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What is IT governance and how can it become a problem – an illustration from the Finnish electronic prescription system project

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ABSTRACT

Governance structure is nowadays an extensively used concept both in management and IT literature as well. Yet the concept seems to be less than established. In this paper we tackle the concept from three points of view. First, we run through a literature study on the concept of governance structure. Second, we build a tentative framework on issues that organizations and their stakeholders, first and most importantly their management, meet when thinking about governance structures. Third, we deliver an example of how the governance structures became a problem in the case of a Finnish national IT project, the introduction of a national electronic prescription system. The project should serve as a prime example on how things can go wrong because of neglecting governance structure issues, even when the conceptual designs and technical solutions are there and would work in a satisfactory way. Our conclusion is that governance structure –related issues and problems can be many and difficult to foresee. However, neglecting them can be disastrous for an IT-project of any kind.

Keywords

Governance structures, IT governance, electronic prescription, IT project management

INTRODUCTION

Let me first portrait a short history how I became interested in “governance structures”. I believe my story is representative for many researchers active on governance structures. I personally found the world of “Governance” after I had studied outsourcing activities for some time. Then, suddenly, talk about “insourcing” emerged and my concepts were devastated. I started to look for an overarching concept, and understood that this in- and outsourcing was actually about governance. Through my earlier research on the transaction cost approach the concepts of markets and hierarchies also fitted nicely to this concept of governance. I suddenly understood that actually I had been a “governance structure” researcher for a long time.

For many there is a temptation to understand governance as just a synonym for management. This is an oversimplification. Management is a goal-oriented activity, whereas governance is often given from outside, and organizations just have to live with it. This is not to say, that all governance structures would be beyond management control: most governance structures management can influence – at least on the long run. The long run is a key term in many aspects: When referring to governance structures we talk about structures that are semi-permanent and not adjustable very easily.

So are either the terms “organization form” and “governance structure” not synonyms. Organizational forms are more formal and touch upon one organization, whereas governance structures are found in a richer selection of forms, and organize themselves over a number of organizations.

The concept of a governance structure is by no means settled or well defined. We define a governance structure here in a very flexible and broad way as a

“structure giving meaning and rules to an exchange relationship”.

Lately we have seen many writings simply stating that governance structure is a synonym to management. Governance issues would be those of management issues. We see management is a concept different from governance structures: management is action and governance is a structure. Of course management is needed in the case of governance structures, and governance structures also exist for management.

Our research question in this article is embedded to the title of the paper: “*What is IT governance and how can it become a problem?*” This paper is kind of polemic in the nature: the goal is to wake up decision makers to be alert to governance structure problems.

Methodologically this paper contains shades of literature analysis and conceptual model building. The most important part is however the empirical work with the Finnish national electronic prescription project, that gave the very idea for this paper and which has also been reported in many other papers of the author and his research group.

The empirical work in total involved some 18 man-months of work during year 2004 and contained a variety of data collection methods: user surveys, process descriptions, questionnaires and interviews, group discussions, test runs of the software, etc. In total 7 researchers were involved.

The group interviewed contained members from different interest groups of the electronic prescription system. The most important groups were:

- The project group working on the electronic prescription (software houses, health care organization and pharmacy representatives, national experts for health care information systems)
- Regulatory authorities
- Pharmacy management
- Health care organizations management
- Pilot users of the various versions of the new electronic prescription system.

During the research work, experiences from abroad were also collected. The similar initiatives in Sweden, Denmark, Holland and Great Britain were studied.

The empirical work was covered with the overall assessment question: “*How is the Finnish national project for electronic prescription doing and what could be done to improve its performance?*”

The rest of the article unfolds as follows: In the section 2 we run through a literature study on governance in general and in IT environment. In section 3 we provide a tentative classification of problem domains in governance structures, and in section 4 we discuss the case project of ours in the light of the framework in section 3. Finally, conclusions are drawn in section 5.

We approach our study here from the IT governance point of view. The project described here falls into several classical mistakes defined in the IT project management literature (Marble 2003; Pressman 1996). Among these are:

- Unclear project goals
- Bad project management
- Too few human resources
- Lack of top management support
- Unwillingness and inability to change the processes behind the IS solution.
- Unrealistic timetable.

Each of these problems could be a topic of its own article. We do not anyway take these issues to the foreground because of the following reasons:

- these issues are well and deeply discussed in the scientific literature
- these issues were well known and documented in the Finnish setting
- We feel that these issues and problems are all subordinate to the governance issue discussion and problems.

The governance issue discussion, however, was totally neglected in the Finnish discussion. We do not speak of an IT project governance, as the electronic prescription system was meant to be stable infrastructure-kind of structure. There surely have been governance problems in the project itself, but the main inhibitors for success are the permanent governance structures of the whole industry behind the system. We want especially to sort out how the industry-wide governance setting is causing difficulties to the setting. We also understand governance here in an inter-organizational setting.

LITERATURE REVIEW ON “IT GOVERNANCE STRUCTURES”

Governance structures are used in many disciplines. Naturally the topic suits to *political science*, where government of the citizens and organizations is central topic. *Economics* is a natural place to study governance structures, and here it is very much about economizing exchange transactions (Williamson 1985; Williamson 1989), typical examples can be seen in (Madhok 1996; Mylonopoulos et al. 1995). The most diverse and recent application area is *management*, including information systems management, where governance structures can be applied in many ways. As we discuss of contracts, *law* is a natural background discipline. On the contrary to the tradition in economics, in management governance structures are not just used for economizing purposes, but exchange relationships can be seen as tools for many organizational goals. Information technology governance structures are discussed here as a subtopic on management governance structures. Here management is focused on information resources.

Governance structures exist in many levels. Any exchange relation between two parties needs some kind of governance structure. Even when organizing their own personal activities, people naturally use some kind of reference frame, a governance structure. A governance structure has a relation to the roles individuals carry. The same person is sure to behave differently, also to have different governance structures for exchange relationships, say in the roles of a husband, father or boss. Running the analysis on an organizational level, we can define between intra- and inter-organizational governance structures, the discussion on intra-organizational governance structures dominating the field (Sambamurthy et al. 1999). Our analysis in this paper is performed at the inter-organizational level, because

- The electronic prescription clearly is an intra-organizational system
- This level of discussion is less developed in the IT field than the intra-organizational theory formulation.

Our definition of governance structure given in the introduction conveys many details. First, the term *structure* refers to something stable that will last over a long period. Governance structures are sure to change over time, but economizing exchange relationships necessitates that governance structures are of lasting nature. Should governance structures change all the time, no exchange relationship would be on a permanent basis.

With *meaning* and *rules* we refer both to the motivation and *guidance functions* of exchange relationships. As governance structures are there to guide exchange relationships, it is natural to expect that they try to foster them. As meaning refers to something meaningful, governance structures of course try to eliminate negative behavioral effects in exchange relationships, such as opportunism (Conner et al. 1996; Dickerson 1998; Genefke et al. 1997; Lyons et al. 1997; Nootboom 1996), bounded rationality (Simon 1991) and information asymmetry (Seidmann et al. 1997; Wang et al. 1995; Xiao et al. 1998), moral hazard (Jeon 1996), small numbers bargaining or negative network externalities (Kauffman et al. 2000; Koski 1999; Shapiro et al. 1999).

The *rules* or *guidance functions* contain three types of rules on how an exchange relationship can be entered

- rules on how to perform an exchange relationship
- rules on how to control and follow-up an exchange relationship.

For example, certain exchange relationships can be reserved just for qualified partners. Just certified partners are entitled to run many transactions, say buy and sell options in stock exchanges or sell medicines. Rules on how to perform exchange relationships can be many and detailed. As a control mechanism should be seen as a permanent entity, it should have some control mechanisms that will foster successful exchange relationships and eliminate bad exchange relationships on the long run.

Finally, the *exchange relationship* can be understood in many ways. First, an exchange relationship can be seen as a transaction, where the relationship between the transaction partners is usually both short and well defined. The other end of the continuum is a long-term relationship. Further the exchange relationship can be onerous, or happen without any visible or instant payment. The object of the exchange relationship can be any, including information, which role of course gains in importance in the information society.

Inadequate governance structures can be a major problem. In the field of electronic government, many applications are for example waiting for proper electronic signature arrangements. This is a governance structure problem, not a technical problem. Candidate electronic signatures are many and they are mostly technically feasible, but the field is lacking proper legislation and leading standards. To take another example, digital television or the third generation mobile phone networks and solutions are not proceeding as expected because of missing standards and shortcomings in relevant business models. Actually governance structures are closely related to business models, but still not the same thing.

A FRAMEWORK OF GOVERNANCE ISSUE WORKING DOMAINS

In this section we build a framework of the governance structure issues. Our framework is both tentative and simple. The goal is to give a kind of classification of the problems and issues managers and other organization stakeholders might meet in their work on governance structures.

Governance structure problems are always emergent and difficult to foresee. Usually they are intertwined in a complex network of causal relationships, and solving one problem may wake up another. However, we feel that a model of the governance structure issues is needed. We call this model the “The working domains for governance structures model”, and it is graphically presented in Figure 1.

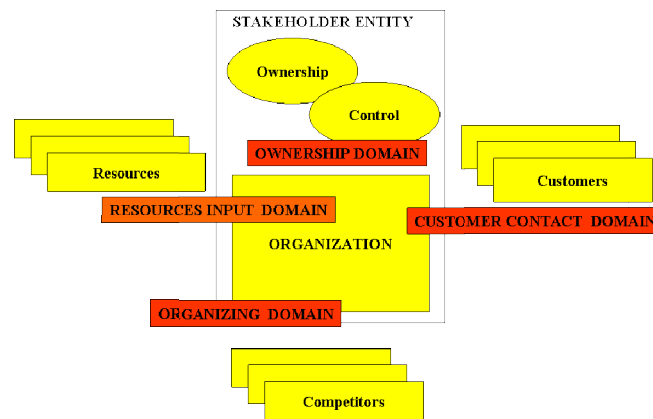


Figure 1. The working domains for governance structures model

Our model structures governance structure issues into four domains:

1. ownership domain
2. resources input domain
3. organizing domain
4. customer contact domain.

These domains are areas for management actions. As said they are intertwined, but for analysis purposes we need some simplification.

An important starting point is that any organization is tightly in a relationship with its owners and controllers. Together these form an entity that is not named clearly in management or organizational sciences. In our model we call it a stakeholder entity: a group of parties having a joint interest. Within this entity the most important governance structure decisions take place: we call this entity the ownership domain.

Any organization needs different kinds of resources as input. These are classical entities such as capital, knowledge, workers, raw materials etc. Organizing the way how these are attained is having to do with the resources input domain.

Further, every organization exists because of some customers it has. Relationships with those customers are managed in the customer contact domain.

Finally, we have the organizing domain. It is very complex and contains many complicated issues. The big question is what to make self and what to buy from the markets, and whether to do these in co-operation with competitors or rather alone. Further, many issues emerge in internal organization, also in the domain of own activities.

As said, the ownership domain is very decisive and dominant. Because of different ownership and control arrangements, organizations often have to organize their governance structures even in the resources input, organizing and customer contact domains differently than what they would do without a strong owner and controller.

Next we shortly go through examples of governance structure issues in each domain. The discussion is of illustrative, not of exhaustive character.

Ownership domain

The ownership domain is the most complex and decisive in governance structure design. Two central elements are ownership and control which usually move hand in hand, but not always, which state would bring even more complicatedness to the governance structure.

An organization might have a strong ownership and control structure, or it might enjoy very big independence. These are issues that can be designed when governance structures are discussed.

The traditional way of looking at governance structures is focused on the ownership and owners' working in the organization's board, as for example defined in (IT Governance Institute 2001) in the case of IT governance:

“IT governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and 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.”

Information technology is also there to support the fulfillment of organizational strategies and objectives. Governance structures must be designed so that these are effectively defined and communicated to the persons responsible for the information system. In the worst case, the governance structure fails to identify relevant organizational strategies and objectives. In an inter-organizational setting this ownership function becomes even more important: objectives for the inter-organizational information systems can not be deducted from the stated goals of the host organization, but they must be genuinely negotiated in an open setting.

The ownership domain might also have a deep impact on the other domains. For example, ownership or control issues might have an effect on the organizations decisions from where to buy and what, which customers to serve, and with whom to co-operate. Several organizations may have a joint owner and control unit, and it is natural that the joint owner and controller wants to see co-operation between the units it controls and owns.

Resources input domain

Here decisions on how to cater for different factors of production are catered for. The area is tightly integrated to the organizing domain, and different make or buy decisions, independently or in co-operation with different competitors/co-operating partners, are of key importance.

A typical governance structure decision here is whether inbound logistics should be performed based on long-term relationships, or rather on individual transactions on spot-type markets. A further relevant issue is that of computer network support, especially in the case of the individual transactions choice: are for example computer network markets such as Internet auctions used or not.

Organizing domain

Organizing domain also has a complex set of governance structure choices to make. A central question is that of internal transfer prices and internal charging.

Location of activities, including information systems, is a central governance structure design issue. In addition to complete decentralization and centralization as main alternatives a lot of other options exist.

Designing for organization internal communication and control is a central governance structure issue. It must be solved what is the right amount of control/independence for different types of activities and decisions.

Customer contact domain

With the customers, each organization has the moment of truth. Here, the issue of long term relationships/short transactions is also of key importance, but the decision power usually lies with the customer, and the seller can not always design these issues.

A key governance structure design issue is, how much to integrate with the downwards delivery chain. Integration can happen through a multitude of ways: joint offerings, ownership, joint information systems, joint customer bonus programs... you name it.

WHEN GOVERNANCE STRUCTURES BECAME A PROBLEM: THE FINNISH NATIONAL ELECTRONIC PRESCRIPTION PROJECT

Ever since late 1980s there have been several pilots in Finland trying to develop a system for mediating medical prescriptions electronically from doctor's offices to pharmacists. Different technologies have been tested, e.g. smart cards and e-mails mediating prescriptions through local servers (The Social Insurance Institution of Finland 2001). Most of these early projects were initiated by technology providers, serving foremost their interests (The Social Insurance Institution of Finland 2001).

Our case discusses the latest Finnish national-level project. In 2001 The Finnish Ministry of Social Affairs and Health initiated a project to establish a system for electronic prescriptions to Finland. The original goal was to have the system running by the end of 2004, which was never achieved.

The initial studies (The Social Insurance Institution of Finland 2001) on different governance structures for the system concluded with a recommendation for a model based on centralized prescription database, hosted by Social Insurance Institution (KELA). The solution model is graphically described in Figure 2. In our international comparison studies we have got the impression that this is the only concept with a totally central national database so far planned.

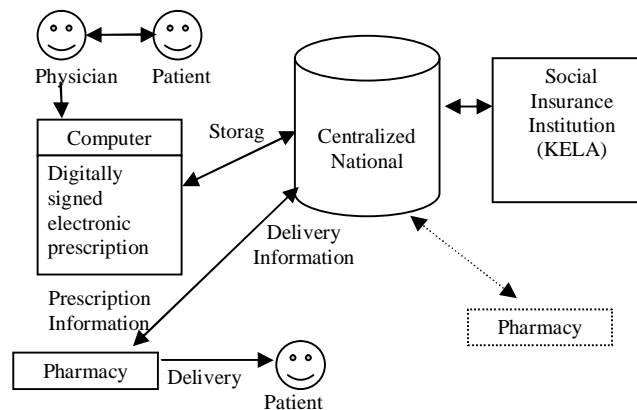


Figure 2. Centralized database solution for the Finnish Medicine Prescription System (The Social Insurance Institution of Finland 2001)

The selected model is based on electronic storage, and the retrieval of prescriptions, which require patient's informed, written consent. The doctor creates an electronic prescription with either a stand-alone electronic prescription program or program integrated to electronic patient records systems. The prescription is signed with doctor's secured electronic signature. Instead of printing it, it is transferred from doctors' offices to the national database, where it is technically stored. Patients receive a printed guide ("comfort slip") instead of a prescription. When they go to the pharmacy, pharmacists use their electronic identification card together with patient's social security number to retrieve patient's prescriptions with their computers, which are connected to the national database. Transferring of information to and from the database is secured against unauthorized access with Secure Sockets Layer (SSL)-technology, same as web-banks use. (Finnish Electronic Prescription Steering Group 2004; The Social Insurance Institution of Finland 2001)

The project established four pilot test areas that should be representative of the Finnish health-care landscape:

1. internal medication processes of a big university hospital
2. a middle-sized central hospital
3. a big city with emphasis on primary health care
4. an occupational health care unit.

In June 2005, the project is in serious difficulties, and pilot tests have been stopped everywhere. The Finnish Ministry of Social Affairs and Health is planning for reorganization of the whole initiative, but the work is happening behind the scenes, and no details of the future project structure are available when this is written.

When assessing the national project, our research team encountered a multitude of different problems, both in the management as well as operational level. The conclusions are reported fully in (Hyppönen 2005). Here we take into discussion ten governance structure problems that we met in the project. We feel that these were all crucial in the failure of the electronic prescription project reported here. These are just sample examples. Many other shortcomings in the pilot project could in addition to the ones reported here be interpreted as governance structure problems.

1 No owner for the project

The whole Finnish project was started with an idea of low budget and networked way of action: each stakeholder organization would carry its own costs, and no joint budget would be established. In this way the project at least would look as “cheap” in the eyes of the taxpayers. This led to the situation that the important national project really had no owner, as The Finnish Ministry of Social Affairs and Health neither wanted to adopt this role very clearly. The project could not enjoy owner and controller attention. This is a governance structure problem clearly falling to the “ownership domain” in our framework.

Here we also come very close to the problem of missing goals and objectives for the upcoming electronic prescription. It is now very much motivated through medical reasons: avoidance of unclear prescriptions, avoidance of unwanted medicine interactions, better control of prescribed medicines for an individual, etc. However, goals that would be measurable, tangible to individual organizations and practical are missing. For example, no cost-benefit calculations of any kind were provided for the system.

2 No working resources for the project

As benefits in financial terms were not defined, it was also hard to assign costs in financial terms to the issue. As said, the project was not getting a central budget and cost accounting solution. This led to the situation that no working resources to the project could be hired and accounted for. The project had a national manager, but no other staff could be hired. Operational work was ordered from different software and consulting houses on a spot-market -basis. This led often to difficulties and inferior work quality because of lack of total view. Here we clearly have governance structure problems in the “resources input domain”.

3 Central actor too independent

As already seen in Figure 2, the central database is in a central role in the project and concept, and so is its operator, in the initial plan the Finnish Social Insurance Institution (KELA).

The Finnish legislation makes KELA very independent and solely responsible for the Finnish Parliament. For example, The Finnish Ministry of Social Affairs and Health has very little control options over KELA. As KELA turned out to be a rather passive partner in the project nothing could be done, which is one ingredient in the project failure.

For understandable reasons, this problem was not openly discussed at all in the Finnish project. The problem clearly locates itself to the “ownership domain”.

4 Project manager not deeply enough involved

An experienced retired IT-consult was selected to the project manager. He had an excellent record in the management of IT-projects. Yet he had two major shortcomings: he was rather technically oriented, and had little earlier experience on the health care industry. Second, and more severely, he seemingly missed the hunger for career development through a successful project that some younger colleague would surely have exhibited. Together these issues, bound to the resource shortcomings, led to a suboptimal situation. Needless to say, this was again an issue that could not be discussed during the project. This is a problem in the “organizing domain” of governance structures.

5 Too big management group for the project

As already mentioned, the project was based on a network-type of organization. This led to a situation that every project participant was involved in the project management group, but few of them involved operational resources. This misbalance between the management and operational resources caused problems during the work of the project. In addition, the project management group became too big and unable to work efficiently. Again, we have here governance structure problems in the “ownership domain”.

6 Marginal resources used for outsourced tasks

Because of many political, price and other reasons, the big Finnish software and consulting houses in the field of information technology did not get a central role in the establishment of the basic technologies for the database and messages to and from it. Rather, a small and relatively inexperienced software house was selected. Its resources turned out to be of unsatisfactory character during the work. To worsen the issue, a member of the software house (as being a too little player) was not included in the project management group. Here we have a “resources input domain” problem with traces of problems also in the “ownership domain”.

7 Biased use of medicine databases and communication networks

During the work it became clear that one of the participating organizations in the project had substantial commercial interests in the basic technology used. For this organization, the medicine databases were an important source of revenue, and they had heavily invested in a secure computer network connecting their member organizations. That organization was not ready for any development that would have threatened the role of these resources and their income generating capacity. Because of that, some solutions became suboptimal. Again, this issue was buried and not discussed openly in the project. Again, this is a documentation of governance structure problems in the “resources input domain” with the ownership function, also the “ownership domain” heavily affecting project outcomes.

8 The final customers not involved

During the whole project the final customers of the final system, patients and citizens, were totally ignored. Their ideas and points of views were never needed. Many abstract benefits of the system were however discussed, that would mostly operationalize themselves on the national health and finances level, rather than on the private person’s level. However, the project insisted that customers would have the freedom to choose whether they want to participate in the pioneering pilots or not. The end result was that many customers declined to take part in the pilots because of missing personal benefits. Here we have a case of ignorance in the “customer contact domain” of governance structures.

9 Key gatekeepers not involved

During the project it became clear that the key users of the electronic prescription, actually the gatekeepers for the whole system, medical doctors, were not interested in the system. Finally, as broadly admitted, the system involved no benefits for them, but just extra work.

One key ingredient in the problems with medical doctors was that the system was designed to be so secure, that too many identifications, authentications and signatures were demanded from the doctors during the prescription writing process. This all complicated their work too much and made them abandon the trials. Maybe the security experts were given too much to say in the project on the cost of usability.

Again, in total we see here a governance structure problem in many areas: “customer contact domain” (medical doctors ignored as customers), “organizing domain” (more work for medical doctors, as the system should have lessened their work), and some shades of “ownership domain” problems (security experts too dominant in the control of the project).

10 Critical assessment not possible

The whole research project on the assessment of the project was run under bad conditions. The work was ordered and financed by The Finnish Ministry of Social Affairs and Health, which led to a situation that its own actions were hard to

criticize, even though a lot of improvement would have been needed in the ministry actions too. So many of the issues now reported here afterwards could not be taken to the original Finnish report, on the basis of which further work (and finance) on the assessment research would be decided. Again, we have a problem in the "ownership domain" of governance structure issues.

CONCLUSIONS

Our analysis in this article has shown that governance is already a lot discussed topic, but yet still not an established one. Current literature on governance can be very theoretical. So it is rather difficult to extract from the current literature what kind of practical governance structure problems organizations and their stakeholders meet. This is also true for the IT governance discussion that should be seen as a subtopic within the general governance discussion.

We provided a tentative classification of governance problems in any organization, not specific to information technology. It distributed governance structure problems into four categories:

1. ownership domain
2. resources input domain
3. organizing domain
4. customer contact domain.

These domains were graphically presented in a model that we call the "The working domains for governance structures model".

In general, in the development of this classification we concluded that governance structure problems are many and emergent, and a comprehensive classification seems next to impossible. Governance structure problems are sure to emerge during IT systems development and usage, and solving one problem might give birth to new ones. However, ignoring governance structure discussions can be disastrous to IT projects and other IT initiatives.

In the case discussion we presented the Finnish national project for electronic prescriptions. The project is based on a viable concept and utilizes standard, tested technologies. Despite of this, the many-year high on the national agenda project turned into a failure in 2004-2005. We present a discussion of then governance structure problems that were identified during an assessment of the project. They show that the many governance structure problems at least contributed to the failure of the project, if not were the main causes of the failure. The ten examples too show that the problems identified can be classified according to "The working domains for governance structures model".

As a special problem in the Finnish electronic prescription project we can see that the project was left too much alone. Many of the problems were connected with missing ownership domain governance structures. The project lived its own life, but never enjoyed a "stakeholder entity", also strong ownership and control, which would be very critical as we commented in section 3. In our further research, among other things, we plan to concentrate on the development of this "stakeholder entity" concept.

REFERENCES

1. Conner, K.R., and Prahalad, C.K. "A resource-based theory of the firm: Knowledge versus opportunism," *Organization Science* (7:5) 1996, pp 477-501.
2. Dickerson, C.M. "Virtual organizations: From dominance to opportunism," *New Zealand Journal of Industrial Relations* (23:2) 1998, pp 35-46.
3. Finnish Electronic Prescription Steering Group "Unpublished internal documentation."
4. Genevke, J., and Bukh, P.N.D. "On hikers, tigers, trust and opportunism," *Academy of Management Review* (22:1) 1997, pp 11-13.
5. Hyppönen, H. (ed.) *Sähköisen reseptin pilotoinnin arvioni. Vaihe I. Loppuraportti*. Osaavien keskusten verkosto (OSKE), Helsinki, 2005.
6. IT Governance Institute "IT Governance executive summary," 2001.
7. Jeon, S. "Moral hazard and reputational concerns in teams: Implications for organizational choice," *International Journal of Industrial Organization* (14:3) 1996, pp 297-315.
8. Kauffman, R.J., McAndrews, J., and Wang, Y.M. "Opening the "black box" of network externalities in network adoption," *Information Systems Research* (11:1) 2000, pp 61-82.

9. Koski, H. "The implications of network use, production network externalities and public networking programmes for firm's productivity," *Research Policy* (28:4) 1999, pp 423-439.
10. Lyons, B., and Mehta, J. "Contracts, opportunism and trust: Self-interest and social orientation," *Cambridge Journal of Economics* (21:2) 1997, pp 239-257.
11. Madhok, A. "The organization of economic activity: Transaction costs, firm capabilities, and the nature of governance," *Organization Science* (7:5) 1996, pp 577-590.
12. Marble, R.P. "A system implementation study: Management commitment to project management," *Information & Management* (41:1) 2003.
13. Mylonopoulos, N.A., and Ormerod, R.J. "A microanalytical approach to the efficient governance of IT service provision: The case of Outsourcing," Proceedings of the Third European Conference on Information Systems, Athens, Greece, 1995, pp. 749-766.
14. Nooteboom, B. "Trust, opportunism and governance: A process and control model," *Organization Studies*: (17:6) 1996, pp 985-1010.
15. Pressman, R.S. *Software Engineering: A Practitioner's Approach*, (4th ed.) McGraw-Hill, New York, 1996.
16. Sambamurthy, V., and Zmud, R.W. "Arrangements for information technology governance: A theory of multiple contingencies," *MIS Quarterly* (23:2) 1999.
17. Seidmann, A., and Sundararajan, A. "The effects of task and information asymmetry on business process redesign," *International Journal of Production Economics* (50:2-3) 1997, pp 117-128.
18. Shapiro, C., and Varian, H.R. *Information rules: a strategic guide to the network economy* Harvard Business School Press, Boston, Mass., 1999.
19. Simon, H.A. "Bounded Rationality and Organizational Learning," *Organization Science* (2:1), February 1991, pp 125-134.
20. The Social Insurance Institution of Finland "Sähköistä reseptiä koskeva esiselvitys," The Social Insurance Institution of Finland (Kela), National Agency for Medicines (Lääkelaitos), Helsinki.
21. Wang, E.T.G., and Barron, T. "Controlling Information-System Departments in the Presence of Cost Information Asymmetry," *Information Systems Research* (6:1) 1995, pp 24-50.
22. Williamson, O.E. *The Economic Institutions of Capitalism. Firms, Markets, Relational Contrsucting*. The Free Press, 1985.
23. Williamson, O.E. "Transaction Cost Economics," in: *Handbook of Industrial Organization*, R. Schmalensee and R.D. Willig (eds.), North Holland, New York, 1989, pp. 137-182.
24. Xiao, Z., Powell, P.L., and Dodgson, J.H. "The impact of information technology on information asymmetry," *European Journal of Information Systems* (7:2) 1998, pp 77-89.