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Correspondence and questions

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IJISPM

Editorial

It is our great pleasure to bring you the fifth number of IJISPM - International Journal of Information Systems and Project Management. The mission of the IJISPM is the dissemination of new scientific knowledge on information systems management and project management, encouraging further progress in theory and practice.

In this issue, readers will find important contributions on information systems sourcing, information technology projects management, and on procurement as part of the supply chain management activities.

As Mirella Muhic and Björn Johansson state in their article "Sourcing motives behind sourcing decisions exposed through the Sourcing Decision Framework", there is no doubt that information systems (IS) are the backbone of today's organizations. Having an initial inspection on sourcing motives in the financial sector, it can be stated that resources used in development of information systems (IS) are seen as an important factor for sustained competitive advantage. However, it can be claimed that it depends to a high extent on the application of different sourcing modes. This lead the authors to a closer inspection on sourcing motives through selected case studies and the following research question: How can motives for sourcing options of IS-development be explained? In the article, the empirical investigation on sourcing decisions and the motives behind, in addition to a literature review on sourcing decisions and sourcing options, ends in four propositions. These propositions are then used in tandem with the findings from the empirical data for initial development of the Sourcing Decision Framework (SDF).

The second article "Social relationships in Information Technology (IT) project teams: its role, complexity and the management thereof" is co-authored by Awie Leonard and Dawie van Zyl. To implement an IT project successfully, many aspects need to be monitored and carefully controlled and managed. One such aspect is social relationships. All IT professionals are exposed to, and in many cases involved, in the phenomenon of social relationships. These relationships are used by software project team members for personal as well as professional purposes. In most cases the impact of these relationships on the success or failure of any given IT project is ignored by IT management. Little attention is given thereto in the literature and this paper attempts to make a contribution in terms of giving a broad perspective of the complexity, the impact, as well as the management of such relationships. This paper shows that these relationships play a significant role and should be managed in such a way that the team members and the project as a whole can reap the benefits thereof. A conceptual framework is proposed for the management of the relationships.

With organizations now placing an increasing amount on attention on the management of their supply chain activities, the role of IT in supporting these operations has been put in the spotlight. In spite of extensive research examining how IT can be employed in various activities of supply chain management, the majority of studies are limited in identifying enablers and inhibitors of adoption. Empirical studies examining post-adoption conditions that facilitate performance improvement still remain scarce. Patrick Mikalef, Adamantia Pateli, Ronald Batenburg, and Rogier van de Wetering, in their article "Business alignment in the procurement domain: a study of antecedents and determinants of supply chain performance", focus on procurement as part of the supply chain management activities. The authors apply the business-IT alignment perspective to the domain of procurement, and examine how certain organizational factors impact the attainment of this state. Additionally, they research the effect that procurement alignment has on supply chain management performance. In order to do so, it is applied the Partial Least Squares (PLS) analysis on a sample of 172 European companies. Their findings show that firms that opt for a centralized governance structure, as well as larger firms, are more likely to attain a state of procurement alignment. Furthermore, the obtained results empirically support the statement that procurement alignment is positively correlated with operational efficiency and competitive performance of the supply chain.

We would like to take this opportunity to express our gratitude to the distinguished members of the Editorial Board, for their commitment and for sharing their knowledge and experience in supporting the IJISPM.

Finally, we would like to express our gratitude to all the authors who submitted their work, for their insightful visions and valuable contributions.

We hope that you, the readers, find the International Journal of Information Systems and Project Management an interesting and valuable source of information for your continued work.

The Editor-in-Chief,

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João Varajão is currently professor of information systems and project management at the *University of Minho* and a visiting professor at the *University of Porto Business School*. He is also a researcher of the *Centro Algoritmi* at the *University of Minho*. Born and raised in Portugal, he attended the *University of Minho*, earning his Undergraduate (1995), Masters (1997) and Doctorate (2003) degrees in Technologies and Information Systems. In 2012, he received his Habilitation degree from the *University of Trás-os-Montes e Alto Douro*. His current main research interests are in Information Systems Management and Project Management. Before joining academia, he worked as an IT/IS consultant, project manager, information systems analyst and software developer, for private companies and public institutions. He has supervised more than 50 Masters and Doctoral dissertations in the Information Systems field. He has published over 250 works, including refereed publications, authored books, edited books, as well as book chapters and communications at international conferences. He serves as editor-in-chief, associate editor and member of the editorial board for international journals and has served in numerous committees of international conferences and workshops. He is co-founder of CENTERIS - Conference on ENTERprise Information Systems and of ProjMAN – International Conference on Project MANagement.

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Sourcing motives behind sourcing decisions exposed through the Sourcing Decision Framework

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M. Muhic and B. Johansson, "Sourcing motives behind sourcing decisions exposed through the Sourcing Decision Framework," *International Journal of Information Systems and Project Management*, vol. 2, no. 1, pp. 5-17, 2014.

Sourcing motives behind sourcing decisions exposed through the Sourcing Decision Framework

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Abstract:
There is no doubt that information systems (IS) are the backbone of today's organizations. Having an initial inspection on sourcing motives in the financial sector it can be stated that resources used in development of information systems (IS) are seen as an important factor for sustained competitive advantage. However, it can be claimed that it depends to a high extent on the application of different sourcing modes. This leads us to a closer inspection on sourcing motives through selected case studies and the following research question: How can motives for sourcing options of IS-development be explained? The empirical investigation on sourcing decisions and the motives behind, in addition to a literature review on sourcing decisions and sourcing options ends in four propositions. These propositions are then used in tandem with the findings from the empirical data for initial development of the Sourcing Decision Framework (SDF). Ultimately, what is at stake here is our framework (SDF) that from the initial development and the first test has shown to be purposive and could be further developed to a useful framework for analyzing sourcing decisions and as a guiding tool for decision-makers when deciding on sourcing options for IS-development.

1. Introduction

When it comes to the topic of information systems most of us will readily agree that it is an important component of a firm. Yet some readers may challenge the view of information systems being used by organizations in the financial sector (such as banks) as a strategic tool for gaining competitive advantage. Indeed our own argument is that information systems have a strategic importance in the financial sector and should be therefore carefully sourced using tailored strategies.

Nevertheless new research show that computerization and information system (IS) reflect the new powerful uses of computers, for the purpose of information management supporting the achievement of an organization's goals [1]. Yet a sober analysis of the matter reveals that the IS and the delivery of strategic systems play a meaningful role in the context of IS-strategy, which should be closely aligned with the overall organizational strategy [2].

The rapid and structural changes in the business environment of the financial sector due to the globalization of financial markets, technological innovations, and the growing importance of the Internet, increase the demand for a higher degree of flexibility in IS-development [3]. Although the strategic importance of IS in the financial sector may seem trivial, it is in fact crucial in terms of today's concern over a rapidly changing market. The strategic importance of IS-development applies abundantly to the financial industry which is characterized by a high degree of IT-supported business processes [4]. Indeed our argument is that IS have strategic importance in the financial sector and especially in banks, and therefore it can be assumed that the sourcing option for their IS-development should be carefully considered. Consequently, if assuming that IS are of high importance for banks, the question is then if this also could be said about resources for IS-development.

Gottschalk and Solli-Sæther [1] concede that outsourcing is a strategic decision made by organizations in order to compensate for lost internal resources. Hence the strategic management within the organization adapts, reconfigures internal and external skills, reconfigures resources and functions, in order to get in pace with the changing surrounding environment and the competitive market.

Albeit, even if the sourcing strategy has been carefully selected dependent on the strategic goals underlying an IS-development project, the denouement is about the strategic value of the resources and capabilities possessed by the organization. To take a case in point, organizations have to consider strategic value of its resources and capabilities, and determine at what stage respectively what part of the software development process it wants to hand over ownership to a third party. This is in line with Balaji and Brown's [5] statement: "As practice has evolved from simple make-or-buy decision to complex contracts and partnerships, sourcing research has endeavored to maintain relevance".

From this our research question is as follows: How can motives for sourcing options of IS-development be explained? In order to develop knowledge related to this question we decided to use the resource-based view (RBV) of the firm as a starting point when analyzing sourcing decisions. In addition we also used existing research especially on outsourcing. Earlier research on sourcing has focused on outsourcing, which as a mode of sourcing has been around for decades as a strategic business tool in various forms and industries. Likewise the academic literature has generated a general understanding why, what, and how firms outsource [6]. What this research aims at is to give a deeper insight in sourcing motives of IS-development sourcing in the financial sector. As stated above, in order to do so we decided to use RBV as a theoretical lens. The reasons for selecting RBV is supported by the fact that RBV is a theory about how firms actually operate [7] and it focusses on organization of resources and capabilities in organizations [8]. Sourcing decisions can be approached from different theoretical perspectives. The resource based view (RBV) and transaction cost theory (TCT) are considered as extremely influential in the field of outsourcing [9, 10]. Past sourcing decisions were often driven by cost where the company would outsource if gained benefit exceeds the transaction cost [1, 6].

In contrast to the TCT perspective, RBV includes the relational view arguing that combining the organization's resources in a unique way holds a source of competitive advantage [10]. We are interested in approaching sourcing from the analysis of the internal resources and how sourcing strategies can be seen as an opportunity to access complementary capabilities to strengthen internal competitiveness.

According to RBV, a resource is considered to be a resource if it holds the potential to "exploit opportunities and/or neutralize threats in a firm's environment" [11]. A valuable resource has to fulfil three further attributes in order to achieve sustained competitive advantage, namely rareness, imperfect imitability and non-substitutability [11]. Barney [11] states that an organization gains a competitive advantage only if the value-creating strategy is not copied by a considerable number of competitors. As the organization's resources are the source of competitive advantage, it can be concluded that those should be kept or gained internally. The central issue of the RBV is accordingly the identification of such resources [12]. The resource based view can be applied to the analysis of the relationship between IT and sustained competitive advantage. "The concept of a firm's resources and abilities are defined broadly, and could certainly include the ability of an organization to conceive, implement, and exploit valuable IT applications" [13].

To summarize, the aim of this research is to develop a framework that has the potential to explain sourcing decisions in organizations that are heavily dependent on IS, such as banks, focusing especially on sourcing of resources for IS-development in the bank sector.

The rest of this paper is organized as follows. Next section discusses and defines four different sourcing options that later are used for development of the Sourcing Decision Framework. Section 3 presents the collection and the empirical data shortly. Section 4 then presents the Sourcing Decision Framework that is a result from the theoretical discussion supported by findings from the empirical data. The final section presents some conclusions and discussions around the suggested Sourcing Decision Framework.

2. Sourcing options for IS development

In the context of IS-development the literature reveals a multitude of IS-sourcing options from different foci. We give an overview and structure the different characteristics of sourcing options in order to finally apply the dimensions of sourcing by Lee et al. [14], deriving four options that build the foundation for the suggested Sourcing Decision Framework.

In general it can be said that IS-sourcing is often seen as the delegation of all or any part of technical resources, human resources and management capabilities associated with providing IT-services to an external vendor [5]. The provision and use of IT-based products and services underlies general economic principles. First of all, organizations – facing the need for a product or service – have two distinct options, to make it on their own or to buy it. However, the practice in IS-development goes beyond simple make-or-buy decision [5, 15]. IS-sourcing options can be classified into strategies with complete internal control, and in strategies with some degree of external involvement. Depending on the definition of the term, the latter category is denoted as outsourcing [16]. Outsourcing can be conceived as the reallocation of already present IS-assets and the associated resources to an external supplier. Here, the transfer of activities that are related to new IS-assets are not implied by the term outsourcing [6]. We follow the perception of De Looff [17] and Quélin and Duhamel [18] and define IS-outsourcing as follows: *Outsourcing in the context of IS-development is defined as the act of shifting some or all of the IS-activities to be performed externally by contractual agreement.*

2.1 IS-Sourcing Options

Based on the analysis above it reveals that IS-sourcing can be considered from different dimensions that give specific characteristics to a sourcing option. Considering all forms of sourcing options – including in-house development – it can be said that confusion exists about terms that may lead to difficulties for the comparability of research results [6, 12]. Johansson [12] concludes that there are at least four general sourcing options involving external providers: traditional outsourcing; insourcing; buy-in; and net sourcing. Lacity et al. [15] developed for practitioners five sourcing

modes namely *buy-in, contract out, preferred supplier, preferred contractor,* and *in-house*. Roy and Aubert [2] likewise derive four categories with different labels namely partnership, conservation, outsourcing and recuperation. Here, even though there is confusion about both terms in the literature [15], Roy and Aubert [2] do not further specify in-house development, which they denote as conservation and outsourcing.

With regards to the critique mentioned above, the categories suggested by Roy and Aubert [2] are adjusted to the four alternatives of sourcing strategies: *insourcing*; *standardization of commodities*; *strategic partnership*; and *outsourcing as a service*. The driving dimension of sourcing is the degree of control and the integration the organization possess in the IS-development. Duration is suggested as a further attribute within the categories. The following four sections describe the sourcing options in depth from these dimensions.

2.2 Insourcing

Basically insourcing is the opposite of outsourcing. However, there is some confusion in the literature. First, the term could simply mean that the organization performs an activity internally, thereby using internal resources and governance. Alternatively, insourcing could mean that external resources are involved but the governance is kept internally. As a third option, insourcing is also conceived as a strategy that retrieves outsourced activities to the organization [15]. Accordingly, we define insourcing: *Insourcing is the opposite of outsourcing, i.e. the activity is governed and performed by internal resources. Here, staff augmentation through external resources is only implied in insourcing as long as it is driven by the need to increase staff capacity, rather than to replace lack of knowledge.*

2.3 Standardization of commodities

Taking the model of Roy and Aubert [2] as a starting point, this sourcing option was denoted as recuperation. With this, Roy and Aubert [2] mean a strategy in which the organization collaborate with potential competitors in order to share the development cost for the IS. As Roy and Aubert [2] elaborate, cost sharing can be carried out in the form of a joint venture or the internal development and later selling of the IS-module to the competitors, to minimize costs.

The idea behind the option is the low strategic value of the specific IS and the internal presence of appropriate resources for the development. Thus, the IS is not seen as a source that provides sustainable competitive advantage. As a consequence, the IS can be freely shared with competitors without facing a competitive disadvantage or losing a competitive advantage. Mainly, the possibility to standardize the requirements for an IS leads to commoditization [19] and purchase from specialized supplier rather than proprietary development [20]. In standardization of commodities, we include the development process of an IS with focus on the resources that are present internally at an appropriate level. The standardization of commodities is defined as follows: *IS-functionality regarded as commodities are standardized to maximize the effect of the economies of scale respectively minimize the organization's transferred cost for the IS-development. Here, the IS-development is carried out with internal resources whereas the governance may be shared.*

2.4 Strategic partnerships

Is the IS-development activity strategic but not a competence of the resources the company has in its possession, then a partnership with an external supplier is an appropriate sourcing option [2]. In line with Roy and Aubert [2], the main goal of the sourcing option is to access complementary resources and capabilities to in-house competences while retaining the ownership and control over IS-activities. The potential dependency on the supplier knowledge is addressed through mixed teams where the internal personnel gradually gains knowledge and takes over responsibility [2]. This sourcing option is in accordance to Roy and Aubert [2], nevertheless, we added the word strategic in order to stress the strategic intention underlying the partnership. Similarly with Roy and Aubert [2] we define this sourcing option as follows: *A strategic partnership aims to gain access to complementary resources and capabilities that are not present internally. Herewith, the organization retains the ownership and control over the IS-project that is linked to the organization's strategic needs.*

2.5 Outsourcing as a service

With regards to IS-development, service implies the development process of an IS independently by an external supplier. Whereas, the delivery of the service finally results in a product, it does not necessarily mean that service provision inhibits the outcome of the development process which can be denoted a product. Furthermore, as the supplier owns the required resources for the IS-development the residual rights are also controlled on the supplier side till the service delivery [14]. It has to be noted that maintenance of the IS is likely carried out by the external supplier as the organization minimize control and involved resources.

However, in this option the customer has least control among the sourcing options. In return, the client uses a minimum of its own resources and pays only a fee for the service that was actually used. Conclusively, the client neither owns appropriate resources nor wants to develop competences related to development of IS. In the long run, the organization does not assign a strategic value to the IS. From this we define the sourcing option, outsourcing as a service as follows: *Outsourcing as a service implies that the residual rights are owned by the supplier during the delivery process as it owns the required resources for the IS-development. The responsibility for delivery is exclusively on the part of the external supplier, i.e. no governance on the client side during the delivery process but at the acceptance test.*

In Table 1 the four sourcing options are summarized from the dimensions: degree of integration; duration time; and allocation of control.

Table 1. Four sourcing options and description of respectively dimensions of these

Dimension/Sourcing option	Degree of Integration	Duration	Allocation of Control
Insourcing	Only internal resources except staff augmentation driven by the need to increase staff capacity	Short-term, long-term	Full governance by the organization, residual rights are owned by the organization
Standardization of commodities	Internal resources are involved to some extent respectively through a jointed venture	Short-term, long-term	Internal, maybe shared (joint venture)
Strategic partnership	Internal and external resources	Short-term, long-term	Full governance by the organization, residual rights are owned by the organization
Outsourcing as a service	External resources	Long-term	Full governance by the supplier, residual rights are owned by the supplier during the delivery process

3. Collection and Presentation of Empirical Data

In this study we use an investigation of sourcing projects to further develop our thoughts about the dimensions of the four sourcing options presented in Table 1. The empirical data was collected by semi-structured interviews conducted with persons in the upper management in charge of certain outsourcing projects or responsible for the strategic sourcing decisions in investigated organizations in 2011. In addition, publicly available sources such as annual reports, interviews with the organization's CEOs in journals, and project documentation are used to provide a rich description of the cases. Interviewees were selected based on their organizational remit charge of sourcing strategies. In total four banks, three from Sweden and one from Germany were part of our study.

Interview guide questions were structured in four parts: general perception of IS-sourcing in the financial sector; characteristics of the IS-sourcing projects; underlying motives for sourcing; and questions concerning the presence of appropriate resources used for the development and its strategic value. Introducing questions seek to investigate the perception of the interviewee in order to test the assumptions underlying implicitly this study. The second part disposition follows the dimensions of sourcing: degree of integration; duration; and allocation of control that characterize the sourcing project. The sequent part gave the interviewee the opportunity to argue the motives underlying

the sourcing project. For the last part we used the four leading questions from the VRIO framework [21] in order to investigate the value, rareness, non-imitability and the organization's exploration of specific resources.

For preparation pre-interviews with two banks were conducted to survey their IT-strategy and to find investigate-able sourcing projects. Actual data collection was then done with four interviewees, all in leading positions concerning IS-sourcing decisions. The interviewees have the following roles: Manager of strategic partnership (Bank A); Head of the development infrastructure (Bank B); Head of sourcing and vendor management (Bank C); and Head of sourcing IT-development (Bank D).

The interviews lasted between 45 min and 2 hours, and were recorded, transcribed and coded. The applied coding system followed the construction of the interview guide. Starting with investigating characteristics of the IS-sourcing project the guide uses the dimensions of sourcing to structure the description of the case. Subsequently, the interview guide exploits the organization's resources guided by the VRIO framework. Derived from this, we used the pattern developed by Barney [21] to conclude the competitive and economic implications following from how the banks use its resources in IS-development. Consequently, the applied coding was concept driven and breaks down the interview text to key statements that then were categorized and condensed.

It has to be noted that the quantification of the strategic value is based on the interviewees' evaluation of the resources. It was not our goal to investigate objectively the organization's resources. Instead, we aimed at designing a theoretical model that have the potential to explain sourcing motives when deciding on a specific sourcing option. Moreover, the interview provides insight in the internal resources or capabilities before entering the IS-development project with regards to its value, rareness, inimitability and the organization's exploitation. The perceived value of the resources were measured indirectly by the value of the IS itself.

Sourcing motives and applied options in the banks

Considering motives for sourcing we have identified an overlap across cases, and our investigation reveals the following main key motives for IS-sourcing in all four cases: flexibility; access to talent; and cost benefit. Based on the analysis of the empirical data, applied sourcing option and expressed main motives for the selection of respectively sourcing option are presented in table 2.

Table 2. Presentation of applied sourcing option and main motives for the selection of options

Case	Applied sourcing option/options	Expressed main motive(s) for applied sourcing option
Bank A	Outsourcing as a service mode/ standardization of commodities	Cost benefit (increased need of cost efficiency, pilot project)
Bank B	Outsourcing as a service	Flexibility
Bank C	Outsourcing as a service	Access to talent, cost benefit (pilot project)
Bank D	Outsourcing as a service/ strategic partnership	Access to talent (retaining customers through improved usability)

Major motives and key drivers were as stated above findings from the interviews. The following quotes illustrate the findings. The Manager of strategic partnership in Bank A, said: *"There were several reasons. One was to reduce cost. Another one was access to talent. Flexibility and I would say improving efficiency. I think that are the four main ones"*. The Head of the development infrastructure in Bank B, stated: *"Bottleneck of staff, gain flexibility, avoid governance overhead"*. However, he also said: *"I think that it is misleading that we do not have the competence and that is why we do Out-tasking. We do have the competence, but we could not do it all alone loosely, if the contract book is too full, we need an outlet where we can make something else we could do just as good alone. This is actually the story behind it"*.

Sourcing strategy and sourcing drivers were described by the Head of sourcing and vendor management in Bank C, as follows: *"We have in our sourcing strategy identified sourcing driver, we call it. They are skills, the need for good skills for us, its cost, and the vendor reducing cost, its flexibility and that's regarding both; flexibility regarding buying resources and also regarding cost. And we have the risk sourcing driver that we are not allowed to increase the risk*

when we outsourcing some maintenance or development. And finally we have the fifth one that we called focus, where we say that's rather important that we can focus our own employees on strategic matters that are the important for the bank. And in this specific case the main drivers was cost - we had, we use a couple of expensive consultants for maintaining the system earlier, so we have significant reduce of cost when we were entering the agreement by the end." Finally, the Head of sourcing IT-development in Bank D presented his view of drivers: *"Three different drivers, first was cost we would like to see if we could achieve a cost benefit of the simple reason that they (Indian employees) have a lower salary than a Swedish employee would have. Technically it was a question of availability; we simply did not have that competence free internally. Of course we have the capability as such of the very simple reason that we have been doing this for a couple of years. But for that particular timing we did not have the availability on the resources. It is also a question of timing I would say, time to market. The third driver would be the scalability; they have the possibility to scale up on a very short period of time".* Table 3 summarizes main motives and key drivers with identification to respectively bank.

Hence we conclude that major motives for selecting IS-sourcing options in the four banks is access to talent and cost benefit, and thereafter flexibility.

Access to talent would according to RBV be knowledge and experiences that are difficult to copy. Here talent itself is seen as a resource and can be alluded to vendor management (since access to talent depends on the talent that a specific vendor holds). This resource is valuable for our case organizations since it has high strategic value in terms of gaining sustained competitive advantage due to its connection to organizational values and core competencies.

The second motive for sourcing option is cost benefit, which is not directly seen as a resource of strategic value from RBV. Yet indirectly it is a resource of strategic value, since a cost benefit implies that the organization has some kind of financial advantage, a fiscal surplus to invest in access to talent for instance.

The third occurring motive is flexibility. Flexibility is here seen as organization's ability to mitigate threats and find new opportunities under pressure.

Table 3. Summarizing major motives and respectively key drivers as described by the interviewees

Major motives for selecting IS-sourcing option	Main key drivers, taken literally from the interviews (in respectively bank)
Access to talent:	Lack of competence internally (Bank D), availability (Bank D), improving efficiency (Bank A), skills (Bank C), focus on core competencies (Bank A), focus in terms of focus own employees on strategic matters (Bank C), the value of an IS is assessed if the IS mitigates threats and exploits opportunities in the competitive environment that financial institutions face to today.
Cost benefit:	Cost reduction (Bank A, C, and D), avoid governance overhead (Bank B).
Flexibility:	Scale up the resources bound to the project in a very short period of time (Bank D), flexibility in terms of cost giving the possibility to transform fixed cost for internal employers to variable cost of external one, balance temporary shortage of staff (Bank C), time to market (Bank B and D).

Divided in four options, the definition of the applicable sourcing option was derived from the presence of appropriate resources and its strategic value. In the next section we use the findings from the investigation of sourcing projects to further develop a framework for explaining sourcing motives.

4. Extending the Sourcing Decision Framework

Embraced as the foundation of our study, the categories from Roy and Aubert [2] are adjusted to the four alternatives of sourcing: insourcing; strategic partnership; standardization of commodities; and outsourcing as a service. In the upcoming section, we expand the IS-sourcing model from Roy and Aubert [2] by adding the four sourcing options derived, and from that we state the implicit propositions from Roy and Aubert [2] explicitly. Using the RBV, Roy and Aubert [2] derived two main factors influencing sourcing decisions in relation to firm's resources: the presence of appropriate resources and the strategic value of those resources. Referring to these thoughts we have developed our model with some variations in emphasis and formulations which is discussed in the following section. Initially, the terms strategic value and appropriate resources are defined in the context of IS-development since these concepts are basically the foundation of the framework.

4.1 Strategic value

With regards to IS-development projects, the decision whether the development activities respectively the needed resources hold a strategic value, depends on the strategic value of the resulting IS. Thus, the organization's resources can only be measured indirectly. As Roy and Aubert [2] argue, the contribution of an employee can only be measured in relation to the value of the IS, i.e., the activity that is performed becomes tangible when the outcome of it is measured. The lower the strategic value of the certain activity and the related expertise of the IS-development, the more organizations are willing to outsource. Conversely, the higher the strategic value of the certain activity, the more organizations are interested in preserving the expertise internally [2]. However, a resource may contribute to a strategic goal and organizational success – such as cost reduction – without being a source of sustained competitive advantage: "IT adding value to a firm – by reducing cost and/or increasing revenue – is not the same as IT being a source of sustained competitive advantage for a firm" [13]. In comparison to Roy and Aubert [2] we want to specify the quantification of the strategic value in accordance to the VRIO framework developed by Barney [21]. Following from our perception of this, a resource holds a high strategic value only if it is potentially a source of temporary or sustained competitive advantage. In contrast a resource holds a low strategic value if it is potentially a source of competitive parity. Indeed, it is expected that the IS-development project is only carried out, if it is to some extent valuable, i.e. sources of competitive disadvantage are not considered.

4.2 Presence of appropriate resources

Subsequent to the evaluation of the strategic value of the IS, the question of whether appropriate resources are available internally is examined. According to the RBV, organizations are seen as the sum of its resources [12]. Barney [11] defines organizational resources categorized in human capital, organizational capital and physical capital controlled by the firm and that allows the firm to strategically use them to boost efficiency and effectiveness. Applied to the attributes of IT and its ability to generate sustained competitive advantage, resources can be narrowed down to financial capital, proprietary technology, and managerial IT-skills together with technical IT-skills of the human capital [13]. In the context of IS-development, the term appropriate resources, refers to availability of financial capital, technology and especially the competence of the employees. Assuredly the competence of the employees is knowledge, which is a significant driving factor in IS-development. The less the company's resources own appropriate expertise, the more the company will seek to overcome the knowledge gap by accessing external, complementary resources and capabilities. Conversely, the more the company's resources possess appropriate expertise, the more the company will seek to max out this competence [2].

From this discussion the following four propositions can be suggested:

Proposition 1: Insourcing - If resources used in IS-development activities hold a high strategic value and appropriate resources are available internally, then IS-development should be kept in-house. The proposition strictly state that if IS-development is of high strategic value and if the needed competencies are available these are then motives for keeping

IS-development in-house. The overall focus of the sourcing strategy is to gain a sustained competitive advantage by internal resources.

Proposition 2: Strategic Partnership - If resources used in IS-development activities hold a high strategic value and appropriate resources are not available internally, then IS-development done in a strategic partnership is suitable. If IS-development is of a high strategic value but needed competencies are not available internally then a partnership with an external supplier is an appropriate sourcing option. The main goal of the sourcing strategy is to gain knowledge through the partnership and keep tight control due to the potential dependency on the supplier. The overall focus of the sourcing strategy is to gain a sustained competitive advantage by complementary, external resources.

Proposition 3: Standardization of Commodities - If the resources used in IS-development activities hold a low strategic value and appropriate resources are available internally, then the IS-development is conducted as standardization of commodities. If IS-development is of low strategic value but a competence of the resources the company has in its possession, then standardization and sharing the cost for the IS with competitors or other interested parties is the appropriate sourcing option [2]. The internal resources could be utilized in a jointed venture or the activity is produced internally and sold to interested parties. The main goal of the sourcing strategy is to recuperate some of the investments that are made for the activity [2]. The overall focus of the sourcing strategy is cost reduction through standardization and the utilization of the economies of scale.

Proposition 4: Outsourcing as a Service - If the resources used in IS-development activities hold a low strategic value and appropriate resources are not available internally, and then IS-development is acquired as a service. Is the IS-development of low strategic value and not a competence of the resources the company has in its possession, then an appropriate sourcing option is based on the provision of IS-development as a service by an external provider. The overall focus of the sourcing strategy is cost reduction and cutting management overhead.

By extension hereinafter two questions in relation to sourcing decisions could be asked:

- Do IS-development activities hold a strategic value for the organization?
- Are resources needed for the IS-development activities present at a sufficient level internally?

In line with Roy and Aubert [2] and inspired by McFarlan's [22] "Strategic Grid" and the more recent work by Nolan and McFarlan [23] on "The Strategic Impact Grid", we suggest "The Sourcing Decision Framework". The framework suggests combining the factors: *presence of appropriate resources* and *the strategic value of those resources*. Depending on the constellation, it is believed that one of the sourcing option defined earlier – *insourcing, strategic partnership, standardization of commodities*, and *outsourcing as a service* – could be positioned in the Sourcing Decision Framework, as shown in Fig. 1.
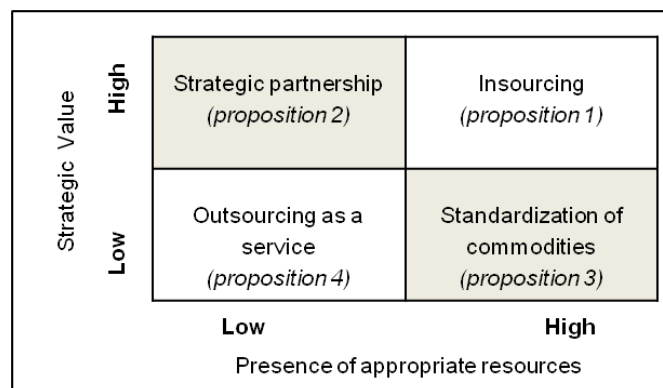

Fig. 1: The Sourcing Decision Framework

5. Conclusions and further development of the framework

The findings from this study add weight to the argument that it is important to look at the relationship between strategic motivation, sourcing options and organizational performance [23-25]. The excepted benefits from the right sourcing option decision based on the right motive may contribute to performance improvements such as reduced cost, higher flexibility and access to skilled talent [26, 27]. Some companies apply a sourcing strategy to reduce costs for instance, to later found out that it is not what they expected [28, 29]. Others have not been able to pursue their overall market strategy as they hoped. Consequently, this makes the motive and decision of sourcing option crucial. Companies that seek to expand to new markets may be more likely to get involved in outsourcing and in specific offshoring or near shoring. While companies seeking operational advantages may source to lower cost locations such as the BRIC countries (Brazil, Russia, India and China) or South Eastern Europe. [23]. This is a question though for future research. Nerveless our discussion of sourcing motives and sourcing decision for a certain sourcing option address the larger matter of the fact that these decisions depend highly on the internal resources and with that said implicitly also organizational characteristics and management strategies.

The research presented in this paper had the aim of developing a framework that would provide answers on the question: How can motives for sourcing options of IS-development in banks be explained?

It can be concluded that the RBV gave the explanation behind the motives for sourcing as well the identification of resources or capabilities that are of strategic value for sustained competitive advantage. Analyzing this, the selection of sourcing mode becomes more comprehensible in terms of understanding and comparing applied mode of sourcing with RBV suggested mode of sourcing.

The RBV approaches IS-sourcing from the internal analysis of its resources and the questions whether those resources mitigate threats and address opportunities. In order to achieve strategic goals, resources are needed that enables the organization to carry out its strategy. For the investigation of the four cases, the RBV helped to identify these resources and its strategic value. Regarding access to talent it was identified that needed competences was not present internally in the organizations. The organization's need for flexibility was caused by labor regulations; however, the underlying basic thought is the competence of internal resources that is maybe present but not at a sufficient level. When it comes to cost benefits the analysis of the organization's internal resources has to be seen in two steps. The first step is the relocation of IS-development to a low-cost country, maybe even though this capability is present internally. As argued before, the relocation of the IS-development to a low-cost country cannot in itself imply a capability of strategic value. Further, it has to be noted that the salary more or less can be seen as a measure of the resources productivity and efficiency. Following from this, this thought contradict RBV that always involves internal resources if they are appropriate and present at a sufficient level.

From the theoretical perspective of the VRIO framework and by suggesting propositions on four sourcing options we developed *"The Sourcing Decision Framework"*. This framework has the ambition to elucidate organizations' motives for selecting a specific sourcing option by posing questions on strategic value and presence of appropriate resources.

Starting from a broader scope and narrowing down, it can be concluded that the empirical findings do support the general assumption that internal resources and their strategic importance for gaining a competitive advantage are considered when making sourcing decisions. Further, the empirical findings reveal that our suggested *Sourcing Decision Framework* does explain the applied sourcing option in the banks. Considering the variety of possible sourcing options in practice and the limitation of a framework that by its nature tries to simplify the observed real world, this outcome can be interpreted as support for the question regarding how to explain motives for selection of sourcing options.

Looking at motives for sourcing we have identified flexibility, access to talent and cost benefits as reasons for deciding on a specific option. However, subsequently to the attempt – save cost through outsourcing – new capabilities are needed that enable the organization to manage this engagement. This capability – vendor management – is crucial to be kept internally and is assessed as a potential source of sustained competitive advantage. With this said gaining cost

benefits is linked inevitably to the analysis of the organizations' internal resources and associated capabilities. In a nutshell, the motives for selecting a specific IS-sourcing option are driven by the analysis of internal resources and its potential being a source of competitive advantage.

It follows then that RBV to some extent gave the explanation behind the motives for sourcing and the importance of resources in doing so. Although, analyzing this in more detail it can be claimed that there is a need to deepen the theoretical base for a more normative usage of the framework. We would suggest that adding some thoughts from transaction cost theory and the resource dependency theory, in the application of the framework for explaining how and why organizations move around in the framework would most likely do the framework even more useful.

References

[1] P. Gottschalk and H. Solli-Sæther, "Critical success factors from IT outsourcing theories: an empirical study," *Industrial Management & Data Systems,* vol. *105*, pp. *685-702*, 2005.

[2] V. Roy and B. Aubert," A Resource Based View of the Information Systems Sourcing Mode," in *33rd Hawaii International Conference on System Sciences*, Maui, HI, USA, 2000.

[3] H. U. Buhl, D. Kundisch, A. Leinfelder, and W. Steck, "IT-Enabled Sophistication Banking," in *8th European Conference on Information Systems (ECIS)*, Vienna, Gabler, Wiesbaden, 2000.

[4] S. Ang and D. W. Straub, "Production and Transaction Economies and IS Outsourcing: A Study of the U. S. Banking," *MIS Quarterly*, vol. *22*, pp. *535-552*, 1998.

[5] S. Balaji and S. A. Brown, "Strategic IS Sourcing and Dynamic Capabilities: Bridging the Gap," in *38th Hawaii International Conference on System Sciences*, Big Island, HI, USA, 2005.

[6] M. C. Lacity, S. A. Khan and L. P. Willcocks, "A review of the IT outsourcing literature: Insights for practice," The *Journal of Strategic Information Systems*, vol. *18*, pp. *130-146*, 2009.

[7] A. Lockett, S. Thompson and U. Morgenstern, "The development of the resource-based view of the firm: A critical appraisal," *International Journal of Management Reviews*, vol. *11*, pp. *9-28*, 2009.

[8] T. F. Espino-Rodríguez and V. Padrón-Robaina, "A review of outsourcing from the resource-based view of the firm," *International Journal of Management Reviews*, vol. *8*, pp. *49-70*, 2006.

[9] B. Watjatrakul, "Determinants of IS sourcing decisions: A comparative study of transaction cost theory versus the resource-based view," *The Journal of Strategic Information Systems*, vol. *14*, pp. *389-415*, 2005.

[10] R. McIvor, "How the transaction cost and resource-based theories of the firm inform outsourcing evaluation," *Journal of Operation Management*, vol. *27*, pp. *45-63*, 2009.

[11] J. B. Barney, "Firm resources and sustained competitive advantage," *Journal of Management*, vol. *17*, pp. *99-120*, 1991.

[12] B. Johansson, "Deciding on Using Application Service Provision in SMEs," Licentiate of Philosophy, Department of computer and information science, Linköping University, Linköping, 2004.

[13] F. J. Mata, W. L. Fuerst and J. B. Barney, "Information technology and sustained competitive advantage: A resource-based analysis," *MIS Quarterly*, vol. *19*, pp. *487-505*, 1995.

[14] J.-N. Lee, S. M. Miranda and Y.-M. Kim, " IT Outsourcing Strategies: Universalistic, Contigency, and Configurational Explanations of Success," *Information Systems Research*, vol. *15*, pp. *110-131*, 2004.

[15] M. C. Lacity, L. P. Willcocks, and D. Feeny, "Making the Outsourcing Decision," in *Information Systems and Outsourcing: Studies in Theory and Practice*, L. P. Willcocks and M. C. Lacity, Eds., New York, USA: Palgrave Macmillan, 2009.

[16] W. R. King, "Developing a Sourcing Strategy for IS - A Behavioral Decision Process and Framework," *IEEE Transactions on Engineering Management*, vol. *48*, pp. *15-24*, 2001.

[17] L. A. De Looff, "Information Systems Outsourcing: Theories, Case Evidence and a Decision Framework," in *Strategic Sourcing of Information Systems: Perspectives and Practices*, L. P. Willcocks and M. C. Lacity, Eds., Chichester, England: Wiley, 1998, pp. *249-281*.

[18] B. Quélin and F. Duhamel, "Bringing Together Strategic Outsourcing and Corporate Strategy: Outsourcing Motives and Risks," *European Management Journal*, vol. *21*, pp. *647-661*, 2003.

[19] N. G. Carr, "IT Doesn't Matter," *Harvard Business Review*, vol. *81*, pp. *41-49*, 2003.

[20] D. Taubner, "Software-Industrialisierung," in *Software-Industrialisierung*, vol. 28, A. Bode, M. Broy, and D. Taubner, Eds., Informatik Spektrum, 2005, pp. *292-296*.

[21] B. Barney, *Gaining and sustaining competitive advantage*, 2d ed. Upper Saddle River, N.J.: Prentice Hall, 2002.

[22] F. W. McFarlan, "Information Technology Changes the Way You Compete," *Harvard Business Review*, vol. *62*, pp. *98-103*, 1984.

[23] R. L. Nolan and F. W. McFarlan, "Information technology and the board of directors," *Harvard Business Review*, vol. *83*, pp. *96-106*, 2005.

[24] J. Dibbern, J. Winkler and A. Heinzl, "Explaining variations in client extra costs between software projects offshored to India," *MIS quarterly*, vol. *32*, 2008.

[25] A. Y. Lewin, S. Massini and C. Peeters, "Why are companies offshoring innovation? The emerging global race for talent," *Journal of International Business Studies*, vol. *40*, pp. *901-925*, 2009.

[26] J. Dedrick, K. L. Kraemer and F. MacCrory, "Global Sourcing Choice and Firm Performance: Impacts of Firm Characteristics, Nature of the Activity and Strategic Motivation, Recent Work," Personal Computing Industry Center, UC Irvine, 2011.

[27] I. Oshri, J. Kotlarsky, J. W. Rottman and L. P. Willcocks, "Global sourcing: recent trends and issues," *Information Technology & People*, vol. *22*, pp. *192-200*, 2009.

[28] M. C. Lacity and J. W. Rottman, "Effects of offshore outsourcing of information technology work on client project management," *Strategic Outsourcing: An International Journal*, vol. *20*, pp. *4-26*, 2009.

[29] A. C. Rouse, "Is There an "Information Technology Outsourcing Paradox"?," in *Information Systems Outsourcing: Enduring themes, new perspectives and global changes*, R. Hirschheim, A. Heinzl and J. Dibbern, Eds., Berlin Heidelberg: Springer 2009, pp. *129-146*.

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Social relationships in IT project teams:
its role, complexity and the management thereof

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Abstract:
Compared to other projects, information technology (IT) projects, characterized by emergency and uncertainty, are unique. To implement an IT project successfully, many aspects need to be monitored and carefully controlled and managed. One such aspect is social relationships. All IT professionals are exposed to, and in many cases involved, in the phenomenon of social relationships. These relationships are used by software project team members for personal as well as professional purposes. In most cases the impact of these relationships on the success or failure of any given IT project is ignored by IT management. Little attention is given thereto in the literature and this paper attempts to make a contribution in terms of giving a broad perspective of the complexity, the impact, as well as the management of such relationships. This paper demonstrates that these relationships play a significant role and should be managed in such a way that the team members and the project as a whole can reap the benefits thereof. A conceptual framework is proposed for the management of these relationships.

1. Introduction and problem description

The information technology (IT) project management literature is extensive with regard to success factors as well as the causes of failure; however, little focus is placed on the role or importance of social relationships and networks within IT projects.

Liebowitz [11] feels that the greatest threat to the success of any IT project is the failure to communicate. This statement in particular draws the attention to the problem area of the research. Although one wants to see a project environment where a culture of sound communications is promoted, it is difficult for any project manager to 'control' any influence this might have on team members and as such on the progress of a given project. Sauer [14] believes that a major part of the problem of IT project failure is the lack of recognition that information systems development is largely a social and political process. This view is also shared by Standing [15]. Considerable effort has already been spent on the process of managing IT projects and has produced multiple methodologies and methods for project management and the IT software development life cycle [16].

Ashworth et al. [2] state for example that:

> *Social network theories suggest that the types and degrees of an individual's relationships in social and communication networks are key impactors of group performance, while resource dependency theory suggests that non-social factors, such as knowledge and skills, figure at least as prominently as social dimensions in determining such performance.*

Social factors are increasingly being considered as important for achieving more consistent and sustainable success in corporate environments. Organizations are spending increasing amounts on social responsibilities outside their operating environments, as their customers are taking cognizance of these issues and are demanding these efforts. Inside the organizations, similar efforts are being made to heed the social factors, especially from a human resources point of view.

In organizational theory, managers are viewed as contributing over and above the skills they have acquired through experience and education, the value of their social networks. These values or assets refer to the social capital of the manager. Scholars have highlighted the ability of these social networks that can be used to the individual's or organization's advantage [7],[2]. With this in mind, the question is how social relationships and networks within IT project teams are viewed, instead of focusing only on that of the project managers. The social capital of the individuals participating in the IT project teams is an influencing factor on the social networks that are active within the project teams.

The first consideration is that of determining the strength of these social networks. Network strength can be defined as the frequency of communication, while the degree of the network is defined as the number of direct links with other network members [8].

Social networks have a key function in the social information processing within an organization, especially relating to connecting social influence, knowledge and the organizational culture to the actual projects at hand. This influence is depicted in Fig. 1.

Fig. 1 illustrates that positive social influence is supportive of IT adoption, whereas negative social information processing contains information opposing system adoption. The +/- valences of the arrows in Fig. 1 indicate the direction of interaction between network strength and social information processing (e.g. positive social information processing increases network strength whereas negative social information processing decreases network strength). The strength and density of the communication network alters the potential of social influence to affect adoption. Stronger network connections increase the likelihood that social influence will be received from different sources, and also increase the frequency with which such transfers occur [8].
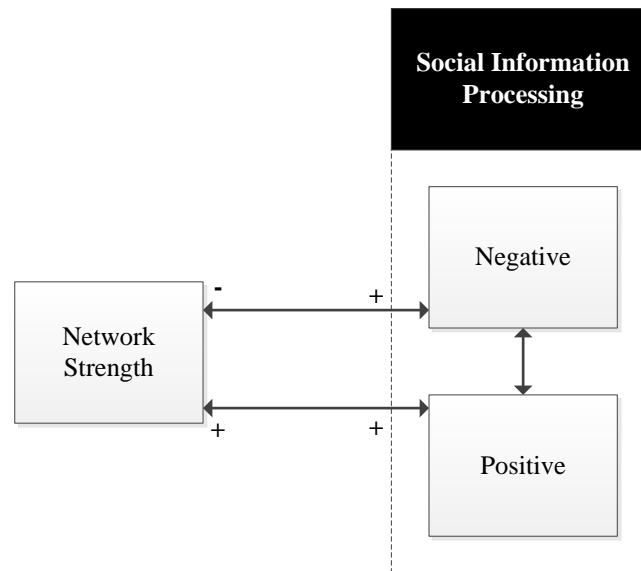
Fig. 1. Interaction of network strength and social information processing [8]

In summary, therefore, the problem under investigation in this research was to determine the role and nature of social relationships and networks within and between the IT project teams, as well as their influence in the success or failure of such projects.

In the rest of the paper a description is given of how the research has been done and how data has been gathered. The paper gives a theoretical overview of social relationships and networks. After this, data is presented and discussed to illustrate how relationships work in practice and how they impact or influence project teams and as such project outcomes.

2. Theoretical background on social relationships and networks

2.1 The establishment and maintenance of sound relationships

Relationships between end users and team members of IT projects are described by Leonard [10] as intriguing and complex. According to Leonard a large number of elements (amongst others: support; cooperation; knowledge; and commitment) are involved during the establishment and maintenance of sound relationships. Furthermore, he argues that if any of these elements are disturbed, the whole relationship is disturbed. In other words, these elements form a holistic 'unit'. Each of these elements therefore plays a specific social role in a relationship, which impacts on the soundness of a relationship and as such on the cooperation between team members.

In order to overcome the problem of poor relationships between IT professionals and end users, for example, it is argued that a 'human-behavior' strategy of some kind should be followed. This strategy should involve amongst other things focusing on those social issues that will enhance trust, commitment, cooperation, etc. Reich & Benbasit [13], referred to by Leonard [10]) point out that there are two dimensions to strategy creation: the intellectual dimension and the social dimension. With regard to this research, the social dimension was the focus.

Sound social relationships could be regarded as an important ingredient for any working environment. Not only between employees in general, but also for the purpose of organizational learning and support.

2.2 The STC framework

Collinson [4] defines the Socio-Technical-Constituencies (STC) framework (see Fig. 2) as a tool to map out and identify the roles of the various sources of knowledge, expertise and other factors influencing the innovation process. In particular social, organizational, technical and economic factors are highlighted. Although the STC of Collinson [4] is based on the innovation process, this model can be extended to IT projects that are in essence projects concerned with innovation. The STC assists in identifying the alliances, alignments and social interactions that can be critical to the success or failure of the IT project. Collinson [4] defines socio-technical constituencies as:

> *Dynamic ensembles of technical constituents (tools, machines, etc.) and social constituents (people and their values, interest groups, etc.), which interact and shape each other in the course of the creation, production and diffusion (including implementation) of specific technologies.*

Applying this idea to relationships and social networks allows one to emphasize the concept of interrelation and interaction between the individual team members participating in the IT project. This interaction occurs between the different sets of social constituents of the team members involved in the IT project, impacting across a variety of networks, and thus from the basis of the socio-technical constituencies.

In IT projects, the use of the STC approach enables the identification of the social, economic and technical networks that form the basis for achieving a successful outcome. Thus the elements that can constrain or facilitate constructive social networks can be identified and addressed. The STC model thus enforces the idea that social relationships and networks are the key to the successful implementation of IT projects.

Trust

Although all the elements mentioned by Leonard [10] are important for the establishment and maintenance of sound relationships, it is noteworthy that the element of trust could be regarded in most cases as the basic ingredient for sound relationships, and therefore more theory is given in this regard.

Trust is an important component in social relationship building, but it remains a complex and ambiguous phenomenon ([9]). Kadefors defines trust as: 'Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another'. This definition implies that trust is not a behavior, but rather a psychological state. Furthermore, Kadefors explains that trust is not a prerequisite for cooperation, but the presence of trust improves and extends the level of cooperation.

Trust becomes important in IT projects due to the high level of cross- functional members that participate in IT projects and the associated fundamental need for cooperation. Required trust levels are directly affected by the situational circumstances and the team dynamics within IT projects. Finding the right balance of trust is important, as there are costs associated with trust [9]:

- Direct costs are associated with the building of trust;
- Potential costs of breaching trust;
- Costs resulting from inefficiencies due to excessive levels of trust.

Trust can be created by the following methods:

- Relational trust. Relational trust is created through repeated interaction between individuals. Trust is based on the personal experiences of individuals and their interpretation of events;
- Calculus-based trust. Calculus-based trust results when the trusting party believes that the trusted party will deliver on the promised actions, as this delivery is in the financial interests of the trusted party;
- Institution-based trust. Trust is created through institutions, such as legal systems, regulatory systems and societal systems. These systems are very much context-related and the levels of trust can thus differ, based on their context.

Competing / interacting
sociotechnical constituencies

(Socio-cultural relations)

Changing patterns
of consumption

Collaborating / competing
institutional constituencies

Dominant
Technologies,
adoption
patterns

Trade
lobbying
groups

(Socio-cultural relations)

Related R&D
organisations

retailers

Intra-institutional
constituencies

universities

customers

Technical
Trends

Technology /
Product

Market
Trends

Government
bodies, standards
agencies etc

banks

FIRM

Co-developers

Venture
capitalists

Historical
circumstances
and trajectories

competitors

Component
suppliers

shareholders

Industry-level,
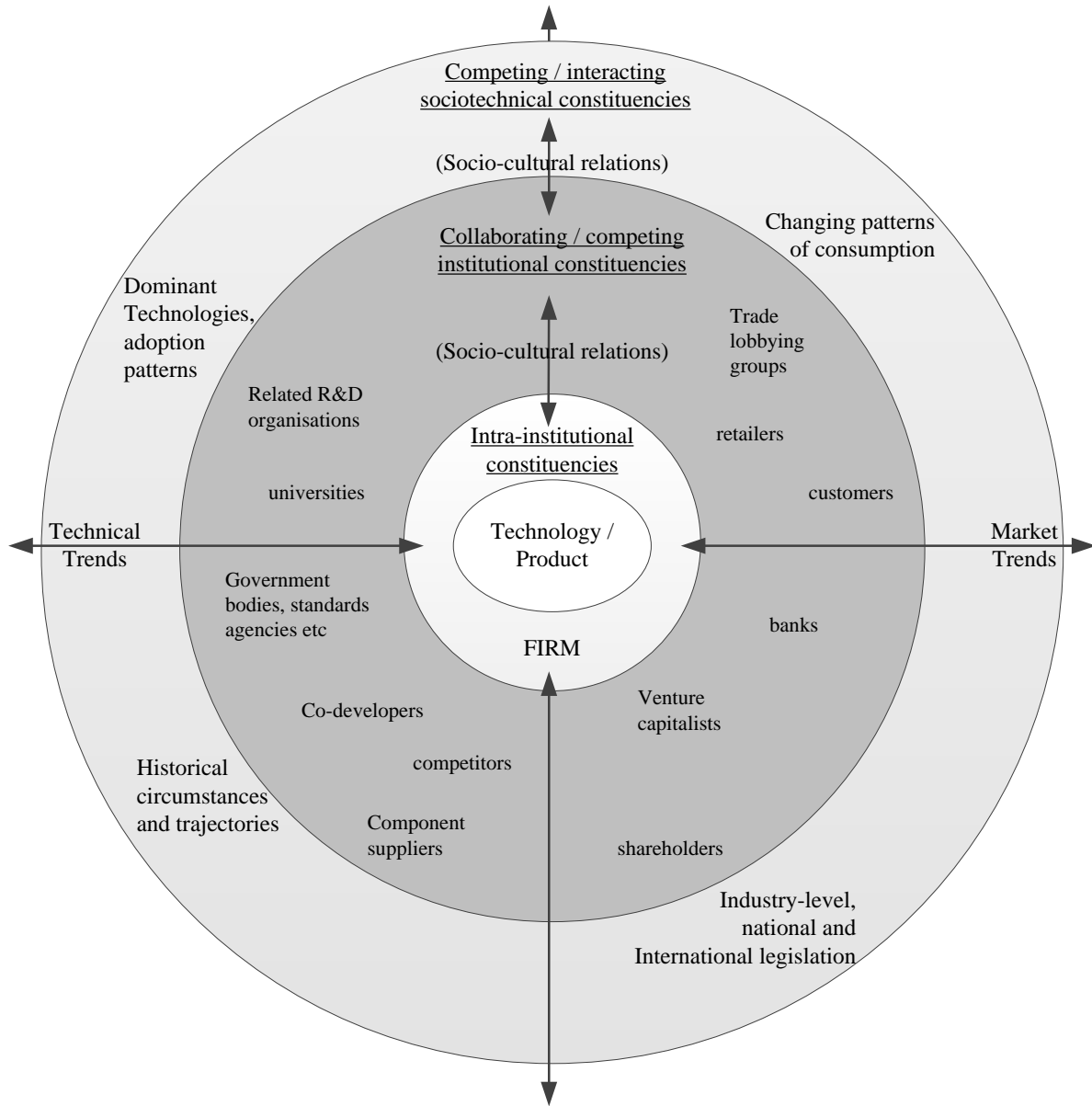national and
International legislation

Fig. 2. Socio-Technical Constituencies framework [4]

Trust is thus a context-based psychological state that is affected by the participating individuals, as well as the associated circumstances. Kadefors [9] explains it in the following way: 'We trust a colleague or exchange partner in some situations but not in others, and decisions on whether or not to trust are continuously revised in the light of new information.'

Due to the need for cooperation in IT projects, relational trust is the prime driver of trust development in IT projects. Close cooperation, especially beneficial cooperation, is only created over time through interpersonal interactions.

This implies that social characteristics and relationships developed between individuals thus have a direct influence on the levels of trust that exist within an IT project environment.

In the next part of the paper the empirical research is presented (based on project charter and project closure documentation) to illustrate what social activities take place in a typical IT project environment.

3. Materials and methods

A large South African financial bank was chosen for the investigation. This investigation took place over a period of several months from the beginning of 2008. The motivation for using this bank was because of the large number of on-going projects that exist at any given point in time. This bank also undertakes a considerable number of IT projects on an annual basis.

Information was primarily obtained from project documentation of completed or abandoned projects within the IT departments of the corporate bank. A survey was created, based on the initial findings of the grounded theory research, and these findings were then sorted into categories.

Based on the information analyzed during the initial literature review and personal experience, the following question was formulated: Do the social relationships and networks within project teams and external to these teams influence the outcome of such projects?

During the grounded theory process the following secondary questions were identified and addressed:

- How are social networks used?
- Do separate and distinct social networks develop within project teams?
- Do pre-existing social relationships and networks between potential team members influence the dynamics of a new project team?
- What factors outside the project team have an influence on the social relationships and networks?

To answer the above mentioned questions, the empirical research process took the form of reading through a large number of relevant project documentation. At the same time data was arranged, categorized and analyzed. Answers to certain research questions emerged and a comparison with existing literature was done. In the following section a theoretical background is given, as well as how the empirical research process took place.

The survey utilized in the research is classified as a cross-sectional survey, as it involves approaching a sample of respondents only once. The sample is regarded as a cross-section of the population under study. The survey results were used to compare subgroups (such as project managers and developers) and evaluate relationships between variables.

The target population for the survey was limited to members (project managers, developers and other participants in IT projects) of two case studies. The survey was distributed to 100 possible candidates in the form of a self-administered internet questionnaire.

The Likert Scale was used to measure the participants' views on the categories identified during the initial data collection phase. The Likert Scale allows for interval scales and a full spectrum of statistical analysis.

A deductive interpretativistic approach was applied to analyze the results of the survey.

4. Empirical research

The data used for the initial Grounded Theory (GT) process was obtained from project documentation. These documents consisted primarily of project charter and closure documentation. The data was used to identify the concepts and categories during the data collection phase of GT. Further information relating to the concepts and categories were obtained using a survey distributed to participants from case studies. In the rest of this section the different case studies that were used are briefly described and an analysis of the data is presented.

4.1 Case Studies

Three case studies were used in this research project. The grounded theory process is based on the first two which come from different IT environments. The third case study is based on the work of Leonard [10]. In his research of how sound relationships should be built and maintained between different role players in the IT project environment, he made use of an interesting constructive thought experiment to base his argumentation on.

The first case study refers to the primary centralized approach and the second case study relates to a decentralized approach. The two environments where the first two case studies come from are briefly described in 4.1.1 and 4.1.2. The third case study in which a thought experiment is used, is described in 4.1.3.

4.1.1 IT Environment 1 (Case study 1)

In the first case a Technology Program Office was created by the bank to provide integrated end-to-end management services for the strategic project portfolio. The bank makes use of program management to control the myriad of projects executed concurrently within its environment. The project management methodology was based on the PMI PMBOK. All nine knowledge areas are implemented, but tailored to the bank's environment.

4.1.2 IT Environment 2 (Case study 2)

The second case focuses on the bank's Personal Loans Information Technology division, which is a full-fledged IT department that services the needs of the Personal Loans business division within the bank. The primary focus of the team is to provide and maintain information systems that cater for the specific needs of the Personal Loans mono-line. Their approach to project management was similar to that of case study 1.

4.1.3 Building of sound relationships - a thought experiment (Case study 3)

Based on the work of Leonard [10] the following thought experiment is used to illustrate the positive impact the building and maintenance of sound relationships can have on different role players in the project environment. The scenario he describes in terms of a thought experiment is as follows:

An end user, Mr. Jones (an employee of the training department of the organization), is experiencing problems with designing a system for his department on the micro-computer in his office. Mr. Jones got the assignment from the manager of his department, Mr. Williams. The purpose of the system is to keep track of all employees' educational details, training courses attended and other abilities. This, Mr. Williams believes, will help him to manage more effectively the assignment of training courses his staff is to present to the employees of the organization during the year. This was one of his main responsibilities as training department manager. Furthermore, Mr. Williams believes that because of Mr. Jones's knowledge of the MS Access package on his office computer, this task could be done without the support of the IT department.

A week after Mr. Jones started with the development of the system he started to experience problems linking certain files in his relational database. Because of his poor knowledge of database technology, Mr. Jones realized that he will definitely need the support of an IT professional to help him overcome the specific problem. Mr. Jones made use of the HELP desk service to communicate his need to the IT department. After entering his details on the system he was given a reference number to use when doing any enquiries in this regard.

The next morning the steering committee evaluated all new service and support requests and saw Mr. Jones' request amongst them. Because of the details the specific end user gave, it was easy for the committee to realize that this service and support request is a "legitimate" one and that it can stay on the HELP desk system for the attention of any IT professional. The committee then updated the request with an official unique HELP desk service and support number which can be used by the requester for future reference.

The next morning an IT professional, Mr. Robertson, scans through the requests appearing on the HELP desk system and his eye catches the request of Mr. Jones. When Mr. Robertson saw the message on his screen it immediately grasped his attention because he loves working with database related system problems. He therefore immediately phoned Mr. Jones to arrange for a suitable time to visit him and help him with his problem. Mr. Jones first reacted by saying that maybe Mr. Robertson could quickly help him over the phone. Bearing in mind that it is the IT department's responsibility to establish sound relationships with its end users, Mr. Robertson responded by saying that apart from the fact that he sees it as his responsibility to go and visit Mr. Jones and to give him personal assistance, he is also very interested to see what Mr. Jones is doing. Mr. Robertson also made the point that maybe he would even see potential for a linkup of Mr. Jones's system to the mainframe system. Mr. Robertson knew that it is important that he should try and build the relationship on a sound basis from the start, so that if Mr. Jones should need more support on the system he is designing, he would not hesitate to contact him.

Mr. Jones had a meeting that morning. They therefore made the appointment for right after the meeting, which was for 14:00 that same day. Mr. Robertson arrived at Mr. Jones's office on time. During their first meeting it became clear to Mr. Robertson that Mr. Jones was clearly quite clued up with the package and it would not take him a long time to explain how to solve the problem. Mr. Robertson also realized that it was his responsibility, based on the general ethical code in the IT department, to book Mr. Jones on a course to enhance his database design skills and thereby make Mr. Jones even more independent of the IT department in the end user computing terrain. Mr. Jones was very pleased with the prospect of getting more training and this made him even more enthusiastic to make a success of the project. They had a very constructive discussion afterwards on a possible future application of information technology in the training department. After adjourning the meeting, Mr. Robertson invited Mr. Jones to contact him should he experience more problems with his project and reminded him that it was his (Mr. Robertson's) responsibility to "look" after him throughout the duration of this project, although the project may only take a few days to complete.

After their meeting they both entered a short report on the HELP desk system in order to keep everyone in the company, especially the steering committee, informed about the status of the original request for support that came from Mr. Jones. In his report Mr. Jones stated his satisfaction with the support he got from Mr. Robertson and that he is looking forward to a constructive relationship with him during this project. Furthermore, he stated that it really feels good to know there is someone he as end user can rely on, in case he runs into new problems during the design process of the system. In his short report Mr. Robertson stated that Mr.'s Jones problem was quickly solved and that they had an interesting discussion on the possible future application of technology in the training department and the he (Mr. Robertson) will definitely "put it on the table" the next time the IT department is doing long term planning.

Throughout the duration of Mr. Jones's project, Mr. Robertson made a point of it to keep in touch with him, so as to get informed how he (Mr. Jones) is progressing. The development of the system kept Mr. Jones busy for approximately three weeks, where-after he decided to terminate the relationship because the project has been completed. He did this by again entering a message on the HELP desk system thanking the IT department (by name Mr. Robertson) for keeping in touch with him during the project. He concluded his message telling that despite the fact that he knew the technology he was using to build the system, the support he got from Mr. Robertson was highly appreciated and most valuable because it gave him some new perspectives on the way to solve certain problems and that he now for the first time believed he is beginning to understand the culture of the IT people.

This case study sketches a situation where an IT professional who took up the responsibility to give service and support to a specific end user, not only solved the end user's problem but also created a relationship environment which made the end user enthusiastic about what he was doing.

Furthermore, the relationship environment ensured that the specific shortcomings in terms of the end user's skills and knowledge were addressed by scheduling the end user on the necessary training course.

This approach not only ensured that the specific end user will be able to cope in similar circumstances in the future without the need to ask for support from the IT department, but it also emphasizes the IT department's responsibility to educate all its end users.

Moreover the way in which the relationship between the specific end user and the IT professional was managed ensured a great deal of trust in the quality of service and support that was given by the IT professional. As such, this kind of service forms the basis for building future sound relationships.

4.2 Analysis of data

The ATLAS.ti software was used to perform the grounded theory data ordering, data analysis and theory development phases. The initial core categories (printer in bold) that were identified are depicted in Fig. 3. Furthermore, the process was used to identify the impact areas as well as the impact types of social relationships and networks.

4.2.1 Impact areas

The impact areas (with their related issues) of social nature are also indicated in Fig. 3. Here follows a brief listing of each.

The role of leadership within the project - The following issues are related to this impact area:

- The presence of a strong leadership component within the project;
- Importance of leadership *versus* procedures;
- The level of leadership and the project outcome;
- The level of support for leadership within the project team.

The project culture - The following issues are related to this impact area:

- The presence of a recognizable culture within the project;
- The effect of the project culture on the project team;
- The role of the project manager in determining the project culture;
- The project culture *versus* the organizational culture;
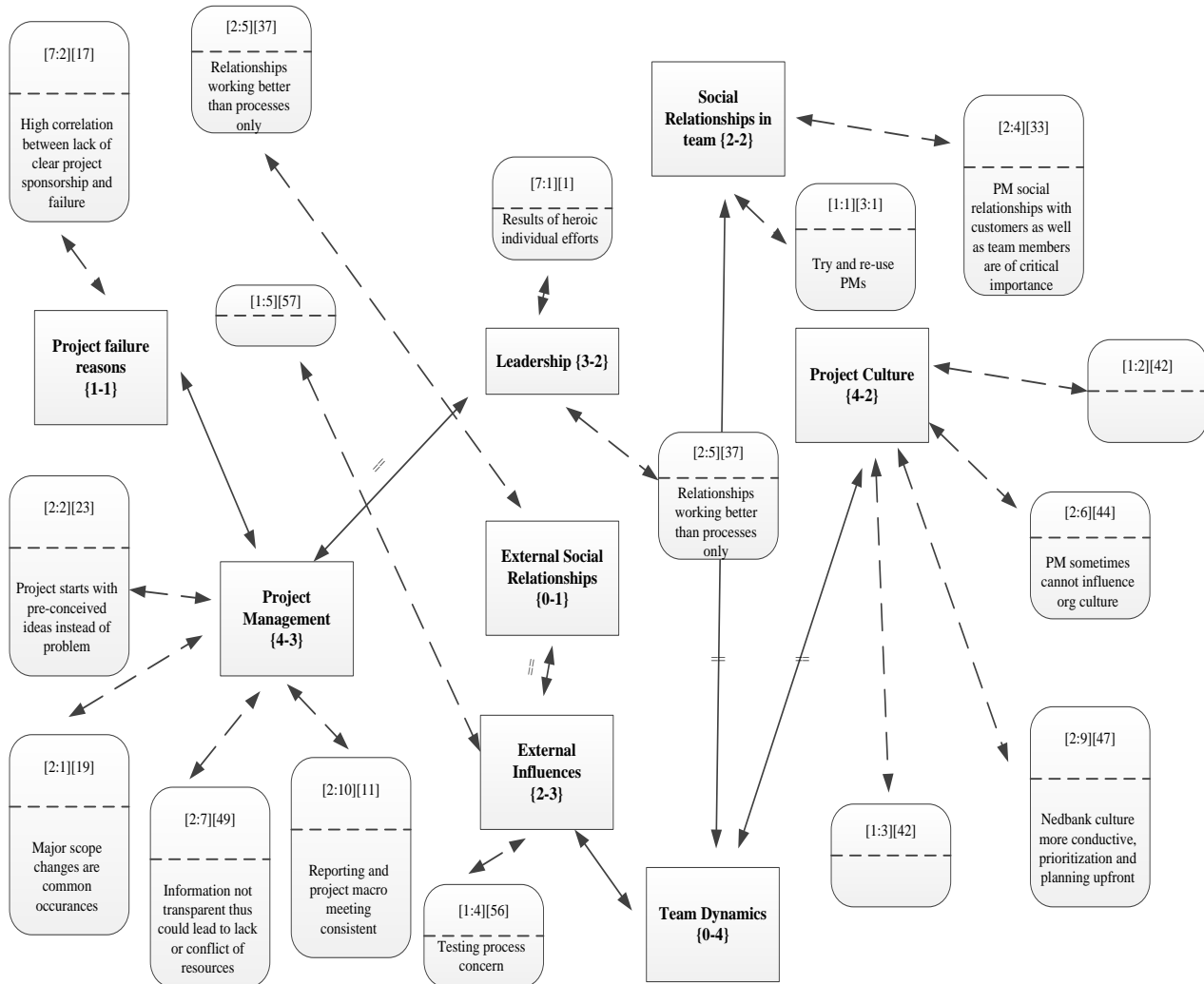- The influence of the project culture on the project outcome.

Fig. 3. Network View of Grounded Theory data; categories, impact types and areas

The social relationships between team members - The following issues are related to this impact area:

- The level of social relationships that develop between team members;
- How the social relationships are used within the project;
- The effect of social relationships on how team members view others.

The individual's external social networks - The following issues are related to this impact area:

- Which type of external social networks are utilized?
- What are the external social networks utilized for?

External influencing factors on the project - The following issues are related to this impact area:

- The effect of external factors on the project outcome;
- The types of external factors influencing projects.

These impact areas were used as basis for gathering more data by means of a survey. The survey and key findings are discussed in the next section.

4.2.2   Impact Types

Social relationships and networks are active in IS projects in three primary formats which are called impact types. They are as follows: influence; friendship; and advice.

Influence

Project team members establish social relationships within project team structures over time through their personal interactions. Stronger social relationships can be developed with some team members compared to others which can create areas of leverage for the individuals. These social relationships provide a platform for individuals to influence the project direction or decisions through:

- Influencing the project leadership;
- Influencing other team members to gain support for their own ideas and agendas;
- Using their social relationships to solve problems when project structures and procedure present a stumbling block;
- Influencing the project culture.

Harnessing this influence to the advantage of the project will increase the contribution of the specific individual to be greater than just their knowledge and skills.

Friendships

Some individuals develop social relationships with other project team members to such a level that it evolves into friendships that extend beyond the project structures. These friendships can result in the creation of certain social groupings within the project team that result in the alienation of other project team members, to the disadvantage of the project. Harnessing these friendships in the composition of new project teams can result in the creation of highly effective project teams that deliver beyond the sum of the capabilities of the individuals.

Furthermore, Leonard [10] states that these relationships have a very intrigue nature. According to him they consist of two dimensions, namely a physical and abstract dimension. The physical dimension describes those elements that are necessary in order to enable contact between team members, whereas the abstract dimension describes the soft issues of a relationship.

These two dimensions enable one to describe the holistic nature of such a relationship fully and to encapsulate the important elements of a support-oriented organization, namely mutuality, belonging, and connection. Because of the holistic nature of the different elements, Leonard [10] argues that any kind of change having an effect on any of the elements of either the physical or abstract dimensions of a relationship will in fact disturb the relationship. Based on this, one can argue that social relationships and networks that are disturbed needs to be managed in such a way that all role players stay focused and committed.

Advice

Individuals make use of their social networks outside of the project structures to gain advice to assist them in performing their tasks and to influence the project.

Individuals with strong and influential social networks can be advantageous to project teams as these networks can be used by other team members and to provide validity to the project.

These networks can assist greatly to identify possible external factors that could influence the project and develop associated actions to minimize potential negative impacts.

4.3 Summary of survey design and results

The survey was distributed to 100 participants across the two cases with 58 valid responses received.

As stated previously, the Likert Scale was used to measure the participants' views on the categories identified during the GT initial data collection phase.

The purpose of the survey was to:

- Gathering further information to saturate the categories identified during GT;
- Gathering personal views of participants in IT projects.

The survey illustrates clearly the huge role played by the establishment and use of social relationship and networks in a given IT project environment.

In summary, the survey indicates the following phenomena:

- In total 87% of the respondents indicated that social relationships between team members developed within the project teams as well as between members of other teams. Almost two thirds indicated that they developed stronger social relationships with some project team members than with other;
- Social relationships are used by team members within and around the structures created in the project environment;
- Project team members used their social relationships to solve problems whilst following project procedures as well as when the procedures proved to be a stumbling block in resolving the particular problem;
- A significant finding is that one in two respondents indicated that they made use of their social networks outside the organization to gain knowledge so that they could influence the project. Fig. 4 shows the variety of issues that could be applicable in this regard;
- A large number of participants indicated that the team members make use of their social relationships to the benefit of the project, but to their individual benefit as well.

4.4 Grounded theory research findings

In this section of the paper the results of the research project is discussed and illustrated.

The survey results were used to deductively evaluate the importance of social relationships and networks within IT projects.

The saturated network in Fig. 4 illustrates the role and importance of social relationships and networks in a typical IT project environment.

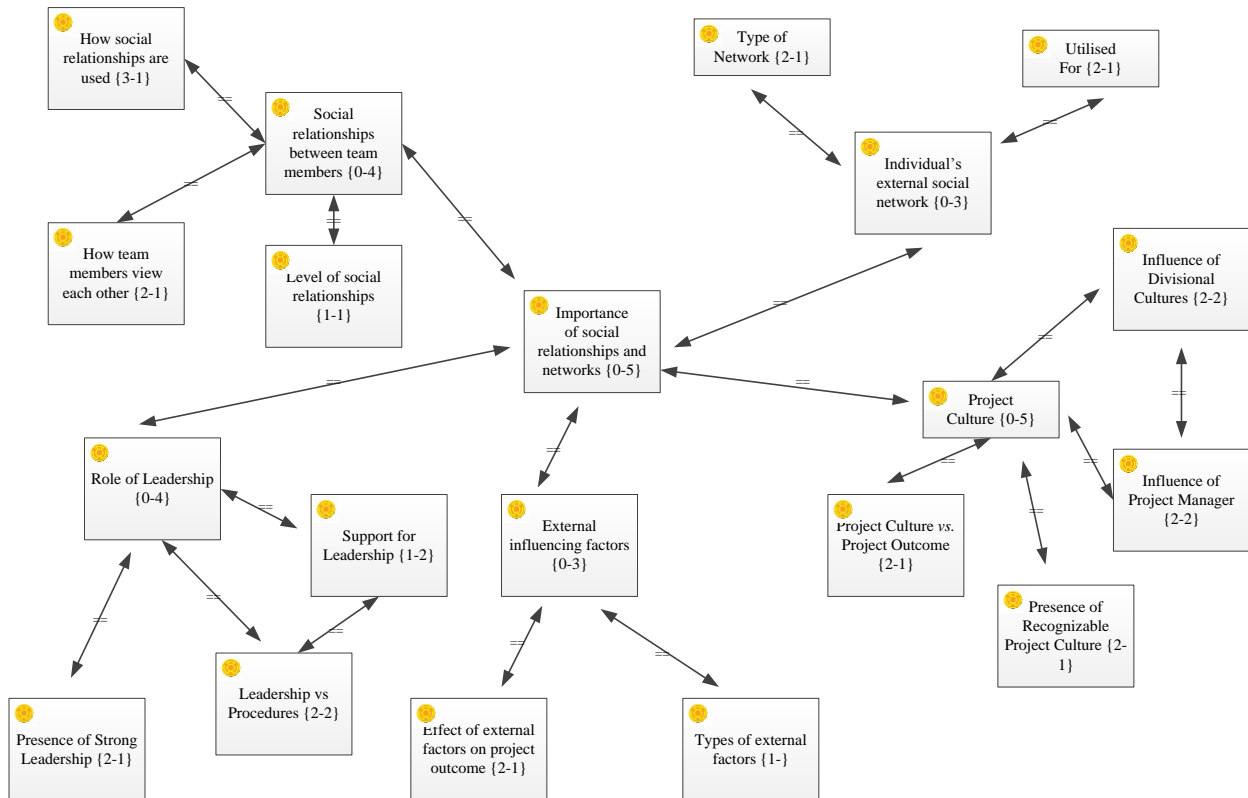At the end of this section a summary is given of the major findings.

Fig 4. Saturated GT network view of how social relationships and networks impact on the different aspects of an IT project environment

5. Summary of the major findings

The nature of IT projects normally requires high levels of team member interaction throughout the project life cycle and thus social relationships will develop between project team members. Two thirds of respondents indicated that they developed stronger social relationships with some team members than with others. This implies that social alignments or clicks can develop within project teams that must be monitored to prevent possible alienation of team members. Harnessing these groupings to the advantage of the project can provide momentum and energy toward successful project delivery. Some social relationships developed between project team members to such an extent that team members developed friendships that extended beyond the project environment. Although this phenomenon is on a personal level, this could also enhance or hamper performance which needs to be monitored.

Project team members use their social relationships primarily to solve problems and to gain some level of advantage. This could be regarded as a positive development in the sense that team members will, because of certain relationship, deal with their problems as quickly as possible and enhance the team performance as a whole.

External relationships and networks also play an important role. These social networks can be of a formal or informal nature. Formal networks include for example industry portals, special interest groups, past colleagues and information feeds, whilst informal networks include blogs, search engines and social networking tools. Individuals can also be used by other members in their social networks to influence the IT project. Influential business people can influence projects

by accessing project team members directly and thus bypassing project structures. Such interventions must be monitored as it could negatively impact on the project direction or results.

6. The literature comparison phase

The literature comparison phase in GT is aimed at comparing the emergent theory from the research with extant literature to improve the internal as well as the external validity. The most important work in this regard is that of Ashworth et al. [2]. They conducted research using social network theory and resource dependency theory to explain the importance and performance of human capital at team levels within organizations. The focus was on the impact of social position and the knowledge of the team members, on the team performance. Ashworth et al. [2] argue that the individual's knowledge and task execution contribute more than the individual's social relationships and networks to the overall team performance. The contribution of the individual's social networks is not discounted as being unimportant, rather placed lower in order of importance. The linkages used for social relationships and networks focused on friendship and advice within their research. This research can be viewed as complimentary and additional to the literature of social network theory.

7. Summary of the major findings

The following conceptual framework has been constructed using the research results of Leonard [10] as well as the insights obtained from the above mentioned grounded theory data and case studies.

Looking at the work of Leonard [10] and the above mentioned data, one can argue that the basis of any 'healthy' working environment for a project team would be an environment where sound relationships prevail most of the time. In this regard, it is important to take note of the abstract elements of the definition of a sound relationship environment. According to the definition a number of soft issues (*cf.* above) play an important role during the establishment and maintenance of sound relationships. Based on his work one can argue that *support* or a need for *collaboration* play an important role in the motivation for individual team members to reach out to other team members inside the project team or external to the project team. These two elements are referred to by Leonard [10] as a *supportive culture* and *cooperative behavior*.

Leonard [10] uses the following basic framework (Fig. 5) to explain the complex working environment of a project team.
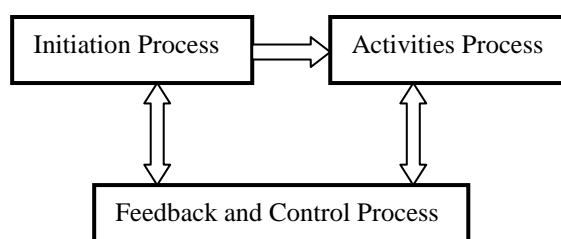

Fig. 5. Saturated GT network view of how social relationships and networks impact on the different aspects of an IT project environment

During the initiation process, end users and the IT department (IT professionals) start together as parties negotiating the terms and means of a specific software project. On the other hand, the activities process should be seen as the process where the rest of the project life cycle plays off. According to Leonard [10], the nature of the activities in this process impact positively or negatively on the different elements in the *physical* and *abstract* dimensions as was stated

previously in his definition. The *feedback and control process* is there to monitor this and to make the necessary changes to the project team environment.

For the purpose of this paper the activities process in Fig. 6 is used as basis to build the conceptual framework and is now explained in more detail.
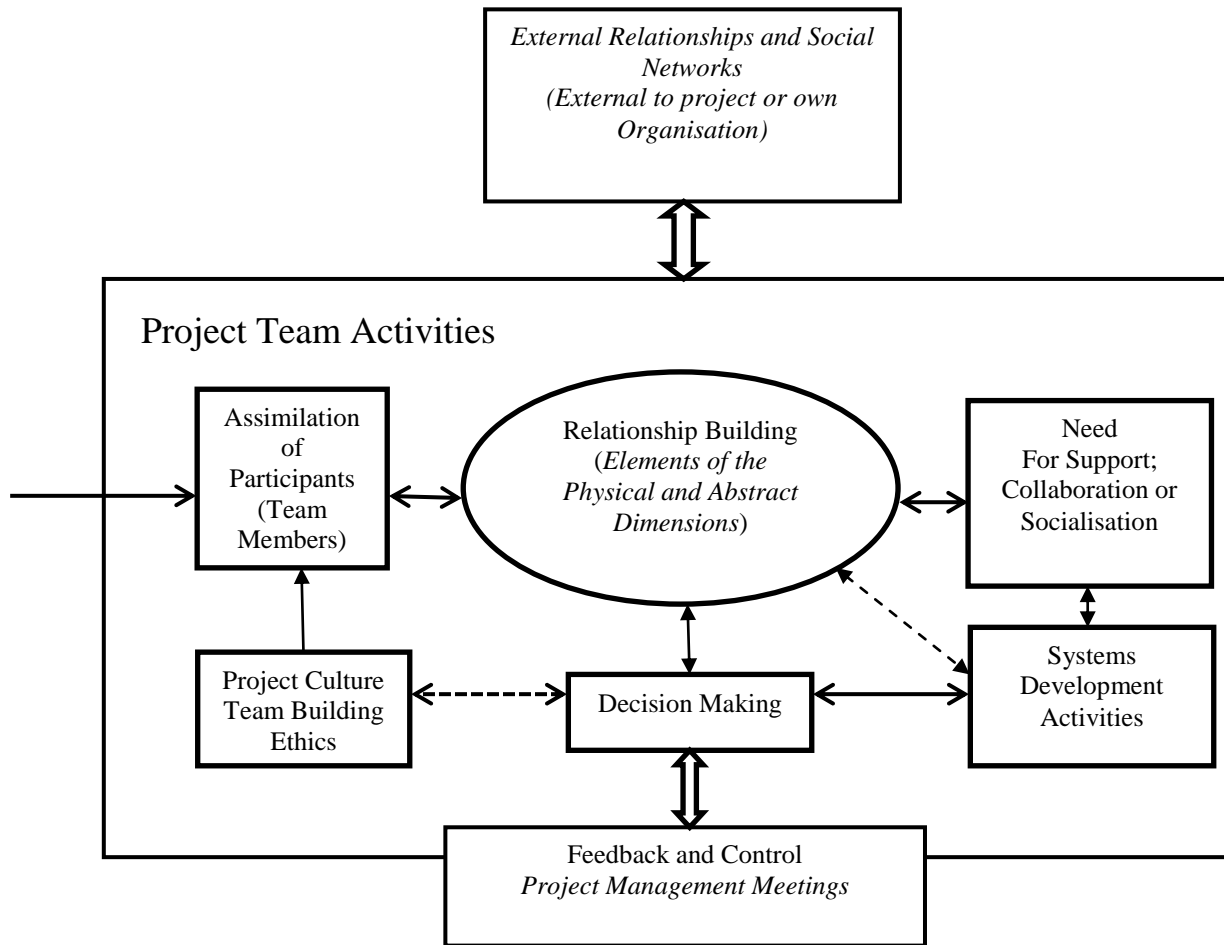

Fig. 6. Conceptual framework for explaining the role and impact of social relationships and networks in the software project team environment (based on the work of Leonard [10])

The main focus of the conceptual framework is to indicate that relationship building is one of the major activities in any software project environment. Team members are initially recruited or chosen from existing IT employees. These new members normally go through an initiation or team development program. Needless to say, in most cases new members start building relationships and also bring 'external' relationship 'links' to the team. As was mentioned earlier, these external relationships could be of a positive or negative nature.

Furthermore, team members do experience the need for collaboration and support as they perform their normal duties in the project team. These 'needs' can lead to the establishment of new relationships within the team or external to the team. As such, team members are influenced (positively or negatively) by other people about how to perform their duties within the project team environment. This will of course impact on decision making in the team and especially at the feedback and control process which normally takes place during project management meetings. In this regard it is also important to take note of the words of other researchers: Collaboration is a complex, multi-dimensional process characterized by constructs such as coordination ([5]), communication ([18]), meaning ([3]), relationships ([6]), trust ([12]) and structure ([1]). According to them the IS literature has discussed at length some factors that support successful collaboration. To put it in their own words: 'successful collaboration is the process through which a specific outcome, such as a product or desired performance, is achieved through group effort'. It follows that the forming of sound relationships inside or outside the project team for the purpose of achieving better results on project related activities should have a positive impact on individual member performance.

In summary therefore, the interpretation of the conceptual framework is as follows:

- Team members are allocated to a given project team. These team members join the team with existing internal and/or external relationships;
- Team members go through a team development process which helps them to understand the aims and objectives of the project. They also position themselves in terms of their respective roles and responsibilities;
- Within the project culture team members have to perform;
- To perform well, team members have to establish sound relationships with all colleagues in the project team;
- Team members can use their different (internal and external) relationships for professional purposes;
- These relationships have to be managed well for the benefit of the project team as a whole. This is the day-to-day responsibility of the project manager. This should also be monitored and managed during project management meetings.

8. Conclusion

The results of the research illustrate that project management philosophies and methodologies alone are not enough to achieve project success and that the social relationships and networks of project team members cannot be ignored. Each project team member contributes more than just their knowledge and skills to the project. Social relationships and networks will develop and evolve within IT project teams and need to be harnessed to the advantage of the project to improve the likelihood of a successful outcome.

This research identified impact areas as well as impact types of social relationships and networks on IT projects. These impact areas and types need to be considered when project teams are established as well as monitored throughout the project life cycle. Taking cognizance of the importance of social relationships and networks within IT projects can improve the management of technology and ultimately contribute to a greater success rate of IT projects.

Furthermore, it is argued that knowledge about social relationships and networks would provide a theoretically sound supplement to the existing literature that is of value to both academics and practitioners in information systems. The nature of such relationships could help IT management to make the right decisions with regard to the composition of teams and also in terms of enhancing a satisfied team member environment. The value for practitioners lies in the guidelines as to what aspects of social relationships and networks need to be considered in establishing and managing project teams. This knowledge also contributes to existing theories of why some projects could be regarded as successful and others as a failure.

It is clear that these social relationships and networks play an important role in the IT project environment. The results put a very important obligation on project managers' shoulders to take responsibility for these relationships and to 'allow' them for the benefit of each project and as such for the organization. One can argue that such relationships enhance easier communication regarding issues that are normally not discussed in a more formal project environment.

Here one can for example think of issues that need 'whistle blowing'. This brings us back to the importance of creating a project culture that should portray the following: 'Instead of shooting the messenger, managers would do well to establish (…) climate that encourages individuals to come forward with accurate project status information, regardless of whether the news is good or bad' [17]. Therefore, social relationships between IT professionals of different teams as well as with other employees in the organization are important to investigate on a deeper level. Furthermore, discussions between practitioners and academics should be encouraged to explore their impact on the normal operations of an IT department and ways to manage it in a professional way.

References

[1] P. S. Adler and B. Borys, "Two types of bureaucracies: enabling and coercive," *Administrative Science Quarterly*, vol. *41*, pp. *61–89*, 1996.

[2] M. J. Ashworth and K.M. Carley, "Who You Know vs. What You Know: The Impact of Social Position and Knowledge on Team Performance," *The Journal of Mathematical Sociology*, vol. *30*, no. *1*, pp. *43-75*, 2006.

[3] B. A. Bechky, "Sharing meaning across occupational communities: the transformation of understanding on a production floor," *Organization Science*, vol. *14*, no. *3*, pp. *312–330*, 2003.

[4] S. Collinson, "Knowledge networks for innovation in small Scottish software firms," *Entrepreneurship & Regional Development*, vol. *12*, no. *3*, pp. *217-244*, 2000.

[5] S. Faraj and L. Sproull, "Coordinating expertise in software development teams," *Management Science*, vol. *46*, no. *12*, pp. *1554–1568*, 2000.

[6] J. J. Gabarro, "The development of working relationships," in *Intellectual Teamwork: Social and Technological Foundations of Cooperative Work*, J. Galegher, R. E. Kraut and C. Egido, Eds., New Jersey, USA: Lawrence Erlbaum Associates, 1990, pp. *79–110*.

[7] M. Gargiulo and M. Benassi, "Trapped in your own net? Network cohesion, structural holes and the adaptation of social capital," *Organizational Science*, vol. *11*, no. *2*, pp. *183-196*, 2000.

[8] D. S. Hovorka and K. R. Larsen, "Enabling agile adoption practices through network organizations," *European Journal of Information Systems*, vol. *15*, pp. *159-168*, 2006.

[9] A. Kadefors, "Trust in project relationships – inside the black box," *International Journal of Project Management*, Vol. *22*, no. *3*, pp. *178-182*, 2004.

[10] A. C. Leonard, "A Conceptual Framework For Managing Relationships between all Participants During IT Service And Support Activities," *South African Journal of Industrial Engineering*, vol. *13*, no. *2*, pp. *81-96*, 2002

[11] J. Liebowitz, "A look at why information systems fail, Kybernetes," *The International Journal of Systems & Cybernetics*, vol. *28*, no. *1*, pp. *61-67*, 1999.

[12] D. Meyerson, K. E.Weick and R. M. Kramer, "Swift trust and temporary groups," in *Trust in organizations: Frontiers of Theory and Research*, R. M. Kramer and T. R. Tyler, Eds., Thousand Oaks, USA: Sage, 1996.

[13] B. H. Reich and I. Benbasat, *Factors that influence the social dimension of alignment between business and information technology objectives*, Society of Information Management (SIM) and the Management Information Systems Research Center (MISRC), 1999.

[14] C. Sauer, *Why Information Systems Fail: A Case Study Approach*, New York (NY), USA: Wiley, 1993.

[15] C. Standing, "Myths and the art of deception in information systems," *Work Study*, vol. *47*, no. *1*, pp. *5–13*, 1998.

[16] C. Standing and A. Bavington, "Implementing and using a structured information systems methodology," *Accountability and Performance,* vol. *2 (2)*, pp. *51-68*, 1996.

[17] H. J. Smith and M. Keil, "The reluctance to report bad news on troubled software projects: a theoretical model," *Information Systems Journal*, vol. *13*. pp. *69–95*. 2003.

[18] K. E. Weick and K. H. Roberts, "Collective mind in organisations: heedful interrelating on flight desks," *Administrative Science Quarterly,* vol. *38*, no. *3*, pp. *357–382*, 1993.

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Business alignment in the procurement domain: a study of antecedents and determinants of supply chain performance

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P. Mikalef, A. Pateli, R. Ratenburg and R. Wetering, "Business alignment in the procurement domain: a study of antecedents and determinants of supply chain performance," *International Journal of Information Systems and Project Management*, vol. 2, no. 1, pp. 43-59, 2014.

Business alignment in the procurement domain: a study of antecedents and determinants of supply chain performance

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Abstract:
With organizations now placing an increasing amount on attention on the management of their supply chain activities, the role of Information Technology (IT) in supporting these operations has been put in the spotlight. In spite of extensive research examining how IT can be employed in various activities of supply chain management, the majority of studies are limited in identifying enablers and inhibitors of adoption. Empirical studies examining post-adoption conditions that facilitate performance improvement still remain scarce. In this study we focus on procurement as part of the supply chain management activities. We apply the business-IT alignment perspective to the domain of procurement, and examine how certain organizational factors impact the attainment of this state. Additionally, we research the effect that procurement alignment has on supply chain management performance. In order to do so, we apply Partial Least Squares (PLS) analysis on a sample of 172 European companies. We find that firms that opt for a centralized governance structure, as well as larger firms, are more likely to attain a state of procurement alignment. Furthermore, our results empirically support the statement that procurement alignment is positively correlated with operational efficiency and competitive performance of the supply chain.

1. Introduction

In response to the increasingly competitive environment, organizations are under pressure to become more agile in their operations, accelerate their innovation process, and deliver products within shorter cycles while minimizing cost. The effective management of supply chain activities is regarded as a top priority in doing so. Empirical findings show that organizations with efficacious supply chains manage to increase organizational performance and secure a competitive edge over their rivals [1]. The realization of the importance of supply chain related activities is evident by expenditures, which average at 70% of total organizational revenues. This fact has attracted the interest of academics especially regarding the potential of information technology in the field of supply chain management [2],[3]. In particular, efforts have concentrated on the use of technology to support the procurement process which is considered to be the cornerstone of supply chain management. Adopting electronic procurement systems has been argued to result in a number of improvements, such as reduced procurement costs, higher quality of purchased goods, shorter delivery times, and better relationships with suppliers amongst others [4]-[6]. Subsequently, there has been much focus on identifying adoption enablers and inhibitors for electronic adoption procurement systems [7],[8].

Although studies that examine adoption enablers provide insight as to what aspects foster or hinder adoption of information Technology (IT) systems, they do not explain under what conditions they result in improvements in performance. This is a well noted problem in Information Systems (IS) literature, i.e., the productivity paradox, in which organizations that spend heavily on IT may not realize any performance gains from their investments [9]. This problem is also apparent in the domain of supply chain management, with practitioners struggling to increase the associated value of their investments on electronic procurement systems [3]. This has lead researchers to go beyond isolating adoption factors, and examine post-adoption conditions and elements that facilitate organizations to leverage their IT investments [10]. Discovering the conditions under which organizations can harness the maximum potential from their IT investments is now regarded as a crucial step in order to realize performance gains and outperform competitors. However, most research studies regarding electronic procurement are still delineating adoption enablers and inhibitors, with few quantitative studies examining post-adoption performance contributors [11]-[15].

The objective of this study is to fill this void by examining the post-adoption conditions that enable firms to realize performance improvement from the electronic procurement investments. To do so, we apply the business-IT alignment view in order to determine if the coherency between elements of the procurement function leads to performance gains. The alignment perspective has been one of the predominant theoretic-states for determining the impact of IT, and has been examined both at a generic [16], as well as at a domain-specific level [17],[18]. The main idea is that in order to realize any performance gains, IT must be in congruence with strategy and operations [19]. Within the domain of supply chain management, research regarding post-adoption aspects of IT and how they impact performance still remains scarce. Therefore, the aim of this paper is to determine what antecedents lead to enhanced business-IT alignment in the procurement domain, and to examine whether such a state is beneficial with respect to performance. Hence, we examine how a set of elements of the organizational structure (procurement centralization/decentralization and organizational size), may act as antecedents in achieving procurement alignment. Additionally, we research if attaining a state of alignment within the procurement domain (procurement alignment) leads to performance gains, and if so, what are the appropriate methods to measure them. In order to do so we distinguish between two types of performance indicators to evaluate the impact of procurement alignment; these are competitive performance and performance over time. Consequently, our research question can be broken down in to two sub-questions:

«Which organizational elements foster the attainment of procurement alignment?»

«Is achieving a state of procurement alignment positively related with supply chain management performance?»

Based on survey data gathered from 172 European companies we conducted an empirical study. In the next section we overview literature on business-IT alignment, and based on theoretical argumentation we derive a set of hypotheses in order to actualize the research objectives. In section 3 the data gathering process is explained and construct measures

are presented. In section 4 we conduct tests for the measurement model (validity and reliability) and empirically test our conceptual model by means of Partial Least Squares (PLS) analysis. In closing we discuss the implications that the outcomes of this research have for practitioners and academics. Additionally, limitations are highlighted and directions for future research are suggested.

2. Theoretical Background

Researchers have recognized that adopting IT will not automatically result in enhanced performance, but rather, it must be in coherence with business needs [20]. In order to conceptualize this degree of fit between business and IT strategies, academics have put forth the notion of business-IT alignment. In essence the concept of business-IT alignment refers to applying IS/IT in an appropriate and timely way and in harmony with business strategies, goals, and needs [20]. The importance of business-IT alignment however is not limited to academic studies, with practitioners consistently ranking it at the top of their concerns [21]. Attaining a state of business-IT alignment has been found to result in a number of performance gains, including market growth, cost control, financial performance, increased outflow of innovation, and augmented reputation [10]. These findings have motivated researchers to study business-IT alignment from two main perspectives [22]: a) to identify antecedents affecting its attainment; and b) to examine how it impacts performance.

Antecedents of business-IT alignment have been studied quite extensively with a number of critical success factors recurring in numerous studies. These antecedents are mostly concerned with the social context between business and IT executives. Reich and Benbasat [23] found that in terms of attaining long term alignment, shared domain knowledge is a prerequisite. Communication between business and IT personnel is also noted as being a critical success factor since it is associated with understanding and increased locus of comprehension [23],[24]. Teo and Ang [25] compiled a list of 12 antecedents of alignment which include top management support and knowledge scope, communication between business and IT, and IT department responsiveness and creativity.

Extensive debate has also revolved around the impact that business-IT alignment has on organizational performance. Although the majority of studies advocate that alignment leads to performance gains, there are some counter-arguments which posit that in certain occasions it may not be desirable. Those in favor of alignment highlight that when attaining a state of alignment, companies are able to make more focused and strategic use of IT, thus leading to increased performance [22]. Other studies also support this finding and empirically demonstrate that firms' that manage to align their business and IT strategies will outperform competitors [26]. In contrast, a number of scholars make the argument that alignment is not a beneficial state since tightly coupled arrangements may have negative outcomes, especially in turbulent environments [27].

Although business-IT alignment was initially examined at a generic enterprise-wide level, recent publications have recognized the importance of more fine-grained approaches, focusing on specific domains [28], IT systems [29],[30], IT architectures [18], and even economic regions [31]. The rationale for opting for such approaches is that alignment may have antecedents and outcomes that are contingent upon certain contextual and organizational factors. We advocate that in the domain of supply chain management, antecedents and outcomes of business-IT alignment may contrast past findings. Following the idea presented in the Strategic Alignment Model (SAM) [32], which identifies domains within a business that must be in balance, we build the concept of procurement alignment upon the domains that Turban et al., [33] define. According to this framework, the purchasing and supply management domain can be distinguished into actions relating to *Strategy, Processes, Control, Organization, Information,* and *IT*. This perspective has been operationalized in past practical instruments like the European Foundation for Quality Management (EFQM) Excellence Monitor (www.efqm.org) and McKinsey's 7S-model [34]. The main proposition of these frameworks is that management should aim for the development of coherent and mutually supportive functional domains in order to realize performance gains. Consequently, we define procurement alignment as the degree of balance between these six dimensions within the purchasing and supply management domain. Although alignment under these dimensions has been empirically put to test in a number of contexts, antecedents and performance outcomes for procurement alignment

still remains under-researched [17],[35],[36]. Furthermore, studies adopting an alternative approach in examining procurement alignment validate their hypotheses through theoretical reasoning [37], or through a small sample size [13]. Hence, the antecedents and outcomes of procurement alignment still remain unexamined through survey-based research.

2.1 Antecedents of Procurement Alignment

Despite the importance of antecedents of alignment applicable at the general level, scholars argue that certain organizational factors also have an impact on attaining a state of alignment [10]. However these factors are contingent upon the domain in which they are examined. In the present study we examine how aspects pertaining to governance structure and size affect a firm's level of procurement alignment. We base this decision on past findings which suggest that these factors are important predictors of alignment; however, they are contingent upon the domain examined [22].

Governance structure is concerned with activities relating to task allocation, coordination, and supervision which are directed towards the achievement of organizational goals [38]. In the majority of studies structure is measured as the degree of centralization/decentralization of decision rights [39]. The choice between a centralized and decentralized governance structure has been extensively researched, with a decentralized governance structure being more appropriate for achieving flexibility, while a centralized scheme is associated with efficiency of operations [40]. Within IS literature a number of studies have examined how governance impacts business-IT alignment; however findings regarding the optimal scheme still remain inconclusive [41].

With regard to the domain of supply chain management, the degree of centralization/decentralization concerns the extent to which the power to make supply chain management decisions is concentrated in an organization. The allotment of decisions rights for supply chain management activities could affect procurement alignment, since within the jurisdiction of these are activities performed through procurement IT systems. We base this argument on past findings which manifest associations between corporate and IT governance structure with alignment [42]. Hence, we consider that the governance scheme will act as an antecedent of business-IT alignment. In the domain of supply chain management it is argued that a higher degree of control can be achieved by centralizing operations and decision rights [43]. Extending on this notion, we postulate that procurement alignment will benefit from a centralized governance structure. Hence, we hypothesize that:

> *H1: Stronger governance centralization will correlate with higher levels of procurement alignment.*

The impact of firm size has been extensively researched in IS research, in studies ranging from the area of innovation development, organizational planning, coordination competence, and ethical predispositions to IT adoption. Outcomes from these studies indicate that firm size is indeed an important predictor, with companies belonging to different size classifications exhibiting differentiating results and dynamics. With regard to alignment, Chan et al., [22] found that larger firms were able to attain higher levels of alignment. The authors argue that his occurs since larger firms have formal processes and structures which ensure the attainment of alignment. Additionally, they have more slack resources and wealth to invest in technologies to support their business objectives. Therefore, we can expect that for procurement alignment firm size will be a strong determinant. Thus, we hypothesize:

> *H2: Firm size will correlate positively with higher levels of procurement alignment.*

2.2 Alignment Performance

The impact of IT on performance has been an extensively studied area, with a vast amount of papers proposing ways by which the effects of investments can be quantified. Traditional firm-level economic analysis has been deemed as ineffective in determining the short and long-term impacts of IT, with scholars suggesting alternative measures as more appropriate reflections of IT value [44]. The position of scholars is that the effects of information systems should be examined over time [45] and in benchmark with competitors [46]. The former measure has been mostly used to capture

the change in operational efficiency compared to a pre-adoption state or between certain time-frames of post-adoption. The later on the other hand reflects the competitive position of a firm in relation with its antagonists as a result of IT investments [1]. These performance measurements are complementary since they reflect the internal and external change in firm performance.

IS literature suggests that a state of alignment between business and IT will have an impact on a firms performance which can be only be identified over time [47]. These performance fluctuations are not reflected by traditional economic outcomes, but are recognizable with measures quantifying change in operational efficiency [48]. Moreover, alignment has been found to have a positive impact on a firms` competitive advantage [26]. The outcomes of these studies show that gaining a competitive edge over antagonists is not possible by simply adopting IT, but rather firms should aim for congruence with business objectives [26]. A competitive advantage implies a superiority in terms of competencies, capabilities and resources which cannot be translated easily into economic figures.

With regard to procurement IT investments, studies indicate the value of IT is often not easy to transfer to corporate-level executives since it cannot be quantified by traditional economic measures [3]. Additionally, studies indicate that simply adopting IT systems to support procurement activities does not automatically result in a competitive advantage or an increase in operational efficiency [49]. Based on the above findings, and in conjunction with previous argumentation, we advocate that value from procurement investments is derived by the alignment with other activities of the procurement functions. Hence, we hypothesize the following:

> H3: Higher levels of procurement alignment will correlate with increased operational efficiency of supply chain management over time.

> H4: Higher levels of procurement alignment will correlate with on the competitive performance of supply chain management.

3. Data & Measurements

3.1 Data Collection

The main target group consisted of firms that had deployed IT systems to support their procurement function, and operate various industries. Respondents were invited to the Department of Information and Computing Sciences of Utrecht University to fill out custom built questionnaires through direct two-hour sessions. Their participation was solicited through 'cold calling', mostly from the social and business networks of Business Informatics students at Utrecht University. This method of data collection is known as convenient random sampling [50] or respondent-driven sampling [51]. In order to eliminate non-response bias, firm representatives that did not attend the direct sessions despite being invited, were asked to either fill out a digital questionnaire or participate in a brief phone interview. The gathering of the data was performed over a period of three years (2006-2008) and resulted in a sample of 172 companies. The majority of the replies were from employees that held managing positions in the purchasing and supply management department and were highly knowledgeable about the process as shown in Table 1.

Our sample covered the entire range of enterprise size classes from micro to large. We adopted this categorization in accordance with the size-class proposed by the European Commission Recommendation of the 6th of May 2003 (2003/361/EC). In adherence with this categorization, large firms (+250 employees) accounted for 52.9% of the sample and SMEs (1-250 employees) 47.1% of the total. During the meetings, respondents filled out the questionnaires which were divided into three main sections. The first section contained 12 questions about the company in general, including questions about the purchase portfolio, governance structure and supply chain position that the respondent holds. The second and main part comprised of 15 questions related to the six procurement dimensions on which the concept of alignment is grounded. The final part, included questions concerning the enterprises supply chain management performance. A preliminary version of the questionnaire was reviewed by a group of procurement experts through interviews in order to validate its adherence to the constructs that were tested. During the direct sessions, facilitating

students and researchers answered respondent's queries regarding any items of the questionnaire that were not clear to them.

Table 1. Frequency of responses by respondents' position

Respondents' Position	N	%
Procurement Director	27	15.7
Supply Chain Manager	14	8.1
Purchasing Manager/Head of Procurement	39	22.7
Initial Buyer/Strategic Buyer	20	11.6
Purchasing Analyst/Supply Chain Analyst	21	12.2
Assistant Buyer/Administrative Buyer/Logistical Buyer	16	9.3
Procurement Employee (Facilitating)	14	8.1
Controller	9	5.2
Boardroom Director (No Procurement Director)	12	7.0
Total	172	100.0

3.2 Construct Measurements

Procurement alignment (ALIGN) was developed as a second-order reflective construct measuring the fit between the six dimensions of the procurement process [6]. For each of the six dimensions which were identified to be critical for the procurement process a number of questions were formulated as items with 5-point scale answer categories congruent to the five stages of purchasing evolution as defined by Van Weele et al., [52]. These five stages comprise evolutionary stages of maturity, where 1 denotes a transactional orientation level and 5 an external integration level. The five dimensions of the procurement function were: *Strategy (STG); Processes (PRC); Control (CNT); Organization (ORG); Information (INF);* and *IT (IT)*.

The structure of the supply chain management domain was measured in terms of centralization/decentralization of decision rights. In accordance with past studies, we distinguished between centralized buying structure, federated structure, and non-hierarchical (decentralized) structure [42]. Hence, we measured the construct of *governance centralization (GOVC)* on a three level scale: [3=] representing centralized governance; [2=] a federated one; and [1=] a decentralized structure. *Firm size (SIZE)* was operationalized by applying the size-classes proposed by the European Commission with respondents having to select if their company belonged to the micro [=1]; small [=2]; medium [=3]; or large [=4] class.

Two constructs related to performance, were measures by asking respondents to evaluate the *perceived operational efficiency increase* over a period of two years *(TPERF)* and the firms' *perceived competitive position (CPERF)*. The use of subjective instead of objective measures is being considered as a useful approach in determining performance since the perceived results are to a great extent a true reflection of actual performance [53]. Additionally, when attempting to quantify operational efficiency improvements over time or in relation with competitors, financial measures may not exhibit any change. Since respondents held top-level management positions in the supply chain management department we assume that they were well informed, thus, the information which they provided is accurate and reliable [54]. Each perspective was measured through the questionnaire by four questions in which respondents were asked to if they agreed or disagreed to the statement presented on a 5-level Likert scale ("*Strongly disagree*" [=1] to "*Strongly agree*" [=5]). The items used to quantify performance were adapted from the study of Gunasekaran et al. [55].

4. Empirical Analysis

4.1 Measurement Model

In order to empirically examine our hypotheses we employed Partial Least Squares (PLS) analysis. The choice of PLS was based on its ability to operationalize and test second-order constructs as well as examine complex causal relationships. More specifically, we used the statistical software package SmartPLS [56]. The total sample of 172 valid responses exceeds the set threshold of observations required according to the SmartPLS documentation for the number of hypotheses and constructs examined.

Before proceeding to the examination of causal relationships, the reliability and validity of constructs was examined. We assessed reliability through measures of composite reliability and average variance extracted (AVE). All values of composite reliability were above 0.77, thus exceeding the required threshold of 0.7 [57]. Additionally, AVE values exceeded the lower limit of 0.5 [58]. Validity of constructs was determined through convergent and discriminant validity tests. Convergent validity was assessed by examining if items loaded significantly on their respective constructs (loadings of above 0.7). Items that did not comply with these requirements where omitted. Discriminant validity was established by testing if square roots of AVE for constructs (diagonal bolded values) were greater than any other inter-construct correlation as presented in Table 2.

Table 1. Assessment of reliability and discriminant validity of constructs

Composite Reliability	Average Variance Extracted		1.	2.	3.	4.	5.
0.90	0.69	**1. ALIGN**	**0.83**				
1.00	1.00	**2. SIZE**	0.30	**1.00**			
1.00	1.00	**3. GOVS**	0.19	0.03	**1.00**		
0.77	0.64	**4. TPERF**	0.35	0.07	0.09	**0.80**	
0.77	0.64	**5.CPERF**	0.20	0.00	0.03	0.26	**0.80**

Since the construct of procurement alignment was developed as a second-order reflective construct, reliability and validity tests were also necessary [59]. We therefore examined if each of the six underlying dimensions of procurement alignment exhibited sufficient levels of reliability and validity. For each dimension reliability was established since the lowest values of AVE (0.64) and composite reliability (0.80) greatly exceeded set thresholds. The same applied for discriminant validity where for all constructs the square root of AVE surpassed inter-construct correlation values. For convergent validity each constructs item loadings were tested, with all remaining values being above 0.71. Additionally, we established that all first-order construct loadings were above 0.7 in relation with the second-order construct of procurement alignment.

4.2 Structural Model

To determine the hypothesized associations of the conceptual model we employed a two-stage approach of structural analysis. We adopted this approach since it is deemed as most suited in cases where the interest is only for the second-order construct, and not for the underlying dimensions [60]. The bootstrap approach (200 re-samples) was applied in order to determine the significance of causal relationships. Fig. 1 presents the outcomes of the PLS analysis from the two-step approach using latent variable scores to estimate inner model weights and significance levels.

Business alignment in the procurement domain: a study of antecedents and determinants of
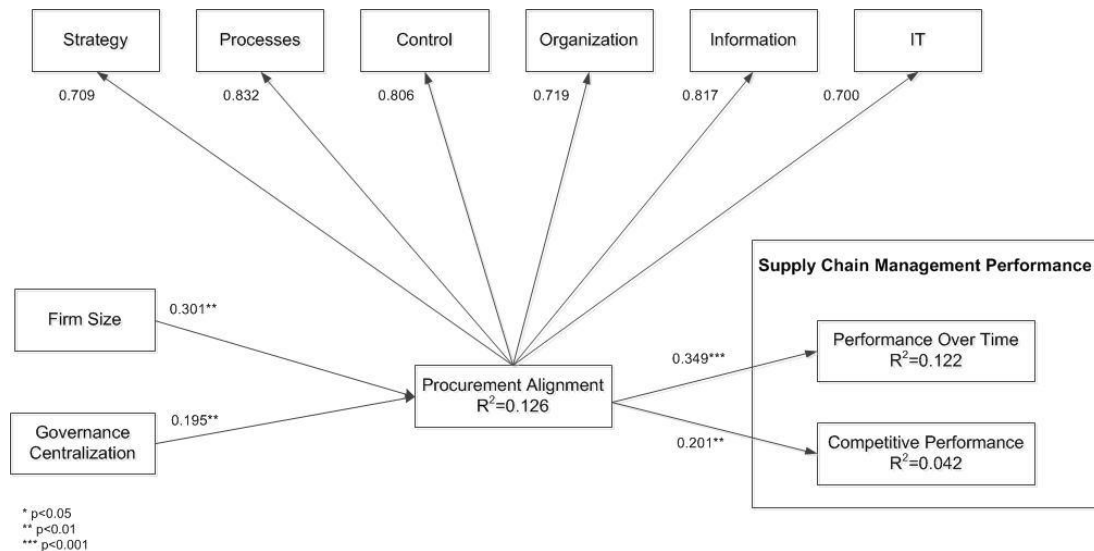supply chain performance

Fig. 1. Structural Model with Path Coefficients

The outcomes of the empirical analysis confirm the hypotheses formulated in section 3. More specifically, we found that from the antecedents conjectured to impact procurement alignment, both governance structure and firm size are significantly correlated. Specifically, we found that a centralized governance structure correlates with procurement alignment, thus supporting H1 (β=0.195, t=2.848). Past studies have found that the impact of governance structure on alignment is contingent upon the domain in which it is examined; therefore findings have not been consistent [61]. The relation between governance centralization and procurement alignment for the supply chain management domain is found to be positive and significant at a p=0.001 (99%) probability level. In adherence with the study of Chan et al., [22], we find that larger firms manage to align the elements of their procurement function more effectively than smaller firms (β=0.301, t=3.936). This correlation is highly significant at a p-value of 0.01 (99%), hence confirming H2. Despite these two positive associations, the explanatory power of our conceptual model regarding procurement alignment is limited to an explained variance of 12.6% (R2=0.126). This finding is an indication that other foreground antecedents of alignment have a stronger influence on procurement alignment as noted in past studies. Regarding the relation between procurement and performance, we find that it is positive and significant for both performance measures. For operational efficiency increase over time, results indicate that procurement alignment has a positive and significant relation on this (β=0.349, t=4.677). This outcome validates our hypothesis (H3), which states that firms that effectively manage to align the various dimensions of the procurement function will realize improvements in their operations, at a probability level of p=0.001 (99.9%). A positive and significant association is also discovered for the influence of procurement alignment on competitive performance (β=0.201, t=2.904). This shows that soliciting fit between elements of the internal domain can have is positively related on a firm's supply chain management position in relation with its competitors (H4 accepted). The explanatory power of out conceptual model is 12.2% (R2=0.122) for operational efficiency performance, and 4.2% (R2=0.042) for competitive performance of supply chain management. These outcomes are an indication that there are additional factors that determine a firm's supply chain management performance which should be examined.

In order to examine the combined relation between governance structure and firm size on alignment in greater detail we plot the interaction effects for the three measures. From Fig. 2 it is apparent that for any organizational size-class a centralized governance structure correlates with higher levels of alignment. For large firms we observe that

procurement alignment does not differ to a great extent when comparing the centralization of governance structure. In contrast, for companies belonging to the SME classification, the more centralized the governance structure, the greater the degree of procurement alignment. The only exception is for small firms which exhibit lowest levels of procurement alignment under federated governance structures. The outcomes of the partial least squares analysis are also apparent on the interaction plot, with larger firms exhibiting greater levels of procurement alignment. For SME`s and micro firms in particular there is a high level of disparity for procurement alignment in relation to large firms. For any type of governance structure, large firms have procurement alignment levels above 2.50 whereas firms belonging to the SME categorization have a significantly lower average procurement alignment of approximately 1,.50. This outcome shows that regardless of the governance structure chosen larger firms are more capable of attaining alignment in their procurement function.
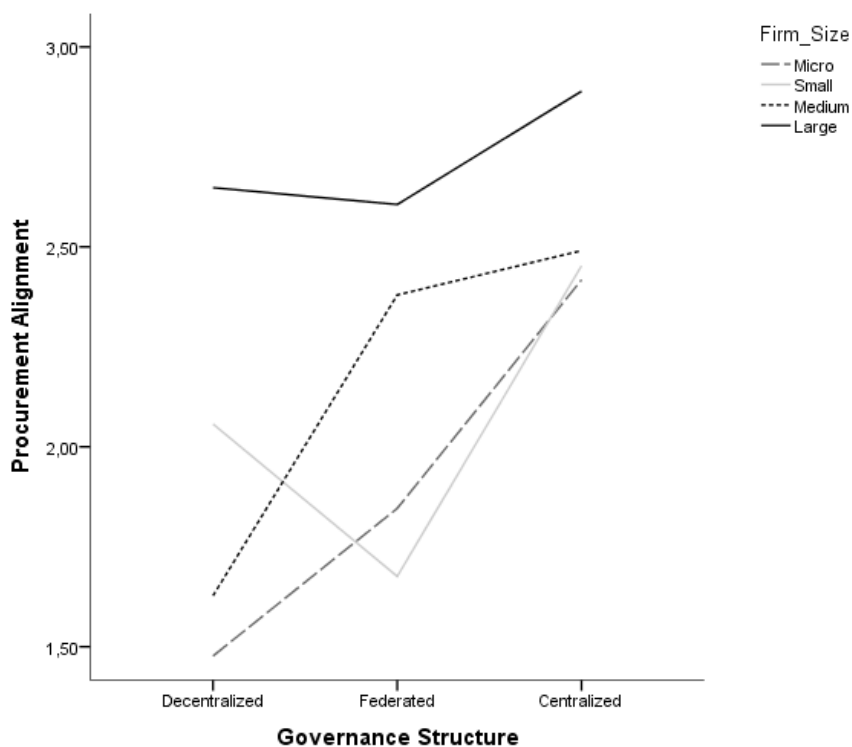
Fig. 2. Interaction Plot of Antecedents on Procurement Alignment

5. Conclusion

In spite of much attention being given to adoption enablers and inhibitors of supply chain management related IT, we still know very little about how these investments yield performance gains. This is due to the fact that literature has greatly disregarded conditions and facilitating factors that foster improvements as a result of IT investments. The predominant view has been to identify aspects that drive adoption of such systems, with the rationale being that adoption will automatically result in improved performance. In order to increase understanding on what conditions enable performance realizations, we employ the widely used alignment perspective. Adapting this perspective for the procurement functions, we seek to uncover antecedents of procurement alignment and performance outcomes. We centered on the procurement function since it is regarded as being the cornerstone of supply chain management.

Building on past studies we formulate a set of hypotheses which are put to test based on survey data from 172 European companies. Results demonstrate several key findings as well as some differences compared to past studies.

One of the most studied aspects of business-IT alignment has been with regard to antecedents. Past studies have found that a number of foreground antecedents such as business-IT communication, top management support, and shared domain knowledge affect alignment. Although these factors apply in any context, there are some elements which are noted as being contingent upon the domain in which they are examined. In this study we analyzed the impact that governance structure and firm size have on procurement alignment. Past studies have been inconclusive regarding the impact that governance structure has on alignment. In this study we find that the greater the degree of centralization of the supply chain management decisions rights, the higher the realized levels of procurement alignment. This finding can be justified on the basis that since decisions are made centrally, it is easier to manage the various elements related to procurement, and thus achieve a state of balance and coherence between them. In contrast, if decisions are made in a decentralized manner it is likely that decisions and investments made by one department may not support operations of others. Hence, for the function of procurement, results indicate that it is optimal for firms to coordinate operations through a centralized governance structure if the aim is to attain alignment.

With regard to firm size, few studies have examined the impact that it may have on business-IT alignment, with the majority stressing that larger firms' are more likely to attain such a state. Consistent with past findings the outcomes of the empirical analysis indicate that larger firms manage to attain a state of procurement alignment to a greater degree than smaller firms. This can be explained by the fact that larger firms have more financial resources to invest in specific areas or IT to support their supply chain management activities. Additionally, larger firms are more likely to adopt formal processes and use standards, therefore enabling alignment. Although smaller firms have less activities and people to coordinate, this relation is mitigated by opting for a centralized governance scheme. Hence, the size of a firm correlates with its ability to achieve procurement alignment. Although these two antecedents are found to be significant determinants of procurement alignment, the explanatory power of the structural model indicates that there are additional aspects that determine a firms' fit between elements of its procurement function. This provides a basis for future research directions to examine other factors that shape procurement alignment. Extending past studies it is important to understand how the turbulence of the external environment drive alignment and through what mechanisms firms can dynamically manage to align their procurement process.

In order to examine if procurement alignment is indeed a desired state, we empirically test how it determines supply chain management performance. Adapting the notion that business-IT alignment significantly correlates with performance in a positive manner, we conjecture that the ability to align the dimensions of the procurement function will have a positive impact on supply chain management performance. Building upon suggestions in the IT literature, we distinguish between two measures of supply chain management performance. These measures are quantified through perceptions of respondents, which are deemed as more appropriate when determining IT investments compared to strictly financial measures. With regard to the first measure of supply chain management performance, operational efficiency increase, we find that procurement alignment correlates with this positively and significantly. According to this finding, companies that manage to align their procurement function perceive an increase of operational efficiency in comparison with two years prior. This outcome shows that procurement alignment enables firms to operate more effectively with regard to their supply chain management activities. However, this is not the sole determinant of procurement alignment, since we find that it also has a positive and substantial relationship with the competitive position of a firm. Results show that procurement alignment facilitates firms to outperform their competitors with regard to their supply chain management performance. The reasons why alignment fosters performance gains have been well documented in literature. In this study we support the notion that alignment is positively correlated with the outcomes for supply chain management. Therefore, procurement directors and top management staff should not only opt to invest in IT, but should also aim for mutually supporting activities of procurement with IT. Disregarding a certain area of the procurement process may severely impact the overall performance of the supply chain.

Although these findings shed light on the importance of procurement alignment and on factors that promote it, there are additional aspects that future research should aim to address. One critical point which is not taken into account in the present study is the impact that environmental turbulence may have on both the attainment of procurement alignment, and on its performance outcomes. The impact of the external environment has become ever more important especially with the dependence of collaborating partners. Future ventures should examine if procurement alignment is indeed a desired state in conditions of high volatility, or could agility be more meaningful in such situations. In settings where companies are required to switch suppliers on an ad-hoc basis it is likely that aiming to create mutually supportive domains may not be a first priority. Furthermore, aspects regarding the type of IT investments made as well as the flexibility of infrastructure could complement the examination of performance enablers. It is likely that investing in a flexible IT infrastructure will have a positive effect on attaining a state of procurement alignment especially in circumstances of frequent operational changes. We encourage researchers to examine these and other aspects relating to post-adoption conditions of supply chain management IT since initial findings from this research provide promising results. In conjunction with the growing importance of IT in the supply chain management domain, there is room for extensive research with many practical and theoretical implications.

References

[1] S. Li, B. Ragu-Nathan, T. Ragu-Nathan, and S. Subba Rao, "The impact of supply chain management practices on competitive advantage and organizational performance," *Omega,* vol. *34*, pp. *107-124*, April, 2006.

[2] R. Batenburg and J. Versendaal, "Maturity Matters: Performance Determinants of the Procurement Business Function," in *ECIS*, Galway, Ireland, 2008, pp. *563-574*.

[3] W. D. Presutti Jr, "Supply management and e-procurement: creating value added in the supply chain," *Industrial Marketing Management,* vol. *32*, pp. *219-226*, April, 2003.

[4] K. Eyholzer and D. Hunziker, "The Use of the Internet in Procurement: An Empirical Analysis," in *ECIS*, Vienna, Austria, 2000, pp. 335-342.

[5] A. Davila, M. Gupta, and R. Palmer, "Moving Procurement Systems to the Internet: the Adoption and Use of E-Procurement Technology Models," *European Management Journal,* vol. *21*, pp. *11-23*, February, 2003.

[6] M. Beukers, J. Versendaal, R. Batenburg, and S. Brinkkemper, "The Procurement Alignment Framework Construction and Application," *WIRTSCHAFTSINFORMATIK,* vol. *48*, pp. *323-330*, October, 2006.

[7] K. A. Patterson, C. M. Grimm, and T. M. Corsi, "Adopting new technologies for supply chain management," *Transportation Research Part E: Logistics and Transportation Review,* vol. *39*, pp. *95-121*, March, 2003.

[8] C. Zhang and J. Dhaliwal, "An investigation of resource-based and institutional theoretic factors in technology adoption for operations and supply chain management," *International Journal of Production Economics,* vol. *120*, pp. *252-269*, July, 2009.

[9] E. Brynjolfsson, "The productivity paradox of information technology," *Communications of the ACM,* vol. *36*, pp. *66-77*, December, 1993.

[10] Y. E. Chan and B. H. Reich, "IT alignment: what have we learned?," *Journal of Information Technology,* vol. *22*, pp. *297-315*, September, 2007.

[11] K. Arbin, "E-procurement maturity in industry," *International journal of electronic business,* vol. *1*, pp. *396-407*, May, 2003.

[12] R. Batenburg, "E-procurement adoption by European firms: a quantitative analysis," *Journal of Purchasing and Supply Management,* vol. *13*, pp. *182-192*, May, 2007.

[13] H. L. Chang, K. Wang, and I. Chiu, "Business–IT fit in e-procurement systems: evidence from high-technology firms in China," *Information Systems Journal,* vol. *18*, pp. *381-404*, April, 2008.

[14] M. M. Rahim, "Identifying factors affecting acceptance of e-procurement systems: An initial qualitative study at an Australian City Council," *Communications of the IBIMA,* vol. *3*, pp. *7-17*, September, 2008.

[15] T. S. Teo and K. h. Lai, "Usage and performance impact of electronic procurement," *Journal of Business Logistics,* vol. *30*, pp. *125-139*, May, 2009.

[16] F. Bergeron, L. Raymond, and S. Rivard, "Ideal patterns of strategic alignment and business performance," *Information & Management,* vol. *41*, pp. *1003-1020*, November, 2004.

[17] E. Bendoly and F. R. Jacobs, "ERP architectural/operational alignment for order-processing performance," *International Journal of Operations & Production Management,* vol. *24*, pp. *99-117*, January, 2004.

[18] P. Mikalef and A. Pateli, "A Systematic Meta-analytic Review on Factors Influencing the Strategic Alignment in Service-Oriented Architecture Projects," in *Proceeding of the 6th Mediterranean Conference on Information Systems, MCIS,* Limassol, Cyprus, 2011, p. *58*.

[19] B. H. Reich and I. Benbasat, "Measuring the linkage between business and information technology objectives," *MIS quarterly,* vol. *20*, pp. *55-81*, March, 1996.

[20] J. Luftman and T. Brier, "Achieving and sustaining business-IT alignment," *California management review,* vol. 42, pp. 109-122, September, 1999.

[21] J. Luftman, R. Kempaiah, and E. H. Rigoni, "Key issues for IT executives 2008," *MIS Quarterly Executive,* vol. 8, pp. *151-159*, June, 2009.

[22] Y. E. Chan, R. Sabherwal, and J. B. Thatcher, "Antecedents and outcomes of strategic IS alignment: an empirical investigation," *Engineering Management, IEEE Transactions on,* vol. *53*, pp. *27-47*, February, 2006.

[23] B. H. Reich and I. Benbasat, "Factors that influence the social dimension of alignment between business and information technology objectives," *MIS quarterly,* vol. *24*, pp. *81-113*, March, 2000.

[24] B. Campbell, "Alignment: Resolving Ambiguity within Bounded Choices," in *PACIS*, Bangkok, Thailand, 2005, p. 54.

[25] T. S. Teo and J. S. Ang, "Critical success factors in the alignment of IS plans with business plans," *International Journal of Information Management,* vol. *19*, pp. *173-185*, April, 1999.

[26] G. S. Kearns and A. L. Lederer, "A Resource-Based View of Strategic IT Alignment: How Knowledge Sharing Creates Competitive Advantage," *Decision Sciences,* vol. *34*, pp. *1-29*, June, 2003.

[27] M. R. Vitale, B. Ives, and C. M. Beath, "Linking information technology and corporate strategy: an organizational view," in *Proceedings of the Seventh International Conference on Information Systems*, San Diego, California, U.S.A., 1986, p. *17*.

[28] P. Cragg, M. King, and H. Hussin, "IT alignment and firm performance in small manufacturing firms," *The Journal of Strategic Information Systems,* vol. *11*, pp. *109-132*, June, 2002.

[29] J. K. Chan and M. K. Lee, "SME e-procurement adoption in Hong Kong-The roles of power, trust and value," in *Proceedings of the 36th Annual Hawaii International Conference on System Sciences*, Big Island, Hawaii, 2003, p. *10*.

[30] A. Madapusi and D. D'Souza, "Aligning ERP systems with international strategies," *Information Systems Management,* vol. *22*, pp. *7-17*, December, 2005.

[31] L. Chen, "Business–IT alignment maturity of companies in China," *Information & Management,* vol. *47*, pp. *9-16*, January, 2010.

[32] D. Avison, J. Jones, P. Powell, and D. Wilson. "Using and validating the strategic alignment model." *The Journal of Strategic Information Systems,* vol. *13*, pp. *223-246*, September, 2004.

[33] E. Turban, D. Leidner, E. McLean, and J. Wetherbe, *Information Technology for Management: Transforming Organizations in the Digital Economy,* 5th ed. New Jersey, U.S.A.: John Wiley & Sons, 2006.

[34] R. H. Waterman Jr, T. J. Peters, and J. R. Phillips, "Structure is not organization," *Business Horizons,* vol. *23*, pp. *14-26*, June, 1980.

[35] R. Batenburg, R. Helms, and J. Versendaal, "PLM roadmap: stepwise PLM implementation based on the concepts of maturity and alignment," *International Journal of Product Lifecycle Management,* vol. *1*, pp. *333-351*, October, 2006.

[36] P. Mikalef, A. Pateli, R. Batenburg, and R. van de Wetering, "Investigating the Impact of Procurement Alignment on Supply Chain Management Performance," *Procedia Technology,* vol. *9*, pp. *310-319*, December, 2013.

[37] D. Knudsen, "Aligning corporate strategy, procurement strategy and e-procurement tools," *International Journal of Physical Distribution & Logistics Management,* vol. *33*, pp. *720-734*, October, 2003.

[38] J. Child, "Organizational structure, environment and performance: the role of strategic choice," *Sociology,* vol. *6*, pp. *1-22*, January, 1972.

[39] R. Batenburg and J. Versendaal, "Maturity Matters: Performance Determinants of the Procurement Business Function," in *ECIS*, Galway, Ireland, 2008, pp. *563-574*.

[40] M. Jensen and W. Meckling, "Specific and general knowledge and organizational structure," in *Contract Economics*, L. Werin and H. Wijkander, Eds., 1st ed. Oxford, United Kingdom: Blackwell Publishers, 1992, pp. *251-291*.

[41] J. Luftman and R. Kempaiah, "An update on business-IT alignment:"A line" has been drawn," *MIS Quarterly Executive,* vol. *6*, pp. *165-177*, September, 2007.

[42] C. V. Brown and J. S. Renwick, "Alignment of the IS organization: the special case of corporate acquisitions," *ACM SIGMIS Database,* vol. *27*, pp. *25-33*, September, 1996.

[43] S. R. Croom, "The Impact of Web-Based Procurement on the Management of Operating Resources Supply," *Journal of Supply Chain Management,* vol. *36*, pp. *4-13*, December, 2000.

[44] P. Tallon, K. L. Kraemer, and V. Gurbaxani, "Executives' perceptions of the business value of information technology: a process-oriented approach," *Journal of Management Information Systems*, vol. *14*, pp. *145-174*, April, 2000.

[45] E. Brynjolfsson and L. M. Hitt, "Beyond computation: Information technology, organizational transformation and business performance," *The Journal of Economic Perspectives,* vol. *14*, pp. *23-48*, September, 2000.

[46] N. Melville, K. Kraemer, and V. Gurbaxani, "Review: Information technology and organizational performance: An integrative model of IT business value," *MIS quarterly,* vol. *28*, pp. *283-322*, June, 2004.

[47] H. Benbya and B. McKelvey, "Using coevolutionary and complexity theories to improve IS alignment: a multi-level approach," *Journal of Information Technology,* vol. *21*, pp. *284-298*, December, 2006.

[48] J. M. Burn and C. Szeto, "A comparison of the views of business and IT management on success factors for strategic alignment," *Information & Management,* vol. *37*, pp. *197-216*, June, 2000.

[49] F. Wu, S. Yeniyurt, D. Kim, and S. T. Cavusgil, "The impact of information technology on supply chain capabilities and firm performance: a resource-based view," *Industrial Marketing Management,* vol. *35*, pp. *493-504*, May, 2006.

[50] M. F. Triola, W. M. Goodman, G. LaBute, R. Law, and L. MacKay, *Elementary statistics*, 12th ed. Boston, U.S.A.: Pearson/Addison-Wesley, 2006.

[51] M. J. Salganik and D. D. Heckathorn, "Sampling and estimation in hidden populations using respondent-driven sampling," *Sociological methodology,* vol. *34*, pp. *193-240*, December, 2004.

[52] A. Van Weele, F. Rozemeijer, and G. Rietveld, "Professionalising purchasing in organizations: towards a purchasing development model," in *Proceedings of the 7th Annual IPSERA Conference*, London, United Kingdom, 1998, pp. *5-7.*

[53] G. G. Dess and R. B. Robinson, "Measuring organizational performance in the absence of objective measures: The case of the privately-held firm and conglomerate business unit," *Strategic Management Journal,* vol. *5*, pp. *265-273*, July, 1984.

[54] T. C. Powell, "Total quality management as competitive advantage: a review and empirical study," *Strategic Management Journal,* vol. *16*, pp. *15-37*, January, 1995.

[55] A. Gunasekaran, C. Patel, and R. E. McGaughey, "A framework for supply chain performance measurement," *International Journal of Production Economics,* vol. *87*, pp. *333-347*, February, 2004.

[56] C. M. Ringle, S. Wende, and S. Will, (2005) "SmartPLS 2.0 (M3) Beta, Hamburg," Available: *http://www.smartpls.de.*

[57] J. C. Nunnally and I. Bernstein *Psychometric Theory 3E*, 3rd ed. Blacklick, Ohio, U.S.A.: Tata McGraw-Hill Education, 1994.

[58] C. Fornell and D. F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," *Journal of marketing Research,* vol. *18*, pp. *39-50*, February, 1981.

[59] S. B. MacKenzie, P. M. Podsakoff, and N. P. Podsakoff, "Construct measurement and validation procedures in MIS and behavioral research: integrating new and existing techniques," *MIS quarterly,* vol. *35*, pp. *293-334*, June, 2011.

[60] J.-M. Becker, K. Klein, and M. Wetzels, "Hierarchical latent variable models in PLS-SEM: guidelines for using reflective-formative type models," *Long Range Planning,* vol. *45*, pp. *359-394*, October–December, 2012.

[61] C. V. Brown and S. L. Magill, "Alignment of the IS functions with the enterprise: toward a model of antecedents," *MIS quarterly,* vol. *18*, pp. *371-403*, December, 1994.

Appendix A. Questionnaire Items

Procurement Alignment

For your organization, please check one checkbox per statement. The degree of professionalism increases from (1) not professional to (5) very professional.

Strategy

Documentation and plan(s)	1.	No action plan
	2.	Formalized action plan focusing on purchasing price reduction
	3.	Policy plan
	4.	Policy plan derived from organizational goals
	5.	Policy plan, action plan and account plans for major (internal) customers and suppliers

Global sourcing (= the degree in which your organization develops an international supply base)	1.	Not, mainly domestic (national) purchasing
	2.	Suggested by other departments because e.g. compensating obligations, focusing on price reduction
	3.	As part of the purchasing strategy focusing on price reduction
	4.	As part of the overall business (organizational) strategy in the frame of risk spreading and/or access to certain markets
	5.	As 4), tuned to long term plans and/or technology road map of the business units

Processes

Product specification	1.	No specification available
	2.	Only technical product specification
	3.	Technical and functional product specification
	4.	Technical and functional product specification and requirements for the supplier
	5.	As 4), using supplier knowledge (Early Supplier Involvement, Collaborative Engineering)

Product selection	1.	Based on experience and gut-feeling
	2.	Based on product price only
	3.	Based on product price, delivery time and other factors
	4.	Based on market research, pre-selection and other objective factors
	5.	As 4), but with TCO (Total Cost of Ownership) calculation and/or risk analysis

Contracting	1.	Just an oral agreement
	2.	Purchase ordering for which the price is determined by pricing list of supplier or earlier order
	3.	Framework contract including logistical, legal and quality constraints (e.g. through purchasing conditions)
	4.	Framework contract, including performance indicators
	5.	Contract containing mutual obligations with regard to performance improvement (for quality, logistical, innovation and cost improvement)

Ordering	1.	Oral ordering or ordering by telephone
	2.	Based on internal order/requirements; prices determined during actual ordering; no contract-based ordering

3. Based on internal order/requirements; prices based on a contract
4. On paper, based on internal order; pricing from an ERP or comparable system
5. Strategic products are related to the primary process via demand/supply chain system (catalogue buying, VMI)

Control

Process control

1. No control mechanisms in place
2. Taking action when the internal customer asks for it
3. Delivery date is checked (a number of days) before expiring (routine status check)
4. Progress control on the supplier's process, based on earlier defined milestones (advanced status check)
5. Automated control; supplier operates as an integrated part in the process, direct delivery to the (production) line (e.g. Kanban)

Internal performance measuring

1. Performance of the procurement function (department) is not measured
2. The procurement function is assessed according to product price savings
3. The procurement function is assessed according to product price and procurement process cost savings
4. The procurement function is assessed according to savings (product price and process costs), and internal customer satisfaction (internal Service Level Agreement)
5. The procurement function is assessed according to the complete value chain contribution

Supplier performance measuring

1. Performance is not measured
2. Performance is only measured according to logistic parameters; there is not feedback to suppliers
3. Performance is measured according to logistic parameters; regularly there is feedback to suppliers and adjustment
4. Supplier performance is measured according to the contribution to organizational goals
5. Supplier performance measurement is dedicated to improvement of the full value chain

Organization

Purchasing department

1. There is no official procurement function
2. There is a purchasing department, responsible for regular purchases of routine purchases of goods/services (indirect materials)
3. There is a purchasing department, responsible for regular purchases of routine purchases of goods/services (indirect materials) and primary goods/services (direct materials) and project based purchasing
4. There is a purchasing department, taking care of its own focus, controlling maverick buying, headcount and its own position within the organization
5. There is a purchasing department, partly responsible for business/product development and results

Staff competences

1. Strong task orientation
2. Purchasing staff has commercial attitude
3. Purchasing staff analyses cost trends and is able to communicate with suppliers credibly
4. Purchasing staff is considered as valuable force, with emphasis on

experience, motivation and attitude
5. Purchasing staff encourages (product) innovation by involving suppliers

Information

	Information processing	1. Ordering information can be generated, by hand; the ordering system is not connected to the financial system 2. Information is available from reports from a system that is connected to the financial system 3. Information is automatically generated, and periodically studied 4. Information can be studied continuously, as it is available through automation, on-the-fly 5. As 4), with the addition that business intelligence information is automatically connected to e.g. supply decision support system and distributed to organization board
	Management information	1. There is no generation of management information 2. The purchasing department pro-actively supplies market information to its most important internal customers 3. Supplier performance is regularly benchmarked; outcomes are used to change the purchasing tactics 4. In the strategic product groups there is insight in value creation in the supply chain (1st tier, 2nd tier, etc.) in relation to the organization's competition 5. As 4), with the addition that the purchasing department has tools and capacities at their disposal to adjust value chain performance pro-actively

Information Technology

	Operational purchasing process	1. IT systems (if any) are directed towards supporting generic administrative processes 2. IT systems are directed towards the automation of transactional processes 3. An (E-)ordering system only serves to automate the internal purchasing processes 4. The (fully) automated purchasing processes are integrated the suppliers organizational processes 5. Het (fully) automated purchasing processes are integrated with the organization processes, as well as with supplier's (selling) processes (e.g. RosettaNet)
	Tactical purchasing process	1. The tactical purchasing process (e.g. sourcing) runs via traditional channels (telephone, fax) 2. The tactical purchasing process runs via external information sources (internet, portals) 3. The tactical purchasing process runs via e-tendering and e-auctioning 4. The tactical procurement process is equipped with an functional contract management system 5. The tactical purchasing process partly runs via an integrated system of suppliers and customers

Procurement Performance

The answers to the following statements range from *relatively low performance* (= strongly disagree) to *relatively high performance* (= strongly agree).

Performance over time

The average time, from purchase order to delivery has decreased in the last two years

The average number of purchased items that do not measure up to the agreed quality has decreased in the last two years

The average purchase *price* of purchased items has decreased in the last two years (controlled for the influence of market forces)

The average purchase (process) *costs* per transaction for purchased items have decreased in the last two years

Competitive Performance

The average time, from purchase order to delivery is shorter compared to our main competitors

The average number of purchased items that do not measure up to the agreed quality is lower compared to our main competitors

The average purchase *price* of purchased items is lower compared to our main competitors (controlled for the influence of market forces)

The average purchase (process) *costs* per transaction for purchased items are lower compared to our main competitors

Biographical notes

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