The political economy of information management
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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 Steinfeld, 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 (Steinfeld, 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 abusus 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 group227 (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

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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.