

MANAGING AND MONITORING IT APPLICATION DEVELOPMENT AND MAINTENANCE SUPPLIERS IN A MULTISOURCING CONTEXT

Herz, Thomas Ph., Institute of Information Management, University of St. Gallen (HSG),
Mueller-Friedberg-Strasse 8, 9000 St. Gallen, Switzerland, thomas.herz@unisg.ch

Hamel, Florian, Institute of Information Management, University of St. Gallen (HSG),
Mueller-Friedberg-Strasse 8, 9000 St. Gallen, Switzerland, florian.hamel@unisg.ch

Uebernicket, Falk, Institute of Information Management, University of St. Gallen (HSG),
Mueller-Friedberg-Strasse 8, 9000 St. Gallen, Switzerland, falk.uebernicket@unisg.ch

Brenner, Walter, Institute of Information Management, University of St. Gallen (HSG),
Mueller-Friedberg-Strasse 8, 9000 St. Gallen, Switzerland, walter.brenner@unisg.ch

Abstract

Many international corporations are now adopting multisourcing approaches to information technology (IT). Multisourcing is described as the blending of services from multiple company-internal – such as captive offshore centers – and company-external suppliers, and is primarily concerned with the relationship between the client organization and the suppliers. To date, aspects relating to performance measurement and governance have scarcely been covered in the IT outsourcing literature and established IT frameworks such as COBIT or ITIL provide only imprecise approaches for monitoring suppliers. With this research study, we intend to sharpen the existing understanding of how corporations manage and monitor suppliers in a multisourcing environment. We provide insights into a real-life example of monitoring IT application development and maintenance (ADM) suppliers and suggest a framework with corresponding key performance indicators (KPIs). This article aims to contribute to the existing body of knowledge in three ways. First, it describes established frameworks that are applied when monitoring suppliers; second, it presents insights into a real-life example of monitoring multiple IT ADM suppliers across various business entities in a leading financial services provider; and third, it proposes a framework and corresponding IT ADM KPIs. This research study is also expected to help corporations facing similar challenges by providing a best practice framework with definite KPIs.

Keywords: IT outsourcing; multisourcing; performance measurement; KPIs; ADM; case study.

1 INTRODUCTION

The market researcher International Data Corporation (IDC) estimated the global information technology (IT) outsourcing market to be worth USD 114.6 billion in 2009, and it is anticipated to reach USD 131.3 billion in 2013 (Tapper, 2009). Lately, it can be observed that IT mega-deals – IT outsourcing deals with a volume greater than USD one billion – conducted using a sole-sourcing approach have become less frequent and that companies have moved towards a more selective IT outsourcing approach by multisourcing. In this context, the sourcing advisory firm Technology Partners International (TPI) found that, whilst mega-deals have decreased in both size and prevalence, the number of IT outsourcing deals being signed has increased (Huber, 2008; Mayo et al., 2010).

In 2005, the concept of multisourcing was first introduced by the market research company Gartner (Cohen & Young, 2006). Gartner describe multisourcing as the blending of services from multiple company-internal (such as captive offshore centers) and company-external suppliers (Cohen & Young, 2006). Multisourcing is mainly concerned with the relationship between the client organization and the suppliers (Levina & Su, 2008). In addition to Gartner, Forrester Research has also contributed to the practitioner-related literature on multisourcing (see inter alia Davis, 2010).

While the practitioner-related and scholarly literature have both identified multisourcing as an emerging key strategy in today's IT outsourcing endeavors (Bapna et al., 2010; Cohen & Young, 2006; Davis, 2010; Janischowsky & Schonenbach, 2009; Levina & Su, 2008; Oshri et al., 2009), there has been very little scholarly recognition of its importance. Bapna et al. (2010) stress that “linear extensions of dyadic client-vendor IT outsourcing relationships are insufficient to capture the nuances of the multisourced environment.”

According to Dibbern et al. (2004), companies are confronted with five major issues concerning IT outsourcing: (1) why to outsource; (2) what to outsource; (3) what decision-making process to take; (4) how to implement the sourcing decision; and (5) what the outcome of the sourcing decision will be. While the first three questions have been addressed intensively, the issues regarding implementation and outcomes require further research. The performance measurement and governance-related aspects of IT outsourcing decisions are scarcely covered, in spite of their relevance (Busi & McIvor, 2008; Clark et al., 1995; Davis, 1996; Dibbern et al., 2004; Gottschalk & Solli-Sæther, 2005; Klepper, 1995; McFarlan & Nolan, 1995; Weimer & Seuring, 2009; Willcocks & Choi, 1995). The majority of the current research studies address dyadic IT outsourcing relationships or investigate performance measurement approaches that are focused solely on internal IT departments (see inter alia Van Grembergen & Saull, 2001 regarding IT balanced scorecard (BSC)), and very little experience-based research has investigated how corporations manage and monitor suppliers in a multisourcing context. Expert interviews with senior IT sourcing/controlling managers and senior management consultants have indicated that managing and monitoring suppliers is of great practical relevance and that practitioners face several challenges. One further finding from the expert interviews was that numerous IT frameworks such as COBIT, VAL IT and ITIL (ITGI, 2007; ITGI, 2008; OGC, 2007) or effort estimation methods such as COCOMO (Boehm, 1981) and function point analysis (Albrecht, 1979) provide a number of KPIs. However, on the other hand, it seems that these KPIs are either very limited in terms of one aspect such as effort estimation (see, for example, COCOMO) or that the number of monitoring KPIs is far too extensive (see, for example, COBIT) to implement when managing and monitoring suppliers. Furthermore, the specific requirements of monitoring suppliers in a multisourcing context are not being met and no standard set of KPIs is accepted across the organizational units that are responsible for managing and monitoring suppliers. This is also supported by statements made by practitioners during expert interviews.

There are numerous KPIs available – loosely listed or comprised in frameworks – and we have already implemented some, and yet we are still missing recommendations regarding which essential ones should be considered.

With this research study, we intend to sharpen the current understanding of how corporations manage and monitor suppliers in a multisourced environment. Therefore, we have defined one overarching research question with three detailed sub-research questions: *How do large corporations monitor suppliers in a multisourcing context?*

- [RQ. 1] *What dimensions are relevant?*
- [RQ. 2] *Why are these particular dimensions relevant?*
- [RQ. 3] *What minimum set of standard KPIs could be applied?*

In order to answer these research questions, we conducted a qualitative case study (Yin, 2003) in order to investigate the multisourcing relationships of a leading global financial services provider (hereafter referred to as organization A). We chose organization A because financial services providers have been at the forefront of outsourcing and offshoring both IT and business processes (Levina & Su, 2008), and because of the organizational setup of organization A – a business group approach with decentralized IT and federal governance.

Grover et al. (1996) differentiated five information systems (IS) functions in IT outsourcing – applications development and maintenance (ADM), systems operations, telecommunications, end-user support and systems planning and management. These functions can be sourced from a company-internal or company-external supplier. In order to provide a set of practice-oriented KPIs while abstracting the relevant dimensions, we limited our research to one specific category of outsourcing relationships, namely ADM. This decision is justified, as the IS function ADM is mainly project-driven in contrast to infrastructure operations (Beulen et al., 2005), and therefore possesses different characteristics (see inter alia Beulen et al., 2005). One expert argued analogously during the interview:

Monitoring aspects of project-related outsourcing endeavors should be considered separately from those of infrastructure outsourcing.

This article aims to contribute to the research on IT outsourcing in general and the monitoring of IT ADM suppliers in a multisourcing context in particular in three ways. First, it describes established frameworks that comprise KPIs that are applied when monitoring suppliers. Second, it provides detailed insights into a real-life example of multisourcing and monitoring IT ADM suppliers within the context of a leading financial services provider; and third, it proposes a framework and corresponding IT ADM KPIs for monitoring suppliers in a multisourcing context. This research is also expected to help corporations facing similar challenges and thereby targets the practical demand observed throughout the expert interviews. The proposed framework and the suggested IT ADM KPIs can be adopted as a “best-practice” framework for any company-specific IT ADM situation.

The remainder of this paper consists of six sections. Section two outlines the research method. Section three provides an overview of the fundamental terms which are used. Section four exhibits the case of organization A. Section five reveals the main case study findings. In section six, we propose a monitoring framework with corresponding KPIs before we conclude in section seven.

2 RESEARCH METHODOLOGY

In order to answer the three research questions, we chose a three-step research method. First, we interviewed experts in order to identify the relevance of the topic, and second, we conducted a case study in order to investigate a real-life example of monitoring IT ADM suppliers in a multisourcing context. Based on these findings, we finally synthesized and proposed a framework with corresponding KPIs for monitoring IT ADM suppliers. This framework has been evaluated over two evaluation cycles.

2.1 Expert interviews

We conducted expert interviews with five experts both from management consultant firms and a financial services provider. Each interview lasted for between 30 minutes and one hour and was carried out during the summer of 2010. For the interviews, we used a semi-structured interview questionnaire and all of the interviews were transcribed (Yin, 2003). The aim of the expert interviews was to identify the specific requirements of practitioners (the relevance of research questions) and to identify approaches that are applied in order to manage and monitor IT ADM suppliers. The experts were chosen based on their particular experience in the IT outsourcing and IT performance management domains.

Expert	Role	Company	Experience
1	Senior management consultant	Management consultant firm X	IT strategy, IT governance, IT sourcing, IT performance management
2	Senior management consultant	Management consultant firm Y	IT strategy, IT organization, IT sourcing, IT shared service centers
3	Senior management consultant	Management consultant firm Z	IT strategy, IT governance, IT sourcing (especially offshoring)
4	Multisourcing project manager	Financial services provider A	IT and operations (especially sourcing and offshoring)
5	Senior IT controlling manager	Financial services provider A	IT (especially ADM) and operations

Table 1: Overview of expert interviews

2.2 Multiple case study approach

In order to gather in-depth data on how an international corporation manages and monitors suppliers in a multisourcing context, we conducted a multiple case study in accordance with the guidelines set down by Yin (2003). Case studies are used to investigate complex phenomena (such as multisourcing) and are an established research design for qualitative research in IS (Benbasat et al., 1987; Palvia et al., 2007). In addition, explorative case studies are described as being an appropriate research method for theory-building (Eisenhardt, 1989). In accordance with Eisenhardt (1989) – who recommends using four to seven cases – we conducted a multiple case study of organization A encompassing seven independent business entities, with each business entity representing one individual case. The unit of analysis was the approach used by each individual business entity to monitor IT ADM suppliers in a multisourcing context (Yin, 2003).

Organization A – a leading global financial services provider – was selected because of the complexity of its multisourcing and the enormous number of business entities involved in the business group structure (Hodgkinson, 1996). Levina and Su (2008) argue that financial services providers tend to be more proactive in outsourcing and offshoring IT and business processes. In order to gather detailed information about the approaches to monitoring used by organization A, we conducted multiple interviews with representatives of seven independent business entities in organization A. We selected business entities from different regions of the world (Europe, America and Asia) that focus on diverse lines of business (insurance and banking). The data collection process was carried out over a two-month period in the fall of 2010. Each interview lasted for between one and two hours. The interview guidelines were based on the expert interviews conducted in the summer of 2010 and were comprised of general questions on the multisourcing approach used by the business entities as well as specific questions on managing and monitoring suppliers. For the purposes of data collection and analysis, the guidelines suggested by Glaser & Strauss (1967) were adopted. Thus, we intertwined data collection and analysis by developing the interview guidelines based on previous interviews (theoretical sampling). For data analyses, we applied open coding (Corbin & Strauss, 1990). As well as the interview transcripts, we were granted access to key documents describing the monitoring approach

and the KPIs which were applied. This enabled the use of triangulation (Brusoni & Prencipe, 2006; Denzin, 2009).

2.3 Synthesis and evaluation

Based on the findings from the cases, we proposed a framework and corresponding KPIs for monitoring IT ADM multisourcing suppliers. In this context, we derived six dimensions that we recommend covering in order to monitor IT ADM suppliers. For each dimension, we have proposed KPIs to quantify supplier performance. The proposed framework and corresponding KPIs have been refined in two evaluation cycles (please refer to Table 2). First, we compared the findings with the existing literature (please refer to section 3.2) in order to complement the proposition. Second, in the context of three expert workshops, we evaluated the framework and corresponding KPIs with representatives of two IT ADM outsourcing providers as well as consultants specializing in IT performance management.

Evaluation cycle	Evaluation	Sources/experts
1	Evaluation with existing literature	(Albrecht, 1979; Boehm, 1981; ITGI, 2007; ITGI, 2008; OGC, 2007; SEI, 2010)
2a	Expert workshop 1	Representatives of global ADM outsourcing provider
2b	Expert workshop 2	Representatives of India-based ADM outsourcing provider
2c	Expert workshop 3	Representatives of consulting firm specializing in IT performance management

Table 2: Overview of evaluation cycles

3 FOUNDATION AND RELATED RESEARCH

In any field of research, it is important for there to be a common understanding of the basic terms. For this reason, Zorn & Campbell (2006) suggest providing key terms. Based on a literature review, we have provided an introduction to multisourcing, a definition of ADM and an overview of frameworks that are used for monitoring suppliers.

3.1 IT ADM in a multisourcing context

While the basic concept of multiple suppliers is not new (see inter alia Porter, 1985) and focuses on economies of scale, the concept of multisourcing – which focuses on services rather than on goods – is beyond the scope of economies of scale and is concerned mainly with the relationship between the client organization and the suppliers (Levina & Su, 2008). The definition of the multisourcing concept comprises the utilization of services from multiple company-internal (such as captive offshore centers) and company-external suppliers (Cohen & Young, 2006).

The main driver behind the emergence of multisourcing strategies has been companies' increased need for cost efficiency, flexibility and quality in a dynamic and global business environment (Levina & Su, 2008). When applying a multisourcing strategy, companies face both opportunities and threats. On the one hand, companies gain flexibility and quality, foster competition between suppliers and thereby mitigate risks or reduce costs (Cross, 1995; Lacity & Willcocks, 1998; McMillan, 1990; Porter, 1985; Richardson, 1993). On the other hand, multisourcing may require the operational model to be adapted, sets high prerequisites for managerial capabilities and entails extensive requirements in terms of governance and performance measurement (Bapna et al., 2010; Cohen & Young, 2006; Levina & Su, 2008).

According to Grover et al. (1996) IT ADM encompasses “systems analysis, design, and construction of application software and the accompanying software maintenance.” It is mainly project-related and requires a high degree of interaction (Beulen et al., 2005; Faraj & Sproull, 2000). In contrast,

infrastructure operations – which include systems operations, telecommunications and end-user support – can be described as a continuous service (Beulen et al., 2005; Grover et al., 1996). Beulen et al. (2005) describe infrastructure operations “as preventative and remedial services that physically repair or optimize computing and communications hardware.” In ADM, the high degree of interaction combined with the management and monitoring of suppliers requires significant managerial capabilities and comprises one of the major challenges in multisourcing. Thereby, IT ADM can be further differentiated into application development (AD) and application maintenance (AM) (see inter alia Dibbern, 2004).

3.2 Monitoring suppliers

By way of example, Clark et al. (1995) stated that “the truly critical success factors associated with successful outsourcing are those associated with vendor governance.” This statement is in line with the findings of Gottschalk & Solli-Sæther (2005), that continuous governance and performance measurement are highly relevant for IT outsourcing success. This notion is also supported by other researchers (see inter alia Busi & McIvor, 2008 or Weimer & Seuring, 2009). Research on contractual governance (see inter alia Poppo & Zenger, 2002 or Goo et al., 2009) and strategic alliances (see inter alia McFarlan & Nolan, 1995 or Lee et al., 2009) has, to some extent, targeted the relationship between client organizations and suppliers; however, very little experience-based research has investigated how corporations manage and monitor suppliers in a multisourcing context in general and with regard to IT ADM suppliers in particular.

Based on expert interviews, we identified six IT frameworks that are applied in order to monitor IT ADM suppliers (please refer to Table 3). The selection criteria for these frameworks were scientific acknowledgement and practical relevance. In terms of scientific acknowledgement, frameworks that have been published in academic IS journals and frequently cited were considered for analysis. Practical relevance was based on the frameworks’ adoption by practitioners. In the following, we describe the frameworks that were analyzed according to the dimensions of origin, scope and number/focus of KPIs.

Framework	COBIT 4.1	VAL IT 2.0	ITIL V3	CMMI-DEV	COCOMO	Function point analysis
Origin	ITGI (2007)	ITGI (2008)	OGC (2007)	SEI (2010)	Boehm (1981)	Albrecht (1979)
Scope	Best-practice framework encompassing 34 IT processes and corresponding control objectives	Framework, that enables the creation of business value from IT-enabled investments	Best-practice framework for IT services	Reference model; primarily applied in software development	Algorithmic software cost estimation model	Size-based software cost estimation model
KPIs	Numerous KPIs for 34 IT processes	Numerous KPIs for three VAL IT domains	Numerous KPIs for five ITIL dimensions	KPIs not specified	KPIs not specified – model as basis for KPIs	KPIs not specified – model as basis for KPIs

Table 3: Overview of frameworks

Our analysis of these frameworks suggests that they are either limited with regard to one certain aspect (particularly cost estimation) or are far too extensive (large number of KPIs). The findings of the analysis indicate that COBIT, VAL IT and ITIL provide numerous KPIs for various dimensions but that they do not recommend a specific set of KPIs that should be adopted in order to monitor suppliers in IT ADM. COCOMO and function point analysis are particularly dedicated to software engineering; however, on the one hand, they provide only a mathematical model and, on the other hand, they are

focused solely on effort estimation. These findings indicate a gap in the existing body of knowledge that we intend to target with this research study. Therefore, we applied the principles of the BSC concept as suggested by Kaplan & Norton (1996) and by Van Grembergen & Saull (2001), who transferred the BSC concept to the IS function and derived an IT BSC. In particular, we adopted the claim that there are a finite number of KPIs and a balanced set of dimensions while not limiting our view of the financial aspects. While the BSC and the IT BSC are limited to company-internal performance management, we extended the concept to include the relationship between a client organization and external suppliers and followed the claim of Weimer & Seuring (2009) that the concept can be applied to governing and controlling suppliers.

4 CASE BACKGROUND

Organization A is one of the world’s leading financial services providers. It can best be described as a multinational business group with a group center and numerous, legally independent business entities which the group center manages. The group center at organization A does not assume any operational responsibility like frequently prevalent in business group organizations (Hodgkinson, 1996). With regard to IS functions, organization A is characterized by a decentralized organizational approach, with both a group chief information officer (CIO) and local CIOs for the individual business entities, as well as a federal model of IT governance.

In terms of sourcing IT ADM, organization A follows a group-wide multisourcing strategy. With a limited number of global external suppliers, organization A entered into a group-wide framework agreement with regard to ADM services. In addition, the business entities also source from specialized local suppliers and from the groups’ captive offshore center in Asia. Each business entity can decide upon its sourcing activities and therefore possesses an individual set of suppliers. Figure 1 illustrates the division of supplier monitoring activities between the group center and the various business entities. Within this system, strategic monitoring – of volume, sourcing and shoring ratios – is accomplished by a central multisourcing unit at the group center, while, the operational monitoring of multisourcing suppliers – focusing mainly on IT ADM KPIs – is carried out by the business entities.

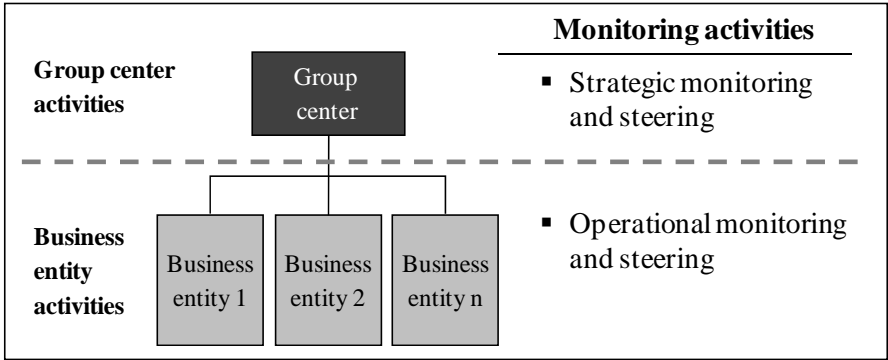


Figure 1. Division of supplier monitoring activities within organization A

5 CASE ANALYSIS

For the purposes of this research study, we analyzed the operational monitoring and steering which occurs within organization A at the business entity level, as these monitoring activities are specifically dedicated to IT ADM. Table 4 illustrates how the different business entities approach supplier monitoring. The matrix summarizes the observed KPIs (on the vertical axis) and maps them to each of the analyzed cases (on the horizontal axis). We identified a total of 47 KPIs. For illustrative reasons, Table 4 is limited to those KPIs that are applied in at least 50 percent of the investigated cases. In

order to avoid redundancies, we aggregated similar KPIs under one term that is stated in the first column of Table 4. In the second column, we provide a short description of the KPIs. In many cases, we observed that the business entities applied different terms for the same or similar KPIs. This has been confirmed throughout the case study interviews by most of the interviewees:

[Within organization A] there is no common set of KPIs ready to use in order to manage and monitor suppliers across the group in a common way.

Four KPIs were encountered across all seven cases, namely *time compliance*, *budget compliance*, *customer satisfaction* and *availability of applications*, while *functional compliance* was applied six times. These KPIs were also named during the evaluation as KPIs which an organization “must have”:

Time, budget, function and availability are absolute standard KPIs you must adopt while monitoring ADM suppliers. In addition, you should gather feedback directly from customers.

Within organization A, we found that the distinction between incident and problem management as suggested by, for example, ITIL (OGC, 2007) was not adopted properly across the group. This indicates that business entities within large, multinational corporations with a decentralized IT organization can be at different levels of maturity in terms of adopting IT standards. One interviewee stated:

For reasons of simplification we do not differentiate between incident and problem management; we use the terms synonymously.

KPI	Description	Case						
		A	B	C	D	E	F	G
Time compliance ratio	Deviation from project milestones	x	x	x	x	x	x	x
Budget compliance ratio	Deviation from budget	x	x	x	x	x	x	x
Satisfaction index	Customer satisfaction according to pre-defined questions	x	x	x	x	x	x	x
Availability of application	Deviation of availability from appointed availability	x	x	x	x	x	x	x
Functional compliance ratio	Project delivered within scope	x	x		x	x	x	x
Defect removal index	Defects found prior to specific development phase	x	x		x		x	x
Incident resolution time	Incident resolution time within service level agreement (SLA)	x	x	x		x	x	
Incident response time	Incident response time within SLA	x	x	x		x	x	
Incidents per severity level	Total number of incidents per severity level		x		x	x	x	x
Defect density	Number of defects per development effort		x		x		x	x
Defect distribution	Number of defects by development phase		x		x		x	x
Attrition rate	Rolling year attrition rate	x	x			x	x	
...	...							

Table 4. Overview of cases and list of applied KPIs (for illustrative reasons in extracts only)

6 PROPOSITION OF A FRAMEWORK AND RELATED IT ADM KPIS

In the following section, we propose a framework with corresponding IT ADM KPIs for a client organization wishing to monitor IT ADM suppliers. An earlier version has been verified in a first evaluation cycle against the literature and specifically against the existing frameworks as described in chapter 3.2. In a second evaluation cycle, encompassing three expert workshops, we redefined the framework with IT ADM outsourcing providers and consultants specializing in IT performance management. Based on these data, we derived a framework encompassing six dimensions which should be covered when monitoring IT ADM multisourcing suppliers and thereby targeted the research questions: *[RQ.1] What dimensions are relevant?* and *[RQ.2] Why are these particular dimensions relevant?*

- *Time*: This dimension and the related KPIs cover aspects relating to time and responsiveness. Based on the interviews, we found that the IS function ADM is project-driven and steered (for example) by project milestones and deviations from the same. This dimension can be, for example, applied in order to penalize suppliers when they fail to meet the agreed deadlines.
- *Quality*: The quality of IT ADM work is primarily measured by defects (in AD) as well as incidents and problems (in AM). When outsourcing IT ADM work to a multitude of suppliers, quality monitoring has been named as a crucial dimension, and KPIs are also applied in order to penalize suppliers when quality-related objectives are not met.
- *Efficiency*: As outsourcing IT ADM work to multiple suppliers results in a loss of direct control over the efficiency of the processes, this dimension is key to appraising the work of suppliers and interrelating it to other dimensions such as time and budget.
- *Monetary*: All of the cases indicated that the monetary dimension is critical when monitoring and comparing multiple suppliers. Interviewees stated that ADM projects frequently run out of money and for this reason it is inevitable that budget compliance will be monitored constantly.
- *People*: When outsourcing, a client organization is advised to monitor the attrition rate of the external suppliers, as this is one of the key success factors for outsourcing IT ADM work according to Rajkumar & Mani (2001). In particular, offshore IT ADM suppliers tend to have higher attrition rates, resulting in a potential loss of knowledge.
- *Customer*: In the context of outsourcing IT ADM work to multiple suppliers, the sourcing unit – which may be, for example, responsible for supplier pre-selection or contract negotiations – has only limited insights into the actual service delivery of the IT ADM work packages, the daily collaboration between suppliers and the concrete satisfaction of the end-customer with the realization of the IT ADM work. For this reason, it is advisable to consider the customer's perceptions of suppliers.

Category Dimension	AD	AM
Time	Time compliance ratio	Incident response time Incident resolution time First-time incident resolution rate Problem resolution time
Quality	Functional compliance ratio Defect removal index Defect density Defect distribution	Availability of applications Incidents per severity level Recurring incidents Problems per severity level Incidents per problem ratio
Efficiency	Function points per person day	Backlog index
Monetary	Budget compliance ratio	
Customer	Satisfaction index	
People	Attrition rate	

Table 5. Framework and corresponding KPIs for monitoring IT ADM suppliers

In order to answer research question 3: [RQ. 3] *What minimum set of standard KPIs could be applied?* we proposed selected KPIs and mapped them onto the six dimensions, resulting in a monitoring framework (please refer to Table 5). On the vertical axis, we have illustrated the dimensions and on the horizontal axis, we have separated KPIs dedicated to *application development (AD)* and *application maintenance (AM)*, and introduced an overarching category named *application development/maintenance (AD/AM)* for KPIs which apply to both categories (i.e., monetary, customer and people). The derived matrix encompasses the identified minimum set of IT ADM KPIs which are recommend for monitoring suppliers.

According to Weimer & Seuring (2009), the BSC concept put forward by Kaplan & Norton (1996) can be adopted for governing and controlling suppliers. Thereby, one requirement is to apply different dimensions while not limiting the view of financial aspects or limiting the number of KPIs (Weimer & Seuring, 2009). The framework addresses these requirements by proposing six supplementary dimensions and focusing solely on essential KPIs that have been grounded in practice and validated with theory and by IT ADM performance measurement experts.

In addition to its theoretical contribution, this research study is also expected to provide support for corporations. For example, we suggest integrating activities for monitoring multiple suppliers across different business entities. This could be achieved by a central body being responsible for defining/adjusting standard KPIs. This would ensure comparability between the suppliers and business entities and would enable the client organization to benchmark suppliers. One interviewee claimed:

Group standard KPIs and resulting benchmarks would help to manage our multiple suppliers both on business entity level as well as group level across the entire organization. However, we do not have a central role in charge of this task.

The KPIs would give such a central role a head-start when defining standard KPIs for monitoring IT ADM suppliers (practical contribution). Further findings of our case study indicate that incident- and problem-related KPIs should be differentiated, as suggested by the ITIL framework (OGC, 2007) which has not been adopted by organization A across the group on a standardized basis.

Furthermore, our analysis reveals that the listed KPIs are specific to the IS function ADM, as this function is project-driven and person-intensive. In terms of the specifics of the industry, we propose that the IT ADM KPIs we observed are industry-independent; however, the case data provided by organization A – being a financial services provider – do not allow for further analysis.

7 CONCLUSION AND FURTHER RESEARCH

Based on the findings of seven case studies and two evaluation cycles, we have proposed a framework and related KPIs for monitoring IT ADM suppliers in a multisourcing context. We derived six dimensions that we suggest should be covered when monitoring suppliers. With this, our proposition is in line with the principles of the BSC concept, and we have extended this concept to include the relationship between a client organization and multiple external IT ADM suppliers by providing a minimum set of KPIs. By proposing and analyzing the six dimensions, we aimed to answer research question 1: *[RQ. 1] What dimensions are relevant?* and research question 2: *[RQ. 2] Why are these particular dimensions relevant?* Furthermore, by providing distinct KPIs, we aimed to answer research question 3: *[RQ. 3] What minimum set of standard KPIs could be applied?* In addition to its theoretical contribution, this research study is also expected to be useful for corporations facing similar challenges like organization A. The framework and the distinct KPIs are ready to implement and would provide any organization with a set of best practice KPIs.

However, this study is also beset with limitations. The authors described and analyzed seven case studies, and yet all of them were based on organization A. In order to further validate the findings and to extend this research strand, the authors suggest expanding it to include different industries and to reflect the findings of this study. Furthermore, it might be interesting to expand the methodology of this research study to the other IS functions described by Grover et al. (1996) and to compare the results or investigate the potential interactions between each of them. In addition, future research could compare and contrast the results of this study with the results of the traditional IT outsourcing activities of organization A or analyze how an organization selects a specific set of KPIs in terms of processes and selection criteria.

References

- Albrecht, A.J. (1979). Measuring Application Development Productivity. Proceedings of the Joint SHARE, GUIDE, and IBM Application Development Symposium, IBM Corporation, Monterey, CA.
- Bapna, R., Barua, A., Mani, D., and Mehra, A. (2010). Cooperation, Coordination, and Governance in Multisourcing: An Agenda for Analytical and Empirical Research. *Information Systems Research*, 21 (4), 785-795.
- Benbasat, I., Goldstein, D.K., and Mead, M. (1987). The Case Research Strategy in Studies of Information-Systems. *MIS Quarterly*, 11 (3), 369-386.
- Beulen, E., Fenema, P.V., and Currie, W. (2005). From Application Outsourcing to Infrastructure Management: Extending the Offshore Outsourcing Service Portfolio. *European Management Journal*, 23 (2), 133-144.
- Boehm, B.W. (1981). *Software Engineering Economics*. Prentice-Hall, Upper Saddle River, NJ.
- Brusoni, S., and Prencipe, A. (2006). Making Design Rules: A Multidomain Perspective. *Organization Science*, 17 (2), 179-189.
- Busi, M., and McIvor, R. (2008). Setting the Outsourcing Research Agenda: The Top-10 Most Urgent Outsourcing Areas. *Strategic Outsourcing: An International Journal*, 1 (3), 185-197.
- Clark, T.D., Zmud, R.W., and McCray, G.E. (1995). The Outsourcing of Information Services: Transforming the Nature of Business in the Information Industry. *Journal of Information Technology*, 10 (4), 221-237.
- Cohen, L.R., and Young, A. (2006). *Multisourcing: Moving Beyond Outsourcing to Achieve Growth and Agility*. Harvard Business School Press, Boston, MA.
- Corbin, J.M., and Strauss, A.L. (1990). Grounded Theory Research: Procedures, Canons and Evaluative Criteria. *Qualitative Sociology*, 13 (1), 3-21.
- Cross, J. (1995). IT Outsourcing: British Petroleum's Competitive Approach. *Harvard Business Review*, 73 (3), 94-102.
- Davis, E. (2010). *The 10 Steps To Multisourcing Successfully*. Forrester Research, Cambridge, MA.
- Davis, K.J. (1996). *IT Outsourcing Relationships: An Exploratory Study of Interorganizational Control Mechanisms*. Harvard University, Boston, MA.
- Denzin, N. (2009). *The Research Act: A Theoretical Introduction to Sociological Methods*. Transaction Publishers, Piscataway, NJ.
- Dibbern, J. (2004). The Sourcing of Application Software Services: Empirical Evidence of Cultural, Industry and Functional Differences. *Physica-Verlag, Heidelberg*.
- Dibbern, J., Goles, T., Hirschheim, R., and Jayatilaka, B. (2004). Information Systems Outsourcing: A Survey and Analysis of the Literature. *The DATA BASE for Advances in Information Systems*, 35 (4), 6-102.
- Eisenhardt, K.M. (1989). Building Theories from Case-Study Research. *Academy of Management Review*, 14 (4), 532-550.
- Faraj, S., and Sproull, L. (2000). Coordinating Expertise in Software Development Teams. *Management Science*, 46 (12), 1154-1568.
- Glaser, B.G., and Strauss, A.L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine Publishing Company, Chicago, IL.
- Goo, J., Kishore, R., Rao, H.R., and Nam, K. (2009). The Role of Service Level Agreement in Relational Management of Information Technology Outsourcing: An Empirical Study. *MIS Quarterly*, 33 (1), 119-145.
- Gottschalk, P., and Solli-Sæther, H. (2005). Critical Success Factors from IT Outsourcing Theories: An Empirical Study. *Industrial Management & Data Systems*, 105 (6), 685-702.
- Grover, V., Cheon, M.J., and Teng, J.T.C. (1996). The Effect of Service Quality and Partnership on the Outsourcing of Information Systems Functions. *Journal of Management Information Systems*, 12 (4), 89-116.
- Hodgkinson, S.L. (1996). The Role of the Corporate IT Function in the Federal IT Organization. In: *Information Management: The Organization Dimension*, M.J. Earl (ed.), Oxford University Press, Oxford, 247-269.

- Huber, B. (2008). Agile Multi-Sourcing: A Critical Business Trend – Concepts and Background. Technology Partners International, Houston, TX.
- ITGI (2007). COBIT 4.1. IT Governance Institute, Rolling Meadows, IL.
- ITGI (2008). The Val IT Framework 2.0. IT Governance Institute, Rolling Meadows, IL.
- Janischowsky, B., and Schonenbach, R. (2009). Getting Multisourcing Right! Sovereign Publications, London.
- Kaplan, R.S., and Norton, D.P. (1996). The Balanced Scorecard. Harvard Business School Press, Boston, MA.
- Klepper, R. (1995). The Management of Partnering Development in I/S Outsourcing. *Journal of Information Technology*, 10 (4), 249-258.
- Lacity, M.C., and Willcocks, L.P. (1998). An Empirical Investigation of Information Technology Sourcing Practices: Lessons from Experience. *MIS Quarterly*, 22 (3), 363-340.
- Lee, J.-N., Heng, C.S., and Lee, J. (2009). Multi-Vendor Outsourcing: Relational Structures and Organizational Learning From a Social Relation Perspective. *Proceedings of the 30th International Conference on Information Systems*, Phoenix, Arizona.
- Levina, N., and Su, N. (2008). Global Multisourcing Strategy: The Emergence of a Supplier Portfolio in Services Offshoring. *Decision Sciences*, 39 (3), 541-570.
- Mayo, M., Lang, T., and Aitchison, D. (2010). The TPI Index – An Informed View of the State of the Global Commercial Outsourcing Market Fourth Quarter and Full Year of 2009. Technology Partners International, Houston, TX.
- McFarlan, F.W., and Nolan, R.L. (1995). How to Manage an IT Outsourcing Alliance. *Sloan Management Review*, 36 (2), 9-23.
- McMillan, J. (1990). Managing Suppliers: Incentive Systems in Japanese and U.S. Industry. *California Management Review*, 32 (4), 38-55.
- OGC (2007). The Official Introduction to the ITIL Service Lifecycle. The Stationery Office, Norwich.
- Oshri, I., Kotlarsky, J., Rottman, J.W., and Willcocks, L.L. (2009). Global Sourcing: Recent Trends and Issues. *Information Technology & People*, 22 (3), 192-200.
- Palvia, P., Pinjani, P., and Sibley, E.H. (2007). A Profile of Information Systems Research Published in Information & Management. *Information & Management*, 44 (1), 1-11.
- Poppo, L., and Zenger, T. (2002). Do Formal Contracts and Relational Governance Function as Substitutes or Complements? *Strategic Management Journal*, 23 (8), 707-725.
- Porter, M.E. (1985). *Competitive Advantage*. Free Press, New York.
- Rajkumar, T.M., and Mani, R.V.S. (2001). Offshore Software Development. *Information Systems Management*, 18 (2), 63-74.
- Richardson, J. (1993). Parallel Sourcing and Supplier Performance in the Japanese Automobile Industry. *Strategic Management Journal*, 14 (5), 339-350.
- SEI (2010). CMMI for Development, Version 1.3. Software Engineering Institute, Carnegie Mellon University, Pittsburgh, PA.
- Tapper, D. (2009). Worldwide and U.S. IS Outsourcing Services 2009-2013 Forecast Update: November 2009. International Data Corporation (IDC), Framingham, MA.
- Van Grembergen, W., and Saull, R. (2001). Aligning Business and Information Technology through the Balanced Scorecard at a Major Canadian Financial Group: Its Status Measured with an IT BSC Maturity Model. *Proceedings of the 34th Hawaii International Conference on System Sciences (HICSS)*, Hawaii.
- Weimer, G., and Seuring, S. (2009). Performance Measurement in Business Process Outsourcing Decisions Insights from Four Case Studies. *Strategic Outsourcing: An International Journal*, 2 (3), 275-292.
- Willcocks, L., and Choi, C.J. (1995). Co-operative Partnership and ‘Total’ IT Outsourcing: From Contractual Obligation to Strategic Alliance? *European Management Journal*, 13 (1), 67-78.
- Yin, R.K. (2003). *Applications of Case Study Research*. Sage, London.
- Zorn, T., and Campbell, N. (2006). Improving the Writing of Literature Reviews Through a Literature Integration Exercise. *Business Communication Quarterly*, 69 (2), 172-183.