The Political Economy of Information Management

A Theoretical and Empirical Analysis of Decision Making regarding Interorganizational Information Systems

Vincent M.F. Homburg

Rijks*universiteit* Groningen

The Political Economy of Information Management

A Theoretical and Empirical Analysis of Decision Making regarding Interorganizational Information Systems

Proefschrift

ter verkrijging van het doctoraat in de
Bedrijfskunde
aan de Rijksuniversiteit Groningen
op gezag van de
Rector Magnificus, dr. D.F.J. Bosscher
in het openbaar te verdedigen op
maandag 26 april 1999
om 14.15 uur

door

Vincentius Martinus Franciscus Homburg
geboren op 9 december 1970
te Zaltbommel

Promotores Prof. dr. ir. J.L. Simons
Prof. dr. H.W.M. Gazendam

This thesis is dedicated to Ine
(1958 - 1996)

Promotiecommissie Prof. dr. B. Nooteboom
Prof. dr. ir. R. Maes
Prof. drs. B.K. Brussaard

Labyrint Publication
Postbus 662
2900 AR Capelle a/d IJssel
The Netherlands

Drukwerk: Ridderprint

ISBN 90-72591-67-4

Preface

In 1994, I joined the Faculty of Management and Organization of the University of Groningen as a Ph.D. student. Now, more than four years later, I think I can say that during my research, I picked up a fascination for the rich insights organization theory provides and I can only hope that this fascination shows in this thesis.

This thesis could not have been completed without the encouragement and support of a vast number of people, some of whom I would like to mention specifically.
First of all, thank you to John Simons and Henk Gazendam. Their guidance and support have proven to be indispensable to me in completing this thesis.
Furthermore, I would like to mention my (former) colleagues in the Faculty of Management and Organization. Without the discussions with Ad Breukel, Hans van den Broek, Constantijn Heesen, Tomas Klos, Han Numan, Margriet Offereins and Johan Oldenkamp, this thesis would probably never have been realized.
For the last two years, I have been involved in the Edispuut, a discussion forum for researchers working in the field of electronic commerce and interorganizational information systems. The Edispuut members' criticism, comments and encouragement (in that order) have inspired me enormously and created the feeling that I was not the only researcher struggling in the complicated world of organizations, decision making and information systems.
I am indebted to all members of the research community who defied the economic and political logic set out in this thesis by unselfishly publishing their thoughts, articles and theses on the Internet, thereby making it accessible to me and other researchers all over the world.

Also I would like to thank the members of my dissertation committee, professor Nooteboom, professor Maes and professor Brussaard, for their comments on this thesis.

Finally, I am indebted to my friends and family.
Arwin Nimis, Ivan Pouwels and Ed Stijnen have, over the last nine years or so, shared their friendship with me by, among many other things, having heated discussions about the sense of being AIO.

My family has gone through tough times, but nevertheless they have always provided the proper encouragement, in particular by not continuously asking how the thesis was progressing and by trusting that me eventually it would be finished.

I end this preface by mentioning Claudia, for her love and for sharing her life with me.

Vincent M.F. Homburg
Groningen / Zwolle, October 1998

TABLE OF CONTENTS

TABLE OF FIGURES

1 Introduction

1.1 Subject of the study

The history of the use of information technology in organizations shows that information technology has had an enormous impact on the functioning of organizations. The roots of these changes can be found in (1) information technology developments (the supply side) as well as in (2) organizational needs (demand side) (Scott Morton, 1991; Simons & Verheijen, 1991).

1.1.1 Developments in the supply of information

'Information technology' (IT) usually refers to some sort of collection of computer hard- and software and the knowledge about its use, which can *collect, store, process* and *disseminate* information[1].

In the past, *processing* capacity and *storage* capacity of hardware have especially changed, while IT costs dropped simultaneously (Madnick, 1991; Breukel, 1996). Moore's Law indicates that costs associated with comparable units[2] of information technology are reduced by an order of magnitude every five years (Gazendam, 1997). This means that the capacity that took a million dollars in the 1960s (a mainframe computer) can be realized with a one thousand dollar personal computer (PC) in the 1990s (Cash, McFarlan & McKenney, 1988).
Nowadays, information technology's *storing* and *processing* capabilities are still progressing. But the technology of *collecting* and *disseminating* information (also referred to as information and communication technology [ICT] or telematics[3]) is changing too. Technological advances have resulted in new communication media (optic cables, satellites), increased capability of input/output devices, et cetera. Because of the efforts of industry associations and groups of organizations, technical standards have been developed and/or accepted. These advancements in technology and standard

[1] A more precise definition is given in chapter two.
[2] Measured in MIPS, *millions of instructions per second.*
[3] Telematics is a compound word, consisting of 'telecommunications' and 'informatics'.

setting have coincided with the liberalization of the now very competitive data communication industry.
Besides changes in hardware, changes in software have occurred. The emergence of, among other things, all kinds of object-oriented programming environments, tools, and standard yet configurable software packages have boosted the productivity of software development. Furthermore, probably due to the increased popularity of the Internet, communication software has improved drastically.

As a result of the changes in hardware as well as in software, information exchange in and across organizations has sunk per cost of unit. “In brief, the development of high-performance, high reliability, comprehensive communication networks, both intraorganizationally and interorganizationally, is occurring at a rapid pace”, comments Madnick (1991, p. 31).
According to the literature, these information technology developments have severe consequences. A typical statement that supports this claim is provided by Senn: “Information technology is itself a driver of globalization, enabling virtually any firm to overcome the fundamental business barrier of geographic distance, as long as it deploys and leverages the technology in an effective fashion” (1994, p. 444). Morgan claims that “(…) there can be little doubt that information technology is among the most important forces reshaping the modern organization” (1988, p. 97).
The statements by Senn and Morgan are modest illustrations of sometimes quite bizarre claims in the literature. Some care must be taken to avoid jumping to tendentious conclusions. Holland, Lockett and Blackman respond to the kind of turbulence-reporting claims stated above: “(…) [t]his tends to lead to a series of war stories and apocryphal tales which may miss much of the underlying richness and long-term developments and trends” (1992, p. 540).

Notwithstanding the sometimes quite eccentric claims in the literature, it can be argued that the emergence of new information and telecommunication technology poses new challenges to an organization and especially to its structure, planning and strategy (Levinson, 1994). However, it must be noted that technological impulses only account for a part of all new challenges to an organization’s information resource structure, planning and strategy. Furthermore, the history of information technology shows that information technology has had an enormous impact on the functioning of organizations, but also that the results to be accomplished immediately are overestimated and that long term consequences are underestimated (Strassman, 1985, cited in Holland, Lockett and Blackman, 1992).

1.1.2 Developments in the demand for information

Apart from developments in the technology, it is also possible to identify developments in the demand side of information technology. Sometimes the literature is plagued with descriptions of ever decreasing product life cycles and increasing turbulence, which, according to the authors, necessitate more and better information technology. Mintzberg

(1994), however, has demonstrated that this turbulence is not at all a contemporary phenomenon. The organizational literature since the 1950s (that is, before information technology gained momentum) has reported an *ever increasing* turbulence in the environment of organizations. Furthermore, he notes that the turbulence of a past period, previously labeled turbulent, is later on described as moderate.
However, other authors provide different impetuses for applications of information technology. For example, Scott Morton (1991) describes numerous changes in organizational structure, organizational strategy and individual roles/skills[4]. These changes are elaborated in the debate on the relationship between IT and centralization/decentralization (see section 1.2.1), the debate on strategic IT (Breukel, 1996) and the debate on upgrading/degrading of labor as a result of the application of IT (Steijn & de Witte, 1996; Cunningham & Tynan, 1993).

One theme that is pervasive in the literature is the theme of new organizational forms that are emerging (for a brief introduction, refer to Schwarzer, Zerbe and Krcmar, 1997). Here, 'new organizational forms' refers to the use of coordination mechanisms other than the traditional hierarchy (within organizations) and markets (between organizations) (Ring and Van de Ven, 1994). These new organizational forms of coordination are now being described in the literature and are referred to as:

- 'Information partnerships' (Konsynski & McFarlan, 1990)
- 'Interorganizational systems' (Barrett & Konsynski, 1982; Cash & Konsynski, 1985)
- 'Hybrid arrangements' (Borys & Jemison, 1989)
- 'Interorganizational configurations' (Levinson, 1994)
- 'Modular organizations' (Kastelein, 1985; Tully, 1993)
- 'Networked organizations' (Miles & Snow, 1992; Powell, 1987)
- 'Team-based organizations and virtual organizations' (Davidow & Malone, 1992)
- 'Learning organizations' (Drucker, 1987)
- 'Electronic integration' (Venkatraman & Kambil, 1991)
- 'Value added partnerships' (Johnston & Lawrence, 1988; Henderson, 1990)
- 'Organic networks' (Morgan, 1989)[5]

As a result of the emergence of these new organizational forms, interorganizational relationships are highlighted. An interorganizational relationship, according to Van de Ven, occurs when "(…) two or more organizations transact resources (…) among each other" (1976, p. 24). Most authors implicitly speak of interorganizational relationship when resources are transacted recurrently and the relationship lasts for a period of time, although it does not have to be a continual exchange (Oliver, 1990).

[4] Note that these various impetuses are not independent of each other.
[5] For a more complete enumeration, refer to Bensaou & Venkatraman (1994), Fredriksson & Vilgon (1996) and Ching, Holsapple & Whinston (1996).

Interorganizational relationships can be governed by a variety of coordination mechanisms: discrete market transactions and hierarchical arrangements being extremes on a continuum (Ring and Van de Ven, 1994). Examples of these intermediate forms are to be found in both the private and public sectors. In the private sector, it is reported that autonomous firms cooperate with respect to joint research and development projects, joint product development, joint manufacturing, shared distribution and service, etc.
Government is sometimes portrayed as a monolithic actor. However, if one rejects this rather radical view of government (see, for example, de Vries, 1992; Kickert, 1993; BIOS-3, 1995; Gazendam, 1997; Kickert, 1997), it is very well possible to discern network structures and interorganizational relationships in public sectors, too.

One explanation for the interest in interorganizational relations is based on Nooteboom's observation that "relations of cooperation are incurred from an expectation of value (…) now and in the future" (1993, p. 13). Often, this premise is interpreted as the possibility of decreasing the costs[6] of specific products if certain activities are outsourced to other organizations, thus resulting in interorganizational relationships between focal organizations and, for example, component suppliers. This explanation is "(…) consistent with the argument that efficiency is an underlying determinant of interorganizational relations" (Oliver, 1990, p. 245).
However, Van de Ven (1976) contests this interpretation. His basic premise is that resources and expertise needed to cope with problems by organizations are contained within organizations and vested interest groups. Using this line of reasoning, interorganizational relations "(…) occur for the purpose of pursuing common or mutually beneficial goals or interests" (Oliver, 1990, p. 244). By means of exchanging resources in interorganizational relationships, goals of individual organizations that were unachievable for individual organizations are now attained (Van de Ven, 1976). Van de Ven's explanation highlights the role of organizations as vehicles for goal achievement. Relations between organizations can be seen as artifacts for goal achievement, created, adjusted and terminated by stakeholders in order to pursue goal achievement. Alexander notes: "(…) it is common sense to realize that an organization can induce other organizations to bias their actions in a direction it desires if it can offer them incentives in the form of resources, especially if the relevant resource is essential for the other organization's survival" (1995, p. 9).
Summarizing, this explanation assumes that interorganizational relationships can improve the individual organization's goal attainment. This explanation of the occurrence of interorganizational relationships is referred to as the effectiveness or reciprocity explanation (Van de Ven, 1976; Oliver, 1990).
The above explanations refer to efficiency and effectiveness, respectively, as primary drivers for interorganizational relations. But there are also other hypotheses that have been proposed in order to account for the occurrence of interorganizational

[6] Here, not only production costs are meant, but also the costs incurred by haggling and learning (so-called transaction costs). See also section 3.3.4.

relationships. For example, a hypothesis that more or less originates in critical organization theory states that, especially in government, hiving-off[7] is not so much pursued in order to economize on costs[8], but rather to detach high-risk activities from the focal organization, thereby safeguarding the interests of the focal organization's top management or politicians[9]. This 'risk averse' hypothesis, however, has gained only limited empirical support.

In an attempt to survey and summarize the literature on interorganizational relationships, Oliver (1990) has identified *six* rationales or reasons for organizations to participate in interorganizational relations (Figure 1)[10].

[7] By means of hiving-off, execution of government activities is changed by attributing or delegating authority to a newly-established or an already-existing organization which has a certain legal status as an independent unit with a relatively high degree of economic independence (Künneke, 1991; Ter Bogt, 1998).

[8] Economizing on costs as a rationale for interorganizational relationships is a style of reasoning typical to economic organization theory. For details, refer to section 3.3.

[9] Here, *political efficiency* rather than economic efficiency is the decision criterion. See Ter Bogt (1998) for a more complete discussion.

[10] The theoretical background of this summary includes specific renditions of economic organization theory (see section 3.3) and political organization theory (see section 3.4), but also theories of class hegemony and institutional theories. A complete discussion of these theories goes beyond the scope of this thesis. For more information, refer to Oliver (1990).

Source	Rationale	Description
Internal processes	Efficiency	The formation is prompted by the organizations in order to improve their internal input/output ratio.
	Effectiveness	The formation occurs in order to pursue common, mutually beneficial goals or interests.
Environment	Necessity	The formation is the result of enforceable laws, drafted by a legislator.
	Legitimacy	The formation is the result of an attempt by organizations to increase their legitimacy in order to justify their existence in agreement with prevailing norms, rules, beliefs or experiences.
	Stability	The formation is the result of an attempt by organizations to reduce environmental uncertainty.
	Asymmetry	The formation is the result of the potential of an organization to exercise power and control over another organization or its resources.

Figure 1: Rationales for interorganizational relationships (adapted from Oliver, 1990)

From the figure above, we conclude that there are many rationales for organizations to participate in relationships with other organizations, efficiency and effectiveness being examples of rationales. These interorganizational relationships do not necessarily have to lead to merger of the participating organizations. The literature describes a variety of forms of cooperation between organizations that do not nicely fit the markets/hierarchy dichotomy. However, the rationales for the occurrences of these various forms of interorganizational relationships result in conflicting explanations. Obviously, the literature on the origins of interorganizational relationships in both private and public sectors is rather fragmented (Oliver, 1990; Alexander, 1995).

1.1.3 Synthesis

It has been argued that the above developments (IT-related trends and increased attention to interorganizational relationships) are not independent of each other. The causality between IT trends and the emergence of interorganizational relations has been subject to some discussions. Markus and Robey (1988) distinguish two opposing perspectives:

- The *technological imperative*, in which new technology drives organizational changes. The literature on information technology often takes this stand. It is

argued that technological developments cause or enable changes in or between organizations. Examples of this stream in the literature are the writings on IT-enabled new organizational forms (for example, the statements by Senn and Morgan [see section 1.1.1], or the writings of Schwarzer, Zerbe, Krcmar [1997]). Critics state that this type of logic underestimates the variety in profiles of organizations using information and telecommunication technology (Fredriksson & Vilgon, 1996).

- The *organizational imperative*, in which the use of (new) technology is determined by organizations or changes in organizational parameters. The organizational literature customarily takes this point of view by mentioning the use of telematics as an important factor. This line of reasoning has been criticized for not studying the IT phenomenon in an in-depth way: for example, by not differentiating different types of technology or by not considering other relevant contextual factors (Kubicek, 1995).

Van der Heijden (1995) points out that the discussion about the causal relationship between interorganizational and technological changes bears some resemblance to the discussion about the relationship between structure and strategy (Mintzberg, 1990, 1994) and between strategy and environment ('environmental determinism' versus 'strategic choice' [van den Bosch, 1993]). In these debates, the direction of causality between variables is questioned: does the strategy an organization wishes to pursue affect the organization's structure, or is an organization's strategy determined by its structure? Does an organization's environment determine its strategy, or is an organization able to control its environment by pursuing a different strategy? From the discussions and debates, no clear-cut answer has yet been formulated; obviously, the relationships between these variables are quite complex.

The *initial* motivation for this study stems from the complexity of the relation between IT and interorganizational relations. In section 1.2, research endeavors that have addressed this theme are discussed and the motivation for the current study is elaborated. This leads to the formulation of the main research goal in section 1.3. Then, in section 1.4, the preliminary theoretical orientation and research questions are presented. Section 1.5 presents various alternative research designs and the motivation for the research strategy to be used. The remaining part describes an outline of the rest of the thesis as a whole.

1.2 Motivation of the study

The relationship between IT as a technological variable and interorganizational relationships as an organizational variable has been scrutinized many times in the disciplines of organization studies and information systems. In this section, two

classical controversies and subsequent research in the discipline of information systems[11] are presented.
Firstly, research on the relationship between IT and organizational parameters is discussed (section 1.2.1). Secondly, research on the relationship between IT and interorganizational relations is addressed (section 1.2.2). These controversies are discussed and the core of the dispute to which further research activities are to be addressed is summarized. The motivation of the current study stems directly from these controversies.

1.2.1 Research on the relationship between IT and organizational parameters

The relationship between information technology and its context, customarily organizational parameters, has been scrutinized many times. One of the first themes that was investigated was the effect of information technology on centralization as an organizational parameter (Kubicek, 1975; see also Kubicek, 1995). This information systems research theme was an attempt to chart systematically the field of information technology and organizational parameters by using research models and techniques that stretched beyond the scope of very descriptive models.
George and King (1991) have surveyed the literature and identified theories that produce conflicting explanations about the relationship between information technology and centralization. One stream in the literature clearly reported that introduction of IT leads to a centralization of decision-making authority. Drucker (1987) assumed that the introduction of information technology leads to elimination of middle management and that lower hierarchical levels could be increasingly directed and monitored by management using information technology. Crozier analogously assumed that information technology in general threatens the autonomy of workers as opposed to management (Bemelmans, 1987).
For the situation in the Netherlands, Frissen argued that the introduction of information technology in governmental agencies leads to bureaucratization (and thus to increased formalization and centralization): “Complexity and interdependencies in the policy field and political responsibilities imply centralization in relation to informatization” (Frissen, 1989, p. 245).
Schrama (1991) described how, in general, the earliest information system researchers found that the use of computers resulted in centralization in organizations. The rationale for this proposition was found in the increased capabilities of information technology to monitor and control the behavior of organization members (control-by-IT or surveillance explanation). The centralization thesis has also gained support in Lee (1965) and Whisler (1970).

[11] Sometimes referred to as ‘management information systems’ (Breukel, 1996). This discipline combines insights from organization science and computer science.

However, there is also a stream in the literature that claims that, in general, information technology leads to decentralization. In this line of reasoning, information technology can be used to perform complicated calculations or simulations[12] so that individual workers are no longer dependent upon higher hierarchical levels or support staff (empowerment-by-IT explanation). Another line of reasoning behind the decentralization thesis is that information technology enables monitoring and control without the need to control and monitor in a direct, tangible way (pseudo-decentralization-by-IT explanation). Surprisingly, the decentralization thesis has gained empirical support too (van der Heijden, 1995; see also Meyer [1968], Klatzky [1970] and Blau, Falbe, McKinley & Tracy [1976]).
For example, Frissen's general observations have been criticized. "I could observe that this [Frissen's bureaucratization thesis] conclusion was mainly based on a specific and rather bureaucratic computerization project, while in the long run a more person-oriented information management approach combined with an equilibrium policy (…) led to a decrease in bureaucracy" (Gazendam, 1993, p. 9). Gazendam (1993) and de Jong (1994) have described the development of information technology in terms of political configurations. They provided well-documented cases in which the application of information technology led to decentralization. Schrama shows that in general, the first empirical results indicating centralization were followed by studies that detected the opposite tendency, towards decentralization (Schrama, 1991).

Various authors have tried to reconcile the above (partial) explanations. Gazendam (1997) states that the centralization tendency was especially vigorous in the 1970s, when relatively high information technology costs (as compared to labor costs) necessitated concentration of information technology, and, with that, centralization of decision making. When the information technology costs dropped in the 1980s and 1990s, concentration of information technology no longer was the only viable option and hence, the accompanying centralization tendency did not occur anymore.
Breukel (1996) proposes a different explanation, based on an exhaustive literature review. Breukel mentions organizational structure and IT as equal aspects of the organization with no one-way causal relation between these aspects. Breukel argues that "feasible set[s] of equally effective, internally consistent patterns" (Drazin & Van de Ven, 1985, p. 335) can be defined. This means that IT and structure are variables of which some combinations of values are assumed to be consistent and other combinations are assumed to be inconsistent. Note that in this line of reasoning, no explicit preference for either organizational imperative or technological imperative is stated. Rather it is assumed that organizational and technological variables are either consistent or inconsistent and that in order to change a 'non-consistent' situation into a 'consistent' situation, either the technological or the organizational variable can be

[12] The technology that is used for these purposes is the technology of decision support systems and expert systems (Heesen, Homburg & Offereins, 1995; Heesen, Homburg & Offereins, 1997).

changed. This perspective is referred to as the 'emergent' perspective (see also van den Bosch, 1993; van der Heijden, 1995). Van der Heijden explicitly supports this view of the relationship between technological and organizational variables. "(…) [T]he emerging perspective seems to be valid for many relationships that concern strategy, structure and environment. These relationships also include the relationship between the use of information technology and organizational design" (Van der Heijden, 1995, p. 20). Note that the technological imperative and the organizational imperative are limited forms of the emergent view.

Finally, Schrama (1991), Delehanty (1967) and Robey (1977) concluded that it is possible to distinguish various IT configurations and various organizational configurations, and that organizations have a certain degree of discretion (freedom of choice) in choosing these configurations: there is no deterministic relationship between IT and structure.

The debate on the relationship between IT and organizational parameters is summarized in Figure 2.

Author	**Hypothesis**
Lee (1965); Whisler (1970); Drucker (1987); Frissen (1989)	IT leads to centralization in organizations.
Meyer (1968); Klatzky (1970); Blau, Falbe, McKinley & Tracy (1976); Gazendam (1993)	IT leads to decentralization in organizations.
Delehanty (1967); Robey (1977); Schrama (1991)	Organizations have a considerable degree of discretion in designing structure and applying IT.
Danziger, Dutton, Kling & Kraemer (1982); Breukel (1996)	There are various consistent combinations of IT and structure.

Figure 2: Summary of the debate over IT and organizational structure

It can be concluded that the relationship between IT and organizational structure has been scrutinized many times, but that theoretical and empirical research has resulted in contradictory findings.

1.2.2 Research on the relationship between ICT and interorganizational coordination

Analogous to the relationship between IT and organizational parameters, a new research theme has emerged recently and is now being discussed thoroughly. The debate concerns itself with the relationship between information and communication technology (ICT) and the emergence of interorganizational relations, or, more specifically, the coordination mechanisms chosen. It is a theme that is especially

relevant since the application of ICT has boomed (see section 1.1.1) and organizations are considering new configurations for their interorganizational relationships (see section 1.1.2).
In a classic article, Malone, Yates and Benjamin (1987) argue that in general, ICT lowers information and coordination costs. Using transaction cost logic[13], Malone *et al* claim that by using ICT, markets ('electronic brokerage') are favored over hierarchical coordination mechanisms ('electronic integration'). Davenport, Eccles and Prusak restate this claim by hypothesizing that "(…) as organizations make widespread use of information technology, information will flow freely and quickly eliminate hierarchy" (1992, p. 54). Malone, Yates and Benjamin themselves state that "(…) in the long run, the significant additional benefits to buyers possible from the electronic brokerage effect will drive almost all electronic markets toward being unbiased channels for products from many suppliers" (1987, p. 492).

The nature of the claim shows some resemblance to the early claims in the information system discipline regarding the impact of information technology on structural parameters. And, also analogous to the centralization and decentralization theses, conflicting conclusions are drawn from empirical studies. Studies by Brynjolfsson, Malone, Gurbaxani and Kambil (1993), Malone and Rockart (1992) and Ebers (1992) support the markets-over-hierarchies claim.
On the other hand, Steinfield, Kraut and Plummer conclude that "(…) both the theoretical arguments and the empirical evidence lead us to believe that firms will use [ICT] to build tight relationships with their trading partners, rather than to select suppliers on a transaction by transaction basis from a large pool. (…) Our review of the literature shows that both electronic hierarchies and markets have been observed in practice, but the former are, in fact, more commonly observed in business to business networks" (1996, hypertext quotation). The observations by Steinfield, Kraut and Plummer are supported by research findings by Johnston and Lawrence (1988) and Hart and Estrin (1991), who also suggest that ICT can be used to favor more hierarchically based interorganizational forms[14]. Furthermore, Steinfield, Kraut and Plummer quote research by Brousseau, who reviewed 26 situations in which two or more organizations exchanged data electronically, finding that most ICTs served to reinforce already existing hierarchical relationships among organizations.

[13] Transaction cost economics will be explained in chapter three.

[14] Steinfield, Kraut and Plummer remark that the use of the term 'hierarchical' is probably misleading, as it implies an authority relationship between autonomous organizations (which is a contradiction or at least a paradox). However, in chapter three, it is shown that hierarchy can also be based upon commonly agreed upon procedures. In this context, hierarchy is used to suggest that partner organizations are tightly coupled rather than linked only by ephemeral market-like transactions.

Ribbers, Ekering and van Zutphen (1994) argue that a specific use of ICT, namely EDI[15] systems, leads to more hierarchical coordination mechanisms because organizations commit each other to specific standards and working procedures. Steinfield, Kraut and Plummer, however, claim that the more extensively firms used interorganizational networks, the more hierarchical were their relationships with partner organizations, even when using highly open and ubiquitous public data network infrastructures: "(…) even open networks are typically used to support hierarchical relationships among firms" (1996, hypertext quotation).
In addition to the Malone-Yates-Benjamin claim (markets-over-hierarchies) and the Steinfield-Kraut-Plummer claim (hierarchies-over-markets), Clemons, Reddi and Row (1993) have formulated the 'move-to-the-middle' hypothesis. Based on evidence from the automobile industries and banking sector, the authors predict that application of ICT will affect production costs and transaction costs in such a way that longer term interorganizational relationships with a smaller set of organizations will appear predominantly.

In an attempt to reconcile contrasting results from various empirical studies, Holland and Lockett remark that ICTs "(…) do not affect directly the evolution of governance structure such as markets or hierarchies, which are instead determined by asset specificity, market complexity and strategic choice. However, [ICT] can affect all of them in some way enabling a much greater flexibility of outcome both in the short and longer terms. (…) In essence, [ICTs] enable organizations to do what they want much more efficiently and flexible" (Holland & Lockett, 1994, p. 409)[16]. This thesis is referred to as the 'anything goes' explanation. Note that the markets-over-hierarchies, hierarchies-over-markets and move-to-the-middle hypotheses are competing hypotheses whereas the 'anything-goes' explanation can supplement any of the three explanatory schemes mentioned above.

[15] EDI (electronic data interchange) is a specific application of ICT.

[16] Holland and Lockett speak of interorganizational information systems instead of ICT or telematics, the terms that we have used thus far. This is a terminological difference which is addressed in section 2.2. Although many definitions of ICT and interorganizational information systems overlap, interorganizational information systems include a knowledge aspect which is absent in most definitions of ICT. For the moment, however, these terms are assumed to be synonymous.

Author	Hypothesis
Steinfield, Kraut & Plummer (1996); Johnston & Lawrence (1988); Hart & Estrin (1991); Ribbers, Ekering & van Zutphen (1994)	ICT favors hierarchies over markets.
Malone, Yates & Benjamin (1987); Brynjolfsson, Malone, Gurbaxani & Kambil (1993), Malone & Rockart (1992); Ebers (1992)	ICT favors markets over hierarchies.
Holland & Lockett (1994)	ICT can favor any governance structure.
Clemons, Reddi & Row (1993)	ICT enables intermediate governance structures.

Figure 3: Summary of debate over ICT and interorganizational coordination

In Figure 3, the debate over the relationship between ICT and interorganizational coordination is summarized.

Not surprisingly, the research that has generated these contradictory findings has been criticized for a number of reasons, which will be elaborated below.

- Firstly, research has been criticized because of empiricism (or, in this case, more precisely theoretical poverty) and ideological prejudice. Zuurmond (1994) states that many researchers have speculated on the existence of trends and have tried to illustrate (rather than validate) these trends by means of case studies. However, Zuurmond does not illustrate his proposition by mentioning specific research projects and does not refer to the key references in the debate mentioned above, which have a clear theoretical orientation and can hardly be accused of having a ubiquitous ideological orientation.
- Secondly, there is criticism of a more or less technical-methodological nature. This type of criticism states that large quantitative studies especially are based on secondary data (i.e., data that was gathered for other purposes). A traditional disadvantage of such an approach is that secondary data often does not contain the variables one requires, or that the data is not gathered at the appropriate level of analysis. For example, analyses conducted at the industry level do not necessarily speak to the way organizations deploy information technology and telematics (Steinfield, Kraut and Plummer, 1996).
- Thirdly, and somewhat more fundamentally, is the observation that the application of telematics is also likely to be influenced by pre-existing relationships among organizations (a so-called 'reinforcement' hypothesis, see, for example, Danziger, Dutton, Kling & Kraemer [1982]). This explanation, in which the direction of causation in the debate on technological and organizational variables is reversed, is not addressed in many empirical studies.

- Fourthly, there is also criticism of the choice of variables in explanatory models. Steinfield, Kraut and Plummer (1996) emphasize the importance of locus of control in interorganizational information systems and, related to this factor, the deployment of interorganizational information systems by partner organizations as a focal point of research. They state furthermore that these aspects are usually lacking in current research on the relationship between information technology and interorganizational relations.

Here it is necessary to elaborate on the more fundamental reasons for criticism: (1) the criticism of doubt as to the direction of causality and (2) the criticism regarding choice of variables.

The criticism of doubt as to the direction of causality is probably addressed best by proposing an emergent perspective for describing the phenomena under scrutiny (see also section 1.2.1). The emergent perspective states that there is a relationship between variables *in a logical sense*[17], although unilateral causal inferences are not stated (see van den Bosch [1993], Mintzberg [1994] and van der Heijden [1995])[18].
The criticism of doubt regarding the choice of variables, and, more specifically, the neglect of 'locus of control' is addressed especially in the literature on information management (for a definition and more complete discussion, refer to chapter two). For now, information management is loosely defined as strategic decision making regarding IT in and between organizations[19].
In the studies mentioned above, it is hypothesized that ICT by itself yields effects. However, it has been proposed that the same type of ICT yields different effects whenever it is subject to different control models, whenever it is put to a different aim (e.g. its functionality is changed), or whenever the architecture that determines how various components are related is changed (Gazendam, 1993). In this line of reasoning, ICT is *malleable*. In fact, the term ICT is no longer used and it is customary to replace it with the term *interorganizational information systems*. As will be explained in section 2.2.2, the term interorganizational information system captures better the fact that technology is always used in a specific organizational context.
According to this view, the decision making that surrounds interorganizational information systems in terms of actors involved and their respective tasks in the development process is far more important than the technology itself. This point of view is adhered to by, for example, George and King (1991), who, with reference to the debate mentioned in section 1.2.1, have emphasized the role of managerial action and decision making. With reference to the debate mentioned in section 1.2.2, Webster

[17] That is, it is assumed that there is a subset of the Cartesian product space over operationalized variables.
[18] For a discussion of 'consistent' interorganizational coordination forms, see Alexander (1995).
[19] In section 2.2.3, a more elaborate definition is presented.

(1995a, 1995b) claims that by explaining the debate solely in terms of ICT, "(…) [q]uestions still arise as to how much information is shared, how access is controlled, who is excluded from certain information exchanges, and to whose relative advantage. (…) These issues are subject to management choice rather than technological imperative" (Webster, 1995a, p. 40). Kubicek (1995) also explicitly adheres to this point of view. He states that information technology is still treated as one property and criticizes the technological imperative that is often immediate in the literature. "Again, technology (telecommunications, networks, standards) is supposed to have a great impact. The literature rarely differentiates types of EDI systems, or considers other relevant contextual factors, and there is almost no analysis of the actors involved and the organization of the development process" (Kubicek, 1995, p. 76). Kubicek furthermore hints at differentiation that is possible with respect to *managerial action*. However, Kubicek does not state how this differentiation is achieved (what different kinds of roles exist, what different kinds of organization of the development process exist, etc.).

The emphasis on decision making and managerial action in the field of interorganizational information systems has a number of antecedents in theory and practice. The Dutch Ministry of Interior has published a number of policy documents (BIOS documents) in which the role of managerial action is stressed as a means of improving effectiveness and efficiency in the fulfillment of organizational tasks. In these documents, attention is also given to interorganizational information systems: "[f]or effective (electronic) communication between firm and governmental agencies and between various governmental agencies, not only the technology itself is involved, but communicating partners also have to commit each other to certain agreements"[20] (BIOS-3, 1995, p. 50). In the BIOS-3 policy document, it is claimed that it is necessary to draw up agreements (regarding content) with respect to the exchange of structured information. Since 1988, information structure outlines[21] have been introduced in order to structure information technology within various policy fields: "Information structure outlines must provide a sense of the direction in which information systems within a policy field have to be developed"[22] (Algemene Rekenkamer, 1997, p. 13).
Furthermore, the idea behind information structure outlines is not specific to governments. In general, the explicit direction of information systems has gained a lot of attention, both by scholars as well as by practitioners.

[20] "Voor effectieve (electronische) communicatie tussen het bedrijf en de overheid en tussen overheidsinstanties onderling komt meer om de hoek kijken dan techniek alleen, er moeten ook allerlei afspraken gemaakt worden tussen de communicatiepartners".
[21] In Dutch: informatiestructuurschetsen.
[22] "Structuurschetsen moeten de richting aangeven, waarin de informatievoorziening binnen een deelgebied zich dient te ontwikkelen".

However, the attention that is given to information management in theory and practice must not be interpreted as unconditional support for information management in all circumstances. Practical experiences and research activities have demonstrated that information management is not at all a trivial activity. Neither information system research nor experience from practice has provided uncontested evidence that structuring of information systems by means of policy pronouncements or bilateral agreement is working well. In the BIOS-3 policy document, it is stated that information management must receive attention in discussions about organizational effectiveness and efficiency, but also warns not to overestimate this role. In 1997, the Netherlands Court of Audit[23] investigated the effects of managerial action (i.e., what happened to twenty policy fields that were designated as targets for information structure outlines). In fact, such an outline was eventually drafted in only nine policy fields. In practice, these nine outlines were often seen as being too abstract, too limited or one-sided. Furthermore, in many of the cases in which an outline existed, it did not direct the information systems development in the organization, partially due to impediments in existing legislation[24].
It is possible, of course, possible to characterize the experiences with information structure outlines as symptoms, signs of resistance of a temporary nature. Breukel (1996) provides criticism of a more fundamental nature on managerial action towards information systems. In his research, Breukel assumed that an explicit, formal, centralized form of information management (called SISP: strategic information systems planning) resulted in an organization's strategic performance through established alignment in an organization[25]. Breukel rejected the hypothesized positive relationship between the presence of this form of managerial action and alignment in organizations.

Summarizing, the relationship between interorganizational information systems and interorganizational relations is a complex one. The debate on the effects of interorganizational information systems on interorganizational relations yielded divergent results, and therefore the original research design with two variables, ICT and interorganizational coordination, should be adjusted. In their discussion of the debate between ICT and interorganizational coordination, Steinfield, Kraut and Plummer (1996) proposed two possible adjustments.
Firstly, shift the focus to managerial action with respect to information systems rather than focus on the underlying technology in order to meet the criticism of lack of

[23] In Dutch: Algemene Rekenkamer
[24] The Chamber of Audit did not investigate effectiveness of information structure outlines. It nonetheless reports that profiles are useful for facilitating deliberation and promoting mutual understanding in a policy field.
[25] In fact, the relationship between (1) alignment between IT, structure and strategy and (2) strategic performance was corroborated; the hypothesis that the presence of SISP causes alignment, however, was rejected.

attention to 'locus of control'. This provides the opportunity to follow Breukel's recommendations for further research, e.g., investigating "(…) the possibility of further differentiating SISP" (Breukel, 1996, p. 242). By analyzing "(…) the way in which the decision-making processes take place (who are committed, which items are discussed), and the communication flows that can be detected (who triggers the decision-making process?)" (1996, p. 244) and the way the results of the above-mentioned decision-making processes are stated "in terms of policy statements about IT and the organizational configurations required" (1996, p. 244), various approaches to information management can be distinguished, meeting Kubicek's criticism.
Secondly, unilateral causal inferences between variables are not assumed. Rather, based on the theory of information management and interorganizational relations, combinations of information management approaches and interorganizational coordination can be scrutinized and consistent combinations can be identified.

1.3 Preliminary research goal

The elaboration of the controversy over interorganizational information systems and interorganizational coordination by identifying consistent patterns of information management approaches and types of interorganizational relationships is the core of the motivation of the current study. Although the motivation stems quite directly from the wish to sharpen theoretical constructs in order to be able to contribute to the debate on interorganizational information systems and interorganizational relations, there are also numerous practical considerations in addressing this problem. Nowadays, there are many challenges for EDI systems in public and private firms. Despite the technological advances mentioned in section 1.1.1, initiatives to exchange data often face unexpected and mindboggling resistance. Hopefully, the results of this research can contribute to a better understanding of these phenomena.

In this study, the focus is on interorganizational information systems and how they are managed in specific interorganizational relationships. Therefore, the focus is not on individual organizations but on relations between two or more autonomous organizations. The scrutiny of appropriateness of management approaches in interorganizational relations has not been pursued often but is not new either (see, for example, Alexander [1995], Grandori [1997]). For example, Grijpink (1997) assumes that decision making on what he refers to as value chain computerization and interorganizational characteristics has to be aligned[26].
Thus, the level of analysis is not so much the individual worker, group, department or organization with principally clear boundaries, limited relations with others, and a focus on internal efficiency and effectiveness (Konsynski, 1993, p. 111; Homburg & Gazendam, 1997), but rather the level of analysis is the relationship between organizations. In this way, the environmental niche of interorganizational arrangements

[26] "Keteninformatisering en coordinatiebehoefte moeten goed op elkaar zijn afgestemd" (Grijpink, 1997, p. 42).

can be examined to determine appropriate information management approaches not only within specific participating organizations but also within the configuration of the interorganizational network as a whole (Levinson, 1994). Using this line of reasoning, emphasis on the organization is replaced by emphasis on the partnership of two or more organizations, including matters of how coordination takes place within interorganizational relations (Cunningham & Tynan, 1993).

In section 1.2, the core argument has been summarized and the motivation of the study has been presented. The objective of this study is to contribute to the theory of information management regarding interorganizational information systems and especially *to attain more insight into combinations of various information management approaches and various types of interorganizational relations.* The outcome desired is thus a theory relating characteristics of information management on the one hand and characteristics of interorganizational relations on the other hand. This theoretical framework may be used in the field of information systems to explain the appropriateness of information management practices in various contingencies. In the field of interorganizational relations and networks of organizations, the framework may be used to indicate which coordination mechanisms are congruous with specific information management approaches.
In the following sections, the research objective will be worked out, eventually into a research design that guides the research activities.

1.4 Research questions

Inspired, in particular, by the debate mentioned in section 1.2.2 and subsequent studies (for example, by Holland & Lockett [1994]), it is necessary to elaborate on the initial relationship between ICT and interorganzational relations, albeit by proposing a number of refinements.
Firstly, 'ICT' will be replaced by the variable 'information management' as the important variable in the research next to 'interorganizational relations'. Information management as a variable provides the opportunity of highlighting the fact that information systems can be deployed differently in different settings, and can be subject to different control models and architectures. Hence, it is probably more appropriate to speak of interorganizational information systems instead of ICTs.
Secondly, it is desirable to avoid the universalistic bias that has been frequent in organizational and interorganizational research (Grandori, 1997) by trying to identify consistent combinations of information management approaches and interorganizational coordination mechanisms. This is achieved by providing an explanation for the appropriateness of various information management approaches in various 'contingent' circumstances: that is, characteristics of interorganizational relations.

This line of reasoning is comparable to, for example, the study of Burns and Stalker (1961). In their study, it is asserted that a 'mechanistic' structure which features strong hierarchical control is consistent with control conditions of task certainty, whereas an

organic structure, featuring loose hierarchical controls, mutual adjustment and widespread use of discretion, initiative taking and participation is consistent with conditions of task uncertainty. Related studies are described by Woodward (1965), Perrow (1970) and Lawrence and Lorsch (1967).

The studies mentioned above have been criticized for a number of reasons.
Firstly, Zuurmond (1994) criticizes the prediction that in complex, turbulent environments, so-called professional organization structures must exist. This is, however, an example of a normative theoretical statement, which is inspired by design-oriented versions of systems theory but which is not representative of the vast majority of empirically-oriented studies.
Secondly, another stream of criticism has developed from the point of view of organizational ecology (Hannan & Freeman, 1977; Donaldson, 1995). The core of the criticism is that organizations are not always capable of adapting to consistent patterns but that they 'survive' when consistency between variables exists or 'die' if there is inconsistency. However, the population-ecology perspective in its most pure form shows some internal inconsistencies (Péli, Bruggeman, Masuch & Nualláin, 1994), it lacks empirical support (Donaldson, 1995) and in a later version of the population-ecology theory, redesign (as a kind of managerial action) became possible (although it was seen as the start of a new organization [Breukel, 1996]).

Using the above line of reasoning, it is possible to rephrase the research objective as the identification of 'fits' or 'gestalts'[27] of information management approaches and various types of interorganizational relations. To reach the research goal, a number of research questions are stated.

The first research question relates to information management, or, more specifically, the differentiation that is possible with respect to information management (see section 1.2.2). It has already been mentioned that, customarily, information management denotes an explicit, formalized and centralized management activity. However, Kubicek has argued for a more differentiated concept of information management (i.e., more decentralized), although he did not indicate how such an information management approach differs from the 'traditional' approach.

1. What approaches to information management for interorganizational information systems can be defined?

The second research question refers to the variety that exists in interorganizational relations. As the Malone-Yates-Benjamin thesis, which served to inspire the current

[27] 'Fit' and 'gestalt' are often used synonymously. The word 'fit' is often used in quantitative research, whereas the word 'gestalt' is customarily preferred in qualitative research.

study, focuses on the coordination between organizations as the most important attribute of an interorganizational relationship, this study attempts to explain why various types of coordination between organizations exist.

2. What types of coordination between organizations can be defined?

With research questions one and two, the variables of the research framework are identified, but an explanation of 'appropriateness' (in terms of 'internally consistent patterns of variables') is not available yet. Such an explanation, in terms of propositions and hypotheses, is addressed in the third research question. On the basis of information management theory, to be discussed in order to answer the first research question, and the theory of interorganizational relations, to be discussed in order to answer the second research question, 'plausible' combinations of information management approaches and interorganizational coordination forms are identified. Note that these hypotheses together form the theory of information management regarding interorganizational information systems which is the stated objective of this study.

3. Which hypotheses relating interorganizational information management approaches and characteristics of interorganizational relations can be constructed?

Thus far, research questions hint at the construction of a theory on information management of interorganizational information systems. This emphasis on theory construction is consistent with the research objective (see section 1.3). However, confrontation of hypotheses with empirical data is the ultimate test for any theory. The fourth and last research question addresses the empirical validation of the theory developed from the first three research questions. With this research question, it is possible to investigate if, in practice, strategic decision-making processes are taking place in accordance with the motives identified in information management theory and theories of interorganizational relations, or if the hypotheses identified in research question three should be adapted or even rejected.

4. Is there empirical validation for the hypotheses relating information management approaches and characteristics of interorganizational relations?

This framework is in a way rather eclectic. The attribute 'eclectic' signifies that the framework draws on various theoretical perspectives without necessarily integrating them into a grand meta theory. By taking various stances and arguing from a number of different, sometimes even contradictory, perspectives, it will be possible to provide much richer insights, compared to simply arguing from one theoretical position. Moreover, as Schwarzer, Zerbe and Krcmar (1997) note, studies that incorporate both information technology aspects as well as organizational aspects not only highlight the complexity of the research area but also show that it is nearly impossible to find one single theoretical approach that can incorporate all different aspects. It therefore seems

reasonable to develop an eclectic framework. In terms used by Bacharach (1989), the theory hinted at in the research objective is connective rather than transformational, where connectivity refers to the ability of a new theory to bridge the gap between two or more theories and transformation refers to the need to reevaluate the preexisting theories.
Of course, there is a danger that this will bring about an 'eclectic smattering of theories' (Van de Ven, Emmett & Koenig, 1974). In chapters two, three, four and especially five, however, it will be shown that it is possible to synthesize a framework that consists of multiple perspectives that nonetheless are grounded in a limited number of theoretical schools of thought. Moreover, the unitary interorganizational theory sought by Van de Ven *et al* either does not exist, is not precise enough or simply has not been able to pass the empirical test until now.

The eclectic framework is confronted with empirical data and may be adapted using the fourth research question. This confrontation takes place in a number of stages. Firstly, the theoretical concepts used are validated by means of studying secondary case material and initial interviews and document analysis of original case material. Secondly, the presumed relationship between concepts, operationalized in variables and indicators, is checked with the empirical data.
The enumeration of research questions sums up *what* is studied, not *how* the investigation takes place. The latter is explained in the following section.

1.5 Research design

1.5.1 Introduction

To indicate *how* research questions are answered (with what strategies, using what methods, etc.), research activities are laid down in a method of research (van der Zwaan, 1990, p. 21) or research design (Yin, 1994). Yin defines a research design as "an action plan for getting from here to there, where 'here' may be defined as the initial set of questions to be answered and 'there' as some set of conclusions (answers) about the questions" (Yin, 1994, p. 28).
In general, there are many research designs available to organizational scientists. In general, the content and form of the research design to be used is dependent on the research goal specified. In this section, firstly, we will present an overview of various research approaches and of criteria that lead to choosing any of these approaches, and we will argue which research approach suits our research goal. Then, secondly, we will give an overview of various research strategies to be chosen after a research approach has been selected as well as of criteria that can be used to select a research strategy, and the selection of the specific research strategy for our purposes will be explained.
A first distinction that is possible is the distinction between problem solving as a research activity and theory developing and testing as a research activity.

1.5.2 Applied research versus fundamental research

In general, it is possible to distinguish two approaches toward research (van Strien, 1986, p. 19; Swanborn, 1984, p. 127). An applied research approach is primarily aimed at solving real, existing problems in a well-defined, step-by-step manner using theoretical frameworks and models to derive a solution for the problem under scrutiny. The steps to be taken are prescribed by the *regulative cycle* (or the diagnosis-intervention-implementation cycle of the applied research approach). Bosman (1977) has applied the regulative cycle to the design of information systems. He has proposed a number of refinements to the research approach, although he has left the core of the regulative cycle intact.

Phase	**Description**	**Results in…**
Problem definition	Perceived discrepancy between an actual and normative situation	Description of actual and desired state
Diagnosis	Formulation of the problem in terms of a theoretical framework	Statements indicating how actual state can be transformed into desired state
Plan	Design of solutions	Proposal for timing and localization of intervention
Intervention	Implementation of the solution proposed	Description of state arrived at after intervention has taken place
Evaluation	Test if gap between actual and normative situation has narrowed	Statements indicating to what extent desired state has been reached

Figure 4: Elements of the regulative cycle

The elements (Figure 4) form a cycle because evaluation of the results of the testing can form the basis of other problem-solving research activities (Figure 5).

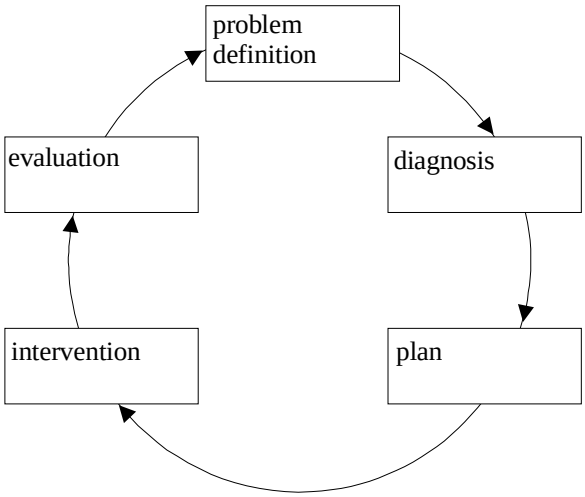

Figure 5: Regulative cycle

However, a fundamentally different cycle is followed when the goal of the research is explaining phenomena by developing a theory. Here, the approach is called the fundamental approach, which is characterized by the *empirical cycle* (Swanborn, 1984, p. 124). The empirical cycle consists of the following elements (Figure 6).

Phase	**Description**	**Results in …**
Observation	Exploration of a phenomenon (previous studies, literature, primary observation)	Indication of relevant concepts, variables
Induction	Design of an exploratory model on the basis of parts of existing theories	Exploratory framework
Deduction	Deduction of testable hypotheses from the explanatory model	Set of hypotheses which together constitute a theory
Testing	Confrontation of hypotheses with empirical data	Statements indicating confirmation / disconfirmation of theory
Evaluation	Rejection, revision or corroboration of the model	Revised theory

Figure 6: Elements of the empirical cycle

Again, the above phases constitute a cycle because rejecting, revising or corroborating an explanatory model can generate new observations and, subsequently, new theory construction and testing (Figure 7). Note that this gradual shaping of theories is very much inspired by the philosophy of science of critical rationalism, in the sense that scientific inquiry is an interplay between knowledge (in the form of theories) and

empirical data. This feature is also adhered to in, for example, Peirce's view on science: in his view, as well as in the critical rationalist view, knowledge in the form of theories is formed in a self-corrective inquiry process, in which the knowledge of previous scholars is inherited and possibly refined. The ultimate source of knowledge, however, is different. In a critical rationalist's view, knowledge is eventually based in theories that explain empirical phenomena. In Peirce's view, this inquiry is at heart a process of free association or creative thinking, or at best the utterance of preference for a hypothesis (out of a set of hypotheses) that explains a phenomenon[28]. Kuhn and Lakatos have proposed other refinements. Kuhn states that there is no gradual cumulation of knowledge, but that the body of knowledge of science grows by 'scientific revolutions' or paradigm shifts, which makes subsequent theories incommensurable. Lakatos, on the other hand, assumes a sort of 'path dependence' in any scientific community; that is, a theory is rejected only if it has proved to be really untenable (after several refutations of hypotheses) *and* if a better theory is available.
The refinements proposed by Kuhn and Lakatos describe well how science progresses over large periods of time (decades). As the current study does not address such a period of time, these refinements are not taken into account here.

The fundamental approach, guided by the phases of the empirical cycle, tries to contribute to the understanding of phenomena through theory construction. It is the goal of theory construction that distinguishes the empirical cycle from the regulative cycle. In the empirical cycle, by means of improved understanding, knowledge in the form of theories is provided that can be used to analyze problems and to plan actions to improve a problematic situation, *but problem solving is not primary to the fundamental approach*.

In section 1.3, contributing to the theory of information management in interorganizational relations was stated as the research objective of this study. Theory building as an objective indicates a fundamental research question and suggests an empirical cycle to be used in this study.

[28] Peirce amends the standard empirical cycle as follows. He discerns abduction, which consists of examining a mass of facts and allowing these facts to suggest a theory; deduction, to deduce from that ideal theory a variety of consequences, and induction, the verification of effects by means of experimentation. Other than redefining some elements of the empirical cycle, however, the addition of an abduction phase does not transcend the induction-deduction-testing phases identified in Figure 6.

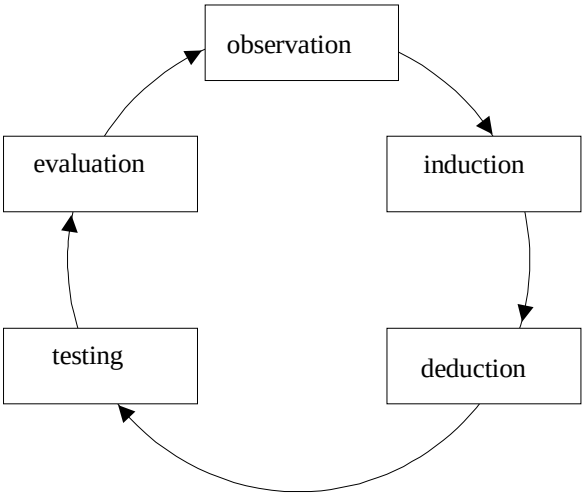

Figure 7: Empirical cycle

1.5.3 Research strategies

Note that the phases identified in Figure 6 and Figure 7 are phases that can be analytically separated but that represent a rather stylized representation of many research endeavors. In practice, the phases of the empirical cycle do not have the same weight in all research activities and they do not always constitute the exact sequence presented in Figure 6 and Figure 7; iterations may frequently occur.

These deviations from the 'pure' empirical cycle may be explained because, in various attempts to explain phenomena by developing theories, researchers are confronted with existing theories that are more or less developed. For some phenomena, there are few theories with testable hypotheses available that explain these phenomena. In these cases, the induction and deduction phases may be given more attention and iteration between induction, deduction, testing and evaluation frequently occurs. For example, in such a situation, considerable effort may be spent on, for example, conceptual analysis, and possibly formalization of various fragments of existing theories, in order to provide a basic comprehension of how empirical particulars are related. Gazendam (1993) proposes the CAST method[29] to explore and formalize existing theories or fragments of

[29] CAST is an acronym for Conceptual Analysis and Specification of organization Theories. CAST is a method to conceptually analyze and formalize organization theories in order to guide the development of knowledge-based decision-support systems (KB-DSS). Although, in the current study, the focus is on theory development rather than on the development of KB-DSSs, the CAST method is considered valuable because it provides guidance in the analysis of (fragments of) theories. The original CAST method consists of a number of steps: (1) summarizing the theory in terms of key concepts, key performance indicators, main hypotheses and reasoning processes; (2) the

theories. In fact, in taking a view on doing research in which theory development is stressed, the exploration (and possibly formalization) of theories may well take up far more energy and time than the gathering and analysis of data.
It is possible to explain occurrences of some phenomena through a full-blown theory. In this case, less energy and time must be devoted to developing testable hypotheses (because hypotheses are often available and well-described); the gathering and analysis of data in these cases often is more elaborate and demanding.
It must be noted, though, that in all research activities, whether based on the wish to develop theory or having theory testing as the research objective, all phases identified in Figure 6 and Figure 7 require attention. Every research activity has an activity involving theoretic inferencing and an activity in which hypotheses are confronted with empirical data.

In the methodological literature, various research strategies to be used within the framework of the empirical cycle have been described (Yin, 1994; Den Hartog & Van Sluijs, 1995; Swanborn, 1984). Figure 8 provides a summary of these research strategies.

specification of an interpretation frame in an object-oriented grammar notation; (3) rule specification; and (4) dynamics specification. As we will describe later on, we will focus on the first phase of the method (see Gazendam [1993] for a more elaborate description of the CAST method).

Research strategy	Description
Case study	Observation of a phenomenon in a natural context, employing various methods to gather information from relevant people, groups or organizations.
Survey	Measurement of a number of variables in many individuals, groups or organizations.
Action research	Manipulation and observation by participating in a real-life setting, for example by participating as a consultant in a project, because of which the researcher is able to access information which would otherwise have remained inaccessible. Eventually, the objective is to provide an explanation (theory) of phenomena.
Ethnographic study	Participative observation in a specific, real-life setting. Here, the emphasis is on the 'Verstehen' (grasping) of phenomena and on doing justice to the context in which a phenomenon takes place. Theory use or theory development is not central.
Simulation	Manipulation of parameters in a model to observe changes in endogenous variables in the model.
Experiment	Measurement of one or more variables in an experimental group and in a control group before and after the experimental group has been exposed to a stimulus.

Figure 8: Fundamental research strategies

Note that in Figure 8, a distinction is made between case study research, action research and the ethnographic study. In other literature, these different research strategies are sometimes subsumed under the heading of case study. However, as has been shown in Figure 8, there are important differences which may influence the selection of these research strategies and, therefore, the distinction is worth mentioning.

There are criteria that can be used to determine the appropriateness of various research strategies. For example, Benbasat, Goldstein and Mead (1987) state that the selection of a research strategy depends on the nature of the research topic and the goal of the research.

A first criterion for the selection of a research strategy is the possibility of manipulating the phenomenon under scrutiny. If the phenomenon is a historical event or if manipulation of a present event is not possible, this leaves out the possibility of choosing the experiment or action research as a research strategy. Simulation may be an alternative to experiments, but only if the original setting can be modeled in a computer model or in a setting in which human actors play the roles of actors in a real-life setting.

A second criterion is the nature of the research, and, related to this point, the state of the theory development. If the research is aimed at theory testing, experiments, explanative

case studies or comparative surveys may be used in order to replicate previous empirical studies. However, if the goal of the research is theory development, explorative cases, surveys and simulation may be used to found theoretical statements on empirical data that is more or less coincidental (Breukel, 1996, p. 174).
These two criteria can be used to form a matrix in which research strategies are positioned (Figure 9)[30]. Note that the positioning of research strategies in the matrix is only a rough indication of the appropriateness of various research strategies. Yin (1994) stresses that there is no (hierarchical) order in research strategies. He opposes the view in which case studies are portrayed as appropriate only for research activities that stress exploration, surveys and ethnographic studies for research activities that emphasize description and experiments for situations in which providing explanations is important. In practice, Yin claims, there are also experiments with an exploratory character and case studies that provide explanations for historical events. So the criteria cannot be applied in a mechanistic way; although each strategy has its own distinctive characteristics, there are large areas of overlap between them and the boundaries between strategies are not always clear and sharp. "No strategy is more appropriate than all others for all research purposes" (Benbasat, Goldstein & Mead, 1987, p. 369).

		Research aim	
		Theory testing	*Theory development*
Manipulation	*Possible*	Experiment, simulation	Action research
	Impossible	Survey	(Exploratory) case study

Figure 9: Appropriateness of research strategies

In the present study, it is impossible for the researcher to manipulate real-life information management approaches or characteristics of interorganizational relations. It is not realistic for any organization scientist or information system researcher to propose to an organization to apply multiple information management approaches or to change interorganizational relations with partner organizations. And even if this was realistic, it surely is impossible to implement each of these interventions in similar circumstances. So experimentation is ruled out as a research strategy.
Furthermore, in sections 1.2.1 and 1.2.2, it was concluded that current research on the relationship between interorganizational information systems and interorganizational relations results in contradictory conclusions, which necessitates further theory construction. Therefore, it was stated in section 1.3, that the research objective was to develop theory. In our tentative matrix, for this combination of circumstances, a case study is suggested.
In the current study, we emphasize theory development and conceptual analysis of existing theories and theory fragments, and we use case studies to enrich and possibly refine the theoretical explanation. For the theory development, conceptual analysis is

[30] As neither theory use nor theory development is central to ethnographic studies, ethnographic studies cannot be positioned in the matrix.

used according to the first phase of the CAST method,[31] which emphasizes identification of key concepts, key performance indicators, main hypotheses and reasoning processes.

The choice of the case study in organization science or information system research in order to illustrate and possibly refine theory is not at all an unprecedented one. Because of the properties of absence of possibilities to manipulate and enmeshment of phenomena with contexts, case studies are frequently encountered in the disciplines of organization studies and information systems. Benbasat, Goldstein and Mead (1987) remark that a distinguishing property of the scientific discipline of information systems is that technological change and innovations (termed 'novelty' by Eisenhardt [1989]) occur frequently and that researchers often find themselves trailing behind practitioners in proposing changes or in evaluating methods for developing new systems. Researchers in this area usually learn from practitioners, rather than providing the initial wisdom for these novel ideas. Benbasat, Goldstein and Mead recommend the case study for capturing the knowledge of practitioners and enriching existing theories with this knowledge.
Johnston and Yetton remark: "Case studies permit rich description, through capturing multiple data sources and perspectives (…) It is not surprising then, that such research frequently reveals emergent patterns and trends which inform theory, and thus facilitate theory development" (1996, p. 193; see also Yin [1994]; Swanborn [1984]).

Summarizing, from the initial scrutiny of the literature on interorganizational information systems and interorganizational relations, conflicting conclusions are drawn and therefore, new theory development and sharpening of constructs is required. It is therefore our aim to develop insights and theory on information management of interorganizational information systems. Furthermore, it is impossible for us to manipulate the variables we are investigating. Using the above arguments, the emphasis on theory development through conceptual analysis of existing fragments of theory, and the tentative matrix (Figure 9), an exploratory case study is chosen as a research strategy in order to enrich and possibly refine theory. Moreover, this strategy provides opportunities to learn the state of the art, and to enrich theories using experiences from practice (Benbasat, Goldstein & Mead, 1987), which is especially relevant because of the rapid change in the field of interorganizational information systems.

1.5.4 Research activities

After having selected the case study as the methodology to be used in this research, bearing in mind the restrictions and accentuations mentioned in section 1.5.3, the question remains how this methodology fits the research design (research goal, research questions).

[31] See footnote 29.

Some authors state that the case study lends itself to theory development by inducing entirely from empirical data ('inductive logic'). For example, Eisenhardt (1989) states that the case study "(…) relies on continuous comparison of data and theory *beginning with data collection*" (Eisenhardt, 1989, p. 534; italics by VH; see also footnote 28). However, a researcher adhering to such a view of the case study runs the risk of 'death by data asphyxiation'. Therefore, a priori specification of constructs and propositions, and possibly variables and hypotheses (Bacharach, 1989) is a prerequisite, and this is only possible through study of existing theory: coherent with the initial order in phases of the empirical cycle.
In this study, the development of these 'prerequisites' is done through conceptual analysis of theories from the disciplines of information systems, economic organization theory and political organization theory, and basic mechanisms are formalized in a mathematical representation. In fact, the larger part of this thesis consists of theory construction through conceptual analysis.
The development of theory is *facilitated* by case-evidence. As the typical case study progresses, some distance is taken from the original empirical cycle: iterations between deduction, induction and testing occur. "[R]esearchers constantly compare theory and data - iterating toward a theory which closely fits the data" (Eisenhardt, 1989, p. 541). This process of theory building through iteration is "(…) the heart of building theory from case studies, but it is both the most difficult and the least codified part of the process" (Eisenhardt, 1989, p. 539). It nevertheless is essential, because "it is the intimate connection [of theory, VH] with empirical reality that permits the development of a testable, relevant, and valid theory" (Eisenhardt, 1989, p. 532).

The iteration of induction and deduction takes place using within-case data as well as cross-case data. Doing this, hypotheses gradually take shape by (1) sharpening of constructs and (2) verifying that the emergent relationships fit with the data (Eisenhardt, 1989). This type of reasoning (termed 'replication' by Yin [1994][32]) especially facilitates theory development because "(…) it forces investigators to go beyond initial impressions" (Eisenhardt, 1989, p. 541). In the literature on case study methodology (Yin, 1994; Patton, 1990; Eisenhardt, 1989; Benbasat, Goldstein & Mead, 1987; van Strien, 1986; Swanborn, 1984), various ways to strengthen the case study design are presented. Firstly, Eisenhardt comments: "The research team must judge the strength and consistency of relationships within and across cases and also fully display the evidence and procedures when the findings are published, so that readers may apply their own standards" (1989, p. 544). This is, of course, in some ways rather trivial and applies to all scientific inquiry. Secondly and more importantly, Denzin (1978, in:

[32] This logic of *replication* (Yin, 1994) differs from the logic in theory testing research because in theory testing research, each hypothesis is examined for aggregate cases, not individual cases as in theory building research. An advantage is that the latter provides the opportunity to refine and extend the theory. A disadvantage is that theory building using this kind of logic is more or less judgmental.

Patton, 1990) mentions that an important way to strengthen a study design is through triangulation. He has identified four basic types of triangulation.

- Data triangulation: the utilization of various sources of data, either documents via document analysis, human informants through interviews, etc.;
- Investigator triangulation: the utilization of various researchers;
- Theory triangulation: the utilization of various theoretical perspectives in the research;
- Methodology triangulation: the utilization of various methodologies (experiments, surveys, case studies) in the research.

In general, the investigation of the alignment between information management approaches and interorganizational characteristics takes place according to two lines of reasoning.

- There are multiple cases included in the study, so there are more combinations of *information management approach* and *types of interorganizational relations* to be analyzed, which enables *replication* of findings between cases.
- If possible, individual cases are studied retrospectively for their history, i.e. how information management approaches and interorganizational characteristics have evolved over time. This also provides opportunities to replicate findings within cases (over time).

Unfortunately, it proved not to be possible to employ investigator triangulation or methodology triangulation. Investigator triangulation was impossible because of the fact that this research, like many research projects, is a doctoral dissertation research project for one researcher. It was therefore impossible to safeguard 'concurrent' investigator triangulation. Possibly follow-up research activities may, over time, safeguard investigator triangulation.

Methodology triangulation proved to be impossible because, in reference to section 1.5.3, it has been argued that the research strategy to be used is dependent on the possibility of manipulation of the subject under scrutiny and the research objective (theory development versus theory testing). As was argued in section 1.5.3, in this research project it turned out to be impossible to create an experimental setting and the research objective was to develop rather than to test theory. This combination of characteristics suggests the use of a research strategy out of the bottom right cell of Figure 9 and this cell contains only one research strategy. Therefore, pursuing methodology triangulation proved not to be possible in the current study.

However, considerable effort has been spent on stressing theory triangulation and data triangulation. Employing the eclectic framework has safeguarded theory triangulation (see section 1.4). Data triangulation has been safeguarded by explicitly interviewing various stakeholders who had been selected on theoretical grounds, and by studying existing documents. The latter proved to be especially important in pursuing the second line of reasoning in the research (the historical analysis of cases).

Overall, the empirical study can be accused of abiding to a relatively positivist point of view, as distinct from ethnographic or interpretivist (Eisenhardt, 1989). The latter typically focuses on describing and interpreting the meaning of behavior within particular contexts. In our research, the focus is on developing theory, which eventually can be tested and potentially generalized across organizations that use interorganizational information systems.

1.6 Thesis outline

In the preceding sections, the variables of interest were indicated and the research goal and research questions were formulated. Moreover, in section 1.5, a research design was chosen. The remainder of the dissertation will answer the research questions according to the strategy that was explained in section 1.4. The structure of the dissertation is depicted in Figure 10.

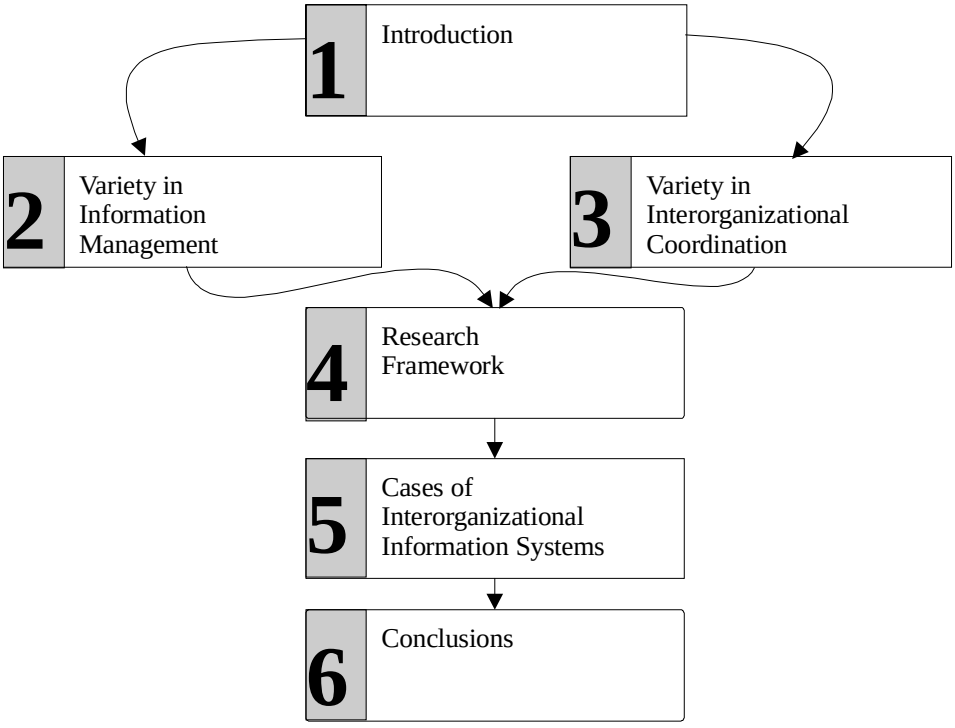

Figure 10: Structure of the thesis

The thesis has two parts: a theoretical part and an empirical part. In chapters two and three, elements of the theoretical framework are documented from two different angles: from the point of view of information management (research question one) and from the perspective of interorganizational relations (research question two). Chapters two and three consist of reviews of existing literature on information management and interorganizational relations, respectively, including development of theory, comments,

criticism and illustrations that have been mentioned. Combination of insights from these angles is postponed until chapter four. Here, elements are synthesized into a theoretical framework and the research objective is reformulated (research question three).
Chapter five provides results that illustrate the proposed mechanisms in an empirical setting (research question four). In chapter six, the conclusions with regard to the theoretical framework are summarized and recommendations for practice and further research are provided.

In addition to the graphical depiction of the structure of the thesis (Figure 10), the contributions of the various chapters are summarized below (Figure 11).

Chapter	Title	Research question addressed	Purpose	Output
1	Introduction	-	Introduction of the subject	Preliminary research goal
2	Variety in Information Management	1	Explore IS&IM concepts and constructs	Description and definition of information management
3	Variety in Interorganizational Coordination	2	Explore interorganizational concepts and constructs	Description and definition of interorganizational relations
4	The Research Model	3	Synthesize research framework	Research framework, research goal, propositions and hypotheses
5	Cases of Interorganizational Information Systems	4	Provide empirical material to test and develop framework	Application of framework to real world situations
6	Conclusions	[*all*]	Draw conclusions based on framework and empirical test and possibly revise framework	Conclusions, recommendations, suggestions for further research

Figure 11: Contents of chapters (summary)

2 Variety in Information Management

2.1 Introduction

In chapter one, we have introduced the subject of the study (information management and interorganizational relations). In previous research, we have seen that 'information technology', 'information systems' and 'information management' are often-used constructs with sometimes ambiguous meaning. In order to define one of the central concepts of this thesis, information management of interorganizational information systems, this chapter will elaborate on definitions of information technology, interorganizational information systems and information management. In section 2.2, these key concepts of this study are combined and this results in a definition of information management of interorganizational information systems.

In section 2.3, the connection between information management and general organization theory is discussed, tending toward the organizational imperative perspective[33]. Section 2.4 discusses information management and the variety that exists with respect to information management, with its frame of reference inclining to the technological imperative[34].

In section 2.5, interorganizational information management is discussed, based on the contributions of the preceding sections, and, consistent with our research objective, the theory fragments offered by organization theory and information systems theory are analyzed conceptually for their key concepts, key performance indicators, main hypotheses and, in general, for their reasoning processes. Section 2.6 describes interorganizational information management in three cases (Dutch PICA Library Automation, information systems in the Dutch penal law enforcement value chain, and the case of information exchange in the British National Health Service). These cases, which have been described in the literature, illustrate some appealing aspects that have been identified in the theoretical literature. The chapter is concluded with an overview of information management approaches and their characteristics.

[33] See section 1.1.3.

[34] See footnote 33.

2.2 Key definitions

Until so far, we have been discussing information technology, information systems, telematics and interorganizational information systems rather loosely. Markus and Robey (1988) claim that the variety in definitions results in various conflicting measures for information technology and that this complicates comparison of empirical and theoretical research and impedes accumulation of knowledge in the field of (management) information systems. Therefore, attention must be paid to an accurate definition of the subject under investigation.

2.2.1 Information technology

Leavitt and Whisler first used the term 'information technology' in 1958. Since then, many authors have used the term 'information technology' in many different senses. Many definitions emphasize the parts which make up information technology (i.e., *analytical* definitions). For example, in the introduction to the 'Management of the 1990's Research Program', Scott Morton refers to information technology as a set of hardware, software, networks workstations, robotics and smart chips. Smart chips refers to embedded information technology, such as the use of microprocessors in washing machines, elevators, etc.

The above definition concentrates purely on technical matters and lack attention to databases, procedures, people, etc. Breukel extends these purely 'technical' definitions by adding what he calls 'an implicit knowledge aspect'. "If a definition includes the role of IT for business functions, the gap between the technological and knowledge angles will be closed slightly" (Breukel, 1996, p. 34). In other words, a *functional* definition of IT is also required. De Jong gives an example of such a functional definition of IT: "all tools that can be used to collect, store, process and spread information" (1994, p. 15).

Other authors combine an *analytical* with a *functional* definition. Stegwee (1992) uses the term information technology as a comprehensive term for hardware, software and services relating to the processing, storage and communication of information, using primarily opto-electronic means. Breukel (1996) defines information technology as the collection of automated tools (hardware, software and telecommunications) that are used for the support of information services of organizations.

Summarizing the writings on a definition of information technology, it is possible to rephrase the definition of IT so that it includes elements of the above-mentioned descriptions.

Information technology (IT)	Collection of automated computer tools and associated methods and techniques that can be used to collect, store, process and spread information.

In the above definition, reference is made to all kinds of optic-electronic, *programmable* computer tools. The inclusion of knowledge ('methods and techniques') in a definition of information technology makes it possible to explain an important aspect of

information technology: its ability to innovate work processes in organizations. Knowledge can be seen as a resource in organizations. According to the resource-based view of the firm (Penrose, 1959; van der Zaal, 1997), innovation of processes or products is the result of the reshuffling of resources in organizations. By using the definition of information technology that includes knowledge as an integral part of information technology, it is also possible to emphasize innovation stemming from information technology: "(…) enlarging the knowledge-base of an organization is an important measure to extend innovative strength" (de Jong, 1994, p. 56). De Jong concludes that it is very likely that application of IT has an innovative character (de Jong, 1994, p. 190).

2.2.2 Information systems

Above, information technology is defined as a collection of technical means and the knowledge to cope with those means. Some information technology definitions overlap with definitions of *information systems*. For example, one of Gazendam's definitions of an information system is "a system consisting of a processor, a memory, data structures and algorithms, in which the processor operates on data structures as specified by the algorithms, and in which the data structures and the algorithms reside in the memory" (Gazendam, 1993, p. 15).

But in general, definitions of information systems explicitly include pragmatic aspects: the fact that information systems are used in organizations and that they in some way contribute to goal achievement. Some authors state that an information system constitutes an integral part of the organization itself. Here, an organization is usually defined as a group of people with goals as well as methods, routines and mutual expectations for achieving these goals. For example, Gazendam defines an organization as "(…) an entity consisting of agents, processes of task performance and other processes, and knowledge" (Gazendam, 1993, p. 14). In this definition, an 'agent' refers to "an entity that can apply and generate knowledge". Agents, according to Gazendam, can be humans, organisms or machines.

It is thus possible to define an information system as the community of machine agents in an organization. The community element in this definition refers to a group with some sort of common expectations and incorporated goals. Machine agents are unique in the sense that they are explicitly developed in order to aid human agents, emphasizing certain values in order to achieve these goals. Essential in the differentiation of information technology and information systems is thus the organizational context (in terms of organizational goal achievement) that is present in the definition of information systems and absent in the definition of information technology.

In chapter one, it was discussed that communication technology has gained importance. An important feature of machine agents is their capability to communicate with humans using human-computer interfaces. But, despite the fact that the technology of telephony has existed for quite some time, the communication *between information systems* using

communication channels based on computers, data carriers and technical networks (Gazendam, 1993) accounts for the new developments in the telecommunications industry (chapter one and section 2.2.1). The advances in information technology and telecommunication give rise to so-called telematics-based systems: information systems that use telecommunication technology. Scott Morton (1991) and Nohria and Eccles (1992) have described the trend towards the use of telematics.
An important distinction within telematics-based systems is the distinction between *deconcentrated information systems* (or distributed data processing [Cash & Konsynski, 1985]) and *interorganizational information systems* (Suomi, 1990; Wierda, 1991). Deconcentrated information systems use telecommunication technology to connect geographically dispersed information systems that belong to one organization. Van der Heijden refers to these kinds of information systems as 'native' systems. This kind of telematics-based systems is relatively easy for organizations to handle:

- An organization can always fully control its information systems at a strategic level.
- The costs of the information system can always be assigned to a single organization, as can the resulting benefits[35] (Suomi, 1990).

Interorganizational information systems use telecommunication technology to couple machine agents that are usually geographically dispersed but always belong to different organizations. This boundary-spanning aspect implies a level of cooperation and coordination well beyond that of the traditional arms length relationship that exists between organizations in a totally free market (Kumar and van Dissel, 1995, 1996). On the other hand, the coordination and communication is not as tightly coupled as is usual between, for example, divisions of one organization.

Wierda (1991) defines interorganizational information systems as information systems that are jointly developed, operated and/or used by two or more organizations that have no joint executives. Barrett and Konsynski define an interorganizational information system as a system "that involves resources shared between two or more organizations" (Barrett and Konsynski, 1982, p. 94). Cash and Konsynski propose referring to an interorganizational information system as "an automated information system shared by two or more companies" (Cash & Konsynski, 1985, p. 134).
This type of information system is characterized by the fact that various machine agents communicate and perform tasks that span two or more organizations. Therefore, including the element of various participating organizations in the information system can transform our definition of an information system into a definition of an interorganizational information system.

[35] In an interorganizational setting, benefits may not always be observed and/or verified by other organizations. See sections 3.3.5 and 4.4 for an elaboration.

Interorganizational information system (IIS)	An information system which is embedded in two or more organizations with no joint executives[36] and which is used and developed by these organizations jointly.

An important element in the definition is the fact that two or more organizations participate in an IIS. In practice, it is possible to think of various ways to analytically separate organizations. Suomi (1990) distinguishes three criteria on the basis of which organizations can be separated.

The first one he identifies is the juridical viewpoint in which organizations are described as having their own assets and liabilities. Schmidt refers to this viewpoint as the formal organization perspective: "[f]ormal organization is to be defined as in terms of ownership and liability as opposed to the dynamic pattern of actual cooperative work reflecting the requirements of the environment and the technical and human resources available" (1991, p. 102). According to Suomi, the problem with this viewpoint is that a parent company can tell a subsidiary to use an information system, even though the organization might be juridically separate.
The second one is the technical viewpoint. An organization can be defined as having its own structure and agents – both machine agents as well as human agents ('technical and human resources', see Schmidt [1991]). The problem with this criterion is that organizations can outsource their machine agents (use external service houses to take the information processing at hand) and even human resources (by means of externalization of labor using services of staffing agencies). In these cases, these resources do not belong to the organization according to a technical viewpoint but strategic decisions regarding the use of interorganizational information systems are still in the hands of the outsourcing organization.
The third one is the managerial viewpoint. This point of view focuses on the independence an organization has in making decisions about interorganizational information systems: with what applications and techniques, but ultimately *whether or not to participate*. According to Suomi, the managerial viewpoint should be decisive and in this study, this viewpoint is accepted[37].

Suomi (1990) distinguishes three main categories of interorganizational information systems.

[36] Very strictly speaking, the definition requires at least one executive, possible acting in two or more roles.
[37] In chapter four, it will be argued in a systematic way that the juridical, technical and managerial viewpoints are hard to separate. At this moment, however, the managerial viewpoint is adopted.

- Electronic Data Interchange systems: structured and standardized exchange of data between organizations over an electronic transmission medium (van der Heijden, 1995, p. 5)[38]. In the most automated form, on the basis of an event in the primary process, an application generates and sends an electronic message which is received and reacted upon by another application (machine-to-machine communication). At this moment, there are several standards for EDI messages, such as EDIFACT and ANSI X.12 (Ribbers, Ekering and van Zutphen, 1994).
- Electronic Mail and Videoconferencing: the transfer of human-initiated information from one computer to another (human-to-human communication). The exchanged messages can be E-mail messages, but also video signals, sound fragments, etc.
- Application to external databases: access to external databases with computer interfaces. This is the most advanced form of interorganizational information systems but also the least described. Nowadays, using, for example, the Internet, it is possible to access databases that are geographically dispersed and whose tables are maintained by various organizations.

Suomi's categorization is somewhat confusing because, ideally, EDI (in its most automated form) also involves access to databases without any human intervention. Some definitions even require the absence of human intervention for an adequate definition of electronic data interchange. In practice, however, EDI comes in a variety of manifestations, with various degrees of integration with an organization's internal databases (Swatman and Swatman, 1991; Figure 12).

[38] Strictly speaking, EDI systems are not always interorganizational information systems because they can also be used for *native* purposes (intraorganizational EDI as a communication medium among departments within the same organization).

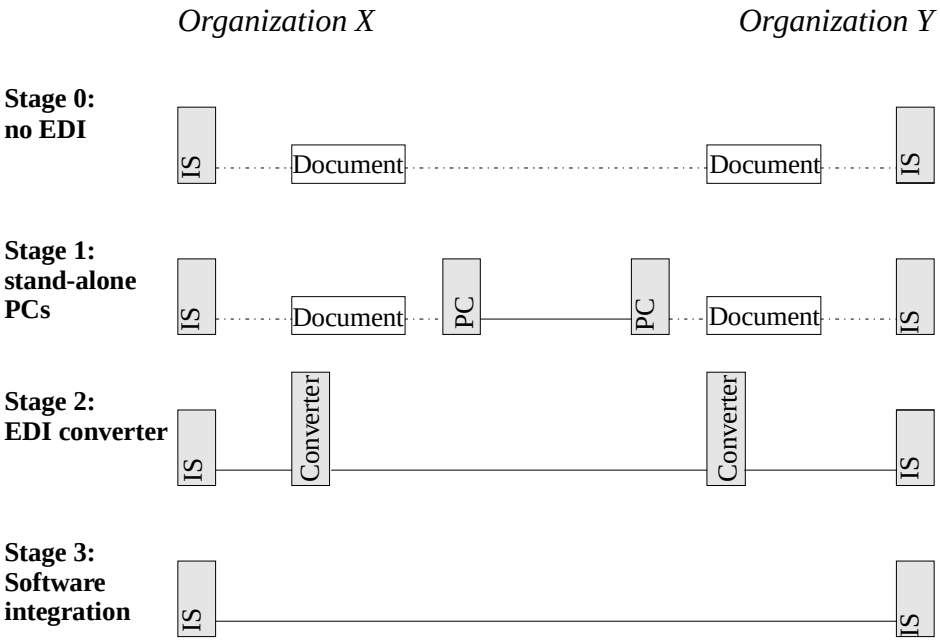

Figure 12: Stages of EDI integration

Swatman and Swatman distinguish four stages of integration of EDI systems. In stage zero, the output of organization X's information system is printed and manually keyed into organization Y's information system. Stage one integrates the information systems somewhat further and uses separate PCs to enhance communication between two separate systems. An EDI converter is introduced in the second stage. Swatman and Swatman's final stage three is an information system with built-in EDI facilities.
It is especially this 'stage three' model of EDI software integration that blurs Suomi's distinction. Suomi's first category sometimes overlaps with his third category, interorganizational databases. Obviously, *integration* is a more useful criterion to distinguish various interorganizational information systems than Suomi's categorization. For this reason, Suomi's classification is rejected.

2.2.3 Information management

Many authors point to managerial action towards information systems as an essential area of concern (Earl, 1989; Porter, 1985; Johnston & Vitale, 1988). The number of applications of information systems has increased over time, and duplication of data and inefficiency caused by piecemeal implementation of many applications have drawn attention to the management aspects of an organization's information system (van Waes, 1991). "Poorly managed data presents real problems for the management of large organizations", comments Shanks (1997, p. 69).
In the literature, it has been noted that many organizations have difficulties with accessing data from multiple functions. Analyses showed that the lack of logical data integration across information systems (as a result of so-called 'island automation')

made answering cross-functional or cross-divisional questions difficult. “This leads to duplicated and inconsistent data and difficulty in the consolidation of data for reporting” (Shanks, 1997, p. 70), because “(…) [i]nformation from several functional areas within an organization is frequently required for strategic decisions” (1997, p. 69).

From the viewpoint of resource allocation, it has been argued that information systems require attention from a management point of view, in order to “align the data management function with the business plans of an organization and develop a data architecture” (Shanks, 1997, p. 70). Such an architecture enables the development of integrated information systems, the elimination of duplicated data, the standardization of definitions of data across all information systems and easier consolidation of data for reporting (Shanks, 1997).
The aspect of management that tries to accomplish this has been labeled information management. Gazendam (1993) distinguishes a number of forms of information management:

- Information resource management (IRM). IRM is the management of the informational aspect of an organization. It emphasizes both the contents of information as well as the processing of information in terms of types of information to be managed in order to meet information requirements.
- Information systems management (ISM). ISM is the management of the information processing system of an organization. It is restricted to systematic (but not necessarily automated) information processing and formal properties of information in an organization.
- Information technology management (ITM). ITM is the management of the information processing aspect of an organization that is based on information technology. ITM also includes the management of changes in strategy and structure accompanying information technology application. ITM is more restricted than ISM by stressing information processing by information technology, i.e. by information processing systems realized on computers using software (Gazendam, 1993).

In the remainder of this thesis, we focus on the role of information technology and thus we will restrict the meaning of ‘information management’ to ‘information technology management’. The broader concepts of information systems management and information resource management are excluded from our analysis of information management, unless explicitly mentioned.

Despite the exclusion of information resource management and information systems management from the specific meaning of information management used in this thesis, a definition of information management has still not been presented. Wassenaar (1995) describes information management as the direction of information systems in and between organizations. Simons and Verheijen define information management as “controlling (at all levels) of information and information supply as an object that

contributes to the realization of an organization's objectives" (Simons & Verheijen, 1991, p. 216). Breukel (1996) views information management as all kinds of tasks that can be performed to bring the information technology in an organization in line with the organization's structure and strategy via a process of encouraging initiatives and enforcing top-down strategic and structural changes.

Information management is thus a rather broad task. Van Waes (1991) defines a number of subtasks. According to van Waes, 'strategy formulation' is the subtask of determining main lines, 'planning' as a subtask sets targets, 'organizing' creates relations between people and tools they use and 'control' checks whether the activities carried out are in accordance with the planning and strategic intentions. Gazendam (1993) explicates the tasks that are to be performed under the heading of information management (Figure 13).

Information strategy determination / information policy determination
Information architecture development / information planning
Information project planning
Information management review
Information system development tasks

Figure 13: Information management tasks (Gazendam, 1993)

In the information management literature, various authors have tried to analytically separate information strategy from information planning and information system development tasks. Boersma (1989) defines information policy as the prescriptive framework for information planning and implementation of information plans. Theeuwes (1988) uses a similar definition in which vision is emphasized. According to van der Poel, information strategy refers to "a complex of implicit or explicit goals, visions, guidelines and plans with respect to the supply and demand for formal information in an organization, sanctioned by management, intended in the long run to support the objectives of the organization and adjust it to the environment" (van der Poel, 1995, p. 31)[39]. Information planning, on the other hand, is defined as "the articulation of a decision-making process aiming at the specification of an information plan, which is to be used as the basis for the development of information systems support as specified by the plan" (van der Poel, 1995, p. 31). Wassenaar describes information planning as "the establishment of coherent, future-oriented agreements with respect to information systems" (1995, p. 288). In Wassenaar's vision an organization is a set of relatively autonomous modules, which represent a business domain and an informational domain. In these domains there is, respectively, a demand for and a supply of information services. Information management as a whole refers to

[39] From van der Poel's use of the term 'formal organization', it seems he is positioning himself in the information system management stream of research. His analysis of information strategy, however, is restricted to information technology.

governance of transactions between the information supply domain and the business domain. Information planning refers to a process of engaging in contracts which aim at alignment of demands to supply of information services. The results of this process, according to Wassenaar, are laid down in an information plan covering a portfolio of information system services, an information system and data structure, information services and databases.

The demarcation of strategy from planning in the above circumscriptions is rather strict. However, other authors confuse the distinction. For example, Theeuwes uses information planning as a comprehensive term for information strategy and architecture development. Breukel captures information strategy and information planning in the term SISP (strategic information systems planning). He defines SISP as follows: "[t]he process of identifying a portfolio of computer-based applications that will assist an organization in executing its business plans and consequently realizing its business goals and/or the process of searching for applications with a high impact and the ability to create an advantage over competitors" (Breukel, 1996, p. 124).
Other authors use terms like Information Systems Planning, Management Information Systems Planning, and Strategic Planning for Information Systems (Breukel, 1996, p.123) and most authors define the terms they are using, but a comparison of these definitions reveals a semantic jungle (Fitzgerald, 1993). In this study, we will use a comprehensive term for decision making regarding information systems in organizations and refer to it as information management. We will define information management as follows.

Information management	Task of decision making regarding goals, prioritization, development and use of information systems in or between organizations.

Note that in section 1.2.2, it was noted that, in the literature, 'information management' is often held synonymous with an explicit, centralized and formalized form of decision making. Note that the definition of information management stated here allows for other forms in which the authority over information systems is dispersed. In this way, the definition of information management is able to meet Kubicek's criticism (see sections 1.2.2 and 1.4).

The literature reviewed customarily pays attention to information management in an intraorganizational setting. Combining the definitions of information management and interorganizational information systems, it is possible to define information management in an interorganizational setting (or information management of interorganizational information systems, or interorganizational information management).

Interorganizational information management (IIM)	Task of decision making regarding goals, prioritization, development and use of information systems that are embedded in two or more organizations that have no joint executives[40].

Note that a decision-making-oriented definition of information management almost inevitably draws attention to matters of (concentration of) authority, or *locus of control* in information systems (see section 1.2.2). Therefore, a decision-making-oriented definition of information management provides the opportunity to:

- Highlight the involvement of the organizations that are participating in the interorganizational information system, which in general complicates the decision-making process, compared to the situation in which only intraorganizational information systems are considered (see also section 2.2.2).
- Respond to the third point of criticism of existing studies in the scientific discipline of information systems as mentioned by Steinfield, Kraut and Plummer (1996), and respond to Breukel's proposal for paying attention to the decision-making process (see section 1.1.3).

Thus far, a definition of information management of interorganizational information systems, which is a part of the initial framework of this study, has been given. In section 2.1, it is indicated that in this chapter, the first research question is addressed ('What approaches to information management for interorganizational information systems can be defined?'). However, before we are able to do so, the origins and development of the concept of information management are first discussed. This discussion takes place along two perspectives.

(1) Firstly, in section 2.3, the 'organizational imperative'[41]-perspective of information management is highlighted by discussing information management in organization studies.
(2) Secondly, in section 2.4, 'the technological imperative' angle of information management is emphasized by scrutinizing how the information systems literature deals with information management.

It is assumed that by discussing information management from these two perspectives, the working of the interaction between information management and interorganizational relations is better understood.

2.3 Information management in organization studies

In the preceding section, a definition of interorganizational information management was synthesized, with decision making regarding information systems as the central concept. Bearing the analyses of the interplay of information technology and

[40] See footnote 36.
[41] See section 1.1.3.

organizational parameters in mind (see section 1.1.3), one would probably expect that information management is a prominent theme in the discipline of organization studies, at least at the conceptual level. Gazendam (1993) has, on the contrary, noted that although the discipline of organization studies provides a rich spectrum of theories[42], the theme of information management is somewhat underexposed[43].

The introduction of the term 'information technology' by Leavitt and Whisler in 1958 has already been mentioned. In 1966, Felix Kaufman made the first reference to interorganizational information systems within a more or less organizational context[44]. Kaufman's ideas were not given much attention in the information systems and organization science researchers community until the late 1980s and 1990s. In the organization studies literature, authors studying corporate strategy and competitive advantage probably made the first references to information management. A well-known reference is that of Porter (1980) who, by the way, did not refer to information systems or information management as a part of an organization's resource pool for competitive analysis. But many other authors have expanded on the original book by drawing attention to the role of information systems in the competitive advantage analysis. Porter himself addressed information management (i.e. information planning) in a more recent article (Porter and Millar, 1985).

Only after competitive analysis and corporate strategy had gained momentum as a topic in organization studies was attention given to the potential for transformation of organizations and for innovation by information systems (Earl, 1989; Scott Morton, 1991; Galliers, 1993; de Jong, 1994; Breukel, 1996). It then proved to be a major theme in research (Galliers, 1993). In the literature, it was stressed that information systems have the potential to increase the value added to products and services of an organization and, moreover, may be able to change the position of an organization in the market in which it is operating (Porter & Millar, 1985). These observations have inspired many researchers to bridge the gap between organization studies and information systems research.
Van der Poel quite explicitly positions information management at the crossroads of information technology and corporate strategy. Boersma (1989) depicts information management in a dynamic, continually changing force field with other aspects of management such as corporate strategy, organizational policy and financial policy. Thus, information management is a form of decision making regarding information systems, in the context of other management activities and decision-making processes.

---

[42] See, for example, Morgan (1986).
[43] Exceptions are Davis & Olsen (1985) and Keen & Scott Morton (1978), although these books are probably more known for their influence on DSS training programs and DSS research than for their influence on information systems research at large.
[44] His claim was that computers can be used to think beyond organizational boundaries.

The interference between an organization's decision making regarding information systems and its strategic management has resulted in a need to manage an organization's information system and to bring strategic management into line with an organization's use of information systems (and vice versa). The rationale for aligning an organization's management of information systems with its strategic management is the claim that this form of alignment can enhance an organization's competitive advantage. Various authors from the academic information systems discipline have reacted in various ways to this claim; nevertheless, the concept of strategy is important in the context of information management. Because the literature on strategy and strategic management is one of the rare fields in organization studies that explicitly pay attention to information management, we will now elaborate on the concept of strategy in organization science.

Chandler (1962) established the concept of strategy in the literature on organization studies. The writings of Ansoff and Ackoff in particular popularized the concept of corporate strategy. Snellen (1975) described strategy as a kind of all-encompassing, explicit, systematical, conscious and comprehensive form of decision making concerning the outlines of a policy. According to Ansoff (1968), it is possible to summarize the process of strategy making in seven steps (Haselhoff, 1977). Snellen (1975) adapted Ansoff's phases and identified six approaches towards strategy formation. Haselhoff, furthermore, elaborated on three approaches in strategy formation.
The correspondence between the distinctions these authors make is depicted in Figure 14.

Haselhoff	Snellen	Ansoff
A. Strategy as planning ('technological strategies')	A1 Strategic variable approach	A1a Identification of *threats* and *opportunities*
		A1b A *strengths* and *weaknesses* analysis
	A2 Personal / intuitive approach	A2 Clear and definitive statements of the *objectives*
	A3 Strategic gap approach	A3a '*Gap analysis*'
		A3b A '*search decision'*: plan on the basis of present prospects or seek additions and/or replacements to present product markets
		A3c A *search* for alternatives and *analysis* of consequences
	A4 'What business are we in'-approach	A.4 The *action decision*: 'what kind of business do we want to be in?'
B. Strategy as exertion of power ('environmental strategies')	B. Stakeholder approach	
C. Strategy as legitimization ('social strategies')	C. 'Social needs' – approach	

Figure 14: Strategy formation

The strategic planning approach towards strategy has long been, and, in some respects, still is, the most documented and well-developed approach in the strategy field. Snellen mainly elaborated on the development of strategic planning techniques, but also, more recently, authors like Earl (1991) and Robson (1993) use Ansoff techniques to characterize organizational strategy formation. In general, the strategic planning approach presupposes that articulating organizational parameters like goals, objectives, strengths, weaknesses, etc., and deducing and formalizing action plans to overcome problems contribute positively to an organization's well-being. Critics have attacked this line of reasoning in organization theory (Wildavsky, 1979; Mintzberg, 1994). Mintzberg in particular has vigorously opposed writings that defended corporate strategy without empirical justification[45]. "A number of biased researchers set out to

[45] For example, van der Poel comments: "In general we must therefore conclude that there is a broad consensus that planning and strategy are sensible and valuable. That

prove that strategic planning paid, and collectively, they paid no such thing" (Mintzberg, 1994). However, Mintzberg's sometimes quite cynical comments mainly pertain to the strategic planning perspective on strategy. In *The Rise and Fall of Strategic Planning*, Mintzberg identifies four conceptualizations of strategy in an organizational context as alternatives to the strategic planning mode of strategy:

- a series of activities from which over time a *pattern* emerges,
- a sense of direction or *perspective*,
- a good eye for opportunities in the environment, a *position*, and
- a *ploy*, a trick.

On the basis of this conceptualization, Mintzberg (1994) discerns ten 'schools' of strategy formulation, each having its own emphasis and result of the formation process (Figure 15).

School	Emphasis	Result process
Design school	Blueprint of concepts and relations	Blueprint of strategy
Planning school	Procedures	Planned internal alignment
Positioning school	Development, identification and selection of strategic positions	Strategic positions
Entrepreneurial school	Role of vision in the shaping of an organization	Vision
Cognitive school	Mental processes of strategy formation	Insights in strategic style of individuals
Learning school	Learning processes, feedback loops	Experience
Political school	Opportunism and incrementalism	Political power
Cultural school	Culture of an organization	Ideology
Environmental school	Alignment to contingent factors	Alignment
Configuration school	Growth process with 'crises' in which adaptation to changed circumstances takes place	Balanced evolution of an organization

Figure 15: Mintzberg's schools of strategy formation

Note that Mintzberg's enumeration also comprises the power or stakeholder perspective (in the political school) and the social needs or legitimization perspective (in the cultural school).

For the moment, it is important to note that a lot of attention has been paid to the 'consistency' (see chapter one; see also Pyburn [1983]) for an analysis of alignment of information strategy and corporate strategy, especially inspired by Mintzberg's design,

---

consensus appears to be based more on popular wisdom (…) than on scientific proof" (1995, p. 35).

planning, environmental and entrepreneurial schools of strategy formation. A well-documented example of consistency of information strategy with business strategy, where business strategy is considered to be positioning in product-market combinations (strategic planning perspective), is provided by the case described by Rackoff, Wilson and Ullrich (1985)[46].

Webster (1995a, 1995b) presents an example of consistency of information strategy with business strategy, where business strategy is considered to be exertion of influence and power. She presents a number of cases in which large companies use electronic data interchange as part of their information strategies in order to "(…) unilaterally [impose] their own in-house computer systems or information handling practices upon their trading partners, [extend] their own hardware systems into their supplier's premises, [dictate] product and inventory coding according to their own established in-house information systems, and [dictate] the type and frequency of data to be exchanged" (Webster, 1995a, p. 37). Here, the information strategy that propagated electronic data interchange has enforced the existing power relation and has crystallized it into electronic data interchange networks. "They [powerful players, VH] use EDI to heighten their control over their trading relationships, and (…) they may even enshrine this control in the EDI system itself, through particular configuration of the network, hardware and software" (Webster, 1995a, p. 37). Normally, interorganizational information systems are developed in a cooperative fashion, but Webster describes cases in which the less powerful parties – the spokes – have little influence over the development process. "They are forced to adopt the systems and information handling procedures developed by their major customers, which are geared to the requirements of the latter, and not to their own procedures or business strategies. (…) Furthermore, the absence of any collaboration or prior consensus about the structure, function and design of these networks afford the spokes little opportunities to develop their knowledge and expertise in EDI use" (Webster, 1995a, p. 37).

The utilization of standards would ideally lock in the less powerful players to a lesser degree. However, according to Webster, standard setting is an intensely political and adversarial process, in which the less powerful parties "(…) are obliged to leave the standard setting to the large companies who can afford to get involved, and to accept the resultant technological solutions which now embody the latter's information handling requirements" (Webster, 1995b, p. 24).

---

[46] Rackoff, Wiseman and Ullrich explicitly make a connection between so-called strategic thrusts and information management activities. Their methodology, however, hardly accounts for an explicit, systematic and formal methodology. Their seven-step methodology includes steps like 'brainstorming for opportunities' and 'discuss opportunities'. These steps resemble the steps 'Apprehend Inputs', 'Add Insights' in strategic planning of which Mintzberg comments that they represent: "(…) the worst example of a problem symptomatic to the entire literature: assuming that a phenomenon has been captured, that action will take place, simply because it has been labeled in a box on a piece of paper" (Mintzberg, 1994, p. 66).

So, what we see here is that large, powerful organizations reinforce their attempts to control other organizations by issuing very compelling instruments of information management. These instruments not only constrain the development of the interorganizational information system, but also indirectly the business strategies of the organizations. The existing power-dependence of the organization is reinforced by the choice of instruments of information management and also eventually in the information technology.

Webster's analysis reveals that apart from consistency between information management and strategy-as-positioning-in-markets (planning perspective), it is also possible to envisage interaction between information management and strategies-as-exertion-of-influence-and-power (power perspective). However, specific combinations of instruments of information management and characteristics of power exertion cannot be derived yet.

2.4 Information management in information systems research

2.4.1 Introduction

In order to further analyze these interactions between information management and strategy, and to analyze the consistency of information management approaches and strategy formation approaches, in the next section we take a look at the differentiation that is possible in information management.

Information management as a subject at the crossroads of, on the one hand, information systems (section 2.2.3) and, on the other hand, strategy (section 2.3), has gained a lot of attention in the academic discipline of information systems. Wassenaar (1995) describes an evolution in the attention that has been given to various aspects of information technology in the theories of organization and information systems (Figure 16).

Period	Label	Emphasis
1950-1965	Information processing technology	Capacity
1965-1975	Information storage technology	Shared Data
1975-1985	Information input/output technology	Integration and Planning
1990s	Information transfer technology	Interorganizational Topics[47]

Figure 16: Evolution in IT emphasis (adapted from Wassenaar, 1995)

Wassenaar's analysis can be used to indicate a number of issues. For example, the claim that the role of telecommunication technology has gained importance (see section 1.1.1)

[47] These topics refer to, for example, the interorganizational coordination debate initiated by Malone, Yates & Benjamin (1987), but also to security issues regarding the exchange of information over public infrastructures.

is supported by Wassenaar's analysis. Furthermore, the analysis suggests a change of emphasis from reasoning very much in line with the technological imperative, to matters usually associated with the organizational imperative. For example, the 'technologists' Cash, McFarlan and McKenney note "much of our thinking has been shaped by literature dealing with general business" (1988, p. 2). Simons and Verheijen (1991) have also noted this change of emphasis.

As in the strategy field, there are a number of schools in information management (Wassenaar, 1995).

- Engineering school (represented by authors like Martin, and, in the Netherlands, Simons and Verheijen). Within this school of thought, so-called architectures are seen as the backbone of the decision-making process. Information management is a rational, centrally-organized process. In general, the engineering school is assumed to follow the technological imperative. There is a strong relationship to the strategic planning mode in the strategy field.
- Strategic school (represented by Porter and Millar, Wiseman, Breukel). Strategic planning with regard to information systems is emphasized as a means to reach the goal of competitive advantage. The perspective somewhat leans toward the organizational imperative. The strategy school resembles the positioning school in the strategy field.
- Adaptive-evolutionary school of thought (represented by Nolan, McFarlan and McKenney). This stream views information management as a process rather than a one-time effort and stresses processes of growth as subjects for information management. An important element of this approach is that knowledge about information systems is gradually built up. The process itself is controlled centrally.
- Organizational-learning school (represented by Hopstaken and Kranendonk, Huysman). Here, gradual convergence of goals with respect to information systems is stressed. It differs from the adaptive-evolutionary school of thought by its recognition of inherent divergence of interests in organizations. Eventual action is only possible, however, after goals have converged.
- Sociotechnical school of thought (represented by Markus and King, Wassenaar, van Bijsterveld). Information management is viewed as taking place in a setting of various stakeholders.
- Organizational school (represented by Tushman and Nadler, Boersma, Gazendam). This school emphasizes decision-making in a context of contingencies like technological, economic and social factors. The organizational school in information management shares many characteristics with the configurational school in the strategy field.

In fact, these categorizations are related in the following manner (Figure 17).

IM Schools / *Strategy Schools*	**Engineering**	**Adaptive-evolutionary**	**Strategic**	**Organizational**	**Organizational-learning**
Design					
Planning					
Positioning					
Entrepreneurial					
Cognitive					
Environmental					
Configurational					
Political					
Cultural					
Learning					

Figure 17: Relationship between information management schools and strategy schools

In section 2.2.3, information management was defined as a task of decision making regarding information systems. In the scientific discipline of information systems, there are indications that make it possible to conclude that the popular view of information management identified in chapter one – an explicit, formalized, centralized form – is not the only view of information management[48].

The enumeration of characteristics (or 'key concepts') focused on in various information management schools reveals a variety in information management, although it is not very clear what makes up this variety. However, previous information management research has resulted in some indications of ways to proceed (Gazendam, 1993; see Figure 18).

[48] See sections 1.2 and 1.3.

Aspect	Description	Elaborated in section…
Control / Involvement of stakeholders	Refers to the way decision-making processes take place[49] and who triggers the *development* of information systems. Gazendam (1993) refers to this aspect as 'control strategy' or 'control approach' and it is strongly related to the way various actors are involved in the process. Note that this line of research reflects Kubicek's emphasis on the role of various participants in explaining eventual effects (see section 1.2.2).	2.4.2
Functionality / goals	Refers to the goals that are adhered to in the decision-making process (and which are explicitly *not* adhered to). Goals can be specifications of common systems, but also less restrictive requirements; for example, descriptions of what the system is supposed to do (functionality), or, inversely, what should explicitly not be done with the system.	2.4.3
Architecture	Architecture (or architectural foundation) refers to a high-level map of the information requirements of an organization (Brancheau & Wetherbe, 1987; see also King & Nault, 1998). It can refer to a set of constraints on the development of an information system that ensures a desired level of integration (data definitions, value consistency) in all future development and maintenance activities through the use of an elaborate diagram, but it is also possible to merely enumerate by what conventions communication takes place.	2.4.4

Figure 18: Overview of information management aspects

Furthermore, in section 2.4.5, it is noted how changes in 'contingent variables' (see Kubicek, 1995) affect information management approaches, and vice versa.

2.4.2 Control and involvement of actors

In the various schools of information management, there is a variance in the degree of centralization of decision-making authorities and a variance in the attention to the

[49] Breukel (1996); see also section 1.2.

degree of participation of various stakeholders in information management. Who the stakeholders are exactly, and in what they participate, is unclear until this point in our analysis.

In the engineering school of thought it is not even that important; the strategy making and planning is done by a 'unibrain' (top management, which represents the rest of the harmonious organization [Haselhoff, 1977]). However, various authors have focused on actors or stakeholders in information management. Ruohonen (1991) departs from the 'unibrain' idea: information management is too complex as a managerial job to be handled by one person. Wassenaar (1995) also opposes the 'holistic view of organizations' and adheres to a more or less political view of organizations in which organizations are viewed as relatively autonomous modules with partly conflicting, partly identical interests. Ruohonen suggests that managerial groups are required and that the negotiated situations that result from these group processes are characterized by organizational power and politics, because various interest groups, or stakeholders, view information management differently (even within single organizations).

Ruohonen identifies three critical stakeholders groups: top management, user management and IT/IS management. Wassenaar adds external actors: consultants, advisors, etc. as a fourth category[50].

In the visions of Wassenaar and Ruohonen, top management (general managers, managing directors, Chief Executive Officers) has a general view of the strategy of the organization. Ruohonen adds that their experience with information systems is often limited to management reporting systems and that their primary interest is curtailing the cost of information systems.

Representatives of the organizational domain (middle management or user management groups) are typically users of information systems and have often played a role in information system development projects as business experts. They typically focus on the contribution of information systems to business performance.

As a third stakeholder group, Ruohonen identifies IT/IS management groups (Wassenaar refers to this group as representatives of the informational domain). This group is made up of information technology experts, in the role of supplier of information technology and information services. They have knowledge of the opportunities and technological constraints of information systems.

Wassenaar also includes a fourth category, advisors, but Ruohonen claims that their role is one of the three roles mentioned above. Therefore, we do not pay attention to a separate stakeholder group consisting of actors who are external to the organization or the network of organizations.

[50] Another category is provided by Nielen (1993). He adds system administrators as a category. According to Nielen, they are often cautious with innovations. In this thesis, system administrators are not identified as a separate stakeholder group as their role in information management is often limited.

Ruohonen merely identifies stakeholders in information management and recommends "improved communication between different parties" (Ruohonen, 1991, p. 17; see also Shanks, 1997, p. 85). Wassenaar's contribution to theory building mainly rests in the recognition that the organizational and informational domains are relatively autonomous modules, that transactions occur between these domains and that formal or informal contracts (planning agreements) are the basis on which transactions take place. The role of top management varies: in vertically-oriented management styles, top management ultimately decides upon the planning agreements. In more horizontally-oriented management styles, this is true to a much lesser extent. Wassenaar indicates that the degree of centralization is dependent on a number of factors, he emphasizes a role for vertically-oriented management styles independent of these factors: "In general, we found that basic problems are caused by inappropriate key conditions. Meta control is crucial for successful IS strategy planning. It matches the IS strategy planning approach and its contingency factors by creating key conditions. These key definitions are involved actors and their expertise, organizational and methodological conditions and the intended outcome of IS strategy planning" (Wassenaar, 1995, p. 318).

Summarizing, we conclude that information management is not always a set of tasks typically performed by 'the organization' or a representative of it. There are multiple stakeholders involved: top management, IT management and business managers. They contribute different pieces of expertise. Eventually, governance of transactions between organizational and informational domains varies.

2.4.3 Functionality and goals of information management

In sections 1.2.2, 1.4 and 2.2.3 it was argued that in the literature, information management is often held synonymous with an explicit, formalized and especially centralized decision-making process.
Key words here are integration of data through standardization and a formalized strategy initiated by top management. Integration in relation to this approach to information management can be defined as the standardization of data definitions and structures through the use of a common conceptual schema across a collection of data sources (Goodhue, Wybo and Kirsch, 1992).

In general, such efforts ideally produce a set of plans that typically include a list of the organization's recommended subject databases and major application databases, a migration path, targeted applications, resource allocation recommendations for application development and guidelines concerning standards (hardware, software and data). "[The] goal is to plan a technology infrastructure that can deliver information to each individual's desktop and then to build databases with the correct structure to store this information without redundancy", summarize Davenport, Eccles and Prusak (1992, p. 55). Note that, preferably, an entire information inventory is addressed.

However, other information management approaches state other types of goals. For example, in the strategic school, the ultimate goal is to achieve competitive advantage, rather than specific (technical) characteristics of information systems. And in the organizational-learning school, no objectives at all are stated.

2.4.4 Architecture

Originally, information management as a field of interest was introduced as a potential solution to problems of data duplication and inconsistency by eliminating 'local' control over information systems. A classical approach towards information management was, therefore, to propose, develop and enforce an elaborate architecture for an entire organization or network of organizations in terms of a common conceptual scheme of data structures and definitions across a collection of data sources. Such an architecture aims at improving poor, inconsistent data quality and gaining control of data redundancy (Martin & Leben, 1989).

The basic steps for developing such an architecture are (Goodhue, Kirsch, Quillard and Wybo, 1992):

- build an enterprise model of business functions (typically 10-30), processes, activities and responsibilities by organizational groups for these elements of the model;
- identify data entities used or created by processes or activities;
- perform 'affinity analysis' to identify groups of data entities that are closely associated (resulting in candidate subject databases); and
- group the subject databases and the processes that use or create that data so that major systems areas can be identified[51].

However, empirical research has highlighted a number of problems (Shanks, 1997; Goodhue, Kirsch, Quillard and Wybo, 1992):

- the architecture is difficult to understand and communicate,
- sustaining management support for the architecture is difficult[52], and
- the architecture is difficult to implement[53].

---

[51] Business Systems Planning (BSP), Information Engineering, Business Information Analysis and Integration Techniques (BIAIT) and Information Quality Analysis are examples of methods that elaborate on these steps (Finnegan, Galliers & Powell, 1997).

[52] Davenport, Eccles and Prusak comment that bureaucratic information management is often carried out by technologists "supported by many technical journals, consultants and technology vendors", (1992, p. 55), while "the senior executives for whom they work usually ignore, or are ignorant of, their efforts. Because these technical models are difficult for non-technologists to understand, managers outside the IS function are rarely active participants" (1992, p. 55).

[53] An explanation for the occurrence of these problems is lacking. In this volume, chapter five, an explanatory scheme is provided.

Goodhue, Kirsch, Quillard and Wybo claim that such a classical approach "though conceived as a generally appropriate method, may not be the best planning approach in all situations" (1992, p. 11). They doubt whether a detailed plan leads to the implementation of a set of subject databases and applications integrated across the target domain of the planning effort. They state that such an architecture may actually only work when data integration is critical to the strategic goals of the organization and when the architecture can be enforced across the organization, either because of negotiated consensus or because of centralized control. They say that, in fact, whenever the organization is too big or too decentralized, the planning process may become bogged down in detail or splintered by divergent interests. In this situation, such activities "may be perceived as a threat to decentralized power [because] functional areas resist a loss of local autonomy and control" (1992, p. 24).

An alternative to such an approach is the retention of several conceptual schemes in terms of data definitions and schemes. The overarching architecture then is not so much a unifying conceptual scheme, but a verbal description of how these various conceptual schemes are related and how communication between various conceptual schemes should take place (with what communication protocols, what messages are used, what the syntax of messages is, what agreements are used, etc.).

2.4.5 Dynamics of information management

In general, it has been observed that information management approaches change over time. Moreover, Gazendam (1987) observed that in a large, divisionalized governmental organization, existing, locally-oriented information management approaches were accompanied, over time, by more encompassing information management approaches, in such a way that these various information management approaches continued to exist simultaneously[54].

Van der Poel (1995) proposes a model to describe the phenomenon of information management (or, more specifically, information strategy) in organizations. On the basis of six case studies and a literature review, van der Poel concluded that information management typically *evolves* over time. Van der Poel developed a typology in which five subsequent information management phases are identified (Figure 19).

Turbulence	Orientation	Consolidation	Exploitation	Tension

Figure 19: Van der Poel's phases of information management

Van der Poel identifies a number of causes as disturbances to information management: a new senior officer, legislation, a change in the organization's strategy, a merger or

[54] Gazendam states that organizations are subject to learning cycles and that, depending on complexity, autonomy of divisions and the number of interorganizational relationships, over time information management approaches are added to an organization's 'repertoire' of information management approaches.

new IT developments. These kinds of disturbances raise commitment of top management and current methodologies are abandoned. In the orientation phase, there is an orientation towards projects, triggered by stakeholders. Methodologies are picked up and architectures are developed. In the subsequent consolidation phase, the process becomes even more mechanistic with a focus on architectures. The mechanistic orientation and nourishment of plans and architectures continues in the exploitation phase. The exploitation phase ends when stakeholders become aware that the situation has stabilized and that fixed architectures seem to obstruct new developments. Architectures become outdated and the process becomes more problem-driven in the tension phase[55].

Gazendam and Van der Poel draw attention especially to the dynamics of information management: information management is obviously not either rationalistic or incremental, but changes over time. According to Gazendam organizations develop a 'repertoire' of information management approaches over time, and according to Van der Poel, organizations abandon information management approaches over time and replace them with other approaches. And as the information management approach changes, so do the roles of various stakeholders and the way in which their activities are coordinated.

2.4.6 Synopsis: information management approaches

Above, we have identified various aspects that are addressed in decision making regarding the goals, prioritization, development and use of information systems in or between organizations.
Previously, we have identified various 'schools' in information management. In these various schools, different aspects of information management are stressed in various ways. This situation is depicted in Figure 20.

[55] The resulting typology resembles Nolan's stage model of adoption of IT innovations, although van der Poel himself claims that it is an elaboration of one of Nolan's phases, the maturation phase. Van der Poel's model shares some of the difficulties of the Nolan phase model, such as the problems of entanglement of prescription and description. In fact, Nolan's model has also been criticized for its technological determinism and its presumed 'one best way of computerizing'. These points of criticism apply to a lesser degree to Van der Poel's model of phases of information management.

	Control approach	Goals & Functionality	Architecture
Engineering	Centralization	Standardization of conceptual schemes	Elaborate
Adaptive / Evolutionary	Centralization	-	-
Strategic	-	Competitive advantage	-
Sociotechnical	Moderate centralization	-	-
Organizational	Moderate centralization	-	Verbal
Organizational-learning	Decentralization		Communication agreements

Figure 20: Information management schools and aspects addressed

Obviously, various approaches towards information management exist. In general, various authors have elaborated on how aspects of information management are dealt with in various schools of information management, thus identifying information management approaches (Schmidt, 1991; Goodhue, Kirsch, Quillard & Wybo, 1992; Gazendam, 1993; de Jong, 1994; Zuurmond, 1994; Johnston and Yetton, 1996). These various information management approaches, in which various key concepts are dealt with in different ways, are identified and elaborated below.

Firstly, there is top-down information management. This stems especially from the Engineering Information Management School. Gazendam (1993) labels this approach 'bureaucratic information management' and it corresponds with the 'top-down strategy' identified by de Jong.
In terms of control, centralization is emphasized. The approach is aimed at "centralized databases, integrated information systems, centralized information system development serving a maximum number of user groups, standardization of work procedures, and centralized control of work" (Gazendam, 1993, p. 298).
In terms of functionality and goals, it is stressed that actions to build or change information systems are taken from a strategic planning vision. Consistent with such a vision is the clear specification of the goals of information management. Eventually, standardization of data structures is the ultimate goal. Gazendam criticizes the top-down information management approach because the most important aim, integration of data models and data definitions, is often incompatible with the political and cultural reality (Gazendam, 1993, p. 262). Gazendam states that "(…) integration of information systems can never be an objective in itself. Integration decreases the diversity in an organization, which can be a threat to adaptivity and flexibility. The striving after integration has to be assessed from the viewpoint of probable practical results [and] is

therefore dependent on the characteristics of the organization" (Gazendam, 1993, p. 262)[56].
In the top-down information management approach, a model of the enterprise, its functions and its underlying data serves as the architecture. Eventually, this model serves as a basis for identifying and implementing an integrated information system that will meet the needs of the organization (Goodhue, Kirsch, Quillard and Wybo, 1992). Zuurmond associates this approach with "a complete, integral, timely and continuous understanding of the target system"[57] (Zuurmond, 1994, p. 63).

Although top-down information management has intuitive appeal, Schmidt remarks that "[i]t is the presupposition of this approach that information is something innocent and neutral. Consequently, it is the ultimate aim of the efforts following this approach to design a Grand Database containing all the relevant data from different parts of the organization so as to provide managers with a unified data model of the organization" (1991, p. 77). Johnston and Yetton illustrate the top-down information management approach as follows: "(…) oriented towards efficiency, integration and cost control, with the centralized structure and tight management controls geared towards achieving this end. This is reinforced by a technological emphasis on standards and a dominant platform/architecture. Such technological architectures often 'grow their own expertise', socializing IT staff through internal recruitment, training and promotion, and rewarding loyalty and length of service. This tends to produce a conservative and risk-averse management style. These IT-configurations are potentially suited to business environments that are relatively stable, and to organizations seeking to control IT costs. This typically large, formalized IT organization is often functionally insulated from the business" (1996, p. 195).
Shanks has described a situation in which top-down information management and organizational characteristics were not consistent. "The centralizing tendency of the data administration group in attempting to gain control over data modeling within project teams was clearly a structural contradiction to the highly decentralized and autonomous business units [and eventually] no change to the structures of domination was achieved" (1997, p. 84).

An alternative to the top-down information management approach is the bottom-up approach. Shanks (1997) refers to this approach as an evolutionary approach which

[56] Note that Gazendam implicitly assumes that diversity, adaptivity and flexibility are virtuous characteristics of 'an organization'. Taking into account that these characteristics are typically associated with decentralized organizations, it is possible to reconcile Gazendam's criticism with the criticism of Goodhue *et al*; both seem to emphasize that bureaucratic information management is incompatible with decentralized organization structures.
[57] "(…) een volledig, integraal, actueel en continu inzicht in het te bestuderen objectsysteem"

would achieve greater participation from stakeholders. Zuurmond's (1994) corresponding archetype is 'local, contextual informatization'. It derives the actions to be taken from operational opportunities or necessities. Initiatives are taken by line managers at all levels in the organization.

This is based, in particular, on the Organizational-Learning Information Management School. Johnston and Yetton (1996) refer to this as the divisional approach. Schmidt has remarked that reality has condemned the idea of top-down information management "(…) to the realm of utopia. In fact, the underlying conventional notion of organizations as being monolithic entities is quite naïve. Organizations are not perfectly collaborative systems. Rather, an organization is a mixture of collaboration and conflict. Most information generated and processed in organizations is subject to misrepresentation, because it has been generated, gathered and communicated in a context of goal incongruence and discord of interests and motives." (1991, p. 77). Johnston and Yetton propose the bottom-up approach as an approach that is better able to cope with circumstances of discord of interests and motives: an approach "supported by decentralized management structures and flexible, project-based management processes, this ideal type focuses on how it can add value to the business. Because it is highly responsive to multiple business divisions, this approach can lead to a relatively high IT cost structure, high staffing levels and a proliferation of systems and platforms. Its professional staff is usually externally trained and mobile, and motivated by a reward system based on performance-driven pay and promotion. Such configurations are typically associated with diversified, market focused business environments. This configuration often features a corporate IT unit coordinating the business divisions' competing demands for IT service, as well as specialized IT staff located within divisions." (1996, p. 195).

In terms of control, the bottom-up information management approach emphasizes decentralized initiatives. Zuurmond claims that, in general, the lack of a control method and lack of an elaborate information architecture results in 'enmeshment of program code and data', 'spaghetti program code', 'operating system commands in applications', 'undifferentiated authorizations' and 'ultimate island automation'. Zuurmond states that because of these characteristics, it is impossible to represent local peculiarities in information systems (1994, p. 63) [58].

[58] Zuurmond adds the property of programming method in order to distinguish between bottom-up and top-down approaches. He associates bottom-up approaches with messy, spaghetti-like coded programs and top-down approaches with neat, well-structured applications. Gazendam and de Jong, on the contrary, argue that bottom-up information management is typically associated with the use of modern, object-oriented programming methods and the use of rapid application development tools. In general, however, the choice of programming techniques is a matter of system development or even software engineering and choices of software engineering are decided upon independent of the information management approach adopted. It is perfectly possible to adopt a top-down approach and eventually use object-oriented tools in order to

In terms of functionality and goals, the bottom-up information management approach in a way parts with the original necessity of information management, by relaxing the ideal of integration: bottom-up information management "(…) is information management aiming at databases that are decentralized according to the structure of the organizational units, a network of small person-oriented information systems (decision support systems), decentral development of information systems, extensive re-use of program code, and line-management-based control of work" (Gazendam, 1993, p. 299). So, integration of data models and data definitions are not pursued immediately. Consistent with the decentralization philosophy, no general common goals are specified. Sometimes, it is specified for what purposes the information system should *not* be used; this is, however, far less restrictive than specification of a goal that should be attained.

In terms of architecture, Zuurmond (1994) explains that this approach does not prescribe an information architecture in terms of a common conceptual scheme for data definitions and data structures. Rather, the architecture consists of a set of agreements on procedures in order to communicate between various conceptual schemes, such as agreements on referring, limited agreements on numbering, agreements on a set of communication primitives used to communicate, etc. (see also Heesen, Homburg & Offereins, 1995, 1997).

Intermediary between top-down and bottom-up information management approaches is the equilibrium approach. It is termed 'governance approach' or 'network approach' by Gazendam (1993) and it is especially rooted in the Organizational - and Adaptive-Evolutionary Information Management Schools. "The equilibrium policy for information management attempts to maintain a balance between centralistic and decentralistic approaches to information management. It is aimed at governing computerization based on the principle of choosing the adequate approach for each problem, and for admitting decentral initiatives while maintaining a central overview and a minimally necessary coordination" (Gazendam, 1993, p. 300). Goodhue, Kirsch, Quillard and Wybo stress that "to be accepted by key stakeholders, data integration efforts may need to find the right balance between the value of global data integration versus local flexibility" (1992, p. 124).
Zuurmond refers to this approach as 'personal political informatization', in which actors very consciously and *opportunistically* decide whether or not to adopt either bottom-up or top-down approaches: that is, dependent on personal or political motives. Analogous to architecture, which is central to the Bureaucratic Information Management approach, the equilibrium approach nourishes a zoning plan, a sketchy architecture in verbal terms. Such an architecture is probably more ambiguous but it has the additional

---

implement information systems, or use a bottom-up approach and decide for each information system to be developed to use either modern object-oriented tools or third generation languages to build information systems with.

advantage that non-technical people do not see an architecture merely as a wiring diagram (Shanks, 1997).

In general, several authors indicate that information management approaches are contingent upon environmental characteristics and changes in approaches are the result of external 'shocks' (de Jong, 1994; Wassenaar, 1995; van der Poel, 1995). However, a 'one best way of organizing' principle has been promoted by Zuurmond (1994) in his discussion of his global, universal informatization archetype. Zuurmond states, however, that this archetype of informatization only occurs if certain criteria are met, such as size of information systems, and a 'cultural levelling and/or homogenization at a worldwide scale'[59] has occurred[60]. This is such a big 'if' that a 'one best way of organizing' principle is rejected in this study.
Gazendam states that "[t]here is no a priori preference for a specific organization metaphor or a specific planning and control structure" (Gazendam, 1993, pp. 255-256). However, Gazendam also states that the objective that can be used to differentiate various information management approaches, integration, is dependent on the characteristics of the organization (1993, p. 262). De Jong identifies the same variety in information management and attempts deliberately to link the appropriateness of information management approaches with specific circumstances. De Jong recommends a top-down approach (bureaucratic information management) for small organizations with flexible structures and cultures and considerable financial resources, operating in a steady environment. In this information management approach, the stability of the architecture on the basis of which information systems are to be developed, is crucial. The bottom-up approach is recommended for any organization that can live with the costs of fragmentation of technology and knowledge and that operates in an environment in which strategic changes are not likely to be necessary. The equilibrium information management approach is preferred for any organization that can afford the cost of fragmentation of technology and knowledge and must operate in an environment in which strategic changes are likely to be necessary.

The above authors indicate 'consistent' combinations of information management approaches and organizational contingencies, but a true explanation is lacking at the moment. In terms of a conceptual analysis of theories, key concepts are identified

[59] "Er moet op mondiaal niveau een 'culturele nivellering en/of homogenisering' hebben plaatsgevonden, wil informatisering door kunnen groeien naar het globale, universele type" (Zuurmond, 1994, p. 65).

[60] Zuurmond assumes a tendency towards cultural levelling and homogenization in western, capitalist countries (1994, p. 65). The argumentation for this statement, however, is lacking. Shanks (1997), on the other hand, indicates that a problem with using a universal informatization (or bureaucratic information management) approach is the problem of alienation of stakeholders: "[A] big problem was in getting people to accept that you could use a generic model to achieve specific needs" (p. 81).

(control model, architecture, goals) and efficiency seems to be an underlying key performance indicator for all information management approaches, but explicit hypotheses are often lacking in information management.

2.5 Interorganizational information management

The question is whether the information management approaches arrived at in section 2.4.6 are also applicable to decision making regarding interorganizational information systems. The essential difference between intraorganizational information systems (even in a divisional setting) and interorganizational settingsis that the control of an interorganizational information system is not located in one organization, and neither are the costs and benefits.

Characteristic of decision making with respect to interorganizational information systems is "(…) the lack of a formal, unequivocal authority in organizational networks", comments Grijpink (1997, p. 5)[61]. Rather, participation is based on agreements, which can be formalized into covenants, contracts, etc. (Wassenaar, 1995).
The literature on interorganizational information systems, like the literature on information systems in general, stresses integration as a virtue and a goal to be pursued in these agreements. For example, it is stated that "[t]he greatest benefits from EDI (…) are obtained when integration of computer applications is achieved over a network of companies" (Huang, 1998, p. 2; see also Benjamin, de Long & Scott Morton, 1990; Scott Morton, 1991; Cunningham & Tynan, 1993). Finnegan, Galliers and Powell (1997) state that top-down information management approaches allow organizations more control over interorganizational information systems. In these statements, there is an implicit preference for a top-down or bureaucratic approach towards information management, based on the design- and planning schools of strategy research (see section 2.3) and especially on the engineering school of information management (see section 2.4.1).

However, interorganizational information management in practice is often less detailed and less formal than intraorganizational information management (Finnegan, Galliers & Powell, 1997). Furthermore, several disadvantages of such an approach are noted from a theoretical point of view. For example, integrated interorganizational information systems can limit the participating organizations' possible actions (the organizations may lose some of their freedom to act independently [Wierda, 1991, p. 15]). Especially when all-encompassing plans are presented, organizations are often confronted with the danger that tasks will be taken away. This often generates opposition, counter-proposals in the form of alternative plans, etc. (van der Vlist, 1987, p. 17). Van Bijsterveld adds that "(…) organizations have to be careful with the copying of integral information management approaches that have been applied to other organizations or networks. (…)

[61] "De belangrijkste factor is het ontbreken van formeel en eenduidig gezag in organisatienetwerken en bedrijfsketens"

Every organization is different with respect to goals, the position of information technology is different, information systems are different, the structure differs, the background of people is different, the history of the organization is different, etc."[62] (1997, p. 205)[63].

As a result of the identification of these disadvantages, Kubicek (1995) has stated that "[t]here are good reasons to question the dominant and popular EDI visions and to ask how EDI gets along with the problems of data modeling and data maintenance and whether a maximum of integration of computer systems across organizational boundaries is possible at all, and more importantly, really to be strived for from a management and workers point of view, or whether there are options for EDI systems with a lesser degree of integration" (Kubicek, 1995, p. 78). Kubicek implicitly proposes information management approaches that put less emphasis on integration (less centralized, 'tightly coordinated', bureaucratic information management styles). Finnegan, Galliers and Powell (1997) state that it could be "an important philosophical decision to move away from mechanistic approaches when dealing with interorganizational issues" (1997, p. 7).
Grijpink (1997) elaborates on Kubicek's argumentation by mentioning that, in general, organizations cherish their own data, so that the establishment of common, integrated interorganizational information systems is hampered. The line of reasoning in this approach starts with the recognition of each organization's autonomy, based on the political, cultural and learning schools of strategy research and the adaptive-evolutionary and organizational learning schools in information management. It is assumed that in the exchange of information, organizations predominantly safeguard their autonomy and this can conflict with the wish to develop, plan and use an information system that exchanges information across organizational boundaries.

In conclusion, in the literature on interorganizational information management, divergence in control models, architectures and goals/functionality has been observed. Divergence in integration as a goal especially confirms Gazendam's observation that diversity of definitions and data models in general is often a result of deliberate choices and that integration is not always possible or desirable. Obviously, this is also true for

---

[62] "Organisaties zullen echter wel moeten (blijven) oppassen met het klakkeloos overnemen van integrale automatiseringsmethoden die binnen andere organisaties of netwerken zijn ontwikkeld en daar succesvol worden toegepast. (…) Elke organisatie is namelijk anders: de doelen verschillen, informatietechnologie neemt een andere positie in, de informatievoorziening is anders vormgegeven en ingevuld, de structuur is anders, de mensen hebben een andere achtergrond, de organisatie heeft een afwijkende historie, et cetera"

[63] Curiously, after analysis of large-scale, integral information management approaches, van Bijsterveld concludes that integral informatization is a utopian ideal, but as such it is not senseless.

organizational settings in which even more autonomy is present, such as in networks of organizations or organizations participating in interorganizational relationships.
It must be noted, though, that, from the literature, it is not clear in what circumstances there is a preference for either one of the extreme information management approaches. Hence, an explanation of the consistency of combinations of 'contingent factors' and information management approaches - that is, the theoretical backing of mechanisms - is lacking.

2.6 Applications of interorganizational information management

2.6.1 Introduction

In section 2.2.3, information management was defined and in section 2.5, it was stated that various information management approaches can be discerned based on the key concepts of control and degree of commitment of stakeholders, goals and architecture used. As we have seen in section 1.5.4, it fits the selected research design to identify key concepts, key performance indicators, hypotheses and, in general, line of reasoning, and compare it with empirical data, working towards a theory by gradually sharpening constructs and verifying relationships. Therefore, in this section, three existing cases of applications of interorganizational information management provide anecdotal evidence of the mechanisms of interorganizational information management. In each of these cases, the appropriateness of information management approaches is discussed.

2.6.2 Application one: PICA in Dutch libraries

Wierda (1991) provides an example of such an interorganizational bureaucratic information management approach with his description of the development of PICA, *Project for Integrated Catalogue Information.* PICA is a joint project of the Dutch libraries, initiated by the Dutch Minister of Education and Sciences, and executed by a separate organization, the 'Cooperative Body Royal Library and University Library PICA', founded in 1969. The first version of a PICA system did not appear before 1979. In these 10 years of development, the joint efforts were characterized by lack of consensus regarding the goals of the interorganizational information system, although the controversy in this regard was often presented as a dispute over technical implementation (Wierda, 1991, p. 51). The PICA staff played a very active role in favor of a more or less centralized group of information systems, with a flexible yet partly uniform data model; because of this, two participating university libraries left the collaboration. This defection was mainly inspired by the fear that they were not capable of continuing their own cataloguing routines (title descriptions, classification system) with the new joint system. The two university libraries returned only after the Ministry compelled them to do so in 1987. But during the development, all participants had second thoughts. "(…) [A]ll respondents considered fear to lose part of their independence a major cause for several libraries to be cautious, or even hostile, towards the effort to develop an IIS (…) [D]ifferences of opinion with respect to communication

protocols and with respect to description formats were major points in which the mutual conflicts were expressed" (Wierda, 1991, pp. 54-55). This resulted in lack of commitment by participants and even manifest opposition against the rather centralized structure of the new joint system.
In 1989, PICA grew in importance, partly due to coercion from the Minister. However, the development of the system took almost 20 years.

2.6.3 Application two: VIPS in Dutch penal law enforcement

Grijpink identifies two opposing information management approaches for interorganizational information systems: value chain computerization and classical computerization.
Value chain computerization resembles organic, bottom-up, person-oriented information management in its emphasis on flexibility, local databases and decentralization and the obvious criticism of messy and inefficient operations.
Classical computerization resembles top-down, bureaucratic information management in its characteristics of centralization of authority and central, integrated databases, and subsequently generated opposition by the participating organizations that feared that their autonomy was threatened. In the latter approach, "[s]ystematic and scientific development tools are used to design databases, from a holistic point of view; no single administrative process of the organization is the starting point of the analysis. Rather analyses are completed from an inter-organizational (network) perspective; organizations that need the information must agree upon the data-definitions, and use the newly defined database" (Zuurmond, 1994, p. 327).

Grijpink illustrates the value chain computerization concept with the example of VIPS[64], an index for use in the (Dutch) value chain for penal law enforcement, in which hundreds of public and semi-public authorities and private partners cooperate to ensure security and law enforcement. Examples of organizations that participate in this chain are the District Attorney (in Dutch: 'Openbaar Ministerie'), Court ('rechtbank'), Prison System ('gevangeniswezen'), Probation and After-Care Service ('reclassering').
An example of information exchange in this value chain is the exchange triggered by the wish to prevent social security fraud. Grijpink states that a 'classical computerization' solution to the problem of how to exchange information between these organizations is to set up either a database with characteristics of prison inmates that are also recipient of a social security benefit, or a temporal comparison of databases of various organizations. Grijpink rejects the latter alternative because in practice, temporal comparison of large databases results in many 'false-positive' cases of fraud. This means that such a comparison results in many cases of suspected fraud which, when inspected further, indicate no fraud in actuality. Setting up a dedicated database, according to Grijpink, also requires the cooperation and active maintenance of the

[64] Dutch acronym for VerwijsIndex Personen Strafrechthandhaving (reference index for penal law enforcement).

database by organizations that do not have a direct interest in keeping the database up-to-date.
Using the alternative of the value chain computerization approach, the participating organizations' databases continue to exist, but software components are used that facilitate the communication (and not so much the registration) of data. In order to accomplish this, Grijpink proposes the following 'building blocks':

- 'Referring', an automated catalogue with reference information;
- 'Numbering', a historically unique numbering system (name, number or combination of the two) to indicate objects in databases; and
- 'Verifying', a limited set of queries with the possible results 'Yes' or 'No'.

In this case, it is possible for organizations to control their own database and to ensure appropriate access rights. In practice, value chain computerization has many disadvantages. It requires a lot of attention to arrangements and commitment with respect to accessibility, continuity of data (timely updates) and restrictions of use. Furthermore, identical verification of identical data is repeated many times in the value chain, resulting in inefficiency. It is therefore not surprising that from time to time, attempts are made to enrich the indices system with information concerning content ('content enrichment'). Examples of information that has been proposed as content enrichment are the date of lock-in ('insluitingsdatum'), expected release date ('verwachte invrijheidstelling') and qualifications such as 'escape danger' or 'firearm danger' ('vluchtgevaar', 'vuurwapengevaar'). In this way, the index system would develop incrementally into an information system. However, Grijpink reports that to date (1996), this development has not taken place in VIPS.

In short, the concept of value chain computerization is an approach to information management that stresses:

- autonomy of participating organizations by emphasizing communication rather than registration;
- focusing on local, decentralized databases; and
- an emphasis on decentral arrangements about access and availability of data in networks of organizations with a few agreed-upon central communication building blocks like referring, numbering and verifying functions.

Grijpink claims that "(…) [m]anagers typically employ practical knowledge and preferential solutions from experiences in the field of internal organization and classical informatization. Consequently, they are apt to support organization border-crossing databases and extensive data interchange on a large scale, which mobilizes extensive opposition when implemented" (Grijpink, 1997, p. 48)[65]. Note that this description

[65] "Managers ontlenen hun impliciete praktijktheorie en hun voorkeursoplossingen aan ervaringen op het gebied van interne organisatie en de klassieke automatisering (…) Het gevolg is, dat men zich snel voorstander toont van organisatie-grensoverschrijdende

resembles the bureaucratic information management approach. It has already been noted that such a bureaucratic information management approach has intuitive appeal but the approach suffers from negligence of political aspects within organizations (Schmidt, 1991; Gazendam, 1993; de Jong, 1994). According to Grijpink, value chain computerization avoids frustration as a result of central direction at the participating organizations, but is inefficient for some organizations at some times. The counter tendency to resort to a more efficient, classical computerization approach, emphasizing centralized databases (content enrichment of databases) is not in the common interest of the participating organizations.

2.6.4 Application three: MDSM in the British National Health Service

Beynon-Davies provides an example of interorganizational information management in the British National Health Service (NHS). The NHS is "a complex network of autonomous and semi-autonomous groups concerned with health matters. Actual delivery of health care is in the hands of powerful clinical professionals who are naturally concerned with preserving their professional autonomy" (Beynon-Davies, 1994, p. 85). As was noted in section 2.2.3, it is possible to speak of an interorganizational information system when various organizations can make decisions regarding information systems independently. In the case of the NHS, "(…) no one has responsibility for IT, IT is exploited and controlled at a number of different levels (…). The lack of clear organization for IT has meant the absence of a clear strategic vision for IT" (Beynon-Davies, 1994, p. 91). We therefore conclude that there is no central authority who has information management authority or to whom information systems control has been attributed: the NHS information systems constitute an interorganizational information system.

Ever since its origin in 1948, the NHS has experienced an information problem. Information systems development occurred in a patchy and piecemeal manner. In order to try to alleviate this situation, a body known as the Department of Health and Social Security Steering Group on Health Services Information was initiated to identify a minimal data set for district health authorities to produce management information. This initiative occurred against the background of the conservative ideology of the 1980s, in which there has been a clamor for management information, or managerial accountability in general.

Eventually, 50 entity-relation diagrams covering 500 entities and 1000 attributes were drafted. These diagrams represented the data requirements of district health authorities, regional authorities and the central government. In addition, definitions for the data were established and detailed formats of each attribute were provided. Later on, this MDSM architecture was supplemented by a common basic specification (CBS): a generalized object model of healthcare data (Beynon-Davies, 1994).

---

databanken en uitvoerige gegevensuitwisseling op grote schaal, die bij realisatie echter grote weerstanden oproepen"

In 1992, an independent report of the MDSM and CBS was commissioned. The conclusions stated that, although the expenses of the development of the architecture were justified, the CBS and MDSM should not be made mandatory and no further money should be spent on enlarging and maintaining the data model. In fact, the District Health Authorities had not used the MDSM in any real sense (that is, in developing or acquiring information systems).

Beynon-Davies reported that these conclusions were mainly based on the observations that doubt had been cast as to the feasibility of large-scale data planning: that is, doubt over "the model's utility as a standard set of requirements for internal and external information systems" (Beynon-Davies, 1994, p. 87). Consequently, the conclusions seemed to suggest the "condoning [of] the current policy of piecemeal development of information systems, presumably because of their ability to reflect local requirements" (Beynon-Davies, 1994, p. 87).
Beynon-Davies quotes Klein and Scriven's comment on the difficulties of the MDSM: "[i]nformation of itself is of little value. It is a tool to be used to aid decision-making and to monitor and perhaps improve performance of tasks. It proves the basis for accountability in an organization and, as such, is enmeshed in its functioning and management. Therefore, the Körner exercise (the development of the MDSM architecture, VH) cannot be viewed simply as neutral and technocratic but as something which raises fundamental questions about accountability within the NHS" (Beynon-Davies, 1994, p. 89).
Here, accountability incorporates both managerial *and* political aspects. Beynon-Davies notes that the MDSM and CBS concepts can be used to produce "financial data that can be used as the basis of comparison between NHS bodies"[66] (1994, p. 91). The fact that this is not in the common interests of the stakeholders (that is, DHAs, who feared that "computing is another weapon used by region to control DHAs […]. [T]he minimum data set […] has been portrayed as an attempt to improve centralized control" [1994, p. 90]), probably explains their resistance to implementing the architecture. It must be noted that the MDSM and CBS as architectures have not been able to meet the original expectations. A subsequent development is the absorption of some elements of MDSM and CBS into a NHS data dictionary (including a new format NHS number and coded clinical terms and groupings).

[66] This fear has antecedents in theory. Finnegan and Ní Longaigh (1996) report that computer technology and, in particular, telematics are suited to the control purpose due to their ability to compute, store, retrieve and communicate data and information very quickly. They refer to it as pseudo-decentralization: top management creates the appearance of delegating decision-making authority downward, but at the same time uses information technology for intensive feedback. However, the analysis of the first chapter, questioning the unilateral causal inferences relating to IT, also applies here.

Beynon-Davies (1994) concludes, "the literature tends to under-utilize the enormous difficulties, particularly of an organizational nature, experienced in large-scale data planning. (…) It is therefore naïve to assume that data modeling (…) can be undertaken painlessly and a (…) data model, once derived, can be conveniently used to drive the process of making strategic decisions" (p. 92). Beynon-Davies recommends giving attention to the social, political, economic and generally the informal context surrounding information systems: "data modeling can be considered as a dialectical process (…) [it] is both shaped by, and shapes, organizational reality" (1994, p. 94).

2.7 Summary and conclusions

In this chapter, we have defined information technology, information systems, interorganizational information systems and information management. Subsequently, a definition of one of the central concepts of this dissertation was synthesized: interorganizational information management. It is the task of decision making regarding goals, prioritization, development and use of information systems that are embedded in two or more organizations that have no joint executives[67].

This decision-making process can be viewed from two perspectives. Firstly, it is a strategic decision-making process in which architectural foundations are created that guide the development of interorganizational information systems. Secondly, it is a decision making process that is triggered by or ideally coherent with other aspects of management, especially organizational *strategy formation*.

Information management has been explored according to these two tiers: that is, by using literature on information technology (especially information strategy, section 2.4) and by using literature on organization studies (especially strategy formation, section 2.3).

In both tiers, it can be concluded that various 'schools of thought' exist with respect to (strategic) decision making. Various authors (Ansoff, Haselhoff, Mintzberg, Snellen) use various categorizations (see Figure 14, p. 48; Figure 15, p. 49).

In chapter one, section 2.2.3 and section 2.5, it has been noted that many authors in the scientific discipline of information systems restrict the meaning of 'information management' to an explicit, formalized and centralized form. It is now clear that such a statement is not very well grounded in theories about information management and strategy. Using these theoretical insights, it is possible to distinguish various interorganizational information management approaches. One form, inspired by the design and planning schools of strategy formation and engineering school of information management, is the top-down information management approach aiming at centralized databases, integrated interorganizational information systems and centralized information systems development. This approach is also referred to as 'classical informatization', 'global, universal informatization' or 'bureaucratic

[67] As was discussed in section 2.2.3, organizations are assumed to be independent if they can make decisions about information systems independently, at least before the interorganizational information system is introduced.

information management' and it is initiated by the participating organization's top management or an umbrella organization.

Top-down information management	Decision making regarding goals, prioritization, development and use of information systems between organizations in which the authority over the information system is concentrated and instruments of information management emphasize standardization of data definitions and structures through the use of a common conceptual schema across a collection of data sources.

In top-down information management, there is a centralized control strategy, aimed at integration as a goal and using an elaborate architecture that serves as a common conceptual scheme of data structures and definitions in order to achieve standardization with respect to these data definitions and data structures.

The rationale for a top-down information management approach is that the development of an interorganizational information system is guided by a clear vision, which is embodied in an unequivocal architecture, which is enforceable through centralized control or consensus. The development of the interorganizational information system, once the architecture has been established, is therefore very predictable.

Another form, inspired by the learning, political and cultural schools of information management and the adaptive-evolutionary and learning schools of information management is the bottom-up information management approach. It is also referred to as 'divisional approach', 'local, contextual informatization', 'value chain informatization' or 'person-oriented information management'.

Bottom-up information management	Decision making regarding goals, prioritization, development and use of information systems between organizations in which the authority over the information system is dispersed and instruments of information management emphasize preservation of various conceptual schemes across a collection of data sources.

In bottom-up information management, control is decentralized (e.g., decentral information system development and, in general, line-management-based control of work), and it in general aims at databases that are decentralized according to the structure of the participating organizations. The architecture used does not serve as a common conceptual data scheme, but rather as a set of agreements over how communication takes place in terms of the use of referral indices, messages used, limited numbering conventions, etc. Obviously, as a result of the general decentralization philosophy, no universal goals for the various conceptual schemes are indicated. Sometimes, it is specified to what purposes the information should not be

used; this however leaves open many options, which is, of course, far less restrictive than specification of a prescribed goal.

The rationale for a bottom-up information management approach is that the practical necessities and information requirements of the participating organizations guide the development of an interorganizational information system, which is supposed to increase the commitment and involvement of the participating organizations. The decision-making process regarding the interorganizational information system is much less predictable and is characterized by sometimes complicated negotiations in which organizations participate in order to safeguard (1) the fulfillment of their own idiosyncratic information requirements and (2) their autonomy.

It must be noted that intermediary forms have also been identified. They are referred to as 'equilibrium approaches', 'governance approaches', 'network approaches' or 'personal-political approaches'. In fact, in practice, the ideal types, 'top-down information management' and 'bottom-up information management', will rarely exist and, probably, these forms will always develop into equilibrium approaches which resemble either a true top-down or a true bottom-up approach. However, in this thesis, the aim is to develop theory and in order to provide an insightful explanation, the distinction in extreme forms is sustained.

Up to now, existing theories in the field of information management have been analyzed conceptually in terms of key concepts, key performance indicators, hypotheses, and, in general, line of reasoning.
Key concepts have been identified (control over development of interorganizational information systems and involvement of stakeholders, architecture used, and goals adhered to in the decision-making process), and, based on the identification of key concepts, information management approaches have been defined. Key performance indicators are stated very loosely in information management research. In general, the literature on information management in combination with strategy formation theories provides a very limited explanation of the appropriateness of various information management approaches. Based on the strategy and information management literature, and inducing from the anecdotal evidence from the case studies described in section 2.6, it is possible to sum up characteristics of distinct information management (efficiency and flexibility advantages). However, the suspicion that this list of characteristics is hardly more than a list of symptoms seems justifiable: the question remains *why* certain information management approaches are more efficient or flexible than other approaches[68]. In other words, hypotheses relating information management approaches and key performance indicators, or hypotheses relating 'Gestalts' of information management approaches and other variables such as characteristics of

[68] In fact, efficiency and flexibility are poorly defined in many studies of information management.

interorganizational relations, are lacking, and so is a characterization of the line of reasoning in information management research.

Therefore, the literature on information management can only partly be used to gain insight into combinations of information management approaches and various types of interorganizational relations. In order to contribute to the required insight, the discussion of information management in this chapter is supplemented with theories of interorganizational relations in the next chapter.

3 Variety in Interorganizational Coordination

3.1 Introduction

In chapter one, it was indicated that the objective of this study - gaining insight through construction of theory - is sought by exploring theories from the discipline of information systems and theories on interorganizational coordination relations. The variety in information management was described in chapter two; this chapter will describe the variety in interorganizational coordination and offers a review of theories and frameworks explaining this variety. This is done by following the first step set out in the CAST method: identification of key concepts, key performance indicators, hypotheses, and, in general, the line of reasoning of existing theories or fragments of theories.

This chapter has the following structure: after an introductory exposé on the positioning of the theme of interorganizational coordination in organization theory (section 3.2), perspectives on interorganizational relations and interorganizational coordination are discussed from the angles of economic organization theory (section 3.3) and political organization theory (section 3.4). Section 3.5 offers a synthesis of these approaches and in section 3.6, conclusions are drawn.

3.2 Interorganizational relations in organization theory

In section 1.1.2, it was shown that the topic of interorganizational relations has gained a lot of attention in organization studies' contemporary publications. The topic of interorganizational relations, though, has not been part of the discipline of organization theory from the beginning. In fact, until 1950, most organization theorists in most of their work assumed that it was possible to understand organizations apart from their environment, and that their important processes and events were internal to the organization (Scott, 1987). In the organization theories of Weber, Taylor, Fayol, Bernard and Mayo, the functioning and design of autonomous organizations is discussed, unconstrained by the environment in which they operate; organizations were seen as 'closed' entities.

However, over time, organization theorists shifted their attention from intraorganizational to interorganizational phenomena (Negandhi, 1969). Krupp

identifies three ways in which the topic of 'environment' has entered into organization theory:

- environment as externally constraining phenomenon for the functioning of organizations;
- environment as network, or 'organizational set', consisting of other interacting organizations; and
- the environment as a 'super-organization', in which the environment constitutes a whole, a collectivity in which the constituting organizations are not explicitly discerned (1961, p. 55).

Note that the third way in which environment is given a place in organization theory is subsumed under the heading of organizational sociology or even macro sociology rather than organization theory, because the focus is not on explaining the behavior of individual organizations.

Benson (1975) states that the emphasis on organizational environments as externally constraining phenomena has been established since the publication of Mill's book *The Power Elite* in 1956. Since then, it has been increasingly recognized that organizational boundaries are both permeable and variable (Krupp, 1961; Scott, 1987). Selznick (1957), March and Simon (1958), Katz and Kahn (1978), Lawrence and Lorsch (1967), Thompson (1967) and Chandler (1962) have explored this field. As a result of the recognition of environmental pressure on organizational design and functioning, interorganizational analysis became popular.
A drawback of much of the research on environments of organizations, either focused on the environment itself or on the functioning of organizations in their environments, is the vagueness of the concept of 'environment'. "The 'environment' figures prominently in almost all contemporary organization theory but is rarely defined in other than a residual way, as everything outside the boundaries of an organization" (Aldrich & Marshden, 1988, p. 369; see also Benson, 1975). The vagueness of the concept of environment has also been described as failure to operationalize hostility, dynamics and other aspects of the environment. And even if successful operationalizations are used, the expressiveness of these variables in organization theory is limited. For example, Aldrich (1979) uses the variables stability, homogeneity, concentration, environmental capacity (lean-rich), domain consensus, turbulence and mobility of organizations in order to characterize the environment. However, if organizations decide to change their relationships with the environment, they do not manipulate 'stability', 'turbulence', 'homogeneity' or 'environmental capacity', but they change contracts with partner organizations, change the technology used, or merge with partner organizations. So, much of the 'classic' interorganizational analysis does not address decision variables (see also Pfeffer, 1997, pp. 158-163).

Contemporary research has shifted its attention from focusing on 'environment' and 'environmental forces' to the second concept of 'environment': that is, to (less abstract)

relationships between organizations, interorganizational cooperation, strategic alliances, partnerships, etc. (Pennings, 1981; Ring & van de Ven, 1992; van der Zaal, 1997). Benson (1975), Williamson (1975) and Van de Ven (1976) pioneered this renewed interest in interorganizational relations. Interorganizational relations are customarily defined as a significant amount of interaction between distinguishable organizations (Benson, 1975) or a pattern of social relations over a set of organizations (Van Alstyne, 1997). Van de Ven (1976) conceives interaction as exchange of resources. Resources here refers to money, physical facilities and materials, services or generally property rights (Van de Ven, 1976; Ring & Van de Ven, 1992; see also section 3.3.5), but it can also reflect issues of competencies and knowledge (Nooteboom, 1993), or even customer or client referrals (Van de Ven, 1976; Grossman & Hart, 1986).
Ring and Van de Ven (1992) also recognize the importance of interaction as a necessary element of a definition of interorganizational relations and they identify two polar interorganizational interaction types. Firstly, there are relatively short-term, market-based transactions, based on discrete contracts, which in fact do not represent interorganizational relations because the resources exchanged tend to be so non-specific that there is hardly any interaction between organizations. Secondly, there are (complete) hierarchies, which do not qualify as interorganizational relations because there are no distinguishable organizations involved.
Interorganizational relations, therefore, seems to refer to all situations between, but not including, these poles. Koenig and van Wijk (1991) identify some 'common threads' in various definitions. They state that if organizations participate in interorganizational relations, they keep their formal identity, even if they sacrifice varying degrees of autonomy. Furthermore, a relation entails the transfer or sharing of (tangible or intangible) goods or assets, in such a way that some control over the object of the cooperation is delegated.

Based on the above-mentioned contributions, a definition of interorganizational relations is presented below.

Interorganizational relations	The recurrent, non-discrete transaction of resources between two or more organizations

In the literature, a distinction is often made between horizontal, vertical and symbiotic relations (van der Zaal, 1997). Horizontal relationships are relations between organizations that compete with each other in obtaining similar resources and/or disposing of similar goods and services. In other words: horizontal relations are relationships between competitors. Horizontal relations are, as far as organizational research is concerned, the domain of strategic management.
Vertical relations are relationships between organizations located in different stages of production service: that is, vertical relations are buyer-supplier relationships. Buyer-supplier relationships have been studied at length within the domain of industrial organization.

Symbiotic relationships exist among organizations that complement each other in the rendering of services. For example, the relationship between Compact Disc producers and manufacturers of hi-fi equipment is a symbiotic one. Another example is the relationship between computer software producers and hardware manufacturers (Alexander, 1995).
The distinction between the various types of interorganizational relations has, among other things, been proposed in order to clarify the fact that horizontal relations reveal more strategic or political flavor than other types of relations. In this view, horizontal relations are seen as a threat to the participating organizations (or, at most, a necessary evil), whereas vertical relations are considered to be an opportunity. However, van der Zaal (1997) has provided evidence that, to some organizations, horizontal relations are considered to be an opportunity, whereas there are also vertical relations that are perceived by the participating organizations as a threat. Moreover, many of the theories on interorganizational relations apply to all three kinds of interorganizational relations. Therefore, the distinction between horizontal, vertical and symbiotic relationships will not be sustained in this study.

Organization scholars' focus on relationships between organizations is remarkable, taking into account the fact that the theme was ignored for a long time. However, current discussions of interorganizational relations have not relinquished organization studies' insistence on an organization's freedom to act independently; interorganizational relations are seen as devices that limit an organization because scarce resources and energy have to be invested in the maintenance of linkages with other organizations[69]. Following this logic, organizations never choose to become involved in an interorganizational relationship for purely voluntary reasons. Van de Ven (1976) stresses that every organization strains to *maintain its autonomy*, that is, it strives to avoid the situation in which the behavior of other organizations has ramifications for the focal organization. Autonomy here refers to the capability of organizations to choose the course of actions they wish to pursue (Van de Ven, 1976). Simon (1976) defines autonomy as a situation in which the organization's decisions are not guided by the decisions of another organization, or in which it at least has the capability of independently examining the merits of such an imposed decision (Simon, 1976). The capability of independently examining merits must include the 'right to the last word' in accepting or rejecting a general rule imposed by another organization.
In other words, organizations prefer not to be guided in their decision making by decision premises that have been set by partner organizations.

Parsons (1960) and Litwak and Hylton (1962) have, on the contrary, described situations in which organizations heavily interacted with other organizations; due to

[69] Chisholm (1989) objects that because every organization operates in an environment constituted by other organizations, no organization is an autonomous entity and thus de-emphasizes the managerial possibilities to maneuver.

some of these interactions, instances of exertion of interorganizational authority did occur. In these cases, that might have occurred for a number of reasons (see Figure 1, p. 6); organizations accept that "(…) a general plan of operations will govern the activities (…) of the organization" (Simon, 1976, p. 10)[70]. Parsons (1960) and Litwak and Hylton (1962) described these situations with the term *unstructured authority*: situations in which parties voluntarily give up some valued conditions in exchange for similar concessions on the other side (Benson, 1975).
In general, authority refers to the situation in which one organization sets a general rule which permits the communicated decision to guide another organization's choices without deliberating on its own part on the expediency of these premises (Simon, 1976). In the case of unstructured authority, modifications of agreements between organizations occur through (1) waxing and waning of resource allocation mechanisms and (2) changes in legitimization or shifting domains (Parsons, 1960). The organizations involved "intervene and extend their influence through association; they alter the resource landscape for themselves (…) and in the process can change the structure of [interorganizational relations]" (Van Alstyne, 1997, p. 4). If attempts by one organization to exert influence on another organization by using authority have succeeded, *dependence* between organizations exists (Pennings, 1981).

Simon states that one of the uses of authority is that it achieves *coordination*. According to Alexander (1995), coordination is a property of decisions; a decision is coordinated if it takes all information into account and makes appropriately spontaneous adjustment. Note that this description views coordination as an end rather than as a means (as will be shown in sections 3.3 and 3.4, coordination brings about costs as well as benefits). This view of coordination sees interorganizational coordination as something to be achieved, not just a phenomenon to be analyzed.
Coordination is also defined as "the process of creating rules or norms for collective action" (Mulford & Rogers, 1982), or "informing each as to the planned behavior of others" (Simon, 1976, p. 72) in such a way that a general plan of operations will govern the activities of the organizations.
Simon distinguishes two modes of coordination: *procedural coordination*, which is the specification of behaviors of and relationships between organizations (it establishes the lines of authority and outlines the spheres of activity of each organization), and *substantial coordination*, which specifies the content of work to be done[71].

Summarizing, in this section a short overview of the position of interorganizational coordination and interorganizational relations has been presented. Various theories analyze interorganizational relations in terms of the key concepts 'autonomy' (of organizations involved), some sort of 'dependence' and the need to 'coordinate'

[70] Simon is mainly concerned with intraorganizational coordination; the same analysis, however, also applies to an interorganizational setting.
[71] Note that Simon refers to coordination as the essence of organizing.

exchanges between organizations. In the various theories, however, obviously incommensurable definitions are presented. At this moment, it is impossible to define these concepts or constructs in an uncontested manner. Therefore, in the following sections, an analysis is made of how the important concepts of *autonomy*, *dependence* and *coordination* are elaborated in specific theories. Furthermore, their interconnectedness in terms of hypotheses is discussed.
The analysis takes place with use of two specific theoretical perspectives that are often used to elaborate on interorganizational relations (for an overview, refer to Krickx [1991] and Van der Zaal [1997]). These theoretical perspectives are economic organization theory (especially transaction cost economics and property rights theory) and political organization theory (especially resource dependence theory). For every theory, a general introduction on the origins and content of the theory is first given and after that it is shown how the key concepts of autonomy and dependence are interpreted within the framework of the theory and how these key concepts relate to matters of coordination between organizations.

3.3 Economic Organization Theory

3.3.1 Introduction

The sociologist Pennings asserted that "(…) interorganizational behavior has been the primary concern of economics, while sociology and other social sciences contributed little" (1981, p. 433). Economics has indeed contributed to the understanding of the way organizations, in general, function. "Probably therefore, economic models are growing in prominence in the social sciences generally, particularly in political science, sociology and organization studies. (…) In fact, one is hard pressed to think of many substantive areas in which economic models are not cited, even if only as providing an alternative hypothesis" (Pfeffer, 1997, p. 44). The economist Hirshleifer even predicted the takeover ('economic imperialism') of the whole of social science by economics (Donaldson, 1995).

Economic organization theory consists of a number of distinct theoretical streams that have been developed more or less independent of each other[72]. Therefore, in the

[72] Several authors have categorized these streams in various ways. The categorization of de Vries (1992) is based on the specific contribution to the neoclassical analysis made in each of the streams, and, more specifically, what variables are made endogenous. Eggertson (1990), on the other hand, assumes that the agency stream is part of the larger transaction cost economics stream. Brynjolfsson (1994) states that neo-institutional economics is synonymous with the property rights stream, with agency theory and transaction cost economics as descendants of the property rights approach. Künneke (1991) discerns three categories of property rights theories: property rights theories applying different categories of property rights, property rights theories paying attention

following sections, firstly the development of economic organization theory is sketched (section 3.3.2). After that, in the sections 3.3.3 to 3.3.5, the emphasis and main line of reasoning within the various theoretical streams are discussed: *transaction cost economics*, the *property rights* stream and the *agency* stream. In section 3.3.6, the role of autonomy, dependency and coordination in neo-institutional economics is summarized.

3.3.2 The economic perspective on organizations

One fundamental starting point in the discipline of economics is the question *why organizations exist*[73]. Previously, we have defined organizations as communities of agents. In these communities, agents are subject to authorities or procedures that guide their tasks. Based on the assumption that markets are very efficient ways of guiding agents in their tasks, it is possible to question the wisdom of both organizing individuals in organizations and organizing organizations in (relatively enduring) interorganizational relations. Whereas to the organization scientist an organization is a very self-evident subject of study, to an economist using the line of reasoning indicating that markets are always very efficient, an organization can be characterized as a 'market failure'. Relationships between organizations are not part of the standard neoclassical economic analysis.

According to neoclassical economic analysis, firms exchange bundles of property rights in order to satisfy their needs. Firms are "(…) feasible production plans, presided over by a manager who, buying and selling inputs and outputs in a spot market, chooses the plan that maximizes owners' welfare" (Hart, 1995, p. 155). In this view, the firm is a monolithic economic actor. The basic economic argument, as formulated in the '*theory of the firm*', is that markets are ideal for guiding firms in their tasks under the following conditions (Douma & Schreuder, 1992):

- There are large numbers of buyers and sellers;
- There is free entry and exit from markets;
- The industry is characterized by standardized, homogeneous products;
- Firms are viewed as holistic units;
- Firms are assumed to have a single objective;
- There is perfect information: every buyer and seller knows all relevant details;
- Buyers and sellers are characterized by maximizing behavior.

---

to different role patterns of economic actors (principals and agents) and property rights theories using the transaction as their basic unit of analysis.

[73] For example, the question 'why is there any organization' is central to Coase's critique of the theory of the firm (see, for example, Williamson [1975, 1985, 1995]).

The *'theory of the firm'* lends itself to an elegant and general mathematical formulation[74] and is very useful for analyzing how a firm's production choice responds to exogenous changes in the environment (through a change in the price of goods or services). Furthermore, it is very useful for analyzing the consequences of strategic interaction between firms under conditions of imperfect competition (Hart, 1995). However, the theory – called rigorous but rudimentary by Hart (1995) – can only explain phenomena when the conditions mentioned above apply. In particular the condition of perfect information in markets has attracted much attention. In the model of perfect markets, all the relevant information is available and compressed in the price of a good or service[75]. In this way, the price contains 'sufficient statistics'. However, often there is uncertainty with respect to the future quality of the goods or services, especially if they are non-standardized or heterogeneous. Furthermore, information can be distributed unevenly among individuals or firms. The *'theory of the firm'* has difficulties dealing with such - more realistic- assumptions.

As a reaction to the 'theory of the firm', institutionalists[76] like Veblen, Commons and Myrdal have criticized the theory of the firm because it views human beings as 'hedonistically calculating individuals'. They emphasized sociological, juridical and technological aspects in the study of behavior of firms, and forcefully condemned the ahistorical, asocietal character of neoclassical economic analysis. The proponents of neoclassical analysis have responded to this critique by mentioning that institutionalists never developed specific institutional models and never identified key trade-offs; in fact, according to neoclassical theorists, institutionalists have formulated only very vague mechanisms (Williamson, 1995, p. 210).
However, the discussions and debates between institutionalists and neoclassical scholars inspired a group of so-called neo-institutional economists who, on the one hand, accepted the critique of neoclassical economic analysis but on the other hand explicitly endeavored for less heroic assumptions (such as those present in the theory of the firm). In general, they pursued a *more realistic* economic analysis. "Neo-institutional economics aims at generalizing neoclassical economics while retaining the 'hard core' of the micro economic paradigm, i.e. stable preferences, the rational choice model and equilibrium structures of interaction" (Neelen, 1993, p. 4).

---

[74] One of the more seditious consequences of mathematical elegance is that it "(…) provides status and makes it less accessible to the untrained, which lends it prestige" (Pfeffer, 1997, p. 54).

[75] In the traditional model, there are no costs of enforcement and administration of rights (Künneke, 1991, p. 45).

[76] Institutions may be defined as the humanly-devised constraints that structure political, economic and social interactions (Williamson, 1995, p. 211). Institutionalization, then, is "a process of crystallization of (…) norms, organizations and frameworks which regulate the process of exchange" (Alexander, 1995, p. 285).

Neo-institutional economic analysis builds upon the work of two Nobel laureates who have especially paid attention to the aspects of uncertainty and unavailability (or uneven distribution) of information.
The first is Herbert Simon. With his *'behavioral theory of the firm'*, Simon asserted that human beings are rational in a necessarily limited way. Therefore, according to Simon, it is principally impossible for individuals to optimize their welfare. As a coping mechanism, individuals seek organizations that enable satisfying outcomes for individuals (transformation of 'intractable to tractable').
The second is Ronald Coase. His works were later popularized in the writings of, among others, Williamson (1975, 1985). Coase emphasized that information is not costless and that organizations are alternatives to markets in the sense that organizations, with authority and procedures, economize on information costs like searching costs, costs of drafting agreements, enforcement costs and monitoring costs. Thus, markets as devices to direct activities of actors can be supplemented by or, in case of extreme uncertainty or information asymmetry, replaced by hierarchy. Clarke and McGuiness describe markets and hierarchies as follows: "The difference between these systems rests on the use of conscious authority in the direction of resources. In the market system specialized and diverse resources are coordinated by 'impalpable forces', in ways that make no use of conscious authority: in other words, as by an 'invisible hand'. In contrast, the firm involves, in some way, the use of conscious authority or the 'visible hand' of an entrepreneur" (cited in Künneke, 1991, p. 30).

Summarizing, the '*theory of the firm'* is a mathematically elegant theory explaining the behavior of buyers and sellers in free and open markets. The theory, however, holds a number of seditious assumptions on the prices as 'sufficient statistics' and on characteristics of products, which are supposed to be homogeneous and standardized. Simon and Coase addressed these flaws. Simon pointed at the impossibility of including all information in decision making, while Coase tried to express informational problems in economic quantities of benefits and, especially, costs.
Their comments were, later on, elaborated into a new discipline, which is referred to here as economic organization theory, which consists of a number of streams. Benefits and costs of information (and uncertainty) are specified differently in various streams of economic organization theory. Agency theory studies the role of information and information asymmetry in economic relations. Transaction cost economics studies costs of exchange relations between separate organizations and within organizations. Property rights theory analyzes various kinds of user rights pertaining to scarce goods between actors in various institutional arrangements[77]. These various streams within economic organization theory differ to such a considerable extent that until this point, it is

[77] Note that both the '*theory of the firm*' and neo-institutional economics lack attention to a role for government: implicitly it is assumed that juridical arrangements do not affect resource allocation (Künneke, 1991, p. 45). De Vries states: (…) economics can do without juridical issues, but not the other way around" (1992, p. 43).

impossible to indicate the role of autonomy, dependence and coordination and the relations between these constructs. Therefore, firstly, autonomy, dependence and coordination are discussed within each of these separate economic organization theories (see Figure 21). The way these three constructs are dealt with in economic organization theory at large is postponed until section 3.3.6

Economic organization theory	Elaborated in section …
Agency theory	3.3.3
Transaction cost economics	3.3.4
Property rights theory	3.3.5

Figure 21: Overview of economic organization theories

3.3.3 Agency theory

Some of the weaknesses of the 'theory of the firm' are addressed in the so-called principal-agent theory, which introduces conflicts of interests between different economic actors through the inclusion of asymmetries of information or observability problems (Hart, 1995). Principal agent theory has therefore an historical antecedent in the works of Barnard, who described the essence of organizing as the transformation of conflict systems (in which no jointly consistent objectives are present) into cooperative systems (with common objectives). But whereas Barnard emphasized the use of devices such as psychological incentives and identification mechanisms, principal-agent theory focuses on reward structures.
In general, agency theory has been elaborated in two distinct directions: the principal agent theory and the positive theory of agency. Principal agent theory[78] is a mathematically-oriented, normative and, in general, non-empirical approach in which the emphasis is on the study of reward structures. The positive theory of agency is a far less mathematical, empirical approach in which the emphasis is on the study of costs of governance in various relationships. The following discussion of agency theory mainly pertains to positive (i.e. empirically oriented) agency theory.

The main line of reasoning is as follows. Firstly, it is recognized that "(…) the firm is not an individual (…) The behavior of the firm is like the behavior of a market, i.e., the output of a complex equilibrium process" (Jensen & Meckling, 1976, p. 311). In this process, three roles are identified: "(…) that of having interest in an enterprise, that of having power over it and that of acting with respect to it" (Berle & Means, 1932, cited in Künneke, 1991, p. 69). Agency theory assumes that in many organizations, these roles do not rest with one person, the entrepreneur, but are dispersed over various persons: the owner, the manager and the employee, respectively. In agency theory, it is assumed that their motives and interests are not necessarily consistent with each other

[78] Also referred to as 'analytical' agency theory.

and not necessarily consistent with the profit maximization behavior of the firm as a whole.
In general, cooperation between parties requires any one of the following conditions (Baiman, 1982, in: de Vries, 1992, p. 63):

- all parties honestly share all information;
- all parties act in the manner agreed upon, that is, each member implements the action rule he is assigned (see below); and or
- all parties agree on a set of individual action rules and a method of sharing the uncertain outcome resulting from their individual actions such that no one can be made better off without making someone worse off.

Agency theory focuses on the situations in which the above conditions are violated. For example, in practice, information sharing and trustworthy behavior are not always in the interest of all the parties involved. Furthermore, it is hard to require compliance with information sharing and trustworthy behavior. Agency theory in essence being an economic theory, the divergence of interests is expressed in terms of costs. The money equivalent of the reduction of welfare as a result of the divergence of interests is termed *residual loss*. This residual loss can be decreased by exertion of control in the form of control by incentive, control by persuasion or control by authority[79]. However, by exertion of control, enforcement costs are incurred. The total *agency costs*, resulting from information asymmetry and divergent behavior, consist of enforcement costs and residual loss, whereas there seems to be a trade-off between these two cost components.
Originally, agency theory focused on the conflict of interest between owners and managers[80]. The basic hypothesis of agency theory is that if one party (e.g., the agent, manager) acts on behalf of another (the principal, owner), both parties strive to minimize agency costs. They do so by considering the marginal values of (1) enforcement costs and (2) residual losses, and structure their relations in such a way that appropriate compensations can be paid in every conceivable state of the world.
The problem of conflict of interest between owners and managers makes agency theory an organization theory explaining intraorganizational phenomena, in which no attention is paid to interorganizational relations. However, the theory can also be applied to organizations, one acting on behalf of another, for example, a municipal housing company acting on behalf of a municipality (Neelen, 1993) or a liner agent acting on behalf of a shipping company (van der Zaal, 1997). In this rendition of agency theory, interorganizational relations are analyzed in terms of the divergence of interests between organizations, and it is hypothesized that organizations devise governance

[79] There are economists who claim that control by authority (imposing rules) and control by persuasion (recommending a course of action) changes the costs and benefits of disobedience and thus can be seen as special cases of control by incentive.
[80] In fact, the *'theory of the firm'* also recognizes owners and managers, but assumes that there is no conflict of interest between these roles (see section 3.3.1).

mechanisms (bilateral agreements, authority relations) in such a way that agency costs are minimized.

Agency theory enriches neoclassical theory significantly by relaxing some of the closed-world assumptions in the theory of the firm and, in general, by pursuing a more realistic analysis. However, seen from the perspective of organization theory at large, agency theory fails to answer the question of what constitutes a firm (or what determines authority relations). The interorganizational rendition of the theory recommends optimal reward structures between organizations X and Y, but fails to specify whether such a reward structure is accomplished by retaining separate organizations X and Y, or whether X and Y should merge with X gaining authority over Y, or Y gaining authority over X (Hart, 1995). Furthermore, de Vries (1992) has shown that much of the theoretical expressiveness of the agency theory is diminished when one organization does not strictly operate on behalf of another. In general, agency theory "can make no predictions about the nature and extent of the firm" (Hart, 1995, p. 156) and, therefore, we will now turn to other streams within economic organization theory.

Economic organization theory	**Autonomy**	**Dependence**	**Coordination**
Agency Theory	[not explicitly mentioned]	[not explicitly mentioned]	the mechanism (profit sharing agreement/hierarchy) that minimizes sum of residual loss and enforcement costs

Figure 22: Autonomy, dependence and coordination in economic organization theory (1/3)

3.3.4 Transaction cost economics

Transaction cost economics focuses especially on the application of various governance mechanisms[81] in and between organizations (Reekers & Smithson, 1996). In general, transaction cost economics is inspired by two questions Coase asked himself. The first one, assuming that markets are superior to hierarchies, is why even large, vertically integrated organizations have managed to survive over time, since, reasoning from an evolutionary perspective, one would assume that hierarchies are, in general, not efficient and are thus unable to pass the filter (competition) that lets through only efficient (fitting) organizational forms? Hart asserted that the 'theory of the firm' fails to explain the occurrence of 'organization': "[m]ore subtly, neoclassical theory begs the question of what a firm is" (Hart, 1995, p. 155). The second question is, given the fact that

[81] Governance mechanism is synonymous with 'institutional arrangement' in the transaction cost approach.

hierarchies have obviously managed to survive, why isn't all production carried out by one big firm?

Transaction cost economics assumes many of the conditions stated in the *'theory of the firm'* (see section 3.3.2). Recall that according to the '*theory of the firm'*, the focus is on firms: profit-optimizing, holistic organizations that buy inputs and sell outputs on spot (short-term) markets. These transactions (buying and selling) occur because "(…) a crucial value of transaction relations lies in complementarity of knowledge, competence and access to other resources" (Nooteboom, 1993, p. 5).
One condition that transaction cost economics does not assume is the condition of perfect information. Rather, bounded rationality is assumed (see also section 3.3.2). According to transaction cost economics, firms are therefore incapable of (1) judging changes ex-ante in supply and demand (novel and perhaps more attractive customers and suppliers appearing on the scene), (2) foreseeing change in productive competencies, and (3) monitoring the partner's actions.
One of the consequences of bounded rationality is that firms participating in transaction relations are not able to anticipate all kinds of circumstances in contractual arrangements. In fact, initial contracts are inevitably incomplete. Especially if transactions do not take place in spot markets, but rather if their completion takes a period of time, unforeseen circumstances result in the need to renegotiate terms of the trade, resulting in adjusted formality and/or detail of contracts, or exchanging or retracting of hostages (Nooteboom, 1993)[82].
It is the assertion of transaction cost economics that in markets, negotiating and renegotiating the terms of the trade yields costs, so-called transaction costs. Some of these costs occur before transactions take place (ex ante), and some of them after the transaction has taken place (ex post). "Specifically, ex ante costs include (1) search and information costs; (2) drafting, bargaining and decision costs; and (3) costs of safeguarding an agreement. Ex post costs of contracting include (1) monitoring and enforcement costs (2) adaptation and haggling costs (3) bonding costs and (4) maladaptation costs" (Mahoney, 1992, p. 566). Hart (1995) summarizes the concept of transaction costs as haggling and learning costs. Note that transaction costs 'by default' result from private ordering (settling disputes involving two parties, which involves opportunity costs of devoting time and energy to productive ends). In excess of private ordering, court ordering may be called for by means of 'ultimate appeal'. The latter is an activity that can make haggling and learning especially expensive.

Assuming bounded rationality, transaction costs are an inevitable by-product of transactions in markets, and result from uncertainty and information asymmetry, or in

[82] An example of exchanging hostages is to invite specialists from the partner organization to stay at the focal organization's facilities. The information gathered by the specialists, which is of value to the organization possessing it, serves as the hostage here.

general from lack of transparency in markets. This lack of transparency, though, is not a real problem, because ongoing interactions between organizations are expected to modify parameters like price, quality and quantity even if both timing and impact of circumstances is unpredictable (according to Williamson, this is due to a process of 'spontaneous adaptation').

According to transaction cost economics, it is possible to decrease transaction costs by giving one party authority over the terms of the trade (Williamson [1995] refers to this situation as 'induced adaptation'[83]). In this situation, however, other costs are incurred: costs of errors and costs associated with administrative rigidity (Williamson, 1995; Hart, 1995), or, in short, bureaucratic costs.

So, markets ('spontaneous adaptation') and hierarchies ('induced adaptation') are governance mechanisms that yield various advantages and disadvantages and hence, result in various benefits and costs. Williamson (1985, 1995)[84] identifies attributes which describe the advantages and disadvantages:

- Incentive intensity (elicitation of effort to adapt to changing circumstances); and
- Ease of adaptation (ease of making uncontested bilateral adaptation[85]).

In general, spontaneous and induced adaptation can be described in terms of these attributes (Figure 23).

Attribute	**Weight**	**Induced Adaptation ('hierarchies')**	**Spontaneous Adaptation ('markets')**
Incentive intensity	a_1	0	+[86]
Ease of adaptation	a_2	+[87]	0

Figure 23: Comparison of governance mechanisms

A strong assumption, according to Williamson, is that 'incentive intensity' is a valued attribute (Williamson, 1995): in the trade-off depicted in Figure 23, $a_1 >> a_2$. Therefore,

[83] It is a peculiar thing that Williamson (1995) refers to markets and hierarchies as 'spontaneous adaptation' and 'induced adaptation', respectively, while the line of reasoning in transaction cost economics is static (for an elaboration, refer to the discussion of 'Dynamics' in section 3.5.3). However, the precise dynamics are not elaborated in economic organization theory.

[84] The characterization of governance mechanisms with these characteristics is open to discussion. Williamson presents these characteristics "(…) without pretending to be exhaustive" (1995, p. 198). However, in order to illustrate the line of reasoning of transaction cost economics, the characteristics are maintained for the moment.

[85] Either by administrative fiat or by third-party arbitration or court ordering. "Hierarchies tend (…) to use administrative fiat while markets resort to the courts for arbitration" (Van Alstyne, 1997, hypertext quotation).

[86] Although there is reliance on (costly) court ordering.

[87] Although there is reliance on (costly) bureaucratic controls.

according to the line of reasoning in transaction cost economics, the market as a governance mechanism is favored over the hierarchy. The rationale is that the transaction costs that are yielded in markets are less than the costs that occur in the alternative of the hierarchy (i.e., bureaucratic costs).

Up to this point in the line of reasoning, neoclassical analysis is somewhat enriched by taking transaction costs into account, but the analysis' results remain unchallenged: the 'survival' of large, vertically-integrated organizations is not explained. However, apart from the departure from the 'perfect information' assumption, transaction cost economics introduces the notion of asset specificity[88]. The condition of asset specificity refers to the situation in which organizations make relation-specific investments, that is, invest in assets that are specific to certain transactions and that cannot easily be re-deployed to other uses. Examples of asset specificity are site specificity (transactions have to be completed at a fixed location), physical asset specificity (transaction requires specialized equipment) or human asset specificity (transaction requires specialized human knowledge).

Because of the inclusion of bounded rationality *and* asset specificity, different conclusions in transaction cost economics are yielded (as opposed to the '*theory of the firm'*). Transaction cost economics states that in the situation of asset specificity, organizations are locked into each other (at least to some extent) and relinquish some of their freedom to act independently. "Transaction cost economics maintains that the condition of bilateral dependency varies systematically (indeed, is defined by) the condition of asset specificity" (Williamson, 1995, p. 198). A situation of asset specificity (Williamson, 1985, p. 95) is also referred to as a 'lock-in' (Williamson, 1985, p. 53), a situation characterized by 'sunk costs' (van der Zaal, 1997, p. 77), or a situation that resembles a 'small numbers exchange relationship' (Williamson, 1975, p. 26).
In the case of 'asset specificity', organizations are increasingly susceptible to opportunistic behavior of other organizations: the partner organization may choose to 'defect', that is, pursue a golden opportunity. The behavior of an organization actually defecting from a relationship with a partner-organization is referred to as 'opportunism'[89].
An important consequence of opportunism in the presence of 'asset specificity', according to transaction cost economics, is that the organization considering

[88] Asset specificity was in fact not introduced by Coase or Williamson, but by Klein, Crawford and Alchian (1978).
[89] Opportunism by the partner organization confronts the focal organization with the loss of the sum of (1) the sunk costs of the relationship and (2) the costs to search and bind a new partner.

opportunism[90] may try to renegotiate terms of the contract with its partner organizations, thus raising transaction costs.
An important hypothesis in transaction cost economics and a forceful assertion in the works of Williamson is that in the case of asset specificity, adaptation to changing circumstances in markets ('spontaneous adaptation') - for example by renegotiating terms of the trade and/or exchanging or retracting of hostages - is prohibitively expensive. In the trade-off depicted in Figure 23, the transaction costs are hypothesized to exceed the bureaucratic costs of a hierarchy. Therefore, assuming optimizing behavior, hierarchies are hypothesized to be better able to deal with asset-specific investments. "As a condition of bilateral dependency builds up (…), forms of organization that are better able to effect uncontested adaptability have more to recommend them – incentive disabilities notwithstanding" (Williamson, 1995, p. 198).

The premise of the transaction cost approach is that by analyzing transaction costs, one can discover how transactions can be handled efficiently: in an unstructured market-oriented setting in which independence is stressed, or in a structured hierarchical setting, or in intermediary settings. Also, it is stated that the relative costs of markets, hybrids and hierarchies change as the level of asset specificity (dependence) changes (Figure 24). It is the analysis of the concept of 'asset specificity' that especially enriches the line of reasoning in transaction cost economics as opposed to the line of reasoning in the *'theory of the firm'*.

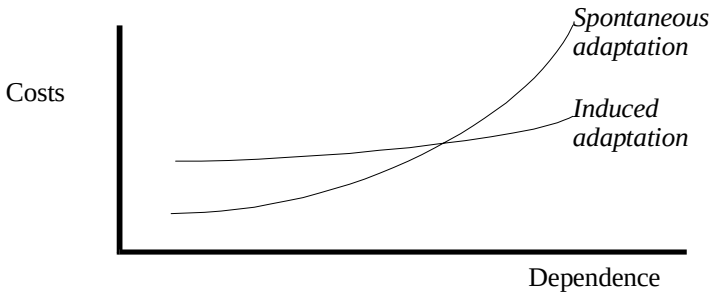

Figure 24: Governance costs (adapted from Williamson [1995, p. 199]).

The line of reasoning of transaction cost economics shows in which cases markets are relatively superior to hierarchies, and enriches neoclassical economic analysis by

[90] For the decision whether or not to 'defect', the relative value of a partner organization is taken into account. Relative value of a partner organization to the focal organization may include matters of efficiency, development capacity, flexibility, adherence to specifications, value as a source of knowledge, international presence, etc. (Nooteboom, 1993).

identifying mechanisms that yield opposite conclusions, thus potentially explaining the occurrence of existing partnerships between organizations.

Economic Organization Theories	Autonomy	Dependence	Coordination
Agency Theory	[not explicitly mentioned]	[not explicitly mentioned]	the mechanism (profit sharing agreement / hierarchy) that minimizes sum of residual loss and enforcement costs
Transaction Cost Economics	state that, in the absence of asset specificity, elicits intensive incentives	state induced by asset specificity[91]	the mechanism (market mechanism, hierarchy or intermediate forms) that minimizes governance costs[92]

Figure 25: Autonomy, dependence and coordination in economic organization theory (2/3)

A conceptual flaw of transaction cost economics is the vagueness of the various costs incurred by having or dispensing with authority. Fischer has asserted that by issuing suitably specified transaction costs, almost anything can be rationalized (Brynjolfsson, 1994). Or, as Hart has demonstrated, in transaction cost reasoning it is still unclear by what exact mechanisms opportunism is reduced if transactions are carried out in hierarchies. "First, even if we accept the strategy of explaining governance structures in efficiency terms, the literature has not examined the possibility that authority opens up new avenues for opportunism. Hence, on the transaction costs school's own criterion for good organizational design, we still lack a full explication of the efficiency advantages generated by authority relations" (Dow, 1987, cited in Pfeffer, 1997, p. 51)[93]. Boone and Verbeke (1991) identify various types of bureaucratic costs: costs resulting from 'complexity' and costs associated with agency problems (especially in multidivisional organizations).

[91] See Williamson (1995), who states that dependence varies systematically and is indeed defined by the condition of asset specificity (quotation in this section).

[92] This is probably most vividly expressed in Figure 24.

[93] In the view of Jensen and Meckling, the firm itself is conceived as a nexus of contracts. However, this theory cannot explain why a nexus disbands (autonomization) or why a nexus decides to merge with another nexus (merger).

Concluding, transaction cost economics sheds some light on market failure as a result of the occurrence of the condition of bounded rationality. However, no convincing, rigorous explanation is provided for the question of how introducing authority mitigates this failure (Grossman & Hart, 1986; Boone & Verbeke, 1991). This latter weakness is addressed in the property rights approach.

3.3.5 Property rights theory

The theory of property rights, although it is often portrayed as a multidisciplinary theory, is discussed here under the heading of economic organization theory because it has very clearly visible parallels with agency theory and transaction cost economics. It is based on maximizing behavior (like the *'theory of the firm'*), emphasizes incentive issues (like agency theory) and emphasizes costs of contracting (like the transaction cost approach). Its distinctive characteristic is the focus on the problem of what exactly differentiates a hierarchy from a market-based contractual agreement, and how ownership of assets affects organizational behavior.

The property rights line of reasoning resembles the line of reasoning of the transaction cost approach. The emphasis, however, is different. Transaction cost economics seems to focus on Coase's first question of why hierarchies exist (i.e., analyzes market failures), while property rights theory seems to seek an answer to Coase's second question: why not all production is carried out by one firm (i.e., studies non-market failures)[94]. Transaction cost economics therefore has many characteristics of a theory of markets, whereas property rights theory has many characteristics of a theory of administration. In the scientific study of public administration, property rights theory has, among other things, been applied to studies of:

- efficiency of legislation (that is, exogenous attenuation of property rights);
- influence of liability on economic behavior;
- state intervention and economic behavior[95]; and
- activities of individuals in various property right structures (Künneke, 1991).

Property rights may be defined as "(…) the sanctioned behavioral relations among men that arise from the existence of goods and that pertain to their use. These relations specify the norms of behavior with respect to goods that each and every person must

[94] This is partly due to the fact that property rights theory is a multidisciplinary theory, influenced by disciplines like law and policy science. Transaction cost theory, moreover, is an extension of economic theory. Killian and Wind (1998) argue that deviation from the market mechanism provides the starting point of research for economists, whereas social scientists (specifically, policy scientists) are more interested in studying withdrawal from hierarchical coordination.

[95] A typical property rights claim is provided by Alchian: under public ownership the costs of any decision or choice are less fully trust upon the selector than under private property.

observe in his daily interactions with other persons, or bear the costs of non-observance. (…) The prevailing system of property rights in the community is, then, the sum of economic and social relations with respect to scarce resources in which individual members stand to each other" (Furubotn & Pejovich, 1974, p. 3). Künneke presents another definition: "the legally allowed alternatives of resource allocation" (1991, p. 54). Hart and Moore (1990) summarize that a property right ultimately is the ability of an owner to exclude others from the use of his or her asset. Künneke mentions the example of ownership of a dwelling and how this involves *a number of* property rights: "(a) the right to use the asset (…) (b) the right to appropriate the returns from the asset and (c) the right to change the asset's form and substance" (Furubotn & Pejovich, 1974, p. 4). These rights are also referred to as *usus*, the right to occupy it, *usus fructus*, the right to let it, and *abusus*, the right to reconstruct or eventually sell the house, respectively (Künneke, 1991, p. 58).

Property rights theory "(…) views the firm as a set of property rights" (Hart, 1995, p. 160). So, an organization is characterized by the (nonhuman) assets under its control[96]. The owner may adapt the assets with cost-saving or quality-enhancing features and may appropriate the benefits of these adaptations. This may occur directly, by generating an income out of it or, indirectly, by allowing others to use the asset embodying these innovations in exchange for an increased compensation, specified in a contract between owner and user of the asset.

The parallel with transaction cost economics is clearly visible in property rights theory's treatment of bounded rationality. According to property rights theorist Brynjolfsson (1994), it is impossible to write a comprehensive, long term contract that governs the terms of the trade in every conceivable state of the world. Initial contracts are *incomplete* (Brynjolfsson, 1994): "(…) the quasi rents from the investment cannot be divided up appropriately in advance" (Hart & Moore, 1990, p. 1120).
Property rights theory states that the right to choose the aspects not covered by contracts resides with the owner of the asset: the owner is *residual claimant*. "Each of the parties will have certain rights under the contract, but its incompleteness means that there will remain some 'residual rights' that are not specified in the contract. When these rights pertain to the use of an asset, the institution which allocates these residual rights of control is property ownership"[97] (Brynjolfsson, 1994, p. 1647).

---

[96] Property rights theory even states that if physical capital is important, control over nonhuman capital can lead to control over human capital (also referred to as organizational capital), because it is hard for employees to find a substitute for this capital in the short run.

[97] Note that residues of property rights not only refer to monetary gains (residual *usus fructus* property rights, profits), but also to residual *usus* and *abusus* property rights. For example, if a contract says nothing about maintenance of a specific piece of machinery, the 'owner' retains the right to decide on maintenance (Brynjolfsson, 1994).

In fact, property rights theory identifies two categories of property rights, designated rights and residual rights (Grossman & Hart, 1986). By means of a contractual relationship, only designated rights are transferred from one party to another, leaving residual rights unchanged. Now, a situation of assets under shared control arises (Van Alstyne, 1997). Ownership, on the other hand, gives access to designated *and* residual rights. Thus, under the condition of bounded rationality, the *owner* of an asset always has an incentive to invest in an asset, or, more generally, in an interorganizational relationship, because even in the case of a circumstance that has not been specified in the (incomplete) contract, over which haggling over the terms of the trade occurs, the *owner* possesses ex-post bargaining power by means of threatening to withhold the assets otherwise. Property rights theory concludes that under a condition of bounded rationality, organizational behavior is not only determined by reward structures as specified in contracts, but also by asset ownership.

In transaction cost economics, common control[98] is seen as a way of reducing the consequences of opportunistic behavior (the transaction costs that can arise, Hart & Moore [1990]).
As property rights theory clearly has visible parallels with transaction cost economics, the basic line of reasoning of property rights theory resembles the mechanisms of transaction cost economics, although the terminology is slightly different.
As in transaction cost economics, the focus is on the advantages and disadvantages of various governance mechanisms, and markets are contrasted with hierarchies. In markets, production is characterized by a series of transactions between autonomous organizations, so that residual property rights are dispersed over these organizations. In hierarchies, property rights are *attenuated*: one party gains authority over the whole transaction.
In fact, the basic transaction cost economics trade-off (see Figure 23, p. 90) is elaborated. It is hypothesized that advantages incurred by authority will not outweigh the disadvantages of decreased incentive intensity (see also section 3.3.4).
As in transaction cost economics, there is a condition in which this does not apply; this situation is referred to as *complementarity of assets* (caused by asset-specific investments). In the case of *complementary assets*, each party can withhold the asset under its control and the haggling over the terms of the trade that occurs if organizations decide to do so increases transaction costs significantly. Property rights theory hypothesizes that in the case of bounded rationality and complementary assets, cost savings resulting from integration will, in fact, outweigh the costs incurred by decreased incentive intensity.

---

[98] Also referred to as *integration.* Here, integration refers to the inclusion of autonomous organizational parts in a common hierarchy or firm, or the degree to which ownership and property rights vest with a central office (Van Alstyne, 1997). At this moment, its meaning is different from the meaning of information systems integration as defined in chapter two. See chapter five for more details.

In the line of reasoning of transaction cost economics, the mechanism that is responsible for suppressing transaction costs is simply embodied in the phrase “a boss can tell a worker what to do” (Hart, 1995, p. 164). It hardly needs argumentation that this phrase represents a caricature of what actually happens in organizations, especially if professionals dominate these organizations (as in professional bureaucracies).
Property rights theory provides an explanation of how hierarchy mitigates transaction costs, and thus, why hierarchies are better able to deal with complementary assets, in a more sophisticated way than is embodied in the phrase ‘a boss can tell a worker what to do’. This explanation is based on the incentive intensity for employees and emphasizes that in the case of asset specificity, it is in the self-interest of the employees to behave in the way the boss tells them to (their incentives are more intense).

The explanation can be illustrated using an example. In the example below, we will illustrate that incentive intensity affects the behavior of owners of firms (in other words, asset owners), but also, more realistically, that it affects the behavior of employees who do not own assets but (in the absence of complete labor contracts) can bargain for a part of the surplus generated by their efforts.
Firstly, let us focus on the behavior of owners of two organizations X and Y that are involved in the production of a good that does not require complementary assets. Owners of organizations X and Y face intensive incentives to invest in assets because - being owners - they can appropriate the gains from these investments. This changes, however, if assets are complementary. Owner X knows that owner Y is able to bargain for a part of the value generated by X’s investment by means of threatening to withhold the complementary asset, and owner Y knows that owner X is able to do the same thing with the value generated by Y’s investments. In the absence of complete contracts, this situation confronts both X and Y with decreased incentive intensity. By means of common control over assets, incentives are restored because the possibility of holding up complementary assets is excluded and in all cases of redistribution of property rights (X buying Y’s assets, Y buying X’s assets, and X and Y being co-owners) incentives are restored.
Secondly, it is possible to show that incentive intensity also applies to employees working with assets. Although employees are not owners, they can bargain for benefits in any form: higher wages, promotions, or even more leisure time or on-the-job consumption.
Employees working with the assets face incentives to engage in, for example, an on-the-job training program because their value will rise and they will be able to bargain with the asset owner for benefits as described above. In this situation, the marginal value created because of the on-the-job training program is, in the long run, expected to be divided among the asset owner and employees.
Now consider a situation in which complementary assets are involved. The same employees engaging in an on-the-job training program face degraded incentives because they have to bargain with the asset owner, who, in his turn, has to bargain with the partner-organization, suggesting a split of the marginal value between employees,

owner and partner-organization. Consequently, the employees' share of gains will typically be lower and so their incentive to acquire new skills decreases.
The incentives for the employees are restored, however, if the complementary assets are placed under common control. In this situation, the employees bargain directly with the owner of the asset, suggesting a split of the marginal value between employee and owner.
Thus, in a case of (1) incomplete contracts and (2) asset specificity, incentives for employees are more intensive under common control than under separate ownership.

This line of reasoning explains how the occurrence of complementary assets enables the owner of the complementary asset to bargain for a part of the marginal value created by employees working with the original asset (by threatening to withhold the complementary asset otherwise), thereby suppressing the employees' incentives. This situation is an example of a market-failure (caused by 'hold-up' power, exercised by the complementary asset's owner) that suppresses incentive intensity in markets. Property rights theory hypothesizes that complementary assets in markets suppress incentives for employees working with these assets, and that this decreased incentive intensity offsets the traditional superior incentives in markets. Furthermore, it is hypothesized that bringing complementary assets under a common hierarchy restores the intensity of their incentives because employees working with the assets have to negotiate with only one party (the 'unified' owner of the complementary assets). The phrase 'a boss can tell a worker what to do' is replaced by the phrase 'rental cars are driven less carefully than cars driven by their owners' (Van Alstyne, Brynjolfsson & Madnick, 1995).
Note that property rights theory's answer to the question of by what exact mechanism hierarchy mitigates contractual failure is still a caricature, but perhaps not such an unrealistic one (Hart, 1995).

Economic Organization Theories	Autonomy	Dependence	Coordination
Agency Theory	[not explicitly mentioned]	[not explicitly mentioned]	the mechanism (profit sharing agreement/hierarchy that minimizes sum of residual loss and enforcement costs
Transaction Cost Economics	the state that elicits intensive incentives but also confronts partner organizations with costs resulting from uncertainty	state induced by asset specificity	the mechanism (market mechanism, hierarchy or intermediate forms) that minimizes governance costs
Property Rights Theory	state characterized by unbounded property rights	state induced by complementarity of assets	the mechanism (dispersed ownership of assets, concentrated ownership of assets) that optimizes incentives

Figure 26: Autonomy, dependence and coordination in economic organization theory (3/3)

3.3.6 Autonomy, coordination and dependence in economic organization theory

In this section, the contributions of agency theory, transaction costs economics and property rights theory with respect to the relationship between autonomy, dependence and coordination are synthesized. Because of the criticism of the use of agency theory for our current purposes (see section 3.3.3), this synthesis is largely based on the contribution of transaction cost economics and (for the larger part) property rights theory.

In section 3.2, it was noted that organization theory in general claims that organizations strain to *maintain autonomy* and avoid situations in which the behavior of other organizations has ramifications for the focal organization.
According to the line of reasoning of economic organization theory, organizations exerting the *usus*, *usus fructus* and *abusus* property rights in an unbounded manner face intensive incentives to perform well. That is, autonomous organizations, accessing other organizations' assets and allowing other organizations access to their own assets through short-term ('spot market') contracts, are hypothesized to pass the evolutionary

filter of market competition. However, this only holds under a number of assumptions, among other things the assumption of perfect information[99]. All economic organization theories discussed in sections 3.3.3 to 3.3.5 are based on the assumption that perfect information either does not exist or that perfect information is prohibitively expensive to gather (the bounded rationality assumption). Consequently, organizations are confronted with *uncertainty*, circumstances that had not been anticipated in contracts with other organizations. So, if circumstances occur that have not been foreseen, adaptation of contracts will have to take place. Consequently, costs are incurred: so-called transaction costs. Despite the fact that adaptation to changing circumstances may be effortful and transaction costs are incurred, it is assumed that intensive incentives yield successful adaptation. Even in the presence of uncertainty and hence transaction costs, organizations are assumed to be able to renegotiate terms of trade in such a way that, in the long run, all organizations involved benefit equally well.

The situation changes, however, if investments have been made in capital that can only generate rents in conjunction with specific (either human or non-human) assets of the partner organization ('asset specificity' or 'complementary assets'). In these situations, organizations are confronted with a lock-in effect. In such a case, the threat of withholding complementary assets by a partner-organization means that a focal organization's decision premises are no longer fully determined autonomously. Hence, dependence occurs as a result of 'asset specificity'. Dependence is seen as a threat because organizations that are 'locked-in' are vulnerable to possible opportunistic behavior by the partner organization (see also van der Zaal, 1997). It is hypothesized that organizations try to avoid asset- specific investments, or, if this is impossible, only engage in cooperation with partner organizations using asset-specific investments if the focal organization "(…) has a more or less well grounded belief, in the form of a subjective probability, that Y will cooperate in the sense of not misusing such dependence. This belief may be based on (perceived) available opportunities for misuse on the part of Y, Y's incentives towards misuse, and Y's propensity to employ the opportunities" (Nooteboom, 1993, p. 11). In the case of asset specificity, autonomy of organizations also refers to the possibility of opportunism.

Organizations may allow for the possibility of opportunistic behavior by partner organizations by anticipating such behavior in contracts. In this way, contractual arrangements limit both organizations' autonomy. However, assuming bounded rationality, it is either impossible to anticipate all states of the world (a Simonian interpretation of bounded rationality) or prohibitively expensive (in a Coasian interpretation); contracts are necessarily incomplete. The characteristic of bounded

[99] Note that concepts like 'sunk costs' and 'asset specificity' are problematic because imperfect information renders full anticipation of consequences in contractual arrangements impossible. Assuming perfect information, though, anticipation is possible and these concepts are not problematic any more.

rationality and hence incompleteness of contracts is crucial in economic organization theory. Thus, economic organization theory, especially transaction cost economics and property rights theory, focuses on the opportunity costs of autonomy: "the cost to the individual of preserving autonomy" (Douglas, 1995, p. 98). In situations of dependence, these costs increase. It is this feature especially that differentiates economic organization theory from neoclassical economic analysis.
Economic organization theory states that although bringing two separate organizations under common control by means of hierarchical coordination yields costs of reduced intensive incentives and increased administrative rigidity, these costs may be outweighed by the benefits of avoiding 'haggling costs' (see Figure 24, p. 92). As complementary assets held by separate organizations are a cause of haggling, it is hypothesized that a net improvement can be realized by integrating assets under a common hierarchy, thereby removing possible hold-up situations (see section 3.3.5).

A key tenet of economic organization theory is that it identifies positive and negative consequences (in terms of costs) of various governance mechanisms in various circumstances. Assuming optimizing behavior of organizations, it explains why organizations accept being limited in the course of action they wish to pursue (e.g. accepting procedural coordination, either by detailed contracts or by accepting hierarchical control; in both ways, transaction costs are decreased).

Often, economic organization theory is viewed as having a preoccupation with the market-versus-hierarchy theme. In section 3.3.4, it was shown that the market versus hierarchy comparison is more likely to be conceived as a continuum. Negotiations between organizations result in contracts that consist of elements that are characteristic of markets as well as elements that are typical of hierarchies (de Vries, 1992). The alternative of semi-structured interorganizational relations is a novelty in the works of Williamson (van der Zaal, 1997). "Whereas I was earlier of the view that transactions of the middle kind were very difficult to organize and hence were unstable, (…) I am now convinced that transactions of the middle range are much more common" (Williamson, 1985, p. 83).

In Figure 27, the position of autonomy, dependence and coordination in economic organization theory at large is summarized. This summary is based on previous summaries on the position of autonomy, dependence and coordination in agency theory, transaction cost theory and property rights theory (Figure 22, Figure 25 and Figure 26, respectively). The summary of economic organization theory focuses somewhat more on transaction cost theory and property rights theory because agency theory lacks a full explanation of relationships between organizations if one does not strictly operate on behalf of another organization (see section 3.3.3).

	Autonomy	Dependence	Coordination
Economic Organization Theory	state in which property rights are exerted with respect to assets in an unbounded manner, which elicits powerful incentives to perform well	state in which assets can only be made productive in association with other assets	the mechanism that optimizes incentives for participants involved

Figure 27: Autonomy, dependence and coordination in economic organization theory (synthesis)

3.4 Political Organization Theory

3.4.1 Introduction

As the statement by Pennings indicates (this volume, p. 82), economic theories have been widely applied to the study of interorganizational relations. However, economics is not the only perspective used. Developments in political science, policy science and sociology have resulted in the emergence of what is referred to here as political organization theory (see also Klijn, 1997). Political organization theory has proven to be a rival theory to economic organization theories. Political organization theorist Jerry Pfeffer and economic organization theory proponent Oliver Williamson have fueled a vigorous debate between political organization theory and economic organization theory. Williamson noted that "[e]conomic and sociological approaches to economic organization have reached a state of healthy tension" (1995, p. 207). Pfeffer has stated that "there is evidence that both institutionalization and power theories of organizations occasionally are more successful than some presumption of rationality or efficiency explaining organizational structure" (1997, p. 52), whereas he stated, with respect to economic organization theories, that the dominance of economic organization theory in the larger field of organization theory does not rest on a readily identifiable set of empirical successes. Williamson, on the other hand, repeatedly quotes March's statement that, for organization theory, power is a disappointing concept[100].

[100] The debate is not only a debate in organization science. Donaldson (1995) explicitly grounds political organization theory in the New Left ideology, whereas economic organization theory is assumed to originate in the conservative ideology of the New Right (Ter Bogt, 1998).

3.4.2 The political perspective on organizations

Political organization theory originates in the works of Homans, Levine and White, Emerson, Zald, Benson, and Pfeffer. A key reference for the political organization theory is Pfeffer and Salancik (1978). They have explicitly positioned their work as being opposite to prior organizational analysis that focused internally and ignored the political dimension (Donaldson, 1995): "[m]ore traditional views of organizations underemphasize the importance of power, conflict, and non-bureaucratic procedures" (Tushman, 1977, p. 207). According to Parsons, in political organization theory "(…) the orientation is the maximization of total command of facilities in the social system held by one actor, individual or collective, relative to the others" (1951, p. 550). Political organization theory, being the study of legitimate power, was particularly vigorous in the early 1970s (Pfeffer, 1997). Since then, attention to power and politicking has diminished. Pfeffer, one of the key theoreticians on political organization theory, stated a number of reasons for this decline and concluded in 1997 that "[p]ower as a topic also suffers from the problem of being politically incorrect. (…) Considerations of domination and force, of getting one's way against opposition - which is, after all, a part of most definitions about power[101] – perhaps are better left out of sight of discussion." (1997, p. 155).

However, because of its value for interorganizational analysis (Pfeffer and Salancik's theory has many characteristics of an interorganizational theory: six of the ten chapters of their work are about interorganizational matters like mergers, joint ventures, cartels, etc.[102]) and the 'rediscovery' of political organization theory by authors working in the discipline of information systems (Holland & Lockett, 1994; Bensaou & Venkatraman, 1996; Klein, 1996; Schwarzer, Zerbe & Krcmar, 1997), political organization theory is discussed here.

3.4.3 The mechanisms of political organization theory

Political organization theory belongs to the so-called interorganizational theories that claim to explain the *development* of interorganizational relations and provide recommendations for their design. In fact, the starting point of political organization

[101] Emerson (1962), for example, defines the power of X over Y as the amount of resistance on the part of Y which can potentially be overcome by X.

[102] Donaldson (1995) even claims that because of phenomena addressed in political organization theory, Pfeffer and Salancik's work is more a theory of (corporate) strategy than of organizational structure. However, Donaldson does not point out on which grounds he differentiates structure theory from strategy theory. For this moment, therefore, we subsume political organization theory, including Pfeffer and Salancik's theory, under the heading of organization theory.

theory[103] is that the behavior of organizations can only be explained in relation to environing organizations.

In political organization theory, organizations are viewed as "(…) political entities: coalitions of interests and demands emanating from within and outside organizations. (…) Boundaries within organizations change, participation in decision domains varies, and decisions are differentially important. Under these conditions, organizations can be viewed as loose structures of interests and demands, competing for organizational attention and resources, and resulting in conflicts that are never completely resolved" (Narayanan & Liam Fahey, 1982, pp. 26-27). These coalitions attempt to acquire and maintain resources by interacting with other coalitions, each with its own preferences and objectives[104]. Here, 'resources' refers to social legitimacy, information and physical and monetary resources.
Thus, the focus is not limited to the functioning and design of the 'internal' organization, but rather stresses the management of relations. Tushman (1977) assumes that (1) to understand the behavior of organizations, one must understand the dynamics and relationships between organizations; (2) organizations may not be equally powerful over different issue areas (and the distribution of power and status over organizations may change over time); (3) organizations will act to limit the uncertainty they are facing; and (4) the greater the differentiation between organizations, the greater the potential for interorganizational conflict.

A key statement of political organization theory is that "(…) in general, organizations will tend to be influenced by those who control the resources they require" (Pfeffer & Salancik, 1978, p. 44). Pfeffer and Salancik state ten conditions that affect the extent to which an organization will comply with control attempts:

1. The focal organization is aware of the demands;
2. The focal organization obtains some resources from the social actor making the demands;
3. The resource is a critical or important part of the focal organization's operation;
4. The social actor controls the allocation, access, or use of the resource; alternative sources for the resource are not available to the focal organization;
5. The focal organization does not control the allocation, access, or use of other resources critical to the social actor's operation and survival;

[103] In the remainder of the discussion, resource dependency theory is assumed to be synonymous with political organization theory, unless other authors than Pfeffer and Salancik are explicitly quoted.

[104] Here, clearly the assumption of methodological individualism is violated. Instead, the view on organizations as held by March and Simon (1958) is more or less followed ('individuals in organizations engage in transactions and exchange contributions for inducements').

6. The actions or outputs of the focal organization are visible and can be assessed by the social actor to judge whether the actions comply with its demands;
7. The focal organization's satisfaction of the social actor's requests are not in conflict with the satisfaction of demands from other components of the environment with which it is interdependent;
8. The focal organization does not control the determination, formulation or expression of the social actor's demands;
9. The focal organization is capable of developing actions or outcomes that will satisfy the external demands; and.
10. The organization desires to survive (Pfeffer & Salancik, 1978, p. 44).

Furthermore, political organization theory hypothesizes that if the environment, which consists of other, possibly linked organizations, changes, the focal organization faces the prospect of either coping with the changed environment (and thus safeguarding the acquisition and maintenance of resources) or not surviving. Coping with the environment, according to the line of reasoning of political organization theory, includes the question how organizations react to their environment (Pfeffer & Salancik, 1978; Donaldson, 1995; Pfeffer, 1997; see also the discussion in Williamson, 1995). However, reverse causality – how organizations can influence the environment – is also taken into account. In this way, the basic mechanism of political organization theory resembles the reasoning of emergent perspective (see section 1.2.1). "If the organization and the environment must be mutually compatible, then either the organization can change or the environment can be changed" (Pfeffer & Salancik, 1978, p. 107). In fact, managers are assumed to have three roles. Apart from the symbolic role, in which a manager is rewarded when things are going well and fired "(…) as a way of altering appearances, thereby removing external pressure, without losing much discretion" (Pfeffer & Salancik, 1978, p. 264), there are both the responsive role *and* the discretionary role. The responsive role is the role of processing of and responding to the environment, and of implementing adaptation. The discretionary role is the role of actively modifying the environment.

Political organization theory does not assume a deterministic line of reasoning as in Burns and Stalker (1961), but rather hypothesizes that organizations are not slavish followers of the demands of the environment (Pfeffer & Salancik, 1978; Haselhoff, 1977). The rationale for this position is that environments of organizations consist of a variety of other organizations, including organizations that are mainly concerned with legal, political or juridical aspects, including but not limited to governmental organizations[105], accrediting organizations, regulatory bodies that were established by agreement of the focal organization itself, etc. Consequently, the demands that an

[105] The fact that the environment consists of other organizations, including government agencies, funding organizations, etc. may be seen as a step forward in comparison to the situation in which a very abstract concept of environment is assumed (see section 3.2).

organization faces are often in conflict with one another and even if organizations were able to comply with these conflicting demands[106], the path dependence of individual responses constrains organizations in its future actions, including responding to other demands. This suggests that organizations cannot survive by responding completely to every environmental demand: such a form of 'compliance' is "a loss of discretion, a constraint, and an admission of limited autonomy. To the extent that the focal organization is subject to successful external influence attempts, it places itself in a situation in which its long-term survival is threatened" (Pfeffer & Salancik, 1978, pp. 94-95). Wamsley and Zald state that organizations typically shield off their technological cores from the environment: "Since organizations exist to accomplish work, the organizational polity must protect and insulate the technological core from external contingencies (…), that would disrupt task accomplishment" (1973, p. 72; see also Thompson, 1967; Homburg & Gazendam, 1997).

The possibilities for actively managing the environment are more or less captured in the conditions that affect the extent to which an organization will comply with control attempts. In general, Pfeffer and Salancik mention two courses of action (1978, p. 97):

- avoiding resource dependence, and
- avoiding control.

Avoiding resource dependence implies avoiding the conditions which demand compliance in the first place, that is, changing "the focal organization's dependence on important critical resource exchanges" (Pfeffer & Salancik, 1978, p. 108). Benson identifies the basic action orientations of maintenance and defense of an exclusive, autonomous domain. "To forestall a loss of autonomy and to remove some of the contextual constraints on behavior, the focal organization may take action to reduce the probability of being subject to successful enforcement of external demands" (Pfeffer & Salancik, 1978, pp. 95-96).
In practice, organizations can choose to buffer inputs and to commit other organizations to long-term contracts for disposal of output. However, buffering does not remove the basic source of vulnerability. Another solution is to develop substitute exchanges ('the redefinition of an exchange so that it is no longer critical') or to diversify ('expansion into a related geographical area, or market, to the conglomeration of the firm so that it includes diverse lines of business with practically no resource exchanges in common'). In general, avoiding resource dependence implies altering "(…) the purposes and structure of the organization so that it no longer requires only a limited range of inputs or serves only a few markets" (Pfeffer & Salancik, 1978, p. 109).

[106] For example, by means of sequential attention to environmental demands, nondisclosure or playing various groups off against one another (Cyert & March, 1963; Pfeffer & Salancik, 1978).

Avoiding control is a course of action that is referred to as 'expanding organizational jurisdiction and encompassing critical contingencies' by Wamsley and Zald (1973). In this course of action, "the control which other organizations might possess over the exchange of that resource" (Pfeffer & Salancik, 1978, p. 108) is manipulated. This manipulation is inspired by the observation that "if the exchange is important for the organization, the organization should attempt to manage its interdependence by extending its own control in those vital areas" (Pfeffer & Salancik, 1978, p. 113). An option is to control the input or output exchange itself, to control the stability and predictability of the exchange relations by controlling the rules of the trade[107]. Pfeffer and Salancik propose a variety of measures to do this.

Firstly, collective structures of interorganizational action[108] can be established: informal or semiformal mechanisms in which behavior is coordinated "not by hierarchical mandate but by agreements to behave in certain ways" (Pfeffer & Salancik, 1978, p. 144) in such a way that access to resources is controlled and assets' use is regulated. This can be done by co-optation (forming interlocking directorates). Co-optation is "a situation in which a person, or a set of persons, is appointed to a board of directors, advisory committee, policy meeting or influencing group, some organizational body that has at least the appearance of making or influencing decisions" (Pfeffer & Salancik, 1978, p. 162).

Secondly, one method is to operate under the protection of government or interfirm regulation. For instance, concentration of control in the environment can be eliminated through appealing to antitrust legislation. However, this is only possible in a limited number of circumstances. For example, governmental power cannot be eliminated using this type of reaction[109]. Furthermore, this second category of measures "still leaves the organization somewhat vulnerable. Cartels can disband, government regulators can become hostile, and informal arrangements can be broken down" (Pfeffer & Salancik, 1978, pp. 108-109).

Therefore, thirdly, partner organizations can be controlled by means of merger. Here, "ownership solves the problem directly; compliance comes through the authority established by owning the other organization" (Pfeffer & Salancik, 1978, p. 145). Merger is viewed as quite a drastic measure (as compared to informal or semiformal linkages), because "relationships established through communication and consensus can be established, renegotiated and re-established with more ease than the integration of organizations by merger can be altered" (Pfeffer & Salancik, 1978, p. 144).

---

[107] Pfeffer and Salancik state that this can be achieved both by legal as well as by illegal means.

[108] Also referred to as 'the negotiated environment' by Cyert & March (1963).

[109] Of course, abusive exertion of governmental power is incompatible with General Rules of Conduct and can be contested using objection and appeal procedures in administrative law (Heesen, Homburg & Offereins, 1995; Heesen, Homburg & Offereins, 1997). The result, however, can never be the dismantling of governmental power.

Furthermore, formal mechanisms like merger may not always be possible (Heesen, Homburg & Offereins, 1995; 1997).

Summarizing, whereas in economic organization theory, profit-maximizing behavior of organizations as atomic agents is assumed, political organization theory makes assumptions about behavior of organizations as well as behavior within organizations (extra-organizational and intra-organizational, respectively). In political organization theory, the behavior of organizations is not guided by cost-benefit considerations[110]; instead, organizations are assumed to be *actors that strive to optimize their self-interest by (1) minimizing their dependence on other organizations and (2) maximizing the dependence of other organizations on themselves* (see also Guetzkow, 1966; Reekers & Smithson, 1996). Donaldson states that "(…) thus, the thesis of Pfeffer and Salancik (1978) is at root a model of political struggle, that is, of different parties seeking to influence each other to their own advantage, both between one organization and another, and between one organizational member and another" (1995, p. 130). Donaldson accuses Pfeffer and Salancik's theory of treating organizations as political actors, represented by top-management, rather than production systems or systems of economic activity (Donaldson, 1995). In fact, Pfeffer and Salancik themselves state that asymmetrical power and dependence relations play an important role in their theory and attention has to be paid to aspects of conflict, struggle for power, exploitation and especially protection of autonomy. "Many of the structural attributes described as desirable for organizational adaptability and for coping with an environment of conflicting demands and interests are represented in political organizations (…). We are not the first to note structural parallels between political organizations and other types of organizations or the similarities in their governance and adaptation. (…) We suspect that it is mainly when the problems confronted by formal organizations become increasingly the management of conflicting demands and adaptation to changing social contexts that structural similarities to political organizations emerge" (1978, pp. 277-278).

Donaldson furthermore states that political organization theory is an example of a theory that overemphasizes politics, has an anti-management quality and has become assocaited with an outbreak of irrationality. In short, Donaldson seems to suggest that "politics are an aberrant form of behavior" (Davenport, Eccles & Prusak, 1992, p. 55). Tushman, on the other hand, states that politicking "arise[s] not because of (…) perversity, but because of the nature of organizational processes and decision-making under uncertainty (…) Conflict is inherent in the system whose social structure is seen as pluralistic, fractured by (…) divergent interests" (Tushman, 1977, p. 212).

Analysis of the political organization theory as depicted in this section shows that political theory mainly states that organizational survival is achieved by adaptation and by influencing the environment in order to retain a degree of organizational autonomy.

[110] Pfeffer and Salancik (1978) assert that subjective and ideological elements play an important role in the causal chain that eventually explains behavior of organizations.

The existence of production systems and economic aspects is not denied but rather viewed is viewed from another perspective[111].

3.4.4 Autonomy, coordination and dependence in political organization theory

Autonomy, coordination and dependence all are literally used in the discussion of Pfeffer and Salancik's version of political organization theory. Dependence is described as being the obverse of power (Emerson, 1962), "the reason why nothing comes out quite the way one wants it to" (Pfeffer & Salancik, 1978, p. 40) and it is defined as a situation in which another has discretion to take actions that affect the focal organization's interests. Dependence exists when there is an unequal balance between two organizations with respect to the concentration of resources and the importance of resources to the organizations. In fact, dependence is portrayed as being the product of the importance of a given input or output to the organization[112] and the extent to which it is controlled by a relatively few organizations. Eventually, dependence is very important in the explanation of interorganizational behavior.
According to Benson, "[a]dministrators undertake or refuse to undertake cooperative ventures on the basis of reasonably careful calculations of costs and returns at the level of resource acquisition. Coordination proposals which threaten the program efficiency of an agency or its established ties to supporting publics are resisted. Proposals which strengthen the agency's position in the resource game are more likely to be adopted" (1975, p. 238).

Coordination is also literally used. It must be noted, however, that a definition of coordination is lacking. Coordination is described as "a means for managing mutual interdependence" (Pfeffer & Salancik, 1978, p. 143). Coordination may be achieved through a hierarchical mandate, but also by so-called interfirm linkages, depending on voluntary behavior in which significant discretion remains with external organizations who may withdraw from the coordinated interaction. Examples of such forms of informal or semiformal coordination are: "co-optation, trade associations, cartels, reciprocal trade agreements, coordinating councils, advisory boards, boards of directors, joint ventures, and social norms" (Pfeffer & Salancik, 1978, p. 144). Pfeffer and Salancik mention the following advantages of interfirm linkages:

- They provide information about the activities of that organization which may impinge on or affects the focal organization;

[111] In fact, not many of the theories discussed by Donaldson (1995) manage to survive his critical review. Schrama (1991) has remarked that Donaldson's analysis is at least a rear-guard action.
[112] Resource importance is often operationalized as the ratio of the amount of a specific resource and the total amount of resources that are transacted by the focal organization (van der Zaal, 1997).

- They provide a channel for communicating information to another organization on which the focal organization depends;
- They constitute a first step in obtaining commitments of support from important elements of the environment; and
- They have a certain value for legitimating the focal organization (Pfeffer & Salancik, 1978, p. 145).

With respect to hierarchical coordination, the following is remarked: "[e]xplicit coordination among organizations is costly. When the external world is brought into the organization, through director interlocks, through the pooling of resources in a joint venture, or by giving authority to some interfirm organization, external influence over the organization is increased and its own discretion is simultaneously constrained even as it increases the certainty of its environment." (Pfeffer & Salancik, 1978, p. 183). Alexander (1995) states that hierarchical coordination may in fact offer few or no benefits and setting up hierarchical coordination structures may involve costs which, even if they are low, offer few prospects of offsetting gains (p. 273).
Moreover, Pfeffer and Salancik remark that "[o]rganizations are willing to bear the costs of restricted discretion for the benefits of predictable and certain exchanges" (Pfeffer & Salancik, 1978, p. 183). Overall, however, Pfeffer and Salancik describe interfirm linkages (that is, in the terminology of this thesis, interorganizational relations) using the term 'collusion' and find them undesirable. "One might ask why collusion is seen as so disturbing. Why are reciprocal trade agreements, cartels, and other forms of interfirm coordination considered to be undesirable? After all, the firms are just solving the problems of dependence through establishing a negotiated environment. The problem is that the negotiated environment established is not one that includes the interests of all parties. If two organizations collude to reduce competition, they have created greater dependence for those who purchase their products. The problem with collusion, or coordination to establish negotiated environments, is that everyone is not freely and openly participating in the process" (Pfeffer & Salancik, 1978, pp. 183-184).

Autonomy is also literally used albeit not defined. Autonomy is a state to be cherished, and dependence is a state always to be avoided, unless uncertainty can be reduced, for example by 'absorbing' information from partner organizations, gaining support from the environment, and, in general, legitimizing the organization. From the fragment "[o]rganizations seek to avoid dependencies and external control and, at the same time, to shape their own contexts and retain their autonomy for independent action" (Pfeffer & Salancik, 1978, p. 261) one might guess that autonomy in political organization theory is the state of non-dependence; that is, self-containment. However, as has also been taken into account, no organization is completely self-contained, so autonomy is more of an ideal state or objective than an existing, observable state.
A peculiar detail of the role of autonomy in political organization theory is that organizations (especially those operating in industries at intermediate stages of concentration) tend to use inter-firm linkages in order to avoid uncertainty. Yet each of

these interfirm linkages in itself involves an element of diminution of autonomy (Donaldson, 1995). So "in order to protect their autonomy, organizations take steps which reduce their autonomy" (Davis and Powell, cited in Donaldson, 1995, p. 148). This 'irony' is further discussed in section 3.5.

The positive causal relation between dependence and uncertainty is notable, especially because a satisfying explanation is lacking (see also van der Zaal, 1997): in some situations, organizations resist external control (interfirm linkages, integration), because it reduces their autonomy. However, organizations are also hypothesized to surrender autonomy actively in order to reduce uncertainty for the benefits of predictable and certain exchanges. Obviously, it is assumed that interorganizational relations that are initiated by other organizations reduce autonomy for a focal organization, whereas if a focal organization initiates interorganizational relations, it enhances the focal organization's autonomy.

	Autonomy	**Dependence**	**Coordination**
Political Organization Theory	the ideal state of self-containment	situation in which another organization has discretion to affect focal organization's behavior and interests by controlling necessary resources	diminishment of freedom to act independently, either by hierarchical mandates, voluntary behavior or co-optation

Figure 28: Autonomy, dependence and coordination in political organization theory (synthesis)

3.5 Synthesizing perspectives

3.5.1 Opportunities for reconciliation between theoretical perspectives

The debate on the appropriateness of economic organization theory and political organization theory (see section 3.3.1) is a vigorous one. The discussions of economic organization theory (section 3.3) and political organization theory (section 3.4) have indeed revealed that there is some tension between authors of the two different streams. The debate is somewhat polarized by Williamson (1995) and Pfeffer (1997).

Nevertheless, there are enough similarities and overlaps in order to try to synthesize the two perspectives: "(…) [W]hile important areas of disagreement remain, more consensus exists than is at first apparent" (Scott, 1987, cited in Williamson, 1995, p. 207). Moreover, many authors have tried to reconcile economic organization theory and political organization theory (Holland & Lockett, 1994; Bensaou & Venkatraman, 1996; Klein, 1996; Schwarzer, Zerbe & Krcmar, 1997). Other authors have even tried to

reconcile strategy formation (see section 2.3), economic organization theory *and* political organization theory (Haselhoff, 1977; Krickx, 1991, van der Zaal, 1997).
In this section, the insights from both theoretical perspectives are compared to each other and combined where possible. The justification for this effort lies in statements like "[i]n many ways, transaction cost theory can be considered as an extension to the resource dependence perspective" (Reekers & Smithson, 1996). Pfeffer (1997) asserted that studying power processes can provide at least a partial test of the economic model of organizations, and can also increase the explanatory power of economic models of, for example, not-for-profit organizations (see also 3.4).

3.5.2 Comparison of political organization theory and economic organization theory

Introduction

The compatibility of both political organization theory and economic organization theory with frameworks addressing consistency of organizational (and, for instance, other organizational or technological) variables has been subject to discussion. Political organization theory's description of mutually adjusting interorganizational and environmental parameters is quite compatible with such a framework (e.g. 'emergent' adaptation to environment, rejection of unilateral causality; see also Rogier (1998), Donaldson [1995]). Donaldson's critique on political organization theory mainly pertains to the overall tone of the theory: "(…) highly damning of the discipline of organizational behavior" (1995, p. 132). In section 3.4.3, it has already been stated that this line of reasoning does not convince from a research point of view.
Economic organization theory can also be regarded as a theory of adaptation of organizational variables to environmental variables (especially technology). Pfeffer concluded with respect to economic research on the relationship between organizational parameters and environment that "(…) structure seemed to vary quite systematically with an organization's strategy, size, technology, and conditions of the organization's environment. (…) Common sense suggested that the appropriate organizational arrangements must surely depend on what is being organized and the environment in which the organization has to operate" (Pfeffer, 1997, p. 160). Therefore, we conclude that both political organization theory and economic organization theory are not incompatible with the overall framework of this study.

In section 3.5.1, opportunities for reconciliation of the often diametrically portrayed interorganizational theories were identified. After all, economic organization theory and political organization theory have in common that they explain interorganizational phenomena like interorganizational relations, integration and mergers and that they, in general, study various means of adaptation of organizations to their environment.

Contrasts

Using the elements of the first step of the CAST method (see footnote 29, p. 25), and using criteria that have been proposed by authors who have addressed both economic organization theory and political organization theory Haselhoff [1977] and Schwarzer, Zerbe, Krcmar [1997], it is possible to emphasize the distinct contributions of economic organization theory and political organization theory (see Figure 29). In Figure 29, the following criteria are used:

1. theoretical roots (Schwarzer, Zerbe & Krcmar [1997]);
2. perspective / actors (Haselhoff, 1977);
3. model formulation (after Haselhoff, 1977);
4. key concepts (CAST method);
5. key performance indicators (CAST method);
6. key statements (CAST method, see also Schwarzer, Zerbe & Krcmar [1997]); and
7. unit of analysis (Schwarzer, Zerbe & Krcmar [1997])

Approach **Criteria**	***Economic Organization Theory***	***Political Organization Theory***
1. Theoretical roots	Neoclassical economy.	Policy Science, Sociology.
2. Perspective (actors)	Although agency theory identifies various stakeholders (owners, managers and employees) within firms, their interests are common (maximization of utility in terms of efficiency and, eventually, profits) and the firm is the actor (methodological individualism[113]). Bounded rationality is assumed[114].	Organization is the actor. The organization is a loose confederation of various stakeholders with diverse interests. Bounded rationality is assumed.

[113] In general, methodological individualism refers to a philosophy in which all human activities are purposeful and meaningful, and, moreover, to a philosophy in which all social phenomena can be explained in terms of individually purposeful and meaningful activities. In microeconomics, as well as in economic organization theory, methodological individualism is applied at a different level of analysis, i.e. at the level of analysis of organizations (Künneke, 1991, pp. 54-56; Hodgson, 1988; see also section 3.3.2).

[114] Economists obviously admit to the idea of bounded rationality, but economic models of organizations "still tend to define 'bounded rationality' as an imperfect approximation of the 'unbounded' one" (Dosi, cited in Pfeffer, 1997, p. 44). Furthermore, institutions are designed to achieve efficiency, and through a process of natural selection, inefficient ones cease to exist. The time frame involved in this process

Approach Criteria	***Economic Organization Theory***	***Political Organization Theory***
3. Model formulation	Qualitative, expressed in quasi-quantitative notation[115]. The expression of information search activities, haggling, administrative rigor etc. in terms of costs enables the expression of these aspects in a general equilibrium model.	Qualitative, verbally expressed. Political organization theory uses concepts (uncertainty, autonomy) that are not yet expressed in comparable units and are thus harder to formulate in an equilibrium model.
4. Key concepts	*Autonomy*: state in which property rights are exerted with respect to assets in an unbounded manner, which elicits powerful incentives to perform well *Dependence*: state in which assets can only be made productive in association with other assets *Coordination*: the mechanism that optimizes incentives for participants involved	*Autonomy*: the ideal state of self-containment *Dependence*: situation in which another organization has discretion to affect focal organization's behavior and interests by controlling necessary resources *Coordination*: diminishment of freedom to act independently, either by hierarchical mandates, voluntary behavior or co-optation
5. Key performance indicators	Efficiency through incentive intensity	Autonomy

may be quite long, though. Economist Williamson has admitted that economists are somewhat far-sighted (Williamson, 1995, p. 226).

[115] Neo-institutional economics shares this feature with, for example, Marxian economic analyses (Gazendam, 1993, p. 281).

Approach Criteria	***Economic Organization Theory***	***Political Organization Theory***
6. Key statement (key problem, propositions)	Minimal costs determine optimal (inter)organizational structure. $P_{Agency\ Theory}$: If one party acts on behalf of another, parties' performance is enhanced by minimizing agency costs; $P_{Transaction\ Cost\ Economics}$: Cooperating parties' performance is enhanced by choosing the governance mechanism that minimizes consequences of uncertainty; $P_{Property\ Rights\ Theory}$: Cooperating parties' performance is enhanced by choosing the governance mechanism that optimizes incentives of participants.	Designing interorganizational structure helps to manage interdependencies. $P_{Political\ organization\ theory}$: In order to perform well, organizations reduce uncertainty by minimizing their dependence on other organizations and maximizing the dependence of other organizations on themselves.
7. Unit of analysis	Transaction	Interorganizational behavior

Figure 29: Comparison of economic organization theory and political organization theory

From the discussion of economic organization theory and political organization theory in Figure 29, two important differences are elaborated here:

- the perspective on the subjects being studied, organizations; and
- the line of reasoning in the theories, as it appears from the key statements.

The differences in perspective are, in a way, coherent with both approaches' theoretical roots. Economic organization theory, like neoclassical analysis, assumes *methodological individualism* (Hodgson, 1988; Künneke, 1991). In general, methodological individualism is a philosophical stance in which, eventually, all kinds of (social) phenomena are explained in terms of individuals. However, many writings on economic organization theory are not always strict in adhering to methodological individualism. Although de Vries (1992) upholds that neo-institutional economics maintains the core of methodological individualism (de Vries, 1992), there are economic organization theorists who state that, in order to understand organizations, it is not necessary to observe microprocesses of individuals (Künneke, 1991, p. 110). Notably property rights theorists experience difficulties in explaining phenomena

concerning, for example, large administrative agencies that function to a certain degree independent of the preferences of individual participants. In fact, two solutions are suggested: (1) property rights are eventually attributed to individuals (customarily owners, or, for administrative agencies, citizens or taxpayers) or (2) to whole organizations. In the latter case, the behavior of individuals is not observed, but rather the behavior of unitary organizations, which in fact is not completely consistent with methodological individualism in a very strict sense[116, 117].

Political organization theories, on the other hand, pursue a more realistic analysis by explicitly distancing themselves from economic organization theory's methodological individualism[118]. Organizations are viewed as coalitions of participants with principally divergent interests (referred to as *methodological interactionism* by Nooteboom [1996]). This viewpoint is a far less elegant, but possibly more realistic, starting point for analysis.
The rationality of organizational behavior definitely differs in economic organization theory as compared to political organization theory. The rationality in economic organization theory assumes that behavior is driven by cost-optimizing considerations (see section 3.3.1). In every condition, the governance mechanism that renders the least costs is preferred, even if autonomy of organizations has to be surrendered. Bounded rationality is assumed in the sense that not all the possible states in the world can be discerned and anticipated in long-term contracts (see section 3.3.4). Political organization theories analyze organizational behavior as behavior that attempts to reduce uncertainty. This can be done by adapting to the environment, but also by actively influencing environmental forces. In order to reduce uncertainty, organizations are assumed to be actors that strive to optimize their self-interest by (1) minimizing their dependence on other organizations and (2) maximizing the dependence of other organizations on themselves. This rationality of behavior is thus of a different kind than the rationality in economic organization theories. In economic organization theory, uncertainty reduction is a means to the end of economizing on costs, whereas in political organization theory, uncertainty reduction is an end in itself.

3.5.3 Common themes

Apart from the differences between economic organization theory and political organization theory, there are also a number of common characteristics in both theories. For example, a striking common characteristic of both theories is that they both lack an

[116] For a more elaborate discussion on methodological individualism in the social sciences, refer to Franssen (1997).
[117] But even if property rights are attributed to organizations, the example mentioned in section 3.3.5 illustrates that incentive intensity refers to the individuals working in an organization.
[118] Neo institutional economics has also pursued a more realistic analysis of organizations by adopting bounded rationality.

explanation of how (i.e. by what exact mechanisms) a hierarchy mitigates the consequences of uncertainty (see the 'irony' in uncertainty reduction and autonomy, section 3.4.4). A notable exception as far as economic organization theory is concerned, is property rights theory[119,120] (which is often portrayed as a multidisciplinary theory). Other common characteristics are:

- the assumption of bounded rationality;
- the fact, in both theories, that 'management of interdependence' is stressed; and
- both theoretical streams' difficulties with dynamics.

Bounded rationality

The origins of both economic organization theory as well as political organization theory seems to lie in the observation that organizations are boundedly rational and hence, uncertainty exists (section 3.3.2; see also Ter Bogt, 1998; van der Zaal, 1997). Uncertainty plays a major role in both theoretical streams. In fact, in both streams, the expressiveness of the lines of reasoning diminishes severely if the assumption of bounded rationality is no longer held.

However, the line of reasoning in political organization theory differs from the line of reasoning in economic organization theory, though, in terms of the way organizations are supposed to cope with uncertainty. With reference to economic organization theory, Williamson (1975, p. 9) explicitly states that uncertainty is not a crucial problem in itself, but that it begins to play a role when asset-specific investments enter into a relationship between organizations. Here uncertainty mainly refers to the possibility of opportunistic behavior by partner organizations, caused by circumstances that are impossible to foresee at the moment contracts are drawn.

Political organization theory, however, assumes that organizations are *always* confronted with bounded rationality. "The current formulation of [economic organization theory] does not acknowledge that uncertainty may have a separate effect (…), independent of asset specificity. [Political organization theory] does acknowledge this independent effect of uncertainty" (Krickx, 1991, p. 147). In fact, uncertainty in political organization theory also stems from the behavior of governmental organizations, trade associations, new legislation, etc.

Concluding, in political organization theory, uncertainty stems from a variety of sources and is always assumed to be problematic, whereas uncertainty in economic organization theory is only problematic in combination with complementarity of assets.

---

[119] In section 3.3.5, we used property rights theory to illustrate that in the case of complementary assets, a hierarchy can improve incentives for employees working with assets, thus providing at least some explanation of how a hierarchy mitigates the consequences of uncertainty in a market.

[120] Therefore, property rights theory is the cornerstone of the model of a political economy framework to be presented in section 4.3.

Managing interdependence

The core of both economic organization theory and political organization theory is that, in the presence of bounded rationality, interdependence between organizations is considered to be problematic by the organizations involved: the interorganizational relationship is subject to management activities. Although the determinants of interdependence in economic organization theory and political organization theory are labeled differently, Krickx (1991) shows that asset specificity in fact *implies* resource dependence: "(…) when asset specificity is high, it implies that resource dependence is high as well" (p. 154). The reverse is not true: resource dependence is broader than asset specificity because there are sources of resource dependence, such as monopolist supply, which do not increase asset specificity (Krickx, 1991).

Both theoretical streams emphasize that organizations engaged in interorganizational relations are able to limit the consequences of uncertainty by restricting the autonomy of the partner organization, that is, by limiting the number of courses of action an organization is able to pursue (procedural coordination): the organization attempts to manage its interdependence by extending its own control in those vital areas, either by hierarchical mandate or by informal or semiformal agreements to behave in certain ways.

In economic organization theory, this is done by drafting contracts (transacting designated property rights) that include compensatory measures for specific circumstances. In political organization theory, it is assumed that this is accomplished through co-optation, interfirm regulation or requesting government regulation. Ultimately, both designated as well as residual property rights are transacted so that input or output exchange itself is totally controlled: the stability and predictability of the exchange relationships are safeguarded by controlling the rules of the trade. Thus, decision premises are imposed on partner organizations that limit the number of courses of action an organization is able to pursue. Note that in both theoretical streams, it is assumed that in order to be able to limit another organization's autonomy, a focal organization must accept decision premises from partner organizations, too: a bilateral dependence develops.

However, such a limitation in the courses of action an organization is capable of pursuing has positive (effects of uncertainty are reduced) as well as negative consequences. Economic organization theory emphasizes that attenuation of property rights yields diminished incentive intensity. Political organization theory states that when the external world is brought into the organization (through director interlocks, through the pooling of resources in a joint venture or by giving authority to some interfirm organization), external influence over the organization is increased and, consequently, its own discretion is simultaneously constrained.

This constraint on discretion is assumed to be a threat, even as environmental uncertainty is decreased. In fact, both organization theories state that a limitation of autonomy may yield benefits ("[o]rganizations are willing to bear the costs of restricted discretion for the benefits of predictable and certain exchanges" [Pfeffer & Salancik,

1978, p. 183]), but, overall, negative consequences of restricted discretion are highlighted more in political organization theory than in economic organization theory: "(…) it is frequently the least powerful and the least organized whose interests are not served in the resultant interorganizational structure" (Pfeffer & Salancik, 1978, p. 183).

Dynamics

The standard analysis pursued in economic organization theory is static. "It is a peculiar thing that on the one hand passage of time [in terms of dynamics and adaptation, VH] is crucial, but on the other hand relevant parameters are seen as timeless. According to [transaction cost economics], a crucial condition for dependence is that time is required, with repeated transactions, to recoup transaction specific investments, and allowance is made for the emergence of unpredictable contingencies that preclude closed contracts to govern dependence. On the other hand [transaction cost economics] implicitly assumes continuation of ex ante inability to judge propensities towards opportunism, unchanged configuration of supply and demand (…) productive competencies, and ability to monitor partner's actions. But surely, ongoing interactions will modify those parameters", comments Nooteboom (1993, p. 4).
The same comment seems to pertain to political organization theory; here, unforeseen changes may happen over time, to which an organization has to respond. Concluding, both economic organization theory and political organization theory seem to assume dynamics, but both theories use timeless parameters.

3.6 Summary and conclusions

This chapter has elaborated on the variety that exists in interorganizational coordination mechanisms and has reviewed theories that explain this variety.

Since the 1950s, the popularity of topics like strategic alliances, partnerships or, in general, interorganizational relations, has increased in organization theory. Characteristic for interorganizational relations is that organizations transfer or share control over resources for a certain period of time, but not necessarily for a continuous period. This entails that autonomy is sacrificed, but at the same time, organizations keep their formal identify. In general, an interorganizational relationship may be defined as significant interaction between distinguishable organizations, or, more precisely, the recurrent, non-discrete transaction of resources between two or more organizations.

In relation to the central concept of this chapter, coordination, the literature provides often hard-to-follow accounts of why organizations that are supposed to strive to maintain their autonomy, seemingly voluntarily accept that their decision making is at least in part guided by decision-making premises set by other organizations. In general, often incommensurable descriptions are provided between (interorganizational) coordination on the one hand and autonomy and dependence on the other hand.

Since the 1970s two distinct theoretical streams have emerged that attempt to explain how autonomy, dependence and coordination relate to each other. These streams are economic organization theory and political organization theory. Both theoretical streams provide explanations of the behavior of organizations in terms of protection and surrendering of organizational autonomy, management of bilateral dependence between organizations, and coordination between organizations.
An important driving force in both theoretical streams is the condition of bounded rationality: organizations are assumed to be partially ignorant because it is prohibitively expensive or even impossible to gather all information required, and hence organizations are confronted with uncertainty. In fact, the condition of bounded rationality is necessary to explain why organizations sometime surrender their autonomy.

In economic organization theory, the starting point of the line of reasoning is the situation in which assets are dispersed over a number of asset 'owners'. Owners can legally exert *usus*, *usus fructus* and *abusus* property rights with respect to their (nonhuman) assets. By exerting the *abusus* property rights, assets may be enhanced with innovations, and the *usus fructus* property right entitles the owner to appropriate the gains of these innovations, for example by having other persons use the modified asset in return for an increased compensation, specified in the terms of a contract. The ability to appropriate the gains of assets confronts each 'owner' in a community of owners with proper incentives to invest in assets. If necessary, adaptation of the terms of the trade occurs 'spontaneously', e.g., through a change in price, quantity or quality. A disadvantage of this form of adaptation is that 'haggling' and 'learning' between owners and users of assets yield costs, so-called transaction costs.

Another situation is the situation in which there is one 'owner', a centralized authority, (a 'unibrain', see section 2.4.2) who exerts *usus*, *usus fructus* and *abusus* property rights with respect to a number of assets in a consistent and uncontested manner, without the need to negotiate and renegotiate the terms of the trade as specified in contracts between autonomous parties, every time circumstances necessitate adaptation. Hence, in comparison to the situation in which assets are dispersed over a number of 'owners', concentrated ownership economizes on transaction costs. However, in such a situation, the owners of assets are faced with less intensive incentives, which results in bureaucratic costs, or, in general, less intensive incentives.

The above situations of dispersed ownership over assets and concentrated ownership over assets are also referred to as the coordination mechanisms of the market and hierarchy. Interorganizational relations represent intermediate situations, in which contracts are used that have characteristics of market-based relations as well as characteristics that are typical for hierarchies. Characteristic of economic organization theory is that it identifies advantages and disadvantages of dispersed ownership and concentrated ownership in terms of bureaucratic costs and transaction costs and that it

explains the occurrence of these ownership structures in terms of maximizing behavior (e.g. cost minimizing behavior) of the organizations involved. An important hypothesis is that normally, bureaucratic costs outweigh transaction costs, or, inversely, that the benefits of access to a control apparatus which enables uncontested adjustment is outweighed by the costs of degraded or suppressed incentive intensity. Hence, dispersed ownership is preferred over concentrated ownership.
There are, however, specific conditions in which transaction costs are prohibitively raised, or, equivalently, incentives are suppressed. Such a situation occurs if assets are only productive in conjunction with assets that are controlled by other organizations; this is a situation in which dependence between organizations exists. In such a case, incentives are suppressed because marginal returns on investments incurred by any of the organizations have to be split between the focal organization *and* the partner organization (because of the presence of hold-up power by the partner-organization; see the example in section 3.3.5). It is assumed that such a situation yields prohibitively high costs of haggling and learning and that, in such a case, attenuation of *usus, usus fructus* and *abusus* property rights (e.g., concentrated ownership) is preferred.

In political organization theory, the starting point of the line of reasoning is that organizations try to avoid uncertainty. That is, they are hypothesized to safeguard their autonomy; they try to avoid being limited in their courses of action. They do so by attempting to minimize their dependence on other organizations and by trying to maximize the dependence of other organizations on themselves.
In reality, however, organizations are limited in their possible courses of action because of unequal balances with respect to the concentration of resources (social legitimacy, information, and physical and monetary resources) and the importance of these resources to the organizations involved (which results in so-called resource dependence between organizations). This form of dependence is a source of uncertainty that can be effectively fought by informal and semiformal linkages between organizations such as co-optation, but also by actively influencing governments and lobbying for, for example, funding, regulation, etc. Merger of the organizations involved also eliminates this source of uncertainty, albeit at the expense of a lot of disadvantages (see section 3.4).

In section 3.5, economic organization theory and political organization theory were mutually compared with respect to their similarities and differences. An obvious difference is the fact that economic organization theory has a more clearly stated trade-off in the form of a general equilibrium model than political organization theory does.
Political organization theory, on the other hand, offers a richer description of co-optation, actively forestalling uncertainty, etc. Here, both theoretical streams reflect their roots: neoclassical analysis for economic organization theory, with an emphasis on elegantly formulated trade-offs, and political organization theory with an emphasis on ineffable constructs like power and status and a tendency to stay close to empirical particulars.

With reference to the treatment of autonomy, dependence and coordination in organization theory at large, and the subsequent elaboration of the line of reasoning in economic organization theory and in political organization theory, it is possible to formulate an answer to the second research question ('what types of coordination between organizations can be defined?'). The answer is based especially on economic organization theory and political organization theory and the synthesis of these two distinct theoretical streams.

The way coordination is defined in these streams is tightly associated with the way 'assets' (or 'resources') are dealt with. In fact, two extreme situations are identified that define a range of coordination types. One type of coordination is the situation in which assets are dispersed over a number of owners, and each owner is granted the right to exert *usus*, *usus fructus* and *abusus* property rights. So, should access to other organizations' resources or assets be required, then designated (usus) property rights may be transferred in return for compensation. As ownership of assets yields intensive incentives, it is assumed that adjustments occur spontaneously, although transaction costs are incurred.

A situation that defines the opposite pole of the range of coordination types is the situation in which the exertion of property rights with respect to a number of assets rests with a centralized authority. This 'unibrain' can adapt the terms of the trade and the assets or resources involved in an uncontested manner, thus economizing on transaction costs but, in the absence of complementarity of assets, also degrading powerful incentives.

4 The Research Framework

4.1 Introduction

In chapters two and three, information management and interorganizational relations were analyzed using the point of view of the discipline of information systems, organization theory at large, economic organization theory and political organization theory. The analysis in the previous chapters focused on the investigation of key concepts used, key performance indicators identified, hypotheses used in the theories and, in general, on the line of reasoning in the various theories.

In this chapter, this study's theoretical investigation is concluded by synthesizing the insights gathered in the previous chapters. The result is referred to as the 'Political Economy of Information Management'[121].

The structure of this chapter is as follows. Section 4.2 offers some introductory comments on the process of theory building and criteria for good theories, which are included here to assist in the development of theory (which, after all, is the research goal; see sections 1.3 and 1.5).

The 'Political Economy of Information Management' is a synthesis of theories on information management and theories on interorganizational relations. In section 4.3, the relationship of the Political Economy of Information Management to the theoretical foundations discussed in the previous chapters is discussed.

The synthesis of the insights from chapters two (information management research) and three (economic organization theory and political organization theory) takes place in two steps. Firstly, in section 4.4, economic organization theory and information management will be synthesized and secondly, in section 4.5, the synthesis of political organization theory with information management will be discussed. Section 4.6 presents the full synthesis in terms of assumptions, propositions and hypotheses.

In section 4.7, the preliminary research goal (section 1.3) is reexamined and restated, in order to guide the empirical investigations. Furthermore, the selection of cases is discussed. This section therefore is the link that connects the theoretical investigation and the actual empirical study of interorganizational information management, which is

[121] The connotation of this term will be explained in section 4.3.

documented in the next chapter. The current chapter is completed with conclusions and a summary in section 4.8.

4.2 Some Comments on Theory Building

In section 1.3, it was stated that the outcome of this research endeavor is a theory explaining the appropriateness of various interorganizational information management approaches. In this chapter, a framework is devised in which insights gathered from the previous chapters are synthesized. This framework, furthermore, structures the empirical investigations.

However, not all research frameworks are necessarily considered theories. The objective of stating theories is to organize data on objects and events adequately in order to explain (and preferably predict) phenomena in a clear and parsimonious way, and in this way theories are distinguished from metaphors, categorizations and typologies, which merely organize data.

In the previous chapters, we have analyzed existing theories and fragments of theories in terms of key concepts and key performance indicators used, hypotheses, and in general the line of reasoning in various existing (fragments of) theories. In chapter two, it was concluded that, in information management, various key concepts are used but that ubiquitous key performance indicators are lacking and that clear hypotheses relating information management approaches and characteristics of interorganizational relations are not explicitly stated. In chapter three, key concepts, key performance indicators and explicit hypotheses in the field of interorganizational coordination were identified.

In the current study, the goal is to *develop theories* (see sections 1.3 and 1.5) based on the analysis of existing (fragments of) theories. In the current chapter, the line of reasoning of the synthesis is presented, again in terms of key concepts, key performance indicators, and hypotheses.

In the process of development, it may be helpful to confront progress with criteria that can be used to assess the quality of theories. In fact, Bacharach (1989) presents a set of criteria that can be used to assess the 'quality' of theories in the terms that have been used in this thesis to analyze the line of reasoning of existing theories and fragments of theories, namely: key concepts, key performance indicators, and hypotheses.

Bacharach initially defines a theory as "(…) a statement of relations among constructs within a set of boundary assumptions and constraints" (1989, p. 496). He argues furthermore that the better assumptions and constructs (or key concepts) are circumscribed and defined and the better and more precisely relations between key concepts are stated, the better the theory is. In fact, in our analysis of existing theories in chapters two and three, we implicitly assumed that it is possible to define the value of a theory in terms of its explicitness of key concepts used and its explicit statement of hypotheses.

Bacharach, however, states additional criteria. In fact, he remarks that every theory contains two types of relations: propositions and hypotheses, relating constructs and

variables, respectively. Here, constructs may be defined as "terms, though not observable either directly or indirectly, [that] may be applied or even defined on the basis of the observables" (Kaplan, 1964, p. 55, cited in: Bacharach, 1989)[122]. A variable may be defined as an observable attribute of an entity which is capable of assuming two or more attribute-values (Bacharach, 1989). So, at a minimum level, the abstraction of variables transcends the level at which the mere existence of attributes is indicated.
Thus, a theory may be defined more precisely as "(…) a system of constructs and variables in which the constructs are related to each other by propositions and the variables are related to each other by hypotheses" (Bacharach, 1989, p. 498; see Figure 30 for a graphical depiction)[123].

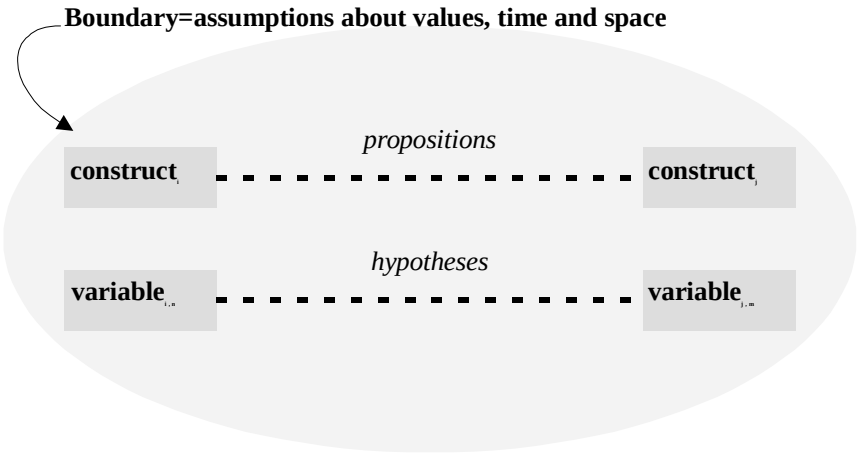

Figure 30: Components of a theory (based on Bacharach, 1989)

Furthermore, all theories are constrained by their specific critical bounding assumptions, i.e. the values of the theorists and explicit restrictions regarding space (specific types of organizations, levels of analysis) and time (i.e., historical applicability) (Bacharach, 1989)[124]. The statement of these assumptions is required because "(…) spatial and

[122] This corresponds to the 'key concepts' used in previous chapters.
[123] This definition of a theory is rather strict. For example, Boesjes-Hommes (1970) presents a less strict definition. She proposes a number of theory layers: theory(1) for the layer of propositions, theory(2) for the layer of hypotheses and theory(3) for the layer that is used to operationalize constructs into variables. This tripartition, however, does not necessarily contribute to the clear delineation of explanations as opposed to metaphors, frameworks and the like, and it is harder to identify clear criteria for good theories. Therefore, in this thesis, the rather strict (but on the other hand, ubiquitous) definition of Bacharach is used.
[124] This often leads to a paradoxical situation: generalization requires abstraction, which means that theory sacrifices the level of detail needed to fit a specific situation.

temporal boundaries restrict the empirical generalizability of the theory" (Bacharach, 1989, p. 500).

From the definition of a theory as stated above, Bacharach states two criteria (Figure 31) to assess the quality of theories in general.

C_{B1}	Falsifiability	This criterion refers to the way constructs are stated in the theory. According to Bacharach, they have to be stated parsimoniously, they have to be accompanied by measurable variables and relations between constructs and variables (i.e., propositions and hypotheses), they have to be stated explicitly and they have to be logically adequate. With this criterion, Bacharach implicitly refers to the process of growth of scientific knowledge according to the philosophy of critical rationalism (see section 1.5.2): theories have to be refutable and able to be corrected by empirical data.
C_{B2}	Utility / Explanatory power	This criterion refers to the statement of theories in such a way that the line of reasoning is uncovered. Hence, propositions and hypotheses must be made plausible.

Figure 31: Bacharach criteria for theories

In the following sections, the Bacharach criteria will be used to assess various existing theoretical frameworks and to evaluate progress in the development of theory.

4.3 Introduction to the Political Economy of Information Management

4.3.1 The Merali & McKiernan framework

In chapter two, we defined interorganizational information management as the task of decision making regarding goals, prioritization, development and use of information systems that are embedded in two or more organizations. Various approaches towards interorganizational information management exist, of which we have defined 'extreme' forms (see section 2.7). The approaches stressing standardization of data definitions and structures through the use of a common conceptual schema across a collection of data sources are often implicitly preferred in information management theory. Empirical research, however, has reported unexpected difficulties in communicating its content, problems with sustaining support by management and users and difficulties in implementation. Furthermore, fundamental questions about accountability are raised (because, for example, comparison of performance between organizations is enabled, see section 2.6).

In order to account for unexpectedly negative results of such top-down information management approaches, it has been suggested that the goal of integration is not a universal goal, and that information management approaches stressing integration to a lesser degree (e.g. bottom-up information management) might be preferred. The rationale for this statement is the observation that information is not something innocent or neutral, and that integration by means of concentrating authority with respect to control over development and use of information systems is often incompatible with the political or cultural reality of an organization.

Merali and McKiernan (1993) attempt to reconcile the information management approaches by proposing a framework in which there is a preference for a specific information management approach, dependent on specific circumstances or conditions.
They propose a number of ideal types of interorganizational information management approaches (Figure 32).

		Need for strategic dependence	
		Low	*High*
Need for organizational autonomy	*High*	Preservation	Symbiosis
	Low	Holding	Absorption

Figure 32: Merali and McKiernan information management approaches

Preservation and holding information management approaches are characterized by the retention of autonomous and independent systems. They resemble the bottom-up information management identified in this study. The rationale for adopting such an approach is that the decision-making processes regarding interorganizational information systems is driven by the information requirements of the organizations themselves.
In information management approaches of the absorption type, there are requirements for a high degree of dependence to create the value expected, but there is a low need for organizational autonomy to achieve it. This situation, in which separate information systems are fully consolidated, resembles top-down information management. The rationale for this approach is that the development of interorganizational information systems is guided by a clear strategic vision embodied in a detailed, unequivocal architecture.
Symbiotic approaches represent a combination of both high autonomy and dependence between organizations. Here, some systems are centralized and combined and some systems are connected through 'bridges'. This approach resembles a 'mixed' or 'equilibrium' approach.

In fact, in relation to the research objective stated in section 1.3, and in relation to the lack of an explanation of appropriateness of various interorganizational information management approaches (see section 2.7), the Merali & McKiernan framework provides

a promising perspective. However, the research objective was also to develop *theory* (as defined in section 4.2). If we attempt to assess the quality of the Merali & McKiernan framework in terms of the Bacharach criteria (which are referred to in this thesis as C_{B1} and C_{B2}), the following remarks can be stated.

In terms of C_{B1}, parsimonious constructs are indeed stated ('need for autonomy', 'need for dependence', 'information management approach') and at least the first two are stated in measurable terms ('low', 'high'). However, precise definitions of autonomy and dependence are lacking, which impedes disconfirmation.

The major weakness, however, is a lack of explanatory power (C_{B2}). An explanation of the mechanisms leading to the framework depicted in Figure 32 is lacking.

4.3.2 Frameworks employing information management theory, political organization theory and economic organization theory

In section 3.5.1, it was noticed that various authors have reconciled the obvious differences between economic organization theory and political organization theory. In this section, some frameworks incorporating information management theory, economic organization theory and political organization theory are presented.

Holland and Lockett (1994) investigated the relation between interorganizational information systems and changes in interorganizational relations. Their research framework consists of four key concepts (Figure 33):

- Asset specificity,
- Market complexity,
- Governance structure, and
- Coordination strategy.

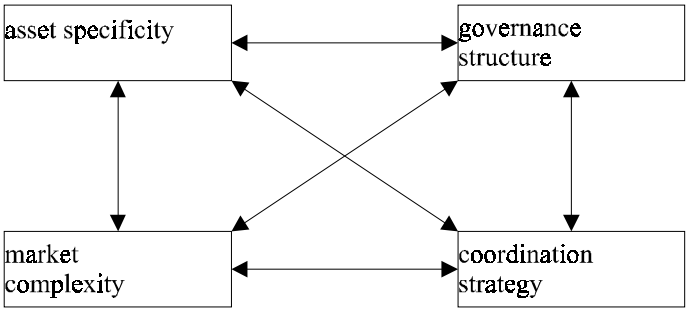

Figure 33: Configuration of interorganizational relations (adapted from Holland & Lockett, 1994)

Characteristic of this approach is that interorganizational information systems are viewed as *information assets*[125] (or *information resources*). The logic of the framework is that managers make strategic choices to coordinate the development and use of interorganizational information systems with partner organizations. According to Holland and Lockett (1994, p. 407), an assumption in the models of Williamson (1985) and Malone and Rockart (1992) is that the variables asset specificity, market complexity and governance structure drive an individual organization's activities. These strategic choices, however, interact with economic and market forces; these forces limit the strategic choices but in the long run are also shaped by strategic choices.

Klein builds upon the work of Holland and Lockett and proposes to focus on coordination strategies, which covers all aspects of the design and maintenance of interorganizational relations and arrangements. Coordination strategy recognizes questions of political and efficiency aspects as well as decisions about the design of interorganizational information systems. Like any strategy, coordination strategy has to take restrictions and contingencies into account. These contingencies are depicted below (Figure 34).
Like Holland and Lockett, Klein does not assume unilateral causal inferences between the elements of the framework, which are:

- Market and industry structure, which indicates organizations' strategic management orientation;
- Governance structure, which indicates institutional arrangements between firms;
- Transaction and relation attributes, which highlight interorganizational relations and their underlying interorganizational transactions; and
- Resource base, which refers to unique competencies of organizations.

[125] In general, an information asset refers to an information system (see the definition in section 2.2). An interorganizational information system consists then of various information assets. For example, if one considers a group of suppliers, the information system in which product inventory is stored is considered an information asset, and so is the information system in which product data are stored. An information asset or resource is also referred to as a 'partition' by Van Alstyne, Brynjolfsson and Madnick (1995). Bakos and Nault (1997) refer to an electronic network as a portfolio of information assets.

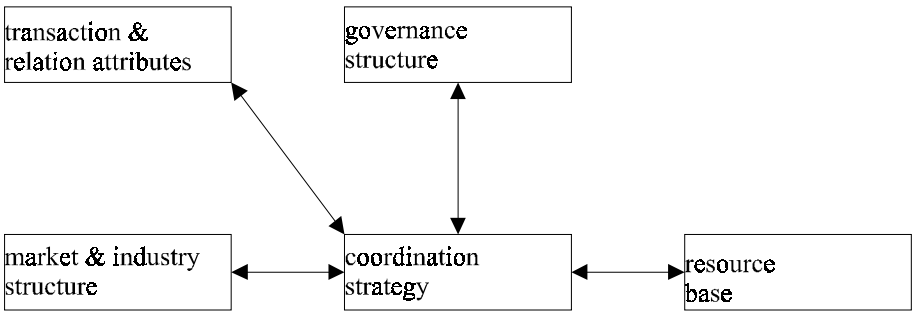

Figure 34: Configuration of interorganizational relations (adapted from Klein, 1996)

Klein's framework also differentiates among various types of interorganizational information systems, but as in the Holland and Lockett study, the role of decision making with respect to interorganizational information systems, in coherence with contingent factors, is unclear.

If we confront both the Holland & Lockett framework and the Klein framework with the Bacharach criteria C_{B1} and C_{B2}, we see that (potentially) measurable variables are used (asset specificity, coordination strategy, etc.) and that, with reference to the Merali and McKiernan framework, some progress is made with respect to C_{B1} (i.e., the use of asset specificity as a variable instead of the variable 'independence'). However, with respect to C_{B2}, both the Holland and Lockett framework and the Klein framework fail in providing an explication in such a way that inferential mechanisms are uncovered. References are made to the literature on transaction cost economics and resource dependence theory, but these references by themselves do not provide a robust explanation.

4.3.3 Towards a synthesis: The Political Economy of Information Management

At this moment, it is possible to conclude that:

(1) Information management theory until now has provided a relatively poor explanation of the appropriateness of interorganizational information management approaches (see section 2.7)

(2) In order to improve this situation, various authors have attempted to synthesize information management theory with theories on interorganizational relations, taking into account that interorganizational information systems can be considered to be *information assets* and *information resources.* As economic organization theory and political organization theory explain in what circumstances having or dispensing with authority with respect to assets is preferred, a synthesis of these

theories with information management theory offers at least the prospect of progress (Brynjolfsson [1994]; Holland & Lockett [1994]; Van Alstyne, Brynjolfsson & Madnick [1995]; Klein [1996] and Elg and Johansson [1997]).

(3) So far, attempts to synthesize various theories have not yielded completely satisfactory results (in terms of the Bacharach criteria) either.

Consequently, existing frameworks or theories are hardly susceptible to disconfirmation, (which is, after all, necessary for true scientific inquiry described as the interplay between knowledge (in the form of theories) and empirical data (see section 1.5.2).

Consistent with our research objective (see section 1.3) and our third research question, we would like to elaborate on the attempts to synthesize economic organization theory, political organization theory and information management theory by providing an explanation of the appropriateness of various interorganizational information management approaches in various types of interorganizational relations. Such an explanation is presented here as the Political Economy of Information Management[126].
The term Political Economy of Information Management refers to the interrelation between a structure of rule and a system for producing and exchanging of information, in which political aspects and economic aspects play a role. 'Political' refers to "(…) matters of legitimacy and distribution of power as they affect the property of an [organization]'s existence; its functional niche (…), its collective institutional goals, the goals of the dominant elite faction, major parameters of economy, and in some instances its means of task accomplishment" (Wamsley & Zald, 1973, p. 18). 'Economic' refers to "(…) the combination of factors of production, the arrangement of the division of labor, allocation of resources for task accomplishment, and maximization of efficiency" (Wamsley & Zald, 1973, p. 19).
This connotation of political economy refers to an arena where money and autonomy are exchanged. Organizations are assumed to pursue an adequate supply of money *and* autonomy (Benson, 1975; see also the discussion of economic organization theory and political organization theory, section 3.5.2).

[126] There are various connotations of the concept of political economy. In the nineteenth century, it was mentioned by economists like John Stuart Mill, Vareto Pareto and William Stanley Jevons as a fundament of the discipline of economics. Furthermore, in the second half of the twentieth century, authors like Arrows, Niskanen and Buchanan referred to political economy as the economics of decision making (Public Choice Theories). However, with the current use of Political Economy, we refer to the use of the concept by Wamsley and Zald (1973) and Benson (1975), who define Political Economy as a field of study at the cornerstone of political science, political analysis, and organization theory.

In order to synthesize the Political Economy of Information Management from (1) information management theory, (2) economic organization theory and (3) political organization theory, economic organization theory will be applied to information management (section 4.4) and secondly, political organization theory will first be applied to information management (section 4.5). The eventual synthesis, the Political Economy of Information Management, in terms of assumptions, propositions and hypotheses (see Bacharach, 1989; section 4.2), is presented in section 4.6.

4.4 Application of economic organization theory to information management

4.4.1 Introduction

Van Alstyne, Brynjolfsson and Madnick (1995) and Bakos and Nault (1997)[127] have provided an application of property rights theory (see section 3.3.5) to issues of information management. Their applications focus on managerial and incentive issues of information management, especially matters of centralization and integration of information systems. In the syntheses of Van Alstyne, Brynjolfsson and Madnick (1995) and Bakos and Nault (1997), a relationship is sought between characteristics of interorganizational relations[128] and (interorganizational) information management approaches. This relationship is important because the ownership structure fundamentally determines the social and economic value of interorganizational information systems: "(…) the ownership structure determines the level of (…) investments [in interorganizational information systems, VH], which in turn determine the functionality, the profitability, and, in some cases, the viability [of these interorganizational information systems]" (Bakos & Nault, 1997, pp. 321-322). According to Van Alstyne, Brynjolfsson and Madnick, this diminished viability eventually results in "subtle intangible costs of low effort [which] will appear as distorted, missing, or unusable data" (1995, p. 282). In short: ownership affects incentive intensity (see also section 3.3.5), and incentive intensity affects the viability of interorganizational information systems through levels of investments in interorganizational information systems.

The rationale for applying property rights theory, in which bounded rationality is assumed, is sought in properties of interorganizational information systems. These systems require at least some investments in specific information assets such as "(…) information, expertise, training and human capital, investments that typically are noncontractible" (Bakos & Nault, 1997, p. 324). Hence, not all costs that are incurred by information assets are fully verifiable, and these costs cannot be compensated directly, so the condition of bounded rationality in decision-making processes

[127] In fact, these authors build upon the work of Grossman and Hart (1986) and Hart and Moore (1990).
[128] In terms of indispensability and complementarity of assets.

concerning information assets is highly relevant (Bakos & Nault, 1997). In fact, the property rights application of information management assumes that all actions (that is, investments) are uncontractable.

In our discussion of economic organization theory of information management, we will assume that information assets either:

- Are dispersed over organizations, which means that organizations 'own' their information systems and may, at any time, exercise their *usus*, *usus fructus* and *abusus* (residual) property rights. For instance, in this situation, organizations may re-model data structures, employ different standards, etc. Inversely, organizations may exclude any other party from the use of its assets (Brynjolfsson, 1994). This control situation is referred to as bottom-up information management (see section 2.7).
- Are concentrated, which means that ownership resides explicitly with one of the organizations involved and that other organizations are allowed to use the information system. However, *usus fructus* and *abusus* property rights reside with the one organization that 'owns' the system. This control situation is referred to as 'strategic data planning' by Van Alstyne, Brynjolfsson and Madnick (1995). Here, it is referred to as top-down information management (see section 2.7).

In the following sections 4.4.2, 4.4.3 and 4.4.4, we model the impact of alternative information management approaches (and hence, ownership structures) on the investments of various organizations that participate in an interorganizational information system, and their corresponding implications. The insights gathered here are used to provide a backing for the propositions and hypotheses of the Political Economy of Information Management (section 4.6).

4.4.2 Notation

The model proposed here consists of the following elements[129]:

- A set S of I organizations, where each organization is indexed by i. Subsets of S are denoted by s: $s \subseteq S$.
- A set A of N assets: $\{a_1, \ldots, a_n, \ldots, a_N\}$. Subsets of A are denoted by a: $a \subseteq A$. In the current context, assets are components of an interorganizational information systems.
- An ownership map α describes control over assets by organizations: $\alpha(s) = \{a_1, a_2, \ldots, a_n\}$. The subset s controls assets $a_1, \ldots, a_n$ and makes investments $x = (x_{i1}, x_{i2}, \ldots, x_{in})$ that are at least to some extent specific to the interorganizational information system. Investments may include investments in on-the-job training programs for employees in order to instruct them in using the system (see section 3.3.5), or in general in hardware, software and expertise to operate the

[129] Here, we follow the notation in the existing models by Van Alstyne, Brynjolfsson and Madnick and Bakos and Nault (as well as the original Goodman-Hart-Moore model, also referred to as the GHM model) as much as possible.

interorganizational information system. The investments in all assets by individual organizations are denoted by $x = (x_1, x_2,\ldots, x_i)$.

- Each organization i takes investment action x_i at cost $C_i(x_i)$ [130]. The costs of investments for the subset s are denoted by $C(x)$.
- There are consecutive periods: a period ($date_0$) in which organizations choose their investment levels, and a period ($date_1$) in which they realize the benefits from the investments. Investment decisions are assumed to be too complicated to be specified in a $date_0$ contract, hence these variables are chosen non-cooperatively by the organizations at $date_0$. The gains then have to be split due to a multi-party bargaining game. The benefits accruing to an organization i are denoted by $p(s).V(s, a|x)$, where $p(s)$ denotes the organization's bargaining power.
- The value generated by coalition s controlling a is denoted by $V(s, a| x)$. The value generated by i is $V_i(s, a| x)$.

4.4.3 Assumptions

Before the core of the analysis is presented, a number of assumptions have to be stated.

A1: $V(s,\ a|x) \geq 0;$ twice differentiable and concave in x

A2: $C_i(x_i) \geq 0;$ twice differentiable and convex in x

A1 and A2 are standard assumptions in economics[131] stating that marginal value decreases while marginal costs increase as a function of investment. Together, these assumptions permit the use of first order conditions to locate a unique solution.

For the sake of brevity, the following notation is used for the marginal return on investment and marginal costs for organization i:

$$\frac{\partial V(.)}{\partial x_i} \equiv V^i(.)$$

$$\frac{\partial C(.)}{\partial x_i} \equiv C^i(.)$$

[130] Note that x_i is a scalar lying in $[0, \underline{x}]$ with $\underline{x} \geq 0$. (Hence, there is a maximum feasible level of investment $\underline{x}$).

[131] Hart and Moore (1990) provide a detailed discussion of all six assumptions stated here.

It is then assumed that an organization *i*'s marginal investment only affects coalitions of which it is a member and no other[132].

A3: $V^i(s,a|x) = 0$ if $i \notin s$

Furthermore an organization i's marginal investments are complementary with those of another organization *j*.

A4: $\frac{\delta V^i(\mathrm{S},\mathrm{A}|\mathrm{x})}{\delta x_j} \geq 0$ for all $\mathrm{j} \neq \mathrm{i}$

This assumption provides for *investment externalities*. As a result of these externalities, marginal network return on investment by any individual participant increases as investments by other participants increase.

The fifth assumption is the assumption of *superadditivity* or *network externalities*. Loosely stated, it says that groups working together create at least as much value as working apart.

A5: For all $a \subseteq A,\ s \subseteq S$: $V(S,A|x) \geq V(s,a|x) + V(S \setminus s, A \setminus a|x)$

The sixth and last assumption states that marginal return on investment increases with the number of organizations and new assets in the coalition. This assumption provides for *marginal network externalities*: the marginal network return from investment by any individual participant increases with the number of participants and assets.

A6: For all $a \subseteq A,\ \mathrm{s} \subseteq \mathrm{S}$: $V^i(S,A|x) \geq V^i(s,a|x)$

Note that assumptions five and six imply that marginal and total value correlate.

From the combination of assumptions one, two, three and four, it is possible to conclude that, given bounded rationality, any control structure leads to underinvestment. That is, the level of investment *in all assets* by organizations participating in an interorganizational information system is less than the level of investment *in all assets*

[132] Investments by a nonparticipant *i* may, of course, enhance its own productivity.

in a situation in which an omnisciently rational social planner dictates individual investments of organizations in a grand coalition (i.e., the socially efficient level)[133].
This underinvestment stems from the fact that an individual organization *i*:

(1) is not capable of fully capturing the returns from investments in the ex-post bargaining process, so direct returns from investment to each organization do not fully reflect the impact of marginal network and investment externalities; when an organization *i* "(…) invests more, some of [its] increased productivity will be dissipated in bargaining at date 1. (…) [S]ome of the benefits will flow to other [organizations]" (Hart & Moore, 1990, p. 1130).
(2) understates the investments compared to the total returns to the grand coalition.

Given bounded rationality, the situation of underinvestment is unavoidable (Bakos & Nault, 1997). That is, there is no control structure that neutralizes the consequences of bounded rationality.
In the line of reasoning of property rights theory (as in economic theory in general), it is assumed that an organization will, over time, adopt an ownership structure that maximizes value, given bounded rationality. In other words, in this line of reasoning, a 'second-best outcome' is arrived at because if a control structure exists that is not optimal given bounded rationality, someone will propose a new control structure and a set of side payments such that everyone is better off (Hart & Moore, 1990).

In the remainder of this section, specific situations proposed by property rights theory (see section 3.3.5) are analyzed. This analysis is aimed at discovering whether, in specific situations, a bottom-up information management approach or a top-down information management approach yields *more* value to the interorganizational information system, and hence, which information management approach best advances the viability of the interorganizational information system[134].

Situation I: value independence

The first situation analyzed here is the 'standard' situation in property rights theory. There are a number of organizations ($I \geq 2$) participating in an interorganizational information systems but to organization *i*, its own functioning is not critically affected by participation or non-participation of any other organization *j* ($j \neq i$). In other words,

[133] For the sake of brevity, the proof for this proposition is not stated here, but the mechanism is described verbally. The complete proof is stated in Hart and Moore (1990, p. 1130 and pp. 1153-1154). A stylized proof is provided by Van Alstyne, Brynjolfsson and Madnick (1995, pp. 272-273) and by Bakos and Nault (1997, p. 327).
[134] It must be stressed that the line of reasoning presented here takes the 'extreme' information management forms 'bottom-up' and 'top-down' into account. In section 2.4.6, intermediate approaches were also identified. However, in order to illustrate as clearly as possible the mechanisms underlying the property rights approach applied to information management, here only the 'extreme' forms are taken into account.

negligible value is provided to organization *i*; marginal value is the same regardless of participation or non-participation of other organizations *j* ($j \neq i$):

$$\text{(I.1) For all } s \subseteq S,\ a \subseteq A,\ V^i(\{i\} \cup s, \{a_i\} \cup \alpha(s) | X) = V^i(\{i\}, \{a_i\} | X)$$

Now assume top-down information management, an approach that is intuitively appealing. In a top-down information management approach, ownership of an interorganizational information system is in the hands of one of the organizations involved, the 'owner'. By definition, the 'owner' can exert residual property rights in order to direct other organizations to submit data to the interorganizational information system according to a given set of standards.
The non-owning organizations k choose their investment levels as follows:

$$\text{(I.2) } \max_{x_k} \sum_{s|k \in s} p(s)\left[V(s, \alpha(s) | X) - V(s \setminus \{k\}, a(s \setminus \{k\} | X)\right] - C(x_k)$$

Which reduces to (given A1, A2, A3 and given value independence):

$$\text{(I.3) } \sum_{s|k \in s} p(s) V^k(\{k\}, \{a_k\} | X) = C^k(x_k)$$

In the current top-down information management approach, the left-hand side is at most $V_k(\{k\}, \{a_k\} | X)$.
Now, by applying a bottom-up information management approach (and hence, by attributing property rights to organizations *k*), *k*'s investments have no effect on the investment of any other organization *j*, ($j \neq k$) so *j*'s incentives are no worse. For organization *k*, however, there is no underinvestment anymore because its investments are no longer subject to possible hold-up.
Formally, in the case of bottom-up information management, because for every *k*, $s = \{k\}$, I4 applies and underinvestment is mitigated.

$$\text{(I.4)} \sum_{s|k\in s} p(s)V^k(.) = V^k(.)$$

Above, an example is provided of how a different information management approach (or, *ownership structure*) can improve incentives for participating organizations, irrespective of the technology used, and hence, how the viability of an interorganizational information system is enhanced (see also Van Alstyne, Brynjolfsson, Madnick, 1995, p. 274).
However, the above result only applies if marginal value to *k* is the same regardless of participation or non-participation of other organizations. According to property rights theory, there are specific situations in which this is not true: either because organizations are indispensable (e.g., information assets are idiosyncratic) or because information assets are complementary.

Situation II: indispensability of organizations

Another situation taken into account is when organizations are indispensable. An organization *i* is said to be indispensable if, without organization *i* in a coalition, some asset a_i has no effect on the marginal product of investment for the members of the coalition. Inversely, that asset is idiosyncratic to organization *i*.
Consider medical specialists (from various disciplines). The information systems to which they submit patient records can be regarded as idiosyncratic assets because the medical specialists can be assumed to be the only ones who are able to create (social) value with the asset.
Formally, indispensability is defined as follows:

$$\text{(II.1) For all } j \text{ in any } s, \text{ for all } a \text{ containing } a_n,$$
$$V^j(s,a|x) = V^j(s,a\setminus\{a_n\}|x) \text{ if } i \notin s$$

Assume a control structure with organization *i* that is indispensable to asset a_n, not owning a_n. Then changing the control structure so that organization *i* does own a_n implies that organization *i*'s incentives are at least as great as before. For any other organization *j*, the change in incentives is the difference in control structure between the new and old situation. This difference is expressed as follows:

$$\text{(II.2)} \sum_{\substack{s|i,j\in s\wedge \\ a_n\notin\alpha(s)}} p(s)\Big[V^j(s,\alpha(s)\cup\{a_n\})-V^j(s,\alpha(s))\Big]-$$
$$\sum_{\substack{s|i\notin s,j\in s\wedge \\ a_n\in\alpha(s)}} p(s)\Big[V^j(s,\alpha(s))-V^j(s,\alpha(s)\setminus\{a_n\})\Big]$$

As a_n is useless to *j* without *i*, the second summation is zero. The first summation is nonnegative according to A6. Thus, by giving *i* ownership of asset a_n to which it is indispensable, *j*'s marginal incentive is not reduced and *i*'s own marginal incentive to invest cannot fall as a result of now owning asset a_n (see A6; Hart & Moore, 1990, p. 1134)[135].

As a result of this proof, it can by hypothesized that organizations which are indispensable to the functioning of an information asset should control that partition (Van Alstyne, Brynjolfsson, Madnick, 1998, p. 275). In fact, if a subset of organizations has investment decisions, one cannot conclude that property rights of assets should be concentrated only on this subset. In fact, if some organization outside the subset is indispensable, the above implies that it is better to give all property rights to that organization (Hart & Moore, 1990, p. 1134; Bakos & Nault, 1997, p. 329).

Situation III: Complementarity of assets

Another situation is that of complementarity of information assets. Complementary information assets are assets that have great value together but have negligible value apart: for example, two pharmaceutical information systems, one for inventories of medicines and one for treatment methods. In this case, there is little sense in prescribing treatments which are unavailable or in stocking drugs which are outdated treatments (Van Alstyne, Brynjofsson & Madnick, 1995, p. 276).

Formally, complementarity is defined as follows:

(III.1) For all *s* and for all *a* containing a_m and a_n,
$V^i(s,a\setminus\{a_m\}|x)=V^i(s,a\setminus\{a_n\}|x)=V^i(s,a\setminus\{a_m,a_n\}|x)$ if $i\in s$

Compared to a situation of bottom-up information management (e.g., a_n and a_m are owned by different organizations *i* and *j*), the transfer of a_n to a group that already owns complementary asset a_m yields an increase in value, which is given by:

[135] Note that if a_n were owned by a third party *k*, this lowers incentives for *j* because an additional hold-up is introduced.

$$\text{(III.2)} \quad \sum_{\substack{s|i\in s\wedge a_m\in\alpha(s)\\ \wedge a_n\notin\alpha(s)}} p(s)\Big[V^i(s,\alpha(s)\cup\{a_n\})-V^i(s,\alpha(s))\Big]-$$

$$\sum_{\substack{s|i\in s\wedge a_m\in\alpha(S\setminus s)\\ \wedge a_n\in\alpha(s)}} p(s)\Big[V^i(s,\alpha(s))-V^i(s,\alpha(s)\setminus\{a_n\})\Big]$$

Considering A3, the second summation is zero; there is no loss of incentives to the former owner of a_n, whereas the new owner has strictly higher incentives[136].
As a result, it is possible to state that information system partitions which are complementary should be controlled together and hence subject to a top-down information management approach (see also Van Alstyne, Brynjolfsson, Madnick, 1995, p. 275).

So, the characteristics of complementarity of assets a_n and a_m yield the conclusion that top-down information management with respect to these complementary assets provides better incentives to the organizations participating in an interorganizational information system than bottom-up information management does.

4.4.4 Remarks

A number of remarks have to be stated. Firstly, the above analysis aims at structuring ownership in interorganizational information systems in order to optimize incentive intensity. The feasibility of the interorganizational information systems principles, however, is not taken into account. Wealth constraints and credit constraints may limit the feasibility of an allocation that optimizes incentive intensity (see also Hart & Moore, 1990, p. 1152; Brynjolfsson, 1994, p. 1650).
Secondly, it must be noted that it is not always possible to ensure compliance with all principles of interorganizational information management. "Occasions arise when design constraints interact or even contradict one another" (Van Alstyne, Brynjolfsson & Madnick, 1995, p. 279)[137]. For example, Van Alstyne, Brynjolfsson and Madnick state that if interorganizational information systems' databases are strictly complementary, and more than one organization is indispensable, no optimal distribution of property rights exists.
Thirdly, the current formalization is heavily stylized as compared to the general formalization of property rights theory by Grossman and Hart (1986) and Hart and Moore (1990). For example, it uses rather informal notions of 'indispensability'. It is, however, possible to add a parameter that represents this notion. For instance, Bakos

[136] Van Alstyne, Brynjolfsson and Madnick remark that "[e]quivalently, a_m could have been transferred in the other direction thereby increasing the other party's incentives" (1995, p. 276).
[137] In accordance with the nature of the model (i.e. economic in nature), it is possible to state that disregarding principles carries a cost.

and Nault (1997) use the parameter λ_{in} to scale the impact on *i* of assets A. An organization *i* is then indispensable to a_T if and only if $\lambda_{jT} = 0$ for $j \neq i$. The elaboration of the consequences of this model adaptation go beyond the purpose of the formalization in this thesis.

4.4.5 Model testing

Concluding, Van Alstyne, Brynjolfsson and Madnick (1995) have provided an explanation of why, at an interorganizational level, "most top-down strategic data planning efforts never meet expectations" (1995, p. 268). The focus is on the impossibility of drawing explicit, complete contracts, in order to compensate organizations for being a source of data[138]. The authors propose 'ownership' as a substitute for eliciting each party's responsibilities and compensation. From their ownership principles, it is possible to derive the appropriateness of bottom-up and top-down information management approaches. According to Van Alstyne, Brynjolfsson and Madnick, an inept information management approach renders subtle, intangible cost of low effort appearing as distorted, missing, or unusable data.

The theoretically-devised hypotheses were partially tested empirically by Wybo and Goodhue (1995), albeit not in an interorganizational setting, but in divisional settings. Their initial observation was that many organizations face problems of not being able to compare divisions in terms of return on investment, or not being able to coordinate inventories across divisions due to 'semantic inconsistencies in data' ("differences in the definitions, names, identifiers, domains, and constraints imposed on data elements across systems and subunits", Wybo & Goodhue, 1995, p. 317). Their basic hypothesis was that if organizational subunits are interdependent, there is a greater need for and benefit from integration (see section 2.4.3): "(…) it is most likely that [standardization] will be employed in situations where the benefits of being able to exchange data unambiguously and efficiently between subunits are high. (…) [S]uch benefits will exist among interdependent subunits" (Wybo & Goodhue, 1995, p. 318).
Their hypothesis is based on:

(1) the observation that, in general, standardization of data definitions and structures through the use of a common conceptual schema across a collection of data sources can reduce the flexibility of an individual subunit to redesign its system to best meet its unique information requirements; hence a high level of standardization could have negative performance impacts, and
(2) the observation that in the case of interdependence, common conceptual schemes could have significant positive effects because communication and coordination are facilitated.

[138] "The intangible nature of information (…) renders measurement of results infeasible and a common theme from information systems literature is that technology assessments alone are insufficient to guarantee system functionality" (Van Alstyne, Brynjolfsson & Madnick, 1995, p. 283).

Semantic standardization is defined as "(…) the percentage of that data required by a subunit to successfully perform its function that is subject to common systems, data sources or record structures used or adhered to by a specified other unit in the firm" (Wybo & Goodhue, 1995, p. 320). Subunit interdependence is defined as "(…) the degree to which the actions and outcomes of one unit are controlled by or contingent upon the actions of another unit" (Wybo and Goodhue, 1995, p. 320). It is measured in terms of the pattern of work flows (pooled, sequential, reciprocal interdependence) and the characteristics of resource exchange between units (perceived importance and frequency). In order to test the hypothesis, the research strategy of a cross-sectional survey was adopted. After having measured the variables, the authors stated that "(…) none of the interdependence measures showed a significant statistical relationship with the level of use of semantic standards" (Wybo & Goodhue, 1995, p. 324). They conclude that "either the hypothesized relationship does not exist, (…) it is smaller than 'small' and not managerially significant, or (…) the findings are the result of some other factor we have not heretofore considered" (1995, p. 324).

As the empirical results disconfirm the presumed relationship, "[s]ome re-theorizing is in order" (1995, p. 326). We will therefore, in the section below, turn to the political organization theory as applied to information management.

4.5 Application of political organization theory to information management

Contributions at the crossroads of political organization theory and information management ('information politics studies') are provided by, among others, Markus (1983), Grover, Lederer & Sabherwal (1988), Davenport, Eccles and Prusak (1992), Knights and Murray (1992) and Webster (1995a, 1995b, discussed in section 2.3).
Central in these contributions is the notion that, in information management, "(…) more than information is at stake" (Davenport, Eccles & Prusak, 1992, p. 54). In fact, it is assumed that "(…) in the information-based organization, information becomes the primary medium of value and exchange, and who would give it away for free?" (Davenport, Eccles & Prusak, 1992, p. 62). The exchange of information is assumed to take place in a context of divergent interests[139].

In general, applications of political organization theory to information management are far less elegantly formulated than the line of reasoning in section 4.4. Here again, the

[139] Although many 'information politics' case studies seem to be inspired by a class politics perspective (e.g., where management is trying to delimit workers' autonomy, or where small businesses are exploited by large, multinational companies [see section 2.3]), less obvious situations have also been described. For example, Davenport, Eccles and Prusak state that in some organizations "(…) hoarding of information was common (…) because a team that shares its information fully may lose its reason to exist" (1992, p. 62).

controversy between economic organization theory and political organization theory can be used to explain that organization theorists inclining to the economic perspective use a somewhat farsighted point of view, in which mathematical elegance is a valued attribute. Political organization theory in general, and, specifically, political organization theory applied to information management, has a preference for rather descriptive accounts, e.g. when property rights theory applied to information management implicitly assumes that when inefficiencies exist and underinvestment occurs, there will be someone who suggests another ownership structure and a set of side payments to make every participating organization better off. Political organization theory applied to information management in this case would customarily emphasize (and merely describe) the way in which such a proposal emerges and how subsequent negotiations take place. In general, it highlights short-term dynamics instead of farsighted, long-term equilibria.

Below, a classical description of short-term dynamics is presented.

Characteristic of many 'information politics' studies is the assumption that "[t]here is reason to believe that, at least in some organizations at certain times, there are situations that do not conform to the Rational Perspective" (Markus, 1983, p. 432). However, on the other hand, it is also noted that "[p]olitical behavior regarding information should be viewed not as irrational or inappropriate but as a normal response to certain organizational situations. Valid differences in interpretation of information, for example, may lead to intransigent behavior" (Davenport, Eccles and Prusak, 1992, p. 54).

In short, uncertainty (or information asymmetry) plays an important role in 'information politics'. Markus states that uncertainty arises if organizations disagree about the nature of the problem an interorganizational information system is supposed to solve, if there is doubt whether an (interorganizational) information system will solve a specific problem, or if power bases are highly valued and in short supply (Markus, 1983).

The specific information politics' dynamics and conflicts (which, according to Markus, are "endemic" [1983, p. 433]) arise from intended and unintended changes in the balance of power in and between organizations as a result of new information exchanges or the introduction of new (interorganizational) information systems. According to Markus, the introduction of information systems into networks of organizations may be resisted by those who lose autonomy and kindheartedly welcomed by those who gain autonomy. "If control over data (…) has prevented certain groups from obtaining needed or desired access to it, distribution of data, even unaccompanied by control over it, will provide those receiving it significant power gains. Their dependence on the controlling group will be reduced, since they will have an alternative source of data. (…) On the other hand, those whose data monopoly is threatened in the process are likely to resist. Distribution of data that makes the performance of a subunit more visible, hence subject to control attempts by other units, is likely to be resisted by the group whose performance is exposed and accepted by those who would like to influence the other's performance" (Markus, 1983, p. 442). Resistance, in this case,

occurs through organizations encouraging its members to sabotage the system, through providing inaccurate data, through not using the system at all, through keeping alternative databases, etc. (Markus, 1983).

Markus illustrates the line of reasoning of Political Organization Theory applied to Information Management with an example of a large chemical company, consisting of several divisions, each having a substantial amount of autonomy. Divisional accountants collected and stored transaction data and reported to corporate accountants according to a standardized format. In this situation, "(…) divisional accountants summarized raw data on the transactions in their divisions and sent the summaries to the corporate accountants for consolidation. Divisions retained control of their own data and exercised substantial control in summarizing it" (Markus, 1983, p. 438).
In this situation, there was suspicion of withholding of data by divisions: "[c]orporate accountants felt the divisions were lying to them. And maybe there was some withholding of data on [the divisional] side" (1983, p. 437). The corporate accountants initiated the introduction of FIS, an information system in which initially the original procedure was mirrored in the design; later on, however, the divisional databases were replaced by a single corporate database. Divisional accountants entered their raw data into the system and the system automatically summarized these data into reports for divisional and corporate use: "(…) all financial transactions were collected into a single database under control of corporate accountants" (Markus, 1983, p. 438).
Although information management theory might argue that such an information management approach is efficient, possibly eliminating duplicated data and increasing consistency, Markus states that "FIS was definitely established for political reasons" (1983, p. 438), motivated by corporate level's need for "ferreting out how the knaves were doing in the trenches" (1983, p. 437). The way in which FIS was designed implied a major gain of power for corporate accountants relative to their prior position vis-à-vis the divisional accountants (Markus, 1983).

The new situation, however, raised substantive opposition from the divisional accountants. The corporate accountants reacted by uttering "[we] can't understand why the divisions don't like FIS. There are so many benefits" (cited by Markus, 1983, p. 435).
The divisional accountants, at the same time, noticed that "(…) except for providing more detailed information, the FIS system has not been beneficial for us" (cited by Markus, 1983, p. 434). They "(…) had to enter data, but they no longer 'owned' it. (…) At any time, corporate accountants had the ability to 'look into' the database and analyze divisional performance" (Markus, 1983, p. 438).
The divisional accountants elaborated on the lack of benefit to them by mentioning downtime, delayed reports and data definitions that did not match their own requirements. In fact, besides writing angry memos, the divisional accountants maintained parallel systems, engaged in behavior that jeopardized the integrity of the

database, and participated in a task force with the public objective of eliminating FIS and replacing it with another system.

The FIS example as described by Markus illustrates how ownership of (and thus control over) information resources is very valuable and is in fact subject to political struggle. Given the history of FIS, Markus states it is likely that divisions resisted the system, whereas corporate management supported it, because the latter gained power in dealing with the divisions. However, the divisional accountants quite forcefully sabotaged the system in order to safeguard the divisions' autonomy.

4.6 Assumptions, Propositions and Hypotheses of the Political Economy of Information Management

4.6.1 Introduction

Given the synthesis of economic organization theory and political organization theory derived in section 3.5, and the application of this synthesis to information management in sections 4.4 and 4.5, it is now possible to state some assumptions and propositions and derive hypotheses on the Political Economy of Information Management.

4.6.2 Assumptions

For the process of theory construction, Bacharach recommends explicitly delineating the theoretical boundaries and assumptions (in terms of values, scope and time) in order to restrict the empirical generalizability of the theory (see section 4.2).
For the Political Economy of Information Management, a number of assumptions are stated.

- Firstly, bounded rationality is assumed. Thus, organizations' decision-making processes are assumed to be guided by reasonably careful calculations of costs and returns (see section 3.4.4), albeit not all possible states of the world are included in these calculations. This aspect was discussed in section 3.3.2. In the discussion of the departure from the 'orthodox' *theory of the firm*, it is stated that full rationality is not a realistic assumption for many theories of organization. In assuming bounded rationality, the contributions of Simon and Coase are acknowledged.
- Secondly, the analysis is restricted to organizations that have a certain amount of discretion (that is, their behavior is not *totally* determined by their environment, a condition which would condemn any consideration of 'strategy' or 'strategic behavior' to the realm of utopia). That is, they are operating in markets that share *at least some* characteristics with monopolies. This assumption is not uncommon in research on strategy formation (see also Haselhoff, 1977, pp. 5-6).
- Thirdly, we analyze organizations that participate in interorganizational relations as defined in section 3.2 in the sense that, for some reason, they are exchanging, have exchanged or are going to exchange information by means of information and communication technology. The Political Economy of Information Management

does not, for example, address antecedents of information exchange (see, for example, Sabherwal & Vijayasarathy [1994], Nidumolu [1995]).

- Fourthly, although the Political Economy of Information Management originates in the discipline of information systems and organization theory at large, the evaluation of the theory by means of case studies took place in the public or quasi-public sectors. Therefore, preliminarily, the theory is restricted to cooperating organizations within the public sector. This assumption is further discussed in the epilogue on the Political Economy of Information Management (section 6.5).

4.6.3 Propositions and Hypotheses

Elaborating on the contributions as described in sections 4.4 and 4.5, it is possible to formulate an explanation in terms of propositions (see section 4.2).

At the heart of the Political Economy of Information Management are the consequences of having or dispensing with authority with respect to information assets.
Information assets or information resources here refers to components of an electronic network (Bakos & Nault, 1997), various databases (Van Alstyne, Brynjolfsson & Madnick, 1995) or parts of an interorganizational information system (see footnote 125, p. 129).
In section 4.3.1, it was already mentioned that the treatment of authority and, consequently, (the potential of) unequivocal adaptation and standardization of data models and structures, differs in (1) information management theory on the one hand and (2) economic organization theory and political organization theory on the other hand.
Information management theory identifies advantages of common conceptual schemes (e.g., alleviation of problems of accessing data from multiple sources in multiple organizations). However, it does not provide an explanation for observed difficulties in communicating and understanding common conceptual schemes, difficulties in sustaining management support and difficulties in implementation of interorganizational information systems (section 2.4.3). Nevertheless, top-down information management approaches are often labeled as ‘efficient’ or ‘efficiency-driven’ (section 2.4.6; see footnote 68) and therefore preferable.
The symptoms mentioned above, however, are *explained* in contributions at the intersection of economic organization theory and information management (section 4.4), and political organization theory and information management (section 4.5), albeit in slightly different ways. The line of reasoning of the synthesis of these theoretical approaches is as follows:

Both in economic organization theory and in political organization theory, organizations are hypothesized to cherish their autonomy with respect to assets, including information assets.
The rationale for this statement from the point of view of economic organization theory is that unbounded ‘ownership’ of information assets (and hence, exertion of residual

usus, *usus fructus* and *abusus* property rights) elicits intensive incentives for management and users to optimize data quality and prevent abuse. The alternative of attenuation property rights for reasons of unequivocal adaptability of various information assets (e.g., top-down information management) in this situation, is hypothesized to degrade incentives, with, consequently, underinvestment. Underinvestment here results in distorted or missing data, or, in general, in an interorganizational information system that does not match the organization's own information requirements.
The rationale from the point of view of political organization theory is that autonomy protects an organization from possible capricious behavior by partner organizations and that, inversely, mitigated property rights with respect to information assets enables 'interorganizational surveillance'[140], which customarily results in politicking by sabotaging interorganizational information systems.

In the Political Economy of Information Management line of reasoning (as mentioned above), cost components are identified (costs of 'distorted, missing, or unusable data' that occur as a result of underinvestment and costs as a result of 'interorganizational surveillance') that are not included in the concept of 'efficiency' that is used in information management theory's claim that top-down information management approaches are efficient. In fact, using this extended view of efficiency derived from the Political Economy of Information Management, it is even possible to state that the efficiency advantages of a top-down interorganizational information management approach (see sections section 2.4.6 and footnote 68) are outweighed by its disadvantages[141].

The above line of reasoning is changed, however, if organizations cannot, in practice, freely exert property rights with respect to their information assets because of any one of the following conditions:

- indispensability (economic organization theory) or resource dependence (political organization theory); or
- complementarity of information assets (economic organization theory); if information assets which are complementary when considered together have great value for their owners but negligible value apart (for a formal definition, refer to section 4.4).

In both cases, dependence between organizations exists.

[140] Also referred to as close monitoring by partner organizations, which might eventually result in organizations losing their reason to exist (see sections 1.2.1 and 4.5).
[141] Section 4.4 provides a formal representation of this statement.

The Political Economy of Information Management, which has been summarized above, can be stated in terms of a proposition as follows:

P$_{\textbf{Political Economy of Information Management}}$
The level of dependence of information assets that are used by organizations determines which interorganizational information management approach is preferred by the participating organizations.

In this proposition, the following concepts are used:

- Dependence of information assets (see chapters 3 and 4, especially sections 3.5 and 4.3). This concept can be operationalized into the variables 'complementarity of information assets' and 'indispensability of information assets' (or 'information resource dependence') (see sections 3.5 and 4.3).
- Interorganizational information management approach (see chapter 2, especially section 2.4.6). The concept of interorganizational information management approach can be operationalized into the control model used, the architecture used and the goals adhered to in the decision-making process (see section 2.4.6 and section 2.7). A top-down interorganizational information management approach refers to a situation in which the goal of standardization of various conceptual schemes across a collection of data sources is striven for *through the use of a centralized control approach and the use of a detailed architecture.* A bottom-up interorganizational information management approach refers to a situation in which preservation of various conceptual schemes is striven for *through the use of a decentralized control model and an architecture in terms of a limited set of agreements on how communication should take place*[142].

Basic to the Political Economy of Information Management is that dispersed ownership of information assets is preferred because it yields intensive incentives to the participating organizations and thereby increases the viability of the interorganizational information systems. This is, however, only true when specific circumstances, such as complementarity of information assets and indispensability of participating organizations, do not apply. If these specific circumstances do not apply, participating organizations are hypothesized to apply a bottom-up information management approach.

In terms of a hypothesis (where variables are used instead of constructs or concepts), this can be stated as follows:

[142] These connections between the variables 'goal of standardization/preservation', 'control model' and 'architecture' are elaborated in chapter 2.

$H_{\text{Political Economy of Information Management, 1}}$
If none of the information assets initially owned by organizations participating in an interorganizational information system is indispensable, and none of the information assets initially owned by organizations participating in an interorganizational information system is complementary, organizations will choose not to standardize various conceptual schemes for information assets.

This hypothesis mainly stems from the analysis of property rights theory in section 3.3.5 and the analysis of political organization theory in section 3.4, but is also quite consistent with the literature mentioned in section 3.2 which states that organizations strive to preserve their autonomy. The hypothesis, however, is *not* consistent with the classical information management hypothesis that centralized control is always better control.

If the conditions mentioned above (indispensability and complementarity of assets) apply, this gives rise to different hypotheses, as was discussed in sections 3.3.5, 3.4, 4.4 and 4.5. Indispensability of information assets and complementarity of assets give rise to the possibility of hold-ups by partner organizations, which degrades incentives.
Bringing various assets or resources under common control by applying a top-down information management approach, in which a detailed architecture is enforced and well-defined goals are adhered to through a centralized control approach, mitigates this effect.

$H_{\text{Political Economy of Information Management, 2}}$
If at least one of the information assets initially owned by organizations participating in an interorganizational information system is indispensable, organizations will choose to standardize various conceptual schemes for information assets.

$H_{\text{Political Economy of Information Management, 3}}$
If information assets initially owned by organizations participating in an interorganizational information system are complementary, organizations will choose to standardize various conceptual schemes for information assets.

In both cases, potential hold-up situations are avoided, which are assumed to optimize incentives eventually for all participants and thereby promote the viability of the interorganizational information system.

In this section, hypotheses were constructed that relate interorganizational information management approaches and characteristics of interorganizational relations (in terms of value independence, complementarity of assets and indispensability of participating organizations), and thus research question three has been answered.

4.6.4 Confrontation with the Bacharach criteria

In section 4.2, two criteria (C_{B1} and C_{B2}) were proposed to indicate progress in the field of theory development. As we have explicitly built upon the Merali and McKiernan frameworks and the frameworks presented by Holland and Lockett and by Klein (see section 4.3), and as we concluded in section 4.3 that these contributions do not yield completely satisfactory results in terms of the criteria C_{B1} and C_{B2}, it might be a good idea to confront the Political Economy of Information Management as a theory with these criteria in order to assess whether progress has been achieved.

C_{B1}: Falsifiability

In terms of falsifiability, constructs were identified in chapters 2 and 3 (information management approach and interorganizational relations). Moreover, variables have been proposed: control approach, elaborateness of architecture and specification of goals, and autonomy, complementarity of assets and indispensability of organizations, respectively. In general, in a strict sense, these variables are not very well developed, but with respect to existing frameworks some progress has been achieved.

C_{B2}: Explanatory power

In sections 4.4 and 4.5, we summarized the insights from sections 2 and 3 and proposed hypotheses that are explicitly based on the theories that were discussed in these chapters. Moreover, a formalization of economic organization theory and a reflection on this theory from the point of view of political organization theory was discussed. Moreover, in terms of explanatory power, at least some progress has been achieved.

4.7 The Revised Research Design

4.7.1 Research goal

Now that the Political Economy of Information Management has been derived and synthesized from Information Management Theory, Economic Organization Theory and Political Organization Theory it is to be evaluated next by confronting it with empirical data, that is, case data (see section 1.5.3). The objective is to check whether the mainly theoretically-devised Political Economy of Information Management holds in practice - that is, whether the hypotheses are confirmed – and, possibly, to refine the Political Economy of Information Management. Since the research objective is not to *test* the theory, the possibility of fundamentally rejecting the Political Economy of Information Management is excluded in this study.

4.7.2 Selection of cases

In the empirical part of this study, three case studies were carried out. In these cases, interorganizational information management approaches between organizations in the public sector, that is, semi-governmental or quasi-governmental organizations, were analyzed.

This seems to be an awkward choice at first glance. However, as was explained in section 1.1.2, the depiction of 'government' as a unitary actor in which no truly interorganizational relations can be discerned, is a radical one. In reality, government consists of a network of organizations (for example, core ministries and independent administrative bodies) in which economic and political aspects play a very important role. Furthermore, the surprising variety of (shifts in) interorganizational coordination forms and information management approaches lends the domain perfectly to an initial evaluation of the Political Economy of Information Management.

4.8 Summary and conclusions

In this chapter, the Political Economy of Information Management was presented, based on the contributions of sections 2 and 3. The theory itself may be regarded as a synthesis of information management theory, economic organization theory and political organization theory.

This synthesis was partly based on a formalization of the property rights theory applied to information management as proposed by Van Alstyne, Brynjolfsson and Madnick (1995) and Bakos and Nault (1997). Furthermore, the theory was elaborated by applying political organization theory to the domain of information management.

The proposition and hypotheses derived in this chapter are used to provide an explanation for the appropriateness of various interorganizational information management approaches in various types of interorganizational relations, and therefore are an answer to the third research question.

In section 4.6, the theory was assessed using Bacharach's (1989) guidelines. The resulting hypotheses are to be evaluated with empirical data in the next chapter.

5 Cases of Interorganizational Information Systems

5.1 Introduction

In the previous chapters, concepts were identified from information management theory and from economic organization theory and political organization theory. In chapter four, especially in sections 4.6 and 4.7, the Political Economy of Information Management was developed.

In section 1.5, the research strategy of the case study was chosen in order to facilitate the process of theory construction. This research strategy provides the opportunity of continuously iterating theory and empirical data in order to further build and reconstruct theory. This iteration has already taken place by building the Political Economy of Information Management on the insights of the cases of EDI information management (section 2.3), library automation (section 2.6.2), informatization in the British National Health Service (section 2.6.3) and informatization in Dutch penal law enforcement (section 2.6.4).

In this chapter, a new iteration of theory (that is, the Political Economy of Information Management) and empirical data is presented. There are two differences with the iterations mentioned before. Firstly, the Political Economy of Information Management has been elaborated and propositions and hypotheses have been explored, which allows a more structured case study description. Secondly, the empirical data presented here is not secondary data but data collected for the purpose of evaluating the Political Economy of Information Management.

The iteration of theory and empirical data presented in this chapter provides an answer to the fourth and last research question of whether there is empirical validation of the theory[143].

In this chapter, three case descriptions and subsequent analyses are presented. In section 5.2, the first case is presented. This case describes the information management approaches and changing interorganizational relations in the field of Dutch Higher Education and Research.

[143] It must be noted that the iterations described in this chapter do not serve as a strict 'empirical test' as was explained in sections 1.3 and 1.5.

Section 5.3 provides a case description of information exchange between the Dutch Ministry of Finance (specifically the Tax and Customs Administration) and Statistics Netherlands. The third case is described in section 5.4 and is a case description of changing interorganizational relations and information management approaches adopted in the field of Social Security in the Netherlands.
The findings of the case studies are summarized in section 5.5.

5.2 Case 1: Research information

5.2.1 The Context: Organizations in Dutch Higher Education and Research

The Dutch Higher Education and Research institutions provide an interesting example of information management in an interorganizational context (Noordegraaf & Kickert, 1993). The field consists of a number of organizations. Traditionally, the Ministry of Education, or, more specifically, the Directorate of Higher Education and Scientific Research[144], is an important player in the field. Besides the Ministry, there are the universities and the institutes for higher vocational education, with their respective interest associations – VSNU and HBO-Raad[145]. Furthermore, there is the Royal Dutch Academy of Sciences– KNAW[146] – which represents research institutes. Recent policy developments (since the beginning of the 1980s) have resulted in the breaking apart of the Ministry into the core Ministry itself along with a number of semi-autonomous agencies[147] and independent administrative bodies (ZBOs)[148]. Expectation of efficiency gains motivated these hiving-off operations (see also section 1.1.2). The newly developed relationships between the Ministry and these semi-autonomous agencies and independent administrative bodies are analyzed elsewhere (e.g., Ter Bogt, 1998). These developments are mentioned here in order to illustrate that nowadays, the field of Dutch Higher Education and Research is characterized by network-like structures rather than by a hierarchical structure, in which the whole field of organizations is presided over by the Ministry of Education (Kickert, 1993; Noordegraaf & Kickert, 1993; Homburg & Gazendam, 1996).

---

[144] In Dutch: Directoraat Generaal voor Hoger Onderwijs en Wetenschappelijk Onderzoek, DGHW.

[145] VSNU stands for Vereniging van Samenwerkende Nederlandse Universiteiten (Association of Cooperating Dutch Universities). HBO-Raad is the Council of Institutes for Higher Vocational Education.

[146] KNAW stands for the Koninklijke Nederlandse Academie van Wetenschappen (Royal Dutch Academy of Sciences).

[147] In Dutch: agentschap. An example is the C*f*I (Centrale Financiën Instellingen, central financial institutions).

[148] In Dutch: zelfstandige bestuursorganen. A ZBO is confronted with some freedom in the outputs that are realized (Ter Bogt, 1998). An example is the Informatiebeheer-Groep (IB-Groep). For a discussion on the legal status of ZBOs, refer to Boxum (1997).

However, this was not always the case. “In the period up to 1945, university education is regulated by the Higher Education Act of 1876 in which the state universities had virtually no autonomy” (Gazendam & Homburg, 1996, p. 327; see also Hermans, 1986). The institutes for higher vocational education, falling under the Secondary Education Act, did not have any autonomy either. The funding of institutions (both universities and institutes for higher vocational education) in this period was based on the universities’ and higher vocational institutes’ statement of expenses (Binsbergen *et al*, 1991; Noordegraaf & Kickert, 1993).

This rather hierarchical institutional system, with the Minister of Education as the top manager, assisted by his Ministry and responsible to Parliament, was discussed for the first time in a report by a State Committee for the Reorganization of Higher Education (the Reinink Committee) in 1949. In the report, the committee recommended increasing the autonomy of the universities. The situation, however, did not really change until the emergence of the Scientific Education Act in 1960 (Binsbergen *et al*, 1991; Noordegraaf & Kickert, 1993; Gazendam & Homburg, 1996). “In 1960, the universities received a certain degree of autonomy by the Scientific Education Act. (…). According to this act, university funding was based on the budget proposals they submitted. Universities received liberty of spending within legal constraints, became corporate bodies and had responsibility for their own personnel management” (Gazendam & Homburg, 1996, p. 328; see also Binsbergen *et al*, 1991). It must be noted, though, that the manner of consultation, however, remained highly hierarchical. In bilateral consultations with the minister or with high government officials, each institution tried to obtain approval of their expansion proposals.
In the period 1960-1969, student numbers rose by 10% per year and minister Veringa asked McKinsey Consultants to issue a proposal for comprehensive planning, a rather centralistic long-term planning system for higher education (Broekhuizen, 1988). This system proposed a matrix system of planning via institutions and via disciplines. The planning via disciplines, however, was not accepted by the institutions. As a result of that, this system of planning was never implemented (Binsbergen *et al*, 1991).
A more pragmatic attempt to realize a planning system proved to be successful in 1975 with the publication of a report by Deputy Minister Klein[149]. Instead of long-term planning, medium-term planning was stressed. Instead of a top-down method of planning, planning was seen as a cooperative effort between Ministry and universities, in which ‘learning by doing’ was stressed. A consultation structure was set up, supported by technical preparation groups in which government officials and university administrators cooperated[150]. The funding of universities was based on a funding model

[149] ‘Planning van het Hoger Onderwijs: Nota inzake de voortgang van de opbouw van het planningssysteem voor het hoger onderwijs en wetenschappelijk onderzoek in Nederland’, Document of the Dutch Parliament TK 13401, 1974-1975.
[150] The POO, Planning Overleg Orgaan (Planning Consultation Body) and the AGP, Adviesgroep Planning (Advisory Committee Planning).

that was based on the tasks to be performed by an institution. Important parameters in this model were the student number forecasts that therefore became an object of negotiation (Gazendam & Homburg, 1996).
This system lasted until 1980, when it was severely criticized in Parliament[151]. In fact, this criticism marked the end of the interorganizational relations which had developed since the introduction of the Scientific Education Act of 1960.

In the mid-1980s, university administrators and especially the minister found their managerial and political discretion to be too restricted by the preparation of proposals in the system of technical cooperation groups. Especially for a minister who must realize budget cuts, the cooperative planning system was no longer suitable, and a system based on consultation and dialogue was proposed in the so-called HOAK report[152] (Binsbergen *et al*, 1991; Noordegraaf & Kickert, 1993; Gazendam & Homburg, 1996; see also Bekkers, 1998a). "In 1985, the Ministry of Education presented a new view concerning the steering of the higher education policy sector in the Netherlands. In this view central government retreats and steers only globally. The Ministry recognizes that universities have self-regulating capacities which should be used and mobilized. (…) One of [the] instruments is a dialogue between the Ministry of Education and the universities" (Bekkers, 1998a, p. 351). Noordegraaf and Kickert (1993) and Bekkers (1998a) interpret this dialogue as an acknowledgement of the self-steering capabilities of the universities.
Plans of universities and of the minister would be seen as proposals to be discussed in a dialogue. "This dialogue has the following character. The discussion is opened by the Minister of Education with the publication of the so-called 'Concept Higher Education and Research Plan'. This plan gives an overview of the wishes of the Ministry regarding the desired development of academic education and research. The Plan can be seen as an agenda with issues for the dialogue. The universities respond to these issues through the publication of their so-called 'development plans'. The exchange of the central Plan and the decentral development plans will lead to bilateral – between the individual universities and the Ministry – and multilateral discussions – between the interest associations of organizations of higher education and the Ministry in the Chamber of Higher Education" (Bekkers, 1998a, p.351). The 'steering philosophy' was implemented in the Higher Education and Scientific Research Act of 1989. Noordegraaf and Kickert reconstruct the rationale of this new policy as a quest for innovation, flexibility and variety for which autonomy is necessary: "[f]ormal legislation has to be minimized and the institutional autonomy has to be maximized. Primary are the self-steering capabilities of the system of Higher Education and Research"[153] (1993, p. 80).

[151] Document of the Dutch Parliament TK 19222, 1985-1986.
[152] Hoger Onderwijs: Autonomie en Kwaliteit (Higher Education: Autonomy and Quality).
[153] "Formele wetgeving en regulering moet worden teruggebracht tot een minimum en de institutionele autonomie op onderwijsgebied moet zo groot mogelijk worden".

In 1993, a new funding model for the universities as well as the polytechnics is implemented. In this model, the funding of the universities is partially based on the real student numbers (instead of student number forecasts) and on numbers of certificates obtained. Furthermore, there is a more or less fixed budget for research. In 1994, the universities and the polytechnics are brought under a new Higher Education Act. The funding of higher education institutions takes a course in the direction of a market-oriented system. The universities and polytechnics have the freedom to start new curricula. The polytechnics have been particularly creative in establishing new curricula. Administrators of higher education institutions concern themselves with their market share instead of lobbying government officials or predisposing the Minister in favor of their plans (Gazendam & Homburg, 1996).

Summarizing this historical exposé, it must be noted that the relationship between the Ministry of Education on the one hand and the universities (and polytechnics) on the other hand has gradually changed over time. The situation of 1945-1985 shows a relationship, in which universities had little autonomy. The relationship is characterized by the fact that initiatives had to be approved by the Minister.
Since 1985, the situation has changed. "The changed relation between government and institutes is marked by more global control and increased autonomy of institutes"[154] (Binsbergen *et al*, 1991, p. 12). Noordegraaf and Kickert (1993) characterize this situation as the replacement of top-down steering on inputs with autonomy and steering on output.
In fact, the situation of the 1990s reveals more market-oriented interorganizational relations (or network structures), in which universities and polytechnics are less restricted in the courses of action they wish to pursue (in terms of acknowledgement of their potential for autonomous adjustment).

5.2.2 Analysis

Introduction

In terms of the Political Economy of Information Management (section 4.3), it is interesting to focus on the information management approach in the period of time from 1945 to the 1990s. As Bekkers notes, "[t]he formulation of an information policy has always been a critical issue in the relations between the Ministry of Education and the universities" (1998a, p. 352). The information management approaches adopted over time will be described and analyzed as follows. Firstly, some general developments[155] in

[154] "De veranderende verhouding tussen overheid en instellingen komen ander ondere tot uiting in de 'globalisering van de overheidssturing' en in een toegenomen autonomie van de instellingen".
[155] In the Higher Education and Research field, four information management 'domains' are identified: finance, personnel, education and students, and research (VSNU, 1996).

the information management approach[156] will be discussed, based on Gazendam and Homburg (1996) and Bekkers (1998a). Secondly, the description and analysis will be restricted to the exchange of research information between universities mutually and between universities and other organizations, such as the Ministry. The latter case description is based on literature review, interviews and document analysis.

General developments in information management approaches

Overseeing the period of time between 1945 and the 1990s, it must be noted that the Ministry of Education has, on a number of occasions, stressed the importance of central registration. Such a central registration, initially in paper form and later on in the form of information systems, implied that the Ministry requested information from the universities and the universities supplied the Ministry with the requested information. In fact, these information relations were, during the last few decades, stated in an information policy. In information management terms, such a model of information gathering resembles a top-down information management approach, because there is a standardized, even central database *owned by* the Ministry. This information management approach continued to exist until 1985.

In 1985, university administrators quite explicitly opposed the top-down information management approach, probably inspired by the changes that were announced in that year (see section 5.2.1). In the years before 1985, the information supplied by the universities was used against them in cutback operations and the universities feared that these cutback operations would continue, inspired by their information. During a discussion on information management organized by the interest association of the universities, an anonymous participant said:

> *"(…) [A] couple of years ago, association measures were identified between input and output. Should we have the fox guard the chicken coup by means of automating our registrations?"*[157]

Therefore, new rules and procedures for the exchange of information were discussed. In 1985 the Ministry of Education and the universities reached an agreement, formalized in an Information Statute, regarding the exchange of information. In the Information

[156] Bekkers uses 'information policy' to indicate the management of information systems and interorganizational information systems. Therefore sometimes 'information policy' is used in Bekkers' citations. It must be noted at this point in the line of reasoning that information policy is synonymous with 'information management' as defined in section 2.2.3. In fact, we are facing the consequences of the 'semantic jungle' regarding information planning, information policy and information strategy (section 2.2.3) here.

[157] "Jaren geleden zijn relaties gelegd tussen input en output. Moet je de kat op het spek binden door middel van het automatiseren van onze bestanden?"

Statute, universities are held responsible for (1) the maintenance of data in information systems and (2) reporting to the Ministry (VSNU, 1996). However, this responsibility was largely a mandated (i.e. transfer of designated property rights rather than a transfer of designated *and* residual property rights; *ownership* issues were not addressed) responsibility. In the following period of time, the Ministry launched a new initiative, according to Bekkers (1998a), to increase the transparency of the 'dialogue' that had been agreed upon. In this new initiative, "(…) [t]he necessity of information to be delivered by the universities for the functioning of the department of Education is stressed. Special attention is given to the document formats of the information to be exchanged and the development of central registrations. The plan also suggests that a central information agency could be established which develops and maintains central registration systems. This agency, it is proposed, should be a joint venture between the Ministry of Education and the universities, with mutual responsibilities" (Bekkers, 1998a, p. 352). The interest association of the universities noted in 1990 that the proposal for a central register at a distance from government, and induced by law, seemed to imply an internal inconsistency.

"Furthermore, [i]n one of the appendices of the Higher Education and Research Plan of 1988 a set of indicators was formulated to enhance the transparency of the universities. The idea behind the presentation of these indicators is that a dialogue between the Ministry of Education and the universities can only be rationalized if objectivity exists about the information to be exchanged in the dialogue. If objective information about the state of the university system is not available to every participant, an open and power-free communication cannot be established. Therefore information, which is mutual and which is mutually maintained, is a necessary condition for a successful dialogue. The indicators presented in the Higher Education and Research Plan can be seen as an objective language which the participants can use as a mutual point of reference for underlining their arguments and perceptions (…)" (Bekkers, 1998a, p. 352). However, "[t]he introduction of the indicators has led to severe criticism of the universities" (Bekkers, 1998a, p. 352); Bekkers explains this resistance by emphasizing that "[f]or the Ministry the transparency created by sharing the same data is seen as a way of neutralizing the role of information as a powerful and strategic resource in an open planning process. A powerless dialogue (…) supposes the absence of strategic information behavior of the parties involved. Here, transparency is seen as a way of fostering the self-regulating capacity of the university system itself. If the Ministry and the universities share the same data and knowledge, it must be easier for them to reach a common definition about relevant trends, developments, problems and solutions. However, the universities feared the degree of transparency which the Ministry wanted to accomplish. It was *the* transparency of *the* Ministry. Moreover, they doubted the intentions of the Ministry. Although transparency could foster a more powerless dialogue, the opposite could also happen: transparency could open the door for more sophisticated ways of control. This was seen as a threat for the proclaimed autonomy of the universities" (Bekkers, 1998a, p. 354). "The system was seen as illegitimate because

it affected the autonomy of the institutions" comment Homburg and Gazendam (1996, p. 329).

By now, a mechanism of proposals and counter-proposals comes into play (see also Van der Vlist's comment in section 2.5). In this case, the interest association of the Dutch universities presented its own information policy proposals. In 1990, it stated a number of information management principles, including (VSNU, 1996, p. 5; see also Bekkers 1998a, p. 352) that:

> *"the information exchanged should match the information requirements of the universities themselves"*[158].

Furthermore, the importance of exchange through formal reports is stressed and it is argued that the number of reports should be minimized. Finally, it is stated that "(…) controllability has to be sought in simplification rather than in integration of overly complex information flows"[159] (VSNU, 1996, p. 5) and it is stated that "(…) there is no need for new, government-owned, centralized registrations"[160] (VSNU, 1996, p. 5; see also Bekkers, 1998a).
"In the discussions regarding the formulation of a new information policy, the recommendations of the Association were mostly accepted in the Chamber of Higher Education. They were also input for a new set of agreements regarding the exchange of information, which were formulated at the 'Information Conference' in 1992" (Bekkers, 1998a, p. 352-353).

The 'Information Conference' of 1992 marked a change in the information management approach adopted for the exchange of information between universities and the Ministry of Education. The set of indicators used by the Ministry raised a lot of criticism. During the conference, the universities agreed that they would be held accountable for their results based on a set of indicators, but they also managed to agree with the Ministry that the initiative for the formulation of these indicators would be primarily in the hands of the universities and their association (see also Bekkers, 1998a). At the same time the universities acknowledged that the Ministry needs this information. However, there is a problem about the desired level of aggregation of the information to be exchanged. Agreement was reached on an approach in which the information needs of the Ministry will more and more be satisfied by the use of indicators.

---

[158] "(…) de informatielevering moet aansluiten bij de eigen informatiebeheofte van de universiteiten en bij de bestaande besluitvormingsprocessen"
[159] "(…) beheersbaarheid moet meer gezocht worden in vereenvoudiging dan in integratie van te complexe gegevensstromen"
[160] "(…) aan nieuwe centrale bestanden onder beheer van de overheid bestaat geen behoefte"

Another very important result of the conference was that "the Ministry of Education acknowledges that the information to be exchanged is owned by the universities" (Bekkers, 1998a, p. 353). It is notable that special, dedicated information systems that support the new situation did not exist. "A variety of information systems are being applied for the preparation of the 'Facts and Figures' document and for the trends presented in the Higher Education and Research Plan" (Bekkers, 1998a, p. 353). Attempts were made to develop an expert system to support the communicative planning cycle. Therefore it was necessary that universities and other institutions of higher education should employ categories in which the status of the dialogue was represented. Using the system, all kinds of associations could be made. "For instance, if a civil servant would like to know something about the number of student registrations, he would not only have these figures at his disposal, but he would also know which other departmental unit and/or civil servants were engaged with this issue. He would also know which letters between universities and the Ministry of Education had been exchanged regarding the issue. However, the system raised such criticism that it was abandoned" (Bekkers, 1998a, p. 353).

Information Management approach regarding research information

A special case within the context of Higher Education and Research Information Management is the case of exchange of information on research activities. The case description will, from now on, focus on the exchange of information on research projects. The information assets involved are information systems embodying information on research projects carried out by universities and research institutes.

Exchanging information on research activities is asked for in order to 'expose' current research activities to the academic community[161] and to social organizations (Wetenschappelijk Technische Raad, 1990).
Since 1970, several organizations within the field of Higher Education and Research have been gathering information on research activities[162] in which various organizations focused on distinct scientific disciplines. In 1988, the NBOI[163] was founded, among

[161] For example for peer reviews, quality assessments, but also to expose research activities to the scientific community at large, or the business community (R&D firms).
[162] Initially, postal questionnaires were used to gather data on current research, researchers and research institutes. However, these questionnaires have, over time, been replaced by electronic data interchange facilities.
[163] The Dutch Bureau for Research Information, or in Dutch: Nederlands Bureau voor Onderzoek Informatie (NBOI). On September 1, 1997, the NBOI merged with the Library of the Dutch Royal Academy of Sciences (Dutch abbreviation: BKNAW), the Social Sciences Information Services (SWIDOC), the Dutch Historical Data Archives (NHDA) and the Bureau for Bibliography of Dutch Literature (BBN). The newly created organization, NIWI, is the new owner of the NOD, the Dutch Research Database.

other things in order to design and develop a National Research Database[164] (NOD). It must be noted that there is no formal obligation for the universities to account for their research activities. In 1995, the following intention was drawn up in an information agreement:

> *"Research institutions have in principle agreed that they will submit research information to the NBOI database (the NOD)"*[165].

As a result of this agreement, the Ministry assumed that the universities were obliged to submit research information to the NOD. The interest organization of the universities, on the other hand, assumed that an obligation existed *only if* there was not a single trace of doubt as to (1) the method of submission of information and (2) what organization should receive the information i.e. NBOI. In practice, the association wanted to postpone its commitment to the agreement until the results of the expected evaluation of the NOD were available and until its own investigation of the possibility of an alternative information management approach had been completed.

> *"The research institutes' efforts to collect, store and distribute information on research activities are only partially justifiable due to the tasks and responsibilities of the institutions; in particular efforts to increase the efficiency of exchange of information among institutions, efforts to increase national and international 'exposure' and efforts to increase comparability, go beyond the level of institutes. If the government merely formulates demands, the institutes will have to be offered complete freedom with respect to technical and organizational aspects, so that it is possible for them to align completely with their own information and management policies. If, on the contrary, government assumes detailed technical and organizational arrangements, that the institutions are not able to influence but that do influence an institution's management, the institutes are not able to comply with this approach"*[166] *(internal report VSNU).*

---

[164] In Dutch: Nederlandse Onderzoeks Databank (NOD).

[165] "De instellingen hebben in principle afgesproken dat zij deze informatie zullen onderbregen in de NBOI database (de NOD)"

[166] "De inspanningen die de instellingen zich moeten getroosten om de onderzoeksgegevens te verzamelen, op te slaan en ter beschikking te stellen zijn slechts *voor een deel* te rechtvaardigen op grond van de eigen taken en verantwoordelijkhefen van de instelling zelf; met name de inspanningen om onderlinge gegevensuitwisseling efficiënt te organiseren en om landelijke (of zelfs internationale) vindbaarheid en vergelijkbaarheid te realiseren, hebben een instellingsoverschrijdend karakter. Waneer op dat vlak door de overheid slechts wordt volstaan met het formuleren van eisen, zal het WO volstrekte vrijheid hebben inzake de technische/organisatorische opzet moeten worden gelaten, zodat geheel bij het eigen informatie- en managementbeleid kan

The NOD raised criticism by universities and its interest association over who should provide the research information and who should contribute to the costs of the NOD. In fact, it was felt by the NBOI that the commitment of universities to the importance of 'exposure' of research activities by the NOD diminished because they did not experience any benefits from the NOD. In Ambtelijk Overleg Onderzoek (1990) of the interest association of the universities, it is stated as follows (Ambtelijk Overleg Onderzoek, 1990, p. 3):

> *"The universities are not fully convinced of the usefulness of the [NOD] (…). The (potential) users of the research are not yet sufficiently identified and specific partitions of the database, to be used by the universities for their own 'strategic' research policies, are not yet available".*

The rationale behind the resistance to the NOD is expressed later on in the same publication (p. 3):

> *"The academic institutes are apprehensive of putting research information, which is to be classified as 'strategic' and which consists of input and output data at specific aggregation levels, at the disposal of (potential) users without explicit permission. If it is not clear to what use the information is to be put, [the institutions] refuse to supply this information"*[167].

During a conference meeting in 1990, an anonymous participant remarked:

> *"(…) a system that aims to harmonize local universities' information system, should allow universities a certain amount of diversity"*[168].

Another participant stated that

---

worden aangesloten. Wander echter de door de overheid geformuleerde eisen gepaard gaan met gedetaileerde technische en organisatorische voorronderstellingen waarop het WO geen invloed heeft, maar die wel ingrijpen in de eigen bedrijfsvoering per instelling, zou het WO daarmee niet kunnen instemmen. (…) Concreet betekent dit (…) dat ook mogelijke alternatieven voor informatielevering via de huidige NOD in de beschouwingen moeten worden betrokken."

[167] "De instellingen van W.O. zijn er daarnaast voor beducht dat de onderzoeksinformatie die als 'strategisch' kan worden betiteld, en die input- en output-data op specifiek aggregatie-niveau bevat, zonder expliciete toestemming ter beschikking wordt gesteld aan (potentiële) gebruikers".

[168] "Een systeem dat landelijke harmonisatie van local voorzieningen bj de universiteiten beoogt dient o.a. aan de voorwaarde te voldoen dat het de universiteiten een zekere mate van diversiteit toestaat wat betreft de lokale voorziening".

> *"(…) if the NOD is accessible unconditionally, government is, through the back door, allowed access to information that, given the position of government, has to be characterized as 'management information'. Seen from the point of view of the universities, the supply of such an amount of management information is not acceptable"*[169].

In the proceedings of a discussion meeting, the following is noted:

> *"(…) from the reports, consults and interviews, it is clear that stakeholders prefer a coordinating and referring function with respect to research information systems. Therefore, no need exists for a complete, central and uniform register with detailed information with respect to output of research activities"*[170].

In the 1990s, two concurrent initiatives for the collection of information on research activities emerged: the centralized NOD initiative, owned by the NBOI (from 1997, the NIWI), and the decentralized initiatives by universities, represented by the VSNU. The latter initiative is inspired by the fact that, for the universities, the current organizational and technical aspects of the information exchange (i.e., the NOD) are by no means given; the position of the interest association is that, as long as there is no optimal cost/benefit ratio or synthesis of interests, the institutes are not obliged to submit information on research activities to the NOD. Furthermore, a problem faced in the NOD initiative is (Wetenschappelijk Technische Raad, 1997, p. 7) that:

> *"[t]here is a problem concerning the filling of the NOD. Of fourteen universities, eight have a contract with NBOI/NIWI for electronic data interchange. By far not all research activities have been entered into the system (…). Users have to experience the utility of such a research system, and*

[169] "Als een NOD ongeclausuleerd toegankelijk is voor de overheid krijgt de overheid via een achterdeur de bschikking over een hoeveelheid informatie die gezien de positie van de overheid als bestuurlijke informatie moet worden beschouwd. Vanuit de universiteiten bezien is een dergelijke verruiming van de hoeveelheid bestuurlijke informatie 'langs een sluiproute', in het licht van de discussie over de bestuurlijke verhouding tussen overheid en universiteiten en de operationalisering daarvan, niet acceptabel".

[170] "Uit de rapportages, adviezen en interviews komt naar voren dat de betrokkenen voor het NBOI/NOD in principe een coordinerende en verwijzende functie zien t.a.v. documantaire informatiesystemen. Daardoor bestaat geen noodzaak tot een centrale faciliteit met een volledig en uniform bestand dat tot op detailniveau informatie m.b.t. output van onderzoek bevat".

> *researchers (suppliers) have to benefit from using it, otherwise the filling of the database will drop behind and, with that, its use"*[171].

On the other hand, the interest association of the universities developed a data model, CombiFormat (VSNU, 1996). In 1997, the CombiFormat was accepted and implemented[172] by ten of the fourteen universities (Advantage, 1997), which have either developed a research information system (in Dutch: OZIS or OIS) themselves, or have bought an existing system which was developed by another university.

Subsequently, the Board of the Royal Dutch Academy of Sciences, under whose heading the NBOI/NIWI operates, stated that it is of the opinion that it is wise to scrutinize the relationship between centralized and decentralized information gathering. The Board states that it:

> *"(…) does not exclude the possibility that, over a certain period of time (five years), the alternative of decentralized data storage will predominate"*[173].

As neither the NBOI/NIWI nor the interest association of the universities had an interest in further fueling the debate between the competing top-down and bottom-up information management approaches of gathering research information, an independent third opinion was requested by the Royal Academy of Sciences and the interest organization of the universities.

In the subsequent report (see Wetenschappelijk Technische Raad, 1997), it is noted that, in general, "researchers do not have a primary interest in supplying information on research activities. (…) In searching for expertise in one's own discipline, a research database does not outperform traditional sources: journals, conference proceedings and professional contacts"[174] (Wetenschappelijk Technische Raad, 1997, p. 6).

---

[171] "Er is een knelpunt rond de vullingsgraad van de NOD. Van de 14 universiteiten hebben er acht een contract met NBOI/NIWI voor electronische gegevensleverantie. Lang niet alle onderzoeksprojecten zijn ingevuld, of moeten moeizaam handmatig worden ingevoerd. (…) Gebruikers moeten het nut zien van een dergelijk systeem en toeleveranciers moeten voordeel hebben van deelname, amders zal de vulling ervan achter blijven en daarmee het gebruik".

[172] It is noted that several universities adjusted the data model to local peculiarities (Advantage, 1997).

[173] "Het bestuur sluit niet uit, dat op termijn (vijf jaar) de tendens naar meer decentrale gegevensopslag de overhand zal krijgen. Voor het NBOI zou dan een meer faciliterende en bemiddelende rol zijn weggelegd, eerder dan een gegevensverzamelende" (Quotation in letter from Board of Royal Dutch Academy of Sciences to curators of NBOI, 1996).

[174] "De wetenschappelijke onderzoekers zien hun naam graag vermeld in de onderzoekwereld, maar hebben geen primair belang bij het aanleveren van de gegevens

In the report, a new-style, more decentralized NOD is recommended. Therefore, "(…) [t]he research data have to be gathered and entered at the source as much as possible"[175], advises the Wetenschappelijk Technische Raad (1997, p. 7). For the NIWI, the Wetenschappelijk Technische Raad proposes the following tasks: firstly, an (inter)national referring function to local information systems, including the marketing of the research activities; secondly, the building, maintenance and distribution among local research information systems of a thesaurus of research data; thirdly, quality assessment of locally-entered information on research projects.

The Wetenschappelijk Technische Raad proposes the following situation (see the report of the Wetenschappelijk Technische Raad, 1997, pp. 11-12). At the level of universities, researchers or project managers enter information on research projects and publications into a local information system at the level of the research group. The information of all research groups within a research institute or university is collected in the university's OIS or OZIS system[176]. For the small research institutes which do not have an OIS or OZIS, it is proposed that the NBOI/NIWI negotiate for them with one of the universities which does own such an information system so that the small institutes' information may be entered in the latter system.

For the NOD, two options are mentioned. Firstly, a database is set up with copies of the OIS/OZIS databases in the CombiFormat data model. Secondly, the NOD consists of (1) a list of projects and (2) references (in the form of *hyperlinks*) to the local databases. According to the Wetenschappelijk Technische Raad, a transition of the (current) first to the second option is a natural one, taking into account the rapid change in telematics (in this case, TCP/IP telecommunication technology). "(…) Rapid developments in the field of the Internet and the World Wide Web beg the question of whether a central database is required. Possibly, over time, WWW searches on decentral databases could be a satisfying solution" (Wetenschappelijk Technische Raad, 1997, p. 8)[177].

---

over lopende onderzoekprojecten. (…) Voor het zoeken van expertise op het eigen vakgebied levert een onderzoekinformatiesysteem niet meer op dan de traditionele bronnen: het raadplegen van vakliteratuur, het bezoeken van congressen en collegiale contacten".

[175] "De WTR adviseert een NOD nieuwe stijl met en meer decentrale opzet dan nu. De onderzoeksgegevens worden zoveel mogelijk aan de bron ingevoerd".

[176] It is supposed that an IOS or OZIS serves primarily the own interests of the university: *firstly*, generating internal reports and *secondly*, giving account to the Ministry.

[177] "De ontwikkelingen op Internet en het World Wide Web gaan zo snel dat men zich de vraag moet stellen of een centrale database nog nodig/wenselijk is. De mogelijkheid moet niet uitgesloten worden dat op termijn volstaan kan worden met WWW-searches op decentrale databases".

The (new) NOD then, would enable access from comparable information systems abroad (the report mentions the European CORDIS information system, the English CRIB database and the Belgian IWETO system). The report states that "NBOI will have to realize international activities in order to realize an intelligent system of mutual references" (Wetenschappelijk Technische Raad, 1997, p. 12).

The Wetenschappelijk Technische Raad advises standardizing the local (university) systems according to an extended[178] CombiFormat (a development that was, at the time of the report, already taking place), and developing a thesaurus of search terms and indices (to be developed by the NIWI).
The Wetenschappelijk Technische Raad warns furthermore that "if the parties involved do not succeed in increasing drastically the timeliness and coverage [of the NOD], it is not likely that a NOD-like structure will survive. And the former is a prerequisite for justifying the costs the NOD incurs"[179] (Wetenschappelijk Technische Raad, 1997, p. 8).
In general, the report of the Wetenschappelijk Technische Raad is supported by the parties involved: the Royal Academy of Sciences, the NIWI and the interest association of the universities (Advantage, 1997). This implies that both the interest association and the Royal Academy of Sciences accept that the NIWI has a new role to play and that the ownership issues with respect to information on research activities have changed. However, both parties continue to elaborate on the report separately.

Developments at NIWI

In a reaction to the proposals by the Wetenschappelijk Technische Raad, the Royal Academy of Sciences notes the following:

> *"The core of the report implies a changed role of the NOD, with a more important role for the decentralized input of data by the institutions who are responsible for the research activities. The role of NBOI/NIWI will change towards quality assurance and the active (international) marketing of the research information"*[180].

[178] Extended with Uniform Resource Locators (URLs) for project, person and university information, and a standard classification code system.
[179] "Indien de samenwerkende partijen er niet in slagen [dekkingsgraad en actualiteit] drastisch op te voeren, is het niet waarschijnlijk dat een NOD-achtige structuur langdurig in stand kan blijven. En alleen in het geval dat dit wel lukt zijn de kosten die de NOD jaarlijks met zich meebrengt te rechtvaardigen".
[180] "De kern van het advies behelst een gewijzigde opzet van de NOD (…) met een grotere rol voor de decentrale invoer van gegevens door de instellingen onder wiens verantwoordelijkheid de onderzoeksprojecten worden uitgevoerd. De rol van het NIWI zal meer verschuiven naar kwaliteitsbewaking en het verzorgen van de ontsluiting door

As a reaction to the report, the Academy has formulated a pilot project proposal for new forms of cooperation between NIWI and three universities. It is acknowledged that the NOD has a new 'referring' function, besides the recording of information on experts, profiles of universities and information on projects.
The pilot project aims at elaborating on and testing the decentralized data input, decentralized access to information, decentralized quality assessment and interfaces between NOD and OZIS systems (among other things through the use of URLs), in order to draw up standard procedures for the other universities and large research institutes. The NIWI focuses on the first task in the report of the Wetenschappelijke Technische Raad, in which databases are transferred from OZIS systems to the NOD database:

> *"In the long run – whenever the technical means are available -, the NBOI/NIWI database will consist of URL hyperlinks to the university OZIS information"*[181].

Developments at the interest association of universities

The interest association of the universities requested an additional independent opinion on the practical elaboration of the report of the Wetenschappelijk Technische Raad (see Advantage, 1997).
In this subsequent report, a number of remarks are made. Firstly, it is noted that various universities and research institutes should discuss whether information from university or faculty level should be exchanged. Secondly, it is noted that the choice for a specific research information system is the responsibility of institutes and that a proposal of the de facto standard OZIS system or any obligation from any party involved is not acceptable. Thirdly, access to secondary databases or WWW servers is preferred over access to the primary databases (aspects of security are more important than aspects of timeliness).
It is recommended that institutes should move incrementally towards the situation as proposed in the report from the Wetenschappelijk Technische Raad. Standardization of the de facto standard OZIS system is not presumed to be possible, and the development of so-called universal applications is not recommended. In the Advantage report, the alignment between interorganizational characteristics and an information management approach is acknowledged (Advantage, 1997, pp. 9-10).

> *"An important point of reference is that the organizations involved are highly autonomous. (…) The choice of a specific (project) approach therefore has to take these relationships and mutual interdependencies into account. Here, the*

---

het verzorgen van een venster op de onderzoeksinformatie en door middel van aktieve marketing, ook internationaal" (NIWI, internal project proposal).

[181] "Op de langere termijn – indien de technische mogelijkheden hiervoor ontwikkeld zijn – zal de NBOI/NIWI database URL verwijzingen naar de universitaire OZIS gegevens bevatten" (internal project proposal, Royal Academy of Sciences).

relationships between institutes and between institutes and NIWI are at stake. A combined bottom-up/top-down approach, in which all participants are taken into account, is preferred. (…) An incremental approach is to be preferred over a waterfall-like approach. (…) It is furthermore important to notice that the relationship between NIWI and the institutes is not self-evident. This relationship will have to be nourished on the basis of mutual value-added".[182]

5.2.3 Review

From the description of the context of the field of Higher Education and Research, it becomes clear that the relationships between the Ministry of Education and the institutes have changed from purely hierarchically-coordinated relationships, in which universities have virtually no autonomy, to relationships that have characteristics of market-like coordination and in which universities are confronted with freedom to act independently of the Ministry (resulting in network structures [Kickert, 1993] or a multi-actor system [Gazendam & Schaap, 1994]).

In section 5.2.2, observations are stated with regard to the information management approach adopted in the exchange of information between universities and Ministry. In this section, these observations are confronted with the hypotheses of the Political Economy of Information Management that were developed in section 4.6.

The first hypothesis stated that if none of the information assets initially owned by organizations participating in an interorganizational information system is indispensable, and none of the information assets initially owned by organizations participating in an interorganizational information system is complementary, organizations will choose not to standardize various conceptual schemes for information assets.

In analyzing the complete period the case study has taken into account, it is interesting to note that up to the 1990s, the hypothesis does not receive support. At that time, the information regarding research activities was gathered by the NBOI (from 1997: NIWI) operating under the heading of the Royal Academy of Sciences. The NBOI/NIWI

[182] "Belangrijk aandachtspunt hierbij is de constatering dat hierbij sprake is van (nagenoeg) zelfstandige organisatie. (…) Bij het kiezen van een (project) aanpak dient met deze relaties en de onderlinge afhankelijkheden rekening te worden gehouden. Het gaat daarbij met name om de relatie tussen de instellingen enerzijds en tussen de instellingen en het NIWI anderzijds. Een gecombineerde bottom-up/top-down benadering waarbij recht wordt gedaan aan alle betrokkenen (…) heeft de voorkeur. (…) Een incrementele aanpak verdient daarbij de voorkeur boven een waterval-achtige aanpak. (…) Belangrijk is te constateren dat de relatie tussen het NIWI en de instellingen geen vanzelfsprekende is. Deze relatie zal op basis van onderling toegevoegde waarde moeten worden ingevuld".

gathered information from universities and research institutes and they owned and used a central database with research information, while none of the information assets were strictly indispensable in the sense that the NOD would be worthless without any one of the assets involved.
With respect to this period of time, Bekkers (1998a) concludes:

> *"A cybernetic view on the use of information dominates the information policies (…) The universities feared that this information would also be used for cutback operations. Moreover, they did not recognize themselves in the information needs of the Ministry*[183]*. The result was that information policies became the object of struggle, lasting many years. Questions, such as the degree and nature of the desired transparency and the ownership of information which was gathered by the universities, dominated the agenda" (Bekkers, 1998a, p. 355).*

In the top-down information management traditionally adopted,

> *"(…) ICTs are very tempting instruments. There is always a latent tendency to use them for developing new and sophisticated ways of monitoring and control" (Bekkers, 1998a, p. 355).*

In the years following 1990, this top-down information management approach met gradually increasing resistance from the universities, because the information management approach:

> *"(…) is seen as a threat for the self-regulating capacities of functionally and territorially decentralized organizations. (…) Information gathered about the individual functioning and output of these organizations could be used to get a better – aggregated – insight in the functioning of sectors, but it can also be used to control the organizations at an individual level" (Bekkers, 1998a, p. 355).*

In general, as the universities were allowed more autonomy, they resisted exchanging information with the Ministry. It is clear that the hypothesized effects, as the line of reasoning of the Political Economy of Information Management states, do occur: theoretically, it is expected that in the absence of dependence between information assets, a top-down information management approach yields underinvestment and hence poor data quality. In reality, the NOD did experience poor data quality in terms of inaccuracies and lack of timeliness, which is consistent with an economic organization theory explanation: the universities felt that they were not benefiting from the information they submitted to the NBOI/NIWI and, in fact, they had no incentives to submit the requested information. Furthermore, institutes feared that giving away information on research activities to the NBOI/NIWI without exactly knowing what the

[183] This is a clear illustration of concept of 'value independence', see section 4.4.

NOD would do with it, would allow the Ministry to monitor their activities and to use that information for cut-back operations. This is consistent with a political organization theory explanation. The consequent resistance was expressed by protesting against the costs that were imposed by the NBOI/NIWI on the universities.
The emergence and adoption of the CombiFormat/CombiSearch initiative, which provides a more or less standardized data model for a decentralized research information system consisting of OIS or OZIS information systems, does provide strong support for the first hypothesis. In fact, the initiative does propose a standardized data model, but at the same time it is stated that ownership of data (and hence residual *abusus* property rights with respect to the data model) resides with the institutes. The universities are therefore allowed to adjust the model to local needs. The bottom-up interorganizational information management approach embodied in the emergence of the CombiFormat/CombiSearch initiative is hypothesized to match the situation of the field of Higher Education and Research, and in practice, it was adopted both by the VSNU and NIWI, preferred by most universities and eventually accepted by the Ministry. Note that the crucial difference, from the point of view of the Political Economy of Information Management, lies in the residual property rights to the information assets involved: in case of incomplete or vague contracts, such as in the statement that 'research institutes have in principle agreed that they will submit research information to the NOD database', residual property rights enable the owners - that is, the research institutes - to exclude third parties from using the information assets. It is stated by the universities as follows:

> *"Cooperating does not mean to say: do everything together. It does mean to say: striving for or cooperating with organizations with comparable needs, development phases and/or a shared vision on information management"*[184] *(Ambtelijk Overleg Onderzoek, 1990, p. 7).*

The second hypothesis stated that if at least one of the information assets initially owned by organizations participating in an interorganizational information system is indispensable, organizations will choose to standardize various conceptual schemes for information assets.
This hypothesis could not be investigated in this case study as strict indispensability did not occur at any moment in time of the period investigated.
It might be concluded that from the point of view in which the Ministry is trying to collect *complete* management information, any information asset can be regarded as indispensable, but such indispensability does not apply to the point of view of the institutes, which, moreover, had alternative sources of the information that the NBOI

[184] "Gezamenlijk wil niet zeggen: alles met zijn allen doen. Wel: streven naar of aanhaken bij instellingen die eenzelfde behoefte, ontwikkelingsstadium en/of een zelfde visie omtrent informatiebeleid hebben"

was attempting to gather: e.g. personal contacts, the World Wide Web, conferences, etc. However, Political Economy of Information Management explains why the Ministry supported the NOD initiative and tried to compel the institutes to submit research information to the NOD, while at the same time it explains why the research institutes rejected it (i.e. because they did not experience that any of the assets involved was indispensable).

The third hypothesis stated that if information assets initially owned by organizations participating in an interorganizational information system are complementary, organizations will choose to standardize various conceptual schemes for information assets. This hypothesis is not applicable either.

Case: Higher Education and Research		
Information Management Approach	*Control/ Involvement of stakeholders*	The NBOI/NIWI initiatives embodied a centralized control model, with a centralized database and centralized development of the interorganizational information system. Universities were only indirectly involved with the development of these centralized systems. The CombiFormat initiative embodied a decentralized philosophy with decentral system development, possibly tailored to local needs. In fact, universities built research information systems themselves.
	Functionality/ Goals	Integration is deliberately pursued in the NOD initiative. Note that the VSNU resisted the NOD because they wanted it to be specified for what purposes the submitted information was going to be used. Being the owner, the NBOI/NIWI was able to decide on that. The CombiFormat initiative offers considerable space for deviations in implementation in OIS/OZIS systems.
	Architecture	The NOD architecture features a common conceptual scheme to be used by all universities, including data models. Although the official goal was to take stock of ongoing research in the Netherlands, the universities feared that an unofficial goal was to assess their performance. The CombiFormat features a proposal for a data model, although it is explicitly stated that universities were the owners of the systems that were to be built and that they were entitled to adapt the architecture to their own, local needs.

Interorganizational relations	*General characterization*	Sense of autonomy was very important for universities. Ministry gradually adopted policy of 'steering at a distance'.
	Indispensability	-
	Complementarity	-
Support for hypothesis	$H_{PEIM,1}$	No support for period up to 1985. Strong support for period from 1985 – 1990s.
	$H_{PEIM,2}$	No conclusion on support. There is no indispensability involved.
	$H_{PEIM,3}$	No conclusion on support. There is no complementarity involved.

Figure 35: Characterization of the Higher Education and Research Case

5.3 Case 2: Fiscal Policy

5.3.1 The Context: Organizations in Fiscal Policy

Overview of Organizations

In the Netherlands, the task of levying taxes and premiums for national insurances[185] is carried out by the Ministry of Finance or, more specifically, the Tax and Customs Administration[186]. Other tasks of the Tax and Customs Administration include fighting tax fraud and monitoring international goods and passenger traffic. For the execution of its tasks, the Tax and Customs Administration depends heavily on information systems. In the use of information systems, improvement of service to taxpayers is prioritized by the Tax and Customs Administration, but intensification of control and combating fraud are considered important too.

In order to execute the task of levying taxes and premiums, the Tax and Customs Administration registers a lot of information in order to support the primary process.

[185] For a more elaborate description of national insurances and social security, refer to section 5.4.1.
[186] In Dutch: *Belastingdienst*.

The gathering of information in itself is not a primary task for the Tax and Customs Administration; however, in the process of levying taxes and premiums, information on, for example, economic sectors and income distribution is gathered as a by-product.

In the Netherlands, the task of gathering information for policy and scientific purposes (but also in order to inform commercial companies on economic developments) is carried out by the CBS (Statistics Netherlands)[187]. The CBS was established in 1899 and is a governmental agency that falls under the Ministry of Economic Affairs. Although the CBS itself is financed out of the budget of the Ministry of Economic Affairs and the Minister is responsible for the Bureau, its policy and tasks are determined by the Central Statistics Commission[188], an independent commission in which various governmental organizations, scientific institutes and other stakeholders are represented. The Central Statistics Commission is a ZBO (independent administrative body; see section 5.2.1).
The CBS gathers, processes and distributes information on a variety of subjects, including macro economic trends (such as economic growth and consumer prices), birth rates, crime rates, income statistics, etc. This information is traditionally gathered through surveys, personal interviews or interviews by phone. A recent trend is to gain access to existing databases; making use of existing databases as a source of data is one of CBS's strategic thrusts.

The Income Information System

In 1987, the CBS and the Tax and Customs Administration agreed to set up an information system, the Income Information System (IIS). This Income Information System records income data of a (fixed) sample of individuals (a 'panel') in terms of gross income, the Tax and Custom Administration's preliminary assessment, declarations, final assessment, appeals and settlements.
In the remaining part of this case description, we will focus on the income information system as an information asset. It must be noted that there exists a long-time cooperation between the Tax and Customs Administration and the CBS in terms of exchanging information. Until the 1990s, the exchange of information about declarations occurred through the transportation of physical paper forms from the Tax and Customs Administration's premises to one of the headquarters of the CBS, where the paper forms were processed for statistical purpose and eventually sent back without any changes to the Ministry of Finance for processing for their primary purpose. Although the Income Information System of that period conforms to our definition of an interorganizational information system, the information management approach with respect to such an interorganizational information system is of the information resource management type rather than information technology management (see section 2.2.3). The Income Information System implied a lot of manual work in terms of keying in data from paper declaration forms.

[187] In Dutch: Centraal Bureau voor de Statistiek (CBS).
[188] In Dutch: Centrale Commissie voor de Statistiek.

This situation, however, changed in 1995 when the Income Information System could use the Tax and Custom Administration's IBS system[189] as a data source. The following description will be restricted to the automated exchange that occurred from this time on[190]. The information asset involved is the (now automated) income information system.

The development of the Income Information System can be characterized by a very gradual, incremental move from a paper-based exchange to an automated exchange of information. Representatives of the Ministry of Finance and the CBS met regularly and, in these meetings, the ownership structure of the Income Information System was discussed explicitly in terms of information management approaches that could be adopted.

In fact, a number of alternative information management approaches were identified. Among them were a bottom-up approach, in which two information systems were proposed, two top-down approaches (one CBS-owned system, and one Tax and Custom Administration-owned system) and a mixed approach (one system, relatively independent of the two participants). Eventually, the participants opted for the 'independent' system (in which the costs are shared by the two participants), because otherwise:

> "*the Income Information System priorities are continuously related to the actual activities of the organizations involved"*[191] *(internal report, Tax and Customs Administration & CBS).*

The CBS and the Tax and Customs Administration signed a contract in which the terms of exchange of information between them were formalized. The contract consists of agreements on the following issues:

- *Organization.* A special IIS working unit was established and based at the CBS's premises. The costs of this working unit were split equally by the Ministry of Finance and the CBS[192,193]. It must be noted here that the working unit only performed tasks associated with the gathering and processing of raw data for general policy and managerial purposes; the analyses that were specific to the Ministry of Finance and the CBS were performed by these participants themselves.

---

[189] Income Taxes System, in Dutch: *Inkomsten Belasting Systeem* (IBS).

[190] Although the automated exchange was established in 1995, many of the specific characteristics of the information exchange date back to the period before 1995.

[191] "(…) de prioriteit van het IIS [kan] steeds aan de overige werkzaamheden van de betrokken organisaties worden gerelateerd".

[192] Additionally, the Ministry invested in conversion software in order to be able to extract data from its production databases. The CBS also invested in additional hardware and especially in data-entry software.

[193] It was noted by the participants that a lot of the costs are hard to specify. To date, no disputes have emerged on the matter of costs accounting of the working unit.

- *Procedure.* The role of the Tax and Customs Administration was the supply of 'raw' data. The IIS working unit's task was to make the raw data anonymous and to manipulate the data that was supplied by the Tax and Customs Administration. The CBS's contribution was the expertise of sampling techniques and knowledge of how to manipulate the data (which was on the level of analysis of individuals) in order to generate information on the level of analysis of households.
- *Information Use*. The Income Information System would be used by the CBS for the generation of statistics on income distributions, fortune distributions and purchasing power. For the Ministry of Finance, the information was used for ex ante and ex post evaluation of fiscal policies and for informing the Parliament. It must be noted that the eventual use (i.e. functionality) of the Income Information System differs for the Ministry of Finance and for the CBS.

  > *"The CBS is meant to undertake only those activities that are required for the tasks as defined by the Central Statistics Commission. The gathering and manipulation of data and the reporting of statistics clearly is such a task. Activities related to administrative purposes, on the contrary, are not such a task"*[194] *(internal report, Tax and Customs Administration & CBS).*

- *Protection of registration*[195]. Here, it is explicitly stated that the use of the IIS is restricted to general administrative use (i.e. generation of statistics and policy evaluation) and that it should never affect individual taxpayers.
- *Privacy.* In the contract, it is stated that the working unit fully respects the privacy of the persons involved in the panel.

In general, the system functions to the satisfaction of both the Tax and Custom Administration and the CBS. The agreements are dealt with in a very informal manner. There are no problems associated with the quality of data submitted by the Tax and Customs Administration to the Income Information System, nor are there problems with the quality of the output generated by the Income Information System.

5.3.2 Analysis

A distinctive characteristic of the case of the Income Information System is that two organizations are involved in the Income Information System, but that only one submits information to it: that is, the Tax and Customs Administration. The CBS contributes to the system because of its knowledge and experience of sampling techniques and of transforming data from the level of individual taxpayers to the level of households.

---

[194] "Het verzamelen, bewerken en tot cijferopstellingen samenstellen van gegevens in het kader van de inkomensstatistieken behoort duidelijk tot dat takenpakket. Het uitvoeren van dezelfde taken ten behoeve van beleidsmatige informatie ten behoeve van de Belastingdienst behoort daar echter niet toe".

[195] In Dutch: *administratieve vrijwaring.*

It must be noted, though, that to the CBS, there is no alternative to the Tax and Customs Administration in terms of a source of data. The Tax and Customs Administration is the only organization in the Netherlands that possesses a complete data set of incomes of taxpayers in the Netherlands. This is what makes the Ministry of Finance indispensable to the Income Information System.

For the decision-making regarding goals, prioritization, development and use of the Income Information System, explicit goals were formulated regarding the use of the interorganizational information system. For the CBS, it should be used for the generation of statistics, and for the Ministry of Finance for the generation of information for ex ante and ex post evaluation of fiscal policy. These goals are quite well circumscribed.
In terms of an architecture, in the decision-making process several alternative architectures were evaluated. Eventually, a uniform data model was chosen to serve as the basis for the development of the Income Information System. The development of the Income Information System was accompanied by a relatively centralized control strategy. But in fact both the Ministry as well as the CBS participated in the development of the system. The working unit that was responsible for the development and operation of the Income Information System consisted of employees of both organizations.

5.3.3 Review

With respect to the first and third hypotheses, no conclusion is possible because this case is characterized by the indispensability of one of the organizations involved. The second hypothesis is supported. In the presence of indispensability, a top-down information management approach was adopted; furthermore, the alternative of a bottom-up approach, which stressed two relatively decentralized information systems at the premises of the Ministry of Finance and the CBS, was rejected because in such a case it was expected that the functioning of the system would be very dependent on the internal priorities of the participating organizations. Hence, the consequences of a possible hold-up were mitigated by adopting a top-down information management approach.

Case: Fiscal Policy		
Information Management Approach	*Control/ Involvement of stakeholders*	Development of the system took place in a centralized way.
	Functionality/ Goals	Goals were explicitly stated.
	Architecture	A common data model served as the backbone of the development process. The alternative of a bottom-up architecture was explicitly rejected.
Interorganizational relations	*General characterization*	Friendly cooperation. No conflicts or tensions over the years.
	Indispensability	For the IIS, the Ministry was indispensable because of its possession of information of incomes on taxpayers. The CBS has unique competencies, but these are not indispensable to the Ministry.
	Complementarity	-
Support for hypothesis	$H_{PEIM,1}$	No conclusion on support.
	$H_{PEIM,2}$	Substantial support. Ministry of Finance is indispensable to the Income Information System. The alternative of a bottom-up information management approach was rejected, because, in the eyes of the participants, it would make the information system too dependent on the priorities of the organizations involved.
	$H_{PEIM,3}$	None. There is no complementarity involved.

Figure 36: Characterization of the Fiscal Policy Case

5.4 Case 3: Social Security

5.4.1 The Context: Organizations in the field of Social Security

Overview of Acts, Schemes and Organizations

The Netherlands has been described as a welfare state (in Dutch: verzorgingsstaat). Although in the 1980s and 1990s, a lot has changed (see for example, Hoffmans [1989], Noordam [1997] and Jacobs [1997]), there still exists an elaborate system of legislation ensuring citizens of an income in case of sickness, unemployment, disability, death of a partner, etc. This legislation follows from the Dutch Constitution (Art. 20.2, Art. 20.3) and in a number of treaties (for a discussion, refer to Noordam [1997]).

In general, the system of legislation is categorized into social insurances (*sociale verzekeringen*), financed by premiums, and social services (*sociale voorzieningen*), financed by the general fund, that is, by tax incomes. The distinction is not only based on the way social insurances and social services are financed, but also on the function of these distinct schemes: social services are meant to guarantee a basic minimum level of income, whereas social insurances compensate for (often temporary) loss of income. Hoffmans (1989) adds that social services consist of 'flat rate' benefits, whereas social insurances consist of 'earnings-related' benefits. "Primarily, social insurances are to be addressed by citizens. In case one is not able to lay any claim to these schemes, or if these schemes do not suffice, one has to resort to the social services"[196] (Noordman, 1997, p. 31).

Social insurances consist of employee benefits (*werknemersverzekeringen*) and national insurances (*volksverzekeringen*). The difference is that the former addresses employees, whereas the latter addresses every citizen. A similar distinction is to be found in the social services: there are schemes with a general domain and schemes that address special target groups. For an overview, refer to Figure 37.

Dutch Social Security	A. Social Insurances	A.1. Employee benefits
		A.2. National Insurances
	B. Social services	B.1. General domain
		B.2. Special target groups

Figure 37: Overview of Dutch Social Security Schemes

Central government is (by definition) responsible for the system of public social security (Noordam, 1997). However, the execution of the social insurances, in particular was, until 1997, partly in the hands of a number of organizations which are co-managed by associations of employees and associations of employers (in Dutch: *sociale*

[196] "Primair moet een beroep gedaan worden op de sociale verzekeringen. Slechts indien men aan dat systeem geen aansparken (meer) kan ontlenen of die aanspraken onvoldoende zijn, komen de sociale verzekeringen in beeld".

partners)[197]. The involvement of these associations is based on the fact that their members contribute to the system of social insurances through their premiums and that the system of social insurances is often tightly connected to negotiations on conditions of employment (Noordam, 1997).
In Figure 38, an overview of organizations active in the social security sector is presented.

Organization	Execution of Acts/Schemes
Industrial Insurance Boards (after 1997: Executive Institutions)[198]	Disablement Benefits Act (WAO, [A.1.]), the Unemployment Benefits Act (WW, [A.1.]), the Sickness Benefit Act (ZW, [A.1.]), the General Act for the Disabled (AAW, [A.2.]), and the Act on Surcharges (TW, [B.2.])
National Health Service (*Ziekenfondsen*)	National Health Services Act (ZFW[199]), General Act on Exceptional Sickness Benefits (AWBZ, [A.2.])
Social Insurance Bank (*Sociale Verzekeringsbank*, *SVB*)	National Old Age Pensions Act (AOW, [A.2.]), the National Child Benefits Act (AKW, [B.1.]) and the National Survivors' Benefits Act (Anw, [A.2.]).
Municipality	Act on Elderly and Partially Disabled Unemployed Employees (IOAW, [B.2.]), Act on Elderly and Partially Disabled Former Self-Employed (IOAZ, [B.2.]), Act on Facilities for the Handicapped (WVG, [B.1.]), Social Security Act (Abw, [B.1.])

Figure 38: Overview of Dutch organizations in the social security sector[200]

[197] For example, the Lisv (to be discussed below) has an Executive Board designated by the Government, which consists of an independent chairman and nine members: three members representing the unions, three representing the employers' organizations and three members by Royal Appointment.
[198] In Dutch: *bedrijfsverenigingen* and *uitvoeringsinstellingen*, respectively. Examples of the latter are Cadans, Gak, GUO, Sfb and USZO (since January 1, 1998).
[199] See footnote 200.
[200] The figures in brackets (e.g. [B.2] refer to the categories in Figure 37. The ZFW is hard to categorize according to the groupings in Figure 37. For a discussion, see Noordam (1997).

Recent developments in the field

Until 1980, the involvement of government in the field of social security showed an almost continual increase. By 1980, "[the] period of expansion of the system of social security had ended"[201] (Hoffmans, 1989, p. 93). Not only the importance of decreasing the number of citizens enjoying social services and benefits was stressed (the so-called *volumebeleid*), but also the need for changes in the execution of the legislation: "Responsibilities are transferred from government to social partners"[202]. It is important to note that the associations of employees and the associations of employers did not fear these changes (Hoffmans, 1989). In subsequent years, the relations between organizations in the field of social security were particularly subject to discussion and compromises. The outcomes of the discussions are characterized as follows: "If the center of responsibilities is in the private sector, there is a simultaneous increase in the legislative and controlling activities of the government. If (semi) governmental organizations are primarily involved in the execution of legislation, the industrial insurance boards are granted an important position in co-opting the Boards" [203] (Roebroek, cited in Hoffmans, 1989, pp. 146-147).

"Both government and social partners do not want to give up their positions", comments Hoffmans (1989, p. 147). Government and social partners have an interest in "maintaining their relative autonomy, in repelling changes and, if possible, reinforcing autonomy"[204] (Roebroek, cited in Hoffmans, 1989, p. 147). In 1989, Hoffmans commented that few structural changes in the system of social security have occurred and that the historically-defined positions of the industrial insurance boards delimit the possibilities of changes in the field.

"Whenever proposals for changes met the resistance of associations of employers and associations of employees, these proposals were abandoned. The existence of a power base, formed when employees and employers cooperate, is clear"[205] (Hoffmans, 1989, p. 148). Buurmeijer (1993) remarks that

---

[201] "De tijd van verdere uitbreiding van de sociale zekerheid was voorbij".

[202] See Document of the Dutch Parliament TK 17475, 1982-1983, pp. 10-11.

[203] "Waar het zwaartepunt bij het bedrijfsleven kwam te liggen is tegelijk voorzien in ruime regelgevende en toezichthoudende bevoegdheden van de overheid, en waar (semi-) overheidsorganen primair met de uitvoering zijn belast, komt het georganiseerde bedrijfsleven tenminste een belangrijke plaats in de betrokken besturen toe".

[204] "het in stand houden van de eigen, vaak relatief autonome positie, het afweren van pogingen zodanig veranderingen aan te brengen, dat deze positie in gevaar komt, en het, waar mogelijk, versterken van de eigen positie".

[205] "Waar wijzigingsvoorstellen stuitten op het gezamenlijk verzet van werkgevers- en werknemersorganisaties, vonden deze voorstellen dus geen doorgang. Het bestaan van het eerder geboemde 'officieuze machtscircuit', gevormd waneer de werkgevers- en werknemenrsorganisaties samenwerken, is hier duidelijk aangetoond".

> *"[p]arliament recoiled from fundamental changes in the traditional relationship between government and social partners"*[206] *(1993, p. 73). "(…) [I]n general and in the investigated period, Parliament was either passive, because of which changes were not stimulated, or was internally divided, because of which fundamental changes in the system and the organization of the execution of changes were not able to be accomplished, or unanimously blocked changes"*[207] *(Buurmeijer, 1993, p. 74).*

Furthermore, Parliament was of the opinion that:

> *"(…) the Industrial Insurance Boards' autonomy was not to be diminished by some sort of central institution, occupied with coordination and control"*[208] *(Buurmeijer, 1993, p. 107).*

The social partners were very wary of consolidating this power, which showed in the way they dealt with information (see Buurmeijer [1993, p. 95]). Illustrative is an evaluation of the system of social security in 1985 by the Ministry. The Ministry required data for this evaluation; however, this was refused based on the opinion that the privacy of citizens would be endangered. Furthermore, the Industrial Insurance Boards wanted to know beforehand exactly for what purposes these data were to be used. Buurmeijer (1993) comments:

> *"[t]he Ministry is of the opinion that the Industrial Insurance Boards did not want the Ministry to strengthen its grip on the execution of social insurance"*[209] *(p. 92).*

Two Landmarks: The Buurmeijer Commission and the Van der Zwan Commission

A first change in the field of social security occurred in March 1992, when the Netherlands Court of Audit issued a report on the functioning of the system of social insurances. The report raised a lot of turmoil in parliament and it was decided to install a Parliamentary Research Commission (the so-called *Parlementaire Enquete*

---

[206] "De Tweede Kamer deinsde terug voor fundamentele ingrepen in de traditionele verantwoordelijkheidsverdeling tussen overheid en sociale partners".

[207] "De commissie concludeert dat de Kamer in de onderzoeksperiode in algemene zin of passief was, waardoor wijzigingen niet werden gestimuleerd, of verdeeld was, waardoor fundamentele wijzigingen in het stelsel en de uitvoeringsorganisatie niet konden worden doorgevoerd, of eensgezind was in het blokkeren van de wijzigingen".

[208] "De autonomie van deze uitvoeringsorganen [bedrijfsverenigingen] mocht niet worden aangetast vanuit een centraal orgaan dat met coordinatie en toezicht was belast".

[209] "De indruk bij het ministerie bestaat dat de bedrijfsverenigingen niet wilden dat het ministerie haar greep op de uitvoeringsorganen versterkte"

Uitvoeringsorganen Sociale Verzekeringen, often referred to as the *Commissie Buurmeijer*, named after its chairman). The central question of the Research Commission was how the industrial insurance boards had implemented the changes in legislation and policy over the last 10 years.
The main conclusions of the Research Commission were that the execution of social insurance legislation is primarily in the hands of the executive organizations rather than the Industrial Insurance Boards, and that, in the execution of legislation, there was a preference for lawfulness over efficiency and effectiveness. Furthermore, it was concluded that associations of employers and associations of employers have a mutual interest in abusing social security schemes (especially the Disability Benefits Act and Unemployment Benefits Acts) as a redundancy scheme for employees. For example, with respect to the Unemployment Benefits Acts, it is stated that:

> *"(…) the system of the Unemployment Benefits Acts and especially the definition of unemployment are as such executable, but they do offer a certain discretion and are susceptible to fraud, especially if plotting between employers and employees is involved"*[210] *(Buurmeijer, 1993, p. 29).*

The Buurmeijer Commission recommended dismantling and privatizing the Sickness Benefit Act and Disability Benefits Act, and reinforcing private (as opposed to public responsibilities (i.e., by means of privatization) rather than encouraging hierarchical control over the Industrial Insurance Boards by issuing supplementary legislation. In fact, as a result of the recommendations, the Industrial Insurance Boards were closed down. Furthermore, the Disability Benefits Act and Sickness Benefit Act were replaced by the Act on Premium Differentiation and Markets in Disability Insurances (in Dutch: Wet *Premiedifferentiatie en Marktwerking bij Arbeidsongeschiktheidsverzekeringen*, PEMBA) and the Act on Payment of Wages during Sickness (in Dutch: *Wet Uitbetaling Loon bij Ziekte*, WULBZ), respectively. The introduction of the Social Insurance Organization Act (Osv '97) on March 1, 1997 brought with it a number of changes in the way several social security arrangements are carried out. The responsibilities of Industrial Social Insurances are now transferred to so-called executive institutes (*uitvoeringsinstellingen*), presided over by the Lisv (National Institute for Social Insurances), an independent administrative body responsible for the execution of Acts and Schemes and aiming to increase competition between the *uitvoeringsinstellingen*[211].

---

[210] "De systematiek van de Werkloosheidswet en met name het werkloosheidsbegrip zijn wellicht niet onuitvoerbaar, maar bieden wel op vele plaatsen gebruikersruimte en zijn fraudegevoelig, met name waar sprake is van samenspanning tussen werkgevers en werknemers" (Buurmeijer, 1993, p. 29).

[211] The Lisv was the successor of the IDSV (and before the IDSV, the TICA), an umbrella organization of the Industrial Insurance Boards (the TICA and IDSV represented the Industrial Insurance Boards whereas the Lisv commissions the executive institutes).

The executive institutes are now commissioned by the Lisv to carry out the actual allocation of these benefits: the executive institutes operate on a contract basis. Until the year 2000, the Lisv will deal with the (now privatized) executive institutes. And also until the year 2000, these institutes are allowed to deliver other services, such as social fund management, schemes for Early Retirement (in Dutch: *Vervroegde Uittreding, VUT*) and pension schemes, provided that these services are delivered in collaboration with other organizations.
After the year 2000, the executive organizations have to compete with one another and with other organizations that would like to enter the market and execute social insurance legislation. Contracts between Lisv and executive institutes specify which tasks have to be carried out and at what cost. The Lisv itself is concerned with the correct allocation of benefits, the management of the funds and, in particular, collaboration with Job Centers and municipal social assistance offices in order to assist as many unemployed people as possible to return to the work force[212].

A second change in the field occurred almost simultaneously with the activities of the Buurmeijer Commission. In the beginning of the 1990s, there were rumors of fraud and susceptibility to fraud in the way the municipal social services agencies execute the Social Security Act.
Again, a Parliamentary Research Commission was suggested, but this time the Ministry of Social Affairs and Employment put an independent Research Committee in office, the Van der Zwan Committee. Its mission was to investigate the execution of the Social Security Act by the municipal social security agencies.
In 1993, the findings of the Van der Zwan Committee were published. It concluded that abuse of services occurs frequently and that there are many opportunities for clients to deceive (Van Geuns *et al*, 1993). This was attributed to two categories of reasons: internal and external reasons. Internal reasons are related to characteristics of the target group, attitudes of the agency's professionals, etc. External reasons are related to the impossibility for many agencies to verify information supplied by clients:

> *"[t]he information is not always available to the social security offices within an acceptable period of time"*[213] *(Van Geuns* et al*, 1993, p. 161).*

In the report, it was observed that:

> *"[f]irstly, social security agencies do not always make use of the possibilities for verifying clients' information. Secondly, possibilities for verification are*

[212] Deputy Minister of Social Affairs and Employment during the parliamentary debate on the new Social Insurance Organization Act of 1997 in the fall of 1996.
[213] "De informatie komt niet in alle gevallen binnen een acceptabele termijn ter beschikking van de GSD-en".

> *sometimes lacking (…) social security agencies do not have any power to enforce the legally required exchange of information"*[214] *(Van Geuns et al, 1993, p. 165).*

From the activities of both the Buurmeijer Commission and the Van der Zwan Committee, and from the subsequent policy developments, it is concluded here that in the beginning of the 1990s, fighting fraud was put in the spotlight in the field of social security (see also Jacobs, 1997). Furthermore, it seems that the organizations working in the field of social security constituted a highly fragmented executive system (see, for example, Buurmeijer [1993, p. 74]), in which, until 1997, executive organizations experienced a high degree of autonomy. This autonomy was, as far as the executive organizations in the field of social security are concerned, reinforced by recent privatization operations.

In the remainder of the case description, we will focus on the information systems that contain information on citizens that can be used to detect fraud and we will refer to these systems as information assets.

The emergence of the RINIS initiative

In the beginning of the 1990s, it was felt within various organizations in the field of social security that it was necessary to facilitate the exchange of information (especially client information) in order to handle the newly-emerged issue of fighting fraud.

> "*The 1980s were the Privacy years; the 1990s are going to be the years of fighting fraud"*[215] *(RINIS, 1996, p. 11).*

At the time, there had been attempts to verify clients' information by means of comparisons of files that were used by various organizations:

> "*In the first few years, this coupling was more or less manual. First all administrations had to work with an identical identifier. In Holland, this was the 'Social Fiscal Number' (…). Tapes with information were exchanged between the different organizations. Now this identifier is in place, comparing data with data from other organizations becomes a routine. Exchanging tapes proved to be rather labor intensive and inflexible" (Zuurmond, 1998, p. 261).*

---

[214] "Ten eerste blijkt dat GSD-en niet in alle gevallen waar in principe verificatie- en valideringsmogelijkheden bestaan informatie over clienten opvragen. Ten tweede blijkt dat er voor GSD-en op een aantal terreinen mogelijkheden tot verificatie ontbreken. (…) GSD-en hebben geen machtsmiddelen om de wettelijk verplichte aanlevering van informatie af te dwingen".

[215] "De tachtiger jaren staan geboekt als de Privacy jaren, de jaren negentig profileren zich als Controle jaren".

The comparisons of files yielded many 'false-positive' signals (see also section 2.6.3). The system of large comparisons of data files had to be replaced by a facility that would enable executive organizations to check clients' information before or at the time of deciding on, for example, their request for a benefit. In other words: the system of ex post investigation had to be replaced by an ex ante notification system.
The Ministry of Social Affairs and Labor is responsible for legislation in the field of social security. Any role for the Ministry in the execution of the legislation, however, did not seem very obvious:

> *"(…) [a]n initiative from the Ministry (of Social Affairs and Labor) would certainly have met resistance from organizations working in the field of social security"*[216] *(Anonymous interviewee)*

Rather, in February 1995, an initiative from the field emerged: RINIS (Institute for (Inter-) National Routing of Information Flows, in Dutch: *RouteringsInstituut voor [inter]Nationale Informatie Stromen*). RINIS is an initiative that originated in the management level of the Social Insurances Bank, the TICA[217] and the Industrial Insurance Boards. A deliberate choice was made not to go through the tripartite, administrative level:

> *"In this way, the administrative and sometimes political circuit could, for the moment, be left out of sight"*[218] *(Anonymous interviewee).*

An important aspect of the RINIS initiative is the establishment of so-called authentic sources of data (in Dutch: *authentieke bronnen*) (see also Bekkers, 1998b). An authentic source of data is 'an organization that is responsible for the operational maintenance, content, quality and verification of a data element'. For example, an executive organization is always the authentic source for a data element that results from its executive process (for example, the Social Insurances Bank is the authentic source for decisions on the basis of the National Old Age Pensions Act). But organizations may also be regarded as authentic source for other data elements; for example, the citizens registration office is an authentic source for a client's name, date of birth and domicile, while the Job Centers is an authentic source for the same client's job seeking history. A study in 1995 revealed that most of the data elements (about sixty) are 'claimed' by one organization. About thirteen are not claimed by any organization and one data element is claimed by more than one organization.

---

[216] "Een initiatief vanuit het ministerie zou zeker op weerstand stuiten bij de diverse organisaties in de sociale zekerheid".
[217] The TICA is an umbrella organization, which, at the time, represented the Industrial Insurance Boards. See also footnote 211.
[218] "Op deze wijze kon het bestuurlijke en soms politieke circuit buiten de deur gehouden worden".

RINIS acknowledges that the claimants are, in fact, to be regarded as authentic source for the data elements involved. This implies responsibility on the part of the organizations involved for the operational maintenance, content, quality, and verification of the registers involved. Moreover, other organizations wishing to use the data of the authentic source may draw up an interchange agreement for the exchange of data from the authentic source as 'supplier' of data to the other organization as 'buyer'.

The exchange of information in the RINIS infrastructure is based on the SoFi number as unique identifier. Furthermore, the RINIS initiative presupposes that the field of social security consists of so-called *sectors*, 'coherent groups of organizations that are responsible for the execution of one Act or Scheme or general societal functions'. Examples of sectors are: the set of Executive Institutes, the Social Insurances Bank, the Tax and Customs Administration, the National Health Service, the set of Municipal Social Security Agencies, etc. Each sector has at its disposal a central verification office (in Dutch*: Sectoraal Aanspreek Punt*, SAP) and a RINIS server.
The RINIS initiative consists of a set of playing rules for the exchange of information between the central verification offices. There are two kinds of information exchanges: 'regular messages' and 'spontaneous notifications'. Regular messages are predefined EDI messages in which one organization queries another organization for information on a client[219] (characterized by his or her SoFi number) and the other organization reports the required information in a predefined message. Spontaneous notifications are the result of so-called change indicators (in Dutch: *afname indicatoren*). Once such an indicator has been installed, it spontaneously issues messages every time a change occurs in the information of a person characterized by a SoFi number. Both types of exchanges are guided by the terms of interchange agreements, consisting of specification of the authentic source, privacy aspects, quality and validity of the information, use of the information by the receiving party, timeliness of delivery, etc.

As has already been mentioned, the involvement of RINIS is restricted to the exchange between sectors' RINIS servers. Sectors are responsible for the way the messages and notifications are dealt with within the sector. It is possible to install a referral index (in Dutch: *sectorale verwijsindex)* at the central verification office, which routes messages to the actual authenticated sources, but this is not strictly necessary. In fact, within one sector, messages and notifications are printed from the server and subsequently sent to the authenticated sources via fax messages. The organizations serving as authenticated sources reply to the central verification office, and there the reply is manually keyed in and sent.

[219] For each query, only one sector is addressed.

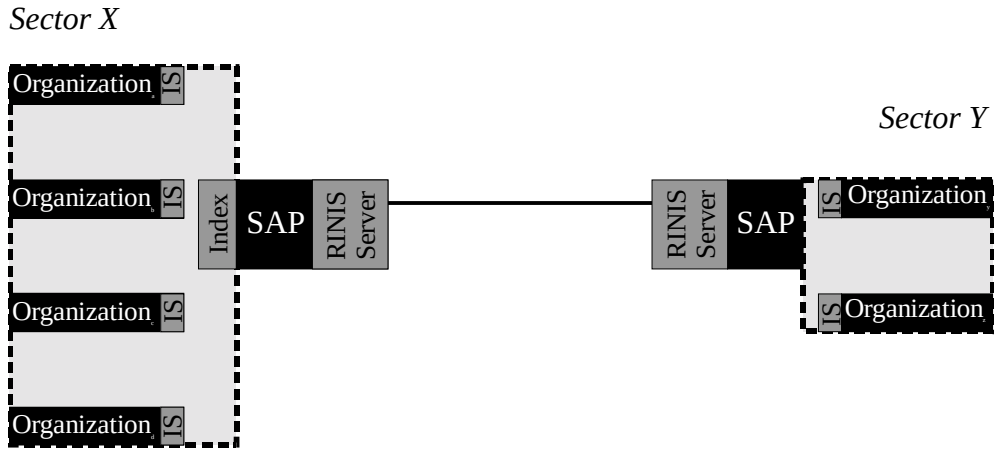

Figure 39: Communication in the social security domain according to the RINIS initiative

In 1996, the first information exchange took place between the Social Insurances Bank and the Executive Institutes. In the pilot project, a change indicator requested by the Social Insurances Bank was placed at the Executive Institutes' central verification office. Using this information exchange, changes in the employment status of employees or beneficiaries who live outside of the Netherlands but are entitled to National Child Benefits are reported to the Social Insurances Bank[220].

The RINIS organization authorizes information exchanges, promotes the RINIS initiative in order to connect sectors to the RINIS infrastructure and acts as an international forwarding point, but it does not own the infrastructure, nor any information assets or referral indices.

At the moment, RINIS is a private organization and a foundation in which participants act as members of an advisory committee. In 1995, it was estimated that ten to fifteen sectors could be discerned and a couple of hundred information exchanges could be identified. Today (1998), six sectors participate in the advisory committee of RINIS and another two are expected to join soon.

It is remarkable that the municipal Social Security Agencies, at the moment of writing, do not participate in RINIS (as user or as a member of the advisory committee), although they were criticized severely in the report of the Van der Zwan Committee. In fact, the Social Security Agencies have had problems organizing a central verification agency for the 572 municipal Social Security Agencies (in Dutch: *Inlichtenbureau voor de Gemeentelijke Sociale Diensten*). The Dutch Association of Municipalities (in Dutch: *Vereniging Nederlandse Gemeenten*) proposed the establishment of such a central verification agency. The agencies' central verification office would enable the agencies to mutually check information but also to communicate with the RINIS network.

[220] See art. 6.1b National Child Benefits Act.

However, it has also been suggested that the central verification agency would be able to assist the municipal agencies in deciding on 'hard cases'. To date, the agencies' central verification agency has not been established. In March 1997, there was a pilot project involving the connection of one municipal Social Security Agency with the RINIS network through a temporary central verification agency, which turned out to be successful, but at the moment of writing it is not clear if or how this project will be continued.

At present, the Dutch Ministry of the Interior has embraced RINIS by mentioning RINIS (after it was established) in the BIOS3 policy document (see also section 1.2.2). Furthermore, the Ministry of Economic Affairs issued a subsidy for the project.

5.4.2 Analysis

Interorganizational relations

In general, the field of social security in the Netherlands is characterized by Buurmeijer (1993, p. 74) as a "divergent system of execution"[221].
Historically, the Industrial Insurance Boards (which were abandoned in 1997) were allowed a rather high degree of autonomy in the way they executed their legally-defined tasks. Until the beginning of the 1990s, parliament had always chosen not to interfere with the execution of legislation by the executive organizations on behalf of the Industrial Insurance Boards. Concerning the relationship between Industrial Insurance Boards and executive organizations, Buurmeijer (1993) states:

> *"The reports by the boards confirm the idea of an important role for the executive organizations (in the actual execution of legislation, VH). (…) The execution has, in the investigated period of time, always emphasized legal correctness, completeness and timeliness of the benefits rather than diminishing the number of benefits paid (pp. 55-56)"* [222]

In the 1980s, the Ministry instructed the Industrial Insurance Boards to develop an Insurance Register (in Dutch: *Verzekerdenadministratie*, VZA). In 1993, Buurmeijer commented:

> *"The Commission is of the opinion that the time it took until the Register was developed, exemplified the relations in the field"*[223] *(1993, p. 93).*

---

[221] "versnipperd uitvoeringssysteem"

[222] "De bestuursverslagen bevestigen het beeld van een grote rol van de administratie. (…) De uitvoering is in de onderzoeksperiode hoofdzakelijk gestuurd op juistheid, volledigheid en tijdigheid van de uitkeringen, en niet op volumedoelstellingen".

[223] "De commissie acht het tijdsverloop, dat intussen nodig is geweest om tot een VZA te komen, illustratief voor de verhoudingen in het veld".

In the 1990s, the issue of fighting fraud was put on the political agenda and the Buurmeijer Commission and the Van der Zwan Committee severely criticized the execution of legislation by Industrial Insurance Boards and municipal Social Security Agencies. The Buurmeijer Commission's criticisms, in particular, had major consequences: the Industrial Insurance Boards were abandoned and the execution of legislation was turned over to privatized executive organizations, which are commissioned by the Lisv. The privatized executive organizations are allowed to render other services and after the year 2000, other organizations may also render services in the field of execution of social insurances. So, as a result of the findings of the Buurmeijer Commission, the interorganizational relations were altered from public law, hierarchical relationships to private law, market-oriented relationships. The executive organizations are allowed more autonomy, are less dependent on governmental organizations (because the Lisv is no longer the only source of income) and are coordinated in a less hierarchical manner.

The position of the municipal Social Security Agencies, to date, has not fundamentally changed. Social Security is still executed by the municipalities.

In the field of social insurances it must be noted that, over time, and especially since 1997, the relationships have changed. The relationship between the Ministry and the executive institutes is not hierarchical any more, but rather it is market-like, in which various executive institutes compete with one another and with possible new entrants. The autonomy of the executive institutes has been reinforced; they are less resource dependent on the Ministry.

Information Management Approach

It is noticeable that against the background of the increasing importance of the issue of fighting fraud, the field of executive organizations in the field of social security at large has always been able successfully to resist a more prominent role of the Ministry of Social Affairs and Labor.

In 1995, the RINIS initiative was announced. This initiative originated in the field of executive organizations and more or less explicitly bypassed the administrative and political levels. RINIS rests on four pillars: (1) the use of authentic sources of information, (2) the RINIS architecture of *exchange of information* between sectors, (3) the RINIS organization, which authorizes information exchanges and (4) the use of standardization in data communication.

In the RINIS initiative, the 'informational autonomy' of the organizations is *acknowledged* instead of mitigated and authentic sources of information are identified. With the emphasis on authentic sources, ownership of information assets is reinforced. By means of interchange agreements, authorized by RINIS, other organizations are allowed to use (*usus* property right) some of these assets. However, in the interchange agreements, it is rather strictly circumscribed to what purposes the assets may be used and, moreover, the authentic source (by definition) retains the residual rights.

Bekkers refers to this situation as a:

> *"way of protecting the informational autonomy of the participating organizations" (Bekkers 1998b, p. 72).*

In the RINIS initiative, the role of stakeholders, that is, (representatives of) organizations in the field, is quite prominent. In fact, by means of the establishment of authentic sources, ownership of information assets is emphasized. The organizations are quite explicitly given responsibility for information and exertion of the *usus*, *usus fructus*[224] and *abusus* property rights; this is stressed in the RINIS publications. Integration, defined as the standardization of data definitions and structures through the use of a common conceptual scheme across a collection of data sources, is not pursued. Rather, RINIS stresses informational autonomy and cooperation between various organizations on the basis of recognition of (1) autonomy and (2) responsibility for the legally-defined organizational tasks.

> *"The RINIS project shows us that it is possible to develop a common information architecture between organizations, which respects the autonomy and the 'checks and balances' between them. The ownership of data is protected in RINIS. If an organization wants to use certain data which is gathered and owned by other organizations, it does not collect the data itself, but it asks (by an automated reference index) if it may use this data" (Bekkers, 1998b, p. 75).*

The RINIS initiative does stress standardization though: explicitly *not* with respect to data definitions and structures, but rather with respect to data communication standards. This, of course, does limit the freedom of choice of the participating organizations to some degree; there is, in other words, always a tension between (any form of) standardization and retention of autonomy.

> *"In the tension between standardization of messages and the retention of autonomy, the principle of 'ownership' of information played an important role. By means of retention of organizational responsibility for information, threats were reduced and commitment was strengthened"*[225] *(Anonymous interviewee).*

---

[224] For a discussion of the *usus fructus* property right with respect to the Executive Organization's information assets and the use of information assets for other (commercial) properties, also refer to section 6.5.

[225] "Bij het hanteren van het spanningsveld tussen standaardisatie van berichten en handhaven van autonomie van organisaties speelde het 'eigendomschap' van informatie een grote rol. Door organisaties hun verantwoordelijkheid voor bepaalde gegevens te laten behouden werd de bedreiging weggenomen en commitment gekweekt"

Autonomy is an important characteristic because the participating organizations are very wary of loss of IT investments as have occurred in the past. Furthermore, there is fear of being held accountable by the Ministry. For example, one interviewee suggested that an important role of the Ministry within RINIS

> *"(…) would be the end of the thought that RINIS is 'our property'. A central institute that would scrutinize statistics and trends would imply that the benevolent cooperation of the field of social security would certainly come to an end"*[226] *(Anonymous interviewee).*

Other statements that characterize the RINIS initiative are its incremental development (and important success factor, according to several interviewees) and the easy entrance for new participants.

Concluding, it is asserted that it is more appropriate to characterize the RINIS initiative as a bottom-up information management approach than as a top-down information management approach. The position of stakeholders in particular (see section 2.4.2), as well as the goals and instruments used (especially the absence of an architecture that stresses integration, see section 2.4.3) support this conclusion.

5.4.3 Review

The first hypothesis stated that if none of the information assets initially owned by organizations participating in an interorganizational information system is indispensable, and none of these information assets is complementary, organizations will choose not to standardize various conceptual schemes for information assets.

Zuurmond (1988) describes the above-mentioned developments in the field of social security at large as a process of rationalization, in which information technology is "tying all (…) organizations together" (1998, p. 261).
In section 5.4.1, we described the history of the field of organization in the social security sector at large. In section 5.4.2 we analyzed recent changes in information management approaches and interorganizational relations in terms of the Political Economy of Information Management, which was developed in section 4.3.
From the description of the history of the field and from the analysis, a rather interesting picture emerges which both illustrates the mechanisms of the Political Economy of Information Management and enriches its theoretical foundations. Primarily, we would like to challenge Zuurmond's observation. The history of the field shows that the Ministry and the Industrial Insurance Boards operated, until the 1990s, quite

[226] "Dit zou het einde betekenen van de gedachte dat 'RINIS van ons allemaal is'. Een centrale instantie die trends zou gaan ontdekken in statistieken zou het einde betekenen van de welwillende medewerking van organisaties in het sociale zekerheidsveld".

independently of each other and that the Industrial Insurance Boards cherished their autonomy.

It is interesting to note that the first attempts to fight fraud consisted of setting up central, temporary databases (see also section 2.6.3). These databases suffered from poor data quality (many false-positive signals of fraud). In fact, the organizations that submitted data had no incentives to provide timely and adequate information to these central, temporary databases. Even the intensification of the theme of fighting fraud could not persuade the participating organizations to cooperate with the Ministry and to provide information of a higher quality. Furthermore, an attempt in the 1980s to set up a central Insurance Register (VZA) was resisted by the executive institutes. Obviously, a top-down information management approach in the divergent field of executive organizations was inappropriate. In general, the executive institutes forcefully resisted any exchange of information, direct or indirect, with the Ministry, let alone any standardization of their own information assets in order to enable information exchange.
In fact, the first hypothesis is supported by (1) the resistance of the organizations working in the field of social security and (2) the emergence of the bottom-up oriented RINIS initiative, in which decentralized control and dispersed ownership are stressed.

The second hypothesis stated that if at least one of the information assets initially owned by organizations participating in an interorganizational information system is indispensable, organizations will choose to standardize various conceptual schemes for information assets.
When the issue of fighting fraud was put on the political agenda, various organizations realized they could prevent fraud by exchanging information on clients with other executive institutions. In this way, the information assets owned by various organizations did not become strictly complementary, but their value for fighting fraud increased and possible hold-up power increased. Therefore, based on the Political Economy of Information Management, it could be expected that the organizations involved accept attenuation of property rights with respect to information assets and standardize the conceptual schemes in terms of data models and definitions.
Within RINIS, the costs associated with possible hold-up power are not mitigated by means of attenuation of property rights with respect to information assets, but by means of co-optation because the RINIS organization is in fact administered by the organizations participating in the infrastructure. Therefore, the second hypothesis gains little or no support.

The third hypothesis stated that if information assets initially owned by organizations participating in an interorganizational information system are complementary, then organizations will choose to standardize various conceptual schemes for information assets.
With the identification of authentic sources of data, the information assets involved become indispensable for the other organizations involved. As there are various

authentic sources, there are also various indispensable information assets. However, in this case, contrary to what is stated in the third hypothesis, property rights were not attenuated and integration by means of standardization of data models and definitions did not take place.

There are, however, some comments that necessitate further discussion and possibly adaptation of the Political Economy of Information Management. For example, the RINIS architecture itself assumes that information exchange takes place between so-called sectors: groups of organizations that are responsible for the execution of one Act or Scheme or perform one societal function. The way information is exchanged within sectors is left to the sector. Some sectors have set up an automatic referral index, but others have set up alternative ways of treating questions (such as communication by fax machines).

> *"Another way of protecting organizational boundaries is the automatic referral index of the RINIS system. If one organization asks certain data of another organization, this question is treated by using a referral index. Certain questions are automatically transferred to the organization in question. Other questions get special treatment if they do not meet the specifications of the protocols. This index functions as an automatic gatekeeper" (Bekkers 1998b, p. 72).*

So, organization into sectors allows organizations to further protect their autonomy. However, the concept of 'sectors' in the RINIS initiative raises some questions. The first one is the question of what exactly delimits a sector. The first organizations entering the RINIS initiative already had some sort of network or sector-like interorganizational structure (the Industrial Boards were represented by the TICA and the Social Insurances Bank acts as one divisional organization since several Labor Councils [in Dutch: *Raden van Arbeid*] merged in 1987). Other organizations met difficulties with the concept of sectors. For example, the Ministry of Justice has a number of independent administrative bodies (ZBOs) which have recently split off from the Ministry and are now considering being organized into a Justice Sector. Another example is the sector of municipal Social Security Agencies whose collaboration in a sector presided over by the *Inlichtingenbureau* has, to date, not been realized because of struggles over the tasks and responsibilities of such a central verification office.
An elaboration of this and other topics will take place in the epilogue (section 6.5).

Case: Social Security – RINIS		
Information Management Approach	*Control/ Involvement of stakeholders*	Predominantly decentralized control. Attempts to centralize control by the Ministry of Social Affairs and Employment are forcefully (and successfully) resisted.
	Functionality/ goals	Fighting fraud is explicitly mentioned as a goal for the exchange of information.
	Architecture	No encompassing architecture stressing integration. Standardization especially in agreements on communication between sectors, guided by interchange agreements.
Interorganizational relations	*General characterization*	Before 1997 public law, hierarchical relationships between Ministry and Industrial Insurance Boards. However, in practice, execution was mandated to Executive Institutes, which enjoyed high degree of autonomy. After 1997, this situation is reinforced by privatizing executive institutions.
	Indispensability	The acknowledgement of 'authentic sources' has created indispensability of many organizations.
	Complementarity	For Executive Institutes, before the issue of fighting fraud was put on the agenda, virtually no complementarity existed. With the emergence of the issue of fighting fraud, complementarity increased but is still low.
Support for hypothesis	$H_{PEIM,1}$	Substantial support throughout the time period described. In general a move from the use of temporal central databases to the RINIS system.
	$H_{PEIM,2}$	The acknowledgement of 'authentic sources' has created indispensability of many organizations, but this has reinforced the decentralized, bottom-up information management approach, and has not led to the adoption of a top-down information management approach. No support for this hypothesis.
	$H_{PEIM,3}$	No conclusion on support.

Figure 40: Characterization of the Social Security Case

5.5 Summary

In this chapter, the Political Economy of Information Management was confronted with empirical data from three case studies: one in the field of Higher Education and Research (especially: exchange of information on research activities between universities and research institutes and the Ministry of Education), one in the field of fiscal policy and one in the field of social security. The purpose was to try to inspect whether the Political Economy of Information Management has any relevance for information management of interorganizational information systems in practice, and to see if empirical data necessitates adjustment of the Political Economy of Information Management.

With respect to relevance, it must be concluded that the central concepts of an information management approach, characterized by commitment of stakeholders, goals striven for, instruments used and interorganizational coordination, proved to be very relevant for analyzing changes in the three cases.
Furthermore, the behavior of organizations in interorganizational relations in terms of quest for non-accountability and quest for exertion of property rights was very consistent with the previous case studies described in sections 2.3 and 2.5. However, there were also phenomena that do not fit the Political Economy of Information Management. These aspects are dealt with in the conclusion in the next chapter, and especially in the epilogue on the Political Economy of Information Management.

6 Conclusions

6.1 Introduction

In this chapter, the conclusions of the study on interorganizational information management will be stated. As was noted in sections 1.4 and 1.6, the study has two parts: a theoretical part (which is emphasized because of the research objective of theory construction) and an empirical part.
In the current chapter, the outcomes of the theoretical study will be confronted with the empirical data that were reported in section 2.6 and in chapter five. This confrontation is used here to shape and possibly refine the theory.
The theoretical conclusions and the results of the confrontation of the theory with the empirical data will be combined and discussed in the epilogue on the Political Economy of Information Management. On the basis of this epilogue, theoretical implications and practical implications will be discussed and further research suggested.

This chapter is structured as follows. In section 6.2, a short recapitulation of the preceding chapters is presented, in which the original motivation of the study, the research objective and research questions are restated. Furthermore, the theories used in the study are briefly re-introduced in order to strengthen the comprehension of the outcomes of the study.
Section 6.3 states the theoretical conclusions, based on the analysis of information management and interorganizational relations in the chapters two, three and four. The empirical conclusions, based on the case analyses of chapter five, are stated in section 6.4.
The theoretical and empirical conclusions are combined in the last section of this dissertation, in which, furthermore, the findings and results are interpreted in relation to the original research objective and research motivation. The discussion and interpretation of the findings are the basis for theoretical and practical recommendations and for suggestions for research in the field of interorganizational information management and related issues.

6.2 Recapitulation: summarizing the argument

This section offers a brief recapitulation of the core motivation and objective of the research and of its subsequent elaboration into a theoretical model. Its function is to enhance the understanding of the phenomena under scrutiny and to support the discussion and interpretation of the findings later on in this chapter.

One of the more pervasive themes in the scientific disciplines of information systems is the relationship between the supply and demand for information in and between organizations. In this theme, information technology represents the supply side and organizational parameters like centralization, formalization and coordination represent the demand side.
For the situation within organizations, various researchers have scrutinized the relationship between (information) technological variables and organizational variables (for a review of studies until 1991, see George & King [1991], refer to Breukel [1996] for subsequent developments).
For the situation between organizations, the relationship between (interorganizational) information technological variables and interorganizational variables has been scrutinized many times (Malone, Yates & Benjamin [1987]; for a review, refer to Steinfield, Kraut & Plummer [1996]).
Both debates have inspired much scientific work, emphasizing both theoretical and empirical issues. From these studies, which are discussed in sections 1.2.1 and 1.2.2, the following observations are stated:

- Contradictory hypotheses relating technological and organizational variables are supported by various studies: e.g., that IT leads to centralization in organizations; that IT leads to decentralization in organizations; that IT does not have any effect on (de)centralization; that IT leads to more hierarchical relationships between organizations; that IT leads to more market-oriented relationships between organizations; that anything goes in the relationship between IT and interorganizational coordination; or that IT leads to intermediate, network-like relationships between organizations. Furthermore, the direction of causality in the hypotheses is questioned.
- Additional explanatory models have been suggested, like the 'reinforcement' explanation (Danziger, Dutton, Kling & Kraemer, 1982, Breukel, 1996).
- There is criticism of the choice of variables in the model, especially the variable of *locus of control* (Steinfield, Kraut & Plummer, 1996). Kubicek refers to this aspect as *managerial action with respect to information technology: the 'contextual' factors of the organization of the development process and involvement of actors* (Kubicek, 1995).

The debates over the relationship between organizational and technological variables yield divergent results, and, therefore, theory construction is required, aiming at a theory that:

(1) explicitly addresses locus of control, that is, identifies various ways of decision making with respect to the goals, prioritization, development and use of information systems in and between organizations (that is, *information management*); and
(2) explains the appropriateness of various information management approaches in various circumstances.

In this thesis, we investigated decision making with respect to interorganizational information systems. The objective of the current research was, therefore, *to attain more insight into various combinations of interorganizational information management approaches and various types of interorganizational relations.* The following research questions were used:

1. What approaches to information management for interorganizational information systems can be defined?
2. What types of coordination between organizations can be defined?
3. What hypotheses relating interorganizational information management approaches and characteristics of interorganizational relations can be constructed?
4. Is there empirical validation for the hypotheses relating information management approaches and characteristics of interorganizational relations?

Given the research objective of *theory construction* (i.e. fundamental research), considerable effort was spent on conceptual analysis of existing theories on information management and on interorganizational relations (specifically, economic organization theory and political organization theory). Therefore, information management research, economic organization theory and political organization theory were analyzed for their key concepts and key performance indicators used, their hypotheses and, in general, for the line of reasoning in these theories.
In order to confront the constructed theory with empirical data, data from three case studies were included in this study in order to be able to verify and possibly to sharpen the theory.

6.3 Theoretical conclusions

6.3.1 Conclusions with respect to information management

In this study, the focus is on information management of interorganizational information systems; that is, on decision making regarding goals, prioritization, development and use of information systems that are embedded in two or more organizations that have no joint executives. Information management is needed by organizations because they are often faced with difficulties with accessing data from multiple areas and multiple sources.

Information management must be viewed from two points of view: from the information systems literature and from the organization science literature (especially strategy formation theories).
From the definition of information management, it is possible to identify characteristics that underlie various approaches in information management strategy schools:

- the control strategy used,
- the architecture used, and
- the goals that are formulated and the specification of the functionality of the interorganizational information system.

Two (extreme) information management approaches are identified:

- *top-down information management*, which is decision making regarding goals, prioritization, development and use of information systems between organizations in which the control strategy emphasizes centralization, in which an elaborate architecture is used that standardizes a data model (data definitions, data structures) in order to achieve integration and in which explicit goals are stated for the eventual interorganizational information system.
- *bottom-up information management*, which is decision making regarding goals, prioritization, development and use of information systems between organizations in which the control over the interorganizational information system is decentralized, in which the architecture consists of a set of agreements on communication between relatively autonomous information systems and in which goals are loosely stated (or which merely excludes certain uses of the eventual information system, which is a far less restrictive approach).

In general, information systems theory argues that centralized control is better control, and for reasons of efficiency, often implicitly, a top-down information management approach is preferred. However, other authors have criticized the preference for such a top-down information management approach because the underlying objective is often incompatible with organizational and interorganizational reality: diversity of definitions and data models (characteristics of a bottom-up information management approach) is often the result of deliberate choices so that integration is not always possible or desirable.

However, information management theory (or, in general, information systems theory) does not provide a robust explanation of the appropriateness of various information management approaches in various circumstances.

6.3.2 Conclusions with respect to interorganizational relations

Interorganizational relations occur whenever resources are transacted between organizations for a certain period of time, but not necessarily for a continuous period. Two distinct theoretical streams have elaborated on the origins and consequences of

interorganizational relations: economic organization theory and political organization theory.

Economic organization theory focuses on costs and benefits of interorganizational relations to the organizations participating in that relationship. Organizations are assumed to strive for autonomy, because in that case, they may exert the property rights of *usus, usus fructus* and *abusus*, and they are hypothesized to strive to minimize acceptance of limitations in courses of actions they wish to pursue.
This situation changes, however, if assets are used that are only productive in conjunction with the other organization's assets. It is hypothesized that, in such a case, incentives can be improved by concentrating property rights in the hands of a centralized authority, so that the possibility of hold-up is reduced and incentives are restored, because any marginal investment specific to assets has to be divided among fewer parties than in the case of dispersed ownership.

Political organization theory, on the other hand, assumes that organizations strive to minimize their dependence on other organizations and to maximize the dependence of other organizations on themselves. Organizations are hypothesized to strive to avoid being limited in their courses of action. However, most organizations are, to a certain degree, limited in their possible courses of action in interorganizational relations. This form of dependence in interorganizational relations is determined by transaction attributes and unequal balances between organizations with respect to the concentration of resources and the importance of these resources to the organizations. In addition to the means identified by economic organization theory, political organization theory holds that these means also include co-optation, actively influencing governments and lobbying for, for example, funding, regulation, etc.

In general, the mechanisms of economic organization theory (that is, property rights theory) and political organization theory resemble each other. The emphasis, however, is different. Economic organization theory has a tendency to strive towards somewhat farsighted yet elegant analyses, while political organization theory seems to stress descriptions of empirical particulars.

6.3.3 Conclusions with respect to the synthesis

The appropriateness of various interorganizational information management approaches in various circumstances has been addressed in various frameworks. For example, Merali and McKiernan (1993) propose a number of ideal types of information management approaches (preservation, symbiosis, holding and absorption) of interorganizational information systems. They explicitly relate the appropriateness of these information management approaches to specific contingencies: the need for strategic dependence and the need for organizational autonomy. The typology by Merali and McKiernan shows that integration may not be a universal objective to be pursued in every possible contingency. However, an explanation of the mechanisms leading to the

Merali and McKiernan typology is hardly available in organization theory and information management theory.
Holland and Lockett explicitly relate the appropriateness of an interorganizational information system's coordination strategy with characteristics of interorganizational relations; however, the explanatory power of their framework is low. The same comment pertains to a comparable framework by Klein (1996).

Building upon the theories and existing frameworks already discussed, an explanation of the appropriateness of various interorganizational information management approaches was constructed. It is referred to as the Political Economy of Information Management and it can be considered a synthesis of information management theory, economic organization theory and political organization theory.
The basic line of reasoning is as follows: information systems can be regarded as information assets and the decision making with respect to information assets inevitably has to take bounded rationality into account. Van Alstyne, Brynjolfsson and Madnick point to "(…) unreliable software metrics, unknown training requirements, disputed opportunity costs, and spent political capital" (1995, p. 273), which make it plausible to assume bounded rationality in decision-making processes concerning information assets. Bounded rationality here implies that not all costs that are incurred by information assets are fully verifiable, so that costs cannot be compensated directly.
In section 4.4, it was remarked that bounded rationality in the context of decision making with respect to information assets implies that all organizations involved underinvest in information assets. However, the level of underinvestment depends on the ownership structure. Information assets either:

(1) Are dispersed over organizations, which means that organizations 'own' their information systems and may, at any time, exercise their *usus*, *usus fructus* and *abusus* property rights. For instance, in this situation, organizations may re-model data structures, employ different standards, etc. Inversely, organizations may exclude any other party from the use of its assets (Brynjolfsson, 1994); or
(2) Are concentrated, which means that ownership resides explicitly with one of the organizations involved and that other organizations are allowed to use the information system. However, *usus fructus* and a*busus* property rights reside with the one organization that 'owns' the system.

By using economic organization theory and political organization theory, it is possible to hypothesize which information management approach (either bottom-up or top-down) provides the participating organizations with the better incentives to mitigate underinvestment and hence, to promote the viability of the interorganizational information system, because subtle intangible costs of low effort (which appears as distorted, missing or unusable data) are avoided.

These hypotheses are:

- *If none of the information assets initially owned by organizations participating in an interorganizational information system is indispensable, and none of the information assets initially owned by organizations participating in an interorganizational information system is complementary, organizations will choose not to standardize various conceptual schemes for information assets.*
- *If at least one of the information assets initially owned by organizations participating in an interorganizational information system is indispensable, organizations will choose to standardize various conceptual schemes for information assets.*
- *If information assets initially owned by organizations participating in an interorganizational information system are complementary, organizations will choose to standardize various conceptual schemes for information assets.*

Now that the Political Economy of Information Management has been summarized in terms of hypotheses, a number of remarks can be stated.

In the introduction, comments by Kubicek were mentioned in which he argued for attention to locus of control over interorganizational information system development (e.g., information management), and the study initially benefited from Grijpink's argument that (in the terminology used in this thesis) interorganizational information management and interorganizational characteristics have to align.
The Political Economy of Information Management acknowledges these points of view and, in general, takes a pluralistic view of information management. In doing this, parallels can be drawn with the contributions to information systems theory by Gazendam (1993), de Jong (1994) and Breukel (1996). Breukel's contribution lies in rigorous differentiation of the IT variable and the identification and validation of 'fits' or 'Gestalts' between the variables IT, organizational structure and organizational strategy. Gazendam and de Jong differentiated the information management variable into a number of information management approaches.
In the current study, relationships were sought between characteristics of interorganizational information management approaches and characteristics of interorganizational relations. It should be clear by now that such an approach, in which pluralism with respect to information systems, or, more specifically, with respect to decision making regarding information systems, is elaborated, quite explicitly builds on the work of the before-mentioned authors.

Furthermore, the line of reasoning of the Political Economy of Information Management explicitly argues against the intuitive notion set out in the traditional information systems literature that more control over the development of information systems is better control. In fact, it is argued that, generally, in the presence of bounded rationality, the effects of 'ownership' of information assets on behavior of organizations in networks of organization is underestimated and that when ownership is taken into

account, the 'traditional' logic is reversed. In fact, in the Political Economy of Information Management, it is hypothesized that top-down information management approaches yield 'alienation' of stakeholders from information systems, and that bottom-up information management approaches increase the involvement of members of participating organizations. It is acknowledged that this brings along disadvantages (e.g., relatively messy, unordered decision-making processes), but eventually, these disadvantages do not outweigh the advantage of viable interorganizational networks that suffer less from underinvestment by the participating organizations than top-down information management approaches do because bottom-up information management approaches provide participating organizations with more intense incentives. Only in specific circumstances are top-down information management approaches able to optimize incentives for the organizations involved.
This kind of logic has been described by other authors, but in the current study considerable effort was spent to provide for an adequate theoretical explanation for mechanisms, which, to date, has been lacking.

With the identification of various interorganizational information management approaches in terms of control, architecture used and goals adhered to, the notion of 'architecture' is especially highlighted. In the 'traditional' information systems literature, the architecture is a more or less fully developed conceptual scheme for an information system or interorganizational information systems in terms of data structures and data definitions. Such a view of an architecture is also used in the top-down interorganizational information management approach identified in this thesis.
However, recent literature in the field of the discipline of information systems proposes a different connotation of architecture, namely a set of agreements on how various information systems can communicate, and it is stated in terms of high-level protocols and message conventions. This connotation is adhered to in the bottom-up interorganizational information management approach identified in this study.
It is noted here that the purpose of both connotations is the same: the guidance of the development of interorganizational information systems. However, the content of the architecture is completely different. Possibly the latter connotation of architecture refers to the minimally required vertically-oriented information management approach proposed by Wassenaar (1995).

In the line of reasoning of the Political Economy of Information Management, appropriateness ('fit', 'Gestalt') of various interorganizational information management approaches in various circumstances has been indicated.

6.4 Confrontation of the theory with empirical data

From the case studies that have been described, the degree to which the hypotheses are supported can be stated and discussed. Furthermore, it is possible to reflect on the secondary case material discussed in section 2.6 and to state some general conclusions with respect to the theories discussed.

Support for hypotheses from case studies

In section 4.5, the first hypothesis was stated as follows:

- *If none of the information assets initially owned by organizations participating in an interorganizational information system is indispensable, and none of the information assets initially owned by organizations participating in an interorganizational information system is complementary, organizations will choose not to standardize various conceptual schemes for information assets.*

In general, this hypothesis receives considerable support from the cases, especially from the case of PICA, VIPS and MDSM, which were described in section 2.6, and from the cases of research information systems and information exchange in the social security sector, which were described in sections 5.2 and 5.4, respectively.
In PICA, it is clear that the participating organizations resisted the uniform centralized structure vigorously, although eventually the centralized system was adopted. In the cases of VIPS and MDSM, resistance by the participating organizations yielded the abandonment of top-down interorganizational information management approaches, which is, in the absence of the specific conditions of information asset complementarity and indispensability, consistent with the first hypothesis of the Political Economy of Information Management.

In the case of research information systems, the initial top-down information management approach (i.e. aimed at the establishment of the NOD) proposed by NBOI/NIWI was opposed by the interest association of the participating organizations (e.g., universities). The universities feared monitoring and possibly cut-back operations, and proposed a bottom-up information management approach which essentially aimed for a federation of OZIS and OIS systems, in which ownership was explicitly delegated to the participating organizations. The acceptance of the OZIS/OIS systems by all the organizations involved yields considerable support for the first hypothesis.

In the case of social security, the initial top-down information management approach, in which temporary central databases were set up by the Ministry of Social Affairs and Labor in order to detect fraud, was abandoned because the quality of the information submitted to these databases was poor and resulted in many false-positive cases of fraud. Obviously, here, the centralized system suffered from lack of incentives for the participating organizations and hence, underinvestment. The emergence and adoption of the bottom-up RINIS initiative is quite consistent with the explanation offered by the Political Economy of Information Management and, therefore, the first hypothesis gains substantial support from the case of information exchange in the social security sector. Furthermore, these findings are broadly consistent with German empirical research (Killian & Wind, 1998): “In the face of the possibilities of ICT, hierarchical directions from the top down within vertical, pyramid ‘shaped’ relations between organizations are often the second best and indeed, occasionally the worst solutions” (Killian & Wind, 1998, p. 274).

The second hypothesis was stated as follows:

- *If at least one of the information assets initially owned by organizations participating in an interorganizational information system is indispensable, organizations will choose to standardize various conceptual schemes for information assets.*

From the secondary case material, no conclusion on support could be drawn as no information on indispensability of information assets was provided by the authors of these cases. However, this hypothesis receives moderate support from the second case, that of organizations exchanging information in the field of Dutch Fiscal Policy. In this case, the Tax and Customs Administration was, being a monopolist in the sense that it is the only source for complete and accurate information on incomes of citizens in the Netherlands, indispensable for the Income Information System. Moreover, in the decision-making process, a bottom-up information management approach was considered but rejected.
However, from the Social Security case, there was no support at all. Through the recognition of authentic sources, at least some indispensability was created with respect to the activity of fighting fraud, but this did not lead to the adoption of a top-down information management approach.
In general, the second hypothesis receives moderate support.

The third hypothesis is stated as follows:

- *If information assets initially owned by organizations participating in an interorganizational information system are complementary, organizations will choose to standardize various conceptual schemes for information assets.*

Surprisingly, not many examples of complementarity of information assets were found in the cases. There is a weak form of complementarity in the field of social security because, from the point of view of fighting fraud, with the introduction of 'authentic sources' in the social security network, complementary assets were created. However, this did not result in the abolition of the RINIS initiative. Therefore, this hypothesis is not supported.

General comments and conclusions

The general conclusions refer to the following matters.
Firstly, especially in the case studies of higher education (section 5.2) and social security (section 5.4), information is an object of struggle, and ownership of information assets plays a very important role in decision making with respect to the goals, development, prioritization and use of interorganizational information systems. The hypothesized value of political organization theories and economic organization theories applied to information management assume prominence.

Secondly, it must be noted that in our theoretical explanation, we distinguished top-down information management approaches from bottom-up information management approaches by pointing at the standardization of various conceptual schemes. However, especially in the case of higher education, it should be clear that the distinction between top-down and bottom-up information management approaches does not so much rest on the distinction between standardized and non-standardized conceptual schemes, as on the question of who owns the residual property rights with respect to information systems. Bottom-up information management does not exclude the possibility of standardization, but rather assumes that participating organizations are ultimately given the right to exert the *abusus* property right, which entitles them to adjust the standardized conceptual model to their own needs.

Concluding, the retreat from top-down interorganizational information management approaches in general is supported, even in cases where hypotheses from the Political Economy of Information Management predict that in fact a top-down information management approach suffices.
The interpretation of this lack of support for hypotheses two and three can take place according to a number of lines of reasoning.

- Firstly, it is possible that due to the choice of a limited number of specific cases of interorganizational information exchange, we were simply confronted with very idiosyncratic interorganizational information management approaches and that further research addressing other cases will support the second and third hypothesis fully.
- Secondly, it is possible that organizations always value non-accountability very highly and that a 'quest for non-accountability' (see section 1.1.2) dominates considerations of efficiency (which, although very broadly defined, are an important driving force in the Political Economy of Information Management). This would necessitate a stronger position of political organization theory in the hypotheses of the Political Economy of Information Management.
- Thirdly, all our cases have described networks in which very large, multidivisional organizations exchange information. These networks of network-like organizations pose problems for the analysis of information exchange, because there are various levels of analysis to which the theory has to be applied, which renders an explanation difficult.
- Fourthly, there is the explanation that due to specific characteristics of information assets (e.g., its capacity for multiplication at virtually no costs, see Van Alstyne, Brynjolfsson & Madnick, 1995), organizations over time are able to avoid complementarities and indispensabilities in exchanges of information. Bakos and Nault (1998) provide an initial explanation for the way in which, over time, airline reservation systems evolved from single-vendor-owned centralized interorganizational information systems to dispersed interorganizational information systems because the initiators lost their unique expertise to operate the interorganizational information system and hence, they became less indispensable.

This is still, however, in terms of the Bacharach criteria discussed in section 4.2, a very weak explanation, whose development is possibly hampered by the lack of a clear definition of 'information asset'. This point will be elaborated upon in the next section.

6.5 Epilogue: the political economy of information management

6.5.1 Theoretical implications

Throughout this study, the 'classical' literature on information management has been confronted and enriched with insights from economic organization theory and political organization theory, among other things inspired by comments by Kubicek (1995), Grandori (1997) and Knights & Murray (1992).

In general, the 'classical' literature on information management starts with the argument that a common data model (or architecture) can always be conveniently used to drive the process of interorganizational information management, emphasizing integration of various conceptual schemes across organizational boundaries. However, such an approach leans heavily on the assumption that data modeling is a neutral activity. The literature has argued that, in the absence of this latter assumption, integration is *not always* desirable and hence strategic decision making regarding interorganizational information systems 'needs to find the right balance between the value of global data integration versus local flexibility'.

The combination of insights from information systems theory with economic organization theory and political organization theory results in the Political Economy of Information Management, which has been developed throughout the chapters 4 and 0. This theory attempts to provide an explanation of behavior with respect to information systems as informational resources or information assets, in which behavioral aspects of ownership are highlighted.

Previously, some (until date, unresolved) controversies in the field of information systems were described, and reference was made to the lack of differentiation with respect to technology, and in general, an alleged lack of theoretical underpinning. Having outlined the Political Economy of Information Management as a theory explaining appropriateness of various information management approaches, it might be interesting to reflect on the controversies mentioned previously in this thesis. By doing so, contours of future research based on the Political Economy of Information Management can be sketched.

Controversy 1: the relationship between IT and centralization

In section 1.2.1 the controversy over the relationship between IT and centralization was depicted. The controversy is summarized in Figure 2 (see this volume, page 10).

Central to the debate is the fact that various explanations exist: (1) the 'surveillance', 'control' or 'pseudo decentralization' explanation, (2) the 'empowerment' explanation, (3) the 'reinforcement' explanation and (4) the social choice explanation.
Using the Political Economy of Information Management does not use properties of the technology itself to explain effects on organizational parameters. Rather, it focuses on behavioral aspects of 'ownership' of information technology when it is, for reasons of bounded rationality, impossible to anticipate all kinds of circumstances by means of agreements.
So, application of information technology in a divisional setting, where the corporate level, represented by top management, is the 'owner' of the information technology involved, allows top management (by definition) access to residual property rights with respect to the information technology. These residual *usus, usus fructus* and *abusus* property rights (in the terminology of economic organization theory) enable top management to set up an apparatus for control and monitoring purposes (in the terminology of political organization theory), and fosters a trend towards centralization with residual property rights in the hands of top management.
A completely different situation occurs when *the same technology* is applied but where 'ownership' of the information technology is dispersed over various divisions. By definition, divisional managers are allowed to exert residual property rights with respect to information technology, and hence to the potential of adapting (e.g., residual *abusus*), for example, existing data models to specific, local needs (when explicit agreements do not exclude that possibility) in order to create new business opportunities by exploiting information technology (i.e. residual *usus fructus*). In this way, a dispersed ownership with respect to information technology fosters a trend towards decentralization with residual property rights in the hands of divisional managers.
This application (or mind experiment) of the Political Economy of Information Management shows that it is possible to reconcile various effects of information technology on the organizational parameter of centralization, based on the underlying question of which stakeholder group[227] (see section 2.4.2) is allowed to exert residual property rights.
So, concluding, for the question of what effects information technology yields with respect to organizational parameters, residual property rights are decisive (which at least excludes the very rigorous 'IT leads to centralization' and 'IT leads to decentralization' explanations). Residual property rights by themselves, however, are not randomly distributed, according to economic organization theory and political organization theory, thereby disfavoring social choice explanations. An explanation in which existing

[227] Based on the comment in section 2.5, it is possible to note that even in a divisional setting, control of information assets ultimately rests with top management and that divisional managers' property rights can always be retracted. However, in many situations, for example in highly professional organizations like hospitals, this is not a viable option.

organizational configurations (in terms of organizational parameters) are reinforced through exertion of residual informational property rights assumes prominence.

Controversy 2: the relation between ICT and interorganizational coordination

A second controversy in the field of information systems was discussed in section 1.2.2. This controversy is summarized in Figure 3 (see this volume, page 13).
Originally, the debate was inspired by the observation that information and telecommunication technology lowers costs associated with learning and haggling over the terms of the trade, thus eliminating the *need*, in many cases, to organize transactions within hierarchies.
The Political Economy of Information Management, however, assumes that application of information technology by itself does not automatically decrease transaction costs. The application of a top-down interorganizational information management approach may yield distorted, missing or unusable data (and hence result in subtle costs of low effort), and bottom-up information management approaches may result in costs associated with mapping various conceptual schemes.
However, in the debate addressed in Figure 3, no attention is given to the important variables of complementarity and indispensability, nor to matters of incentive intensity. At this moment in the development phase of the Political Economy of Information Management, it is impossible to explain how specific interorganizational information management approaches eventually affect interorganizational relations. However, it is our expectation that attention to the constructs and variables that are used in the Political Economy of Information Management eventually will increase the explanatory power of a more robust and possibly more complex description of the relationship between ICT and interorganizational coordination.

6.5.2 Further research

Fundamental

It has already been indicated that this research has emphasized theory construction. To some extent, the Political Economy of Information Management adds explanatory power to existing discussions of the relationship between IT and organizational variables, but, obviously, a lot of work must still be done.

Firstly, it was noticed in section 3.2 that the concepts of autonomy, dependence and coordination are in need of further exploration and more precise operationalizations. In this thesis, some progress has been made by explicitly stating what the position of these concepts in economic organization theory and political organization theory is, but rigorous operationalizations are lacking.
Moreover, we have addressed Kubicek's comment that many studies can be accused of not examining the IT phenomenon in an in-depth way, for example by not

differentiating among different types of technology or by not considering other relevant contextual factors (Kubicek, 1995).
In the formalization of the property rights application to information management, the concept of 'information asset' was introduced. Acknowledging Kubicek's comment (which we do in our study) almost inevitably necessitates a more elaborate study and definition of the concept of 'information asset'.

Secondly, all case studies in this study took place in semi- or quasi-public sectors. It might be interesting to replicate the case studies in private sectors. A promising perspective is provided by all kinds of activities that are performed under the heading of 'e-commerce' or 'e-business' (Homburg, Janssen & Wolters, 1998). It might be interesting to analyze how exchange of information in e-commerce activities takes place and how various ownership structures affect the viability of e-commerce activities.

Thirdly, in chapter four, an initial formalization of property rights theory applied to information management was presented. This formalization can be elaborated in various ways:

- by the explicit inclusion of elements of political organization theory,
- by a more elegant formalization of the concepts of 'indispensability' and 'complementarity', and
- by including budget restrictions and wealth considerations.

Fourthly, we would like to state that, eventually, the only test for any theory is the empirical test. In this study, only the working of the theory has been illustrated by means of case studies. However, once more advanced operationalizations of the variables used have been developed, and once relations have been explored using formalization of the Political Economy of Information Management, then hopefully the Political Economy of Information Management can be tested in quantitative empirical study.

Applied

However, this study also opens doors for applied research.
Firstly, in this thesis, different information management approaches were identified, characterized by, among other things, different architectures used. With respect to top-down information management approaches, methods are available for strategy formation and architecture specification. In section 6.3, it was concluded that architecture specification in top-down information management is different from the specification of architectures to be used in bottom-up information management (Gazendam, 1997). At this moment, information engineering methods can be used to aid in the development of 'top-down' architectures, but bottom-up information management approaches lack such methodical support for developing architectures. Heesen, Homburg and Offereins (1995, 1997) propose architecture specification based on agreements as to how to communicate, but these proposals need to be elaborated further.

Secondly, in networks of organizations that exchange information, a bottom-up interorganizational information management approach is adopted in many cases. Such an approach necessitates the design, maintenance and evaluation of agreements on how information is exchanged. These activities are described as the organizational *interface* between organizations. Sometimes a separate organizational interface unit executes these activities. However, in general there is a lack of knowledge of how these interfaces should look and how they should be implemented in the organizations that are participating in a network of organizations. Here, applied research is in order to provide guidelines for the development and implementation of these organizational interfaces.

Literature

Advantage. (1997). *Oplossingsplan voor de VSNU inzake het WTR advies.* (Solution for the VSNU concerning the WTR report). Internal report. Rozenburg: Advantage/Utrecht: VSNU.

Aiken, M., J. Hage. (1968). Organizational interdependence and intra-organizational structure. *American Sociological Review*. 33. pp. 912-930.

Aldrich, H.E., P.V. Marsden. (1988). Environments and organizations. In: N.J. Smelser (ed.). *Handbook of sociology*. Newbury Park: Sage Publications. pp. 361-392.

Aldrich, H.E. (1979). *Organizations and environments*. Englewood Cliffs: Prentice-Hall.

Alexander, E.A. (1995). *How organizations act together.* Amsterdam: OPA.

Algemene Rekenkamer. (1987). *Structuurschetsen informatievoorziening.* (Information structure outlines information provision). Den Haag: SDU.

Alstyne, M. van, see Van Alstyne, M.

Ambtelijk Overleg Onderzoek. (1990). *Notitie inzake het onderzoek-informatiebeleid van het W.O.* (Report concerning higher education research information policy). Internal report. Utrecht: VSNU.

Ansoff, H.I.. (1968). *Corporate strategy: An Analytic Approach to Business Policy for Growth and Expansion.* Harmandsworth: Penguin.

Bacharach, S.B. (1987). Organizational Theories: Some Criteria for Evaluation. *Academy of Management Review*. 14(4). pp. 496-515.

Baiman, S. (1982). Agency Research in Managerial Accounting: A Survey. *Journal of Accounting Literature*. pp. 154-213.

Bakos, J.Y., B. Nault. (1997). Ownership and Investment in Electronic Networks. *Information System Research.* pp. 321-341.

Barrett, S, B. Konsynski. (1982). Interorganizational Information Sharing Systems. *MIS Quarterly.* Special Issue (December). pp. 93-105.

Bekkers, V.J.J.M. (1998a). New Forms of Steering and the Ambivalence of Transparency. In: Snellen, I.Th.M., W.B.H.J. van de Donk. *Public Administration in an Information Age.* Amsterdam: IOS Press. pp. 341-358.

Bekkers, V.J.J.M. (1998b). Wiring Public Organizations and Changing Organizational Jurisdictions. In: Snellen, I.Th.M., W.B.H.J. van de Donk. *Public Administration in an Information Age.* Amsterdam: IOS Press. pp. 57-77.

Bemelmans, T.M.A. (1987). *Bestuurlijke informatiekunde en automatisering.* (Management information systems and computerization). Leiden: Stenfert Kroese.

Benbasat, I., D.K. Goldstein, M. Mead. (1987). The Case Research Strategy in Studies of Information Systems. *MIS Quarterly.* September. pp. 369-386.

Benjamin, R.I., D.W. de Long, M.S. Scott Morton. (1990). Electronic Data Interchange: How Much Competitive Advantage? *Long Range Planning.* 23(1). pp. 29-40.

Bensaou, M., N. Venkatraman. (1996*).* Interorganizational relationships and information technology: a conceptual synthesis and a research framework. *European Journal of Information Systems.* 1996(5). pp. 84-91.

Benson, J.K. (1975). The Interorganizational Network as a Political Economy. *Administrative Science Quarterly. pp.* 229-249.

Beynon-Davies, P. (1994). Information Management in the British National Health Service: The Pragmatics of Strategic Data Planning. *International Journal of Information Management.* 14(2). pp. 84-94.

Bijsterveld, M.J.L. van. (1997). *Integraal automatiseren: de kloof tussen retoriek en realiteit.* (Integral information systems development: the gap between rhetoric and reality). Delft: Eburon.

Binsbergen, P.A., H.F. de Boer, H.P. Potman, F.A. van Vught, A.M. Bruggert. (1991). *Hoopvol perspectief of ijdele hoop?* (Promising perspective or idle hope?). Zoetermeer: Ministerie van Onderwijs en Wetenschappen.

BIOS-3. (1995). *Terug naar de toekomst : over het gebruik van informatie en informatie- en communicatietechnologie in de openbare sector*. (Back to the Future: on the use of information and information and communication technology in the public sector). Den Haag : Ministerie van Binnenlandse Zaken, 1995.

Blau, P.M., C.M. Falbe, W. McKinley, P.K. Tracy. (1976). Technology and organization in manufacturing. *Administrative Science Quarterly*. March. pp. 20-40.

Boersma, S.K.Th., O.A.M. Fischer. (1987). *Structureren van het ongestructureerde: Bedrijfskunde in praktijk.* (Structuring disorder: organization science in practice). Groningen: OFIR.

Boersma, S.K.Th. (1989). *Beslissingsondersteunende systemen: Een praktijkgerichte ontwikkelingsmethode.* (Decision support systems: A practice-oriented development method). Schoonhoven: Thesis Publishers.

Boesjes-Hommes, R.W. (1970). *De geldige operationalisering van begrippen.* (The valid operationalization of constructs). Meppel: Boom.

Bogt, H.J. ter. (1998). *Neo-institutionele economie, en verzelfstandiging van overheidsorganisaties : overwegingen voor verzelfstandiging en effecten op efficientie en financieel-economische sturing*. (Neo-institutional economics, management control and autonomization of governmental organizations). Capelle aan den IJssel : Labyrint Publication.

Boone, C., A. Verbeke. (1991). Strategic Management and Vertical Disintegration: A Transaction Cost Approach. In: Thépot, J., R.-A. Thiétart. *Microeconomic Contributions to Strategic Management.* Amsterdam: North Holland. pp. 185-205.

Borys, B., D.B. Jemison. (1989). Hybrid arrangements as Strategic Alliances: Theoretical Issues in Organizational Combinations. *Academy of Management Review.* 14(2). pp. 234-249.

Bosch, F.A.J. van den. (1993). Ontwikkelingen in de wetenschappelijke benadering van strategie- en omgevingsvraagstukken (1910-1990): History Matters! (Developments in the scientific approaches to strategic and environmental matters [1910-1990]: History Matters!). In: H. van Driel (ed.). *Ontwikkelingen van bedrijfskundig denken en doen: een Rotterdams perspectief.* (Development of management science thinking and practice: The Rotterdam Point of View). Delft: Eburon.

Bosman, A. (1977). *Een metatheorie over het gedrag van organisaties.* (A meta-theory of organizational behavior). Leiden: Stenfert-Kroese.

Bowers, V. (ed.). (1966). *Studies on behavior in organizations.* Athens (Ga.): University of Georgia Press.

Boxum, J.L. (1997). *Algemene wetgeving voor zelfstandige bestuursorganen.* (A general law for independent administrative bodies). Deventer: Kluwer.

Brancheau, J.C., J.C. Wetherbe. (1987). Key issues in information systems management. *MIS Quarterly*. March. Pp 23-36.

Breukel, A.W.V. (1996). *Strategic IT, but not by ITself.* Groningen: SOM.

Broekhuizen E.H. (1988). *Minder plannen, meer planning?* (Less plans, more planning?). In: Lieshout, W.C.M. (ed.). Bestuur en Meesterschap. Opstellen over samenleving, staat en sturing. (Administration and Mastership. Essays on Society, State and Control). The Hague: SDU.

Brynjolfsson, E. (1994). Information Assets, Technology and Organization. *Management Science*. 40(12). pp. 1645-1662.

Brynjolfsson, E., T.W. Malone, V. Gurbaxani, A. Kambil. (1993). Does Information Technology Lead to Smaller Firms? *Management Science*. 40(12). pp. 1628-1644.

Buland, T., H. Finne, S. Helmers, U. Hoffmann, J. Hofmann. (1997). *Management and New Technologies*, Proceedings from the COST A3 workshop Trondheim, Norway, 22-24 November 1995. Luxembourg: Office for Official Publications of the European Communities.

Burns, R., G. Stalker. (1961). *The management of innovations.* London: Tavistock.

Buurmeijer, J.F. (1993). *Parlementaire enquête Uitvoeringsorganen sociale verzekeringen.* (Report Parlementary Research Commission). Den Haag: Sdu uitgeverij Plantijnstraat.

Cap Gemini Data Overheid. (19XX). *Onderzoek naar een theoretisch model voor sectorale verwijsindexen ten behoeve van persoonsinformatievoorziening. Eindrapportage*. (Study of a theoretical model for sectoral reference indices for personal data information systems. Final report). Internal report, ordered by the Ministry of the Interior.

Cash, J., B. Konsynski. (1985). IS Redraws Competitive Boundaries. *Harvard Business Review*. 64(2). pp. 134-142.

Cash, J.I, F.W. McFarlan, J.L. McKenney. (1988). *Corporate Information Systems Management. The Issues Facing Senior Executives.* Homewood: Irwin.

Chandler, A. (1962). *Strategy and structure: Chapters in the history of American industrial enterprise.* Cambridge: MIT Press.

Chisholm, D. (1989). *Coordination without hierarchy: informal structures in multiorganizational Systems*. Berkeley [California]: University of California Press.

Ching, C., C.W. Holsapple, A.B. Whinston. (1996). Toward IT support for coordination in network organizations. *Information & Management* .1996(30). pp. 179-199.

Clemons, E.K., S.P. Reddi, M.C. Row. (1993). The Impact of Information Technology on the Organization of Economic Activity: The "Move to the Middle" Hypothesis. *Journal of Management Information Systems,* 10(2), pp. 9-35.

Copeland, D., J. McKenney. (1988). Airline reservation systems: lessons from history. *MIS Quarterly.* 12(3). pp. 353-370.

Cunningham, C., C. Tynan. (1993). Electronic Trading, Inter-organizational Systems and the Nature of Buyer-Seller Relationships: The Need for a Network Perspective. *International Journal of Information Management.* 13. pp. 3-28.

Cyert, R.M., J.D. March. (1963). *A Behavioral Theory of the Firm.* Englewood Cliffs: Prentice-Hall.

Danziger, J., W. Dutton, R. Kling, K.L. Kraemer. (1982). *Computers and Politics: High Technology in American Local Governments.* New York: Columbia University Press.

Davenport, T.H., R.G. Eccles, L. Prusak. (1992). Information Politics. *Sloan Management Review.* Fall. pp. 53-65.

Davidow, W.H., M.S. Malone. (1992). *The Virtual Corporation: Structuring and Revitalizing the Corporation for the 21st Century.* New York: Harper Business.

Davis, G., M.H. Olsen. (1985). *Management Information Systems. Conceptual Foundations, Structure, and Developments.* New York: McGraw-Hill.

De Jong, W.M., see Jong, W.M. de

De Looff, L.A. see Looff, L.A. de

Delehanty, G. (1967). Computers and organizational structure in life-insurance firms: The internal and external environment. In: Meyers, C.A. *The Impact of Computers on Management.* Cambridge: MIT Press.

Den Hartog, F, see Hartog, F. den

Denzin, N.K. (1978). *Sociological Methods: A Sourcebook.* New York: McGraw-Hill.

Doelen, F.C.J. van der, P.-J. Klok. (1989). Beleidsinstrumenten. (Policy instruments). In: Hoogerwerf, A. *Overheidsbeleid.* (Government policy). Alphen aan den Rijn: Samsom.

Donaldson, L. (1995). *American anti-management theories of organization.* Cambridge: Cambridge University Press.

Douglas, M. (1995). Converging on Autonomy: Anthropology and Institutional Economics. In: Williamson, O.E. *Organization theory. From Chester Barnard to the Present and Beyond.* Oxford: Oxford University Press.

Douma, S., A. Schreuder. (1992). *Economic approaches to organizations.* London: Prentice-Hall.

Drazin, R, A.H. Van de Ven. (1985). Alternative forms of fit in contingency theory. *Administrative Science Quarterly.* 30. pp. 514-539.

Drucker, P.F. (1987). The Coming of the New Organization. *Harvard Business Review.* Jan-Feb. 1988. pp. 45-53.

Earl, M.J. (1989). *Management strategies for information technology.* New York: Prentice-Hall.

Ebers, M. (1992). *Transaction scale and scope: how organizations get hooked on interorganizational systems.* Paper prepared for ESF Planning Workshop, Milano.

Eggertson, T. (1990). *Economic behavior and institutions.* Cambridge: Cambridge University Press.

Eisenhardt, K.M. (1989). Building Theories from Case Study Research. *Academy of Management Research.* 14(4). pp. 532-550.

Elg, U., U. Johansson. (1997). Decision Making in Inter-firm Networks as a Political Process. *Organization Studies.* 18(3). pp. 361-384.

Emerson, R.M. (1962). Power dependence relations. *American Sociological Review.* 27 (February). pp. 31-40.

Finnegan, P., S. Ní Longaigh. (1996). *Pan National Corporations: Control, Co-ordination and Information Technologies.* (Internal working paper). Cork: Executive Systems Research Centre, University College.

Finnegan, P. R. Galliers, P. Powell. (1997). *Planning Inter-Organisational Systems: A Mapping Study.* (Internal working paper). Cork: Executive Systems Research Centre, University College.

Fischer, S. (1977). Long Term Contracting, Sticky Prices, and Monetary Policy: Comment. *Journal of Monetary Economics.* 7. pp. 31.

Fitzgerald, E.P. (1993). Success measures for information systems strategic planning. *Journal of Strategic Information Systems.* pp. 335-350.

Franssen, M.P.M. (1997). *Some contributions to methodological individualism in the social sciences.* Delft: Technical University of Delft.

Fredriksson, O., M. Vilgon. (1996). Evolution of inter-organizational information systems in industrial distribution: the cases of Luna and Pappersgruppen. *European Journal of Information Systems.* 1996(5). pp. 47-61.

Frissen, P.H.A. (1989). *Bureaucratische cultuur en informatisering* (Bureaucratic culture and computerization). Den Haag: SDU.

Furubotn, E.G., S. Pejovich. (1974). *The Economics of Property Rights.* Cambridge: Cambridge University Press.

Galliers, R.D. (1987). *Information Systems Planning in Britain and Australia in the mid-1980s: key success factors.* (Unpublished Ph.D. thesis). London: London School of Economics and Political Science.

Galliers, R.D. (1993). IT strategies: beyond competitive advantage. *Journal of Strategic Information Systems.* pp. 283-291.

Gazendam, H.W.M. (1987). Vier wijzen van aanpak van informatieplanning. (Four approaches towards information planning). In: Boersma, S.K.Th, O.A.M. Fischer. *Structureren van het ongestructureerde: Bedrijfskunde in praktijk.* (Structuring disorder: organization science in practice). Groningen: OFIR.

Gazendam, H.W.M. (1993). *Variety Controls Variety.* Groningen: Wolters-Noordhoff.

Gazendam, H.W.M. (1997). *Voorbij de dwang der techniek: Naar een pluriforme bestuurlijke informatiekunde.* (Beyond technological coercion: towards pluriform management information systems). Inaugural speech. Enschede: Twente University.

Gazendam, H.W.M., V.M.F Homburg. (1996). Emergence of Multi-Actor Systems: Aspects of Coordination, Legitimacy and Information Management. In: *Proceedings of the COST A3 Conference 'Management and New Technologies'*, 22-24 June, Madrid.

Gazendam, H.W.M., D.J. Schaap. (1994). *Het gebruik van Feiten en Cijfers.* (Use of Facts & Figures). The Hague: Ministry of Science and Education.

George, J.F., J.L. King. (1991). Examining the computing and centralisation debate. *Communications of the ACM.* 27(7). pp. 650-665.

Geuns, R. van, G. Homburg, M. Hulshof, T. Visser. (1993). *Het recht op bijstand. De mazen van het vangnet.* (The right to social security. Through the loopholes in the law). Den Haag: VUGA.

Goodhue, D.L., L.J. Kirsch, J.A. Quillard, M.D. Wybo. (1992). Strategic Data Planning: Lessons from the Field. *MIS Quarterly.* 1992(3). pp. 11-34.

Goodhue, D.L., M.D. Wybo, L.J. Kirsch. (1992). The Impact of Data integration on the Costs and Benefits of Information Systems. *MIS Quarterly.* 16(3). pp. 293-311.

Goodhue, D.L., J.A. Quillard, J.F. Rockart. (1988). Managing The Data Resource: A Contingency Perspective. *MIS Quarterly.* Sept. pp. 373-391.

Grandori, A. (1997). An Organizational Assessment of Interfirm Coordination Modes. O*rganization Studies.* 18(6). Pp . 897-925.

Grijpink, J.H.A.M. (1997). *Keteninformatisering, met toepassing op de justitiële bedrijfsketen.* (Value chain informatization, with application to the juridical supply chain). Den Haag: SDU.

Grossman, S., O. Hart (1986). The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration. *Journal of Political Economy.* 24(4). pp. 691-719.

Grover, V., A.L. Lederer, R. Sabherwal. (1988). Recognizing the Politics of MIS. *Information & Management.* pp. 145-156.

Guetzkow, H. (1966). Relations among organizations. In: Bowers, V. (ed.). *Studies on behavior in organizations.* Athens (Ga.): University of Georgia Press.

Hage, J.C., T.J.M. Bench-Capon, M.J. Cohen, H.J. van den Herik. (1995). *Legal knowledge-based systems: Telecommunications and AI & Law.* Lelystad: Koninklijke Vermande.

Hannan, M.T., J. Freeman. (1977). The population ecology of organizations. *American Journal of Sociology. pp*. 929-964.

Hart, P., D. Estrin (1991). Inter-Organisational Networks, Computer Integration, and Shifts in Interdependence: The Case of the Semiconductor Industry. *ACM Transactions on Information Systems.* 9(4). pp. 370-398.

Hart, O., J. Moore. (1990). Property Rights and the Nature of the Firm. *Journal of Political Economy.* 98(6). pp. 1119-1158.

Hart, O. (1995). An Economist's Perspective on the Theory of the Firm. In: O.E. Williamson. *Organization theory. From Chester Barnard to the Present and Beyond.* Oxford: Oxford University Press.

Hartog, F. den, E. van Sluijs. (1995). *Onderzoek in organisaties. Een methodologische reisgids.* (Research in organizations. A methodological roadmap). Assen: Van Gorcum.

Haselhoff, F. (1977). *Ondernemingsstrategie, een dilemma.* (Organizational strategy, a dilemma). Alphen aan den Rijn: Samsom.

Heesen, H.C., V.M.F. Homburg, M. Offereins. (1995). LACA: An Architecture for Legal Agents. In: Hage, J.C., T.J.M. Bench-Capon, M.J. Cohen, H.J. van den Herik. (1995). *Legal knowledge-based systems: Telecommunications and AI & Law.* Lelystad: Koninklijke Vermande.

Heesen, H.C., V.M.F. Homburg, M. Offereins. (1997). An agent view on law. *Artificial Intelligence & Law.* 5(4). pp. 323-340.

Heijden, H. van der. (1995). *Towards Organisational Redesign in EDI Partnerships.* Delft: Eburon.

Hermans, H.L.C. (1986). *De bestuurlijke zelfstandigheid van de universiteiten in Nederland.* (Administrative autonomy of universities in the Netherlands). Zwolle: Tjeenk Willink.

Henderson, J. (1990). Plugging into strategic partnerships: the critical I/S connection. *Sloan Management Review.* 31(3). pp. 7-18.

Hodgson, G.M. (1988). *Economics and institutions: A Manifesto for a New Modern Institutional Economics.* Oxford: Oxford University Press.

Hoffmans, J.G.F.M. (1989). *Veranderingen in de social security. Op weg naar een geprivatiseerd stelsel?* (Changes in social security. Towards a privatized system?). Zwolle: Tjeenk Willink.

Holland, C.P., G. Lockett. (1994). Strategic Choice and Interorganisational Information Systems. *Proceedings of the Twenty-Seventh Annual Hawaii International Conference on System Sciences. pp.* 405-415.

Holland, C.P., G. Lockett, I.D. Blackman. (1992). Planning for Electronic Data Interchange. *Strategic Management Journal.* 13. pp. 539-550.

Homburg, V.M.F., H.W.M. Gazendam (1997). The Management of Variety. In: Buland, T., H. Finne, S. Helmers, U. Hoffmann, J. Hofmann. *Management and New Technologies.* Luxembourg: Office for Official Publications of the European Communities. pp. 99-115.

Homburg, V.M.F., M.F.W.H.A. Janssen, M.J.J. Wolters. (1998). *Electronic Commerce: Crossing Boundaries 1998.* Rotterdam: Edispuut.

Hoogerwerf, A. (1989). *Overheidsbeleid.* (Government policy). Alphen aan den Rijn: Samsom.

Huang, K. (1998). *Organizational aspects of EDI: A norm-oriented approach.* Enschede: Twente University.

Huysman, M.H. (1996). *Dynamics of organizational learning.* Amsterdam: Thesis Publishers.

Jacobs, A.T.J.M. (1997). *Veranderend sociaal zekerheidsrecht.* (The Changing System of Social Security). Lelystad: Koninklijke Vermande.

Jensen, M.C., W.H. Meckling. (1976). Theory of the Firm: Managerial behavior, agency costs and ownership structures. *Journal of Financial Economics. pp.* 305-360.

Johnston, H.R., M.R. Vitale. (1988). Creating Competitive Advantage with Interorganizational Information Systems. *MIS Quarterly.* (6). pp. 153-165.

Johnston, K.D., P.W. Lawrence. (1996). Integrating information technology divisions in a bank merger. Fit, compatibility and models of change. *Journal of Strategic Information Systems.* 1996(5). pp. 189-211.

Jong, de W.M. (1994). *The Management of Informatization.* Groningen: Wolters-Noordhoff.

Kaplan, A. (1964). *The Conduct of Inquiry.* San Francisco: Chandler.

Kastelein, J. (1985). *Modulair organiseren doorgelicht.* (A review of modular organization). Groningen: Wolters-Noordhoff.

Katz, D., R.L. Kahn. (1978). *The Social Psychology of Organizations.* New York: Wiley.

Keen, P.G.W., M.S. Scott Morton. (1978). *Decision support systems (An organizational perspective).* Reading: Addison-Wesley.

Kickert, W.J.M. (ed.). (1993). *Veranderingen in management en organisatie bij de rijksoverheid.* (Changes in governmental management and organization). Alphen aan den Rijn: Samsom H.D. Tjeenk Willink.

Kickert, W.J.M., E.-H. Klijn, J.F.M. Koppenjan. (1997). *Managing Complex Networks: Strategies for the Public Sector.* London: Sage.

Killian W., M. Wind. (1998). Changes in Interorganizational Coordination and Cooperation. In: Snellen, I.Th.M., W.B.H.J. van de Donk. *Public Administration in an Information Age.* Amsterdam: IOS Press. pp. 273-291.

King, J.L., B.R. Nault. (1998). *High Level Requirements.* (Research Note). Http://www.ics.uci.edu/~king/hlr.html.

King, W.R. (1988). How effective is your information systems planning? *Long Range Planning.* 21(5). pp. 103-112.

Klatzky, S.R. (1970). Automation, size and the locus of decision-making: The Cascade Effect. *Journal of Business.* April. pp. 141-151.

Klein, B. (1988). Vertical integration as organizational ownership: the Fisher Body - General Motors relationship revisited. *Journal of Law, Economics and Organization.* 4(1). pp. 199-213.

Klein, B., R. Crawford, Alchian, A. (1978). Vertical Integration, Appropriable Rents and the Competitive Contracting Process. *Journal of Law and Economics. pp.* 297-326.

Klein, S. (1996). The configuration of inter-organizational relations. *European Journal of Information Systems.* 1996(5). pp. 92-102.

Klijn, E.-H. (1997). Policy Networks and Network Management: A State of the Art. In: Kickert, W.J.M., E.-H. Klijn, J.F.M. Koppenjan. *Managing Complex Networks: Strategies for the Public Sector*. London: Sage. pp. 14-34.

Knights, D., F. Murray. (1992). Politics and Pain in Managing Information Technology. A Case Study in Insurance. *Organization Studies.* 13(2). pp. 211-228.

Koenig, C., G. van Wijk. (1991). Inter-firm Alliances: The Role of Trust. In: Thépot, J., R.-A. Thiétart. *Microeconomic Contributions to Strategic Management.* Amsterdam: North Holland. pp. 169-183.

Konsynski, B.R., W. McFarlan. (1990). Information partnerships – Shared Data, Shared Scale. *Harvard Business Review*. Sept-Oct. pp. 114-120.

Konsynski, B.R. (1993). Strategic Control in the Extended Enterprise. *IBM Systems Journal.* 32(1). pp. 111-142.

Krickx, G.A. (1991). Vertical Integration: Why Transaction Cost and Resource Dependence Explanations Can't Easily Be Separated. In: Thépot, J., R.-A. Thiétart. *Microeconomic Contributions to Strategic Management.* Amsterdam: North Holland. pp. 143-167.

Krupp, S. (1961). *Pattern in organization analysis: a critical examination*. New York: Chilton Company.

Kubicek, H. (1975). *Informationstechnologie und organisatorische Regelungen. Konzeptionele Grundlagen einer empirischen Theorie der organisatorischen Gestaltung der Benutzerbereichs in computergestützten Informationssystemen.* (Information technology and organizational procedures. Conceptual foundations of an empirical theory of use of information systems in organizations). Berlin: Dunker, Humbolt.

Kubicek, H. (1995). The organizational gap in large-scale EDI systems. In: Williams, R. *COST A4: The social shaping of interorganizational IT systems and electronic data interchange. Proceedings of the PICT/COST A4. International Research Workshop*. Luxembourg: Office for Official Publications of the European Communities. pp. 75-108.

Kumar, K., H.G. van Dissel. (1995). Conflicten en samenwerking bij interorganisatorische informatiesystemen. (Conflicts and cooperation in interorganizational information systems). *Informatie.* 37(11). pp. 774-781.

Kumar, K., H.G. van Dissel. (1996). Sustainable collaboration: managing conflict and collaboration in inter-organizational systems. *MIS Quarterly*. 20(3). pp. 279–300.

Künneke, R.W. (1991). *Op armlengte van de overheid: een theoretisch en empirisch onderzoek naar de effecten van verzelfstandiging op de efficientie van openbare nutsbedrijven.* (At arm's length of government: a theoretical and empirical study of the effects of autonomization on efficiency of public utility firms). Enschede: Twente University.

Lawrence, P.R., J.W. Lorsch. (1967). *Organization and environment.* Boston: Harvard School of Business Administration Press.

Lee, H.C. (1965). *The Impact of EDP upon the pattern of business organizations and administration.* Albany: State University of New York.

Lederer, A., V. Sethi. (1991). Critical dimensions of strategic information systems planning. *Decision Sciences.* 22(1). pp. 104-119.

Levinson, N.S. (1994). Interorganizational information systems: new approaches to global development. *Information & Management.* 26. pp. 257-263.

Lieshout, W.C.M. (ed.). *Bestuur en Meesterschap. Opstellen over samenleving, staat en sturing.* (Administration and Mastership. Essays on Society, State and Control). The Hague: SDU.

Litwak, E., L.F. Hylton. (1962). Interorganizational analysis: A hypothesis on coordination agencies. *Administrative Science Quarterly.* 6 (June). pp. 395-426.

Looff, L.A. de. (1997). *Information systems outsourcing decision making: a managerial approach.* Hershey: Idea Group.

Madnick, S.E. (1991). The Information Technology Platform. In: M.S. Scott Morton. *The Corporation of the 1990s.* New York: Oxford University Press. pp. 27-60.

Mahoney, J.T. (1992). The choice of organizational form: vertical financial ownership versus other methods of vertical integration. *Strategic Management Journal. pp.* 559-584.

Malone, T.W., J.F. Rockart. (1992). Information Technology and the New Organization. *Proceedings of the Hawaii International Conference on System Sciences.* Volume IV. pp. 636-643.

Malone, T.W., J. Yates, R.I. Benjamin. (1987). Electronic Markets and Electronic Hierarchies. *Communications of the ACM.* 30(6). pp. 484-497.

March, J.A., H.A. Simon. (1958). *Organizations.* New York: Wiley.

Markus, M.L. (1983). Politics and MIS Implementation. *Communications of the ACM*. pp. 430-440.

Markus, M.L., D. Robey. (1988). Information technology and organizational change: causal structures in theory and research. *Management Science.* 34(5). pp. 583-598.

Martin, J., J. Leben (1989). *Strategic Information Planning Methodologies.* Englewood Cliffs: Prentice-Hall.

Merali, Y., P. McKiernan. (1993). The strategic positioning of information systems in post-acquisition management. *Journal of Strategic Information Systems.* 2(2). pp. 105-124.

Meyer, M.W. (1968). Automation and bureaucratic structure. *American Journal of Sociology.* pp. 256-264.

Meyer M.W., L.G. Zucker. (1989). *Permanently failing organizations.* Newbury Park: Sage.

Meyers, C.A. (ed.). (1967). *The Impact of Computers on Management.* Cambridge: MIT Press.

Miles, R.E., C.C. Snow. (1992). Causes of Failure in Network Organizations. *California Management Review.* 34(4). pp. 53-72.

Mills, C.W. (1956). *The Power Elite.* New York: Oxford University Press.

Mintzberg, H. (1990). The design school: reconsidering the basic premises of strategic management. *Strategic Management Journal.* March 1990. pp. 171-190.

Mintzberg, H. (1994). *The Rise and Fall of Strategic Planning.* Englewood-Cliffs: Prentice-Hall.

Morgan, G. (1986). *Images of organization.* Newbury Park: Sage.

Morgan, G. (1988). *Riding the Waves of Change.* San Francisco: Jossey-Bass Publishers.

Morgan, G. (1989). *Creative Organization Theory: A Resource Theory.* California: Sage Publications.

Mulford, C.L., D.L. Rogers. (1982). *Definitions and Models.* In: Rogers, D.L., D.A. Whetton (1982). *Interorganizational Coordination: Theory, Research and Implementation.* Ames: Iowa State University Press.

Narayanan, V.K., Liam Fahey. (1982). The Micro Politics of Strategy Formulation. *Academy of Management Review.* 7(1). pp. 25-34.

NBOI. (1996). *Jaarverslag 1996*. (Annual Report 1996). Amsterdam: NBOI.

Neelen, G.H.J.M. (1993). *Principal-agent relations in non-profit organizations.* Enschede: Twente University.

Negandhi, A.R. (1969). *Interorganizational Theory.* Kent: Center for Business and Economic Research.

Nidumolu, S.R. (1995). Interorganizational information systems and the structure and climate of seller-buyer relationships. *Information & Management*. 28(2). pp. 89-106.

Nielen, G.C. (1993). *Van informatie naar informatiebeleid.* (From information to information policy). Alphen aan den Rijn: Samsom.

Nohria, N., R.G. Eccles. (1992). *Networks and organizations. Structure, Form and Action.* Boston: Harvard Business School Press.

Noordam, F.M. (1997). *Sociale zekerheidsrecht.* (Social Security Law). Deventer : Kluwer.

Noordegraaf, M. (1993). Sturen op afstand in het hoger onderwijs. (Steering from a distance in Higher Education). In: Kickert, W.J.M. (ed.). *Veranderingen in management en organisatie bij de rijksoverheid.* (Changes in governmental management and organization). Alphen aan den Rijn: Samsom H.D. Tjeenk Willink. pp. 77-90.

Nooteboom, B. (1993). *Trust, opportunism and governance: a process and control model.* Internal SOM research report. Groningen: RUG.

Nooteboom, B. (1996). Trust, Opportunism and Governance: a Process and Control Model, *Organization Studies*, 17(6). pp. 985-1010.

Oliver, C. (1990). Determinants of interorganizational relations: integration and future directions. *Academy of Management Review.* 15(2). pp. 241-265.

Parsons, T. (1951). *The Social System.* New York: The Free Press.

Parsons, T. (1960). *Structure and Process in Modern Society.* New York: The Free Press.

Patton, M.Q. (1990). *Qualitative Evaluation and Research Methods.* Newbury Park: Sage.

Péli, G., J. Bruggeman, M. Masuch, B. Ó Nualláin. (1994). A Logical Approach to Formalizing Organization Ecology. *American Sociological Review*. 59 (4). pp. 571-593.

Pennings, J.M. (1981). Strategically interdependent organizations. In: Nystrom, P.C, W.H. Starbuck. *Handbook of organizational design.* Oxford: Oxford University Press.

Penrose, E.T. (1959). *The Theory of the Growth of the Firm.* Oxford: Basil Blackwell.

Perrow, C. (1970). *Organizational analysis: a sociological view.* London: Tavistock.

Pfeffer, J. (1997). *New Directions for Organization Theory. Problems and Prospects.* Oxford: Oxford University Press.

Pfeffer J., G.R. Salancik. (1978). *The external control of organizations.* New York: Harper & Row.

Poel, K.G. van der (1995). *Theory and practice of information strategy.* Tilburg: Tilburg University Press.

Porter, M.E. (1980). *Competitive Strategy*. New York: The Free Press.

Porter, M.E. (1985). *Competitive Advantage*. New York: The Free Press.

Porter, M.E., V.E. Millar (1985). How information gives you competitive advantage. *Harvard Business Review.* July-August. pp. 149-160.

Powell, W.W. (1987). Hybrid Organizational Arrangements: New Form or Transitional Development. *California Management Review.* 30(1). pp. 67-87.

Pyburn, J. (1983). Linking the MIS plan with corporate strategy: an explorative study. *MIS Quarterly.* 7(2). pp. 1-14.

Rackoff, N., C.Wiseman, W.A. Ullrich. (1985). Information Systems for Competitive Advantage: Implementation of a Planning Process. *MIS Quarterly. pp.* 285-294.

Rasmussen, J. Brehmer, J. Leplat (eds.). (1991). *Distributed Decision Making (Cognitive Models for Cooperative Work)*. Chicester: John Wiley and Sons.

Reekers, N., S. Smithson. (1996). The role of EDI in interorganizational coordination in the European automotive industry. *European Journal of Information Systems.* 1996(5). pp. 120-130.

Ribbers, P.M.A., C.F. Ekering, M.G. van Zutphen. (1994). EDI Verhoogt de Transactiekosten. (EDI Raises Transaction Costs). *Bedrijfskunde.* 66(2). pp. 66-72.

Ring, P.S., A.H. Van de Ven. (1994). Structuring cooperative relationships between organizations. *Strategic Management Journal.* 13. pp. 483-498.

RINIS. (1996a). *RINIS Concept*. (The Concept of RINIS). Amstelveen: RINIS.

RINIS (1996b). *SAP: Het sectorale aanspreekpunt.* (SAP: The central verification agency). Amstelveen: RINIS.

RINIS (1996c). *Specificatie van de RINIS server*. (Specification of the RINIS server). Amstelveen: RINIS.

RINIS (1996d). *Achtergrondinformatie bij de RINIS server.* (Background information on the RINIS server). Amstelveen: RINIS.

RINIS (1996e). *Context of the RINIS server.* (Context of the RINIS server). Amstelveen: RINIS.

RINIS (1997). *Businessplan Stichting RINIS.* (Business plan RINIS Foundation). Amstelveen: RINIS.

Robey, D. (1977). Computers and management structure: Some empirical findings re-examined. *Human Relations. pp.* 963-976.

Robson, W. (1993). *Strategic management and information systems : an integrated approach.* London : Pitman Publishing.

Roebroek, J. (1986). *De politieke toekomst van de sociale zekerheid. Politieke eisen en maatschappelijke krachtsverhoudingen.* (The political future of social security. Political demands and societal forces). Den Haag: Ministerie van Sociale Zaken en Werkgelegenheid.

Rogers, D.L., D.A. Whetten (eds.). (1982). *Interorganizational Coordination: Theory, Research and Implementation*. Ames: Iowa State University Press.

Rogier, J.H. (1998). *De wisselwerking tussen markt en organisatie.* (Balancing market and organization). Groningen: SOM.

Ruohonen, M. (1991). Stakeholders of strategic information systems planning: theoretical concepts and empirical examples. *Journal of Strategic Information Systems.* 1(1). pp. 15-28.

Sabherwal, R., L. Vijayasarathy. (1994). An empirical investigation of the antecedents of telecommunication-based interorganizational systems. *European Journal of Information Systems*. pp. 268-284.

Schmidt, K. (1991). Cooperative Work: A Conceptual Framework. In: Rasmussen, J. Brehmer, J. Leplat (eds.). *Distributed Decision Making (Cognitive Models for Cooperative Work)*. Chicester: John Wiley and Sons.

Schrama, G.H.I. (1991). *Keuzevrijheid in organisatievormen: Strategische keuzen rond organisatiestructuur en informatietechnologie bij het invoeren van personeelsinformatiesystemen bij grote gemeenten.* (Freedom of choice in organizational forms: strategic choices regarding organizational structure and information technology surrounding implementation of personnel information systems in large municipalities). Enschede: Twente University.

Schwarzer, B., S. Zerbe, H. Krcmar. (1997). An Eclectic Framework for Understanding New Organizational Forms. In: Buland, T., H. Finne, S. Helmers, U. Hoffmann, J. Hofmann. *Management and New Technologies*, Proceedings from the COST A3 workshop Trondheim, Norway, 22-24 November 1995. Luxembourg: Office for Official Publications of the European Communities.

Scott Morton, M.S. (1991). *The Corporation of the 1990s.* New York: Oxford University Press.

Scott, W.R. (1987). *Organizations (rational, natural and open systems).* Englewood Cliffs: Prentice-Hall.

Selznick, P. (1957). *Leadership in Administration – A Sociological Interpretation.* New York: Harper & Row.

Senn, J.A. (1994). A Framework for International Information Systems Research. In: *Proceedings of the Twenty-Seventh Annual Hawaii International Conference on System Sciences. pp.* 444-452.

Shanks, G. (1997). The challenges of strategic data planning in practice: an interpretative case study. *Journal of Strategic Information Systems.* 1997(6). pp. 69-90.

Simon, H.A. (1976). *Administrative behavior*. New York: The Free Press.

Simons, J.L., G.M.A. Verheijen. (1991). *Informatiestrategie als managementopgave: Planning, ontwikkeling en beheer van de informatieverzorging op basis van Information Engineering* (Information strategy as management task: planning, development and control of information provision based on Information Engineering). Deventer: Stenfert Kroese.

Smelser, N.J. (ed.). (1988). *Handbook of sociology*. Newbury Park: Sage Publications.

Snellen, I.Th.M. (1975). *Benaderingen in strategieformulering.* (Approaches in strategy formation). Alphen aan den Rijn: Samsom.

Snellen, I.Th.M., W.B.H.J. van de Donk. (1998). *Public Administration in an Information Age (A Handbook).* Amsterdam: IOS Press.

Stegwee, R.A. (1992). *Division for conquest: Decision Support for Information Architecture Specification.* Groningen: Wolters-Noordhoff.

Steijn, A.J., M.C. de Witte. (1996). 'Chaotic' patterns in the upgrading of labor. A test of the internal-differentiation hypothesis. In: *Proceedings of the COST A3 Conference 'Management and New Technologies'*, 22-24 June, Madrid.

Steinfield, C., R. Kraut, A. Plummer. (1996). The Impact of Interorganizational Networks on Buyer-Seller Relationships. *Journal of Computer Mediated Communication. (Web Journal).* Http://jcmc.huji.ac.il.

Strassman, P.A. (1985). *Information Payoff, The Transformation of Work in the Information Age.* New York: The Free Press.

Strien, P. van. (1986). *Praktijk als wetenschap*. (Practice as Science). Assen: Van Gorcum.

SUAA. (1989). *Inventarisatie Informatievoorziening Wetenschappelijk Onderzoek*. (Taking Stock of Information Provision Scientific Research). Internal report. Amsterdam: SUAA.

Suomi, R. (1990). *Assessing the feasibility of interorganizational information systems on the basis of the transaction cost approach.* Turku: Kirjapaino Grafia Oy.

Swanborn, P.G. (1984). *Methoden van sociaal-wetenschappelijk onderzoek: inleiding en ontwerpstrategieën.* (Social Science Methods: Introduction and Design Strategies). Meppel: Boom.

Swatman, P.M.C., P.A. Swatman. (1991). Integrating EDI into the organization's information systems: a model of stages of integration. In: *Proceedings of the 12th International Conference of Information Systems.* New York. December 1991. pp. 1-16.

Ter Bogt, H.J., see Bogt, H.J. ter.

Theeuwes, J.A.M. (1988). *Informatieplanning.* (Information Planning). Deventer: Kluwer.

Thépot, J., R.-A. Thiétart. (1991). *Microeconomic Contributions to Strategic Management.* Amsterdam: North Holland.

Thompson, J.D. (1967). *Organizations in action.* New York: McGraw-Hill.

Tully, S. (1993). The Modular Corporation. *Fortune.* February 8. pp. 106-115.

Tushman, M. (1977). A Political Approach to Organizations. A Review and Rationale. *Academy of Management Review. pp.* 206-216.

Van Alstyne, M., E. Brynjolfsson, S. Madnick. (1995). Why not one big database? Principles for data ownership. *Decision Support Systems.* 15. pp. 267-284.

Van Alstyne, M. (1997). *The State of Network Organization: A Survey of Three Frameworks.* Cambridge: MIT Sloan School of Management. Http://ccs.mit.edu/CCSWP192/CCSWP192.html. (Unpublished research report, forthcoming in Journal of Organizational Computing, 1997, 7(3)).

Van Bijsterveld, M.J.L., see Bijsterveld, M.J.L. van.

Van de Ven, A.H. (1976). On the Nature, Formation and Maintenance of Relations among Organizations. *Academy of Management Review. pp.* 24-36.

Van de Ven, A.H., D.C. Emmett, R. Koenig. (1974). Frameworks for Interorganizational Analysis. *Administrative Sciences Journal.* 5(1). pp. 24-36.

Van den Bosch, F.A.J., see Bosch, F.A.J. van den.

Van der Doelen, F.C.J., see Doelen, F.C.J. van der.

Van der Heijden, H, see Heijden, H. van der.

Van der Poel, P.G., see Poel, P.G. van der

Van der Zaal, G.A.W. see Zaal, G.A.W van der.

Van der Zwaan, A.H., see Zwaan, A.H. van der.

Van Strien, P., see Strien, P. van.

Van Waes, R., see Waes, R. van.

Ven, A.H. van de, see Van de Ven, A.H.

Venkatraman, N., A. Kambil. (1991). The Check's not in the Mail: Strategies for Electronic Integration in Tax Return Filing. *Sloan Management Review.*

Volkskrant. (1998a). Privé gegevens personeel vrij voor commercie. (Personnel Data Available for Commercial Purposes). March 22th.

Volkskrant. (1998b). Drie spelers verdelen sociale zekerheid. (Three players divide social security). March 25th.

Volkskrant. (1998c). Arbeidsbureaus leveren topprestatie. (Job Offices are performing very well). March 31st.

Volkskrant. (1998d). Concurrentie mag in sociale zekerheid. (Emerging Competition in the Social Security System). June 6th.

Vries, P. de (1992). *De lastige verhouding tussen departement en agent.* (The difficult relationship between department and agent). Enschede: Twente University.

VSNU. (1994a). *Definitie-Afspraken Wetenschappelijk Onderzoek.* (Agreements on Definitions of Scientific Research). Internal Report. Utrecht: VSNU.

VSNU. (1994b). *Integrale Informatie. Toelichting op de nieuwe verslaglegging VSNU-kengetallen en Informatie-Afspraak 1994.* (Integral Information. Explanation of the new reports VSNU benchmarks and Information Agreement 1994). Internal Report. Utrecht: VSNU.

VSNU. (1994c). *Quality Assessment of Research.* Internal Report. Utrecht: VSNU.

VSNU. (1996). *CIB-Nota Informatiebeleid 1996.* (CIB-Report Information Policy 1996). Internal Report. Utrecht: VSNU.

VSNU. (1997). *KUOZ-Kengetallen Universitair Onderzoek.* (Benchmarks University Research). Internal Report. Utrecht: VSNU.

Waes, R. van. (1991). *Architectures for information management: a pragmatic approach to architectural concepts and their application in dynamic environments.* Amsterdam: Thesis Publishers.

Wamsley, G.L., M.N. Zald. (1973). *The Political Economy of Public Organizations.* Lexington: Lexington Books.

Wassenaar, D.A.W. (1995). *Informatieplanning in transactioneel perspectief : inzicht in de bestaande informatieplanningsproblemen, uitzicht op verbetering van informatieplanning in de toekomst.* (Information Planning in transactional perspective: insight into existing information planning problems and overview of improvement in the future). Amsterdam: Thesis Publishers.

Webster, J. (1995a). Networks of collaboration of conflict? Electronic data interchange and power in the supply chain. *Journal of Strategic Information Systems.* pp. 31-42.

Webster, J. (1995b). Networks of collaboration of conflict? The development of EDI. In: Williams, R. *COST A4: The social shaping of interorganizational IT systems and electronic data interchange. Proceedings of the PICT/COST A4. International Research Workshop.* Luxembourg: Office for Official Publications of the European Communities.

Whisler, T. (1967). The impact of information technology on organizational control. In: Meyers, C.A. (ed). *The Impact of Computers on Management.* Cambridge: MIT Press.

Wierda, F.W. (1991). *Developing Interorganizational Information Systems.* Delft: Eburon.

Wildavsky, A. (1979). *The politics of the budgetary process.* Boston: Little, Brown and Co.

Williams, R. (1995). *COST A4: The social shaping of interorganizational IT systems and electronic data interchange. Proceedings of the PICT/COST A4. International Research Workshop.* Luxembourg: Office for Official Publications of the European Communities.

Williamson, O.E. (1975). *Markets and hierarchies.* New York: The Free Press.

Williamson, O.E. (1985). *The economic institutions of capitalism.* New York: The Free Press.

Williamson, O.E. (1995). *Organization theory. From Chester Barnard to the Present and Beyond.* Oxford: Oxford University Press.

Woodward, J. (1965). *Industrial Organization.* London: Oxford University Press.

Wetenschappelijk Technische Raad. (1997). *De Nederlandse Onderzoeks Databank Nieuwe Stijl. Systeem voor Lopend Onderzoek Informatie.* (The New Style Dutch Research Data Base. A System for Information on Current Research). Internal Document. Utrecht: Wetenschappelijk Technische Raad.

Wybo, M.D., D.L. Goodhue. (1995). Using interdependence as a predictor of data standards. Theoretical and measurement issues. *MIS Quarterly.* pp. 317-329.

Yin, R.K. (1994). *Case Study Research. Design and Methods.* Newbury Park: Sage Publications.

Zaal, van der, G.A.W. (1997). *De drie strategische kerndimensies van interorganisatorische samenwerking.* (The three strategic core dimensions of interorganizational cooperation). Amsterdam: Thesis Publishers.

Zuurmond, A. (1994). *De infocratie.* (The infocracy). Den Haag: Phaedrus.

Zuurmond, A. (1998). From Bureaucracy to Infocracy: Are Democratic Institutions Lagging Behind? In: Snellen, I.Th.M., W.B.H.J. van de Donk. *Public Administration in an Information Age.* Amsterdam: IOS Press. pp. 259-270.

Zwaan, A.H. van der. (1990). *Organisatie onderzoek.* (Research in organizations). Assen: Van Gorcum.

Samenvatting

Het onderzoek waarover in dit proefschrift wordt gerapporteerd heeft betrekking op verschillende vormen van besluitvorming ten aanzien van informatiesystemen die door meerdere organisaties worden ontwikkeld en gebruikt.

In *hoofdstuk één* worden aanleiding en motivatie van het onderzoek weergegeven en wordt het onderzoeksontwerp geschetst.
De aanleiding en motivatie van het onderzoek komt voort uit een tweetal debatten zoals die al jaren worden gevoerd in de discipline van de bestuurlijke informatiekunde (in het Engels: information systems, of ook wel management information systems).
Het eerste debat heeft betrekking op de samenhang tussen informatietechnologie (IT) en organisationele parameters als centralisatie binnen organisaties. Verschillende auteurs zijn in de loop van de jaren met verschillende, vaak volledig tegenstrijdige verklaringen gekomen.
Het tweede debat heeft betrekking op de samenhang tussen informatie- en telecommunicatietechnologie (ICT) en coördinatievormen tussen organisaties. Ook in dit debat worden verschillende verklaringen voorgesteld.
Aangezien er in verschillende onderzoeken steun wordt gevonden voor strijdige hypothesen, kan worden geconcludeerd dat de theorie achter de verklaringen niet voldoende ontwikkeld is. De motivatie voor het huidige onderzoek is om dieper in te gaan op het tweede debat en theorie te construeren die de relatie tussen ICT en interorganisationele relaties precisieert.

Het onderzoek naar de relatie tussen ICT en interorganisationele coördinatie wordt wel bekritiseerd omdat vaak relatief eenvoudige causaliteit wordt verondersteld, terwijl het ook mogelijk is meer geavanceerde verklaringen te construeren (uitgaande van het zogenaamde ‘emergent perspective’, waarin de samenhang tussen verschillende vormen van ICT en verschillende vormen van interorgansationele coordinatie worden geanalyseerd maar waarin geen uitspraak wordt gedaan over de richting van de causaliteit). Bovendien wordt vaak weinig aandacht gegeven aan de besluitvorming ten aanzien van ICT (in termen van ‘locus of control’) en als dat wel gebeurt, wordt vaak slechts een bepaalde wijze van besluitvorming verondersteld, namelijk een gecentraliseerde, geformaliseerde vorm van besluitvorming.

In het huidige onderzoek wordt daarom ook niet de variabele 'informatie- en communicatietechnologie' bestudeerd, maar de variabele 'strategische besluitvorming ten aanzien van interorganisationele informatiesystemen'. Deze variabele wordt in het onderzoek ook wel aangeduid als 'informatiemanagement van interorganisationele informatiesystemen', of 'interorgansationeel informatiemanagement'. Op deze wijze is het mogelijk om niet zozeer de technologie zelf, maar de sturing en het gebruik van de technologie in een interorganisationele setting te analyseren. De doelstelling van het onderzoek is om meer inzicht te verkrijgen in combinaties van verschillende benaderingen in interorganisationeel informatiemanagement en verschillende vormen van interorganisationele relaties.

De onderzoeksvragen die zijn afgeleid uit deze doelstelling luiden als volgt:

1. Welke informatiemanagementbenaderingen met betrekking tot interorganisationele informatiesystemen kunnen worden gedefinieerd?
2. Welke coördinatievormen tussen organisaties kunnen worden onderscheiden?
3. Welke hypothesen ten aanzien van informatiemanagementbenaderingen en kenmerken van interorganisationele relaties kunnen worden geconstrueerd?
4. Is er empirische validatie voor de hypothesen waarin informatiemanagementbenaderingen en kenmerken van interorganisationele relaties worden gerelateerd?

Het doel van het onderzoek is om te komen tot theorieconstructie en is daarom meer fundamenteel dan toepassingsgericht. Dit gebeurt door:

- bestaande theoriefragmenten te analyseren en waar mogelijk tot een synthese te komen
- gedurende het proces van theorieconstructie verklaringen te confronteren met de empirie.

Aangezien er op voorhand geen bestaande theorie beschikbaar is, en de mogelijkheden tot manipulatie in de praktijk ontbraken, is er met betrekking tot de confrontatie van de theorie met de empirie de keuze gemaakt voor de 'case study' als onderzoeksstrategie. Deze strategie biedt bovendien veel mogelijkheden om theorieconstructie te ondersteunen en is erg geschikt voor het onderzoeken van situaties waarin snel veranderende technologieën een grote rol spelen.

In *hoofdstuk twee* worden de variabelen 'interorganisationeel informatiesysteem' en 'interorganisationeel informatie management' gedefinieerd om een antwoord op de eerste onderzoeksvraag te kunnen geven. Een interorganisationeel informatiesysteem wordt gedefinieerd als een informatiesysteem dat (1) is ingebed in twee of meer organisaties die geen gemeenschappelijke leidinggevenden hebben en (2) gezamenlijk wordt ontwikkeld en gebruikt door de betrokken organisaties. 'Interorganisationeel informatiemanagement' is de (strategische) besluitvorming met betrekking tot de

doelstellingen, prioritisering, ontwikkeling en gebruik van informatiesystemen die zijn ingebed in twee of meer organisaties die geen gezamenlijke leidinggevenden hebben.

Zowel vanuit de organisatietheorie (met betrekking tot ‘strategische besluitvorming’) als uit de informatiesysteem-literatuur (met betrekking tot ‘informatiesystemen’) is het mogelijk informatiemanagement te analyseren. De organisatietheorie, of, meer specifiek, de literatuur over strategievorming, geeft aan dat er verschillende ‘scholen’ van strategievorming bestaan, zoals de ‘design school’, ‘planning school’, ‘positioning school’, ‘entrepreneurial school’, ‘cognitive school’, ‘learning school’, ‘political school’, ‘cultural school’, ‘environmental school’, en de ‘configuration school’. In de informatiesysteem-literatuur worden ook verschillende scholen onderkend, zoals de ‘engineering school’, ‘strategic school’, ‘adaptive evolutionary school’, ‘organizational school’, ‘sociotechnical school’ en de ‘organizational school’.
Deze twee soorten ‘scholen’ blijken echter niet onafhankelijk van elkaar te zijn. Op basis van de achterliggende variabelen ‘besturingsmodel’, ‘functionaliteit en doelstellingen’ en ‘architectuur’ blijkt het mogelijk een spectrum te onderscheiden met als polen ‘top-down’ informatiemanagement en ‘bottom-up’ informatiemanagement.

‘Top down’ informatiemanagement heeft betrekking op besluitvorming ten aanzien van doelstellingen, prioritisering, ontwikkeling en gebruik van informatiesystemen tussen organisaties waarbij de autoriteit over het informatiesysteem is geconcentreerd en er een nadruk is op standaardisatie van gegevensdefinities en -structuren door het gebruik van een overkoepelend conceptueel kader.
‘Bottom-up’ informatiemanagement heeft betrekking op besluitvorming ten aanzien van doelstellingen, prioritisering, ontwikkeling en gebruik van informatiesystemen tussen organisaties waarbij de autoriteit over het informatiesysteem is verspreid en waarin het behoud van verschillende conceptuele kaders voor verschillende gegevensverzamelingen wordt benadrukt.

Overigens moet opgemerkt worden dat de beide benaderingen ‘uitersten’ vormen op een spectrum. De literatuur geeft indicaties in welke omstandigheden welke vorm van informatiemanagement wordt geprefereerd, maar een verklaring voor deze voorkeur ontbreekt. Geconcludeerd kan worden dat de literatuur een variëteit aan informatiemanagementbenaderingen weergeeft en dat de voorkeur in de literatuur voor een gecentraliseerde, geformaliseerde benadering (‘top-down’ informatiemanagement) geen duidelijke theoretische onderbouwing kent.

In *hoofdstuk drie* worden interorganisationele relaties en interorganisationele coördinatie behandeld om de tweede onderzoeksvraag te beantwoorden.
Een interorganisationele relatie wordt gedefineerd als een terugkerende transactie van hulpbronnen tussen twee of meer organisaties. In de literatuur worden interorganisationele relaties vaak beschreven met de begrippen autonomie, afhankelijkheid en coördinatie.

Een theorie die specifiek ingaat op interorganisationele relaties is de economische organisatietheorie, die bestaat uit de agentschapstheorie (‘agency theory’), transactiekostentheorie (‘transaction cost economics’) en economische theorie van de eigendomsrechten (‘property rights theory’).
In economische organisatietheorie wordt onder autonomie verstaan: die toestand waarin onbeperkt eigendomsrechten met betrekking tot activa (‘assets’) kunnen worden uitgeoefend, hetgeen krachtige prikkels (‘incentives’) met zich mee brengt. Afhankelijkheid is een toestand waarin activa alleen in combinatie met andere activa productief kunnen worden gemaakt en coördinatie is dát mechanisme dat de prikkels voor betrokkenen optimaliseert.
De verklaring voor het vóórkomen van verschillende coördinatievormen is dat steeds dát coördinatiemechanisme wordt gekozen dat de prikkels van participanten (en daarmee de overall efficiëntie) optimaliseert.

Een andere theorie die ingaat op de problematiek van ‘managing interdependence’ is de politieke organisatietheorie (ook wel theorie van de afhankelijkheid van hulpbronnen of ‘resource dependence theory’).
Deze theorie gaat ervanuit dat organisaties politieke entiteiten zijn (d.w.z. bestaan uit coalities van soms samenwerkende, soms conflicterende groepen). Organisaties kunnen samenwerken en een gedeelte van hun autonomie opgeven om afhankelijkheid of beheersing door een derde organisatie te voorkómen of te bestrijden. In het algemeen wordt verondersteld dat elke organisatie streeft naar het minimaliseren van de afhankelijkheid ten opzicht van andere organisaties en het maximaliseren van de afhankelijkheid van andere organisaties op zichzelf. In politieke organisatietheorie wordt autonomie gedefinieerd als ‘self-containment’ of capaciteit om zelfvoorzienend te zijn. Afhankelijkheid is de situatie waarin een andere organisatie noodzakelijke hulpbronnen beheerst en daardoor invloed heeft op het gedrag van de oorspronkelijke organisatie. Coördinatie refereert aan een inperking van de bewegingsvrijheid van organisaties.
De verklaring voor het vóórkomen van verschillende coördinatievormen is dat organisaties onzekerheid vanuit de omgeving reduceren door het minimaliseren van afhankelijkheid op andere organisaties en het maximaliseren van de afhankelijkheid van andere organisaties op zichzelf.

Een nadere beschouwing leert dat de redeneringen achter de economische organisatietheorie en de politieke organisatietheorie veel gelijkenis vertonen. In het algemeen heeft coördinatie, in beide theorieën, te maken met eigendom van activa (of hulpbronnen). Een (extreme) coördinatievorm is de situatie waarin activa zijn verspreid over een aantal eigenaren (‘owners’), waarbij iedere eigenaar bij definitie gerechtigd is eigendomsrechten uit te oefenen met betrekking tot deze activa of hulpbronnen, hetgeen krachtige prikkels met zich meebrengt, waarbij overigens wel geldt dat afspraken over uitwisselingen tussen organisaties soms moeizaam tot stand komen.

Een andere coördinatievorm is de situatie waarin alle activa (of hulpbronnen) in handen zijn van één eigenaar. Dit heeft als voordeel dat afspraken over uitwisselingen veel gemakkelijker tot stand komen. Als nadeel geldt dat er minder sterke prikkels voor de betrokkenen zijn.

In *hoofdstuk vier* wordt getracht tot een synthese te komen van de theorie van informatiemanagement en de theorie van interorganisationele coördinatie. Deze synthese wordt aangeduid als de 'politieke economie van informatiemanagement' ('Political Economy of Information Management'). De synthese refereert aan de uitwisseling van informatie tussen organisaties waarbij economische en politieke aspecten een rol spelen.

Op basis van de analyse de theoriefragmenten over informatiemanagement, economische organisatietheorie en politieke organisatietheorie wordt een verklaring voor het vóórkomen van verschillende informatiemanagementbenaderingen in verschillende typen interorganisationele relaties voorgesteld. Een balangrijk element in deze theorie is het beschouwen van interorganisationele informatiesystemen als een 'portfolio of information assets'.
De 'politieke economie van informatiemanagement' is weergegeven in de vorm van een aantal assumpties, een propositie en een aantal hypothesen. De redenering achter de synthese wordt onderbouwd met een formalisatie op basis van de Grossman-Hart-Moore benadering van de economische theorie van de eigendomsrechten.

De 'politieke economie van informatiemanagement' bouwt voort op vier assumpties:
1. de assumptie van beperkte rationaliteit;
2. de assumptie dat het gedrag van organisaties niet geheel door de organisatie wordt gedetermineerd; met andere woorden, er wordt gesteld dat organisaties in ieder geval enige bewegingsvrijheid hebben;
3. de assumptie dat de theorie betrekking heeft op organisaties die informatie uitwisselen of gaan uitwisselen met behulp van informatie- en communicatietechnologie
4. de assumptie dat de theorie vooralsnog alleen een verklaring kan bieden voor uitwisselingen in netwerken van publieke of quasi-publieke organisaties.

De basispropositie is dat de mate van afhankelijkheid tussen 'information assets' de voorkeur voor een bepaalde interorganisationele informatiemanagementbenadering bepaalt. Deze afhankelijkheid komt voort uit complementariteit van 'information assets' (uit de economische theorie van de eigendomsrechten) en/of op onmisbaarheid van organisaties (uit de economische theorie van de economische eigendomsrechten en de politieke organisatietheorie).

De volgende hypothesen kunnen worden afgeleid:

$H_{PEIM,1}$: Als geen enkel 'information asset' dat onderdeel is van een interorganisationeel informatiesysteem, onmisbaar is, en 'information asset' niet complementair zijn, zullen organisaties niet kiezen voor het standaardiseren van conceptuele kaders (door het invoeren van een gemeenschappelijke architectuur en het afdwingen ervan door een gecentraliseerd besturingsmodel).
$H_{PEIM,2}$: Als minimaal één 'information asset' van een organisatie die deelneemt aan een interorganisationeel informatiesysteem, onmisbaar is, zullen organisaties kiezen voor het standaardiseren van conceptuele kaders (door het invoeren van een gemeenschappelijke architectuur en het afdwingen ervan door een gecentraliseerd besturingsmodel).
$H_{PEIM,3}$: Als 'information assets' die aanvankelijk eigendom zijn van organisaties die deel participeren in een interorganisationeel informatiesysteem, complementair zijn, zullen organisaties kiezen voor het standaardiseren van conceptuele kaders (door het invoeren van een gemeenschappelijke architectuur en het afdwingen ervan door een gecentraliseerd besturingsmodel).

Met de 'politieke economie van informatiemanagement' wordt een verklaring voorgesteld voor het vóórkomen van verschillende informatiemanagementbenaderingen, waarbij nadrukkelijk is gestreefd naar het voortbouwen op bestaande theoriefragmenten. Bovendien is getracht om zowel de falsifieerbaarheid ('falsifiability') als de verklaringswaarde ('explanatory power') van die fragmenten te vergroten.

In *hoofdstuk vijf* worden de propositie en de afgeleide hypothesen geconfronteerd met drie beschrijvingen ('case studies') van besluitvormingsprocessen die betrekking hadden of hebben op het ontwikkelen en gebruik van interorganisationele informatiesystemen.

De eerste case study heeft betrekking op besluitvorming in het Nederlandse veld van Hoger Onderwijs en Onderzoek. In dit veld is een aantal organisaties actief. Er is het Ministerie van Onderwijs, Cultuur en Wetenschappen, de universiteiten, de belangenbehartiger van de universiteiten, de Vereniging van Samenwerkende Nederlandse Universiteiten (VSNU), onderzoeksinstellingen, en de Koninklijke Nederlandse Academie van Wetenschappen (KNAW).
Centraal in deze deelstudie staat een centrale databank met onderzoeksgegevens, de Nederlandse Onderzoeks Databank (NOD), die wordt beheerd door de KNAW.
De universiteiten krijgen in de loop van de jaren steeds meer beleidsvrijheid. Gedurende dit verzelfstandigingsproces groeit het protest tegen de NOD. De universiteiten protesteren tegen het feit dat ze moeten betalen voor het gebruik van 'hun' gegevens, en vrezen dat het Ministerie op basis van de NOD de recent verworven zelfstandigheid weer kan inperken. De vullingsgraad van de NOD blijft achter bij de verwachtingen.
De universiteiten lanceren daarop, via de VSNU, een alternatief interorganisationeel informatiesysteem: het CombiFormat (of 'CombiSearch') initiatief, een systeem waarbij

onderzoeksdata decentraal wordt opgeslagen (in zogenaamde OIS of OZIS systemen), en het eigenaarschap van de informatie nadrukkelijk aan de universiteiten zèlf wordt toegekend. Gemeenschappelijke afspraken betreffen een initieel datamodel, waarvoor nadrukkelijk wordt gesteld dat het mag worden aangepast aan 'lokale behoeften', en een set communicatieafspraken.
Het CombiFormat / CombiSearch alternatief wordt thans ondersteund door alle participanten. De KNAW erkent dat de NOD in de toekomst een geheel andere rol zal gaan spelen, waarbij de nadruk ligt op het beschikbaar stellen van decentraal opgeslagen onderzoeksinformatie aan buitenlandse onderzoeksinstellingen.

De tweede case study heeft betrekking op een uitwisseling tussen het Ministerie van Financiën en het Centraal Bureau voor de Statistiek. Het Ministerie van Financiën, of, meer specifiek, de Belastingdienst, heeft als enige organisatie in Nederland de beschikking over een bestand met accurate gegevens van inkomens van ingezetenen in Nederland. Het CBS stelt statistieken op voor de personele inkomensverdeling van Nederland.
Al jaren wisselen Belastingdienst en CBS gegevens uit. Sinds 1995 worden de statistieken opgesteld met behulp van het zogenaamde Inkomens Informatie Systeem (IIS). Het CBS kan op deze wijze gebruik maken van accurate inkomensgegevens uit het IBS systeem van de Belastingdienst, en het Ministerie van Financiën krijgt informatie over de personele inkomensverdeling terug die het kan gebruiken voor de ex-ante of ex-post evaluatie van fiscaal beleid.
Het IIS kent een relatief gecentraliseerde opzet. In het besluitvormingsproces zijn nadrukkelijk bottom-up varianten geanalyseerd, maar er is gekozen voor een top-down informatiemanagementbenadering omdat een dergelijke werkwijze minder gevoelig zou zijn voor een wijziging in de prioriteiten bij één van beide partijen.

De derde case study heeft betrekking op het systeem van uitvoering van sociale zekerheidswetgeving in Nederland. Hierbij is een groot aantal partijen betrokken: het Ministerie van Sociale Zaken en Werkgelegenheid als opdrachtgever, verschillende uitvoeringsinstellingen, gemeentelijke sociale diensten, de Sociale Verzekeringsbank, ziekenfondsen, et cetera.
Tot ongeveer begin jaren tachtig is de uitvoering van werknemersverzekeringen in handen van bedrijfsverenigingen, bestuurd door werkgevers en werknemers. Als het thema van de fraudebestrijding op de politieke agenda komt, stuiten pogingen van het Ministerie om te komen tot bestandsvergelijking op weerstand. Bovendien leveren de bestandsvergelijkingen die worden uitgevoerd, veel fout-positieve meldingen op; de bestanden die worden gebruikt voor de vergelijking, blijken niet accuraat te zijn.
In de jaren negentig worden de uitvoeringsinstellingen langzamerhand geprivatiseerd. Verschillende uitvoeringsorganisaties nemen dan het initiatief tot een bottom-up interorganisationeel informatiesysteem in de vorm van de RINIS infrastructuur. Dit initiatief benadrukt de 'informationele autonomie' van de betrokken partijen, stelt

communicatieafspraken tussen sectoren voor en wijst nadrukkelijk integratie als doelstelling af.
Het RINIS initiatief wordt thans breed geaccepteerd.

In *hoofdstuk 6* worden conclusies van dit onderzoek samengevat en wordt vervolgonderzoek voorgesteld.
Met gebruikmaking van economische organisatietheorie en politieke organisatietheorie, en met het beschouwen van interorganisationele informatiesystemen als 'portfolios of information assets' kon een synthese tot stand worden gebracht tussen theorieën met betrekking tot informatiemanagement en theorieën over interorganisationele relaties. Met gebruikmaking van economische organisatietheorie en politieke organisatietheorie kon inhoud worden gegeven aan het aspect van 'locus of control' in de besluitvorming over interorganisationele informatiesystemen en konden 'fits' of 'Gestalts' worden geïdentificeerd tussen kenmerken van interorganisationele relaties (in termen van onmisbaarheid, complementariteit) en informatiemanagementbenaderingen (in termen van top-down, bottom-up benaderingen).

Na analyse van de case studies is het mogelijk uitspraken te doen in welke mate de theorie wordt ondersteund door de empirische data. De eerste hypothese wordt bevestigd door case study één (Hoger Onderwijs en Onderzoek) en door case drie (Sociale Zekerheid). De tweede hypothese werd gesteund door de observaties in case twee (Fiscaal Beleid). De derde hypothese kon niet worden bevestigd. Er is een geringe mate van complementariteit in case drie (Sociale Zekerheid), maar de organisaties bleken hier geen top-down informatiemanagement toe te passen.
In het algemeen blijken de belangrijke elementen van de politieke economie van informatiemanagement (politieke en economische aspecten, specifiek eigenaarschap van 'information assets') een belangrijke en aanwijsbare rol te spelen in de besluitvorming over interorganisationele informatiesystemen.

Toekomstig onderzoek in het verlengde van de politieke economie van informatiemanagement zou zich kunnen richten op fundamentele en toegepaste aandachtspunten.
Fundamentele aandachtspunten zijn:

- verdere precisiering en operationalisering van de begrippen 'autonomie', 'afhankelijkheid' en 'coordinatie' in de context van interorganisationeel informatiemanagement;
- verdere precisiering en operationalisering van het begrip 'information asset'
- het toepassen van de inzichten van de politieke economie van informatiemanagement in het opkomende gebied van de 'e-commerce' of 'e-business';
- uitbreiding van de formalisatie van interorganisationeel informatiemanagement; en
- het testen van de hypothesen van de politieke economie van informatiemanagement in een grootschalige, kwantitatieve studie.

Toegepaste aandachtspunten zijn:

- verdere ontwikkeling van bottom-up architecturen als stelsels van afspraken over informatieuitwisseling en communicatie; en
- het geven van ondersteuning aan het ontwikkelen, onderhoud en evalueren van stelsels van afspraken over het uitwisselen van informatie en het inbedden van deze activiteiten in organisaties (de zogenaamde *interface*-functie).