Alignment of IS and business strategies for inter-organisational networks: The case of *ARC Transistance*

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Draft of 11 May, 2011

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Abstract

A long-standing concern of information systems (IS) and business managers is the alignment between IS and business strategies as a prerequisite for organisational performance. This paper considers the processes of alignment in coordinated inter-organisational networks (sometimes called virtual organisations). We present a case study of a systems development project in *ARC Transistance*, a network of thirty-eight national European automobile clubs that cooperate to provide pan-European roadside service. The case is analyzed using Henderson and Venkatraman's (1999) strategic alignment model, following Eisenhardt's (1989) suggestions on theory building from cases. The theoretical contribution of the paper is two-fold. First, we propose a modified strategic alignment model for inter-organisational networks that distinguishes between alignment of IS with a network strategy and alignment of IS with the multiple concurrent business strategies pursued by the collaborating firms. Second, we propose that for a network organisation, IS architectures should strive for being "business strategy-neutral" to the members to more easily accommodate the diversity of members.

Keywords: IS-business alignment; inter-organisational networks, virtual organisations

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Introduction

A long-standing concern of information systems (IS) and business managers is the alignment between IS and business strategies as a prerequisite for organisational performance (Luftman 2005). Studies of IS-business alignment have generally focused on how alignment can be achieved within a firm for better effectiveness. The tenor of most publications is that alignment is often a missing link in organisational performance and a potential reason for IS project failure. Increasingly, however, firms cooperate as members of inter-organisational networks (Gulati 1998), (sometimes called virtual organisations, Mowshowitz 1997). To be competitive, these networks need to achieve performance levels equal or superior to integrated firms, and inter-organisational information systems provide an essential infrastructure (Kumar et al. 1996). The importance of these systems raises the question of how IS-business alignment can be achieved when there is more than one business and hence more than one strategy. Since multiple organisations are involved, each with a potentially different business strategy and IS strategy, alignment becomes difficult even to define. Can alignment be based on the individual firms' business and IS strategies? Or should the network of firms as a whole be thought of as having one business strategy and one IS strategy, with alignment conceptualized as between those strategies? The goal of this paper is to develop a theoretical perspective on the question of IS-business alignment in network organisations that addresses these questions, based on an empirical case study.

The case study presented is of the *ARC Transistance* network organisation (www.arctransistance.com), which developed in the 1990s as an inter-organisational network comprising thirty-eight independent national European automobile clubs, best

known for their yellow highway patrol vans. A list of acronyms is given at the end of the article. As cross-border travel increased with European integration, these old, tradition-rich national clubs faced an internationalisation challenge to their business strategy, which led them to form an inter-organisational alliance, while still wanting to preserve their national identity. Even though clubs differed greatly in size and resources, *ARC Transistance* had no single dominant partner that could impose its strategy on the other firms. Rather, the numerous peer partners had diverse national strategies, organizational infrastructures and systems that had to be accommodated.

Initially, the case presented here was motivated by a desire to understand the causes of persistent difficulties during the collaborative implementation of a new trans-European information system, a project led mainly by four of the larger clubs. While the case can be read many ways and potentially offers multiple lessons, we turned to the literature on IS-business alignment because many of the difficulties seemed to stem from a perceived lack of alignment of the information system with the stated business objectives of the network and of its members, the four clubs more specifically.

A particular feature of the case is that it provides a novel setting for examining IS-business alignment, specifically a network organization. Consideration of the evolution of the project over nearly a decade demonstrates the difficulties of achieving IS-business alignment in an inter-organisational network and provides insight into the process of developing alignment in this setting, answering the call in a recent review article on IT alignment (Chan et al. 2007) for examination of the process of alignment across time (p. 310) and with new loci of alignment. The case demonstrates in particular that careful experimentation by club managers and systems developers with the appropriate degree of strategic alignment — rather than simply increasing alignment — has been key to advancing the project.

The case also illustrates how development of an appropriate service-oriented IT infrastructure can provide both integration for interoperability and flexibility to accommodate diverse business strategies of partners, if its rationale is not only simple efficiency gains through standardisation or through imposition of a lead firm's strategy on subordinate partners. The case therefore has implications for the appropriate IT architecture to fit the circumstances of an inter-organisational network.

In the following section, we briefly review research on IS and business alignment. We find that there has been little work on the question of IS alignment in the setting of an inter-organisational network. Even though the characteristics of these networks make it more difficult to achieve, alignment in this setting is arguably even more important, given that many alliances and network organisations rely on IT to coordinate their activities. Indeed, the advent of Internet is often seen as a driver to more business networking. To address this gap in the literature, we present our case study and analysis. We conclude by discussing theoretical issues of IS alignment in inter-organisational collaboration, stages in the alignment process and appropriate system architectures for networked organisations.

Review: IS-business alignment in inter-organisational collaborations

IS-business alignment has been a long-standing research topic in information systems. Alignment is considered important because organisations with more consistent technology, structure and strategy have been found to perform better (Pollalis 2003). Although parallels can be drawn between IS-business alignment and alignment with other aspects of business performance (e.g., manufacturing or marketing, Ansoff 1982), IS alignment is considered particularly important because IS has the potential to drive significant innovations in business strategy.

The construct of IS-business alignment has been conceptualized in several different ways, mostly starting from the business strategy of the firm. In an early article, alignment was defined as “the extent to which business strategies were enabled, supported and stimulated by information strategies” (Broadbent et al. 1993). Some researchers have compared systems and business strategies by examining particular IS applications to see if they enabled stated business strategies (Broadbent et al. 1993). At a higher level, alignment can be conceptualized as the match between a business strategy and an IS architecture. Following a contingency logic, researchers have developed typologies of business strategies and IS strategies and assessed fit as coherence in the positioning of a firm in these matched typologies (e.g, Bergeron et al. 2004; Chan et al. 1997; Croteau et al. 2004). Another approach to this question has been to develop the typologies of strategies empirically, for example, assessing the fit between the critical success factors (CSFs) of academic institutions and their IS capabilities by first grouping institutions based on their CSFs and then comparing each institution’s IS capabilities to the profiles of the most successful members of their group (Sabherwal et al. 1994).

Other authors have provided more detailed views on alignment. In this paper, we draw in particular on the conceptualization offered by Henderson and Venkatraman (1999) in their strategic alignment model, shown in Figure 1. Henderson and Venkatraman describe alignment between business and IS by considering four domains: strategy and infrastructure for business and IS. Each of these four domains is further described in terms of several components: skill, structure and processes for infrastructure, and scope, governance and competencies for strategy. Their model extends earlier conceptualizations of alignment by describing an external focus for IS strategy, considering the organization’s relation to the external marketplace for IT as well as its internal infrastructure. The model suggests that the four domain of the business

have to be in balance for overall performance: external strategy must fit internal infrastructure for both IT and business, and business must be integrated with IT at both strategic and operational levels. We chose to start our thinking about alignment in the case with this model because it explicitly includes aspects of both strategy and implementation for business and technology. Furthermore, consistent with our view of virtual organizations as enabled by IT, the model recognizes the importance of IT as an enabler of business strategies.

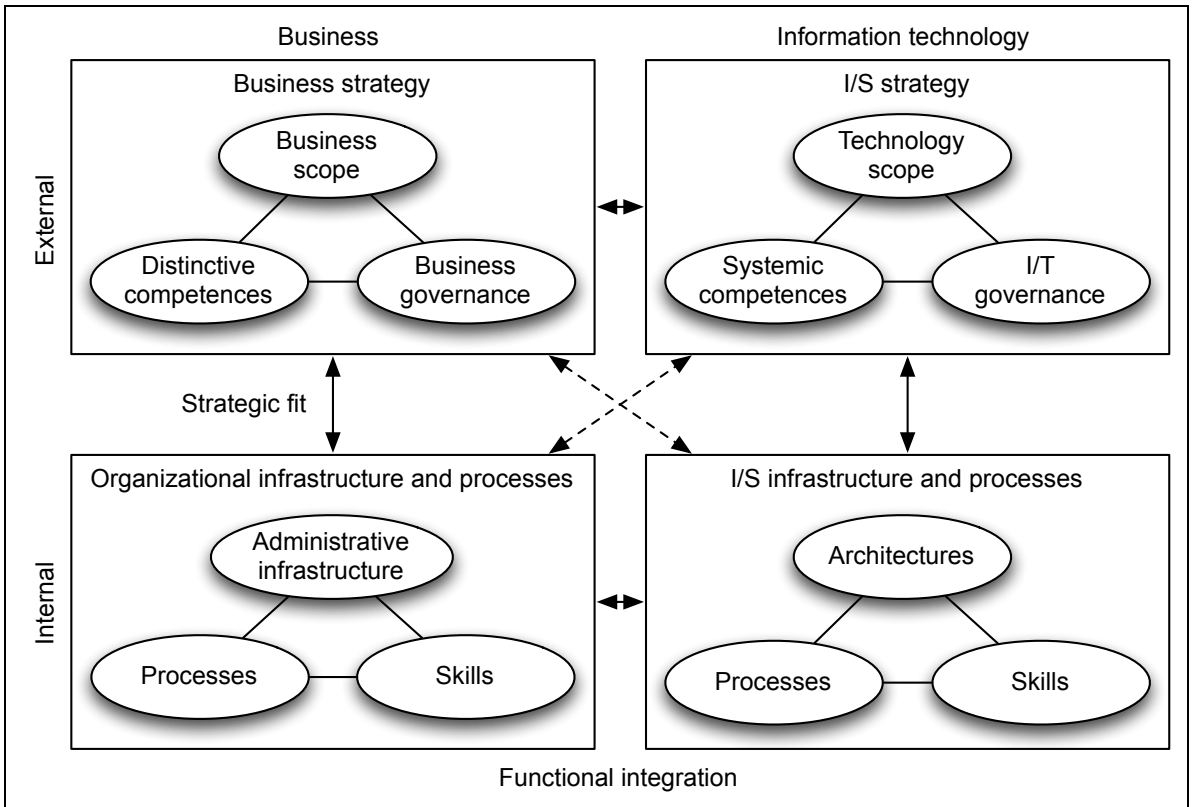

Figure 1. The Strategic Alignment Model (Henderson et al. 1999)

We next briefly review research that discusses how alignment might be achieved. IS implementation projects face different degrees of challenges, and research has identified numerous factors that enhance or impede alignment, which we used as a starting point in analyzing our case study. For example, Reich and Benbasat (2000) identified four factors that influence IS-business alignment consistent with a managerial

perception of alignment, namely “1) shared domain knowledge between business and IS executives, 2) IS implementation success, 3) communication between business and IS executives and 4) connections between business and IS planning processes”.

Alignment is sometimes viewed as an objective rather than a given. For example, Henderson and Venkatraman (1999) state that “strategic alignment is not an event but a process of continuous adaptation and change” (p. 473). This view suggests studying the process of achieving alignment over time and appropriate managerial approaches (e.g., Peak et al. 2005; Sledgianowski et al. 2005), an approach we adopted in our case study. Broadbent and Weill (1993) suggested that alignment is built through practices that include planning, development of appropriate organisational structures, executive consensus on firm strategic-orientation and consideration of information strategy, business management responsibility for information-based developments and extensive interaction between IS and business.

Generally speaking, in this view achieving IS alignment is part of a well-crafted IS implementation project that takes the business strategy into account and guides implementation accordingly. Henderson and Venkatraman (1999) further suggest four patterns for achieving IS-business alignment, depending on the path taken through the four domains of their model: strategy execution, in which the business strategy drives the design of the organization and IS infrastructure; technology transformation, in which the business strategy drives the choice of IS strategy and thus IS infrastructure; competitive potential, in which the business strategy adapts to emerging IS strategy and thus drives changed business infrastructure; and service level, in which the IS strategy drives development of IS infrastructure, which is then deployed to meet business needs.

Still, the general assumption of the research reviewed so far is that one governing business strategy exists to which IS can be aligned with more or less effort, a theoretical limitation in the literature that we seek to address. For example, the

Henderson and Venkatraman's model assumes a single business strategy that needs to fit a single IS strategy. There have been a few studies that relax this assumption, for example, studies of IS-business alignment in global firms in which different subsidiaries might have different strategies to fit their local conditions. Under these circumstances, IS alignment is more complex than alignment to the single business strategy of one firm. For example, Hanseth and Braa (2000) described problems in systems implementation in a conglomerate, where different units pursued different implementation projects. However, even work in this setting has mostly examined the single global IS strategy and overall corporate structure. For example, Bartlett and Ghoshal's models of the structure of global firms were found to fit a typology of IS structures (Jarvenpaa et al. 1993). Similarly, King and colleagues found that IS strategies in transnational companies differ among companies with different configurations (King et al. 1999; King et al. 2001).

Other research treats the problem of systems development in a conglomerate as a problem of standardization. For example, Kirsch and Haney (2006) developed a model of the process of requirements analysis for common systems that includes both rational knowledge acquisition and political negotiation processes to determine the one integrated set of global requirements and to achieve acceptance of the system from the local stakeholders. Again, this approach assumes that a common strategy and standard system can and should be developed. An exception to this approach is Peppard (1999), who developed a conceptual framework for analysing information management in a global enterprise to highlight the role of IS in supporting business strategies. He drew a distinction between the IS architecture, which might be common, and the "suprastructure" that would support particular strategies.

In this paper, we develop a theoretical model of IS-business alignment in a network organisation. By network, we mean some kind of cooperative agreement or alliance among organisations, possibly supported by some kind of interorganisational

system (Kumar et al. 1996). Despite the observation that information systems are a driver towards more inter-organisational collaboration and virtual organisations (Mowshowitz 1997) and indeed, that information systems are a necessary infrastructure for such organisations (Kumar et al. 1996), we note that there have been few studies of the process of IS alignment in the context of an inter-organisational network. A recent review article on IT alignment (Chan et al. 2007) calls for research on different "loci of alignment" (p. 311) but alignment in an inter-organisational setting is not discussed. The few studies that have addressed such a setting all have limitations. Sanders (2005) studied alignment for suppliers in supply chains, but the particular supply chains studied had dominant firms that could impose a strategy on the others. Kumar and van Dissel (1996) discussed different kinds of systems for different configurations of networks, but focused on the possibility of conflicts arising in such networks, e.g., from attempts by one party to control others. Mandal *et al.* (2003) discuss IS planning for an alliance, but do not include empirical data. Volkoff *et al*. (1999) examined system development in a network but focused on the need for a sponsoring executive in each firm.

In summary, our review of the literature on IS-business alignment reveals broad consensus that achieving alignment between business and IS strategies is important for organisational performance. As well, the literature provides useful definitions of the basic concepts of alignment and measures for alignment and highlights some of the factors that enhance or impede alignment. We draw on these theories in analysing our case of a network in need of a joint strategy in certain domains while preserving strategic diversity in other domains

However, our review shows that we know little about alignment in inter-organisational networks, a gap in the literature we address. Studies of alignment in global firms are suggestive, but much of the work to date has been done in contexts where central management or a supply chain leader can provide direction for the

process Indeed, it is difficult within the existing frameworks to even define what would be meant by alignment in such a setting. For example, the dominant approach seems to be standardization on one strategy and system, which is not an option when diverse strategies and systems need be accommodated. For example, multiple firms in a network might require IS-enabled integration to achieve high performance for the shared business. At the same time, they pursue different individual business strategies, for which all attempts to standardize on a single system will prove unsatisfactory. How can an inter-organisational network then implement a common system and achieve IS-business alignment in the face of diverse member business strategies? This is the question we address with our case.

Research method

In this paper, we report on an exploratory case study of the development of a shared information system for an inter-organisational network. This development project was itself organized as a collaborative project of the network partners, making it an appropriate setting to examine the question of achieving IS-business alignment in a network setting. In carrying out this study, we followed the advice of Jarvenpaa and Ives (1993), who suggest that IS-business alignment should be examined not as a static outcome but rather as “an emergent process” (p. 570). Our approach is thus similar to that of Sabherwal *et al*. (2001), who carried out case studies in three organisations to examine how IS-business alignment evolved over time. In this paper, we followed the theory-building approach outlined by Eisenhardt (1989), though our analysis is focused on a single case, a limitation we discuss in the discussion section. In the remainder of this section, we describe the case site, the project, our data elicitation, and analysis approach.

Research setting: ARC Transistance

Our case is set in the *ARC Transistance* organisation, which has become the leading European provider of roadside assistance. This network was chosen because it provided a revelatory setting for our research (Yin 2003); revelatory because the process of implementing a common system revealed the nature of IS-business alignment and the process of achieving it in a network setting. Furthermore, the authors had good access to the organisation (Yin 2003), facilitating the research. In this section, we first recount the history of the *ARC Transistance* network organisation to explain the background of and challenges facing this inter-organisational network.

ARC Transistance is a collaborative venture of 38 European automobile clubs, led by the largest automobile clubs in eight major European countries — AA (United Kingdom), ACI (Italy), ADAC (Germany), ANWB (Netherlands), ÖAMTC (Austria), RACE (Spain), TCB (Belgium), and TCS (Switzerland).

In most European countries, a "Yellow Patrol Van" offering roadside services is what first comes to mind when motorists think of an automobile club. These clubs, comparable in function to the American Automobile Association (AAA) in the United States, have a long history: in the case of the Netherlands, for example, the national club provided roadside assistance even before the invention of automobiles. Today, clubs offer membership to car owners and drivers in nearly every European country. Services include free roadside assistance from the club's fleet of assistance vans, as well as maps from the club printing house, testing of cars, air-rescue services by helicopter and plane in the event of an accident, a club magazine and a travel agency, among others.

Strategic motivation for the network. The separate national clubs were motivated to collaborate by several converging changes in their markets. First, European integration led to strong growth of cross-border traffic and cross-border travel (increasing 10% annually since the mid 1980s), which created a demand from members for pan-

European services. To meet this demand, many of the large national clubs independently operated foreign services — called 'key points' — for their members travelling abroad (e.g., a Dutch key point in France to provide services to Dutch members travelling on holiday). The task of the key points was to establish their own local contacts, to manage cooperation agreements with local clubs and to coordinate assistance services for members travelling out of their home country. Increased demand prompted consideration of better ways to deliver these services.

Second, the early 1990s brought a radical change in the industry, when motor vehicle manufacturers started offering life-long roadside assistance as a way to maintain customer relationships throughout the lifecycle of a car in the face of decreasing automobile brand loyalty. Some manufacturers set up their own roadside assistance operations, thus directly competing with the clubs. Others emerged as business-to-business (B2B) customers for outsourced roadside assistance services. However, these manufacturers required a single European-wide provider that would fit their distribution organisations, thus creating a new kind of business. While the larger clubs did have some foreign services, as noted above, it would have been difficult for any of them individually to offer a truly pan-European service. As well, the B2B nature of the business was a change from their historic focus on individual client/members.

Third, the changes in demand discussed above coincided with a change in the competitive landscape. Roadside assistance had become an independent industry, with approximately 142 million people in Europe covered by some roadside assistance service. Insurance companies accounted for around 35% of the European market share. As well, regional repair shops and towing companies were significant players in this market, both as competitors and as suppliers. Despite the increasing competition, the clubs were still optimistic that they could sustain their competitiveness because of their distinctive services. Rather than simply towing a disabled car to a nearby garage, the

mechanic in the van will attempt a repair on the spot ("Go, don't tow"). As one executive explained,

> "An insurance company insures you against financial risks of starving, the roadside assistance clubs brings you water to the desert" (Volker Knapp, Chairman of the Board of ARC)

ARC Transistance. In 1991, in response to the demand for a European-wide scope of operations, the eight major European automobile clubs (noted above) created a new organisation, *ARC Transistance*, to offer roadside assistance services on a pan-European basis, marketing these services in particular to the car industry as a B2B service. The Chairman of the Board of Directors laid out the organisation's goals as follows:

> "The mission of *ARC Transistance* is first to combine the network services of the national clubs to a pan-European network and second, to offer roadside assistance services to the car industry and gain a high market share on that market sector" (Volker Knapp, Chairman of the Board of *ARC Transistance*).

The *ARC Transistance* organisation had the responsibility to negotiate the business-to-business (B2B) roadside assistance contracts with the auto manufacturers on a pan-European basis, while the national contracts remained with the individual clubs. *ARC Transistance* did not build its own operations but utilized the network of its clubs for service delivery. As the Chairman explained:

> "*ARC Transistance* is not a club itself, *ARC Transistance* is a coordination body for the clubs" (Volker Knapp, Chairman of the Board of *ARC* Transistance).

In other words, the clubs together formed a network organisation to provide pan-European roadside assistance. The clubs remained independent and served individual drivers in their home markets, but cooperated to provide European-wide coverage coordinated through the *ARC* office in Brussels, Belgium. In Kumar and van Dissel's (1996) terms though, the network was initially characterized by multiple layers of

reciprocal interdependencies, as each club negotiated and maintained relations with the others.

Network members were not homogenous: the clubs' strategies and operational practices differed depending on local circumstances. As well, not all European countries had clubs. For example, since France did not have a club, a group of clubs created a shared office (called *ACTA*) in a touristic region of France to serve club members travelling there. In some Eastern European countries, clubs were founded only after the fall of the Berlin Wall and resembled franchises of the Western clubs. On the other hand, no single club in the network was dominant and the *ARC* office served as a coordinator rather than head office. These differences made coordination and management of a European *ARC Transistance* network a challenging task, as its CEO noted:

> "The major shareholder clubs of *ARC* are generally long established, and successful organisations, and often built their own operation systems, trained their own staff and developed their own operation methods in the way that suits their own market needs" (Andrew Johnson, Chief Executive *ARC Transistance*)

ARC Transistance was actively involved in the coordination of network activities, including the definition and monitoring of service-level standards for the auto manufacturers' contracts. However, managers of *ARC* and of the clubs in the network had varying visions of the future of *ARC*. Most viewed the network as focused strictly on B2B marketing of European-wide assistance network to complement the independent national efforts. However, a few considered the Brussels office as an emerging future holding company for the integrated business, modelled after AAA in the US. These differences in perspective were one source of difficulty in achieving alignment in this setting.

From the start, *ARC Transistance* launched a number of cooperative activities to gradually harmonize operations, as well as products to integrate the *ARC* network into a more cohesive pan-European roadside assistance organisation. One visible sign of this

integration is that the name "*ARC* Europe" has been used since about 2004 as a European-wide co-brand with the names of the national clubs.

We turn next to a case study of one of these cooperative efforts, the creation of a common information system. The systems implementation project we studied was led by four clubs (AA, ADAC, ANWB, and RACE) along with the *ARC* coordination office in Brussels and the *ACTA* office in France, and the interactions among these actors is the primary focus of our study. These entities took the lead because of their need for the system and because they had the available resources to commit to its development. We focus on this system development project in particular because it recurrently forced the crystallisation of questions of IS-business alignment in this network setting.

Data elicitation approaches

Data for the case come from multiple data collection methods, as suggested by Eisenhardt (1989), specifically analysis of archival documents and interviews with key players in the case. First, data about the organisation were gathered from an extensive document analysis of business strategy and systems development project reports, including technical specifications and assessment reports covering three successive IS implementation project phases. A summary of the documents analysed is given in Table 1.

Table 1. Documentary evidence for the case study

- Organisational documents
  - 6 club advertising fliers
- Project documents
  - 4 strategy documents
  - 3 project plans
  - 6 project management/structure reports
  - 4 business process analysis/specification reports
  - 2 risk assessment and measurement reports
  - 5 evaluation reports
  - 2 minutes from review meetings
  - 9 progress reports from the project to funding agencies

Second, an interview instrument was developed and executed between 2001 and 2003 by the two European authors. The protocol included questions about the history of the collaboration and system development project (as identified from the document review), and about the process of alignment of IS and business strategies and the managerial actions taken to accomplish that alignment (as drawn from the literature review). However, because our goal was theory development to fit a novel situation, questions were left somewhat open-ended in order to allow new concepts and ideas to emerge, rather than attempting to fit the data to a pre-existing theory. Nineteen semi-structured interviews were undertaken with employees at the *ARC Transistance* coordination office in Brussels and *ACTA* France as well as with one board member, one or more operational managers and one or more IS managers from each of the clubs in Great Britain (AA), Germany (ADAC), the Netherlands (ANWB) and one representative of RACE in Spain. Interviewees included dedicated project leaders and managers, club chief operating officers or information officers who took leadership roles in the project, and club personnel who worked on the project or who served as user representatives. Interviews were undertaken in English, lasted approximately 60–70 minutes and were transcribed for analysis. Given our focus on the dynamics of the systems development process, interviews were carried out only with representatives of the organisations directly involved in this effort. These organisations and the informants provided a rich picture of the evolution of alignment within the collaborative venture.

Data analysis techniques

To analyse documents, interview transcripts and notes, we applied hermeneutic analysis techniques, supported by the software package Atlas-TI. One author began by examining all interview transcripts and notes to establish the history of the organisation and of the systems development process, as recounted in the case below. This write-up of the case is the first step suggested by Eisenhardt (1989) for a within-case analysis.

The interview transcripts and notes were next coded to identify text referring to the management of the relationship between the partner clubs. These segments were then assigned to theoretically meaningful categories derived initially from the literature. However, the categories evolved through the course of the data analysis as shown below. As we coded each segment, we discussed whether the segment fit an existing code, or required a new code or existing codes to be revised. We continued to revise the codes until each identified segment fit cleanly within some category. These codes were then grouped into higher-level categories and the relationships between these codes were elaborated to develop our final model, as suggested by Eisenhardt (1989). The resulting set of codes are shown in Table 2.

As one means to validate our findings, intermediate versions of the case description were submitted to club IS and operational employees for review and

Table 2. Final data analysis codes.

- Changes in demand for services from markets and in business strategy
- Network building and scaling
  - Club relationships
  - Relationship building across time and space
  - Complementarities among clubs in organizational infrastructure
  - Contradictions in club strategies
  - Development of new processes
  - Resource allocations
  - Resource allocation decisions
  - Sense making for joint action
- Networked organisation
  - Network structure
  - Power
  - Authority
  - Norms
  - Conflicts
- Limits of network alignment
- IS architectures for network organisations
  - New technologies and architectures
  - Inter-club systems
  - Service-oriented IS

discussed at an *ARC* board meeting. These interactions confirmed the basic validity of our case description and findings and provided additional insights to sharpen our findings. As well, board members found the analysis helpful in understanding the underlying source of the problems that had been encountered in the implementation project, again providing a source of validation for our interpretations.

Case study: Creating a European incident management platform—The *ARC* IP project

In this section, we present a description of the system development effort undertaken within the *ARC* network. The development effort went through several phases and illustrates the issues and complications in achieving IS-business alignment in an inter-organisational network. The key events in the case, as identified from the documents and interviews, are listed in Table 3 and will be discussed in more detail in the rest of this section.

The various clubs had of course all individually invested in their own computer systems to support their member services and maintained databases of management and marketing information. But experiences in cooperation gained in the early phases of the *ARC* B2B contracts and with *ACTA* in France created awareness amongst the chief executive officers of the *ARC* Clubs that:

> "Incident management is a pan-European affair and incident management services should be provided to a European citizen according to the highest standards." (Periodic Project Progress Report)

The CEOs created a vision that an operator in a club anywhere in Europe should be able to communicate with the member in his or her native language, verify the services available, manage the incident in co-operation with the local service providers, and to a successful completion. There was strong agreement amongst these actors about why this new form of service was needed.

Table 3. Timeline of key events in the *ARC IP* development project.	
Date	**Event**
01/12/96	*ARC IP* Project launched
19/02/97	Software development delayed; project board approves a high risk "prototyping approach"
24/03/97	Project board reviews final version of prototype with users and agrees on implementation plan with developers
03/06/97	Project board endorses decision to suspend implementation and notify *ARC* Board of Directors of impact
25/09/97	*ARC* Board of Directors decides to delay work on Phase 2 until after Phase 1 implementation
18/12/97	Approval given to start Phase 2 scoping exercise in Q1 98
24/02/98	Senior technical representative of the clubs met and identified a strategy for Phase II with the following three stages: II a) Separation of Front and Back office implemented for ACTA (F) only. II b) The further development of the generic solution by incorporating additional services enabling the solution to be extended to AA and ADAC at Lyon II c) The implementation of the AA/RACE link. The AA will use the generic system whilst RACE will adopt the data standards and incorporate into its current domestic system.
01/99	Technical Audit by AA and ADAC led to a technical architecture paper by AA, ADAC and ANWB. ADAC evaluated the impact of the revised architecture upon the software and hence effect upon the build of Phase 2. Phase 2 put on hold till Q4/99.
09/99	Phase 1 pilot at ACTA (F)
11/99	Presentation made at annual network meeting in Amsterdam. Clubs invited to register their interest in the early application of Phase 1 and the subsequent use of Phase 2. Project relaunched as *ARC-TIME.*
08/00	Business processes agreement.
02/01	Completion of System architecture
04/02	Pilot of Phase 2 at ADAC

To support this vision, work began on a common operational information system, named the *ARC IP* system. In addition to improved functionality, cost savings were expected from creating standards supporting efficient pan-European information exchange. Many clubs were investing in international roadside assistance networks that operated in parallel and fully independent of other clubs' systems. However, these independently developed systems did not allow for inter-operability, hence for example all cross-border *ACTA* service requests had to be printed, faxed and re-entered. The new system was intended to eliminate these inefficiencies.

Period 1: 1994 to 1995—Interoperation through standard data interfaces

To develop a set of requirements for the new system, conferences between operation managers and IS system development specialists from all *ARC* clubs were organized every six months starting in 1994. During these meeting, IS specialists and operations managers came up with an initial list of priorities for the *ARC IP* project. The partners described the benefits they expected from the *ARC* inter-organisational network. Benefits as perceived by the managers of the *ARC* clubs and the *ARC Transistance* organisation are summarized in Table 4. The table reveals perceptions that are only partially aligned, which represent potential problems for the IS implementation project. On the side of the clubs, expectations varied between the larger and the smaller clubs. Large clubs identified the benefits collected in Table 5, while smaller clubs prioritized the benefits as shown in Table 6.

Table 4. *ARC* management expectation of ***ARC*** *IP* system benefits

- Increase speed to market with rapid introduction of new products, because development can be shared
- Support the drive for higher service level standards across Europe for all club members
- Provide standard management information
- Reduce system costs and provide potential revenue for future development via licensing fees
- Provide an *ARC*-wide system and data communication framework with potential for further innovation such as Telematics entitlement checking, or mobile fleet management
- Provide economies of scale with common development and maintenance
- Create a common system at Lyon with an integrated Back Office, potentially offering improving operational efficiency

(source: club documentation)

Table 5. Large club management expectations of ***ARC*** *IP* system benefits

- Interface to home club patrol deployment system
- Support for complex, low volume roadside assistance products
- Piloting of new roadside assistance products
- Foreign traveller support for both home and foreign members

(source: club documentation)

Table 6. Smaller club management expectation of ***ARC** IP* system benefits

- Off-the-shelf package system supporting both domestic and foreign business
- Low level of local IS support required
- Ability to implement Front and Back office independently

(source: club documentation)

Championing the *ARC IP* project was a working group of the clubs' IS departments, which established their own set of priorities as given in Table 7. To information systems people, this project was a good opportunity to test the concept of interoperability from its technical perspective, standardise data interfaces, data definitions and business processes, and indeed, these participants felt that they had succeeded in developing these.

Table 7. Club IS service management expectations of ***ARC** IP* system benefits

- First true language independent system effectively able to translate data via comprehensive lists of incidents, actions, vehicle data, etc
- The use of *ARC* codes rather then free format text to facilitate more comprehensive, consistent meaningful management information
- Common and easy to use system to shorten training times
- Real-time entitlement checking will reduce fraudulent usage and service abuse

(source: club documentation)

In contrast to the opinions of the IS representatives, the project seemed much more problematic for the operations people because of the diversity of business infrastructures among the clubs. These infrastructures suited each club's particular operations and business strategy, but did not easily lend themselves to alignment with a single IS infrastructure. This is not to say that the operations people disagreed on the need for an encompassing IS infrastructure, but they wanted it only if it followed operational priorities. And the perception differences between general managers of large and small clubs can be taken as an indication of the differing strategies of the different clubs and of the likely problems to be faced in developing alignment between business and IS in this inter-organisational network.

Despite these reservations, work commenced on system development. The assignment for the project was given in 1994 and exploratory talks were initiated to determine the development approach for a new integrated system. A core project team was created consisting of the most experienced members of the IS departments from the three large clubs AA, ADAC, and ANWB. These clubs felt the strongest need for the system and had the most experience in systems development as well as the resources to devote the project. The initial approach for the project was adopted from best practices in enterprise integration with the initial development of a common data standard to allow different clubs' systems to communicate with each other at the system level. As the project manager described it:

> "From that we did actually develop the data standard, we wanted to actually capture common data, data structures and coding structures in order to facilitate the transfer of data across the virtual network" (Graham Warner, Project manager of Phase I and IS General Manager of AA Membership until 1994)

However, development of the data standard definition quickly ran into difficulties. It was almost impossible to define standard terms for the various service packages offered by the different clubs, each tailored to a national market, as one manager described:

> "The products offered by our club are quite different from each others, and our customers expected a certain degree of service quality which sometimes can not be fulfilled by other clubs." (Ton Groenewege, Manager of International Assistance of ANWB and senior user)

The difficulty of defining data standards revealed that specific services offered by different clubs required diverse explicit skills or resources that were not always available or sometimes not even known by all clubs. Differences were driven by the diversity of the products offered by each national club, differences in expected service levels, different cultural backgrounds, national or even regional languages and individual

operation systems. The clubs determined service levels as suitable for their own national members but they differed considerably between countries, as one manager noted:

> "For example, if there is a customer whose money was stolen during the weekend in Spain, they can call us, and we will send our taxi or towing car to the hotel and give him/her some money, but this is impossible in Germany, where the customer has to go to a bank. This makes the service decision-making process rather difficult if it were to be handled by other clubs. We have to work a lot on the different services levels. I think *ARC* can do a lot in coordinating this." (Belen Yome, Manager RACE assistance centre Madrid)

In other words, in attempting to determine the European-wide B2B service offering, club managers were guided by their own business strategies that reflected what customers wanted as well as norms and rules about what was appropriate or allowed, leading to significant differences among the "the visions and perceptions" of the various club managers. The unavoidable number of European languages alone created a dimension of diversity and system complexity when communicating that made alignment to a single system apparently impossible and there was no central power to dictate a common standard. However, this phase of the project did have several beneficial outcomes. A data model was defined that could support communication among the different clubs and more importantly, a practice of regular communication amongst functional managers of all clubs was started that continued through the years.

Period 2: 1996—Alignment of business strategies: ARC *business process reengineering*

At the end of 1995, the project team decided on the need to go one step deeper in harmonizing not only data but also operations by defining a common business process model for international breakdown assistance services. This development was consistent with the focus on business process re-engineering in the 1990s and the insight that changes in technology require changes in process as shown in Henderson and Venkatraman's (1999) strategic alignment model. Such a business process model would provide a framework for cooperation and hence data sharing. In other words, to

align IS and business, attempts were now made to first harmonize the businesses of the various member clubs. Again, this was a rather complex process, as the project manager described it:

> "Within the project team we developed a business process model. We probably have more than twenty versions. It was not anywhere near perfect and we did have a lot of problems with compromising the business process, because there is no such thing as the one and only business process. So, we actually did compromise quite a lot." (Graham Warner, Project manager of Phase I and IS General Manager of AA Membership until 1994)

Once drafted, the project team sought to promote the business process model to all clubs involved. A regular cooperation conference of IS managers from all clubs seemed the appropriate occasion:

> "We promoted this business process model and went through it with some details, and we asked everybody to brainstorm and write down their business processes to see whether it fits well. The results of it were a few minor changes only." (Graham Warner, Project manager of Phase I and IS General Manager of AA Membership until 1994)

By the end of the year, the project team had agreed on an *ARC*-wide business process model for roadside assistance services across Europe, describing the standard business processes to support customers and members. An overview of the resulting processes is

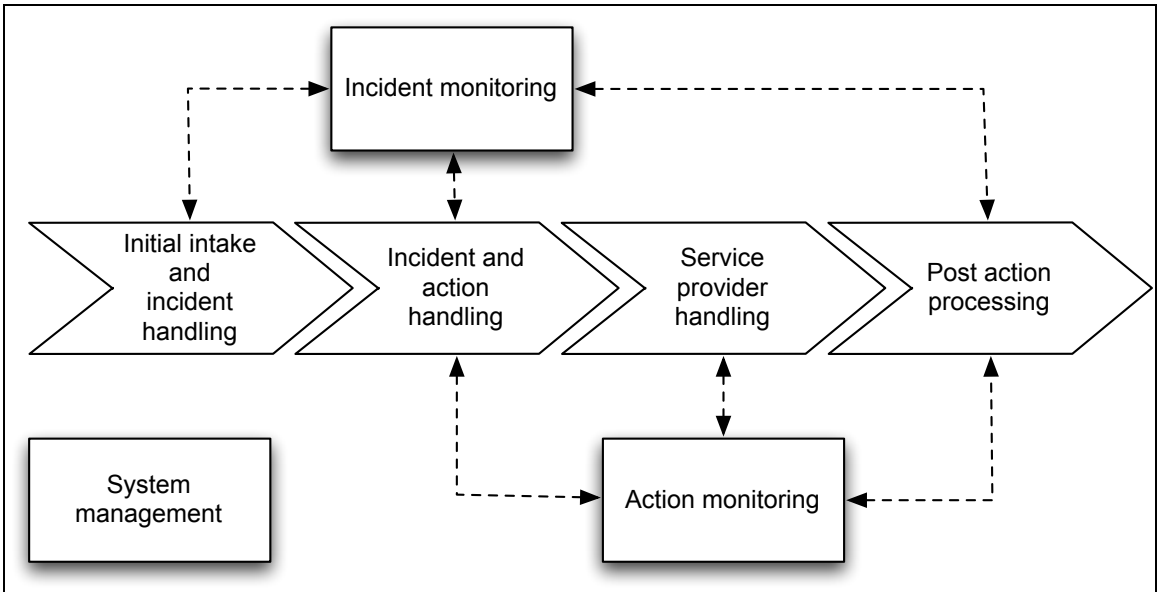

Figure 2. Main Business Processes of the ***ARC*** IP Project

shown in Figure 2. Two general types of assistance processes were defined: Front Office and Back Office. When an incident occurs, a customer calls a dedicated telephone number for assistance. This phone call is directly handled by the customer's own club's Front Office, where the operator can communicate in the customer's native language (or even regional dialect) and be familiar with the details of the club's offerings. The interaction results in orders to local service providers, which are sent to the Back Office for execution. The Back Office organizes service fulfilment in each locality upon action requests from the Front Office but should normally have no direct customer contact. After field personnel complete a service, the Back Office sends a message to the Front Office to deactivate the action.

While conceptually simple, this service model represented a radical change of operations strategy for some clubs. With their current systems, the operators placed orders directly with field personnel, for example, communicating directly with garages for towing when needed. Reliance on these direct links made it difficult to integrate the different clubs' operations. The new *ARC IP* operational strategy prescribed that all Front Offices should only handle the call, check service entitlement and select the services offered, while the integrated Back Office should deploy all service orders. All information exchange between the Front and Back Office of all clubs would be realized via automatic electronic transfer, rather than by fax or telephone. This separation would eventually allow the Front Office of any club to automatically dispatch services from any other club in order to provide pan-European services.

The project team did not struggle with the conceptual ideas of the business processes as much as with organisational and national culture and language differences. Their own project collaboration was itself rather difficult, as translation services and numerous meetings were needed to ensure that all partners grasped the ideas and tenor of the project. Still the achievements made at that point were generally

accepted by all *ARC* clubs and stakeholders, which the project team took as legitimation to move on with implementation.

Period 3: 1997–2000—Alignment through information systems development

In 1997, a large international project was formed to develop a new common system to be used by all European clubs. The system was to support the newly developed and agreed on process model for international incident management among the three large clubs AA, ADAC, and ANWB and those small clubs who are heavily involved in trans-European incident management for holiday traffic, e.g., the Spanish club RACE and ACTA France. The project — a collaboration of ACTA, several clubs and a software developer — was co-funded as a collaborative innovation project by the European Union (EU), which made the developer a partner of the clubs rather than strictly a contractor to them. As in *ARC* as a whole, no club had a dominant role in the project — the structure was as well a network with reciprocal dependencies amongst members. As well, executives made it clear that the system could only be cost-justified with the additional outside funds from the EU, because the benefit of the network in general and its information system in particular were not clear enough for the clubs to go forward on their own, further indicating the mismatch between the visions of the various clubs and the evolving network structure.

The system development effort was organized in two phases. In Phase I, a pilot implementation was planned to enable validation of requirements and specifications. In Phase II, the results and experiences from the pilot would be used to improve the *ARC IP* system and European-wide rollout of the system. The joint ACTA office in Lyon, France was chosen as the most suitable pilot site for the proof of concept for two reasons. First, key points for four of the major *ARC* clubs were already present and functioning independently within the same building. Second, support from ACTA France

seemed guaranteed and in their best interest because the projected growing market in France demonstrated a clear business need for the system. As a project leader commented:

> "To us it is very important, because we have a combined office in Lyon, which was first created by ANWB, due to the travelling behaviour of our members and later joined by the German and English clubs. However, having different IS systems operated by different clubs, the integration in Lyon was not easy" (Jan Barkhof, Vice Chairmen of ANWB Executive Committee, and Chairmen of *ARC IP* project board until 1998)

ACTA France would thus become the pilot model of a pan-European assistance organisation with re-designed business processes and supported by a specific IS solution.

Within Phase I, the system development project followed essentially a waterfall model of software development, with different clubs taking on the three steps of requirements analysis, coding and acceptance testing. At the end of the requirements analysis stage, four main business functions had been specified: *Intake* (call handling), *Incident Management*, *Service Provision*, and *Accounting*. These were to be supported by standards for *Entitlement Checking*, *Incident Data Exchange*, *Incident Deployment Data*, *Accounting* and *Inter-Club Cross Charging*. The functional specifications for the system were then passed to the development company for implementation.

In February 1997, the first warning signals were received that software development would be delayed as a result of extended negotiations between the contractor and ACTA and the clubs regarding the degree of functionality to be implemented. During the project board meeting in May 1997, a decision was made to return the software to the contractor for further development, system integration testing and incorporation of change requests from the user testing at ACTA in Lyon. The new schedule was targeted to coincide with the move of ACTA to a new building in Lyon, during November 1997. However, this target was also missed, as the required

functionality was not completed, a situation the contractor blamed on late delivery of stable requirements. We see the problem of achieving a stable set of requirements as a symptom of the deeper issues involved in achieving alignment, as will be discussed.

Early in 1998, three major priorities were identified for the system development: first the separation of Front Office and Back Office to be implemented for ACTA only; second, focus on serving the clubs AA and ADAC in Lyon but with a more complete solution with additional supported services; and third, the implementation of a link between the systems of AA and RACE. In other words, in order to complete the pilot, the IS implementation was increasingly focused on the prototype and tailored to the needs to that particular implementation site and its interface with individual clubs.

The Phase I development was expected to finish in the second half of 1998, but already in 1997 it was clear that the system would still have serious stability and response time problems and that a number of essential modifications would be identified during testing, causing further delays. It was not until September 1999 that the Phase I prototype of the *ARC IP* system, now based on the common data standards, was implemented for ACTA in Lyon. Implementation and rollout were a success; the system has been running smoothly in ACTA since the implementation. However, after all the discussions and delays, scepticism remained throughout the *ARC* network. Typical reproaches were that the system was only a B2B system entirely tailored for the use of ACTA, that the requirements for an interoperability system were not met, and that the Front Office and Back Office were still not separated. In short, the system was apparently only usable by ACTA, as one club manager bluntly put it:

> "The project and the system development have been hijacked by ACTA Lyon".

Apparently, increased IS-business alignment in this context contributed to the success of the system for the specific business strategy of ACTA, but at the expense of alignment with other clubs of the network.

Period 4: 2000 — Re-aligning operations and IS

With Phase I completed with mixed results, a great deal of work was undertaken to identify a workable Phase II strategy. The lead of the project was moved from those representing the B2B business to one of the large member clubs, ADAC. ADAC concluded that the aim of the project should be changed from an integrated monolithic pilot to a modular system that could freely be assembled into a true pan-European operations platform, an approach similar in retrospect to the layered model proposed by Peppard (1999). The system was intended to prove the applicability of interoperability concepts as well as to provide validated information on best practices in managing international IS initiatives. In other words, project managers no longer sought to achieve alignment between diverse business needs and instead focused on identifying basic commonalities so that the IS would provide an infrastructure for cooperation while minimizing constraints and norms for one particular way of doing business.

To signal the re-launch of the project, it was officially re-assigned to the leadership of the *ARC Transistance* CEO Andrew Johnson and re-named *ARC TIME*— Tailored Incident Management Europe (TIME). Project leaders increased their efforts to involve users with a set of three-day workshops that began in November 1999. Workshops continued until January 2000, with the aim to capture the requirements from as many users as possible and to validate feasibility directly with technical people. Both users and technical representatives from most of the clubs attended the workshops. However, attendance at the workshops varied from time to time, which slowed down the process of capturing the entire business process.

> "It is difficult to get different people from different clubs in order to try to obtain a generic solution, there was lack of consistency." (Tim Weston of the AA, *ARC IP* Business Analyst and Implementation Manager)

> "The workshops did help for the users, but the problem is still the same, things were starting very well, everyone was attending the workshops, but at the end we were only left with a few clubs which were directly in charge of the system development" (Belén Yome, Assistance Centre Manager of RACE and Senior User)

Again, a key theme is the problems posed by the diversity of business strategies and user needs in an inter-organisational network. A particular discrepancy in strategy was that about this time the British club, AA, was purchased by a for-profit company, while the continental clubs remained non-profit member organisations. This phase demonstrates the power over development held by the richer clubs. However, despite the differences in size, resources and power, no club was sufficiently powerful to impose its vision on the rest, thus necessitating the continued process of seeking alignment amongst the clubs in the network.

Since the development of the *TIME* system, ADAC showed strong interest in using it as its own system and therefore agreed to contribute resources (system developers, project managers, and financial support). Moreover, ADAC took the lead in the development of the rollout phase. The managing director described their role:

> "For ADAC, the first phase is the B2B business, which is to integrate other clubs into our organisation in order to provide the service. So we have to find a way to make entitlement checking within our own system and give the order to other clubs. The next step is that other clubs are able to see a service order online in our system, reply to it, then take over the order, and finally give information back when the break down service car reaches the garage. In that way we try to bring *ARC TIME* Phase III to the B2B area, and in future maybe to medical assistance and only then to the membership services." (Dietrich Heide, Managing director of the ADAC service company and Senior User)

However, at this point in the case, and apart from the pilot implementation of the Phase II system between the clubs RACE and AA, only the clubs ADAC and ACTA France had

confirmed their participation in the Phase III development, as the senior users of the clubs reported:

> "We will push this activity in ADAC, and we will replace our stations abroad with the new system, then the site in Munich" (Dietrich Heide, Managing director of the ADAC service company and Senior User)

> "To get further investment, we need a quite sound business case, so from our perspective unless it shows significant improvement on time for processes and quality there is no clear reason for us to invest, because we are quite happy with our existing systems. And we are not going to invest in any system development in a short time scale. So we need to wait and see what it is going to be delivered, and look if there is any significant improvement to justify a business case" (Jean Pocock, European Operation Manager of AA and Senior User)

> "We have to see who is going to use the system, and where they are going to implement the system, then we will decide whether it is making sense for us to participate" (Belén Yome, Assistance Centre Manager of RACE and Senior User)

In other words, the process of network aligning continued between a diverse set of business strategies and the desire for a shared network strategy enabled by a common IS. We fade out from the further evolution of the case at this point, but indeed, in the end, ADAC may also come to be seen as "hijacking" the project.

Discussion

In this section, we discuss the implications of the case presented above for understanding the dimensions of the IS-business alignment process in a network organisation. We first reflect on the meaning of alignment in this setting before discussing the role of IT in the alignment process.

Theoretical contribution

Building on the work reviewed above, the first theoretical contribution of the case is to help clarify the meaning of strategic alignment between business and IS in the context of an inter-organisational network lacking a dominant partner. In order to conceptualize the development of alignment within a network such as *ARC*, we started with Henderson and Venkatraman's (1999) strategic alignment model. However, to

address the concerns of an inter-organisational network, we must consider not only alignment within a single firm, but also alignment across the many firms that comprise the inter-organisational network. Figure 3 shows our proposed new model as it applies to the presented case, including the forms of alignment proposed by Henderson and Venkatraman (1999) for each club, but as well the need for alignment between different network members. We thus distinguish between alignment of IS and the individual businesses' strategies and infrastructure ("IS-business alignment") and alignment of IS and the overall network strategy ("IS-network alignment").

In terms of Henderson and Venkatraman's (1999) model, business-IS alignment means balancing the four domains of business and IS strategy and infrastructure and comprises strategic fit (strategy aligned with infrastructure) and integration (IS strategy and infrastructure aligned with the business). In parallel, we define network alignment as the alignment of the network strategy and IS with the individual member firms' strategies

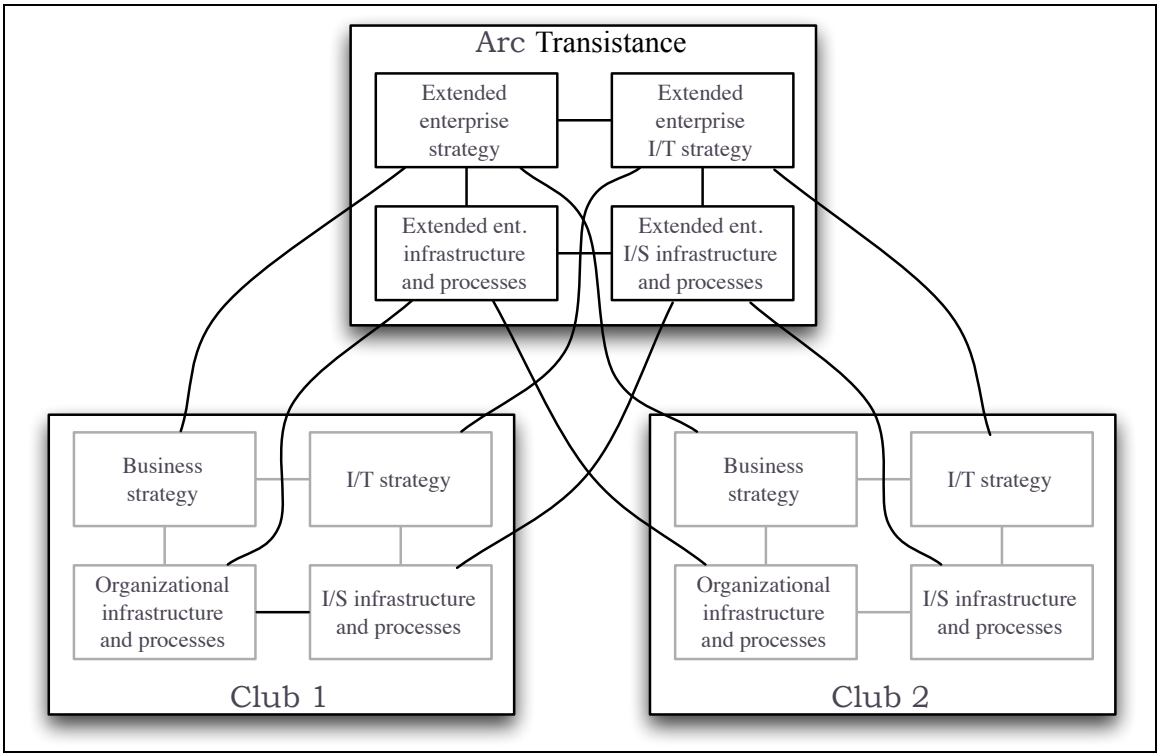

Figure 3. The Inter-organisational network Strategic Alignment Model.

and IS, comprising fit between the network strategy and the members and integration between the network and member's business and IS. Were full network alignment to be achieved, the organisational boundaries in this framework would have disappeared. Indeed, the the model could be used to describe transitional periods of alignment, such as would arise in post-merger integration situations. Formerly independent—hence not aligned—firms increase mutual alignment in each of the dimensions until ultimately full alignment is achieved.

In the *ARC* case though, full integration was the goal of only a few participants, while for the most part clubs jealously guarded their independence. The lower part of Figure 3 therefore shows multiple adjacent Hendersen and Venkatraman (1999) alignment figures, as each club maintained its own business strategy and business and IS infrastructure. It is a characteristic of the network that alternative strategic configurations coexist, such as a structure of reciprocal dependencies (Kumar et al. 1996) between the clubs together with a centralized structure with pooled dependencies for the B2B business.

The various network-wide alignment efforts undertaken during the *ARC IP* project can be positioned in the alignment model, as shown in Figure 4. Interoperability and network alignment was the aim of the *ARC IP* project, which produced extensive specifications from lengthy consensus-building workshops of management, IS, marketing and operations representatives. Initial work in period 1 on the common data dictionary and interchange standards contributed to alignment of the IS infrastructure among clubs; the development in period 2 of a shared architecture contributed to alignment of the operations strategy; and the common business process models addressed alignment of the organisational infrastructure and processes. These models also provide an explanation for why the project failed initially to deliver a working

information system: because the independence of the multiple club IS-business configurations were not sufficiently honoured.

In the second phase of the project, the focus shifted to developing a concrete prototype of the information system. However, as the implementers struggled to finish the system, the prototype was narrowed to handle B2B contracts only and, even more specifically, only those occurring at ACTA France. Research on change management (Senge 1990) suggests that successful pilot cases will increase the chances of adoption by the large organisation, but the opposite was the case for *ARC* network, where the successful pilot system was rejected by the other clubs as having been “hijacked”.

Our model suggests that this can be explained by the fact that in the course of implementation the pilot system was aligned to the distinct business strategy of ACTA France and in doing so, the gap between the network strategy and the strategies of the

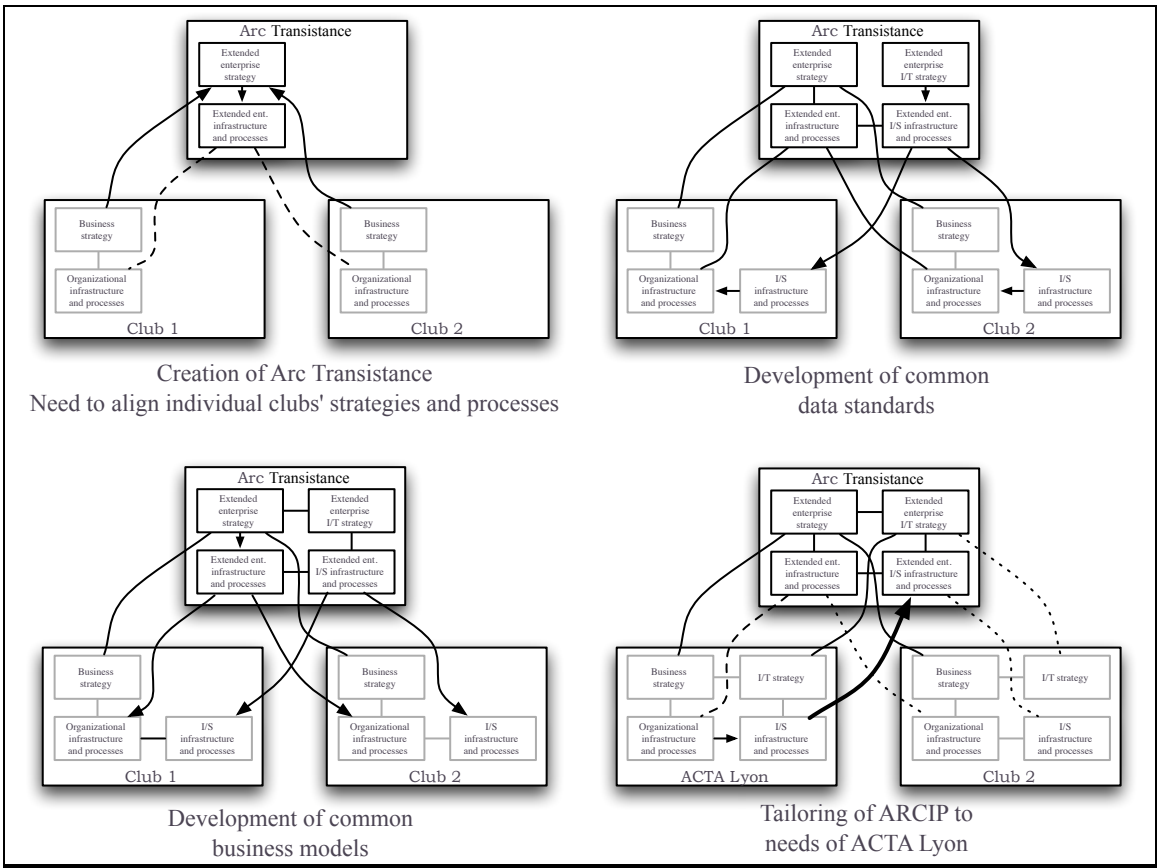

Figure 4. Stages of the case positioned in the network Strategic Alignment Model.

other clubs increased or at least, was perceived to have increased by staff of the other clubs. This change of perception can be visualized in the alignment model as the project moves from a network-alignment level to just another firm-level business system. In other words, the failure of the project in initial periods was not necessarily caused by poor specification of the data models and processes. Rather, the system could not meet the conflicting demands posed by the continued alignment of the individual clubs' business processes to their unique business strategies, rather than to a common network strategy. The final period of the project, as seen through our model, emphasized alignment to the largest club, ADAC, and thus increased the chance of success for the (technology) project, but again at the possible cost of alignment to the network.

On the other hand, the model helps explain how the project contributed to the evolution of genuine strategic alignment of the *ARC* network. For example, the network initially focused its strategy on B2B contracts on the network level while relying on the national clubs for service provision and thus did not compete with the member clubs for the member assistance business (recall that the clubs were created originally to serve individual drivers and the B2B business was a new development). Similarly, the structuring of operations and IS systems into Front and Back office became generally accepted in the course of system development, so that it in fact emerged as a network standard. And the IS platform strategy evolved to describe which functions are included in the network platform and which are left to the national clubs and specific businesses. So, instead of working towards unconditional alignment along all dimensions for all clubs, the decision was made to focus on only limited services (such as entitlement checking) and shared technical functionalities (such as the data dictionary) to be provided throughout the network.

Our extended model has several immediate implications for understanding the nature of IS alignment in an inter-organisational network. For one, we do not assume

that participation in a network implies that members have to, or need to attempt to achieve, full business alignment or implement all of the same systems in a standard way. Our case study suggests that network alignment can deliberately remain partial, including conscious space for diversity. For example, one manager stated that:

> "We are interested in adopting the data standard, and the backbone infrastructure, but we don't know yet whether we are going to use the software package or not, because we have our own software system to support our own operation" (Dorine Van Lammeren, Manager of ICT Department of ANWB and Senior User)

In other words, individual business strategies and network strategy may remain distinct but connected strategies. Each club concurrently had committed to the overall European network, as seen in the creation of *ARC Transistance* in 1991, but continued to pursue its own individual national strategy as well. These distinct strategies found their complement in distinct information systems for the different levels, with tensions arising when the network system was seen as tied too closely to one particular business strategy. Thus, we conclude that network alignment is of a distinct nature from alignment of business, even if it is undertaken through a joint venture within the network.

The role of network information systems in network aligning

While the focus of the first half of our discussion has been on understanding the managerial actions involved in work towards network alignment, the reminder of this discussion is dedicated to a reflection on the role and appropriate structure of information systems for this setting. Network information systems, like the *ARC IP* and *ARC-TIME* systems, are instruments to create relations between the clubs. We consider first the way the system development effort interacted with network development efforts before considering the applicability of new system architectures.

Information systems as the crystallisation point for network aligning

First, in the course of the project, observable *ARC* network structures were created as elements of an IS platform strategy, such as the joint data dictionary,

business process definitions and elements of a shared network architecture that distinguishes between Front Office and Back Office, as one interviewee noted:

> "The benefit of phase 1 was a proof of concept that the complete separation of front office and back office does work, leading to a new virtual organisation. [Q: Was that achieved?] Yes, for all clubs it is possible to connect through the interfaces to the back office at Lyon. (Jan van Dijk, Senior ICT Architecture Manager, ANWB)

However, while the structures were prepared technically, they were not readily adopted by all the clubs, as the remainder of the quotation shows:

> [Q: But connection through the interfaces has not been done by all clubs?] No, that was in fact because the phase 1 didn't complete with the separate front and back office, and because of the structure of the software." (Jan van Dijk, Senior ICT Architecture Manager, ANWB)

This perspective on the project is helpful in understanding why it initially failed despite the sound application of best practices in software development management. We recall that a limited pilot was implemented successfully in ACTA France, as perceived by some members:

> "I think the interoperability has become a success in Lyon, and that is a good example to show that we have to go in that direction." (Yang Barkoff, Vice-chairman ANWB executive committee)

However, as noted above, many managers perceived the delivered system as overly tailored for ACTA and therefore less suitable for other clubs. Managers, even those within the same clubs, offered two conflicting explanations for this failure. The first group attributed project failure to technical features of the system, which they perceived as insufficiently modularized and so incapable of being tailored as needed. Similarly, Hanseth et al. (1996) suggested modularisation as key to managing the need for flexibility in standards.

On the other hand, others suggested that interoperability and good functionality had actually been achieved but the system was in need of more implementation support

in the other clubs. Nevertheless, from both groups there are clear indications about the impact of power structures (or lack thereof) in the network on the project implementation:

> "We started with very disjoint tasks: ANWB did analysis, ADAC built, and AA did test and implementation. Everything was done very isolated. We introduced quality review, but the success of that was limited. We also introduced change management due to creeping functionalities but we still have these problems […]. We introduced stage managers who are responsible for the stage of the project. The idea was, to pull the whole thing together, but there is still a problem, […] they don't have real authorities within their club. When you don't have the lead of the project, there is no ultimate authority over other organisations." (Gaynor Clark, AA and *ARC-TIME* project manager 1997-2000)

This situation changed in the final period of the project, when a single club, ADAC, continued the systems development project. ADAC has its own resources (being one of the largest clubs) and has not promised that the system will be of use to others. It therefore negotiated with the other clubs to get access to their resources. Interestingly, most technical specifications were re-used from the former phases, suggesting their essential applicability.

In the final phase, ADAC combined three forms of power as suggested by Phillips *et al*. (2000): formal authority, from their role in the project, control of critical resources, and discursive legitimacy through the various teams in the project. Ciborra argues that a top-down approach to infrastructure planning works only when the technology can be planned and controlled in all of its features (Ciborra 2000, p. 35). When control of resources is diffuse, collaboration will involve greater levels of negotiation, compromise, sharing of resources—all elements seen in the case. As seen in the *ARC-TIME* system, in Ciborra's case studies, attempts at top-down control failed, resulting in an evolution to "management by deals", very much like the approach to Phase III in our case. It may be that the management of ADAC was more used to working in this fashion, as ADAC is itself a network of regional German clubs.

In practical terms, our case suggests that the degree to which the information system is aligned to the current state of inter-organisational structural relationships determines the chances of success of the IS project. The more the information system is used as an instrument of change and network aligning (e.g., transporting managerial visions about future network strategies), the more network-development effort the project has to bear and so the greater the risk of misalignment should those efforts not pan out.

Shared information systems can thus be seen as a crystallisation kernel for network aligning, providing a shared history that can serve as a basis for building shared beliefs over time. Clearly, the external competitive pressure that led to the foundation of the *ARC* network is such a shared history, but equally so is the shared experience of lengthy discussions and resulting definitions of data models, business processes and the front office / back office architecture of the IS development. As one participant put it,

> "*ARC* is a phenomenon you always get when you put up a collective office over different ones who are very used to doing their own show. It is a discussion on how far it is helping and when do they realize you are very powerful, because you have all this knowledge and how do they react to that." (Andrew Johnson, CEO, *ARC*)

From this perspective, aligning IS and business in the *ARC* network was not a spontaneous phenomenon but was rather based on managerial actions at the inter-organisational network level. The *ARC* office in Brussels and the committees in the *ARC-TIME* project provided program and project management capabilities, learning practices throughout the network, software development and organisational design routines, for example, to improve quality of service levels. In practical terms and to a considerable extent, they are non-technical results of the *ARC-TIME* project as well. But, as networks are comparably young and still emerging phenomena, more research is needed into the structures for strategic alignment of network organisations in their own right.

Strategy-neutral system architectures for networked organisations

Our final discussion point concerns appropriate information systems architectures for networks. While we have argued in the beginning of the discussion that network strategy-IS alignment has an equal impact on the multiple business strategy-IS alignments of the network partners, we explore here the different nature of network-IS alignment that the case suggests. Specifically, we suggest that the alignment process was eased by the creation of information systems that were "strategy-neutral" with regards to the network partners. As we have discussed throughout the case, it proved difficult to serve multiple business strategies and a network strategy with one integrated monolithic software package. In the case, the later version of the *TIME* platform, developed using a service-oriented architecture (SOA), offered improved modularity to address this issue. This structure included a distinct middleware layer through which each Front Office can potentially communicate with each Back Office in a standardised way while maintaining its own unique characteristics, contract conditions, language and so forth. This architecture, similar to the infrastructure/superstructure framework developed by Peppard (1999), fit the newly introduced Back/Front office organisational structure and reduced the complexity of the system (Leymann et al. 2002) .

The *ARC* case shows that basic services such as entitlement checking or dispatching assistance services could be wrapped into modules of agreed quality that could be used network-wide. And because these systems were largely neutral to the strategies of the clubs involved in the network, meaning that they did not interfere with the clubs' individual business strategies, the network performed better with the loosely-coupled systems. This approach to inter-organisational infrastructure thus bridges tensions between variety and standard enforcement in the *ARC* network. The limits of alignment, however, are not a simple lack of standardisation, but a careful balance

between standardized middleware infrastructure and deliberate service diversity, thus spanning the levels shown in Figure 3.

Developing information systems in a strategy-neutral way proved particularly beneficial in the case for maintaining the agility of the network under the conditions of dynamic change, similar to Chung et al.'s (2003) finding of the importance of infrastructure flexibility. Failures in the early phase of the *ARC-IP* project had been attributed to difficulties in accommodating constant "requirements" changes. The evolution of the *ARC IP* project can be seen as an experimental search for the most appropriate assignment of functions to the middleware layer versus business services, and development of interfaces between these. We have seen that purely technical specifications of the interfaces in the initial periods of the project were not successful, because their context remained operations- and strategy-specific. In its later periods, the project benefited from aligning the emerging network strategy to the IS platform strategy. The SOA structure especially enabled progress with interoperability of the *ARC-TIME* system without having to wait for achievements in business alignment across the *ARC* network. As one potential user noted:

> "We are interested in adopting the data standard, and the backbone infrastructure, but we don't know yet whether we are going to use the software package or not, because we have our own software system to support our own operation" (Dorine Van Lammeren, Manager of ICT Department of ANWB and Senior User)

In fact, such decoupling of progress in technical implementation from progress in network alignment helped build the network organisation, as it avoided disturbing day-to-day praxis of the member clubs. Rather than creating a feeling of uncertainty and insecurity, which is often associated with organisational change, the network organisation advanced network aligning through middleware implementation and the provision of complementary, new business domains, such as the B2B contracts for *ARC*.

In summary, the experience with system development in this case suggests that IT architectures for networked organisations are not an alternative gestalt of architecture but can be placed along a continuum of degree of tight coupling to the business versus loose integration of commodity modules. Indeed, this continuum may be extended to what might be called strategy-free systems, those designed to support many diverse organisations without change. Simple examples include common office applications that are used unchanged in many organisations. The case suggests that even complex enterprise level systems, here for the Back office, could be designed to be used with little tailoring to the specific business strategies and infrastructures of the members of the network. This phenomenon may in fact be gaining in importance beyond the specific case, as the range of such applications is increasing with the rise of cloud computing, in which identical applications are provided to diverse organisations. The attraction of such systems is such that many organisations now face problems accommodating so-called shadow applications, as employees turn to outside providers such as Google or Facebook for applications such as email or document sharing without the support and control of their IS departments.

Conclusions

This paper has presented an exploratory case study of the development of a common information system to support a networked organisation comprising members with partially shared but—equally important—partially diverging business interests. It contributes first, an analysis of IS strategy, specifically, IS-business alignment, to the growing literature on networked organisations. The case provides the basis for a theory of network aligning, a process that not only impacts success of IS implementation projects in network settings, but in which IS plays a driving role for the evolution of the organisation.

We conclude from the case of the *ARC Transistance* network that attention should be paid to the long-term network alignment process, a perspective that complements the mainstream of network organisation research, which has been largely motivated by the agility and speed with which transactions and projects can be undertaken. The practical contribution of this insight for management teams is that network management is a necessary and considerable effort, though its long-term nature may be in conflict with generally applied short-term reporting periods. For example, the case suggests the importance of regular communications between partners to build trust and to find commonalities that can be a basis for network alignment. However, more research is needed to understand the impact of network alignment on network performance, as sustaining network aligning efforts over the long-term requires measurement methods to make the achieved intermediate results visible.

Second, the conclusion of the study for the domain of IS-business alignment is that, for networked organisations, a simple fit between one business strategy and one IS infrastructure is not sufficient. Nor does the general belief—that the more alignment between business strategy, business processes, IS strategy and IS systems, the better—seem to hold completely for network organisations. Rather, more sophisticated theories are required to explain the co-existence of multiple businesses, multiple strategies and multiple operations sharing a common network infrastructure. Network strategy-IS alignment is not only a separate alignment issue, but needs to satisfy different requirements. The paper contributes a model that distinguishes these multiple concurrent loci of alignment.

Finally, the paper proposes design recommendations for networked IS architectures. In this case, a system neutral to business strategy enabled broader adoption and so better performance by concurrently supporting multiple business strategies and with it, the agile change from one business strategy to another. The

practical contributions of this insight for IS departments facing such diversity is that they should consider embracing open standard information systems more strongly, changing the department's role to one of a service orchestrator. Future research in this direction is recommended, as an extrapolation of the IS architecture characteristics in the case might help understand next-generation information systems, such as cloud computing and software as a service, that provide broad availability of strategy-neutral information infrastructures.

A limitation of the study presented in this paper is that it is based on a study of a single case. Eisenhardt's (1989) suggestions on theory building from cases suggests the value of comparison across multiple cases, but the scale of studies of networks composed of multiple organizations makes that suggestion infeasible to implement in a single paper. Furthermore, different networks have their own unique logic and configuration, complicating comparison. In this paper, we have instead studied the same network as it developed over 10 years, which provides a basis for the same kind of comparative logic. Eisenhard (1991) does note that "the appropriate number of cases depends upon how much is known and how much new information is likely to be learned from incremental cases". Nevertheless, an important goal of future research should be to study other networks to generalize our findings.

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List of acronyms

AA	The Automobile Association (of Britian)
AAA	American Automobile Association
ACI	Automobile Club D'Italia ("Automobile Club of Italy")
ACTA	Automobile Club Touring Assistance (French operating arm of *ARC*)
ADAC	Allgemeiner Deutscher Automobil-Club ("General German Automobile Club")
ANWB	Algemene Nederlandse Wielrijders Bond ("General Dutch Wheel-Riders Club")
ARC	Auto and Road Clubs
ARC IP	*ARC* Interoperability Project
ARC TIME	*ARC* Tailored Incident Management Europe system
B2B	Business to business
ICT	Information and communications technology
ÖAMTC	Österreichische Automobil-, Motorrad- und Touring Club ("Austrian Automobile, Motorcycle and Touring Club")
RACE	Real Automóvil Club de España ("Royal Automobile Club of Spain")
SOA	Service oriented architecture
TCB	Touring Club de Belgique/van België ("Touring Club of Belgium")
TCS	Touring Club Schweiz ("Swiss Touring Club")