When network governance is needed to control IT-applications used in coordination and innovation

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Abstract

The governance of network IT has become more prominent in the last decade by arising new technologies like crowd sourcing, open source and cloud-computing. This challenge IT-governance.
This paper assesses the implications of a network governance for IT.
The presented theoretical model helps to understand how companies should use arising new technologies, which tasks are suited for network-driven IT-applicaitons. The model enables to understand the tension between technical possibilities and institutional boundaries related to demand uncertainty, task complexity, human asset specifity and frequency.

Key words: Entrepreneurship, Innovation, Network-IT, IT Governance, Information technology, Network governance theory.

1. Introduction

Current governance practices are questioned by arising new international networks driven by changing institutional conditions such as the application of new ICT-technologies. A global economy is arising in which new technologies change sector conditions. Within the ‘new’ economy coordination mechanisms need to be redefined and hybrid governance mechanism seem to appear (Elsner (2004).
Critical in this development is network IT, ICT applications that enable users to share information, work together across boarders, co-develop products, and off-shore and outsource business processes. All forms of knowledge transfer are directly affected by network driven IT in which it is not always clear who is the owner of what and related to that, who can control what. The platform, the software, the applications of the software, the exchange of information and the knowledge creation is in the hands of many.
Currently, academics and practitioners are struggling with how to create new interdependencies and, related to that, new coordinating mechanisms (Elsner 2004).
Until now many popular authors focus on the opportunities, using examples as the Linux, Apple Apps and Google Android as example how companies use ICT to innovate by co-developing products. Companies do not only benefit from new ICT-applications, but have their struggles also

In this paper we combine current theory on network governance (Jones et. al. 1997), with new insights within interorganizational cooperation within IT-governance (Ibrahim & Ribbers 2009).

By developing a new model in which the adoption an governance of Network IT adoption can be assessed, we try to give insight in what types of task are suitable for a networked collaboration approach, and what type of mechanisms allow networked collaborations to be effective?

In this, we take a governance perspective. Governance indicates a set of – formal or informal – processes and decision rights that together support accountability (Jones 1997, De Graaf Herkstroter 2007). How should the topmanagement assess the relevance of certain network IT-solutions based on the objectives of the company and which the tasks - that should be performed to reach these objectives- need network IT-solutions, are governance questions. Within this governance perspective, we assume that the board will try to create new fruitful interdependencies, without become solely dependent of forces they do not know and do not control. The should be able to assess when ICT-technology should help employees of the company to freely communicate and build networks with the outside world, and when arising new technologies need to be controlled,when arising questions and topics should be discussed and solved between the walls of the individual company.

Within our perspective, we follow perspective of Jones et. al. (1999), is defined network governance as involving "a select, persistent, and structured set of autonomous firms (as well as nonprofit agencies) engaged in creating products or services based on implicit and open-ended contracts to adapt to environmental contingencies and to coordinate and safeguard exchanges" (Jones et. al. p…). They define conditions when network governance will be are should be developed.

Our paper is structured as follows. Below [section 2], we will elaborate on the emerging developments within current economies, often coined as 'new'- or network economy.

Thereafter [section 3] we will elaborate on developments within corporate governance and the arising need for network governance, partly driven by new ICT solutionss.

Within the fourth section, current development will be discussed that need network governance.

In the fifth section, we develop a model in which new technologies can be assessed. Based on the characterstics of network governance, the model explains the various modes of governance necessary to deal with arising new technological opportunities.

2. The Network Economy

The term “network economy” is generally meant to denote the business environment that has emerged as a result from ubiquitous information technology allowing access to information anytime and anywhere, irrespective of time and location. Some descriptions of this kind of environment have been described in a number of books, including those by Kelly (1998), Malone et al. (1998), Bloem and van Doorn (2006), Chesbrough et al. (2006), Fingar (2006) and Tapscott and Williams (2006).

Traditionally, the different business functions within a company were located close to where the business dictated, e.g., close to prospective customers, resources, or the decision making unit of the company. The emergence of information technology and the global spread of access to the internet have allowed much more unconstrained location of business functions and of the individuals contributing to those functions, and ultimately the delegation of responsibilities for certain business functions to other organisations (outsourcing) and/or collections of more or less unorganised individuals (crowd sourcing).

- **Outsourcing:** This is a fairly common practice, where – typically non-critical – business functions are handed over to an outside party. One of the advantages of outsourcing is that it allows a company to focus on its key business processes. One example of an industry branch that has made extensive use of outsourcing is the automobile industry, where the production of many of the components of cars has been outsourced to different companies. Deciding which business processes are key and which are not has led in extreme cases to companies that focus themselves on only one business process, e.g. Nike which is essentially a – albeit very successful – marketing & sales organisation.
- **Crowd sourcing:** An interesting phenomenon is the creation of products via the contribution of many – often without payment – professionals. Examples are the operating system Linux and the internet encyclopaedia Wikipedia. In these examples, a task is outsourced to a – often unspecified – group of individuals, i.e. the crowd, who then each contribute according to his or her interests and abilities.

We are interested for the sake of this paper in situations where a business decides to perform part of its business endeavours via a temporary collaboration with other businesses and/or individuals. The governance of the involved IT is seen from the perspective of one business, i.e. the primary business that ultimately makes the sourcing decision.

The network economy signifies a philosophy of innovation and entrepreneurship where multiple parties contribute according to their specific strengths. Although cost reduction is a typical primary objective of sourcing, other benefits derive from allocating functions to other

parties according to respective strengths, such as quality and innovative strength. The latter provided one allows outside parties to become contributors to innovation processes. This opening up of innovation processes to outside parties is also termed “open innovation”, see e.g. Chesbrough (2003).

The basic underlying assumption in “open innovation” is that there is more creative and innovative talent outside a company than inside. This talent can be tapped by making the innovation platform of a business transparent. By combining outside ideas – including those of customers – with inside business models and development platforms, a business should be able to improve upon its innovative power. A current example are the Iphone Apps, where Apple has invited the general public to develop new applications for its Iphone and Ipod products, resulting in literally tens of thousands new applications developed by outsiders, but sold through Apple’s distribution channels.

Table 1 Differences between Closed and Open Innovation

Closed innovation	Open innovation
All relevant smart people work for the company	There are more smart people outside than inside the company
The company only profits from R&D when the company explores, invents and develops in house	The company profits from other’s R&D. provided sufficient
If the company invents something themselves, they will be first to market	A company can profit from the inventions of others outside the company
Whoever communicates an invention first, is the winner	A good business model is more important than being first to market
Those who have the most and brightest new ideas, wins	Those who make the best use of anybody’s new ideas, wins
A company has to protect intellectual property to prevent others from benefiting	A company benefits from others using their intellectual property and a company should be able to use others’ intellectual property

These examples have in common that business results, specifically innovation, are achieved by collaboration between temporarily and loosely coupled entities (other businesses and professional workers). The question that arises is: how does a business manage its ongoing business and innovation while adopting ways of working from the network economy and how does a business benefit from the network economy?

Developments that are allowing businesses to allocate business functions to more suitable outside functions also are also responsible for a considerable change in the relationship between a company and its employees. Since the industrial revolution in Western economies, the role of businesses as primary providers of employment has been growing. Businesses had become by the end of the twentieth century relatively stable organisations with employees set on life-long employment. But the last decade, the number of self-employed professionals has been growing again (van den Born, 2009). While – on the one hand – companies want to be flexible in hiring and firing employees as ever faster market developments dictate, professionals – on the other hand – are becoming more aware of their value and are increasingly seeking interesting projects irrespective of the company commissioning the

project. As a consequence IT governance has to accommodate for an increasingly fleeting relationship between a business and the professionals it employs to pursue its business endeavours.

3 Vanishing boundaries: Networks, Inter-organizational governance and IT

When we assess corporate governance literature, governance is about the conflict of interest between various groups that are involved within a company. Within 1932, Berle & Means discussed the development of the modern firm in the United States. These big companies where owned by a large group of shareholders, but controlled by managers that had an own interest. Between shareholders (principals) and managers (agents) a critical conflict of interest existed, as Berle and Means claimed. Governance mechanisms should enable to create an optimal balance between the shareholder and the manager. Distrust, control, contracts and the need for transparency which would enable shareholders to make the management accountable – are key elements in this perspective. This so-called agency theory is still a guiding governments, managers and shareholders all over the world (De Graaf Williams 2009).

New societal and technological developments have led to the arisen of network governance. Within this perspective not the conflict of interest between principals and agents is central, but companies operate in networks which enables them to create 'products or services based on implicit and open-ended contracts to adapt to environmental contingencies and to coordinate and safeguard exchanges" (Jones et. al. p…).

Network governance makes the world more complicated. Critical distinctions in business, for example between the inside and the outside of the company, seem to disappear. For example, within corporate governance theory, a distinction is made between internal governance, how the various parts of the company are structured and where decisions are made, and the external governance, how the company is dealing with stakeholders, for example shareholders and the government (Gillan 1998).

A new theoretical starting point

[[ELABORATE ON TABLE 1, The difference between agency and network governance]]

Table 1. The difference between a traditional corporate governance and a network governance

	Agency perspective on governance	**Network governance**
Unit of analysis	Principal-agent	Network of companies and other relevant organisations

Control system	Contracts	Reputation
Market demand	Stable and transparent	High product demand uncertainty with stable supply
Human Resources relations	Based on stable contract settings	Customised exchanges high in human asset specificity.
Task characteristics	Well defined tasks that lead to accountable results	Complex tasks under intense time pressure which are difficult to assess by non-specialists
Boundaries of the firm	Clear and stable division of labour between costumer and supplier	Frequent exchanges among parties.

4. IT in organizations

IT is pervasive in most companies, although in different roles and in varying degrees of requiring IT governance for their the company's health. McAfee proposes a useful classification., by subdividing IT in three categories (McAfee, HBR):

- Function IT: IT supporting the execution of discrete tasks, such as simulators and word processors
- Network IT: IT facilitating interactions, such as email and social media
- Enterprise IT: IT constituting business processes, such as ERP, CRM and supply chain management

McAfee argues that Function IT requires no, or hardly any, executive involvement and therefore limited IT governance. From a network economy perspective

Network IT on the one hand requires governance to set norms for the use of such IT and on the other to determine if and how Network IT can be used to perform tasks. Typically, employees start using Network IT such as social media and blogs on their own accord. When left unchecked completely, this may lead to undesirable leakage of information and damage to brand perception, for instance. Rules stipulating what can and what cannot be communicated will help to mitigate these risks. Furthermore, Network IT can be used as a tool to perform company tasks effectively, such as knowledge management and company-wide discussions towards developing a new strategy.

Network governance (Jones et al., 1997) deals with this type of collaborative work. Network governance takes input from social network theory and transaction theory to understand the mechanisms involved that allow networked communities to achieve results and to safeguard information exchanges. Key elements to network governance are social embeddedness (i.e.

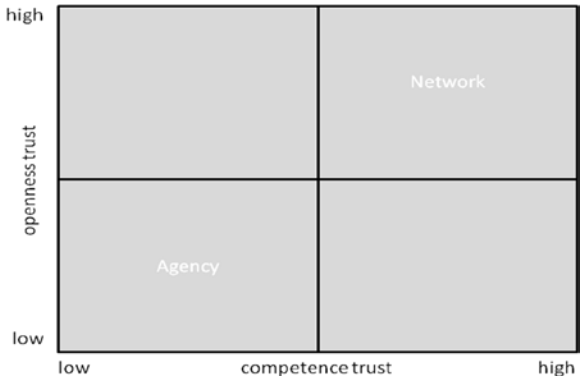
relationships are not just dyadic, but embedded in a network of relationships), informal social contracts, and reputation (i.e., some form of social commodity participants in a network seek to maximize). An interesting question is whether these three elements can be tailored to "engineer" desired performance of a particular social network.

Enterprise IT performs business processes, i.e. coincides with the way a company is doing business, and warrants therefore considerable attention to IT governance.
Developments in IT and the network economy are also changing the conditions that drive the need for and approaches to IT governance. For long, IT governance would be considered as an internal governance issue. However, technical and economic opportunities make various IT solutions currently an issue of external governance also. For example, technical advancements allow processes such as customer relationship management and payrolling increasingly to be implemented using solutions based on cloud computing. This introduces dependence on resources and functionality developed and maintained outside the organization. A step further is outsourcing of responsibility for executing processes to other organizations, possibly even abroad, to organizations not owned or controlled by those companies.

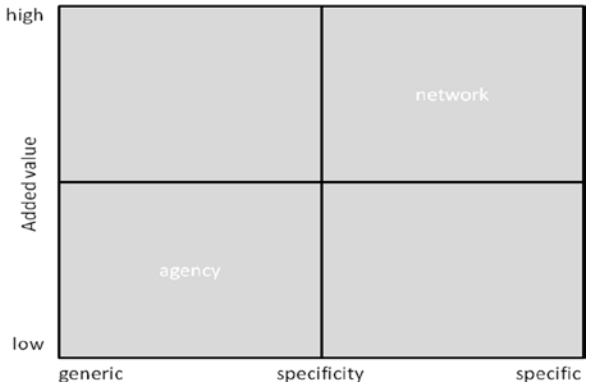
These examples also illustrate that there exist varying degrees of delegation in Enterprise IT. We argue that these varying degrees require also varying governance systems, ranging between agency governance and network governance. Certain outsourcing relationships dealing with clearly defined, compartmentalized business processes, are very well suited for an agency approach, including formal and stable contracts, well-defined tasks and accountable results, and a clear division of labour between customer and supplier. On the other end of the spectrum, we see relationships that are better suited for a network governance approach. These are relationships as defined in Phases 3 (supplier management) and 4 (collaborative innovation) in the Global Sourcing Learning Curve of Willcocks and Craig (Willcocks & Craig, 2008). We discuss several models that help assess whether a certain process and relationship is better addressed via an agency or a network governance approach.

The first model is based on (Ibrahim & Robbers, 2009). This paper discusses IT governance w.r.t. interorganizational cooperations and discuss the two notions competence trust and openness trust. Competence trust denotes the level of confidence one has in the competences of, in this case, a supplier. Outsourced tasks that require only low competence trust are those tasks that are common and not very well developed. Information trust denotes the level of confidence that a counterpart will handle information relevant to the relationship with transparency and equity. This in turn supports intensified collaboration and innovation.

Network governance appears most suited for tasks with high competence trust and high openness trust requirements. Such tasks require partners with established, but rare competences that contribute in an open, explorative style on the development of systems and processes.



Another model is derived from Kraljic's procurement matrix (1983). This matrix uses the two axes supply risk and profit impact. In our adaptation supply risk is translated as specificity. The rationale being that the more specific a task is, the fewer potential suppliers there are and the higher the supply risk is. Profit impact is translated into added value to encompass benefits that are not purely financial and do require executive attention, thus governance. In Kraljic's matrix, generic and low value contributions are related to commodities. Typically, those can be addressed wel by formal contracts and an agency governance approach. Contributions that are specific, require substantial investment in a close collaboration which is only affordable if the contribution has sufficient added value. It could be argued that a task with high specificity, but low in added value should not be addressed at all.



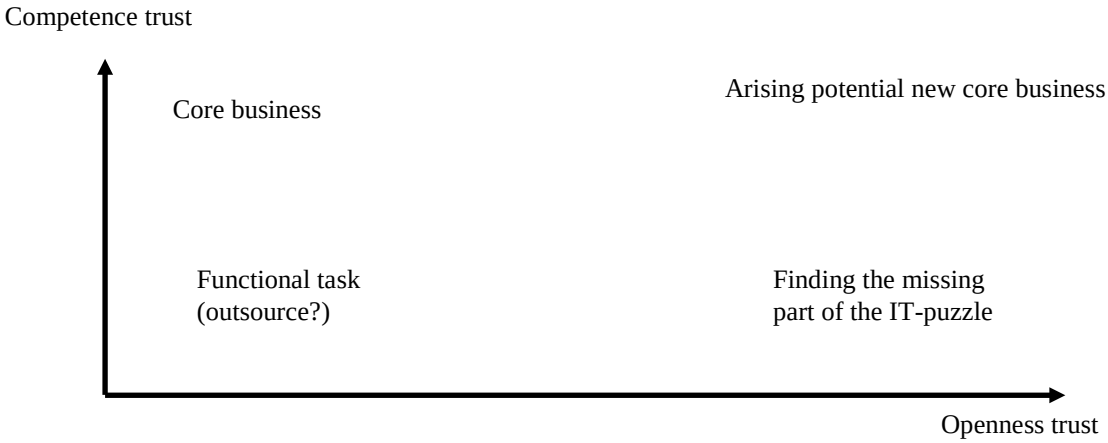
5. A model to assess Network IT within inter-organizational coordination and innovation

In this paper we combine current theory on network governance (Jones et. al. 1997), with new insights within interorganizational cooperation within IT-governance (Ibrahim & Ribbers 2009).

Competence trust orientation determined by:	Human asset specifity Task Uncertainty
Openness trust orientation determined by:	Demand Uncertainty Frequency

Based on our matrix, decision makers can decide how much competence trust and openness trust is necessary and what kind of governance measures are necessary. Also, we present more insights of the role the institutional environment in determining whether inter-organizational cooperation will be successful.

IT Competence trust matrix: When is trust in competences and openness relevant in IT governance



Logic:
High trust on competences (needed) means high human asset specifity and task Uncertainty (Example Ipod apps)

Low trust on competences (needed) means simple tasks that can be easily performed and ensured
High trust on openness (needed) means that it is uncertain how the demand will look like in detail and that the solution hardly can be found, the frequency that the solution will appear (example Android solution found in Waskemeer, small village in the North of the Netherlands)
Low trust on openness (needed) means that it is easy to formulate the demand and to fill it, normally the tasks are easy to fullfill and have a repeated character.

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