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Information Governance: In Search of the Forgotten Grail

Michiel Kooper
M.N.Kooper@uva.nl

Rik Maes
maestro@uva.nl

Edo Roos Lindgreen
E.E.O.RoosLindgreen@uva.nl

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University of Amsterdam
Department of Information Management
Roetersstraat 11
1018 WB Amsterdam
<http://primavera.fee.uva.nl>

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Michiel Kooper
M.N.Kooper@uva.nl

Rik Maes
maestro@uva.nl

Edo Roos Lindgreen
E.E.O.RoosLindgreen@uva.nl

University of Amsterdam
Business School

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Abstract

Information governance as an approach to better govern the use of information within and outside an organization is rapidly gaining popularity. A common and scientific ground for this approach has not yet been formulated. In this report the authors describe a unific definition for information governance, extending the common, one-dimensional approach into a more generic statement. Starting from the wellknown principles of IT-governance the authors further explore the aspects of both information and governance. Five hypotheses are proposed to give ground to the use of information governance. These hypotheses will be basis for further research.

INDEX

<i>1. Introduction</i>	4
<i>2. The inadequacy of IT governance</i>	5
<i>3. Inherent limitations</i>	6
<i>4. Self-imposed limitations</i>	8
<i>5. Definition of information governance</i>	9
<i>6. Value creation and information governance</i>	11
<i>7. Governance as interaction</i>	15
<i>8. Concluding section</i>	17
<i>9. References</i>	19

1. Introduction

‘Governance’ is by now a well known term in business. It has focused on the role of boards of directors in representing and protecting the interests of shareholders. A critical role for governance is to monitor and control the behavior of management, who are hired to preside over the day-to-day activities of running the organization (Fama *et al*, 1983).

Maybe its best known use is at the corporate level: ‘corporate governance’, as the set of processes, customs, policies, laws and institutions affecting the way a corporation is directed, administered or controlled. Corporate governance also includes the relationships among the many stakeholders involved and the goals for which the corporation is governed. The principal stakeholders are the shareholders, management and the board of directors. Other stakeholders include employees, suppliers, customers, banks and other lenders, regulators, the environment and the community at large (description taken from *Wikipedia*¹).

In the ICT world, the term ‘IT governance’ (or ‘ICT governance’) is well established (Van Grembergen, 2004 and Weill and Ross, 2004). It is a subset discipline of corporate governance focused on information technology systems and their performance and risk management. The rising interest in IT governance is partly due to compliance initiatives (e.g. Sarbanes-Oxley (USA) and Basel II (Europe)), as well as the acknowledgement that IT is an increasingly important element of organizational products and services and the foundation of enterprise wide processes (Weill and Ross, 2004). It consists of “the leadership and organizational structures and processes that ensure that the organization’s IT sustains and extends the organization’s strategies and objectives” (IT Governance Institute, 2003). IT governance, hence, is an instrument of strategic business-IT alignment (Henderson and Venkatraman, 1993 and Hirschheim and Sabherwal, 2001).

This article takes a deviant, information based approach, built on the observation that (1) information is the missing linking pin between business and IT and (2) information is a business resource, independent of the supporting IT. Furthermore, relevant information is more and more originating from external sources

¹ This Wikipedia page was last modified on 17 December 2008, at 01:21

and surpassing the classical IT (basically: database) formats. As a consequence, the proper *use* and *application* of information (and not only its *production*) is of vital importance and hence appropriately a candidate subject for governance. Our fundamental belief (and our premise) is that organizations with an instituted information governance process are more effective at collecting, processing and applying information and are getting more value from their and others' information sources.

Information governance involves establishing an environment and opportunities, rules and decision-making rights for the valuation, creation, collection, analysis, distribution, storage, use and control of information; it answers the question "what information do we need, how do we make use of it and who is responsible for it?". Investigating current practice reveals that many organizations, if not all, lack an all encompassing information governance policy (Economist Intelligence Unit, 2008), especially for external and free format information, and often the policies and processes they do have aren't effective.

First steps have been taken to define such policies and processes from a compliance perspective (Donaldson and Walker, 2004 and Kahn and Blair, 2004), but the aim of this article is to define and discuss information governance in a more explorative way. To this end, we first ponder the inadequacy of IT governance to deal with the decisive role of information in present-day organizations. In section 5, we explore the value of information and discuss the governance aspects to optimize the effective use and application of information. We continue with a discussion on the aspects of governance and the various mechanisms that have been explored so far. We conclude with a research agenda in information governance. This agenda is by definition a full and wholehearted attempt to combine rigor (academically speaking) and relevance (from the point of view of practice). Information governance is "rigorously relevant" both in theory and in practice.

2. The inadequacy of IT governance

Although IT governance is now widely accepted and is considered by many authors to be a powerful and necessary instrument to improve the added value of IT investments and manage IT risks at the same time, we argue that both the foundations and the current application of IT governance also suffer from serious limitations. Some of these limitations are *inherent*, meaning that they logically follow from the very concept of IT governance. Other limitations are *self-imposed*, meaning that they are caused by the way organizations apply the concept of IT governance in practice. Both categories and their effects will be described below.

IT governance includes decision making structures, alignment processes and communications tools (Weill and Ross, 2004). A definition in line with this is given by Van Grembergen (2004): “IT governance is the organizational capacity exercised by the board, executive management, and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT”.

IT governance is said to be deprived of a clear and commonly agreed upon definition and to be based on too operational frameworks, such as COBIT and ITIL (Simonsson and Johnson, 2006). Notwithstanding its operational nature (Van Grembergen and De Haes, 2007), IT governance is still considered the foremost mechanism linking investments in IT and business value; however, the concept of aligning business and IT, in itself, has been called difficult to master (Chan, 2002) and even harmful (Ciborra, 1997) and misleading (Maes, 2007). The concept of governance has been criticized from the side of systems studies (Hoebeke, 1990) as being a mechanism developed to manage the unmanageable, in this case incoherent aggregates. All activities transgressing boundaries, e.g. innovation, are then discouraged or even discarded by falling back to governance. Governance, if established in this manner, is primarily a tool of repression (Hoebeke, 2006). Besides, Carr (2003) has argued that IT is no longer of strategic importance and hence no longer a concern of top management. Despite all this, strategic business-IT alignment and IT governance still score points in any CIO survey of imperative questions.

3. Inherent limitations

The inherent limitations of IT governance logically follow from its two constituent words “IT” and “governance”.

The first major inherent limitation of *IT* governance is that it is not concerned with the way information can be created, consumed, processed and exchanged in order to add value to a business, but that it solely focuses on managing the resources that eventually must be deployed to achieve such a goal, and the associated risks. In other words, IT governance addresses the way an organization should take care of its information technology systems, but dramatically and inherently fails to address the sheer purpose and right of existence of these systems. As a result, professionals trying to find answers even to the simplest of information-related questions will find no consolation in IT governance. Examples of such questions are:

- How can we shape our management information so that management is informed timely on the actual value of relevant key performance indicators?
- How can we optimize communication with other parties in the supply chain in order to minimize stocks and lead times?
- How can we obtain a better profile of our customers, so that we can target them directly with tailored offers?

- How can we make optimum use of the fast-growing internet communities where our potential customers flock together and share information?
- How can we assure that the revenue generated by selling online content is fairly and completely represented in our financial systems?

The present concept of IT governance (Van Grembergen en De Haes, 2007 or Weill and Ross, 2004) will leave these and many other information-related questions unanswered – which is not very surprising, since it was never designed for that purpose.

The second major limitation of IT *governance* is that it exclusively inhabits the “control” half of the business universe, including administration, policymaking, responsibility, authorization, reporting, monitoring and audit. IT governance relies on the paradigm that IT investments and the resulting IT systems can and must be controlled in order to be successful. At the same time, IT governance carefully avoids the other half of the business universe, which hosts such vital elements as entrepreneurship, innovation, business development, creativity, improvisation, value creation and experiment. Advocates insist that IT governance is a valuable instrument to ensure that IT investments are aligned with the organization’s strategy (proof of which yet has to be delivered), but in our view, this merely illustrates its top-down “control” nature. It should be noted that this supposition, that IT investments should be directly derived from a top level business strategy (strategy-driven IT alignment), implies that the reverse (IT-driven strategy alignment) should not be possible.

The undesired effects of these inherent limitations are that CIOs who embrace IT governance (a) tend to over-concentrate on IT and lose sight of the information that really matters to the business and (b) tend to over-concentrate on control and spend less time on innovation and business development.

The CIO who retracts in the technology- and control-driven IT governance domain may soon lose contact with the business and its vital needs. He may not be included in new innovation projects started up by the business. Worse, these projects will be hampered by the formal policies and procedures that have been implemented as part of an IT governance framework, which will even further alienate him from the business. Thus, conscientiously implementing IT governance may widen the well-described gap between business and IT (Peppard and Ward, 1999) instead of bridging it.

Another more or less inherent limitation is that the concept of IT governance was conceived by auditors instead of IT professionals or business professionals (Overbeek *et al*, 2005); in fact, the current IT

Governance Institute, publisher of the well-known COBIT framework, used to be a branch of the Information Systems Audit and Control Association (ISACA). As a result, IT governance material bears many audit characteristics and contains “audit jargon” that may hamper its acceptance by the IT and business communities.

Other inherent limitations have been mentioned in the introduction of this section, most notably the lack of clear definitions and the fact that it is primarily based on operational frameworks.

4. Self-imposed limitations

Self-imposed limitations of IT governance stem from the way it is currently applied in practice. It turns out that even for its narrow purpose, IT governance may be difficult to implement properly.

First, many implementations of IT governance singularly focus on compliance, ignoring the part that deals with alignment and adding value. A possible reason for this is that many IT governance implementations are started precisely for compliance reasons (“because the auditor wants it”).

Second, in many cases, the implementation of IT governance does not transgress the boundaries of the IT organization. It is clear that a substantial part of IT governance cannot be implemented by the IT organization alone, but can only be implemented together with or even by the business. But for the reasons mentioned above, and adding a lack of knowledge on the specific subject of IT governance, the business is often found to leave IT governance untouched, and gets away with it.

Third, practice shows that IT governance, even if it is restricted to the IT organization, often suffers from incomplete or half-hearted implementations. Examples include impressive policy documents of dubious operating effectiveness, information security projects that are delayed or aborted altogether, service levels that remain unmonitored, and failing internal controls that remain undetected until an incident occurs. There may be several reasons for this; it has been noted that the added value of IT governance is not always clear to the IT organization, and IT governance often leads to a more formal and sometimes bureaucratic environment that is not always liked by IT professionals (Overbeek *et al*, 2005).

Fourth, governance, for some reason, is most often translated into strictly hierarchical approaches. Governance, however, includes a wide variety of solutions. More of these solutions are discussed in our section on governance approaches.

So by all kinds of self-imposed limitations, which admittedly are aggravated by the inherent limitations described above, IT governance is not always effective for its originally intended restricted purpose. In fact, there are many examples of organizations that have invested substantially in IT governance but that are not so successful from an IT perspective, if failed IT projects, network outages and security incidents

are a measure. At the same time, there are many examples of successful companies that do not excel in IT governance (Weill and Ross, 2004). Apparently, IT governance is neither sufficient nor necessary for success. Clearly, a new approach is needed.

5. Definition of information governance

To this extent we introduce ‘information governance’ as a logical alternative, focusing on the use and application of information and not only on its production (systems). Information governance is not a new term, but the proposed definition in this article is different from the approach in existing literature. Information governance was introduced scientifically by Donaldson and Walker (Donaldson and Walker, 2004) as a framework to support the work at the National Health Society on security and confidentiality arrangements to apply at multiple levels in electronic information services. More recently a report was published by the Economist Intelligence Unit (Economist Intelligence Unit, 2008) on the use of information governance in enterprises. Information governance in these approaches typically includes records management, privacy regulation, information security, data flows and ownership, and information lifecycle management.

The explorations so far all show the potential pitfall to rely on ‘old principles’, by introducing a hierarchical control framework without exploring the possibilities of alternative governance approaches. We will explore a wider view on information governance as a basis for further research. Similar to the previous sections we split our approach in an ‘information’ part and a ‘governance’ section thereafter.

Information has several unique characteristics, which render it difficult to value. But independent of its content (financial information, client information, etc), generic principles on understanding the value of information can be defined. Information is an unusual good in many aspects—production, distribution, cost, and consumption. Information is both an end-product and an instrument or input into the production of other goods, decisions, and information (Rafaelli, 2003). It is expensive to produce and cheap to reproduce (Shapiro and Varian, 1999). The value of information is subjective, since it may be more useful in satisfying the wants of one person than another, or of no use to one person and of use to another. Huizing (Huizing, 2007) describes in his paper, that the difference between IT and information is the human aspect. Giving meaning to information is a human element and by definition subjective, since objectivism cannot deal with the human sense making. The governance of information should therefore be considered with the inclusion of the human element to understand and utilize information’s value to the business.

Information has many definitions (Pijpers, 2006) and by itself is more or less without value. By giving means to the information it has value to a person. In general, any actor, receiving or consuming information, will give meaning to the information that he or she encounters. At the same time, information that the ‘consumer’ or ‘receiver’ of information encounters is always produced by some actor (the ‘producer’) in some format, which implies that production of information cannot be without any subjectivism. Information Governance should therefore include the human interaction with data and the underlying systems.

Finally information should always be viewed within its context. Therefore we follow Pijpers, noticing that information can only be evaluated with an awareness of the context in which it is being interpreted. Context is an element of the *information environment*, which incorporates all the factors affecting how an organization deals with information (Davenport and Prusak, 1997). Similarly to the information environment, Huizing and Bouman (Huizing and Bouman, 2002) describe the *information transaction space*, which ‘represents the set of all possible information exchanges – economists say transactions – available to any actor at any time’. If an organization wants to influence these exchanges, if possible at all, some form of governance should be introduced, and accordingly, a governing actor to guard these governing principles. Therefore we introduce the ‘governing actor’, the third actor involved, as a representative of an organization and a determinant of the information transaction space, being able to influence the interaction between the producer and the receiver of information.

Summarizing the above, Information Governance may be viewed as a way for an organization to deal with the use of information between the actors involved within the information transaction space. Based on these considerations we propose the following definition:

Information Governing:

The totality of interactions between actors that realize their goals using information they have in common, establishing a normative foundation for all those activities.

Information Governance:

The totality of theoretical conceptions and principles related to information governing.

With this definition we follow the approach by Kooiman (Kooiman, 2007), splitting our definition into Information Governing and Information Governance to stress that various conceptions and principles may apply to the governing of information.

6. Value creation and information governance

One may view information governance as a way to optimize the value of information in some sense to the actors involved. Our definition leads to the question to whom the value is optimized, and what the dependencies are to enable optimization of the information value. Obtaining a better understanding on the optimization of the information value and its dependencies will give a basis for the choice of a matching governance concept.

To answer the first question ('to whom is the value optimized') we consider the actors involved, as discussed in the previous section: the producer, the receiver, and the 'governing actor'. All three may reflect one or more persons (single person, group, group of individuals). The governing actor may be viewed as the actor who is governing the 'interaction' between producer and receiver within the information transaction space. All three (groups) will give value to the shared information and to this respect the optimization of the value will depend on the value that is given by the three actors involved. This leads to our first hypothesis on the value of information. In the continuation of this section we will describe five hypotheses. They will be stated here, but not 'proven'. They will provide a basis for further research, as described in the concluding section.

HYPOTHESIS 1: a 'successful' implementation of an information governance approach will lead to an optimal balance of the information value to the three (groups of) actors involved

We use the term 'optimal' instead of maximal because of two reasons:

- 1 Maximization would imply that the value of information can be measured. However, this is questionable since no objective measurements can be applied (by definition). Possibly some form of classification may be introduced, that will be helpful in the valuation of information;
- 2 Since three actors are involved and information is subjective by definition information governance may establish an 'optimum' that is acceptable for all the actors involved. Since they all may have different perspectives it is better to consider the 'optimum' instead of the 'maximum'.

To answer the second question in the beginning of this section ('what are the dependencies to enable optimization of the information value') we propose three hypotheses, each with an emphasis on the role of one of the three actors:

HYPOTHESIS 2: the optimization of the value of information to the actors involved will depend on the reliability, relevance and usability of the information to the receiver and the way the information enables the receiver to take action

For example, a financial report may give value to a CFO, who is able to interpret, for example, the 'financial health' of a business unit, based on the given numbers. In this case the report may come from a controller, who is highly trusted by the CFO, and who always delivers a report with an extensive oral clarification and analysis on the status of the specific business unit and who ends with an advice on the actions to be taken by the CFO. With this approach the report is relevant to the CFO, due to the approach of the controller. The CFO is able to take action based on the received information. He trusts his controller and the systems that were used by the controller, based on confidence, but probably also on the controls that were incorporated (such as an audit on systems and data, and a number of system controls). The reliability of the information in this example is therefore easy to verify and both relevance and reliability support optimization of the information value to the CFO. If none of this applies, then the CFO will probably take no action. The value of the information to both receiver and producer would then be worthless.

Besides reliability and relevance of the information the usability of the information is a factor that may contribute to the optimization of the information value to the receiver, because it determines the way the receiver takes action. Information use involves the selection and processing of information in order to answer a question, to solve a problem, to make a decision, to negotiate a position, or to understand a situation (Choo, 1998). Many person related factors play a role in the process of making use of the information, such as level of subjectivity and level of intersubjectiveness between producer and receiver (Huizing, 2007), but also culture, physical context and mental frameworks (Putnam, 1983).

HYPOTHESIS 3: optimizing the value of information to the actors involved will depend on the environment wherein information is shared. This can be influenced by the governing actor through the governance of the related information interactions (producing and receiving information), which follow the principles of economic, political, financial and social mechanisms.

This hypothesis covers the most complex, but most interesting part of this section. With our introduction of information governance we aim to move beyond the regular boundaries of information management, taking into account the possibility to influence the valuation of information through the governance of the interaction, or the information flow. This hypothesis is supported in Huizing and Bouman (2002), who

describe an example of the information transaction space from a knowledge management point of view. In this paper they developed 'a dynamic framework for managing the information transaction space and ground it into an economic theory, integrating the coordination, cost, and learning perspectives on this subject'. Moreover, they evaluate four possible governance approaches to manage the transaction space.

Raban (Raban and Rafaeli, 2003) note that: 'another view on the viability of the information society is by assessing the vitality of information exchange and flow within it'. In some cases this may be a one-way issue, but more often a flow goes back and forth until consumer and producer have reached the same level of understanding (Griffith *et al*, 2003).

At one hand the governance of the interaction(s) will depend on the aim of the governing actor, responsible for the governance of the interaction(s). He may want to strictly control the process and outcome of the information flow, more or less independent of (the value to) the receiver, e.g. a CFO wants to control all information that ends up in the annual report. In other cases the governance will be set up to facilitate, creating an environment where information flows can meander freely (e.g. creating a content specific community to support employees in sharing knowledge), so that the synergy between receivers and producers of the information may reach its optimal value. A third aim may be to organize the flows in order to optimize the effectiveness for the receiver of the information.

At the other hand the information flows follow rules of economic, political, financial or social mechanisms. This is clarified through an example on social mechanism; in some countries police departments are yearly evaluated on a number of performance indicators, giving insight in their policing activities through the year. An example of such an indicator is the total number of speed tickets distributed through the year. Although the number of speed tickets can be measured objectively, it appears that most departments are able to reach the required standard every year. Having a closer look shows a consequent peak in the number of speed tickets in December. Apparently the police departments put more effort in giving speed tickets at the end of the year to obtain the required standard. Consequently other activities may be neglected in that month. It is questionable whether the effectiveness of the police department is optimal due to this behavior. On top of that is the value of the performance indicator worthless, because it does not give a good insight in the policing activities of the departments through the year. The information value for all actors involved is not optimized. It shows that the information flow regarding performance indicators leads to a desired behavior, a social mechanism. Taking this into account, applying effective information governance would probably lead to a system where performance indicators are measured at random instead on a yearly basis.

Similarly, economic mechanisms in relation to information flows play a role. Especially because information is costly to produce, but very cheap to reproduce (Shapiro and Varian, 1999) people are conscious to share information without a reward. One may state that 'useful' information does not come for free. Setting up and governing an information flow will require attention to these mechanisms.

To complete the optimization of the information value we will define a hypothesis on the third actor, the producer of the information. The producer may either construct the information himself, but may also be an aggregator, consolidator, maintainer, or assimilator of information, produced by others. It's not an enviable job, usually balancing between various stakeholders of the information. Therefore the fourth hypothesis focuses on the constraints to the producer of the information.

HYPOTHESIS 4: optimizing the value of information to all actors involved will depend on the constraints for the producer of the information

The position of the producer is better understood when we consider the range of constraints that is possible:

- There are legal rules and regulations, that prescribe the way information is exhibited or that restricts the publication of certain information
- The information in the information flow may be produced solely for this flow, but often the information is based on data with multiple purposes. This may lead to constraints in the availability and usability of the data
- If information is not directly available, costs have to be made to produce the required information. Costs may therefore be a constraint (Huizing and Bouman, 2002)
- The position of the producer in the organization and his relation to other actors and/or stakeholders will strongly determine the ease to obtain the necessary information for the flow.

In most cases an information flow does not have a one-way direction, but goes two directions. In that case the hypotheses 2 and 4 are interchangeable. The last three hypotheses imply that interchanging information and optimizing its value is a play between three (groups of) actors. The choices to optimize its value will have an impact on the design and organization of the information processes and its underlying systems. Focusing solely on one actor, for example by optimizing the information systems on the producer side, may lead to sub optimization. Therefore information governance takes all three actors into account.

Approaching information in this manner is closely related to communication disciplines. But our scope focuses on the information aspects, and not on the communication aspects. In more detail, we are focusing on giving meaning to, e.g. ‘financial information’, but not on the way a CFO gives a press conference to explain the numbers. Other related disciplines are ‘information behavior’ (Julien *et al*, 2009), information management and information management compliance (Kahn and Blair, 2004), and knowledge management and the learning organization (Choo, 1998, Senge, 2006).

7. Governance as interaction

Governance is generally interpreted as a hierarchical framework for guidelines, policies, responsibilities, and procedures to ensure a certain level of control within an organization. But the definition of information governance does not necessarily restrict its use to one specific framework. Information governance may vary from a set of policies, a way of working, or the creation of a space within a predefined settlement (such as an online community), or it may as well apply to a framework of strict (accounting) rules within a country (such as IFRS, the International Financial Reporting Standards). As we previously discussed we question the one framework approach to governance in relation to the use of information. Other frameworks for governance may be more effective to govern the use of information, especially since information exchange does not restrict itself to the boundaries of an organization. In the past years the work of Kooiman has been generally accepted as a major contribution to governance approaches, both in theory (Kooiman, 2007) and in practice (Kooiman, 2005). In this section we will discuss the approaches he proposed and the relationship we envision to the use of information.

The basis for governance, according to Kooiman, is the interaction concept. Actors within a certain environment interfere, collaborate and are involved in many interrelations. Actors by themselves do not have the knowledge required to solve complex, dynamic and diversified societal challenges that come along. They will need a governance *approach* to streamline the patterns of interactions.

Kooiman defines three governance approaches as a way of governing. The *hierarchical approach* can be considered as the ‘classical approach’. It has been around for many years and is traditionally the basic for a way to govern an organization or a state. The hierarchical approach is based on steering and control (Kooiman, 2007). The key element of steering is ‘direction’, and control is the way to give the ‘insurance’ that rules are followed. In modern times this kind of governance is moving from command to regulation, from procuring to enabling and from benevolence to activation, but the basis consists of a centrally directed approach, including a structuration framework, using structure and agent concepts. It is a topic for discussion whether such a framework is always effective for all forms of information governance, since

sharing information, formally and informally, is not necessarily restricted to organizational borders. The fleetingness of information makes that implementing controls may barely give sufficient insurance that the use and sharing of information is under control. How people act with the sharing and use of information is not based on the trustiness of the information, but on the value that is given to the information. Hierarchical designed control will probably not hold them back to share information in the way they prefer. On top of that is information hard to produce, but easy to reproduce. It is therefore easy to uncontrollably share information.

In his book Kooiman defines two other approaches of governance, known as *co-governance* and *self-governance*. The essential element of co-governance is that the interacting parties have something 'in common' to pursue together, that in some way autonomy and identity are at stake. A good example of co-governance is the governance of networks. This is a research field in development, that started with Castells (Castells, 1996), but with more recent developments on the governance of networks by Provan and Kenis (2008). Co-governance includes key forms of 'horizontal' governing: actors communicate, collaborate or co-operate without a central or dominating governing actor. When the actors involved and their relationship are known, this may be the basis for the way to share information in an acceptable manner. Although the formal relationship may be hierarchical, for example in a client-supplier situation, the way to share information may be based on a more horizontal governing. Co-governance may lead to a higher willingness to share information or to guarantee a higher level of reliability of the shared information, because a commonly agreed set of rules has been defined and effectuated.

Self-governance refers to the capacity of social entities to govern themselves autonomously. Internet communities are often set up in a more or less self governing manner, where, during the process, values and norms may be defined on the way information is shared. Kooiman speaks of informal agreements, self-applying rules, and also semi-formalized codes of conduct. Other examples can be found in mass psychology, for example in the work of van Ginneken (2009). Self-governance may be an effective approach to decrease the chance that sharing information will be abused and to increase the chances that the use of information will be optimized in some sense.

The approaches of Kooiman offer a wide range of possibilities on the governance of information, each of them with its own capabilities and flaws. It leads to new research questions on what approach may contribute to a successful form of information sharing, for example by giving enough space to innovate with information, or to mitigate the risks of information abuse. We end this section with a hypothesis that relates the actors and the governance approach that may be applied:

HYPOTHESIS 5: there is a direct relation with the constellation of the actors involved and the effectiveness of the (information) governance approach.

As we discussed earlier the optimization of the information value is related to the three (groups of) actors involved. These actors do not necessarily belong to the same organization. For example, producer and receiver may belong to different organizations and the ‘governing’ actor may be part of either one of them. In this case the ‘optimal’ governance approach might be a co-governance form, such as a network governance approach. Other examples and approaches may apply as well.

8. Concluding section

The broad definition of information governance that was given in this paper offers opportunities for a different approach to governing the information interactions within and outside an organization. We explicitly put effort in the thought that governance should not be viewed as a hierarchical framework; this approach may even be contra productive in relation to managing information within a certain environment.

With the hypotheses proposed we give direction to further research that may be valuable in the field of information sciences. Research themes to be considered are:

- 1 The optimization of the information value (Hypothesis 1): how is the value of information defined and is there a way to describe its optimal value?
- 2 The role of the receiver (Hypothesis 2): how is the receiver influenced to take the action that is to be desired? Related research comes from Choo (Choo, 2008), who made an analysis on the social use of information in organizational groups. It shows that group discussions are fraught with difficulties. Groups tend to focus their discussion on information that is common to most members at the expense of unique information known to few leading the group to make more extreme decisions than what individual members would do on their own. Similarly Griffith (Griffith *et al*, 2003) propose a number of hypotheses on collaboration within groups and the role of information systems as a ‘jealous mistress’, more specifically in relation to virtualness of the teams. A study on various governance models to be used may lead to higher effectiveness of information sharing and decision making within groups
- 3 The role of the governing actor and the governing approach (Hypothesis 3): we already referred to Huizing and Bouman (2002), but the research on this topic should be extended to other varieties of the information transaction space. E.g., with the growth in organizational networks questions have come

up on the effectiveness of a network (Provan and Kenis, 2008). For example, policing departments within a country are often not hierarchically dependent, but work together in networks. By sharing information they may come to new insights that were not available based on information from one source. Effectiveness of sharing information within such organizational networks is closely related to the topic of network effectiveness. From an information governance point of view it is a challenge to explore various governance models within networks to optimize the sharing of information.

- 4 The role of the producer (Hypothesis 4): interesting to this extend will be the multipurpose usage of information. What effect will it have on the producer of information and how should he deal with the various stakeholders?
- 5 Finally, hypothesis 5 on the constellation of actors offers many research opportunities. What constellations are to be considered? What elements of a constellation will have an effect on the optimization of the information value?

This paper will therefore be the start for a new area of research within the rich field of information sciences and may hopefully be a basis for new insights to come.

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