

Business-IT Alignment Domains and Principles for Networked Organizations: A Qualitative Multiple Case Study

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Abstract. Applying principles for business-IT alignment in networked organizations seems to be key for their survival in competitive environments. In this paper, we present a qualitative multiple case study conducted in three collaborative networked organizations: (i) an outsourcing relation between an international IT and business integrator and a mass-marketed service provider, (ii) an inter-organizational collaboration among governmental departments of the state of Tamaulipas in Mexico, and (iii) a networked organization between the province Overijssel, the municipalities Zwolle and Enschede, the water board district Regge & Dinkel and Royal Grolsch N.V. in the Netherlands. Drawing from this case study, we derive four principles that networked organizations seem to adhere to when striving for alignment at a certain level of maturity.

Keywords: Alignment principles, inter-organizational cooperation, business networks.

1 Introduction

Despite years of research, aligning IT solutions with business needs remains one of the modern-day areas of concern for both business practitioners and researchers. Interest in business-IT alignment (B-ITa) is stimulated by cases of organizations that have successfully aligned their IT to gain competitive advantage and to improve organizational performance [1].

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Several research studies claim that B-ITa can be achieved at various levels of maturity. Therefore, maturity models (MMs) seem a suitable vehicle for organizations to use in order to gain a deeper understanding of how they progress toward better alignment. Although we can find MMs to assess B-ITa (e.g., [2,3,4]), to the best of our knowledge there is no MM that specifically addresses the aspects needed for achieving alignment between business and IT in collaborative networked organizations (CNOs). CNOs arise when organizations redesign their structure to cooperate with other enterprises to address increasing competitive pressure in their markets. In our research, we are developing a MM to assess B-ITa in CNOs: the ICoNOs MM¹. We believe that achieving B-ITa in CNOs differs from achieving B-ITa in single organizations because in such settings, B-ITa is driven by economic processes instead of by centralized decision-making processes.

In earlier publications [5,6], we have reported on our motivation for developing the ICoNOs MM and on how we began to validate the model. In this paper, we describe a qualitative multiple case study conducted in three CNOs (two single case studies presented in our earlier work [6,7], and a new one). We used this multiple case study to identify the B-ITa domains included in the ICoNOs MM, i.e., **partnering structure, IS architecture, process architecture and coordination**. A domain is a group of processes that helps to have improvements in a particular CNO's area. The results of this study also led us to induce B-ITa theory in the form of principles that can be used in CNO settings when striving for B-ITa. The term 'principles' requires some explanation. Principles, in our context, are fundamental statements concerning B-ITa that should be helpful to CNOs. The principles should be helpful because they summarize important insights of B-ITa that we found in three real-life CNOs when striving for B-ITa. The principles crosscut B-ITa domains. The terms 'domains' and 'principles' are not used as synonyms in this paper.

The rest of this paper is organized as follows: in Sect. 2, we outline our theoretical framework. Section 3 describes our research approach explaining the research question, the rationale for the selection of the case study sites, the data gathering and analysis techniques, and the results. Then, Sect. 4 discusses the B-ITa principles for CNOs. Finally, Sect. 5 concludes the paper.

2 Definitions and Assumptions

2.1 Business-IT Alignment

B-ITa is, in this paper, defined as the *collaborative process to create an environment in which IT services support the requirements of the business*, whether such services are individually or collaboratively offered. We do not consider alignment as a steady state but as an operational process that needs to be improved continuously. With the term 'IT services' we mean the services offered by the information systems (software applications including the supporting infrastructure and

¹ The acronym ICoNOs MM stands for **IT-enabled Collaborative Networked Organizations Maturity Model**.

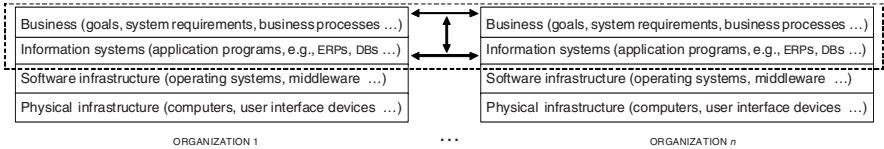


Fig. 1. Business-IT alignment framework

maintenance processes) to match the business requirements. By ‘requirements of the business’ we mean the systems requirements derived from analyzing the goal(s) of the CNO.

We analyze the B-ITa concept in CNOs based on the scheme shown in Fig. 1. The horizontal layers classify entities in a service provisioning hierarchy in a business: physical entities provide services to a software infrastructure, which provides services to information systems, which provide services to businesses. Participating organizations in a CNO need both to fit the different entities (horizontal arrows) as well as to address B-ITa (vertical arrow). Our interest is in the upper two layers of the framework (the area delimited by the dotted line), because there is where the business and IT alignment in CNOs takes place.

2.2 Collaborative Networked Organizations

We define a CNO to be any “mix-and-match” network of profit-and-loss responsible organizational units, or of independent organizations, connected by IT, that work together to jointly accomplish tasks, reach common goals and serve customers over a period of time [8]. Our interest is in IT-enabled CNOs, i.e., collaborations that are made possible by IT where the participants interoperate each other by means of information systems.

CNOs continue spreading since hypercompetitive environments [9] exist. Hypercompetitive environments force organizations to re-think the way they are doing business by connecting and aligning the business and IT operations among them to meet organizational goals. Participants in a CNO can be seen as distinct loosely coupled stakeholders with commonly conflicting interests and goals [10]. However, if they want to collaborate, they need to formulate a clear-enough common goal(s) toward which they strive together.

To strive in their environments, which essentially are characterized by rapid changes in IT, easy competitors’ market entry and uncertain market demands, CNOs should be dynamic. Therefore, we consider that CNOs can change from moment to moment. Having well-defined collaborative work structures as basis, participants need to react promptly to customer needs [11,12]. They will collaborate while mutually interesting ‘business’ opportunity exists. When this opportunity is over, the CNO dissolves while, perhaps, the organizations are active in other CNOs or look for new ‘business’ opportunities.

2.3 The ICoNOs MM

Maturity models have been around for almost 15 years. A MM is an instrument that assesses specific domains against a norm. Based on maturity assessments, organizations know the extent to which activities in such domains are predictable. That is, organizations can be aware of whether a specific area is sufficiently refined and documented so that the activities in such area now have the potential to achieve its desired outcomes. The ICoNOs MM will help CNOs to assess the maturity of B-ITa activities to identify lacks of efficiency that can have a negative impact.

The ICoNOs MM is a two-dimensional framework. These dimensions are the maturity levels and the domains to which these levels apply [13]. In the following, we give a short summary of the domains included in the MM.

- **Partnering structure**, defined as the inter-organizational work division, organizational structure, and roles and responsibilities definition that indicate where and how the work gets done and who is involved.
- **IS architecture**, defined as the fundamental organization of the information management function of the participants embodied in the software applications that realize this function, their relationships to each other and to the environment, and the principles guiding its design and evolution.
- **Process architecture**, defined as the choreography of all (individual and collaborative) processes needed to reach the shared goals of the participants.
- **Coordination**, defined as the mechanisms to manage the interaction and work among the participating organizations taking into account the dependencies and the shared resources among the processes.

These domains have been identified in a literature survey and using the qualitative multiple case study presented in this paper. This identification was the main goal of our research (as presented in the next section). However, when analyzing the results of the case study, we recognized that some new statements could be derived. In this paper, we present these statements in the form of four principles that can be used by CNOs when striving for B-ITa (see Sect. 4). So, ‘domain’ and ‘principle’ are terms that should not be taken as synonyms. While domains refer to topics to consider when striving for B-ITa, the principles are general statements that crosscut domains and, therefore, are not applicable to specific domains only. The next section presents the research method we followed.

3 Research Approach

Multiple case studies enhance generalizability and reduce bias [14]. Therefore, this research uses a multiple case design. A multiple case study differs from a set of single case studies in that a multiple case study is an empirical inquiry that investigates a phenomenon within its real-life context to answer the same research question in different single case study sites. The objective of the study we conducted was to identify the necessary domains that CNOs must consider to

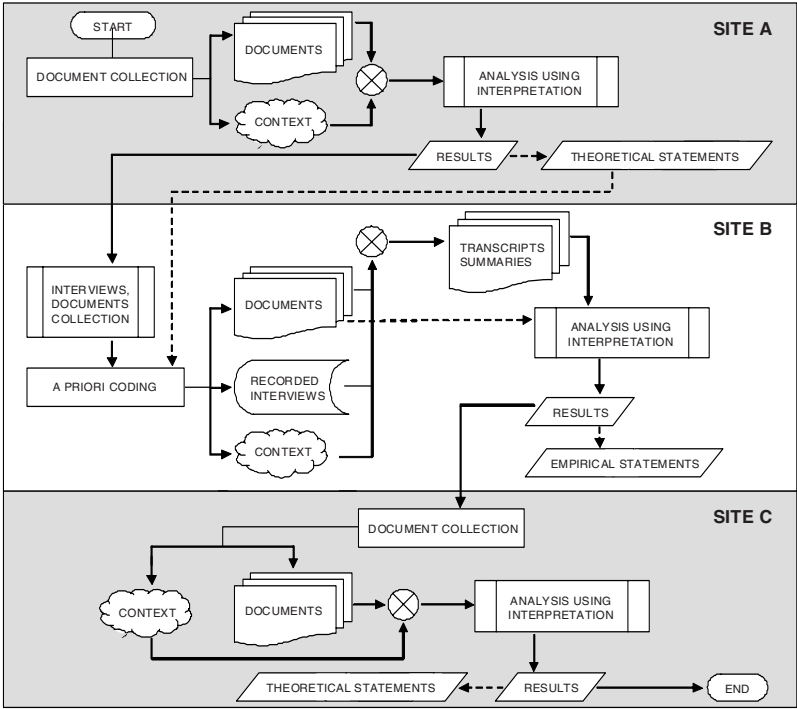


Fig. 2. Multiple case study method

achieve B-ITa. At the end, we found the four domains presented in the previous section. The case study findings also could be summarized in four B-ITa principles for CNOs (see next section). The research question to answer with this case was: *What are the necessary domains to consider when aligning IT with business needs in a CNO?*

A high-level view of our overall research process is presented in Fig.2. It shows the way we conducted the study through the three case study sites. In the subsections that follow, we explain this in more detail.

3.1 Sites, Unit of Analysis and Timeline

Our main criterion for selecting the case study sites was the collaborative network perspective they take in the efforts for achieving B-ITa. B-ITa was the unit of analysis in this study. Once this criterion was met, the only other two requirements were that the CNOs explicitly had a B-ITa project and that they were willing to grant us access. To develop an overall MM we conducted our multiple case study in one entrepreneur-led CNO (site A) and two governmental CNOs (sites B and C). We did not intend to conduct a comparative study across CNOs, but rather to enrich our MM by bringing different insights from each CNO. In this sense, it is important to consider the particular context of each

CNO when interpreting the data (see Fig. 2). Therefore, we chose a hermeneutic approach [15] to analyze it. In our particular case, a hermeneutic approach helps to obtain results from analyzing the information sources, the sites, and their organizational contexts altogether. The data were collected during April 2006 and April 2008. A summary of the CNOs' background can be found in the appendix.

3.2 Data Collection and Analysis Techniques

The data collection technique used in each case study site was individually selected. This choice is motivated by the resources at our disposal. We considered the use of interviews for all sites. However, it turned out that we could only collect data through interviews in site B because professionals from sites A and C were not available. We only obtained documentation as source of evidence in these two sites. The documentation was carefully used and was not accepted as literal recording of information and events. Furthermore, in site B we used semi-structured interviews with an average duration of 1 hour per interview. The interviews were taped to help writing the transcripts which we used for analyzing. In this site, documents were supplementary sources of data.

The data analysis was conducted using interpretation [15]. We bear out this decision by the following statements: first, as we explained above, documentation was an important data source in this multiple case study. Documents are not simply containers of meanings. They are collectively produced, exchanged, and consumed. They summarize many decisions made by more than one person for a specific purpose. Documents represent specific circumstances including different insights. Therefore, the analysis of documents requires interpretation [16]. Second, in site B, professionals, i.e., people, were the primary data sources. In such situation, interpretation also is a suitable analysis technique. Generally, people develop and use their own understanding and observations of themselves and their environment. Therefore, it was expected that the interviewees attached their own meanings to their answers in the interviews. People interpret their world and we, as observing researchers, interpret their interpretations.

We followed a replication logic [14] when conducting this qualitative multiple case study. That is, after conducting the first single case study in site A, we uncovered significant findings (theoretical statements) that led us to conduct a second and a third single case study with replication as immediate research goal. Only with replication of findings, such findings could be robust for generalization [14]. We also took some steps to counterpart validity threats. As we were uncertain whether external conditions could produce different case study results, we articulated these conditions more explicitly identifying different case sites. We chose CNOs from different countries, one international and two of national nature, one entrepreneur-led and two government agencies, and one with a large amount of participants and two with only 2 or 3 participating organizations. We must also note that the B-ITa key drivers they have are different. The key drivers of the case study site A are to control costs and to manage

risk, while the B-ITa key drivers of sites B and C are to improve quality and to increase effectiveness. With all these different conditions in the sites included in our case study, we countered external validity. Construct validity was counterparted by data triangulation (i.e., use of multiple sources of evidence) and having our case study reports reviewed by peers and by professionals of the case study sites [14].

3.3 Case Study Findings

Fig. 3 presents a summary of the findings of our case study. Detailed information of the results of the single case study in site A can be found in [6]. The findings in this site suggest that the **coordination** and the **partnering structure** domains were the most important topics for the work between Outsourcer and Insourcer. Cost management also was a domain that strongly affected their B-ITa efforts. We used these findings to derive some theoretical statements that helped to codify themes for the second case study.

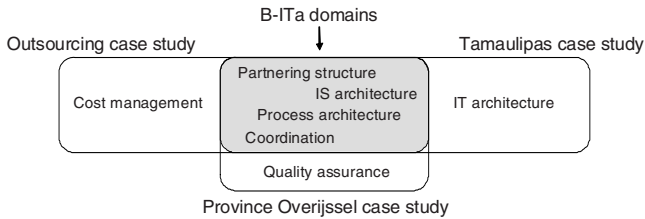


Fig. 3. B-ITa domains found in the validation case studies

As in site A, the findings of the case in site B suggested that **coordination** and **partnering structure** are indeed necessary domains that CNOs take into account in their B-ITa efforts [7]. However, the government of the state of Tamaulipas also consider the **process architecture**, **IS architecture** and **IT architecture**, as domains to address when striving for B-ITa. Following recommendations by Lee and Baskerville [17], with these results we could derive empirical statements from the theoretical statements created in the previous case study. It helped us to generalize results. However, we decided to conduct a third case study.

The results of the case study in site C replicated our previous findings. This CNO considers the four B-ITa domains as key areas to work on. It must be noted that for them **partnering structure** and **process architecture** were the most important domains. Also, in this case, we could identify a domain that is distinctive from the B-ITa domains. It is **quality assurance**. They consider testing, verification and control as activities that need to be present in all projects. The quality team is always trying to assure quality in the B-ITa project we had access.

Despite of the variation in the findings of sites A, B and C, the ICoNOs MM includes only four B-ITa domains. We did not consider ‘cost management’, ‘IT architecture’ and ‘quality assurance’ as B-ITa domains because such domains are not replicated in the single cases.

4 B-ITa Principles

We used the results of our case study to develop new theory in the form of principles that can be used by CNOs when striving for B-ITa. Below, we present these principles along with a short discussion on them.

Principle 1 (B-ITa domains). *Partnering structure, IS architecture, process architecture and coordination are necessary B-ITa domains to consider in CNOs.*

Clearly, one might argue that there are more domains that must be addressed when striving for B-ITa. However, we were looking for the necessary domains within the entire population of those domains that are sufficient to achieve B-ITa in CNOs. The necessary domains are the minimal number of domains that must be taken into account to achieve B-ITa in CNOs. The rest of the domains are additional domains that might be considered in B-ITa improvement attempts, but are not necessary. For example, an additional condition for achieving B-ITa in CNOs would be cost management (as found in site A). But while managing costs could be important, it is by no means necessary for achieving B-ITa.

Principle 2 (Domains order). *The order in which the domains are taken into account by CNOs in their efforts to achieve B-ITa should not affect the results.*

In the case study, we found that the importance of the domains varies according to the settings where a CNO works. When aligning IT with the business, each CNO can work in the domains that best meet its objectives. As our model is a continuous MM [18], it will let CNOs focus, for instance, on the domains with a low level of maturity. Those domains that are associated with higher maturity can, then, be included in later improvement efforts. For example, in site B, the government of Tamaulipas left the partnering structure unchanged. They concentrated in process architecture, IS architecture, and coordination in its B-ITa effort.

Principle 3 (B-ITa approach). *A top-down approach, which starts from strategic goals and plans to business/IT activities, should ensure B-ITa and provide value.*

Although we found that the order to address the B-ITa domains was not a considerable shortcoming to achieve alignment, we believe that an approach to strive for B-ITa is needed to provide ways to measure value and make real B-ITa improvements. Figure 4 presents a B-ITa approach. This approach is not the only one but it could work in practice since we derived it from the case study findings and it covers steps presented in other B-ITa methods (e.g. [19,20]). It addresses the four B-ITa domains presenting a view from an organization-centered perspective (i.e., the organization and structure of a CNO must exist a priori and the participants ought to follow it), where the first five steps of the approach are performed compulsorily before the rest.

Using a different perspective (e.g., a process-centered perspective), the relations (i.e., the arrows) between steps in Fig. 4 can be differently presented. Our approach does not contradict **Principle 2** but it does structure CNO B-ITa

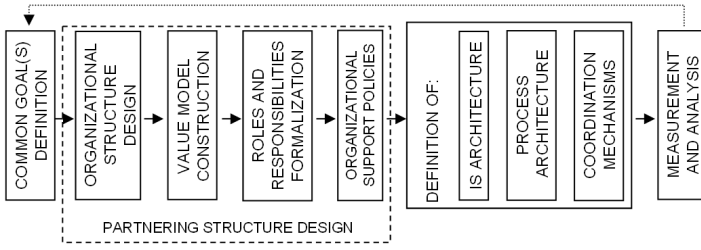


Fig. 4. B-ITa approach: A high level view

efforts from an organizational view. Explanation of most of the steps can be found in our earlier work [12]. The measurement and analysis step helps to define measures (e.g., financial and internal) and communicate the B-ITa results in order to consider them in future B-ITa projects to ‘assure’ quality and real improvements.

Principle 4 (B-ITa strategy). *Swift-reacting but in a delayed form is a strategy to follow when achieving business-IT alignment in networked organizations.*

As CNOs are dynamic, they need to react quickly to customers needs and to run apace B-ITa projects in order to survive in a hypercompetitive environment. For example, sites A and C are almost constantly analyzing their present IS architecture and how it helps them in order to align their strategies to the present situations. They also use, for instance, customer satisfaction analysis and market studies to define B-ITa projects. They react fast, but before ‘doing’, they take considerable time in discussing, planning and analyzing such projects. Our findings in this sites replicate the results presented by de Koning and van der Marck where they show how “no case, no go” [3, p.45] (i.e., if there is no positive fact-based explanation of the reasons for investing in IT, no action should be taken) is the motto of the most succesful business in the Netherlands for B-ITa-related decisions. It is to avoid unfavorable future results.

According to empirical research methodologies, we can conclude these four principles are empirically valid since we have justified them through the evidence provided by the multiple case study we conducted. However, we still consider them as hypotheses that can be admitted as true general principles only when they can, under other circumstances, be deduced again from verifiable observations.

5 Conclusion

The multiple case study presented in this paper has contributed to identify, and by means of replication, to validate necessary domains that should be considered by collaborative networked organizations when striving for business-IT alignment. The study has helped us to continue with the development of a maturity model to assess this alignment in collaborative settings. However, when

analyzing the data, we were able to propose four principles that might help networked organizations in their efforts for aligning IT services with business requirements. These principles relate to the domains included in our model, the order to address them, and an approach and strategy to achieve alignment.

Future work includes justifying these principles on the basis of evidence provided by other cases. Only after that, these principles can be considered fundamental statements that must be taken into account for alignment improvement efforts in collaborative settings. The principles presented in this paper are open to further empirical confirmation or refutation. Although much more research is required on this important topic for networked organizations, we hope that our study will contribute to the growth of this relevant research stream.

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Appendix: Background of the CNOs studied

Site A: Technology Outsourcing Relation.
<p>The first CNO we studied was an outsourcing relationship between a leading international business and technology integrator and a local provider of mass-marketed services (hereinafter referred to as: Insourcer and Outsourcer, respectively).</p> <p>Insourcer is an international IT services company, providing consultancy, systems integration and managed operations. Outsourcer offers a wide range of services for both the private and business market. The stock of both Insourcer and Outsourcer is traded on Euronext, the pan-European stock exchange, where both companies are in the top 100 in terms of market capitalization. Outsourcer decided to outsource part of its IT operations to Insourcer in 2001 and this was a measure to confront the company's troubled IS architecture management. The 2001 architecture consisted of home-grown applications, stove pipe solutions, and a lot of point-to-point connections. The company experienced problems related to inconsistent data, significant operational expenses, and below-average customer satisfaction. The outsourcing measure had the objective to help (i) provide continuity of service to the customers so that number of complaints is reduced, (ii) improve financial results due to purchase price and cost reduction, and (iii) optimize the IT architecture and performance.</p>
Site B: State Government Collaboration.
<p>A network of more than hundred departments of the state of Tamaulipas in Mexico was the second CNO we studied. As a response to the necessity of having a modern government administration, the government of Tamaulipas implemented Domino/Notes to allow the departments to maintain fast and uninterrupted internal communication. Their overall requirements were to make the service-delivery process more effective and efficient, and to create a better government-citizen relation responding to the society expectations.</p> <p>The first project under Domino/Notes was the Citizen Attention Service System (CASS). This system helps to collect all the individual requests and petitions that the citizens raise to the government. The CASS project began in 2001. The initial situation in the area of service provisioning to citizens was characterized by much bureaucracy and poor response time. Only few of the departments had a system to manage the requests. Those systems were home-grown applications developed by IT sections of different departments. Each had its own application logic and data semantics and contributed in a unique way to a lack of homogeneity and communication among systems. The CASS facilitates the allocation, distribution and communication of citizens' requests among departments, as well as all the information related to such requests. This helps to have better control in each of the processes, while having a close relation with the citizens to keep them informed on their requests' process.</p>

Site C: Regional Government Network.

People who want to build, re-build, or re-use a house, factory, or barn, in the Netherlands, can often need to apply for licenses and permits regarding residency, spatial planning, and the environment. Each of these licenses and permits has their own set of criteria, procedures, administrative desks, waiting periods, fees, and staff. For both citizens and companies, this is a complex and time consuming process that costs both applicants and the government a great deal of money. The Ministry for Housing, Spatial Planning and Environmental Management (VROM – initials in Dutch) wants to gather the different licenses together within the 'omgevingsvergunning' – the environmental permit. All aspects can then be requested from a single point of contact to obtain a decision although such decision needs the collaborations of different organizations.

The environmental permit project is part of a set of measures that has been initiated to substantially reduce administrative charges for citizens and businesses. From January 1st 2009, municipalities, provinces and water board districts should be able to use the new process. The environmental permit is part of the modernization plan for VROM legislation, in which the ministry is reducing and improving its rules and regulations. The project includes a development of an implementation plan with pilot projects and advice. The third CNO we studied was one of this pilot projects. It is a networked organization among the province Overijssel, the municipalities Zwolle and Enschede, the water board district Regge & Dinkel and Royal Grolsch N.V.