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# TOWARD AN AUTOPOIETIC PERSPECTIVE ON INFORMATION SYSTEMS ORGANIZATION

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## Abstract

*This paper applies autopoietic theory to examine the nature of IS–organization relationships involving co-evolutionary processes among an organization and its IS, IS organization issues, and the impacts on an organization’s competitive advantage. By drawing on a longitudinal field study in an international investment banking organization, where the development of a core IS has been studied since 1999, this paper (1) presents the distinct characteristics of the autopoietic approach; (2) demonstrates its explanatory power for understanding the IS–organization coevolutionary processes and IS organization, and (3) shows the implications of these autopoietic explanations for the firm’s current and future competitive advantage.*

**Keywords:** IS organization, autopoiesis, IS development, structural coupling

## 1 INTRODUCTION

Understanding the relationship between organizations and their information systems (IS), and the ways in which this relationship affects organizations, continues to fascinate and trouble researchers and practitioners alike. In this paper, we propose a new view of the IS–organization relationship based upon the biological systems theory of Maturana and Varela (1980), known as *autopoietic theory*. How and in what ways have a firm’s survival and competitive advantage become dependent upon the emergent IS–organization relationship? How is this relationship affected by the process of IS development, transformation, and increasing globalization, and what are the potential implications for the firm’s competitive advantage in the longer term? These questions will be addressed from an autopoietic perspective which will be illustrated by drawing on a longitudinal field study of a core IS in an international investment banking organization.

Autopoietic theory was developed to provide explanations of the nature of living systems and is broad ranging, including within its scope descriptions of cognition, the development of language, consensual behaviors, and the modes by which people interact with their environment. While there have been a number of attempts to apply autopoietic theory in a social systems context, there is currently no agreement regarding whether social systems may be considered autopoietic or how the theory may be applied (see Kay 2001; Luhmann 1990; Morgan 1997; Robb 1992; Zeleny and Hufford 1992). In the IS literature the arguably most notable use of the theory is that by Winograd and Flores (1986) in relation to artificial intelligence, and by Mingers (1995a) to explore the concepts of information and meaning in the IS context. Without the ambition to expand this debate, in this paper we apply some of the key concepts of autopoietic theory with a different purpose: to explain the nature of IS–organization relationships and to demonstrate how such an explanation enables us to understand the impact of an IS development and increasing globalization on a firm’s competitive advantage. In addition our objective is to demonstrate the value of autopoietic theory in this context.

To achieve these objectives, we refer to a longitudinal field study (1999–2002) focussed on the continuous in-house development of an investment bank’s core IS, which has become an essential medium for the bank’s service provision and relationships with its clients. This case is of particular interest to IS research as it represents almost a paradigmatic example of an emerging

IS–organization relationship that has become a key determinant of the firm’s competitive advantage. Namely, with the increasing role of the IS in the bank’s core processes and delivery of services to clients, its competitive advantage has become progressively more dependent on the firm’s ability to maintain the ongoing development of the system coupled with its organizational development. However, the question is whether this coupled IS–organization development will be sustainable in the future and how the increasingly globalized IS will affect the firm’s competitive advantage.

The research into relationships between IS and the organization’s performance and competitive advantage so far has been scattered across a range of organizational and IS studies, informed by a variety of theoretical foundations, often with incomparable or conflicting results. Some case studies, for instance, have found that an organization’s IS capability is a key differentiating factor and contributor to its competitive advantage (Baharadwaj 2000; Hitt and Brynjolfsson 1996) while others have found no discernible link between investment in IS and a company’s business performance (Strassman 1997). A range of theoretical approaches are offered in the literature, including the resource-based view of the firm (Baharadwaj 2000), strategic business–IT alignment (Beats 1992; Henderson et al. 1992; Powel 1993), and the evolutionary theory of IS development (Peters et al. 2002). By proposing a specific view of the relationship between an organization and its IS, each of these approaches offers insights into the complexities involved in developing a strategic IS capability, and in some cases implications for competitive advantage. These approaches are limited to the extent that they explain general relationships between the concepts (e.g., the alignment of IS and business strategy and the implications for an organization’s performance); however, they do not sufficiently explain the underlying processes by which these relationships evolve and are maintained over time.

We attempt to address this limitation by applying autopoietic theory to explain processes underlying the IS–organization relationship and how it impacts on the competitive advantage of an organization. To achieve our objectives, we first provide a brief description of key concepts from autopoietic theory. This is followed by a description of the longitudinal field study through which these concepts will be illustrated in more detail, providing a deeper understanding of the underlying process by which the IS–organization relationship emerges over time. This increased understanding, as we show in the next section, enables us to draw a new autopoietic approach to the explanation of how the IS–organization relationship impacts on the competitive advantage of the organization.

## 2 AN OVERVIEW OF AUTOPOIETIC THEORY

Autopoietic theory was developed by Maturana and Varela (1980) to provide explanations of the characteristics of living systems, as opposed to non–living systems (Mingers 1991). Their central thesis is that living systems are characterised by their autopoietic, or self producing, nature. The processes and rules that underpin an autopoietic system’s operation, provide the basis for explanations of the nature of human behavior, cognition, the development of language, and, to some extent, the characteristics of social system behavior. It is not possible within this paper to provide a detailed summation of the theory in its entirety, however, key concepts that are necessary in order to discuss the theory’s implications for the study of IS–organization relationships will be described. Many writers have been tempted to assert that social systems themselves may be considered to be autopoietic (Luhmann 1990; Zeleny and Hufford 1992), however, we will not, for reasons of epistemology and ontology, consider them to be so (see Kay 2001; Mingers 1995b). Rather, we would argue that the concepts that underpin autopoietic theory provide useful explanations of the generative processes in social systems.

The idea that living systems are *self-producing* technically means that the components of the system further produce the components of the system with the output of the system being the system itself. In the context of this paper, however, what is most significant are the rules described by autopoietic theory, with reference to the way in which the individual persists in and interacts with the environment and the implications these rules have when applied to humans and their behavior.

An individual’s behavior is determined by particular states of nervous system activity (Maturana and Varela 1980). The nervous system’s activity is defined by what Maturana and Varela have described as *operational closure*. This presupposes that in all cases nervous system activity results from, and leads to, further nervous system activity in a closed cycle. Possible and actual changes in the state of the nervous system are therefore dependent on the *nervous system’s structure* and not external forces. External or environmental forces may act as *triggers* for change but it is the nervous system’s structure that dictates which forces can be a trigger (Mingers 1991). Therefore, changes to the structure of one person’s nervous system, and consequently their behavior, will be unique to that person. The environmental perturbations that act as a change trigger in one person will not necessarily trigger a change in another, or if they do, the change that is triggered may take a different form and/or have different implications for the viability of that person in his/her environment, given his/her history.

Over time, through ongoing interactions with the environment, an individual will experience what Maturana and Varela describe as a *structural drift*, or a gradual change to their structure. This change is possible because, although the nervous system is operationally closed, it does not have a fixed structure, it is plastic, its structure changes over time, and it is this quality which allows for changes in behavior and subsequently what we describe as learning (Mingers 1991). The nature of this change will be defined by their *ontogeny*, or history of interactions with the environment. When considering the ontogeny of two people, the situation of structural change can be viewed from the perspective of either individual. Depending on which person is under study, the other simply becomes a component of the environment with which that individual is constantly interacting. When these interactions become *recurrent*, two or more individuals (considered as autopoietic unities) can become *structurally coupled*. Hence, there is a history of recurrent interactions leading to a structural congruence between two or more people. Language is an example of higher level structural coupling, or what Maturana and Varela would describe as a *consensual domain*. A consensual domain is “a domain of arbitrary and contextual interlocking behaviors” (Mingers 1995b, p. 78). Within a consensual domain, two individuals would be able to observe the attribution of meaning to common events and undertake coordinated actions.

As a domain of consensual action emerges over time, so too do linguistic acts. The *linguistic domain* of an individual is the domain of all linguistic behaviors and, therefore, is also in a process of continual change, responding to and affecting the individual’s continuous interactions with the environment. As the individual operates within a linguistic domain with other people, the self and its circumstances will be generated as *linguistic distinctions* of his or her participation in that linguistic domain. Similarly, the notions of a group or organization are also generated and distinguished from the environment. These distinctions are not real in a physical sense, but provide the basis for the coordination of behaviors. The distinguishing feature here is that language (as opposed to the many other forms of coordinated action) is the object of the coordinated action. This is manifest in organizations where particular words, metaphors or language emerge to describe shared understanding of a situation and coordinate particular activities unique to the environment of that workplace.

In order to further illustrate what this means for studying the IS–organization relationship, these key concepts from autopoietic theory will now be discussed in terms of an illustrative field study that the authors have been conducting in an international investment banking organization. It is important to note that the above overview of autopoietic theory should only be considered as very cursory with a number of important dimensions of the theory omitted.

### 3 FIELD STUDY: THE EVOLUTION OF AN INFORMATION SYSTEM

The field study has been taking place in the Australian branch of the equities division of an international investment banking organization since the beginning of 1999. The focus of the study is on the core IS of the research department, which provides market and company analysis to clients for the purposes of investment decision making. Our approach to studying the development of the IS can be classified as an interpretive field study (Klein and Myers 1999; Walsham 1993). The approach involves gaining understandings from actors in the situation and their interpretations of events and situations as they occurred. Being outsiders to the organization and due to the extreme time pressures experienced by the members of the research department, nonparticipant observation techniques have been used. We maintain monthly informal communication and semiformal discussions with members. We also participate in some formal meetings with analysts and company management. Additionally we have collected and analysed documents and e-mails relating to the development and use of the Company Research Information System (CRIS). We also conducted one survey and 12 semi-structured interviews focussing on specific users’ and developers’ problems. Combined, these various forms of empirical data and personal experiences enable the creation of a rich description of the complex interrelationships taking place within the case study context and allow us to chart the simultaneous changes that have occurred in the organization, and to the IS.

The design of CRIS was initiated in 1995 to improve the company’s research performance and make its services more easily accessible for clients. CRIS has been developed in an ongoing and continuous cycle of innovation, implementation, and renewal. Its original purpose was to collect data from the financial analysts’ projections and financial models of listed stocks, collate and process the information, and make it available to both clients and the analysts for the purposes of investment decision making.

CRIS was developed in-house by the research department, which at the beginning of the study, consisted of approximately 50 people, including directors, analysts, research assistants, and clerical staff, grouped by industry sectors. It also included an IS support team composed by one director, two technical support staff who have both IT and financial knowledge, four programmers, and one computer trainer. The role of the IS support team involves system development, technical support for the analysts, training of new recruits (research assistants, analysts) on how to use the system, and generally gaining “user buy-in” to the system. During the study, the constitution of the research department in terms of organizational structure has remained unchanged.

Over the duration of its development, CRIS has come to be considered the state-of-the-art in terms of proprietary systems of its type (as assessed by its users, clients of the company, and competitors). This is due to a combination of both the breadth of functionality the system offers and the ease of its use. This was not always the case, however, and during the initial stages of CRIS's development, there was considerable resistance by users to the adoption of the system. Analysts were not prepared to spend time working with developers on what they considered to be an unknown and unnecessary system. Many analysts complained about CRIS's complexity and the structure of the database; they argued that the designers didn't understand the meaning of their financial models or the processes involved in analyzing the financial performance of companies.

The tensions that emerged between the analysts and the IS support team as they attempted to implement CRIS produced an ongoing pattern of interaction between members of the two groups that would come to underpin CRIS's development. The fact that the IS support team "sat" with the analysts facilitated regular face-to-face contact between the two groups, allowing for the development of increased understanding and a reduction of the "us and them" mentality often experienced between IT/IS support functions and other parts of an organization. The resistance experienced during CRIS' initial development was partly a function of the fact that the IS support team and the analysts had only a limited understanding and experience of each others' roles and tasks and the implications of their actions for the other group. Over time, and through the ongoing interaction of analysts complaining and requesting changes to the system (e.g., the database, interface, functions), seeking advice from the IS team on how to use the system, or engaging the IS team in helping them resolve a complex problem, members of the two groups (analysts and IS team) gradually developed a common history of recurrent interactions in their work environment and thus became, in terms of autopoietic theory, structurally coupled. The IS director made the following observation in regard to the relationship that had developed between the two groups:

This is what I like about this job...you work with these people and try to understand their job and what they need to do it better, and then create something that doesn't exist anywhere else, implement it and test it with them and see whether you actually meet their needs. They are not aware of what they need, nobody is...They don't know what is possible to get [out of the IS] how would they then be able to say "this is what we want."

The recurrent interactions took many different forms. For example, both groups were interacting with CRIS in order to undertake their work. This meant that as CRIS composed an aspect of their work environment, they learned to orient themselves against the structure of the database, the user interface, and the functions that the system allowed. At the same time, members of the research department were becoming structurally coupled to other aspects of the work environment, including each other. They had common experiences with CRIS, with clients, with the organization's management; experiences to which they attributed shared meaning over time. It is also important to note that these interactions took place against the background of their previous experiences, or their ontogeny (which could include work at other investment banks, their knowledge of financial analysis, and the needs of clients). Although at the beginning, the respective experience of members of the IS team and that of the analysts may have been very different, through ongoing and recurrent interactions in the work environment, commonalities emerged. These commonalities form the basis for the creation of consensual domains.

The creation of consensual domains between the analysts and IS team members is significant as they enable a reinterpretation and transformation of the analysts' complaints into new functionalities and work processes. Recurrent interactions lead to improved understanding among analysts and the IS team members, thus enabling increased cooperation in problem solving and innovations in work practices. In such a way, they have developed consensual domains that in turn resulted in further changes and innovations of CRIS, and ultimately continual improvements of services to clients. The IS director commented in this regard:

So, as I know, on one hand, what can be done with [CRIS], mind you I designed it, and on the other I can understand their problems, the nature of their work processes, I am in a position to envisage how the processes can be improved, made easier, more sophisticated. For instance, I am now developing a new feature of [CRIS] that will allow them to simulate situations and based on that make predictions. I don't know whether they are going to like it or use it, I'll test it of course, and something will develop.

Over the first 4 years of CRIS's development, various additions were made to the system. These included the addition of market information (some purchased in the form of live information feeds from external information providers), an in-house designed and built workflow enabling the coordinated and semi-automated production of over 150 different market reports for clients, and the addition of online daily access for clients to these market reports. These additions also coincided with a broadening in the market for CRIS's output. Initially only clients in Sydney and Melbourne received reports produced by CRIS. With the addition of online access, however, offices in New Zealand were also added to the system. These developments had an impact on the way in which CRIS was developed and the patterns of interaction that underpinned that development. Put simply there were now additional users of the system, who did not sit with the IS support team, and who maintained contact with them through regular visits and over the phone.

More recently, via CRIS's support team, key external clients can now also make special requests for information, not normally included in the analyst's reports. These requests require further modifications to the system. The implication of these additions is that the IS support team now has two social groups with which it interacts and with whom consensual domains are developing and being maintained. It is important to note, however, that the process by which the consensual domains develop between the IS team and the analysts, and the IS team and the clients, is largely the same, i.e. through recurrent face-to-face interaction and regular contact. Clients either come to the IS team or members of the IS team visit the clients. Furthermore, as a function of the consensual domain that had emerged around CRIS, a language specific to the IS was also developing.

In terms of the IS–organization relationship, these developments were also significant. The work practices of the analysts had all become implicitly linked to CRIS, it was effectively impossible to do their jobs without accessing CRIS either to retrieve information or undertake an analysis. The nature of the IS–organization relationship had become bound in a tight coupling of socio-technical interactions (the work practices of the analysts) and recurrent interactions between a growing number of social groups (the local analysts, the remote analysts, the IS team, the company's clients).

As a function of these relationships, the firm's competitive advantage was gradually shifting from the personal relationships that historically the analyst alone had held with the client, to a complex of the analyst and the information system that supports them. Furthermore, CRIS now also represents an important dimension of the company's product portfolio, drawing its own income stream from subscription to the reports and services it provides. This directly attributable income is currently estimated to be approximately 3 percent of the Australian operation's total income; however, CRIS's indirect contribution in terms of supporting the research capability of the firm is much higher. Put simply, if the system was turned off, the implications would be catastrophic for the firm.

It was in this context that the most significant challenge to CRIS's ongoing development occurred: A head office decree (in 2000) that all parts of the company should use one standard information system (developed in the head office). This call arose from a situation where previously different parts of the international company had been given complete autonomy to make decisions in regard to the systems they developed and used. The decision led to CRIS becoming effectively a competitor to the head office's IS (admitted by its proponents to be far inferior to CRIS). Without going into the political side of this competition, we note that CRIS has survived and its application has expanded. In the last two years, CRIS has been successfully rolled out in 16 countries around the world, where it is used by the analysts in various company branches. While becoming increasingly globalized, CRIS remains serviced by the same support team. The implications for the system's ongoing development and the firm's competitive advantage are considerable and form the focus for the remainder of this paper.

#### **4 DISCUSSION: TOWARD AN AUTOPOIETIC PERSPECTIVE**

Although CRIS is considered the best system in the market and is currently ahead of the competition in terms of both technological sophistication and functionality, the systems of the other firms are also undergoing continuous development in order to catch up. The ability of competing firms to be in a position where they are able to offer a similar service is dependant upon both the speed with which they can develop their systems, the skills of their analysts in using them, and the speed with which our case study firm is able to continue CRIS's development in harmony with its other organizational processes. In many ways, this observation is consistent with Hart's (1995) thesis that the competitive advantage of the firm can only be maintained if the capabilities that create its advantage (in this case CRIS–organization coevolution) are supported by resources that are difficult to duplicate (initially analysts–CRIS–IS team relationships and more recently external client–CRIS–IS team relationships).

In applying autopoietic theory to this context, we do so in a particular way. A growing number of researchers (see Hejl 1993; Kay 2001) have argued for a perspective, based upon autopoietic theory, where organizations may be thought of in terms of *composites of structurally coupled unities*. What this means is that individuals within the organization have become, over time, structurally coupled through ongoing recurrent interactions, to the point where they distinguish within their consensual domain their interactions as a group or organization as distinct from phenomena in the environment.

CRIS's development occurred through a series of ongoing interactions between a number of different social groups. Initially these social groups were limited to the IS support team and the analysts in the Sydney office of the research department, but more recently these groups have included analysts in other countries and external clients. It is the nature of these interactions that we consider to be significant and a core reason for CRIS's success. A key determinant of these interactions is the organizational structure within which the developers and users work and interact.

CRIS's support team were always a part of the research department, not IT. This had significant implications: First, the support team sat in the same area as the analysts (users); second, they were subject to the same management structure as the analysts; third, the level of face to face contact between the IS team and the users was very high. Each of these factors helped define the nature of the work environment and, with that, the nature of human interactions, the development of linguistic domains, and the creation of unique consensual domains, both within CRIS's support team and between the support team and the analysts. These points were acknowledged by a member of the IS support team as key to the success of CRIS' development.

Important thing is that we are not part of the IT department. They put every single imaginable constraint on our use of the database....If we were not part of the research department where the major company business is, we would not have done a single thing. Like in so many other places, where IT is just another bureaucracy that freezes processes instead of creating new stuff, innovating businesses....No wonder business hates IT and IT hates business.

In other competing companies, it is standard practice that software development takes place within the IT department, with other departments banned from undertaking this kind of activity. In our field study firm, CRIS's support team and the IT department were completely separate: sitting on different floors of the building, subject to different management structures, only interacting in relation to the installation and maintenance of infrastructure, hardware, software, and network support. This allowed the IS team and the analysts to all identify themselves with the same department and organizational activity.

Further contributing to the unique nature of the social interactions in the research department, was the hierarchical organizational structure of the analysts (each in their own sector groupings under a director) characterized by high staff turnover, a relatively local focus, undertaking quasi-repetitive, integrated decision making involving risk (Carley 1992). This meant that there was a constant source of new ideas which could be integrated into CRIS. On the other hand there was the team structure of CRIS's support group, characterized by a stable personnel pool, regional-global focus, undertaking a combination of quasi-repetitive and complex non-repeating problem-solving tasks. The lessons learned from past attempts and approaches to issues in CRIS's development, understandings, and appropriate responses were held in the consensual domain of the support team, where there was very little change in staff.

As a group, the various members of CRIS's support team collected a large number of similar experiences over time, developed mutual understanding of their individual skills, strengths, and weaknesses, and to a degree developed their own language to describe certain recurrent events, i.e., analyst and user problems, attitudes, requests and needs. Furthermore, through these common experiences, they developed *consensually* appropriate responses to occurrences in the organization. As noted above, the use of the term consensual within autopoietic theory (as in the creation of a consensual domain) does not refer to agreement, but rather the creation of a domain of interlocking behaviors, i.e., "a behavior that arises in an ontogenic structural coupling between two organisms" (Maturana and Varela 1992, p. 209). As such, through ongoing interactions in the organizational environment, members of CRIS's support team developed a range of consensual domains (or domains of interlocking behaviors) that were both within the support team and between the support team and user groups. That the different social groups participated in a number of consensual domains is not what is particularly significant. The differentiating feature in this case is the overlap between domains and the emergent understanding which then resulted in improvements to the system.

Another contributing factor in the management of these overlaps was the attitudes and actions of the IS team director:

This is how I work with my team. We not only work together, we live our lives together, we are building our home, our company, our future, we want it to succeed.... We have true team loyalty, mutual trust, self-reliance, commitment to each other...I don't control them, I don't ask them to make reports for me, no way...we just talk about what would be interesting to do, how things can be done differently...we share what we found out, what we learned from communicating with analysts and clients...we share our concerns, our views on the company, clients, users, anything.

We would argue that the significance of developing relationships, such as those described above, is highlighted when concepts from autopoietic theory are applied. The way in which problems are solved and the system evolves are implicitly related to the way in which the consensual domains of the individuals within the organization are produced and change over time. The competitors of our case study firm, due to the patterns of recurrent interaction that their work environment supported, were arguably unable to produce consensual domains of the richness and type that gave rise to CRIS. This may in part be due to the fact that their system's developers were divorced from the users by being placed in IT departments, thus changing the nature and scope of interactions that were possible between the users and IS developers and reducing their ability to produce qualitatively

richer domains of interlocking behaviors. As such, the ability of the developers to cocreate meaning with the users of their systems through recurrent interactions was reduced.

By applying autopoietic theory in this context, a number of issues are raised. In particular the IS development process becomes an integrated aspect of the recurrent interactions between developers and users in the work environment. CRIS' development has become an ongoing and unfolding process underpinned by the continuous cocreation of consensual domains between and within the different social groups (analysts, IS team and clients) that have contact with the IS. This idea is consistent with the notion of emergent IS development (Trues et al. 1999), but also allows us to discuss and examine the detailed processes involved, such as the way common understandings between organizational members emerge as a function of interactions in the work environment. This new understanding, achieved through the autopoietic perspective, presents the significant role of the work environment (both physical and nonphysical) in the success of IS projects. It also presents the creation of the IS–organization relationship in a new light. Furthermore, the theory also provides a basis from which to explore the implications of future changes to the state of the work environment and consequently the sustained competitive advantage of the organization.

We would argue that, in our field study firm, a balance between the stable sets of interactions within defined groups of workers (i.e., CRIS's support team) and the instability drawn from interactions between distinguishably different groups (i.e., CRIS's support team and the analysts and more recently clients) produced an environment that allowed the development of structural coupling between members, while at the same time perturbing change to the system overall. Whether this balance was achieved consciously or by luck is a matter for debate. However, the ability to consciously achieve such a balance represents a matter of concern for the future development of the system. Put simply, how will our case study firm create consensual domains across countries when the IS support team is no longer on location?

## **5 IMPLICATIONS FOR CRIS' FUTURE**

To date, CRIS's development has taken place in a single location, meaning that the key stakeholders involved in the system's development were all more or less in one place. Furthermore, key personnel, such as the IS team director, have been able to facilitate the ongoing development of consensual domains in support of the continued development of the system. With CRIS being rolled out across a range of locations globally, however, the ability to create and maintain consensual domains will arguably be diminished. If it is accepted that part of the success of CRIS's development is derived from the overlapping consensual domains that emerged between the analysts, the IS support team and more recently the firm's clients, then how these patterns of behavior may be replicated across multiple locations is a significant issue.

We would argue that the globalization of CRIS poses significant risks for the organization, particularly in terms of establishing and maintaining competitive advantage in multiple locations. There is arguably a clear advantage from the perspective of establishing these sets of interlocking behaviors, in being able to maintain regular face-to-face contact and communication. The contextual nature of a consensual domain means that the environment created by the interactions is unique, with the meanings and understandings that emerge potentially limited in scalability. As the use of CRIS expands globally, including increasing numbers of analysts and external clients, the ability to continually develop consensual domains and shared language between the users and the IS team will inevitably decrease. While the existing organization of the IS enabled remarkable IS–organization codevelopment, this same IS–organization relationship has now become a limiting factor.

## **6 CONCLUSION**

In this paper, we explained the nature of IS–organization relationships in a field study organization through the lens of Maturana and Varela's (1980) autopoietic theory. It was shown how processes of recurrent interaction between members of different groups—analysts, the IS team, and external clients within the organization's work environment—gave rise to commonalities in understanding, which in turn enabled continual IS–organization co-emergence. It was also explained how the particular structure of social interactions in our field study organization underpinned the organization's IS capability and led to the success of the organization's IS. Based upon these insights, drawn from viewing the field study context from an autopoietic perspective, the impact of the organization's increased IS capability and the emerging IS–organization relationship on the firm's current and future competitive advantage was also explained. These insights and explanations illustrate the potential value of the autopoietic perspective in the context of IS research.

While acknowledging the difficulty in presenting both autopoietic theory and its application to a field study in such a short paper, we hope that sufficient explanation of the theory has been provided to demonstrate its potential theoretical and practical



contributions to the IS field. We would suggest that autopoietic theory provides a new way of conceptualising and interpreting information systems, organizations and their emergent relationships; a more in-depth understanding of the processes giving rise to and maintaining the IS–organization relationship; and the organization’s IS capability, together with the implications of these notions for the organization’s competitive advantage.

The relevance of such theoretical explanations for IS practice is demonstrated by our ability not only to suggest grounded explanations of the past and current events and consequences, but also to envisage and analyse potential future developments and risks. By conceptualising CRIS’ development and the different social groups involved in it, in terms of the notions of structural coupling and consensual domains, a deeper understanding of the issues involved in globalizing the IS emerged. The ability of our field study IS support team to develop consensual domains, or domains of interlocking behavior and understanding with their users, was found to be pivotal and a major impediment to the ongoing development of complex IS on a global scale. Such explanations helped the study organization reconsider its IS organization and the strategic codevelopments of the IS and the organization itself.

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