

# UNFOLDING DYADIC DEPENDENCIES IN IS OUTSOURCING RELATIONSHIPS – DEVELOPMENT OF TWO MULTIDIMENSIONAL CONSTRUCTS

*Research-in-Progress*

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## **Abstract**

*While dependence is seen as a major risk in IS outsourcing relationships, to date little attention has been paid to fully and unambiguously capturing the complex nature of this phenomenon and specifying how to measure it. Research in reference disciplines has shown that dependence is a dyadic concept, i.e., studies should assess both the client's and the supplier's dependence in order to draw adequate conclusions. Hence, to provide a thorough basis for future IS outsourcing studies, this research-in-progress paper follows a multi-method approach (extensive literature review, case study interviews, Q-sorting, questionnaire pretests, two-sided pre-study with 44 responses from 367 companies) to develop two multidimensional "dependence" constructs, reflecting both sides of an IS outsourcing dyad, i.e., client and supplier dependence. Our research efforts aim to contribute to and extend inter-organizational IS studies and to support client and supplier firms in monitoring and influencing dyadic dependence structures.*

**Keywords:** Outsourcing relationships, information systems, client dependence, supplier dependence, multidimensional scale development, dyadic, mixed methods

## Introduction

Dependence has been identified as a crucial aspect of exchange relationships in various contexts and disciplines (e.g., Bode et al. 2011; Casciaro and Piskorski 2005; Gulati and Sytch 2007). IS outsourcing relationships can also be understood as sets of interdependent organizations, involved in developing and operating information systems. Since the early days of outsourcing, a high dependence on IT suppliers has been identified as a major business risk for client firms (e.g., Gonzalez et al. 2005; Lacity et al. 2009). However, the converse fact – that IT suppliers might also run the risk of a critical dependence on their clients, for example, through voluminous, long-term contracts with those clients – has been largely disregarded (Kaiser et al. 2013). Although dependence research in many disciplines is already advanced and has produced interesting results by studying phenomena such as the impact of dyadic dependencies (i.e., the dependencies of both parties) on exchange relationship performance, the nature and consequences of dependence are under-researched in the IS outsourcing field.

The few publications that treat dependence in our domain are predominantly case-based but substantiate its critical role. The publications relate e.g., to the risk of dependence imbalance favoring the supplier (Willcocks and Kern 1998), the impact of the supplier's perceived importance of outsourcing deals on the relationship quality (Blumenberg et al. 2009), barriers and power plays that arise during supplier switching and transitions (Chua et al. 2012; Whitten and Wakefield 2006), and multi-sourcing as a means to reduce client dependence on each individual supplier (Levina and Su 2008). A shortcoming of these studies is that they usually do not adopt the dyadic approach, which simultaneously considers the client's and the supplier's dependence. Yet such an approach could answer important questions, such as: is it always advantageous to decrease dependence on a partner or can relationships characterized by strong joint dependence have beneficial consequences due to both parties' mutual interest in the relationship? To enable our discipline to unfold the full potential of dependence research, a thorough conceptualization and operationalization of client *and* supplier dependence can be considered as necessary pre-conditions. Our paper tries to fill this research gap by identifying and validating key facets of dependence.

Our overall research agenda aims to 1) extend the existing literature on outsourcing relationships with a conceptualization of organizational dependence grounded on theoretical considerations and empirical investigations, 2) provide validated measurement instruments useful for future research, and 3) identify for practitioners key aspects of their own and their partner's dependence that should be useful for monitoring and influencing the overall dependence structure. In this research-in-progress paper, we follow established guidelines (e.g., MacKenzie et al. 2011) and rely on a multi-method approach to develop two multidimensional "dependence" constructs that capture client as well as supplier dependence.

The remainder of our paper is structured as follows: First, we provide the theoretical background for our work and describe related work on exchange and IS outsourcing relationships. We then describe our process of conceptualization and scale development. Finally, we discuss expected theoretical, methodological, and practical contributions of our work along with promising avenues for future research.

## Theoretical Background and Related Literature

### *Related Work on Dependence in Exchange Relationships*

In contrast to the IS outsourcing domain, there is a long tradition of research on dependencies in related research fields, such as supply chain management and relationship marketing. Also recently, various articles have investigated the role of dependence in exchange relationships (Bode et al. 2011; Gulati and Sytch 2007; Palmatier et al. 2007; Scheer et al. 2010). According to Frazier (1983, p. 158), *dependence* is the need to maintain a relationship to achieve desired goals. While its crucial role is beyond doubt, researchers have proposed different operationalizations to capture dependence, producing contradictory findings and often leaving the researcher confused about which is best to use in a specific context. Proposed measures include the role performance approach (Frazier 1983), a replaceability scale (Heide and John 1988), the concentration and importance of a relationship as reflected in the sales and profit approach (El-Ansary and Stern 1972), global dependence measures (Noordewier et al. 1990) and several variations on these. Emerson (1962) also offered a pioneering conceptualization in which each party's

dependence is determined by *both* the importance of the relationship for achieving desired goals *and* the extent to which there are alternatives for achieving these goals.

### **Related Work on Dependence in IS Outsourcing Relationships**

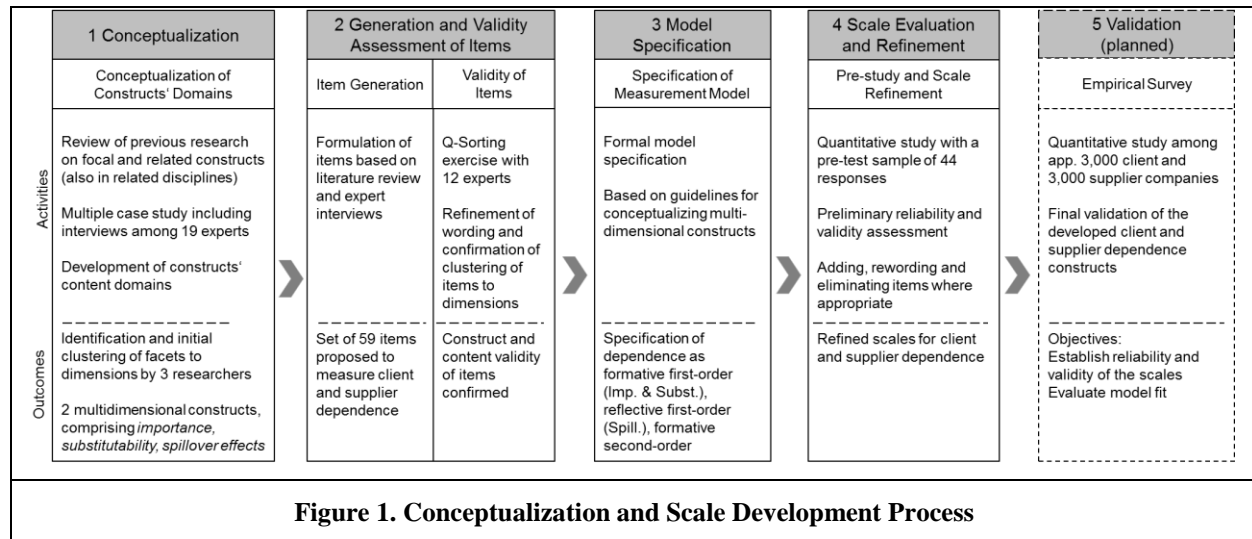
Prior IS outsourcing literature has linked dependence to the field of “relational governance”, i.e., the softer practices associated with managing client-supplier relationships, as a determinant of clients’ outsourcing success (Lacity et al. 2009). Combining this with findings from reference disciplines, dependence can be seen as a “contextual” variable and thus as an antecedent of relational governance facets like trust or conflict (e.g., Goles et al. 2005; Palmatier et al. 2007). Although various studies point to the relevance of dependence in IS outsourcing relationships (Aubert et al. 2005; Chua et al. 2012; Lee and Kim 1999; Levina and Su 2008; Willcocks and Kern 1998), little research to date has been directed towards its conceptualization, taking into account findings from reference disciplines, and studying dependence on both sides of an outsourcing dyad. Table 1 lists a selection of related concepts and operationalizations in the IS outsourcing domain.

<b>Table 1. Related Concepts and Operationalizations</b>		
Source	Concept	Operationalization
Lee and Kim 1999	Mutual dependency	In our relationship, our service provider 1. is responsible for lots portions of our system development and 2. supports and manages most core information technologies we need.
Goo et al. 2007	Extent of substitution	The average annual contract amount with your IS vendor as a percentage of total IS.
Sia et al. 2008	Ease of exit	1. If our outsourcing relationship was discontinued we would have difficulty finding a replacement for the outsourcing vendor (R). 2. Changing our outsourcing vendor will significantly affect our future operating performance (R). 3. We are heavily dependent on this outsourcing vendor (R).
Swinarski et al. 2008	Client power (=supplier dependence)	1. If your company decided to stop supplying application services to SouthBank, you could easily replace their profit contribution with application service supplied to other customers (R). 2. If the relationship with SouthBank were terminated, it would not hurt our operations (R). 3. Finding new buyers for the application services currently supplied to SouthBank would not have a negative impact on our costs (R). 4. It would be relatively easy for us to find other buyers for the application services currently supplied to SouthBank (R).
Lee et al. 2008	Client’s mutual dependency	1. It would be difficult for us to replace the service provider with others. 2. My company would suffer greatly if we lost our relationship with the service provider. 3. The support of the service provider is crucial to our ability to manage ISs. 4. We are relying on the service provider’s expertise for managing ISs. 5. The relationship with the service provider is important to our business.
Goo et al. 2009	Mutual dependence	Both parties in the relationship 1. share the risks that can occur in the process of business, 2. have collective responsibility of benefits and risks, and 3. effectively carry out services that the other is dependent on.
Bahli and Rivard 2013	Bargaining power	1. There is not a sufficient number of reputable external IT vendors who can potentially provide IT facilities and services to us for this outsourced operation. 2. There is not a sufficient number of trustworthy external IT vendors who can potentially provide IT facilities and services to us for this outsourced operation. 3. If we decided to terminate the current contract with the IT vendor, there would be no other external service providers who could provide us with the same level of IT facilities and services for this outsourced operation.
Bahli and Rivard 2013	Holdup problem	1. If our relationship was discontinued with our IT vendor, we would have difficulty making up for our IT operation. 2. This IT vendor is crucial to our future performance. 3. It would be difficult for us to replace this IT vendor. 4. We are dependent on this IT vendor (and four more items).

Reviewing the related concepts, considerable differences in their operationalizations are evident. While we acknowledge the existing research efforts in our field (and of course, dependence was not the central focus in those studies), we are not aware of a “dependence” construct that has undergone a thorough scale development process. Many prior operationalizations of related concepts raise critical questions with regard to content validity, its exhaustiveness as well as the transferability of items developed in other disciplines.

## Conceptualization and Scale Development

To address the lack of prior scale development for client and supplier dependence in our domain, our research aims at developing two scales that allow for domain particularities. To date, we have conducted a comprehensive literature review, 19 interviews, 2×2 Q-sort experiments, extensive questionnaire pre-tests with 10 experts, and a two-sided pre-study with 44 responses from 367 companies. Following multidimensional construct development guidelines (Diamantopoulos and Winklhofer 2001; MacKenzie et al. 2011; Polites et al. 2011), Figure 1 shows our process, comprising five essential stages.



### Stage 1 Conceptualization of Client and Supplier Dependence

Our conceptualization of client and supplier dependence began with a literature review in IS and related disciplines. Since this review revealed a lack of profound dependence conceptualizations in our domain as well as different approaches used in reference disciplines, we conducted an explorative multiple case study with a dyadic approach.<sup>1</sup> Building on company documentation and 19 expert interviews on the client and supplier sides (totaling 20 hours and 382 pages of transcribed text), we aimed to provide an understanding of dependence in the IS outsourcing context and to identify key aspects of the construct's domain (MacKenzie et al. 2011).

Both theoretical considerations (Emerson 1962) and our interviews suggest that when client dependence is attributed to a client organization, it must be done so *with regard to* a specific client-supplier exchange relationship. In our context, an exchange relationship covers development and/or supply of an information system, for which the supplier is compensated. Reference to a specific relationship is important since several exchange relationships can coexist between the same client and supplier (for example, other IS outsourcing relationships). Note that supplier dependence can be specified analogously.

Two *dimensions* emerged from our case study analysis, confirming the general applicability of Emerson's twofold conceptualization in our field. Dependence is determined by (1) importance of the resource obtained and (2) its source's substitutability (Bourantas 1989; Emerson 1962; Jacobs 1974). Conceptually, a multiplicative relationship between the two determinants was proposed, as dependence is absent when either importance or substitutability is close to zero (Bourantas 1989; Pfeffer and Salancik 1978). More specifically, client dependence in our domain comprises (1) the importance of the delivered information system (component) (IS) for the client company and (2) the substitutability of the incumbent supplier. Supplier dependence comprises (1) the importance of the outsourcing relationship for achieving the supplier's goals and (2) the substitutability of the client with an alternative outsourcing company.

<sup>1</sup> An earlier version of our conceptualization efforts (Stage 1) appeared in Kaiser et al. (2012, 2013). Here, conceptualization has been refined and elaborated to satisfy requirements for multidimensional construct development (MacKenzie et al. 2011). The process stages 2-4 are completely new to the present research-in-progress paper.

Grounded on case study interviews, related literature (e.g., on IT business value, Melville et al. 2004; Tallon et al. 2000), and theories, such as *resource dependence theory* (Pfeffer and Salancik 1978), *transaction cost economics* (e.g., Williamson 1981), *social exchange theory* (Thibaut and Kelley 1959), and *switching cost perspective* (e.g., Whitten and Wakefield 2006), the salient facets of the two dimensions shown in Tables 2 and 3 were identified.<sup>2</sup> Here we strived for exhaustiveness and mutual exclusivity of the facets.

Table 2. Facets of the Client Dependence Construct		
Dimension	Facet	Description
Importance	1 Relative magnitude (+)	Share of magnitude, e.g., purchasing volume, related to the IS.
	2 Revenue enhancements (+)	Business value generated by IS in form of revenue enhancements in, e.g., supported business processes.
	3 Cost savings (+)	Business value generated by IS in form of cost savings.
	4 Regulatory requirements (+)	Contribution of IS to fulfilling official and legal requirements.
	5 Strategic advantages (+)	Contribution of IS to achieving strategic advantages.
Substitutability	6 Supplier alternatives (+)	No. of supplier alternatives for the IS.
	7 Evaluation and selection efforts (-)	Time and effort needed for evaluating and selecting a new supplier.
	8 Performance uncertainty of alternative suppliers (-)	Uncertainty or perception of risk surrounding the performance of alternative suppliers.
	9 Sunk costs (-)	Non-recoverable time, money, and effort invested in the outsourcing relationship.
	10 Lost benefits (-)	Benefits from the current relationship that would be lost upon contract termination.
	11 Post-selection client-side costs (-)	Time, effort, and financial outlays that would be needed to conduct the switching process on client side.
	12 Setup costs for alternative supplier (-)	Investments in the alternative supplier that would be necessary to reach the previous work state (related to the IS).
Spillover effects (+)		Expected negative reactions in other exchange relationships with this supplier caused by a (planned) termination of the focal relationship.

Table 3. Facets of the Supplier Dependence Construct		
Dimension	Facet	Description
Importance	1 Relative revenue (+)	Share of current turnover accounted for by this relationship.
	2 Relative profit (+)	Share of profit achieved with this relationship (expresses margin).
	3 Fut. financial magnitude (+)	Relative magnitude of future revenues expected with this relationship.
	4 Strategic impact (+)	Importance of this relationship to achieve supplier's strategic goals.
Substitutability	5 Client alternatives (+)	No. of client alternates for achieving these financial and strategic goals.
	6 Sunk costs (-)	Investments made in this relationship that could not be applied to other relationships.
	7 Acquisition and setup costs (-)	Time, cost, and effort that would be needed to acquire alternate clients and again reach an efficient level to compensate for affected goals.
	8 Lost benefits (-)	Benefits from the current relationship that would be lost upon contract termination.
	9 Termination costs (-)	Additional time, effort and financial outlays needed for handling termination of focal and related contracts (e.g., with IT suppliers/staff).
Spillover effects (+)		Expected negative reactions in other exchange relationships with this client caused by a (planned) termination of the focal relationship.

During data analysis, another *unanticipated dimension* emerged that is assumed to influence perceived dependence in the focal relationship: we call this *spillover effects*. Spillover effects are specific in the sense that they result from other exchange relationships between the client and supplier. They represent *potential, undesirable consequences* that a partner might cause in reaction to a (planned) termination of the focal relationship. Even though, for example, a supplier might react negatively within the focal relationship by delaying the process of switching to a competing supplier, the scope for negative reactions

<sup>2</sup> Due to space constraints, not every facet can be described here in detail. Details can be found in Kaiser et al. (2012, 2013).

increases with additional exchange relationships, especially if the partner possesses untapped power potentials in this regard.

## Stage 2 Generation and Validity Assessment of Items

### Generating Items

To capture all essential aspects of the dependence constructs' domains, we generated items that directly reflect the focal constructs, their dimensions, and the underlying facets (MacKenzie et al. 2011). Here we relied on prior literature and statements from expert interviews. The process produced a total of 59 items, as shown in Table 4:

Table 4. Initial Set of Items			
Client Dependence (CDep, 5 items)		Supplier Dependence (SDep, 5 items)	
Importance (CImp)	5 items + 5 items for facets	Importance (SImp)	5 items + 4 items for facets
Substitutability (CSubst)	4 items + 7 items for facets	Substitutability (SSubst)	4 items + 5 items for facets
Spillover (CSpill)	5 items	Spillover (SSpill)	5 items

### Validity of Items

Q-sorting is a widely recognized technique used in IS research to ensure content, convergent, and discriminant validity, by asking domain experts to group items according to their similarity (Petter et al. 2007; Straub et al. 2004). We applied a 2×2 Q-Sort with 12 judges (4 practitioners, 8 researchers) in each round, following procedures set forth by Moore and Benbasat (1991). To avoid bias, judges were not engaged as coders or interviewees in the first stages of our research process. We divided the 12 judges equally into two expert groups, one for client dependence and the other for supplier dependence. To avoid confounding judges with our different aggregation levels, we conducted each round *in two steps*. The first step was dedicated to dimensions and the second step explored the validity of facets. In the first round (step 1) the judges were asked, without being told what the underlying constructs were, to categorize items into groups and to label them (e.g., Moore and Benbasat 1991). Our proposal of three underlying major dimensions (importance, substitutability, spillover effects) was confirmed (in 83% of the cases), although, of course, judges described the categories in their own words. In step 2, the judges were asked to sort the facet items into two categories, importance and substitutability. As a check, we included two very similar but “false” items, which were successfully discovered (in 83% of the cases). In each round, judges had the option to sort out items that were ambiguous or not clearly assignable to one of the provided categories.

	<i>Client</i>						<i>Supplier</i>					
	Item Placement Ratio				Avg. Raw Agreement	Avg. Cohen's Kappa	Item Placement Ratio				Avg. Raw Agreement	Avg. Cohen's Kappa
	CImp	CSubst	CSpill	Avg.			SImp	SSubst	SSpill	Avg.		
R 1.1 Dim.	0.93	0.96	0.97	0.95	0.92	0.87	0.83	0.88	1.00	0.90	0.84	0.77
R 1.2 Facets	0.90	0.98	-	0.93	0.88	0.80	0.97	0.70	-	0.81	0.76	0.60
R2.1 Dim.	0.97	0.96	0.97	0.96	0.96	0.93	0.97	0.92	1.00	0.96	0.94	0.91
R 2.2 Facets	0.93	0.98	-	0.94	0.88	0.80	0.97	0.90	-	0.93	0.86	0.75

To assess construct validity, we used Moore and Benbasat's item placement ratio, which reflects the overall frequency of judges placing items within the intended theoretical constructs. Both raw agreement and Cohen's Kappa were used to assess inter-rater reliability. For the client expert group, the items on the dimension level received an average item placement ratio of 0.95, average raw agreement of 0.92, and average Cohen's Kappa of 0.87 (see Table 5). Sorting of facets resulted in an average placement ratio of 0.93, average raw agreement of 0.88 and average Cohen's Kappa of 0.8. Although the results were acceptable after the first round, we further scrutinized the items – in this case two – that were not sorted into the intended categories more than once and consequently reworded them. This improved the figures in the second sorting round. Items for supplier dependence were analogously assessed and reworded.

### Stage 3 Model Specification

Based on our conceptualizations, we modeled client and supplier dependence as composite latent constructs comprised of three dimensions: importance, substitutability, and spillover effects. Importance and substitutability present themselves as composite constructs of several facets. To decide how to model the relationship between identified facets and their dimensions, we applied Jarvis et al.'s (2003) decision rules, which all call for formative measurement (direction of causality is from items to dimensions; indicators need not to be interchangeable; not necessary for indicators to covary with each other; nomological net for the indicators may differ). Jarvis et al.'s rules also indicate that the dimensions are in turn formative indicators of the second-order focal constructs. Therefore, we treat our (second-order) focal constructs, client and supplier dependence, as functions of their (first-order) dimensions (see, e.g., Polites et al. 2011). To avoid identification problems in models with formative indicators, it is recommended that at least two global reflective indicators of the latent constructs be included (Diamantopoulos 2011; MacKenzie et al. 2011). With the inclusion of (reflective) indicators (see Table 4), the resulting model in Figure 2 shows a complete MIMIC (multiple indicators, multiple causes) structure.

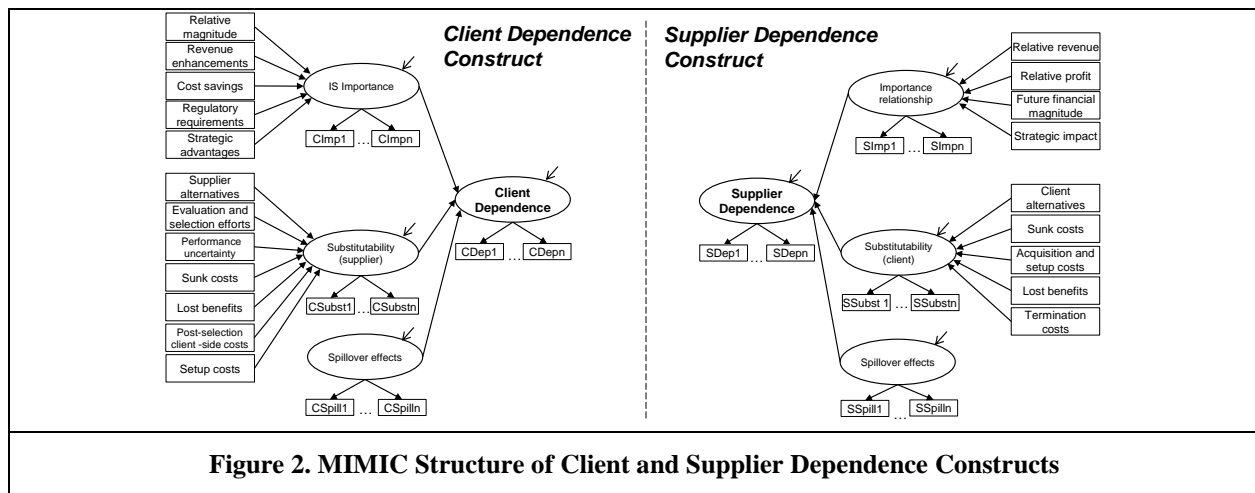


Figure 2. MIMIC Structure of Client and Supplier Dependence Constructs

### Stage 4 Pre-study and Scale Refinement

Personalized invitations for our pre-study were sent via an online social business network to 367 randomly selected IT professionals in client and supplier firms of different sizes. Participation was encouraged by offering a results report and a raffle for a tablet device. Reminder emails were sent two–three weeks later to all non-respondents who had initially indicated interest. A total of 44 completed questionnaires were received, 20 from the client side and 24 from the supplier side, yielding a response rate of 12%. The majority of client participants were supplier managers (45%) and project managers (40%), whereas the suppliers were mainly (key) account managers (38%) and project managers (25%).

The purpose of our pre-study was to (1) ensure the questionnaire’s comprehensibility, (2) conduct preliminary reliability and validity assessments, and (3) shorten scales where appropriate. We included an open question allowing respondents to comment on content, wording, and questionnaire length. We assessed reliability with traditional techniques discussed in the literature: we checked for the unidimensionality of our constructs’ reflective indicators using exploratory factor analyses (EFA); we assessed internal consistency through Cronbach’s alpha (alpha) and corrected item-total correlations (CITC), and we tested for formative indicator redundancy using the variance inflation factor (VIF). Furthermore, Average Variance Extracted (AVE) and Fornell and Larcker’s criterion of discriminant validity was assessed (Fornell and Larcker 1981). We tried to identify candidates for elimination from reflective item pools by analyzing inter-item correlations, CITC, “Cronbach’s alpha if item deleted” statistics, and standard deviation scores (e.g., Sun 2012).

#### Assessment and Purification of Client Dependence Scale

We confirmed unidimensionality for the client dependence scale’s sets of reflective indicators with an EFA (principal axis factoring, promax rotation, extraction based on factors with eigenvalues greater than 1).

The reliability test results exceeded commonly suggested thresholds (alpha 0.7; minimal CITC 0.5): CDep (0.834; 0.609), CSubst (0.931; 0.811) and CSpill (0.900; 0.696). Only the results for importance (CImp) have not yet been sufficient: Cronbach's alpha at 0.668 was slightly below the threshold of 0.7. Hence, we tried to improve the items by rewording to avoid small standard deviations and skewness in the items' distributions (e.g., the ceiling effect).

Although a larger sample is needed to provide final evidence for reflectively measured constructs' validity, two criteria were used to early reveal potential threats to validity. Convergent validity was initially assessed by calculating AVE<sup>3</sup>. Except for CImp (0.448), AVE values of remaining constructs exceeded the critical value of 0.5 (Fornell and Larcker 1981): CDep (0.753), CSubst (0.834) and CSpill (0.761). Furthermore, the square roots of AVE were greater than the respective correlations with other constructs, suggesting discriminant validity according to Fornell and Larcker's criterion (see Appendix, Table 6).

Assessing the formatively measured items, we found that the VIFs for the importance dimension ranged from 1.386 to 2.843, all below the cutoff level of 10 (Diamantopoulos and Winklhofer 2001) and the more conservative level of 3 (Diamantopoulos and Siguaw 2006). At this stage, therefore, there is no indication to remove or change any of the importance facets. However, multicollinearity might arise in our substitutability dimension, as the VIF value for *setup costs for alternative supplier* (item #12) exceeded the cutoff level of 10. An in-depth analysis revealed a high inter-item correlation for evaluations of the two client-side cost facets, *post-selection client side costs* (item #11) and *setup costs for alternative supplier* (item #12). So although they are conceptually distinguishable, it seems unlikely that these two facets are independent in their magnitude. To ensure content validity, we decided to merge these facets and draw them on a higher abstraction level. The final instrument will include one item for the client's total costs and will no longer distinguish between direct and indirect costs. We pre-tested this approach by merging (arithmetic mean) the items' responses in our pre-study sample, with resulting VIF values all below 3.

### **Assessment and Purification of Supplier Dependence Scale**

The supplier dependence scale was assessed analogously, identifying candidates for elimination and, where deemed appropriate, changing the questionnaire. Reduced reflective indicator sets for SDep (0.903; 0.674), SImp (0.852; 0.686), SSubst (0.853; 0.648), and SSpill (0.85; 0.591) met the unidimensionality and reliability criteria. Furthermore, strong indications for convergent validity were found: AVE of all dimensions clearly exceeded the threshold of 0.5: SDep (0.781), SImp (0.799); SSubst (0.695); SSpill (0.680). In addition, a preliminary discriminant validity analysis was also here conducted (Fornell and Larcker 1981). For all constructs, square roots of AVE were greater than the respective correlations with other employed constructs (see Appendix, Table 6). Thus, tentative results of this pre-study equally suggest convergent and discriminant validity of the supplier dependence scale.

Again, we checked the formative indicators of our substitutability and importance dimensions. The VIF values for the formative indicators for importance ranged from 1.233 to 1.515, with no indication of multicollinearity. Formative indicators for substitutability received VIF values from 1.042 to 4.019, slightly exceeding the conservative threshold of 3 but still well below the cutoff value of 10. While this result could be considered satisfactory, we critically analyzed the items and modified them slightly to potentially yield even better results in our main survey.

## **Conclusion**

### ***Main Survey as Final Stage of Scale Development***

While our pre-study was a valuable research step, we will gather a new, larger-sized sample to obtain conclusive empirical proof for the validity and reliability of the developed scales. Final tests will be performed through an online survey directed to IT professionals in client and IT supplier firms. Thus, two separate studies will be launched; the "client study" will have client organizations as the primary source, while the "supplier study" will be sent to supplier firms in the first instance. Reliability and validity tests will be repeated for the new sample; in particular, direction, magnitude, and significance of indicators will

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<sup>3</sup> SmartPLS was used for calculation (Ringle et al. 2005).



be analyzed. The main study will address nomological validity by showing that our measures of focal constructs can be related to other constructs in the expected way (MacKenzie et al. 2011). Furthermore, evaluation of overall model fit (e.g., assessing goodness of fit, model comparisons and model parsimony) is expected to be a central analysis step. The final analysis will also include control variables, such as contract duration, firm size, and type of outsourcing (IS development, maintenance and/or operations).

### **Expected Contributions, Limitations, and Future Research**

Management of client-supplier relationships has recently received increasing attention in IS outsourcing research and practice (e.g., Hirschheim et al. 2008; Kaiser and Buxmann 2012; Oshri et al. 2011). We have focused on a crucial aspect of these dyadic relationships, the dependencies between clients and suppliers. To refine the rather simplistic prevailing view of these dependencies in our field, we applied a plurality of methods to identify, structure, and evaluate their constitutive elements. While reflective and formative measures have different strengths and weaknesses, such as parsimony versus richness and generality versus precision (Barki et al. 2007), misspecification should in any case be avoided (Jarvis et al. 2003). Two dependence dimensions, importance and substitutability, emerged, for which a multiplicative relationship has been theoretically discussed in literature (Bourantas 1989; Pfeffer and Salancik 1978). Moreover, and interestingly, spillover effects emerged as an unexpected dimension. In 70% of our cases on the client side, the client-supplier relationship under consideration was one of several exchange relationships between that client and supplier. Of these clients, 42.9% feared an exploitation of untapped power potentials in their other relationships with the supplier. Even on the supplier side, 56.2% indicated moderate to high levels of potential spillovers (66.7% were nested relationships). If spillover effects are confirmed as a substantial dimension in our main survey, this may serve as an important contribution to general dependence research and can inform related disciplines.

While our proposed client and supplier dependence scales can be used to assess individual firm-level dependencies, they can also be combined to address dependencies on the relationship-level. Two constructs primarily evolved in reference disciplines: relative dependence (i.e., the difference of the individual dependencies) and joint dependence (i.e., the sum of the dependencies) (Casciaro and Piskorski 2005; Gulati and Sytch 2007). The developed client and supplier dependence scales, used either individually or in combination, should be useful for a variety of established and emerging IS themes. For example, they might inform and extend inter-organizational IS studies on relationships and outsourcing success (Gulati and Sytch 2007), innovation generation (Jean et al. 2012) and on influence strategies, adoption, and compliance (Hart and Saunders 1998; Payan and McFarland 2005). Future research might transfer our dyadic dependence conceptualization to complex exchange networks or study intercultural differences. Our findings also have practical relevance, offering client and supplier firms insights into how to influence dependence positions. The facets we have identified provide a basis for fully assessing and monitoring their own and their partner's dependence.

## **Appendix**

<i>Client</i>					<i>Supplier</i>				
Variables	1 CImp	2 CSubst	3 CDep	4 CSpill	Variables	1 SImp	2 SSubst	3 SDep	4 SSpill
1 CImp	<b>0.669</b>				1 SImp	<b>0.894</b>			
2 CSubst	0.346	<b>0.913</b>			2 SSubst	0.718	<b>0.834</b>		
3 CDep	0.515	0.806	<b>0.868</b>		3 SDep	0.876	0.756	<b>0.884</b>	
4 CSpill	0.033	0.333	0.252	<b>0.872</b>	4 SSpill	0.482	0.190	0.383	<b>0.824</b>

Notes: Square root of average variance extracted (diagonal elements) and correlations between reflectively measured constructs (off-diagonal elements)

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