamental principles applying to all systems. A system can generally be defined as “a set of interacting units or elements that form an integrated whole intended to perform some function” or, put differently, as “any structure that exhibits order, pattern and purpose”, which in turn implies some constancy over time [27 (p. 17)]. In our attempt to better understand organizational and governance issues at the “integration” and the “transcendence” stage of e-government maturity, we conceive organizations, inter-organizational arrangements and inter-personal networks as (parts of) systems of value creation and dissemination. We thereby build our analytical framework around some of the core principles identified by systems theory.

## 3. DRIVERS BEHIND “INTEGRATION” AND “TRANSCENDENCE”

There are different rationales behind inter-organizational arrangements and goal-directed inter-personal networks. In this section we draw on existing literature on cross-agency collaboration, organizational networks, organizational partnerships, peer-production and open communities in order to provide an overview. We conclude the section by a short discussion of the particularities of the public sector.

### **3.1 Rationales Behind Inter-Organizational Arrangements**

Rationales behind inter-organizational arrangements identified in the literature [e.g., 7, 17, 37, 33] can be assigned to three broad categories: effectiveness considerations, efficiency considerations, and considerations of legitimacy with regard to regulation and/or funding rules.

In accordance with *Contingency Theory* we can assume that organizations need to adapt to their environment in order to ensure the performance necessary for their survival and that this adaptation takes the form of an interplay between integration and differentiation. A cursory analysis of existing inter-organizational e-government projects leads to the following conclusions: In some projects coordination among organizations occurs because the social, economic and political problems do not stay within the boundaries of jurisdictions and administrative units. Increasing differentiation of organizations (e.g. in the health sector), combined with the increasing importance of so called “wicked issues”, which cannot be solved by an organization acting alone, entails a growing need for inter-organizational integration [cf. 4, 16]. IT can be employed to support these collaborations, but the basic rationale behind them can be described as policy driven. In other projects, the pooling of resources occurs in order to make better use of IT, allowing for the provision of new types of services or resulting in a decrease of transaction costs. These projects can be seen as technology-driven. Thus, inter-organizational integration takes place in a context characterized by imminent failure and promising new opportunities [cf. 7].

### **3.2 Rationales Behind Goal-Directed Inter-personal Networks**

Rationales behind goal-directed inter-personal networks can be analyzed in similar terms as those behind inter-organizational arrangements: In some cases, the prospect of imminent failure moves companies towards experimenting with tapping into collaborative communities. This is illustrated, for example, by the Goldcorp case, where an online community was set up to prospect for gold [29 (p. 8)], or by the embracement of an open source approach by major companies, such as Netscape or Sun, facing the dominant position of Microsoft on the software market. A public sector example where imminent failure has given way to a collaborative approach is the Peer-to-Patent project, which endeavors to improve patent quality in sectors plagued with a high number of possibly unmeritorious patents and high litigation costs, such as software or business methods [40].

Collaborative communities have also provided a viable solution to prevent the danger of mutual blockage occurring due to overlapping property rights in research areas characterized by a high degree of sequential and complementary innovation (e.g., the Human Genome Project [28]).

In other cases, new ventures and collaboration projects, such as InnoCentive, an “open innovation” company, or Wikipedia, are driven by the prospect of promising new opportunities for doing business or creating public value. New ways of creating public value are also employed with regard to the public sector, often at the instigation of civil society organizations. Examples include “WhatDoTheyKnow?” – a British portal for Freedom of Information requests – or “FixMyStreet” – a British website which helps people report problems they have found to their local council by locating them on a map.

### **3.3 Particularities of the Public Sector**

As to the prospect of imminent failure and the readiness to exploit new promising opportunities, the public sector differs from the private sector in two crucial points: First, there is little competitive pressure, which makes failure in the sense of going out of business an unlikely event. Second, there are hardly any new entrants challenging the incumbents by doing business in radically new ways. This could lead us to expect public administration to be rather reluctant to engage in inter-organizational collaboration or to tap into inter-personal networks. There are however a series of aspects which mitigate this picture: First, public administration has a long tradition of dealing with “wicked issues” and collaborating across organizational boundaries [cf. 30]. Second, budget constraints, the increased focus on efficiency, and the opening up of some areas of the public sector to competition in the wake of NPM-reform have put some pressure on public administrations. And third, new ways of harnessing the value creating power of user communities in the context of the public sector have successfully been proposed by civil society organizations (see for example various e-participation projects, such as offerings enhancing transparency or services allowing users to ask elected officials questions [2]). Radically new ways of doing things in the public sector may indeed emerge from civil society.

As Lenk notes, e-government constitutes a countercurrent to NPM-reform, by shifting attention away from the single administrative unit to administrative value chains, which often span across organizational boundaries [15]. This is particularly true for the “integration” stage of e-government maturity, whereas the “transcendence” stage takes us even one step further by transcending administrative boundaries altogether. We could however argue that one of the core precepts of NPM-reform remains untouched: that manageability needs to be restored by re-establishing unity of tasks, resources and competency. This time, however, market ideology and the preoccupation with a stronger vertical line has been replaced by network thinking and a focus on collaboration.

## **4. THE LOGICS OF VALUE CREATION**

### **4.1 Adopting a Systemic View**

From a systemic perspective, any e-government activity can be conceived as a part of a system of value creation and dissemination on behalf of end-users or some other beneficiaries. Further stakeholders in value creation are contributors (of financial or other resources), who may or may not be identical with the beneficiaries. In accordance with *General Systems Theory* we can expect a certain number of principles to hold true with regard to such systems of value creation (cf. [27]):

First, systems fulfill a function by transforming input into output. In the case of the systems of value creation in question, the function consists in creating and disseminating value by transforming or employing various forms of resources (financial resources, knowledge and information, etc.). The distinction between resources and value is a purely analytical one: what appears to be the value stream (output) from the point of view of one system may be considered a flow of resources (input) from the point of view of another one.

Second, the functioning of systems cannot be understood solely on the basis of an analysis of their parts, nor can the parts be understood by the sole analysis of the system. With regard to the

creation and dissemination of value this implies that both the system itself and its parts have to be considered as *loci* of value creation. We therefore have to assume that both the system as a whole as well as its parts have their own logics of value creation.

Third, systems are complex wholes made up of smaller subsystems. We can therefore dissect the systems under analysis into their components if this enhances our understanding.

Fourth, systems persist only as long as they import energy from their environment. We can therefore assume that the systems of value creation under analysis tend to disintegrate if they cease to mobilize resources from their environment.

## 4.2 Different Faces of Value

In order for the different components of a system of value creation to remain integrated, each of them needs to be able to appropriate a share of the value added. The concept of "value" has however different meanings and interpretations (see [9] for an overview). Alongside the distinction between "use value" and "exchange value", present in classical economic thought, new concepts such as "public value" or "common good" have made their appearance. Authors following the *Business Model Approach* usually consider the realization of exchange value in form of profits as the purpose of a company's activities. This focus on exchange value is however of limited use in the context of public sector activities. We therefore have to elaborate on the notion of value, which is at the heart of our analytical framework. Some clarification is achieved by distinguishing "use value" and "exchange value". Use value refers to the specific qualities of a product (i.e. the output of a system of value creation) perceived by end-users or other beneficiaries in relation to their needs. Assessment of use value is subjective; it pertains to the individual consumer. Exchange value, in contrast, is the monetary amount realized at a single point in time when the exchange of the product takes place. As such it is determined by the bargaining relationships between buyers and sellers. With regard to public sector organizations reference is often made to yet another type of value: "public value". Unlike for the aforementioned types of value, there is no generally accepted definition of "public value". We can however point to some of its characteristics: Public value takes into account externalities as well as the aspect of sustainability. Furthermore, it does not pertain to an individual consumer, but to a collective. This is illustrated by the concept of merit goods, introduced by Musgrave, which implies the provision of goods in the name of the public interest, regardless of individual preferences.

In analyzing e-government activities as parts of systems of value creation we have to account for the different faces of value: Systems of value creation may indeed produce different forms of value, and economic actors involved in the systems may vary in their value orientation (the distinction of different faces of value is particularly relevant in analyzing public-private partnerships or participants' motivations in user communities).

## 4.3 Subsystems of Value Creation

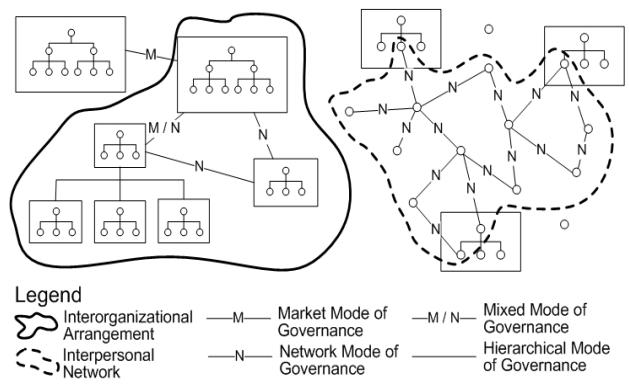
The adoption of a systemic view as described above suggests that we can dissect the systems of value creation under analysis into several subsystems. The delimitation of the system and its subsystems is a purely analytical one, containing no ontological statement [27]. For the purpose of analysis, we suggest two approaches to delimiting subsystems of value creation: First, we

conceive of inter-organizational arrangements and inter-personal networks as subsystems within larger systems of value creation in the public sector. Second, we consider e-government development and its distinct stages as subsystems of value creation. The first approach puts e-government in a wider context of public sector activity, whereas the second approach focuses on the development of IT-solutions for the public sector.

### 4.3.1 Inter-organizational Arrangements and Inter-personal Networks

An inter-organizational arrangement (inter-personal network) can be defined as a set of organizations (individuals) the interactions of which are goal-directed and predominantly coordinated by a network mode of governance. According to this definition, inter-organizational arrangements and inter-personal networks can be distinguished from their environment by the mode of governance by which interactions are coordinated (see figure 1). This allows us to distinguish inter-organizational arrangements from other forms of integration that are preponderantly hierarchical or market-based (see [4] for a discussion of different forms of integration).

If we analyze inter-organizational arrangements and inter-personal networks from the systemic perspective outlined above, both the relationships with their environment as well as the relationships among their components can be understood as resource flows and value streams. Any analysis of interactions within inter-organizational arrangements or engaging such arrangements with their environment therefore needs to focus first of all on the logics of the underlying flows of resources and values; for if they cease, the (sub)system as such will eventually disintegrate.



**Figure 1. Interorganizational arrangements and interpersonal networks.**

### 4.3.2 Value-Chain of E-government Development

Based on Agranoff's typology of "public management networks" [1], we can identify four subsystems of value creation in the context of e-government development, which constitute a value chain (see figure 2):

**Informational subsystems** serve the exchange of information and know how. Participants in informational subsystems decide individually whether they will take up any changes or actions (symposia serving the diffusion of information on present trends in e-government among the IT- and the government community fall in this category).

**Developmental subsystems** serve the provision of training, research and other services which increase the participants' capacity to implement solutions individually (cf. e-government research communities).

**Outreach subsystems** serve the elaboration of strategies for change, leading to an exchange or coordination of resources, although decision making and implementation are ultimately left to the individual participants of the subsystem. The exchange and coordination of resources may involve the common development of artifacts which in turn are implemented by each participant individually (interoperability between the partners' systems being no requirement; e.g. common development of prototypes for new e-government applications).

**Action subsystems** serve as platforms to make inter-organizational or inter-personal adjustments, formally adopt collaborative courses of action, and deliver services or ensure production in a coordinated fashion. This may involve the common or parallel implementation and use of standards or artifacts (interoperability between the partners' systems being a requirement; e.g. shared processes, shared services, the use of common standards, etc.). Action subsystems are at the end of the e-government value chain. This implies that any value creating activity within the context of e-government has to be assessed with regard to its ultimate impact at the level of action subsystems, typically reaching beyond the sphere of e-government.

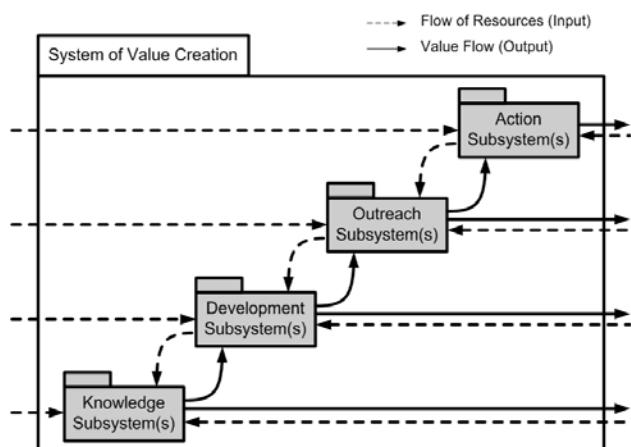


Figure 2. Value chain of e-government development.

The distinction of different subsystems in the e-government value chain reflects two insights: First, within every inter-organizational arrangement there are many different types of relationships that bind it together [22]; some form "goal-directed" networks and others "serendipitous" networks, such as networks of trust, reputation, etc. (in the present paper we focus exclusively on the first kind, although there is no doubt that the second kind has a major impact on the success of an inter-organizational arrangement or a purposive inter-personal network). Second, networks are structured differently, depending on the resources involved. Thus, Provan and Huang found that in a given inter-organizational arrangement, networks serving the sharing of non-tangible resources (such as knowledge) were less centralized than networks where relationships were based on control of material resources [22].

Similarly, Lowndes and Skelcher report in their study of urban regeneration partnerships, that the partnerships relied predominantly on a network mode of governance in the preparation stage (knowledge and development subsystems), on a hierarchical mode of governance during "creation and consolidation" (outreach), on a market mode of governance for "program delivery" (action) and again on a network mode of governance at partnership "termination or succession". In addition it was found that the network mode of governance had continuing importance in ensuring collaborative success throughout the entire life-cycle of the partnerships [16]. In a similar vein, Bouwman and MacInnes observe, on the basis of a case study examining the way a company adjusted its business model, that "[b]usiness models change as collaborating firms move from research to roll-out and maturity as a result of influence from forces such as technology, regulation, and markets. Firms will seek out new partners as they move from stage to stage" [6 (p. 9)].

#### 4.4 Models of Value Creation and Resource Mobilization

Business models are a means to conceptualize how an organization or an organizational network creates value. They usually contain descriptions of the businesses value proposition, of its sources of revenue, of the various business actors and their roles, as well as of the expected benefits of the various stakeholders. In the following, we will adopt a business model approach in order to reach a better understanding of how inter-organizational arrangements and inter-personal networks create value, and of how organizations create value in the context of such arrangements and networks (similarly, we could treat the question of how different participants in inter-personal networks create use-value for themselves). It is important to adopt both view-points – the inter-organizational arrangement / the inter-personal network taken as a whole, and the participant organizations taken individually – given the fact that "in the network context the balancing of value propositions and revenue streams between partners is a crucial task in order to achieve an incentive compatible solution for the participating players" [24 (p. 15)].

##### 4.4.1 Models of Value Creation

Research on business models in the e-government context is still scarce, the work of Janssen et al. [13] being a notable exception. Drawing on previous work in the context of e-commerce, the authors identify a number of atomic Web-based business models for e-government, which can be used as analytical building blocks to describe the logics of value creation in e-government. Building on their work, we can suggest a number of atomic models of value creation for inter-organizational arrangements and inter-personal networks respectively (table 1).

At the level of individual organizations, corresponding atomic models of value creation would point to roles or functions within the network, such as "infrastructure service provider", "value-net integrator", "content provider", "front office operator", "community broker", "collaboration platform provider", etc. They exist along with other atomic models of value creation present within an organization.

#### 4.4.2 Models of Resource Mobilization

In a similar vein, we can build on Griggs and Wild's work on revenue sources of public administration [11] in order to propose a set of atomic models of revenue generation and/or resource mobilization (table 2). Most of them may be applied both at the network level and at the level of individual organizations. Some limitations apply: Taxes and fines (and partly fees) generally contribute to a common budget of a political entity; only organizations being part of the political entity can receive money directly from the budget. In clubs and open communities, resource flows may occur in both directions: from the members to the club/community or vice versa (the member perspective is indicated in brackets). The atomic models give an idea of how organizations and networks mobilize resources.

The “club” model corresponds to inter-organizational arrangements (contributions taking either the form of membership fees, in kind contributions, or work directed at common activities), whereas the “open community” model requires the existence of an inter-personal network. The creation of inter-organizational arrangements may also be motivated by prospects for external funding.

### 5. GOVERNANCE STRUCTURES

*New Institutional Economics* conceives of governance as “the means by which to infuse *order* in a relation where potential *conflict* threatens to undo or upset opportunities to realize *mutual gains*” [38 (p. 1090)]. Thus, the term “governance structures” refers to the rules, roles and behavioral patterns which configure the way collective action occurs.

Governance structures in inter-organizational arrangements have been analyzed from various angles: focusing on the prevailing modes of governance, on internal administrative structures and their development paths, on the impact regulation and funding policies have on the functioning of collaborative arrangements, etc. [e.g., 16, 23]. Similar research exists in the field of open communities. These analyses can serve as a basis for the development of governance models for inter-organizational arrangements and inter-personal networks. This is however beyond the scope of this paper. In the remainder of this section we will therefore limit ourselves to sketching out what we suggest to be a valid foundation for a normative approach in dealing with issues of governance. The adoption of a normative approach (as opposed to a purely descriptive and explanatory one) is necessary if the theoretical framework sketched out in this paper is to be used to guide action or to evaluate existing governance structures.

#### 5.1 Effectiveness of Governance Structures

The abovementioned definition of governance implies that the effectiveness of governance structures needs to be assessed in terms of their contribution to solving collective action problems. Within the framework of our systemic model of value creation, collective action problems can be understood as organizational problems relating to the creation of value as well as to its appropriation, distribution or dissemination. The collective action problems identified in political science and institutional economics can roughly be attributed to four main types: “free riding/opportunism”, “blockage”, “congestion”, and “depletion” (see table 3).

**Table 1. Atomic models of value creation in inter-organizational arrangements and in inter-personal networks.**

#### Value-net integration

The collection, processing, and distribution of information and data from several organizations within a value-net or along a value-chain are coordinated; several organizations collaborate in a network to provide products or services to a certain customer segment.

#### Single point of contact

Provision of an organization wide single point of contact, consolidating all services provided by a large multiunit organization; front office activities of the various units of one large organization are centralized.

#### Full service provision

Provision of a one-stop shop, bundling information and services from a number of organizations for a specific target group; front office activities of several organizations are centralized.

#### Service-oriented architecture

Many organizations with similar needs in terms of functionality use the same infrastructure services provided by a single organization; a (semi-)autonomous organization concentrates and provides services to participant organizations acting as users.

#### Collaboration

People with a common interest or common objectives collaborate to create value.

#### Virtual community

A community of recurring customers or users (e.g., customers and sellers on a community-enhanced online-marketplace) interact and thereby generate content valuable to others.

**Table 2. Atomic models of revenue generation and/or resource mobilization.**

#### Advertising

Advertising space is sold on premises or websites.

#### User fees / license fees / public monopoly rents

Money is levied from users or beneficiaries of specific goods or services or from holders of a public license (various professions and trades, pollution, software, etc.).

#### Sales

Goods or services are commercialized.

#### Private sponsorship / public funding

Financing is received from third parties under particular conditions, within a given legal framework, for a particular purpose, from the public budget, etc.

#### Club / closed community: membership fees / member contributions (member benefits)

The club receives financing or contributions from club members. (Club members receive benefits from the club.)

#### Open community: contributions (benefits)

The open community receives contributions from participants, such as contributions to open source software, etc. (Participants profit from the contributions of others).

#### Donations

Financing or contributions are received from third parties without return considerations.

#### Taxes / fines

Money is levied in form of income tax, consumption tax, targeted tax or fines and attributed in a political process.

**Table 3. Typology of collective action problems.**

Type	Definition	Example(s)
Free Riding / Opportunism	Someone takes profit from the value producing activity of others without due retribution or accepts retribution for a value producing activity without duly accomplishing it.	Scientific plagiarism; opportunistic behavior in a principal-agent setting.
Blockage	Someone having control over a resource prevents others from employing it in value creating activities, and/or different resources cannot be put to use in combination because of a lack of interoperability.	The use of patents to block certain technological developments; Interoperability/compatibility problems.
Congestion	Excessive usage diminishes the overall utility of a resource at a given moment in time.	Air pollution (if negative externalities outweigh the benefits obtained thanks to the polluting activity); traffic jams, network overload, etc.
Depletion	Usage intensity or the type of usage is such that the essence of a resource is diminished or destroyed.	Over-exploitation of renewable natural resources (e.g., overfishing, overgrazing); Exploitation and irreversible transformation of a non-renewable natural resource (e.g., the burning of petrol).

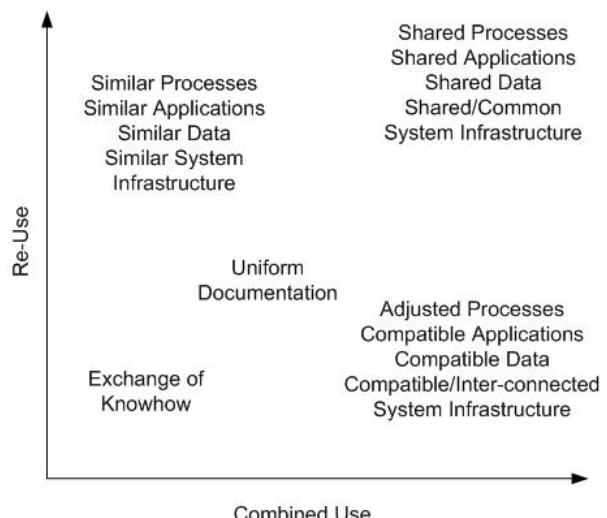
From an economic point of view, collective action problems tend to lead to underproduction or to excessive consumption of a good or a resource, putting at stake overall utility. Collective action problems vary in function of their context. One of the major influence factors are the characteristics of the goods or services concerned. Thus, economic theory distinguishes between various types of goods which are characterized by particular collective action problems. The classical typology is based on two criteria: rivalry in consumption and excludability of consumers. Originally, its focus was on the distinction of goods which can be provided in a market system and goods the production of which calls for state intervention, opposing “private goods” and “(inclusive) public goods” [19]. Further contributions to the theory have led to a deeper analysis of intermediary types of goods and to the identification of additional differentiation criteria, resulting in the description of new types. Common to all these approaches is the assumption that different types of goods are characterized by different collective action problems, which require different governance structures to regulate production and consumption.

The inherent characteristics of goods are mediated by exogenous factors, such as social practices regulating their use, property regimes defining who has legitimate control over them, or the ways in which a good or a resource can be combined with other goods or resources to create value (depending on the state of technology) [10, 19]. All these factors have an influence on the effectiveness of governance structures in a given setting. In the following, we will discuss the characteristics of goods generic to e-government (referring to the value chain of e-government development). The focus will be on the identification of collective action problems, laying the basis for the analysis of two particular types of governance structures, characteristic for the “integration” and the “transcendence” stage of e-government maturity: clubs and open communities.

## 5.2 Characteristics of Goods Generic to E-government

From a technical point of view, we can generally distinguish between four architectural layers in e-government settings: processes, data, applications and system infrastructure. The “integration” and the “transcendence” stage of e-government maturity are characterized by the fact that elements of these layers are developed and/or deployed in an increasingly coordinated fashion across and beyond organizational boundaries. Depending on

where they are located within the value-chain of e-government development (cf. section 3.3.1), inter-organizational arrangements and inter-personal networks may focus on the generation and the exchange of knowhow, or they may concentrate either on the re-use of architecture elements, on their combined use, or on both (see figure 3).



**Figure 3. Re-use and combined use of architecture elements.**

Two types of goods described in the literature seem particularly useful for analyzing the goods present in e-government settings: infrastructure resources [cf. 10] and information goods [cf. 34]:

### 5.2.1 Infrastructure Resources

Infrastructure resources may be consumed non-rivalrously and serve as inputs into a wide range of productive processes. Social demand for the resources is driven primarily by downstream productive activity. Often, the outputs from these processes are public and nonmarket goods that generate positive externalities. Traditional infrastructure resources comprise transportation, communication, governance systems, education, energy supply, and water supply. A wide range of other resources, not traditionally considered infrastructure resources, have similar characteristics: natural resources, information resources, the Internet, etc.

Infrastructure resources are associated with a set of economic problems: Costly exclusion and large economies of scale (natural monopolies) result in under-provision when provision is left to the market, and large positive consumption externalities make it difficult to measure overall utility. Infrastructure resources often exhibit network effects (utility increases with the number of users) and economies of scope. Some of them exhibit problems of congestion (e.g., computer hardware) and depletion (natural resources). Infrastructures taking the form of networks display blockage problems with regard to connection and recombination (interoperability problems) and bottlenecks (resulting from a particular network structure).

### 5.2.2 Information Goods

Information goods are goods which can be represented in digital form. Their economic characteristics vary according to the function they take in the context of an act of communication: In their function as code or as transmission media, information goods display the general characteristics of infrastructure resources – examples comprise programming languages, document formats, or software used for information exchange. They are non-rival in consumption (although the hardware on which software runs may exhibit congestion problems), and they exhibit interoperability problems (due to the existence of legacy systems, or because of strategic behavior). Information goods in their function of message/content (e.g. the text of a book) are often non-rival (with the exception of strategically relevant information) and display the characteristics of experience goods, which means that they need to be (at least partly) consumed before their value can be appreciated, which raises the opportunism problem. In addition, they are often cumulative, i.e. they are characterized by sequential and incremental innovation. In this case they display the characteristics of an infrastructure resource. In contrast, information goods in their function as unique identifiers (e.g., the name of a person, an ISBN number) are rival in use.

### 5.2.3 Collective Action Problems in E-government Settings

Based on this overview, the collective action problems present in different e-government contexts (knowledge sharing, re-use, or combined use of architecture elements) can be described as follows:

*Exchange of knowhow* is associated with medium network externalities, given relatively high transaction costs of knowledge sharing. The main collective action problems are non-disclosure for strategic reasons (which can be assimilated to free-riding/opportunism or blockage, depending on the circumstances) and the free-rider problem. Network externalities increase if a common standard for documentation is agreed upon, reducing transaction costs of knowledge and information sharing. Uniform documentation standards display however compatibility problems (blockage due to strategic behavior or existing legacy standards).

*Combined use of architecture elements* can generally be said to be associated with large network externalities; exceptions however apply concerning shared data (due to data protection issues), shared hardware infrastructure (prone to congestion), and adjusted processes (as long as process adjustment is more of a one-to-one issue between two distinct partners than a question of widely used process standards). The main collective action problems associated with “combined use” are incompatibilities (blockage due to

legacy systems and/or strategic issues). Agreement on common standards and, in the case of the combined use of data, agreement on unique identifiers is required.

*Re-use of architecture elements* can be expected to be associated with medium network externalities, given the transaction costs of knowledge sharing. Their amount varies however in function of the compatibility between systems. The main collective action problems of “re-use” are non-disclosure for strategic reasons (trade secrets – which can be assimilated to free-riding or blockage, depending on the circumstances), for reasons related to high transaction costs (blockage problem due to incompatibilities), or due to the free rider problem. The problem of non-disclosure can be eschewed when processes, applications and system infrastructure are provided in a “black box”-manner. In this case, problems due to lock-in may arise (risk of opportunistic behavior on behalf of the provider, or blockage, e.g. when support is discontinued).

## 5.3 Different Modes of Governance

According to institutional economic theory, there are three modes of governance accounting for the social coordination between organizations: the market mode, the hierarchical mode and the network mode of governance. The market mode of governance is characterized by contractual relationships over property rights mediated by a price mechanism. Markets are efficient if demand and supply are constituted by a (potentially) large number of entities, if property rights are well defined and enforceable, and if information is (nearly) perfect. If one of these conditions is not satisfied, market inefficiencies occur. The hierarchical mode of governance in turn is characterized by a hierarchical structure based on employment relationships and administrative fiat. Hierarchies are efficient if interactions are largely routine-like (based on stable roles and rules), if control, supervision and feedback are facilitated by relatively small organizational size and if organizational complexity is relatively low [37]. The network mode of governance is characterized by informal relationships, based on interdependencies and complementary interests, which are sustained by trust, loyalty and reciprocity [16]. Networks are efficient if opportunist behavior by the partners of a network can be precluded thanks to reputational concerns. This usually implies that network composition and membership have to be relatively stable.

The three modes of governance are ideal types and therefore rarely to be found in their pure form [16]. In reality, we may rather find that a particular organizational arrangement is associated with different modes of governance. In addition to the three classical modes of governance, a fourth generic governance structure has been suggested: “bazaar governance” [8], alternatively termed “peer production” [5] or “community governance” [36].

In the following we will point out why, from the perspective of *New Institutional Economics* and *Transaction Cost Theory*, inter-organizational arrangements and inter-personal networks as forms of non-market and non-hierarchical modes of governance are gaining in importance in the e-government context, and conclude this section with a short description of two ideal types of governance structures, corresponding to the “integration” and the “transformation” stage of e-government maturity.

### **5.3.1 Reasons for the Growing Importance of Non-market and Non-hierarchical Modes of Governance in the E-government Context**

Decreasing transaction costs for information exchange have led to increasing economies of scale and network externalities in the field of information goods. Different market failures occur in this context: imperfect competition due to natural monopolies, under-provision due to large positive consumption externalities, as well as other problems associated with information goods due to their character as experience goods. A private property regime may under some circumstances encourage the production of information goods, but as consumption is largely non-rival, it has only limited benefits or even disadvantages on the consumption side. Hierarchy failures, on the other hand, occur due to large organizational size and high organizational complexity. Furthermore, it has been noted that markets and hierarchies are inferior to communities in identifying and allocating creativity [36]. In the face of important market and hierarchical failures, other governance structures have proven more effective, such as clubs (in the form of partnerships, organizational networks, consortia, etc., but also in the form of closed communities) and open communities. As we enter the “transcendence” stage of e-government, we will more frequently witness how closed inter-personal networks, which often ensure the good functioning of inter-organizational networks (see for example [4] for a discussion of the critical role of communities of practice for the functioning of inter-organizational networks in the health sector), are opened up to form open communities. On the other hand, we can expect to observe more examples of inter-personal networks organized as clubs or open communities taking on parapublic functions with regard to information collection, information processing, transparency, etc.

### **5.3.2 Clubs**

“A club is a voluntary group deriving mutual benefits from sharing one or more of the following: production costs, the members’ characteristics, or a good characterized by excludable benefits” [25 (p. 335)]. Clubs are efficient forms of governance when collective production and/or consumption lead to congestion or crowding. Exclusion mechanisms ensure optimal club size, optimal homogeneity and prevent free-riding (exclusion entails however organizational and administrative costs). In the context of e-government, these characteristics are of particular interest in the face of congestion problems (sharing of hardware) and free-rider problems as well as in situations, where a certain degree of homogeneity is of advantage (e.g., the elaboration of common standards for knowledge, information and data exchange), or in cases where the need for a certain degree of hierarchical control and oversight and/or data protection issues prevent a full opening up of an inter-personal network.

### **5.3.3 Open Communities**

“A community is an organizational form for economic value creation that is characterized by voluntary membership, high autonomy and whose members receive little or no extrinsic rewards” [36 (p. 126)]. Value created by open communities is to a large extent subject to a collective property regime (e.g., open source licenses) or has the characteristics of a public good. Open communities transcend existing organizations. Furthermore, contributors exercise control over the production process [8]. Compared to other governance structures, open communities have a number of advantages: First, they are associated with important

economies in terms of transaction and production costs (no exclusion costs, no contracting costs, basically no direct monetary rewards for contributions). Second, they show important network effects – especially where future contributions remain under a free access regime (cf. copyleft licenses). Third, they alleviate the free rider problem thanks to a large number of potential contributors, large economies of scale, and network effects. And fourth, the open access regime allows for maximum overall utility in the face of consumption externalities. Drawbacks of open communities include high transaction uncertainty (no enforcement mechanisms for contributions), the difficulty to impose quality standards on contributions, and a high rate of project failure [8]. These drawbacks are however alleviated by a parallelization of tasks and projects, resulting in a high degree of redundancy [36].

## **6. CONCLUSIONS AND OUTLOOK**

The present paper has identified inter-organizational arrangements and inter-personal networks as the two distinctive organizational forms of the “integration” and the “transcendence” stage of e-government maturity. The main drivers behind them are the quest for effectiveness in the face of complexity, as well as the prospect of leveraging the efficiency-enhancing potential of information technology. Inter-organizational arrangements and inter-personal networks add value to public sector activities by integrating the work of multiple organizations and by tapping into the value creating power of open communities. A look at the economic characteristics of the resources involved in the e-government value chain reveals great potential for inter-organizational collaboration and open communities. Careful analysis of the collective action problems occurring in a given context is however needed in order to choose the most effective governance structures.

In order to facilitate this analysis we have provided a framework which can serve as a basis for strategic decision making by practitioners in the context of the public sector – such as public and private sector executives or program and project leaders eager to harness the value creating power of inter-organizational collaborations and open communities. The analytical framework underscores the importance of getting a differentiated picture of value creation and resource mobilization: it provides a multiple networks perspective and a two-sided view, considering both individual organizations and inter-organizational arrangements (inter-personal networks) as *loci* of value creation. In addition, it sets the foundations for an evaluative approach to governance structures, assessing their purposefulness with regard to their contribution to solving collective action problems and taking into account the intrinsic and exogenous characteristics of the goods and services involved.

Besides its practical use, the framework will guide further research, including a study of the implementation of the Swiss e-government strategy which draws heavily on inter-organizational collaboration in order to implement its forty-two prioritized projects. Particular attention will be paid to the role of clubs and open communities in the development, implementation and exploitation of e-government solutions as well as to the dynamics involved when public authorities increasingly move from coordination mechanisms characterized by hierarchical oversight and control to forms of co-leadership within inter-organizational arrangements and/or open communities. In addition, the present paper provides valuable insights in the field of e-participation.

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