
Implementation of inter-organisational mediums: synthesising framework as a design exemplar

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Abstract: The field of management research has an utilisation problem. A considerable avenue in which the translation from theory to practice has been only partial is the management control of inter-organisational relationships. In this particular stream of management (accounting) research, open-book accounting (OBA) is a key concept. Based on the OBA literature, our ambition is to develop an implementation framework for inter-organisational mediums (IFFIM). The first part of the framework, IFFIM_1: the relational view is concerned with the multidimensional nature of inter-organisational relationships by illustrating relational complexities through the OBA dimensions. The second part of the framework, IFFIM_2: the process view is an outlook to the stepwise implementation process, where the factors that influence OBA implementation have been integrated to the phases of the so-called enterprise system experience cycle. Unlike most contemporary research, our work is based on the idea of ‘design science’, the aim of which is to develop general knowledge to support the design of solutions to field problems. IFFIM is a design exemplar to practitioners, i.e., a guideline to follow in the design of interventions.

Keywords: inter-organisational relationships; inter-organisational mediums; open-book accounting; OBA; implementation framework; implementation; framework; design science; design exemplar.

Reference to this paper should be made as follows: Ylä-Kujala, A., Marttonen-Arola, S., Sinkkonen, T. and Kärri, T. (2020) ‘Implementation of inter-organisational mediums: synthesising framework as a design exemplar’, *Int. J. Networking and Virtual Organisations*, Vol. 22, No. 1, pp.55–74.

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1 Introduction

The field of management research has an utilisation problem. Despite that the academia has generated a vast and impressive body of scientific knowledge over decades; the impact of research on day-to-day managerial practices is poor at best. The disconnection between theory and practice is often known as ‘the rigor-relevance gap’, where ‘rigor’ refers to the academic credibility of research and ‘relevance’ to its practical applicability (e.g., Rynes et al., 2001; Starkey and Madan, 2001; Weick, 2001; Van de Ven and Johnson, 2006; Shapiro et al., 2007; Kieser and Leiner, 2009; Starkey et al., 2009; Banks et al., 2016). According to Van de Ven and Johnson (2006), the gap can be explained with three types of arguments

- a transfer of scientific knowledge to practice is flawed
- b theory and practice are distinct forms of knowledge
- c production of practical scientific knowledge is challenging for the academia.

In explanation (a), the knowledge is – as Shapiro et al. (2007) phrase it – ‘lost in translation’, i.e., managers fail to adopt research findings because they are not directly applicable to practice. Explanation (b) implies that the gap is unbridgeable, as scientist and managers inhabit different social systems and thus the relevance of rigorous research is, well, irrelevant (see e.g., Kieser and Leiner, 2009). Those in favour of explanation (c)

question the established mode of science, where the knowledge is – as Shapiro et al. (2007) phrase it – ‘lost before translation’, i.e., the research findings are unimportant to practitioners.

In their ‘point-counterpoint debate’ with Kieser and Leiner (2009), Starkey et al. (2009) argue that practical relevance should be reimagined. Rather than being a separate entity, relevance could be interpreted as a condition of rigor, i.e., management researchers should investigate topics that are of interest to managers without abandoning the scientific approach to inquiry. In order to achieve this, management research has to become a ‘design science’ (Starkey et al., 2009). Van Aken (2004, 2005) distinguishes design science from explanatory science, the latter being congruent with the established mode of science in management research, including both quantitative and qualitative methodologies. The divider between the two approaches is the nature of the research products. Whereas explanatory sciences commonly seek to describe, explain, predict and thus understand observable phenomena, the objective of design sciences is to generate knowledge that can be used in designing solutions to actual problems. Unlike explanatory sciences that deal with pure knowledge problems, design sciences thus endeavour to improve the human condition (Van Aken and Romme, 2009). The desideratum to see management research as a design science stems from critique to explanation (b), while accepting explanation (c) as well. Assuming that scholars insist on segregating rigor from relevance, it is understandable that most findings are ‘lost before translation’ as a consequence.

According to Van Aken (2004), design science has two missions

- 1 to develop knowledge for the design of artefacts (i.e., to solve construction problems)
- 2 to develop knowledge for the design of interventions that enhance the performance of existing artefacts (i.e., to solve improvement problems).

The characteristics of ‘knowledge’ and ‘problem’ are essential. Design sciences are concerned particularly with developing ‘general knowledge’ to support the design of solutions to ‘field problems’, hence ‘specific’ – as in ‘specific knowledge’ and ‘specific field problems’ – remains as the domain of practitioners (Van Aken, 2004, 2005; Van Aken and Romme, 2009). General knowledge can be expressed in the form of ‘a technological rule’ that follows the logic of ‘if you want to achieve Y in situation Z, then perform action X’, or as a ‘design exemplar’, where the last part of the rule is framed more nebulously ‘... then perform something like action X’ [Van Aken (2005), p.23]. Each design exemplar provides a general solution for a type of a field problem, of which the practitioner creates a specific variant for a specific situation. Flexibility in comparison to technological rules makes design exemplars as appropriate research products in management research. Scholars simply cannot give managers straightforward instructions plausibly, as organisational problems are typically indeterminate by nature, and the solution is case-specific and reliant on the heuristic processes of each practitioner.

Apart from original design science research, design exemplars may arise also from the empirical findings of explanatory science (Romme, 2003; Van Aken, 2004, 2005; Van Aken and Romme, 2009). For instance, Romme (2003) states that preliminary design exemplars can be grounded in ‘science’ that also functions as a source of ill-defined areas to which the ‘design’ mode can effectively contribute. From the perspective of the rigor-relevance dilemma, design science therefore accepts also

explanation (a). The argument that valuable scientific knowledge is frequently ‘lost in translation’ is the premise of this paper, applying to management research in general and management accounting research in particular. A considerable avenue where the translation from theory to practice has been only partial is the management control of inter-organisational relationships. Open-book accounting (OBA), which stands for information transparency in the inter-organisational interface is a key concept in the above-mentioned stream of research (e.g., Mouritsen et al., 2001; Kajüter and Kulmala, 2005; Agndal and Nilsson, 2010; Windolph and Möller, 2012). Regardless of recurring empirical studies, it remains unclear how OBA should be implemented. A common denominator for successful implementations in a number of studies seems to be the utilisation of ‘an inter-organisational medium’. By inter-organisational mediums, we refer collectively to various (accounting) techniques (see e.g., Cooper and Slagmulder, 2004), decision-making tools (see e.g., Kajüter and Kulmala, 2005), collaborative methods (see e.g., Kumra et al., 2012), and information/accounting/management control systems (see e.g., Pernot and Roodhooft, 2014).

In the crossroads of management (accounting) research and design science, both

- 1 construction problems
- 2 improvement problems exist (see Van Aken, 2004, 2005).

In this particular paper, however, our ambition is (2) to develop knowledge for the design of interventions that enhance the performance of existing artefacts, i.e., to solve improvement problems. In the abstract, the term ‘artefact’ is typically employed in reference to man-made objects, tangible and intangible alike. The artefact that we seek to improve is the management control of inter-organisational relationships by developing an OBA-based framework from the existing literature that managers can use as a design exemplar when they want to implement an inter-organisational medium (i.e., a technique, tool, method or system) successfully. Therefore, our research questions can be framed as follows:

- RQ1 Which theoretical perspectives are central in the implementation of inter-organisational mediums?
- RQ2 What kind of a framework, i.e., a design exemplar to managers, can be built from the theory?

Van Aken (2004, 2005) emphasises that technological rules, and consequently also design exemplars, need to be field-tested, i.e., experimented in the intended context of application, and grounded, i.e., the generative mechanisms of the solution untangled, resulting in certain outcomes in specific variants of the intended context. As far as the field testing of design exemplars is concerned, Van Aken (2004) suggests that there should be two phases; α -testing (by the researchers themselves) and β -testing (by a third party to counteract unrecognised defenses that may blind the researchers to flaws and limitations). The grounding of design exemplars will eventually occur through several rounds of α -testing and β -testing. In addition to the framework, the findings of initial α -testing are also presented in the paper.

In order to get a practitioner’s opinion on the framework, we conducted a small-scale survey among students participating in a continuing education program at our university. The program is targeted specifically to engineers and managers employed by energy and environmental technology companies in Finland. The size of these organisations varied

from local small and medium-sized enterprises to significantly larger international players. The participants of the program, and thus the respondents of the survey, were experienced professionals with an up-to-date view to inter-organisational relationships within the above-mentioned industries. Their job titles included, e.g., facility planner, development engineer, service engineer, project manager, area manager, invoicing and shipping coordinator, and spare parts purchaser. The total number of respondents was 27.

The above kind of α -testing has two particular functions. Firstly, it reveals certain underlying realities that may have an effect on the realisation of information transparency in the current organisational landscape. Secondly, it demonstrates how the framework enables collaborating companies to make more informed managerial decisions when they create a specific variant of the general design exemplar.

2 OBA: an inter-organisational phenomenon

When the focus of management control is taken from the intra-organisational domain to the inter-organisational one, disclosure of potentially sensitive information becomes emphasised. Within the management (accounting) research tradition, such transparency that exceeds organisational boundaries is known as ‘OBA’ (e.g., Carr and Ng, 1995; Seal et al., 1999; Mouritsen et al., 2001; Kajüter and Kulmala, 2005; Agndal and Nilsson, 2010; Windolph and Möller, 2012; Alenius et al., 2015). Some authors refer to the phenomenon also as ‘open-book costing’ (McIvor, 2001; Humphreys et al., 2003), ‘open-book negotiation’ (Lamming, 1996; Lamming et al., 2005), ‘open-books policy’ (Agndal and Nilsson, 2008; Kumra et al., 2012), or ‘open-books’ (Axelsson et al., 2002; Agndal and Nilsson, 2009).

Despite the somewhat inconsistent nature of OBA terminology, its purpose is rather unambiguous. Kulmala (2002) states that OBA is employed

- 1 to reveal cost structures to another company as a sign of commitment
- 2 to strengthen the competitive position
- 3 to learn about other companies’ operations
- 4 to improve cost efficiency in a supply chain jointly.

The establishment of trust is typically recognised as a key issue in OBA (e.g., Mouritsen et al., 2001; Kajüter and Kulmala, 2005; Free, 2008). According to Kajüter and Kulmala (2005) in particular, trust should be seen both as a prerequisite and a consequence of OBA. They refer to Tomkins (2001), who argues that information disclosure can either warrant trust to an inter-organisational relationship (i.e., trust as a prerequisite), or make collaborative mastering of events possible in a later, more mature stage of the relationship (i.e., trust as a consequence).

In relation to OBA, we should also discuss ‘inter-organisational cost management’ (IOCM), which was first introduced by Cooper and Yoshikawa (1994), who observed boundary-spanning cost management practices in a Japanese supply chain. As concepts, IOCM and OBA are clearly aligned with each other. Coad and Cullen (2006), for instance, state that information sharing is central to the concept of IOCM, the purpose of which is, with cooperative efforts by members of separate organisations, to modify cost structures and create value for its participants. Before anything else, IOCM is an umbrella

term that encompasses various (accounting) techniques, such as ‘target costing’ (e.g., Carr and Ng, 1995; Caglio and Dittilo, 2012), ‘value engineering/analysis’ (e.g., Cooper and Slagmulder, 2004; Agndal and Nilsson, 2009), ‘activity-based costing’ (e.g., Dekker and Van Goor, 2000; Suomala et al., 2010), ‘value chain analysis’ (e.g., Dekker, 2003; Coad and Cullen, 2006), and ‘OBA’. Unlike the other techniques that are mostly suitable for a type of situations and problems, OBA should be seen more as a ‘platform’ that enables IOCM. Thus, the element of inter-organisational transparency is an integral part of IOCM, although some of these techniques may be employed also without disclosing any information.

OBA is not just another management (accounting) fad, but also a distinctive stream of research that contributes arguably to the wider networking discussion, which should be of interest to the IJNVO audience. By looking through the past volumes and issues of IJNVO, we found certain commonalities between OBA and IJNVO research topics. Organisational context can be seen as the first commonality. Novel approaches, such as OBA, are prerequisites to the management of new organisational forms. In this regard, both supply chain relationships (e.g., Coleman, 2010; Hammervoll and Toften, 2010; Mazzawi and Alawamleh, 2013) and virtual organisations (e.g., Alves and Rabelo, 2013; De Mattos and Laurindo, 2015) have been observed by IJNVO scholars in the past. The second commonality relates to the transparency of information that is – as described above – central to OBA and IOCM as phenomena. Other types of knowledge and information sharing practices have been considered in a number of IJNVO publications (e.g., Lopez and Eldridge, 2010; Feng and Yue, 2011; Shamsuzzoha et al., 2012; Paiola et al., 2013). Transparency often requires trust, which is the third commonality. Yasir et al. (2014), for instance, have studied the role of trust in the development of virtual organisations. The last commonality is the need for partner selection and related criteria (Zarvic et al., 2010), which is also essential in OBA implementation.

2.1 The nature of OBA: three distinct dimensions

Windolph and Möller (2012) argue that OBA consists of three distinct dimensions

- 1 the degree and quality of disclosure
- 2 the direction of information exchange
- 3 the boundaries to openness.

Similarly to Windolph and Möller (2012), also Agndal and Nilsson (2010) have found three OBA dimensions. Their dimensions are

- a the nature of data and accounting data disclosure practices
- b the uses of disclosed accounting data
- c the conditions of OBA.

Of these dimensions, (a) seems to incorporate dimensions (1), (2) and (3). Even though the categorisation of Agndal and Nilsson (2010) is evidently more extensive, the perception of Windolph and Möller (2012) is favoured in this paper for two explicit reasons. First, application, i.e., dimension (b), does not have to be acknowledged in the framework as it stems directly from the medium in question. Moreover, the

conditions, i.e., dimension (c), are redundant to other elements in the framework (see Section 2.2/3.2).

The type of information and its level of detail are covered in the first dimension, the degree and quality of disclosure. Despite the term ‘accounting’ in the name of the concept, different types of information are disclosed within the OBA practice. In addition to costs, cost structures and other types of accounting data, companies have been reported to exchange, e.g., sales forecasts (Mouritsen et al., 2001), technical knowledge and development support (Kajüter and Kulmala, 2005), levels and measures for target profitability (Suomala et al., 2010), materials and manufacturing data (Caglio and Ditillo, 2012), and feedback, including benchmarks and suggestions (Kumra et al., 2012). As far as quality is concerned, information can range from unspecific (e.g., estimates/predictions) to specific (e.g., data from internal information systems), depending on the decision-making situation and thus the application of OBA.

Disclosure takes often place in a dyadic inter-organisational relationship, i.e., between two independent companies. Within such a relationship, the second dimension, the direction of information exchange is either bilateral or unilateral (Windolph and Möller, 2012). Bilateral, two-way disclosure stands for companies’ reciprocal willingness to exchange information in a relationship, whereas unilateral, one-way disclosure denotes that only one company reveals information to the other. Most studies on OBA to date have described empirical settings where suppliers disclose information to customers in a unilateral fashion (e.g., Carr and Ng, 1995; McIvor, 2001; Kulmala, 2004; Agndal and Nilsson, 2010; Kumra et al., 2012). Despite the fact that such one-sided transparency may lead to customers’ opportunistic behaviour, as repeatedly highlighted (e.g., McIvor, 2001; Free, 2008; Suomala et al., 2010; Windolph and Möller, 2012), unilateral disclosure remains as the predominant OBA approach in customer-supplier relationships.

According to Windolph and Möller (2012), there are two ways to draw the boundaries to openness. Information can be exchanged either in a dyadic inter-organisational relationship or within a more extensive network of companies. While also other types of dyadic inter-organisational relationships naturally exist, customer-supplier dyads seem to prevail in the literature (e.g., Mouritsen et al., 2001; Dekker, 2003; Kulmala, 2004; Agndal and Nilsson, 2008, 2009, 2010; Möller et al., 2011; Kumra et al., 2012; Romano and Formentini, 2012). Only a handful of authors have reported on more extensive, network-wide disclosure practices (e.g., Cooper and Slagmulder, 2004; Kajüter and Kulmala, 2005; Coad and Cullen, 2006; Alenius et al., 2015). As ‘network-wide disclosure’ is conceptually somewhat ambiguous, it should be clarified that here it refers to situations where information is disclosed beyond a dyadic relationship.

2.2 Factors that influence OBA implementation

Arising from their findings from multiple case studies, Kajüter and Kulmala (2005) have recognised three categories of factors that may have an impact on the implementation of OBA

- 1 exogenous factors
- 2 endogenous factors
- 3 network-specific factors.

To begin with, the degree of competition and economic trend are included in the exogenous factors. As the role of such factors is ambiguous and mediating at best, we have disregarded the exogenous factors from the framework because companies are unable to control systematically the environment in which they operate.

According to Kajüter and Kulmala (2005), the endogenous factors incorporate organisational size, cost accounting systems, competitive policy, and relational commitment. Even though Kajüter and Kulmala (2005) distinguish policy from commitment, we would argue, however, that they are both included in the concept of 'purchasing strategy' that Agndal and Nilsson (2010) have previously discussed in the context of OBA. As far as divergent purchasing strategy alternatives are concerned, Agndal and Nilsson (2010) disassociate the transactional approach from the relational one. The transactional purchasing strategy relies on arm's length procurement, whereas long-term commitment, collaboration and mutual benefits are emphasised in the relational alternative. The choice is not, by any means, binary. Axelsson et al. (2002) state that the two purchasing approaches are complementary, which means that companies apply different strategies to different relationships simultaneously. A strategic disparity is a sign of differing ambitions, which may become an issue from the implementation standpoint.

Organisational size influences OBA implementation through several mechanisms. Many characteristics, such as organisational structure, company policies and organisational culture are linked directly to the size of an organisation. Kajüter and Kulmala (2005) also mention that larger companies are often able to commit more development resources towards the adoption of new methods and systems than their smaller counterparts. Thus the problematic nature of organisational size arises from the differences in size between collaborating companies rather than 'largeness' or 'smallness' per se. Organisational size is also related to cost accounting systems, which are considerably more sophisticated in larger companies. A poor state of companies' cost accounting systems has been reported to impede or even prevent OBA (e.g., Seal et al., 1999; Kulmala et al., 2002; Kajüter and Kulmala, 2005; Agndal and Nilsson, 2009; Suomala et al., 2010). While only the role of cost accounting systems is recognised by Kajüter and Kulmala (2005), we would emphasise information systems in general. The linkage between information disclosure and various types of information systems has been studied by a number of authors (e.g., Humphreys et al., 2001; Vélez et al., 2008; Fayard et al., 2012; Pernot and Roodhooft, 2014). We think that this is an important perspective and addition, as the degree of disclosure in OBA is not limited to cost information alone.

According to Kajüter and Kulmala (2005), the network-specific factors comprise the type of network, the type of product, the network infrastructure, and the social nature of network relationships. The type of network is defined by two particular elements; structure and maturity. Kajüter and Kulmala (2005) claim that especially hierarchical, mature relationships provide opportunities for cost savings and other improvements, which is the reason why OBA functions better in these relationships in comparison to project-based, non-hierarchical networks. The type of product is closely related to the type of network. To date, OBA has been observed mainly in hierarchical manufacturing supply chains and networks, including, but not limited to, automotive industry (Möller et al., 2011), food industry (Alenius et al., 2015), electronics industry (Seal et al., 2004), kitchen fittings industry (Romano and Formentini, 2012), construction industry (Kumra et al., 2012), and fashion industry (Caglio and Ditillo, 2012).

Network infrastructure, which is an assemblage of inter-organisational mediums (i.e., techniques, tools, methods and systems), contributes significantly to the success of OBA. In addition to the (accounting) techniques and systems (information/accounting/management control) that have been discussed above, tangible examples of network infrastructure are also decision-making tools (e.g., Ylä-Kujala et al., 2016 – inter-organisational asset management mediated by two managerial models) and collaborative methods (e.g., Kumra et al., 2012 – cross-functional meetings between customer and supplier as a part of joint development of the manufacturing process). Lastly, the social nature of network relationships deals largely with the importance of trust (Kajüter and Kulmala, 2005). Even though OBA can be occasionally coerced due to asymmetrical balance of power, trusting behaviour is likely to warrant better results in the long run, especially when transparency is extended beyond dyadic inter-organisational relationships.

3 Implementation framework for inter-organisational mediums (IFFIM)

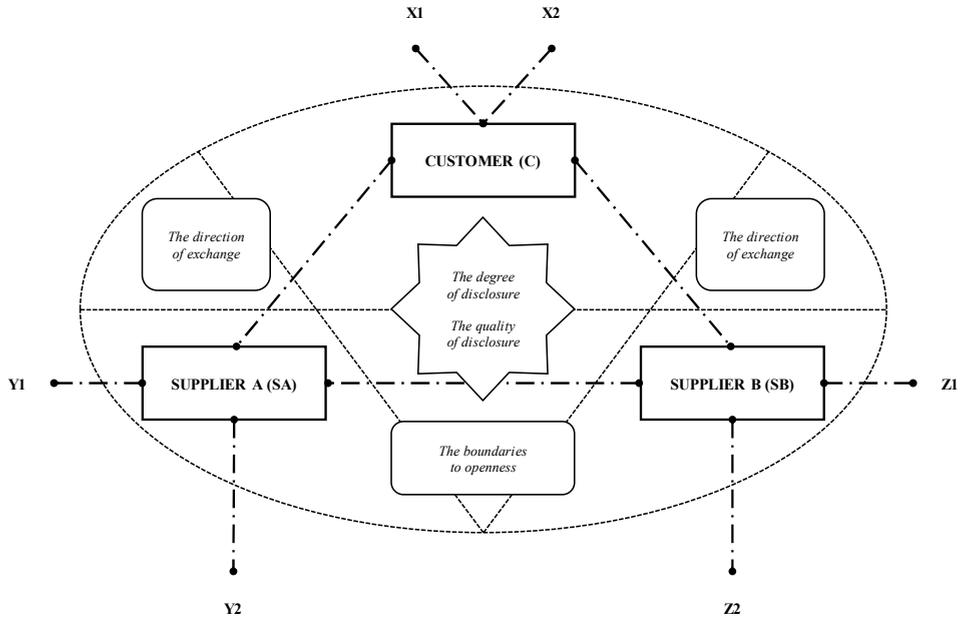
In the beginning of this paper, we stated that our main objective is to improve boundary-spanning management control by developing an OBA-based IFFIM. In the spirit of design science, that particular framework should be seen as a design exemplar, i.e., an instrument for practitioners to design situation-appropriate interventions. By building upon the theoretical perspectives discussed in the preceding section, we have created a bipartite framework called ‘IFFIM’. The first part of the framework (i.e., IFFIM_1) is concerned with the multidimensional nature of inter-organisational relationships in networked environments, which is the reason why IFFIM_1 is here also referred to as ‘the relational view’ (see Figure 1). IFFIM_1 illustrates relational complexities visually through the OBA dimensions (Windolph and Möller, 2012). The function of IFFIM_1 is to facilitate managerial decision-making in a given network in relation to the degree and quality of disclosure, the direction of information exchange, and the boundaries to openness.

The second part of the framework (i.e., IFFIM_2) is an outlook to the stepwise process of implementing an inter-organisational medium, and is therefore here referred to as ‘the process view’ (see Figure 2). The classification of implementation phases in IFFIM_2 is based on the ‘enterprise system experience cycle’ of Markus and Tanis (2000), the phases of which have been later modified by Nah et al. (2001). The enterprise system experience cycle contains four chronologically consecutive phases; the chartering phase, the project phase, the shakedown phase, and the onward and upward phase. By integrating the factors that influence OBA implementation (Kajüter and Kulmala, 2005) to the phases of enterprise system experience cycle, we have established a manner of representation where each factor is considered separately in each phase of the implementation. The function of IFFIM_2 is to increase managerial awareness in a given network in relation to the endogenous factors and the network-specific factors that may hinder, or occasionally even prevent, an implementation to be a success. As can be seen, the exogenous factors have been demarcated outside of IFFIM_2 as justified above (see Section 2.2).

3.1 IFFIM_1: the relational view

IFFIM_1 as shown in Figure 1 is a demonstration of the interplay between the OBA dimensions in the simplest imaginable form of a network, i.e., a triad that is comprised of three dyadic relationships; customer – supplier A (CSA), customer – supplier B (CSB), and supplier A – supplier B (SASB). As far as the degree and quality of disclosure is concerned, it has been placed to the core of IFFIM_1 because the other dimensions are more or less insignificant without it. While the significance of the direction and boundaries would be weakened by incongruous (i.e., wrong degree) or inadequate information (i.e., flawed quality), the absence of disclosure would make them completely irrelevant.

Figure 1 IFFIM_1: the relational view

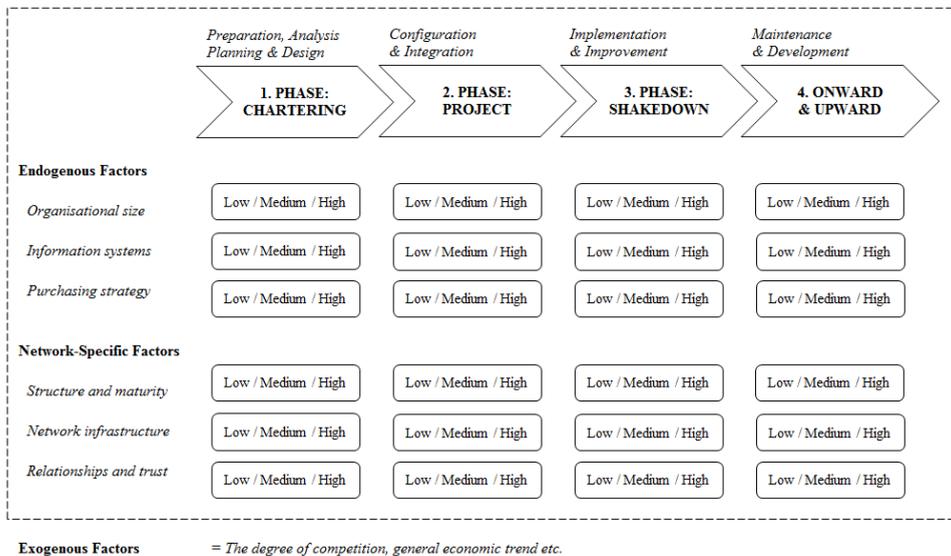


The stronger dashed lines that interconnect companies are a representation of the direction of information exchange. The nature of exchange (unilateral vs. bilateral disclosure) delineates how these lines are presented visually. If we take the relationship CSA as an example, it can play out basically in one of the following ways; unilateral disclosure from SA to C, unilateral disclosure from C to SA, or alternatively the companies engage in bilateral disclosure. As each dyad in the network can be analysed separately, the directions of information exchange may vary from one relationship to another. Moreover, the lighter dashed lines that both surround and segregate the companies illustrate the boundaries to openness. In the exemplary network triad, there are effectively four boundaries. The left-hand diagonal, for instance, segregates SA from the relationship CSB. The circular borderline, on the other hand, sets restrictions to disclosure in relation to external actors (e.g., end customers and second-tier suppliers). Several boundaries can be placed simultaneously, but each is another constraint to transparency.

3.2 IFFIM_2: the process view

As can be seen in Figure 2, the endogenous factors and the network-specific factors in IFFIM_2 consist of three factors each. Organisational size, information systems and purchasing strategy are included in the endogenous factors, whereas structure and maturity, network infrastructure, and relationships and trust are subsumed into the network-specific factors. The impact of each factor to the stepwise implementation process is assessed in our example on a tripartite scale (ranging from low to high) that each manager can assimilate to suit the specific needs of his/hers practical situation.

Figure 2 IFFIM_2: the process view



It should also be underlined that the right configuration of implementation phases depends heavily on the medium. By conjoining techniques to tools and methods to systems, we have created a category, the entities of which are similar relative to their inter-organisational nature, but not commensurably relative to the extent of their application. A simple decision-making tool, for instance, does not necessarily require a full-scale implementation process to be operable in the inter-organisational interface, but an information system probably does. As far as the exogenous factors are concerned, their potential influence on the process should always be taken into account, although external circumstances cannot be revised, e.g., in times of recession, the implementation of a new medium might prove to be challenging.

4 The framework: as seen by practitioners

The engineers and managers who participated in our survey completed a form that comprised three types of questions; open-ended questions, multiple choice questions, and rating scale questions. The inquiry on the degree and quality of disclosure was based on two open-ended questions, in which the respondents defined the types of information that

they/their company would be willing to disclose and what quality-related challenges such transparency might pose. Multiple choice questions were utilised in addressing the direction of information exchange and the boundaries to openness. In our approach, we laid down a set of conceivable options for how information disclosure might occur in each relationship (i.e., in CSA, CSB and SASB) from which the respondents disassociated the feasible alternatives from the unthinkable. Lastly, the potency of each factor in the endogenous factors and the network-specific factors on the stepwise implementation process was evaluated by the respondents with a rating scale (low/medium/high), and completed phase by phase.

4.1 The OBA dimensions: what kind of preconditions are imposed to transparency?

The practitioners' opinions on the degree and quality of disclosure are shown in Table 1. Due to the nature of open-ended questions, there was lots of variation in the responses. After the contents of each survey form were analysed in detail, we were able to categorise the types of information that companies are willing and unwilling to disclose. Our content analysis also revealed certain challenges that stem from the quality of information in general and information systems in particular.

Table 1 As seen by practitioners: the degree and quality of disclosure

<i>Degree</i>	<i>R</i>	<i>N</i>	<i>R%</i>
Willing to disclose...			
1 General (product) specifications and technical documentation	10	27	37%
2 Best practices, assessments, and short-term plans and estimates	10	27	37%
3 Publicly accessible information (e.g., annual reports, references, etc.)	7	27	26%
4 Track records on suppliers/sub-contractors/in-service equipment	6	27	22%
5 Economic information (e.g., annual budgets, limited cost data, etc.)	4	27	15%
Unwilling to disclose...			
1 Information about pricing (e.g., cost structures, profit margins, etc.)	19	27	70%
2 Trade secrets (e.g., R&D innovations, proprietary technologies, etc.)	12	27	44%
3 Detailed product, service, equipment and/or process specifications	8	27	30%
4 Long-term strategies and scenarios (e.g., outsourcing decisions, etc.)	4	27	15%
5 Other types of sensitive information (e.g., contractual terms, HR, etc.)	4	27	15%
<i>Quality</i>	<i>R</i>	<i>N</i>	<i>R%</i>
Challenges in quality and information systems...			
1 Information systems are inadequate (e.g., poor quality, availability, etc.)	10	27	37%
2 Definition disparities and other inter-organisational challenges	10	27	37%
3 The question of information timeliness and obsolescence	8	27	30%
4 Differences in information systems and software (i.e., compatibility)	5	27	19%
5 Incompetent users and/or limited access to required information	4	27	15%

Note: R = The number of responses per category.

Regarding the degree of disclosure, the respondents seemed to be rather conservative. The pricing of products/services including cost structures and profit margins was seen as the most sensitive piece of information. Only four respondents out of 27 were of the opinion that economic information could be occasionally disclosed. Strangely, the willingness to disclose publicly accessible and mostly obligatory information, such as annual reports, was mentioned in several responses. From the perspective of information quality, the poor state of information systems was highlighted together with inter-organisational disparities. The question of timeliness and obsolescence was perceived important as well.

The perspectives on the direction of information exchange and the boundaries to openness are shown in Table 2. In the case of CSA/CSB, the majority of respondents found all directions feasible, but bilateral disclosure in particular had a nearly unanimous support. As far as SASB was concerned, most respondents were of the opinion that unilateral disclosure is unthinkable. The support for bilateral disclosure was also decreased in comparison to CSA/CSB. The explanation for the difference of opinion between the two situations arises probably from a perceived asymmetry in bargaining power. As the inquiry did not rule in the type of information, unilateral disclosure from C to SA/SB may therefore also contain non-sensitive information that C feeds to its suppliers in order to control them.

Table 2 As seen by practitioners: the direction of exchange and boundaries to openness

<i>DIRECTION</i>	<i>F</i>	<i>U</i>	<i>N</i>	<i>F%</i>	<i>BOUNDARIES</i>	<i>F</i>	<i>U</i>	<i>N</i>	<i>F%</i>
Customer \leftrightarrow supplier A/B	18	9	27	67%	Customer – supplier A/B	18	9	27	67%
Bilateral disclosure \leftrightarrow	26	1	27	96%	Supplier A – supplier B	9	18	27	33%
Supplier A \leftrightarrow supplier B	7	20	27	26%	Network/supply chain	21	6	27	78%
Bilateral disclosure \leftrightarrow	18	9	27	67%	Vacillating boundaries	4	23	27	15%

Note: F = Feasible, U = Unthinkable, N = Sample size, F% = Feasibility percentage.

As can be noticed, two boundary configurations were found particularly feasible by the practitioners. The majority of the respondents favoured network-wide disclosure, which would require that information disclosure takes place in all relationships (i.e., CSA, CSB and SASB). Many would draw a boundary between the suppliers, which is also consistent with the above-mentioned power asymmetry explanation. By eliminating the exchange of information between SA and SB, C is able to dictate the degree and quality of disclosure in the entire network. It has to be pointed out that the reality and ideals were mixed in the findings to some extent. On one hand, there was support for network-wide and bilateral disclosure, but on the other hand, the respondents were entangled to a world view, where transparency is constrained by bargaining power asymmetries. Bilateral disclosure between SA and SB is only feasible when C is included in the arrangement, i.e., a set boundary to openness subsumes the entire network.

4.2 Stepwise OBA implementation: how is the significance of each factor experienced?

The practitioners' outlook on the importance of the endogenous factors and the network-specific factors in relation to the stepwise implementation process are shown in Table 3. According to the respondents, information systems that stand out especially from the

project and shakedown phases is the most significant endogenous factor. In the project phase, collaborating companies concentrate on integrating the medium into the existing systems, and eventually in the shakedown phase, it will become a functioning piece in the companies' systemic puzzle. Dissimilarities in the information systems thus weaken this process as, e.g., availability and quality of information differ from one company to another.

Table 3 As seen by practitioners: factors that influence OBA implementation

	<i>1</i>	<i>2</i>	<i>3</i>	<i>N</i>	<i>AVG.</i>		<i>1</i>	<i>2</i>	<i>3</i>	<i>N</i>	<i>AVG.</i>
1	<i>Phase: chartering</i>					2	<i>Phase: project</i>				
Endogenous factors						Endogenous factors					
Organisational size	7	9	11	27	2.15	Organisational size	8	9	10	27	2.07
Information systems	5	13	9	27	2.15	Information systems	2	15	10	27	2.30
Purchasing strategy	4	11	12	27	2.30	Purchasing strategy	6	12	9	27	2.11
Network-specific factors						Network-specific factors					
Structure and maturity	6	12	9	27	2.11	Structure and maturity	5	12	10	27	2.19
Network infrastructure	5	13	9	27	2.15	Network infrastructure	1	15	11	27	2.37
Relationships and trust	2	5	20	27	2.67	Relationships and trust	1	4	22	27	2.78
	<i>1</i>	<i>2</i>	<i>3</i>	<i>N</i>	<i>AVG.</i>		<i>1</i>	<i>2</i>	<i>3</i>	<i>N</i>	<i>AVG.</i>
3	<i>Phase: shakedown</i>					4	<i>Onward and upward</i>				
Endogenous factors						Endogenous factors					
Organisational size	7	11	9	27	2.07	Organisational size	7	13	7	27	2.00
Information systems	1	12	14	27	2.48	Information systems	4	15	8	27	2.15
Purchasing strategy	8	14	5	27	1.89	Purchasing strategy	5	15	7	27	2.07
Network-specific factors						Network-specific factors					
Structure and maturity	4	13	10	27	2.22	Structure and maturity	9	8	10	27	2.04
Network infrastructure	3	7	17	27	2.52	Network infrastructure	5	11	11	27	2.22
Relationships and trust	2	5	20	27	2.67	Relationships and trust	2	4	21	27	2.70

Note: 1 = Low influence, 2 = Medium influence, 3 = High influence, N = Sample size, AVG. = Average influence.

As far as organisational size is concerned, the effect of size differences seems to decrease gradually through the implementation process. Granted that, e.g., colliding organisational cultures or a resource imbalance may play a certain role in the beginning; the respondents were of the opinion that organisational size is the least significant endogenous factor. In fact, only purchasing strategy was perceived more important than information systems at

any stage of the process. It is, however, logical that companies' aims and expectations should be aligned at the outset. A large disconnection in the purchasing approaches would likely undermine the entire process from the chartering phase onwards.

The single most influential factor in the study, both endogenous and network-specific factors included, is relationships and trust. It has been frequently argued in the literature that trust is both a prerequisite and a consequence of continued relational engagement. The respondents seemed to agree with this particular perspective. The importance of structure and maturity, on the other hand, increases towards the onward and upward, which is not surprising, as an established hierarchy coupled with mature interaction reasserts collaboration. Still, the respondents were of the opinion that structure and maturity is the least significant network-specific factor. Similarly to information systems, network infrastructure is highlighted in the project and shakedown phases, but achieves consistently somewhat higher averages in comparison. It appears that a prior network infrastructure between the collaborating companies is regarded even more important than a decent state of information systems. The process of implementing new additions to the infrastructure is therefore facilitated by the current assemblage of mediums.

5 Discussion and conclusions

In the beginning of the paper, we argued at length that there is an utilisation problem in management research, which is often referred to as the rigor-relevance gap. As a potential way to bridge the gap between scientific rigor and practical relevance, we suggested that more studies in the field should be based on an alternative mode of research known as 'design science'. Design science is concerned with developing general knowledge to support the design of solutions, i.e., the design of artefacts and interventions, to field problems. Depending on the nature of the problem, general knowledge can be expressed either in the form of a 'technological rule' or a 'design exemplar'. While technological rules are applied to the letter like 'recipes' to achieve certain outcomes, design exemplars are more like guidelines that practitioners can follow in the design of a solution variant for a specific situation.

In order to increase the relevance of management research in general and management accounting research in particular, we developed an IFFIM that can be employed as a design exemplar in the design of boundary-spanning managerial interventions. Theoretically, the framework is founded on the concept of OBA, the success of which can be dependent on the deployment of inter-organisational mediums (i.e., techniques, tools, methods and systems). According to Van Aken (2004, 2005), an integral part of the design science process are field testing (α -testing + β -testing) and grounding of design exemplars. The empirical findings discussed in this paper represent one phase of α -testing that has two functions.

The first function of α -testing was to reveal certain underlying realities that may have an effect on the realisation of transparency in the current organisational landscape. Based on the survey, there are multiple pitfalls. As far as the degree and quality of disclosure are concerned, both the respondents' conservativeness towards disclosing costs and other economic information, as well as the poor state of information systems are potential issues. The disparity between ideals and the reality is important to recognise as well. If collaborating companies agree that the direction of information exchange is bilateral in

all relationships and the boundaries to openness subsume all companies involved in the above-mentioned relationships, then these preconditions should also be carried through. The lack of consensus among the respondents showed that inter-organisational discourse is critical to success.

The second function of α -testing was to demonstrate how practitioners are able to make more informed managerial decisions with the framework, i.e., to provide a 'proof-of-concept'. Let us imagine that the respondents of the survey are representatives of C, SA and SB. These companies are currently in the middle of collaborative negotiations, the purpose of which is to increase integration between them through the implementation of an inter-organisational information system. After the responses to IFFIM_1 are revealed to the managers of these companies, they agree that information disclosure should always be bilateral in the network, but also limited to the following relationships; CSA, CSB and SASB. A key requirement in the new system is the transparency of cost structures, which has been causing uneasiness in suppliers' representatives, who feel that their cost information is poor in comparison to C. Once the issue has been identified with the framework, the situation can be resolved collaboratively. The management is also keen to analyse the responses to IFFIM_2. The importance of relationships and trust among the respondents motivated them to establish a new tradition that is comprised of weekly network meetings and monthly team-building events. A closer look is also taken on the compatibility of information systems when the implementation proceeds to the project and shakedown phases.

The α -testing discussed above is still very much preliminary. As suggested by Denyer et al. (2008), further testing of the framework could follow the so-called CIMO-logic (i.e., context, intervention, mechanisms and outcome). Two design-wise comparable interventions will likely result in slightly different outcomes depending on the specific context of application and the mechanisms that the intervention triggers in that specific context. Thus IFFIM has to be tested more extensively (α -testing + β -testing) before we can convincingly state that

"If you want to increase information transparency in a company network by implementing an inter-organisational medium (context), use IFFIM (intervention) to raise awareness of pitfalls, identify what influences the stepwise implementation process and develop a sense of solidarity (mechanisms), the result of which is a successful implementation (outcome)."

Managerial implications aside, our IFFIM contributes also to the theoretical discussion. In this paper, we have determined a new taxonomy, 'inter-organisational medium' that stands for (accounting) techniques, decision-making tools, collaborative methods and information/accounting/management control systems in the inter-organisational interface. By synthesising some of the existing literature on OBA, we have also formed an understanding on what kind of dimensions (relational) and factors (processual) are important to the implementation of such mediums. Overall, we think that the design science approach should receive more attention in the field of management (accounting) research.

In addition to further testing and grounding of the design exemplar, the influence of external factors on the implementation of mediums should also be mapped. Even though companies are unable to change the environmental conditions directly, it would still be beneficial to know when and how external factors, such as fierce competition between suppliers, or macroeconomic conditions like recession, may compromise all the attempts

to increasing inter-organisational transparency. Knowledge about these factors would most likely support organisations in making decisions that are more informed. To summarise and conclude, the next research steps could include:

- 1 conducting further α -testing of the framework so that the IFFIM could be finalised
- 2 proceeding to β -testing and thus grounding the design exemplar by conducting multiple case studies and following, e.g., the CIMO-logic
- 3 examining the influence of external factors to organisations' willingness to implement mediums that require OBA.

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