

# Succeeding in Application Services Outsourcing Strategies: A Perspective of Internal Configuration

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## Abbreviations

ACIS	Australasian Conference on Information Systems
AIS	Accounting Information Systems
AMCIS	Americas Conference on Information Systems
AM	Application Management
APM	Application Portfolio Management
ASO	Application Services Outsourcing
BIT	Banking and Information Technology
CC IIM	Competence Centre Integrated Information Management
DSR	Design Science Research
ECIS	European Conference of Information Systems
EDS	Electronic Data Systems
e.g.	exempli gratia (for example)
et al.	et alii (and others)
HSG	Official abbreviation for University of St.Gallen
HICSS	Hawaii International Conference on System Science
IT	Information Technology
ITO	Information Technology Outsourcing
IS	Information System(s)
RQ	Research Question
SaaS	Software as a Service





## Abstract

Although information technology outsourcing (ITO) is a commonly accepted practice, outsourcing failures continue to happen. As a consequence, firms experience the loss of essential capabilities or even business performance. ITO failures are mainly caused by an outsourcing decision ignoring the contextual circumstances the organisation is facing and neglecting the associated multifaceted impact factors on ITO success. Researchers have emphasised the importance of internal organisational factors for success in ITO arrangements. More recent studies view ITO success from the perspectives of strategic fit and configuration for coping with the complexity of ITO decisions. Furthermore, previous research revealed that due to a lack in standardisation, outsourcing in the field of application development and maintenance fails more often than outsourcing in other information technology (IT) functions.

In this light, the present cumulative dissertation endeavours to investigate how organisations design their application management organisation, including the entity responsible for vendor management, to succeed in different application services outsourcing (ASO) strategies. ASO includes all services related to the development and deployment of an organisation's IT applications. Based on Lee et al.'s (2004) ideal ITO strategy configurations, the so-called *gestalts*, the moderating internal factors and their varying roles in each *gestalt* are investigated. In addition, the outsourcing motive is considered as a major driver of strategy choice and internal configuration and, therefore, of different forms of outsourcing success, such as efficiency, as the targeted outsourcing outcome.

As a result, the centrepiece of this cumulative dissertation is a contingency model of the internal factors that moderate the influence of ASO strategy *gestalts* on outsourcing success. These internal factors span three broad categories: organisational structure, application portfolio and information systems (IS) capabilities. Furthermore, the single publications provides a more in-depth view into the role of IS capabilities and the application portfolio, including its management. The findings reveal the specific importance of application portfolio management (APM) for ASO success. Moreover, the dissertation presents ASO practices for helping organisations complement their application services delivery driven by a different role of ASO. The work also reasons strategy shifts and the specific challenges of the banking industry.

The present dissertation contributes to the scientific knowledge base by enhancing the understanding of ASO strategies and revealing the moderating internal factors for success. Practitioners could use the developed model, methods and practices to improve their ASO decision-making process as well as to assess the requirements of the current ASO arrangements in their internal organisation and to suggest measures for improving the success rate.



## Zusammenfassung

Wenngleich das Outsourcing von Informationstechnologie (IT) eine weitverbreitete Praxis ist, scheitern viele der Outsourcingprojekte immer wieder. In der Konsequenz sind Unternehmen mit dem Verlust von essentiellen Ressourcen und oder dem Rückgang der Unternehmensperformanz konfrontiert. In vielen Fällen wird der vielseitige Einfluss von kontextbezogenen Besonderheiten der Organisation auf den Erfolg bereits bei der Outsourcingentscheidung unterschätzt. Frühere Forschungsarbeiten heben die Relevanz von interorganisationalen Faktoren für den Erfolg von Outsourcingvorhaben hervor. Jüngere Arbeiten betrachten den Erfolg von IT Outsourcing daher aus der Perspektive von Konfiguration und strategischem Fit. Das Outsourcing von Applikationsentwicklung und –wartung scheitert dabei nach eingehenden Studien aufgrund einer geringeren Standardisierbarkeit noch öfter als das Outsourcing anderer IT Funktionen.

Vor diesem Hintergrund untersucht die vorliegende kumulative Dissertation die Gestaltung des Applikations- und damit verbundene Anbietermanagements, welche zum Erfolg in der Anwendung unterschiedlicher Application Services Outsourcing (ASO) Strategien führen. Unter ASO werden hierbei alle Services berücksichtigt, die mit der Entwicklung und Bereitstellung einer IT Applikation einhergehen. Aufbauend auf den von Lee et al. (2004) entwickelten idealtypischen Strategiekonfigurationsformen, sogenannten Gestalten, werden die erfolgsmoderierenden internen Faktoren und deren variierende Rolle für jede Gestalt ergründet. Darüber hinaus berücksichtigt die Arbeit divergente Outsourcingmotive als Grundlage für die Strategiewahl, die interne Konfiguration des Applikationsmanagements sowie unterschiedliche Ausprägungen von Outsourcingenerfolg, wie beispielsweise Effizienz als Outsourcingergebnis.

Das Kernstück der Dissertation bildet dabei ein Kontingenzmodell, welches die den Outsourcingenerfolg moderierenden internen Faktoren und deren Einfluss auf ASO Gestalten aufzeigt. Diese Faktoren lassen sich in die folgenden drei Kategorien zusammenfassen: organisationale Struktur, Applikationsportfolio und IT Ressourcen. Einzelne Publikationen der kumulativen Dissertation bieten eine granulare Sicht auf die Rolle von IT Ressourcen, sowie das Applikationsportfolio und dessen Management. Die Arbeit beinhaltet darüberhinaus ASO Praktiken, welche Organisationen dabei unterstützen eine geeignete ASO Strategie vor dem Hintergrund unterschiedlicher Ausgangspunkte und Ziele zu wählen. Weiterhin werden die Besonderheiten und Herausforderungen der Bankenindustrie im Kontext der Arbeit diskutiert.

Die vorliegende Dissertation erweitert somit die vorhandene Wissensbasis im Bereich der internen Einflussfaktoren auf den Erfolg von ASO Strategien. In der Praxis können die Ergebnisse bei der Verbesserung des Entscheidungsprozesses, der Evaluierung bestehender ASO Partnerschaften und der Ableitung von Maßnahmen unterstützen.



## **Part A   Synopsis**



# 1 Introduction

## 1.1 Research motivation

Nowadays, companies rely on the support of third parties to develop, maintain and operate their information technology (IT) landscape (Smith and McKeen 2004). In 2013, the IT outsourcing (ITO) market reached a market volume of 288 billion US dollars by growing 2.8 per cent over the previous year (Gartner 2013). Even though ITO is ‘a commonly accepted and growing practice’, failures are still present (Han et al. 2008). Several prior studies reveal failure rates higher than 50 per cent (e.g. Whitten and Leidner 2006). As a consequence, organisations experience hidden costs (Barthelemy 2001; Earl 1996), reduction in the performance of information systems (IS) (Gorla and Somers 2014), loss of essential capabilities or even business failures (Loh and Venkatraman 1992a; Ngwenyama and Bryson 1999).

‘Overall, we know that client readiness, good strategy, good process, sound contract, and good relationship management are key success factors’ (Lacity et al. 2009, p.131). Previously, scholars discussed ITO success extensively from the perspective of the ITO decisions, and contractual and relational governance (Lacity et al. 2009). However, the results of these studies investigating success determinants are contradictory. Looking at the outsourcing scope, for example, Lacity and Willcocks (1998) showed that the success rate when outsourcing more than 20 but less than 80 per cent of the IS budget is higher than when outsourcing more than 80 per cent of the IS budget. In contrast, Rouse and Corbitt (2003) revealed that both approaches could lead to ITO success. Cullen et al. (2005) explains these contradictory findings by assigning varying importance to the factors of different ITO arrangements.

Instead of investigating the determinants of success as a single relation, more recent research adopts the perspective of configuration and fit (Cullen et al. 2005; Lee et al. 2004). Thus, each outsourcing situation is associated with a combination of contractual attributes that are more likely to lead to success (Cullen et al. 2005). Analysis of ITO from a strategic perspective furthermore leads to the understanding of ‘how firms formulate and implement strategies in order to accomplish a desired performance goal’ (Cheon et al. 1995, p. 211). Lee et al. (2004) identified ideal outsourcing strategy configurations, so-called *gestalts*, which outperform other strategy settings by considering distinct outsourcing motives.

But not only is relational and contractual governance important for succeeding in outsourcing. The need to include the organisational context in order to succeed in outsourcing was also emphasised by Jayatilaka and Hirschheim (2009). Furthermore, past studies have revealed that the outsourcing of IT application development and maintenance is more likely to fail than the outsourcing of other IT functions such as IT infrastructure services (Lacity et al. 2009). While the outsourcing of infrastructure services

are more standardised and largely handled as a commodity, the outsourcing of IT application services requires a more individual approach as IT applications are closely tied to business functions (Abbas et al. 2010; Fisher et al. 2008). Historically grown application landscapes confront organisations ‘with obsolete information technology (IT) systems and applications that no longer deliver full value to the business’ (Howery et al. 2011, p. 5). The need to modernise the application landscape as well as the pressure to increase efficiency, however, also drive companies to consider the support of outsourcing vendors to achieve these goals (Britz et al. 2012). Thus, the complexity of outsourcing arrangements and also the risk of failure is increased (Lacity and Hirschheim 1993; Loh and Venkatraman 1992a; Ngwenyama and Bryson 1999).

Hence, the challenge for application services outsourcing (ASO), including ‘all services associated with the acquisition, development, and deployment of an IT application’ (Schwarz et al. 2009, p. 750), starts with the management of applications, including the organisational, process-related and personnel aspects as well as the condition of the application portfolio. Therefore, it is important to consider the internal configuration of an organisation for deriving the appropriate outsourcing strategy. Previous research has illustrated the relevance of organisational structures (Plugge and Bouwman 2012) and the development of distinct IS capabilities (Dibbern et al. 2005; Rouse and Corbitt 2003; Willcocks et al. 2006) for outsourcing arrangements. Furthermore, Barthélemy and Geyer (2004) revealed that organisations with highly integrated application landscapes tend to be more successful with mainly one comprehensive outsourcing arrangement. Ross and Beath (2006) discussed outsourcing partnership models from the viewpoint of outsourcing for large-scale transformation to harmonise and modernise IT application portfolios.

These examples illustrate the importance of several internal components and motives for forming and implementing an outsourcing strategy. Thus far, the literature that offers a comprehensive view of ASO is scant (Ross and Beath 2006). Lately, Schwarz (2014) emphasised that both the conceptualisation of and factors that drive outsourcing success need further investigation for gaining a fuller understanding of how to design successful outsourcing arrangements.

## **1.2 Research objective and research questions**

Based on the motivation outlined above, the research endeavour is to investigate internal determinants for succeeding with different ASO strategy configurations. In addition, this dissertation targets the development of guidelines, methods and models for supporting practitioners in forming successful ASO strategies and broadening scientific knowledge in the field of ITO strategies and their utilisation for ASO from the client organisation’s perspective. Thus, the research was guided by the following research question:



*How should organisations design their application management to succeed in different application services outsourcing strategies?*

Based on the guiding question, three detailed research questions (RQ) have been derived to individually guide the research projects.

First, the salient factors which moderate the success of ASO strategies need to be identified. Previous scholars have already revealed single factors such as the influence of the application portfolio structure (e.g. Barthélemy and Geyer 2004) or the importance of IS capabilities on ITO in general (e.g. Han et al. 2008), which provide a basis for analysing the internal moderating factors needed for comprehensively succeeding with ASO strategies. Thus, first, the following research question was derived:

*RQ1: What are the salient internal moderating factors for succeeding with various application services outsourcing strategies?*

Instead of eliminating the IT function, the nature of work evolves with outsourcing arrangements (Carr 2003). Thus, different capabilities and structures are necessary for coping with changing requirements toward the retained organisations (Han and Mithas 2013). Particularly, with the emergence of new outsourcing models and forms, organisations need to develop differently (Smith and McKeen 2004). Based on this assumption, the following research question aims to understand how ASO strategies differ within an internal configuration:

*RQ2: How do these internal determinants vary for different ASO strategies?*

ITO can play different roles in an IT organisation, which is reflected in the outsourcing drivers (Smith and McKeen 2004). Lee et al. (2004) discussed the role of outsourcing distinct strategy configurations being more likely to succeed for a particular outsourcing outcome such as efficiency. Thus, the outsourcing motive influences the chosen strategy, which leads to the third research question:

*RQ3: How do outsourcing motives impact the choice of ASO strategies?*

The targeted audience of the dissertation includes researchers and practitioners. The research project is dedicated to the research area of ITO implementation and ITO success for ASO. This research field is, in particular, addressed from the perspectives of internal factors, configuration, strategy fit and contingencies. Thus, researchers from the field of strategic management or those with an interest in the contingency perspective, too, could use the results for further generalisation and theory enlargement. Because the dissertation is based on practice-oriented and constructive research, the work targets IT managers responsible for the decision and management of ASO arrangements, including representatives from application management, vendor management or entities handling related central functions in a firm. The developed guidelines, meth-

ods, models and revealed findings aim to provide guidance and a structure for the planning, implementation, management and operation of ASO arrangements.

### 1.3 Research design

The present dissertation was realised at the Institute for Information Management at the University of St.Gallen (HSG) within the Ph.D. programme ‘Business Innovation’. The author completed this dissertation as part of her work at the Competence Centre Integrated Information Management (CC IIM), chaired by Prof. Dr. Walter Brenner. These competence centres are designed in line with the principles on consortium research (Österle and Otto 2010). The initial data used in the dissertation were extracted from a research study funded by Hewlett-Packard GmbH and supported by Navisco AG – Sourcing Professionals. This study was carried out in several iterations between December 2011 and October 2012, with a total of 37 organisations from different industries in Germany and Switzerland. The author was part of the research team and was fully responsible for the research design concerning the content of this dissertation.

According to Saunders (1998), IS research has often neglected the relevance of its findings to the practitioner community by emphasizing rigour over relevance. Relevance research is defined as ‘interesting, applicable, and currently having the potential to be useful for practitioners’ (Sambamurthy and Zmud 1999, p. 12). Embedded in the practice-oriented and applied research under the chair of Prof. Dr. Walter Brenner, the dissertation was guided by the basic concept of design science research (DSR) (Hevner et al. 2004; Peffers et al. 2007). While behaviour science aims to understand cause-and-effect relationships among people, technology and organisations, DSR further aims to conceptualise and develop problem solutions relevant to business (Hevner et al. 2004; March and Smith 1995; Peffers et al. 2007). The solution to this problem has to be innovative and has not been obtained thus far or has to possess the potential to be solved in a more effective or efficient manner (Hevner et al. 2004). Thus, the artefact, as the design result of the problem, has to be applicable and useful, while contributing to scientists’ and practitioners’ knowledge bases (March and Storey 2008). Nevertheless, the research endeavour should by no means neglect scientific rigour (Hevner 2007; Winter 2008).

Artefacts can either be constructs, models, methods or instantiations (March and Smith 1995). Owing to the nature of this cumulative dissertation, instead of one central artefact, several artefacts were developed. These artefacts are interrelated or even built upon each other. Furthermore, each article within the dissertation may not be a completed artefact because some articles present partial results or provide the knowledge basis for later artefacts. In order to develop and evaluate artefacts, various research methods and approaches can be adopted depending on the nature of the problem (Iivari 2007). While the overall dissertation project was guided by DSR, the single articles

focus on the distinct research methodologies used for data collection and analysis. Thus, each single research project leading to an article predominantly used three different intertwining research methods: *case study research*, *focus group methodology* and *literature review*.

In the present dissertation, *case study research* is the foremost applied research method. The dissertation endeavours to explore why and how the success of ASO strategies is influenced by internal determinants to develop and evaluate methods and models for successfully implementing distinct ASO strategies in organisations. Case study research is a suitable instrument for answering such ‘why’ and ‘how’ questions and for studying a phenomenon in its context when behavioural events cannot be controlled (Yin 2003). Furthermore, this research method allows for ‘capturing knowledge of practitioners’ and for researching ‘an area in which few previous studies have been carried out’ (Benbasat et al. 1987, p. 370). Case study research allows for flexible research design wherein new measures and constructs occur in the course of investigation (Eisenhardt 1989; Paré 2004), which enables the idea of iterative DSR cycles (Hevner et al. 2004; Peffers et al. 2007).

For multiple holistic case study research, the five design components suggested by Yin (2003) were applied: First, the *research questions* (design element 1) have to be derived, which were presented in section 1.2. Even though there were no distinct a priori *propositions* (design element 2, optional), the research follows the general proposition that different variables of internal configuration moderate the success of an applied ASO strategy based on the findings of previous research. The *unit of analysis* (design element 3) describing the ‘case’ was the entity responsible for the application service delivery, including all functions related with the outsourcing of application services. In order to establish the *logic linkage between the data and the proposition* (design element 4), the case study analysis strategies ‘pattern matching’, especially ‘explanation building’ to understand how and why to succeed in a particular ASO strategy, as well as ‘cross-case synthesis’, were utilised. In order to explain strategy shifts, as in *Articles V* and *VI*, the data were collected for different instances of time in order to enable time-series analyses. (For further details of the strategies for case study analysis strategies, please see Yin et al. 2003, p. 127-164.) Lastly, the *criteria for interpreting the findings* (design element 5) were derived by prior research and the dimensionalisation of the discovered attributes to enable the comparison across strategies.

Data were collected by multiple means (Benbasat et al. 1987). A questionnaire with closed questions was provided to the case organisations, and data from external sources were collected upfront. The interviewing process included a preparatory call on the phone as well as on-site interviews. In each process, at least one additional researcher was present in order to guarantee the separation of interview guiding and note taking (Dubé and Paré 2003). The interview partners validated all minutes and interview protocols. Furthermore, internal data were provided by the organisations. The

chosen data analysis strategies were guided by the principles of qualitative data analysis (Miles and Huberman 1994). Several coding iterations were performed, and cross-case patterns and intra-group similarities were investigated (Eisenhardt 1989). To limit the risk of inconsistency in data collection and analysis, the entire process was overseen by at least one additional supporting researcher (Patton 2002).

*Focus group methodology* is a specific type of group discussion moderated by the researcher(s) for collecting and comparing the experiences and perspectives of a group of individuals with similar backgrounds in the investigated topic (Kitzinger 1994; Stewart et al. 2007). The interactive character of this research method allows the participants to influence each other, thus helping the development of common understanding about a topic without ignoring individual differences of opinions (Krueger and Casey 2009). The structure and the moderating and questioning techniques of focus group designs vary widely depending on the manner in which a study is carried out (Morgan 2002). The focus group methodology appears to be an appropriate instrument for evaluating artefacts (Rosemann and Vessey 2008; Venable et al. 2012). Tremblay et al. (2010) proposed to adopt the traditional focus group methodology for evaluating artefact design (exploratory focus groups) or to confirm artefact use (confirmatory focus groups). During the dissertation project, the focus group methodology was used for confirmation. The focus group workshops can also be considered an integral part of the case study design because all workshops were held with representatives from the case organisations.

A continuous *literature review* process completed the research endeavour. Several researchers have outlined the importance of literature reviews for realizing a research project (Baker 2000; Cooper 1998; Webster and Watson 2002). Considering the DSR perspective, the effective use of the existing knowledge base enables the rigour of the evaluation (Hevner et al. 2004). Furthermore, relevance can be ensured by proving that the distinct research aspect has not been investigated before (Baker 2000) and by uncovering areas in which research is needed (Webster and Watson 2002). ‘A review of prior, relevant literature is an essential feature of any academic project’ (Webster and Watson 2002, p. xiii). Hence, prior research findings can be said to guide research design as well as the entire approach (Sutton and Staw 1995; Yin 2003). The framework by vom Brocke et al. (2009) guided rigour in the documentation of all performed literature analysis with the aim of structuring the approach and enabling replicability.

The cumulative dissertation consists of six articles extracted from the data collected within the overall research study, with a total of 37 cases. Table 1 gives an overview of the applied research method, the addressed research question and the number of cases included.

	Research methods applied			Research questions addressed			Number of cases
	Case study	Focus group	Literature review	RQ1	RQ2	RQ3	
<b>Article I</b>	X		X	X	X	X	20
<b>Article II</b>	X		X	X	X		8
<b>Article III</b>	X		X	X	X	X	11
<b>Article IV</b>	X	X	X	X	X		37
<b>Article V</b>	X	X	X		X	X	37
<b>Article VI</b>	X		X			X	5

*Table 1: Addressed research questions, utilisation of research methods and number of cases throughout the publications*

All data were collected by means of case study research. Each single research project furthermore required a rigorous literature review in order to deliver valid research results. In addition to the questionnaires, interviews and internal and external data collected in the overall research design, focus group sessions in order to validate the findings of *Articles IV* and *V* were held.

*Article I*'s contingency model explaining the moderating internal variables of ASO strategies on success constitutes the centrepiece of the dissertation. Thus, the publication addresses all three research questions. *Articles II* and *IV* focus on the identification of distinct salient internal factors and their differentiating role in ASO strategies (*RQ1* and *RQ2*). *Article III* addresses all three RQs from a granular perspective on the application portfolio. *Articles V* and *VI* concentrate on the motives that form and drive ASO strategies in general and for the banking industry in particular (*RQ3*). *Article V* furthermore includes the differentiation between the internal configurations for applied ASO practices and thus also delivers answers to *RQ2*.

For each publication project, the appropriate number of cases was selected in order to analyse the data toward a specific topic. The selection of the cases was driven by different criteria such as the significance of each data set toward the questions asked or the necessary amount of data required to answer the research questions of the publication. In order to investigate an equal number of successful and unsuccessful organisations for each identified outsourcing strategy, the research project of *Article I* included 20 cases. *Article VI* investigates the applied and intended ASO strategies as well as the motives and challenges for the banking sector. As the overall research study included five companies from this particular industry, these organisations were researched in more depth. For *Articles IV* and *V*, the combined data of all 37 cases was necessary in order to achieve valid data. In contrast, the inclusion of additional cases to the final number within *Articles II* and *III* did not lead to any further findings. Thus, the necessary amount of cases was smaller.

## 1.4 Thesis structure

The dissertation follows the guidelines of cumulative dissertations at the University of St.Gallen. The cumulative doctoral thesis is structured into two parts. The first part

(Part A: Synopsis) provides an overview of the entire research endeavour as well as a synopsis of the articles by describing their contributions to the dissertation project. The second part (Part B: Imprints of Articles) consists of the complete version of the publications.

The first section of Part A starts with the research motivation, followed by the research objectives and the research questions deduced based on said objectives. Next, the research design including the research environment as well as applied research methodologies are presented. The theoretical foundation of the dissertation project, including brief introductions to ASO, the concept of outsourcing success and outsourcing strategies, is laid out in section 2. The third section explains the findings and discusses their implications to scientists' and practitioners' knowledge bases in the context of previous research. The synopsis of the articles (section 4) summarises the research results of each publication as well as emphasises the contribution of each publication to the dissertation project. The last section concludes the results, describes the limitations of the doctoral thesis and reveals potential paths for future research.

Part B comprises the imprints of the author's six publications, which are part of this thesis. Minor grammar and spelling mistakes in the original publications have been corrected. The format remains unmodified.

## 2 Theoretical Foundation

Research progress depends on the outcomes and the conclusions of work by prior scholars (Baker 2000). This chapter introduces the central terms and concepts on which the present research endeavour was constructed. Therefore, a brief introduction into the fields of ITO and a positioning of the dissertation in ITO research is given. This is followed by an overview of the concept of ITO strategies and gestalts in particular, as well as ASO and its internal counterpart.

### 2.1 Information technology outsourcing

The 1963 deal between Electronic Data Systems (EDS) and Blue Cross of Pennsylvania marks the first time a firm transferred their entire data processing department to a vendor and, thus, the birth of ITO (Dibbern et al. 2004). Nevertheless, in 1989, when Kodak outsourced its IT functions, a bandwagon effect, the so-called ‘Kodak effect’ occurred, and common acceptance of ITO was developed (Loh and Venkatraman 1992b). The effect was felt not only in ITO practice, but also in ITO research, which has increased and evolved vastly over two decades. For the present dissertation, Kern et al.’s (1997, p. 37) definition of outsourcing is applied: ‘IT outsourcing is broadly defined as a decision taken by an organisation to contract-out or sell the organisation’s IT assets, people, and/or activities to a third-party vendor, who in exchange provides and manages assets and services for monetary returns over an agreed time period.’ In order to structure and categorise the enormous amount of available ITO studies and to expose gaps in ITO research, several high-quality literature analyses have been published over the past decade (e.g., Blaskovich and Mintchik 2011; Dibbern et al. 2004; Gonzalez et al. 2006; Lacity et al. 2010; Lacity et al. 2009).

Dibbern et al. (2004) provide the most comprehensive and, probably, the most popular analysis of the ITO literature. To classify the existing body of knowledge, they developed the *stage model of IS outsourcing* with two phases and five outsourcing stages. Phase one, the *decision process*, synthesises all studies investigating the *why*, *what* and *which* of the outsourcing decision. This includes determinants and advantages of outsourcing, outsourcing alternatives and guidelines, procedures and stakeholders of the decision process. The second phase, *implementation*, involves work considering the *how* of outsourcing as well as the *outcome* of an outsourcing arrangement. ‘In general, “how” relates to the implementation of best practices – methods, techniques, and approaches used to effect the outsourcing decision that tend to result in a higher degree of outsourcing success (i.e. outcome)’ (Dibbern et al. 2004, p. 16). Studies on the outsourcing outcome focus on experiences or implications and mostly deal with the achievement of outsourcing success.

Dibbern et al. (2004) concluded that research in the area of outsourcing success in its varying organisational context should be further investigated. They also call for more

investigation by differentiating the perspective of the outsourcing objects such as the IT function. With the increasing variation of ITO options and the vast knowledge base of past ITO arrangements, the practitioner-oriented literature analysis of Lacity et al. (2009) calls for more research on ‘shaping the context and mobilising resources to deal with the adaptive challenge organisations face’ (Lacity et al. 2009, p. 142). The need to further investigate outsourcing strategies and their impact on performance is also emphasised in the literature review of Chadee and Raman (2009). By studying more recent works of ITO scholars, Blaskovich and Minchik (2011) revealed a gap in viewing ITO as a ‘complex practice characterised by multifaceted motives’ and that achieving ITO success remains an elusive concept (Blaskovich and Mintchik 2011, p. 28).

The present work can be classified as research on the *implementation phase*. Even though Dibbern et al. (2004) separated the phases *how* and *outcome*, most available studies cover both aspects, as does this dissertation. The research endeavour follows the above-described call for research. This is firstly because the research project investigates the performance determinants of different outsourcing strategies from an inter-organisational perspective. Secondly, the work provides insights into the peculiarities of ASO. Lastly, the investigation takes a multifaceted view on outsourcing motives and considers the varying requirements of each strategy.

In the following text, the concept of ITO strategies and outsourcing success is introduced. Subsequently, ASO is described in detail. Hence, the foundation of terms and classifications is given. Even though outsourcing is not an IT-specific phenomenon, for the present dissertation, the term is exclusively used in the context of ITO.

## 2.2 Outsourcing strategies

Lee et al. (2004) define ‘an outsourcing strategy [as] the logic visible in a firm’s portfolio of IT outsourcing decisions’ (Lee et al. 2014, p. 112). Early studies on outsourcing strategies started with typologies of choices within contractual governance. Lacity and Hirschheim (1993) introduced the most popular typology, which differentiated among three outsourcing types based on the IT budget outsourced. Further strategy dimensions were introduced by the research, such as the contract type, description of the authority over the processes (Lacity and Willcocks 1998) or the contract duration (Pinnington and Woolcock 1995).

Research on strategy in general investigates the determinants of a firm’s success (such as Porter 1998). ITO success is most commonly measured by satisfaction (Gonzalez et al. 2010). Satisfaction with the ITO arrangements is determined by the objectives achieved, including constructs regarding strategic, economic and technological benefits or the overall outsourcing relationship (Dibbern et al. 2004). However, the research on ITO success by investigating each strategy dimension on its own led to different results (Cullen et al. 2005). This might be due to the difference in how success



is measured (Dibbern et al. 2004) or because ITO arrangements differ in types and forms given the extensive variation in outsourcing choices (Cullen et al. 2005).

Based on the latter assumption, Cullen et al. (2005) viewed ITO in the light of configuration to enable better decisions, appropriate management and achievement of better ITO outcomes. A strategic perspective on ITO arrangements allows an understanding of ‘how firms formulate and implement strategies in order to accomplish a desired performance goal’ (Cheon et al. 1995, p. 211). Taking the concepts of strategic fit and the residual rights theory into account, Lee et al. (2004) derived the three ideal ITO strategy configurations, so called *gestalts*, which are more likely to succeed. Therefore, Lee et al. (2004) adapted Miller’s (1981) definition of *gestalts* as ‘configurations [that] represent very commonly occurring and, therefore, predictively useful, adaptive patterns or scenarios’ (Miller, 1981, p. 3).

To describe an outsourcing strategy, Lee et al. (2004) used established outsourcing dimensions, mainly derived from the work of Lacity et al. (1996) and Lacity and Willcocks (1998), namely, the decision scope, contract type and contract duration. The definitions of each of the dimensions are given in Table 2.

Strategy dimension	Description	Categories	Reference
<b>Decision Scope</b>	Proportion of IS budget outsourced to a third party	Minimal: <20% of IS budget Selective: <20 and >80% of IS budget Comprehensive: < 80% of IS budget	Lacity et al. 1996; Lee et al. 2004
<b>Contract type</b>	Determination of authority over processes	Buy-in: No authority transfer, hiring workers on hourly basis Fee-for-service: Authority transfer to the outsourcing provider for the contracted part of IT functions with a detailed contract specification Partnership: Authority for most IT functions are transferred to the provider based on an unspecified contract	Lacity and Willcocks 1998; Ang and Beath 1993; Lee et al. 2004
<b>Contract duration</b>	Time span for which an organisation and a vendor close a contract	Short-term Medium-term Long-term	Lee et al. 2004

*Table 2: Outsourcing strategy dimensions*

In order to describe each ITO gestalt, Lee et al. (2004) include the dimension of ITO success as well as the form of governance applied. The dimension of ITO success (ITO outcome) is important as strategies are driven by different objectives. Lee et al. (2004) suggested that each ITO gestalt is more likely to succeed in a particular ITO outcome (Lee et al. 2004). *Strategic competence* is described as an attempt toward ‘redirecting the business and IT into core competencies’ (Lacity and Willcocks 2001, p. 316). While the outcome *cost efficiency* is self-explanatory, *technology catalysis* refers to ‘strengthening resources and flexibility in technology services to underpin business’ strategic direction’ (Lacity and Willcocks 2001, p. 317).

Together with the governance forms derived from common governance literature such as Williamson (1994), Lee et al. (2004) anticipated the ITO gestalts described in Table 3. Therefore, three different governance forms were applied: *hierarchy*, *market* and *network*.

	<b>Independent</b>	<b>Arm's length</b>	<b>Embedded</b>
<b>Governance form</b>	Hierarchy	Market	Network
<b>Decision scope</b>	Minimal	Selective	Comprehensive
<b>Contract type</b>	Buy-in	Fee-for-service	Partnership
<b>Contract duration</b>	Short-term	Medium-term	Long-term
<b>ITO outcome</b>	Strategic competence	Cost efficiency	Technology catalysis

Table 3: ITO gestalts introduced by Lee et al. (2004, p. 116)

The hierarchic gestalt *independent* involves the outsourcing of only a small amount of the IS budget with a short contract duration. External resources are managed internally, which implies that the relationship to vendors is tenuous and contracts are easily replaceable. The gestalt reveals a high internal value added and thus is more likely to achieve strategic competence. The gestalt *arm's length*, in contrast, benefits from the advantages of the market and is more likely to realise cost efficiency. This gestalt involves fee-for-service contracts with variable vendors, which require a detailed specification in tasks and responsibilities. The ITO arrangements cover between 20 and 80 per cent of the IS budget with medium-term contract durations. The gestalt *embedded* utilises the advantages of the network in which the contracting parties commit to a long-term and comprehensive relationship characterised by sharing risks and benefits. Thus, the gestalt is more likely to accomplish technology catalysis (Lee et al. 2004).

The cumulative dissertation consists of articles investigating the varying role of internal perspectives of ASO in the light of Lee et al.'s (2004) outsourcing gestalts or those investigating specific strategy dimensions and outsourcing motives.

## 2.3 Application services outsourcing

Dibbern et al. (2004) emphasised that there is a need to better understand the 'differences in outsourcing behaviour depending on the object of outsourcing, e.g. different outsourcing functions' (Dibbern et al. 2004, p. 88). ITO research classifies IT functions from the technical as well as the offering perspectives. Grover et al. (1996) distinguished between application development and maintenance, system operation, networks/telecommunication management, end-user computing support, system planning and management and purchase of application software (Grover et al. 1996). Based on the established offering categories, Mahnke et al. (2005) differentiated between infrastructure, applications and business processes. The research endeavour focuses on the outsourcing of application services, which includes the outsourcing of 'all services

associated with the acquisition, development, and deployment of an IT application' (Schwarz et al. 2009).

Because this dissertation investigates internal determinants relevant to ASO, application management (AM), as the entity responsible for application services in a firm, will be introduced briefly in the following. The definition of AM varies widely among scholars because no common term has been established thus far. Earlier definitions of AM focus on application maintenance functions at the strategic, management and technical levels (Boldyreff et al. 1997; Hather et al. 1996). More recent definitions additionally include application enhancement in terms of developing existing and additional applications and, thus, all application development functions as part of application management (Györy 2014; McKeen and Smith 2010; van der Pols and Backer 2006). Nevertheless, all these definitions state that AM is not only about the technical functions but also about the management and strategic components. For this dissertation, AM 'is broadly defined as the responsible instance for the planning and the controlling of the application portfolio and of all services including the acquisition and deployment of applications' (Zelt 2014, p. 4).

Besides operational application service management, application portfolio management (APM) is an essential part of AM. APM covers the evaluation and planning of an application portfolio to enhance or enable the business value of IT applications in the most effective and efficient manner (McKeen and Smith 2010; Simon et al. 2010; Weill and Vitale 1999). Research on APM 'predominantly covers analytic approaches to classify applications, the condition of the portfolio, as well as initiatives improving the application landscape' (Zelt et al. 2013). Prior studies from research and practice have emphasised that APM supports ASO by facilitating application selection and allowing for better control over the vendor's deliverables (Gliedman 2004; McKeen and Smith 2010; Prahalad and Krishnan 2002). The application portfolio consists of IT applications that can be described by different application characteristics ranging from purely technical attributes (Weill and Vitale 1999) to business-related attributes (Ward 1990). The role of the application portfolio structure as a sum of all applications attributes as well as the characteristics of each applications within the portfolio has been discussed in previous studies addressing to the outsourcing decision (e.g. Barthélemy and Geyer 2004; Cheon et al. 1995; Gable et al. 2001; Schwarz et al. 2009).

For the internal organisation, outsourcing is more than just the substitution of IT investments (Han and Mithas 2013). The IT organisation has to support the firm in outsourcing decisions and vendor relationship management (Smith and McKeen 2004). Instead of eliminating the internal function, the nature of work and, therefore, capabilities and organisational structures change and evolve (Carr 2003). In addition to capabilities such as business IT alignment or technical IT capabilities, vendor management capabilities are found to be essential for outsourcing arrangements (Han et al. 2008; Willcocks et al. 2006).

A comprehensive analysis of ASO is quite scant (Ross and Beath 2006), especially from the perspectives of strategy configuration and fit. The described terms and definitions, as well as the findings at the general ITO level, provide a solid starting position for revealing and investigating the internal determinants that moderate the success of distinct ASO strategies.

### 3 Findings and Discussion

In the following, the findings of the cumulative dissertation are presented as a condensed synopsis of the publications. Each article is furthermore described in Chapter 4, and a full-length version is provided in Part B of the dissertation. Based on the outsourcing gestalts by Lee et al. (2004) and their notion of outsourcing success, the centrepiece of the dissertation is a contingency model of the internal factors that moderate the success of each ASO strategy for a distinct form of outsourcing success. The overall research model shown in Figure 1 includes the contingency model as well as the impact of ASO objectives and challenges on the choice of ASO strategies.

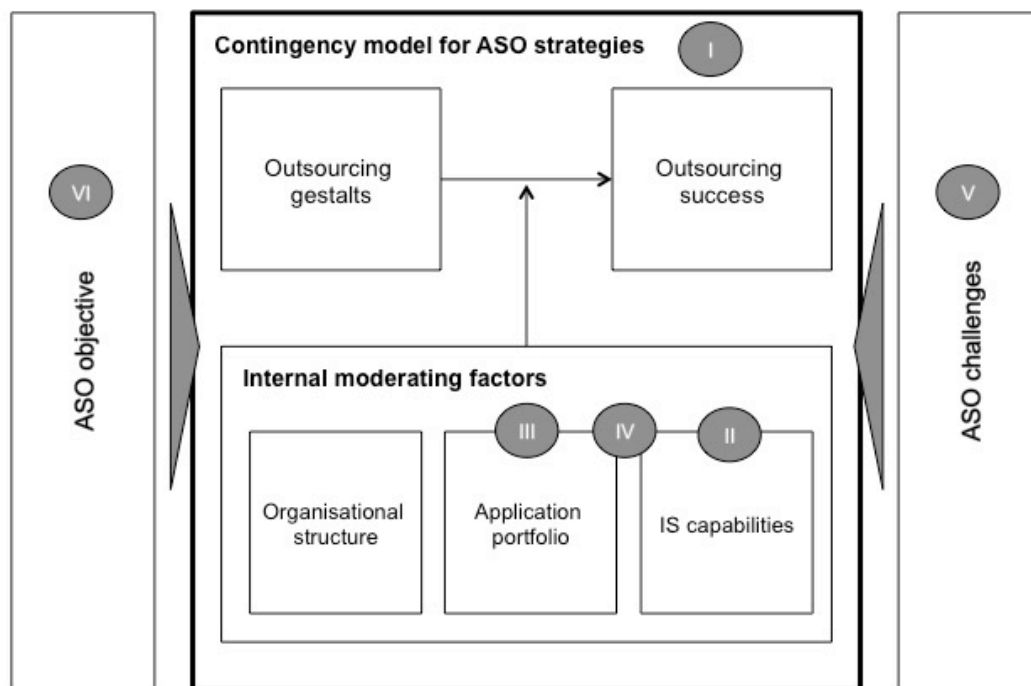


Figure 1 Overall research model of the dissertation

The articles (numbered from I to VI) either answer one or more research questions from different perspectives or provide an in-depth view on a particular aspect of the research questions. The position of the article number in Figure 1 indicates the focus of each individual paper within the overall research model.

#### 3.1 A contingency perspective on ASO strategies

The centrepiece of the dissertation constitutes a contingency model describing the salient internal determinants for succeeding in ASO strategies described in *Article I*. Contingency models are utilised for a holistic investigation of various contexts and contingency factors to better apprehend the interdependence of strategy and performance (Drazin and Ven De Ven 1985). The developed model implies three salient categories

for the internal configuration (*RQ1*) as shown in the centre of Figure 2: (1) *organisational structure*, (2) *application portfolio* and (3) *IS capabilities*. Organisational structure is a common research subject related to the obtainment of different design elements (Damanpour 1991; Pugh et al. 1968). Three of these elements are considered to influence the success of ASO strategies: centralisation, formalisation and specialisation. The application portfolio can be characterised by the various attributes of its structure (e.g. Simon et al. 2010; Weill and Vitale 1999). In the present model, the degree of standardisation (Gable et al. 2001), technical condition (McKeen and Smith 2010; Simon et al. 2010) and complexity, described by the numbers of applications, interfaces and further characteristics describing the technical complexity (McKeen and Smith, 2010) are considered. Willcocks et al. (2006) and Han et al. (2008) discussed the essential IS capabilities salient for ITO arrangements in general. Based on those, four categories of IS capabilities were identified that moderate the success of ASO strategies: organisational relationship capabilities (ability to align IT and business), IT capabilities (managerial and technical), APM capabilities and four vendor management capabilities (informed buying, contract facilitation, contract monitoring and vendor development). *Article 1* gives an granular definition and description of the contingency factors (see Part B: Imprints of articles).

To understand the varying roles of the factors for each outsourcing gestalt (*RQ2*), the salient factors have been dimensionalised further (mainly as high, medium and low). A high specification in the AM, for example, refers to a separation of application development and maintenance into different teams. As another example, the applications' source code quality, maintainability, compatibility, degree of documentation and architectural fit determine the health of the technical condition of the application portfolio (Simon et al., 2010). Sambamuthy and Zmud (1999) furthermore suggests that contingency factors differ in the way they impact performance by introducing different contingency forces. Based on the forces by Sambamuthy and Zmud (1999), two contingency forces were identified during data analysis: While *reinforcing* contingencies have a positive and amplifying effect on the outsourcing performance, a *dominating* force is essential for outsourcing success.

Table 4 lists the salient contingency factors with their dimensions and forces for each gestalt. The findings reveal that the factors differ among the gestalts. While for example a high degree of formalisation is essential for the success of the arm's length approach, the gestalt 'independent' benefits from a low degree of formalisation. However, similarities between the internal configurations were also identified such as the need to possess high vendor management capabilities for the gestalts 'arm's length' and 'embedded'. The analysis also reveals that within one category the contingency forces can differ. Looking at the gestalt 'arm's length', a high degree of standardisation and low portfolio complexity increase but do not determine the chance of out-

sourcing success (reinforcing). A healthy technical condition of the portfolio in contrast was found to be essential for success (dominating).

<b>Gestalt</b>	<b>Independent</b>	<b>Arm's-length</b>	<b>Embedded</b>
<b>Contingency</b>			
<b>Organisational structure</b>			
Centralisation	Medium (r)	High (r)	High (r)
Specialisation	Low (r)	High (r)	N/A
Formalisation	Low (r)	High (d)	N/A
<b>Application portfolio</b>			
Standardisation degree	N/A	High (r)	Low (r)
Portfolio complexity	N/A	Low (r)	High (r)
Technical condition	N/A	Healthy (d)	N/A
<b>IS capabilities</b>			
Organisational relationship	N/A	N/A	N/A
Application portfolio management	Low (r)	High (d)	N/A
Managerial IT capabilities	N/A	N/A	N/A
Technical IT capabilities	High (r)	Medium (r)	Low (r)
Informed buying	N/A	High (d)	Medium (r)
Contract facilitation	N/A	High (d)	High (d)
Contract monitoring	N/A	High (r)	High (r)
Vendor development	N/A	High (d)	High (d)
Legend: N/A: No clear results could be derived from the data or the factor did not seem to influence the success of the gestalt Contingency forces: (r) reinforcing; (d) dominating			

*Table 4: Salient contingency factors and forces for gestalts in ASO (based on Zelt et al. 2014, p. 7)*

In summary, the results reveal which and how internal factors influence the success of ASO strategy gestalts. Comparing the requirements for internal factors for each strategy gestalt, the arm's length approach possesses the highest investment in organisational structuring, IS capabilities and development of the application portfolio. As the strategy gestalt targets efficiency, organisations need to carefully compare the necessary investment and the anticipated savings to prevent the so-called hidden costs of outsourcing. The independent approach in contrast is more easily applied but only provides short-term capacity compensation. Organisations utilising the embedded approach should not completely rely on the capabilities of the outsourcing partner. Without a moderate investment in IS capabilities for the outsourcing arrangement, the outsourcing endeavour is more likely to fail and to cause major damages to the IT and overall organisation due to lock-in effects.

*Articles II – IV* provide more detailed and deeper views of the contingency factors *IS capabilities* and *application portfolio*. While *Article II* discusses the IS capabilities and their impact on ASO strategies, *Articles III* and *IV* investigate the application portfolio and the role of APM. *Article III* describes the role of APM at three different levels: APM capability in the light of APM maturity as defined by Simon et al. (2010), application portfolio structure (as discussed above) and influence of the characteristics of

each single application as an additional dimension. The results give a detailed view on how organisations develop their IS capabilities (*Article II*), and APM capabilities in particular, as well as their application portfolio structure in order to apply different ASO strategies (*Article III*). Considering common *application characteristics* that influence ITO decisions, *Article IV* presents a method for selecting the application to be outsourced following the arm's length approach throughout the *application lifecycle*. The application lifecycle perspective enhances the integration of ASO in the planning of the application portfolio and the support of APM objectives with ASO. Furthermore, the selection becomes more differentiated compared to common selection approaches.

### 3.2 ASO strategies in the light of outsourcing motives and challenges

By further differentiating between distinct forms of outsourcing success more likely to be achieved by the particular gestalt, the developed contingency model of *Article I* furthermore allows for a decision on an ASO strategy based on a firm's objectives (*RQ3*). The arm's length strategy on one hand is more likely to succeed in terms of efficiency because each outsourcing package is contracted for the most competitive market price. The embedded approach on the other hand is more likely to support the modernisation and harmonisation of an application portfolio and/or an application management organisation.

Considering the objectives that drive the ASO decision, *Article V* describes four practices to complement the internal application services delivery with ASO: (1) *Support*, (2) *Optimise*, (3) *Transform* and (4) *Innovate*. While the first practice, *Support*, is predominantly motivated by the access to the skills required to absorb capacity constraints and/or short-term knowledge gaps, the practice *Optimise* aims to increase efficiency when using ASO. By applying the third practice, *Transform*, ASO can further be used to redesign or modernise the application portfolio or application services delivery. Lastly, the practice *Innovate* employs ASO to enable and achieve innovation.

Each ASO practice can further be seen in the context of the applied outsourcing gestalt, the strategic impact, the institutionalisation of the vendor management and the professionalisation of the application management. The investigation of the practices reveals a correlation among the applied gestalt and the strategic impact as well as the institutionalisation of vendor management and the AM professionalisation. As a result, the strategy matrix shown in Figure 2 has been developed in order to describe each practice for implementation.

Thus, for example, the achievement of efficiency (*Optimise*) requires developing strong vendor management capabilities and a strict professionalisation of the AM. The accomplishment of a healthy application portfolio, a successful organisational transformation (*Transform*) or even the creation of real innovation (*Innovate*) through out-



sourcing furthermore implies the will to strike up an outsourcing partnership. That involves sharing risk and benefits and bearing the consequences of lock-in effects. As also explained by the contingency model, the gestalts ‘arm’s length’ and ‘embedded’ involve the building of vendor management capabilities and a professionalisation of AM structures. The presented ASO practices allow for a different and more practitioner-oriented perspective of the contingency model’s core results. The arrows in Figure 2 further illustrate the shift from one to another ASO practice intended by the investigated organisations. Overall, the practices *Support* and *Transform* are largely considered as transitional practices. No organisation currently utilising the *Optimise* practice intends to shift toward *Support* or *Transform*.

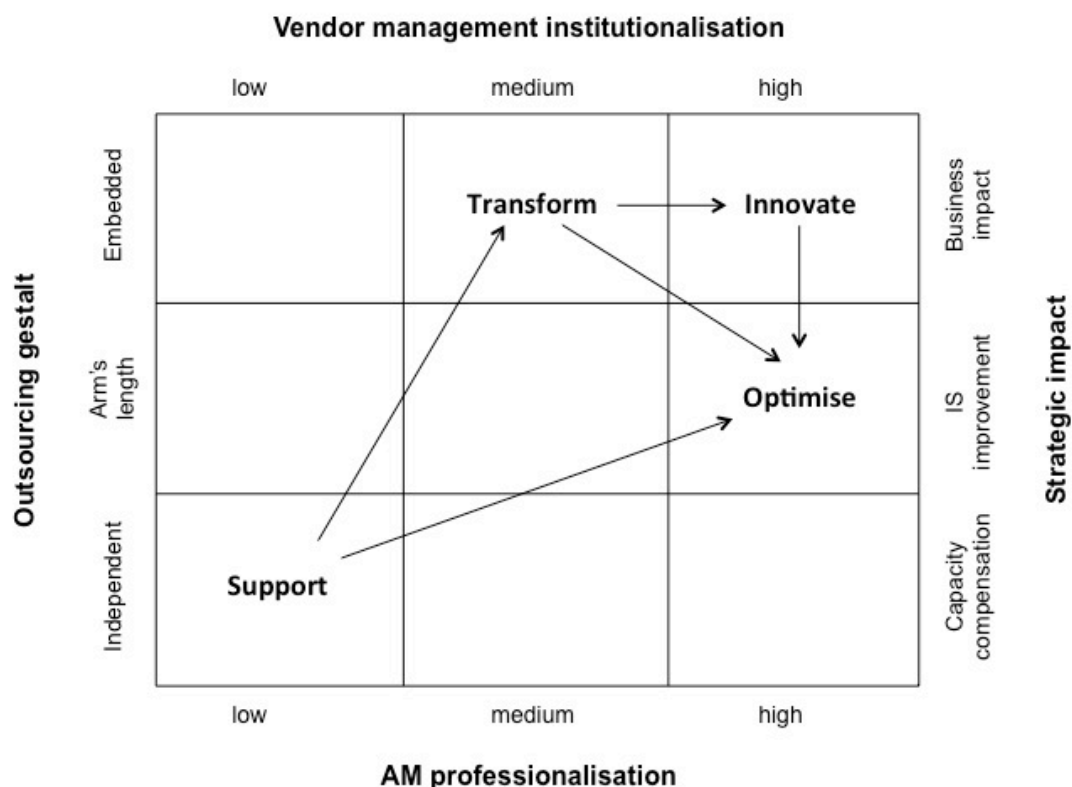


Figure 2 Strategy matrix for ASO practices (based on Zelt 2014, p. 13)

*Article VI* completes the dissertation project by revealing and discussing the current and intended applied ASO strategies as well as the challenges faced by organisations in the banking sector. Thus, the article presents a deeper view of the peculiarities of a specific industry. The results show that most of the banks interviewed tend toward the arm’s length strategy, while currently utilizing the independent approach. Even though the banking industry took a pioneering position in application development outsourcing, the outsourcing of application maintenance services is quite new to IT organisations in the banking sector. Furthermore, the industry struggles with some explicit challenges such as increasing regulations and/or complex and rarely standardised application portfolio structures. In summary, the results show that the outsourcing mo-

tives and, thus, the ASO strategy choice are also driven by external industry-specific factors.

### 3.3 Theoretical implications

In the following the results are discussed in terms of the existing body of knowledge. The section starts with a discussion of the applied line of research and adopted theories followed by a reflection on the three contingency categories organisational structure, application portfolio and IS capabilities. The results are then discussed in light of the research on outsourcing motives and ITO maturity models as well as the peculiarities of the banking industry.

The findings of the dissertation contribute to the research of ITO implementation and outcome (Blaskovich and Mintchik 2011; Dibbern et al. 2004). In alignment with more recent studies on ITO success, a perspective of configuration and strategic fit (Cullen et al., 2005; Lee et al., 2004) was taken. The present research agrees with the notion that each outsourcing situation is unique and depends on the particular circumstances of the organisation (Watjatrakul 2005). The contingency perspective from *Article I* was utilised as the theory suggests that there is no single best way to realise fit (Galbraith 1973) and, hence, success in outsourcing arrangements. As contingency models benefit from theory triangulation (Venkatraman 1989), the utilisation of strategic, economic and organisational reference theories as a foundation for identifying the salient contingency factors ensures a comprehensive investigation from a theory perspective as suggested by Lee and Kim (1999).

In their contingency model investigating the impact of IS capabilities on ITO performance, Plugge and Bouwman (2012) identified organisational structure as one of the salient contingency factors. The presented findings of the dissertation (*Article I*) also establish the importance of the deployed organisational structure for the success of different ASO strategies. These findings could be explained by taking the different market situations that each ASO strategy type (gestalts) implies into account. Morgan (1986) revealed that organisational structures vary to meet the requirements of particular market situations.

The findings regarding the application portfolio structure in *Articles I* and *III* could be reflected in the light of asset specificity (Cheon et al. 1995; Coase 1937). Previous research revealed that standard software possesses a higher potential to be efficiently acquired and operated by the market (Gable et al. 2001). However, as the number of parties involved increases, an application portfolio with highly interdependent applications requires more intensive coordination between vendors (Hui et al. 2008). Therefore, a comprehensive ITO approach was found to be more successful (Barthélemy and Geyer 2004). This among other reasons explains why the arm's length strategy tends to be more suitable for a standardised, less complex portfolio. The embedded

approach, in contrast, is more suited to individual and highly integrated application landscapes. The characteristics of a single application furthermore determine its outsourcing feasibility. Prior scholars mainly identified the importance of the strategic impact and business criticality of the IT application as dominant characteristics from the outsourcing decision viewpoint (Lacity et al. 1996; Pati and Desai 2005). The findings of *Article IV* confirm the impact but moreover show how the application lifecycle phase changes the view of the characteristics related to outsourcing feasibility.

Besides the importance of selecting the suitable application for outsourcing, previous scholars have furthermore discussed the role of APM to better control vendor relationships (McKeen and Smith 2010). The present results nevertheless allow a differentiated view on how APM is required for each ASO strategy. Even though the ability to implement APM is the most discussed IS capability in the cumulative dissertation, further IS capabilities play an important role in the configuration of successful ASO arrangements. The IS literature has vastly addressed the importance of IS capabilities (Barney 1991; Wade and Hulland 2004) and their impact on the success of ITO in general (Willcocks et al. 2006). The lack of required capabilities is a fundamental cause of ITO failures (Rouse and Corbitt 2003). Because firms can choose between various forms of IT arrangements, different capabilities must be developed (Smith and McKeen 2004). The results of *Articles I* and *II* enhance the knowledge base by revealing different levels to which IS capabilities essential for each ASO strategy.

The results of *Articles I* and *IV* illustrate how the outsourcing motive influences internal design and strategy choices. The present findings coincide with Lee et al.'s (2004) results, revealing that the arm's length approach outperforms the other gestalts in efficiency and that the embedded approach is most likely to succeed in technology catalysis. Looking at the role of ASO, the finding toward the correlation between the outsourcing gestalt and the strategic impact of ASO could be explained by the findings of DiRomualdo and Gurbaxani (1998) or those of Smith and McKeen (2004). They argue that IS improvement requires highly specified contracts, and business impact is only achieved by outsourcing partnerships. The developed model and ASO practices provide further insight into the required internal design from the perspectives of outsourcing readiness scholars such as that provided by Cullen et al. (2005).

Moreover, the findings provide insights into how and why organisations shift ASO strategies and, thus, allow for a view of ITO development over a period of time. The intended shifts in ASO practice and ASO strategies presented in *Article V* could be reflected in the light of outsourcing maturity models. Gottschalk and Solli-Sæther (2006) and Adelakun and Wabash (2004), for example, reason that the outsourcing relationships of firms mature over time and, thus, lead to a high strategic impact of ITO. Nevertheless, this assumption does not explain all detected shifts. Jayatilaka and Hirschheim (2009) argue that shifts in ITO arrangements are mostly not as 'stage-model-like'. Furthermore, the shifts are aligned with the organisation's orientation.

With changing organisational objectives, back-sourcing might be exemplified (Jayatilaka and Hirschheim 2009). Thus, the results of the dissertation also consider changes in the requirements of the internal organisation and its capabilities and resources regarding ITO arrangements (Carr 2003; Han and Mithas 2013; Smith and McKen 2004).

The results from *Article VI* pertaining to the current and intended ASO strategies within the banking industry, as well as the associated challenges, underscore the assumption of the industry being particularly risk-averse toward outsourcing decisions (Baldwin et al. 2001). Overall, the work also confirms that changes in ASO strategies are driven by institutional factors (Jayatilaka and Hirschheim 2009). As the banking industry has fundamentally changed over the last years (Özbay et al. 2011), the findings allow an understanding of the impact of such changes on the strategy configuration and adoption of ASO.

### 3.4 Managerial implications

At its heart, the present dissertation aims to contribute to unsolved challenges in ASO with the practice-oriented and constructive research approach adopted herein. From a practitioners' perspective, there is a lack of research on effective internal design and a lack of knowledge about the resources necessary to deal with changing outsourcing arrangements and challenges (Lacity et al. 2009).

Organisations are constantly confronted with changes in their internal and external environments. These changes influence ITO arrangements and trigger the desire to adjust ITO strategies (Jayatilaka and Hirschheim 2009). The results published in the dissertation provide guidelines for the internal configuration to succeed in different ASO strategies. The findings of this dissertation, especially the ASO practices presented in *Article V*, can guide firms in deriving a suitable ASO strategy to complement internal application service delivery. Thus, organisations are able to compare their starting positions with the given prototypes of organisational circumstances and firm objectives to improve ASO decisions. Furthermore, the contingency model and the methods can be used to assess the internal design of the currently applied ASO strategy. Thus, initiatives to improve the ASO arrangement can be developed. The differentiation among ASO strategy types allows organisations to better focus their specific requirements. Thus, for example, organisations can concentrate on implementing essential IS capabilities in order to achieve faster results in their particular outsourcing situation.

Particularly regarding the arm's-length approach, organisations need to consider the role of APM. Implementing APM allows for a more appropriate selection of the outsourcing scope as well as control over current ASO arrangements. Including the application lifecycle in the selection of an IT application to outsource allows decision mak-

ers to integrate the outsourcing decision into the planning of the application portfolio. The selection of applications becomes more differentiated upon enlarging the outsourcing options compared with previously suggested common selection criteria such as suggested by Lacity et al. (1996) or Pati and Desai (2005). The results of *Article IV* can further support any evaluation of the current sourcing portfolio, consideration of back-sourcing and reintegration of applications into the internal application service delivery.

Representatives from the banking industry in particular can reflect on their current and intended ASO strategies in light of the presented results (Article VI). The identified challenges can assist decision makers in developing initiatives for overcoming various challenges such as increasing regulation. Outsourcing vendors targeting the banking industry can use the results to understand the future intentions of their clients and offer novel solutions accordingly.

## 4 Synopsis of Articles

The following chapter summarises each article of the cumulative dissertation. Therefore, a description of the contribution to the dissertation project and each research question and an abstract of each article are provided. Table 5 presents an overview of the articles.

Article	Title	Authors	Publication outlet
I	Succeeding in Application Services Outsourcing Strategies – A Contingency Perspective	Zelt, Saskia; Wulf, Jochen; Neff, Alexander A.; Uebernickel, Falk; Brenner, Walter	Proceedings of the 22nd European Conference on Information Systems (ECIS), 2014
II	The Varying Role of IS Capabilities for Different Approaches to Application Services Outsourcing	Zelt, Saskia; Wulf, Jochen; Uebernickel, Falk; Brenner, Walter	Proceedings of the 19th Americas Conference on Information Systems (AMCIS), 2013
III	The Role of Application Portfolio Management in Application Services Outsourcing: Explicating Variations in Application Portfolio Management among Outsourcing Gestalts	Zelt, Saskia; Wulf, Jochen; Neff, Alexander A.; Uebernickel, Falk; Brenner, Walter	Proceedings of the 24th Australasian Conference on Information Systems (ACIS), 2013
IV	Towards an Application Life-Cycle Approach for Selective Outsourcing	Zelt, Saskia; Wulf, Jochen; Neff, Alexander A.; Uebernickel, Falk; Brenner, Walter	Proceedings of the 47th Hawaii International Conference on System Sciences (HICSS), 2014
V	Practices for Application Services Outsourcing: Current Use and Future Direction in Large German and Swiss Enterprises	Zelt, Saskia	Institute for Information Management, University of St.Gallen, 2014
VI	Application Services Outsourcing in the Banking Industry – Current Strategies and Challenges	Zelt, Saskia; Wulf, Jochen; Uebernickel, Falk; Brenner, Walter	BIT - Banking and Information Technology, 2014 (15:2)

*Table 5: Overview of relevant articles for the cumulative dissertation*

## **4.1 Article I: Succeeding in Application Services Outsourcing Strategies – A Contingency Perspective**

### **4.1.1 Publication facts**

Title: Succeeding in Application Services Outsourcing Strategies – A Contingency Perspective

Authors: Saskia Zelt, Alexander A. Neff, Jochen Wulf, Falk Uebernickel and Walter Brenner

Organ: Proceedings of the 22nd European Conference on Information Systems (ECIS), Tel Aviv, Israel, 5-13 June 2014

### **4.1.2 Classification in the scope of the dissertation**

‘The contingency theory perspective suggests that neither the structural feature nor firm choices directly impact performance; rather, contextual or structural features moderate the efficacy of choices or work practices’ (Lee et al., 2004, p.112). The developed contingency model contributes to the dissertation by revealing the factors moderating success in the distinct ASO gestalts by Lee et al. (2004) (*RQ1*). Furthermore, it demonstrates how the factors contribute differently to the success of each ASO gestalt (*RQ2*). The model offers a comprehensive view on the requirements of the internal design for a chosen ASO gestalt, as an ideal ASO strategy configuration, for achieving a particular kind of outsourcing success (*RQ3*). The work constitutes the centrepiece of the dissertation.

### **4.1.3 Abstract**

By utilizing the contingency theory perspective, the present work identified the internal factors that moderate the relationship between a particular gestalt as the ideal outsourcing strategy configuration and its success in ASO. The developed contingency model reveals the salient contingency factors and the forces amongst them by considering the organisational structure, application portfolio and the IS capabilities implemented. Furthermore, the model considers the achievement of distinct forms of outsourcing success derived by the initial outsourcing motive to correspond to a particular strategy and internal design. The results contribute toward the development of a more differentiated understanding of outsourcing contingencies and support an anticipatory assessment of the internal configurations for ASO strategies in relation to targeted outsourcing outcomes.

## **4.2 Article II: The Varying Role of IS Capabilities for Different Approaches to Application Services Outsourcing**

### **4.2.1 Publication facts**

Title: The Varying Role of IS Capabilities for Different Approaches to Application Services Outsourcing

Authors: Saskia Zelt, Jochen Wulf, Falk Uebernickel and Walter Brenner

Organ: Proceedings of the 19th Americas Conference on Information Systems (AMCIS), Chicago, USA, 15-17 August 2013

### **4.2.2 Classification in the scope of the dissertation**

The availability of essential capabilities is vital for outsourcing success (Fisher et al. 2008). By analysing the varying role of IS capabilities proven to be critical for ITO arrangements (Han et al. 2008; Willcocks et al. 2006), the article contributes to the questions ‘which internal factors are important’ and ‘how these differ for ASO approaches (RQ1 + RQ2)’. The results provide a more detailed view of IS capabilities as part of the overall contingency model proposed in the dissertation.

### **4.2.3 Abstract**

The literature on IT outsourcing contains several works on the IS capabilities required to succeed in outsourcing. Prior research, however, does not differentiate between the deployment of IS capabilities in different ASO approaches. Such approaches vary not only with respect to the ratio of the IT budget allocated externally but also with respect to the extent of control transferred to the vendor. The investigation of the required IS capabilities for different ASO approaches led to the derivation of propositions about the variance of required IS capabilities, which imply that organisations need to carefully align their IS capabilities with the ASO strategy and capability development initiatives.



### **4.3 Article III: The Role of Application Portfolio Management in Application Services Outsourcing: Explicating Variations in Application Portfolio Management among Outsourcing Gestalts**

#### **4.3.1 Publication facts**

- Title: The Role of Application Portfolio Management in Application Services Outsourcing: Explicating Variations in Application Portfolio Management among Outsourcing Gestalts
- Authors: Saskia Zelt, Alexander A. Neff, Jochen Wulf, Falk Uebernickel and Walter Brenner
- Organ: Proceedings of the 24th Australasian Conference on Information Systems (ACIS), Melbourne, Australia, 4-6 December 2013

#### **4.3.2 Classification in the scope of the dissertation**

According to previous studies, APM possesses the potential to support outsourcing decisions as well as to enable better vendor management of ASO arrangements (McKeen and Smith 2010; Prahalad and Krishnan 2002). Article III contributes to the overall research endeavour by investigating the varying role of APM as a selective set of internal factors that moderate the success of different ASO strategies (*RQ1 + RQ2*). Furthermore, it discusses how ASO strategies and internal APM implementation support the achievement of APM objectives (*RQ3*). Thus, the paper offers a more detailed view of the contingencies application portfolio structure, APM capabilities and so forth.

#### **4.3.3 Abstract**

Since application portfolio management pursues improvement and optimisation of the application landscape, it supports and facilitates decisions in the field of ASO. The paper investigates the varying roles of APM for different ASO strategies. Therefore, the behaviours of companies successfully applying particular strategy types was compared by analysing the differences in their APM capabilities, application portfolio structure and influence of application characteristics. The results reveal that the companies applying different strategies vary in the extent to which APM is implemented in an organisation. Furthermore, the findings offer insights into how ASO supports and facilitates the APM objectives.

## **4.4 Article IV: Towards an Application Life-Cycle Approach for Selective Outsourcing**

### **4.4.1 Publication facts**

Title: Towards an Application Life-Cycle Approach for Selective Outsourcing

Authors: Saskia Zelt, Alexander A. Neff, Jochen Wulf, Falk Uebernickel and Walter Brenner

Organ: Proceedings of the 47th Hawaii International Conference on System Sciences (HICSS), Maui, Hawaii, USA, 6-9 January 2014

### **4.4.2 Classification in the scope of the dissertation**

IT application characteristics influence the suitability of outsourcing (Gable et al. 2001; Lacity et al. 1996). Article IV contributes to the dissertation by providing an enhanced method for the selection of IT applications for one distinct outsourcing gestalt, namely, the arm's length approach, in order to gain efficiency with outsourcing. Because the selection method is based on the positive experience of organisations with selection patterns considering different application characteristics, it contributes to the future success of ASO arrangements. Thus, the article concurs with the understanding of what and how influences the success of a distinct ASO strategy (*RQ1 + RQ2*).

### **4.4.3 Abstract**

For a selective approach to ASO, the right choice of IT applications is critical for success. In combination with the common selection criteria identified by prior research, the application lifecycle perspective offers a more precise view of the decision between insourcing and outsourcing an application. The findings reveal that high strategic impact or business criticality does not hinder outsourcing at each application lifecycle stage. Thus, considering the lifecycle phases enlarges the outsourcing options as well as allows for shorter contract duration and smaller application packages. The view facilitates the integration of ASO decisions into the entire planning cycle of an IT application and, thus, into the process of maximizing the IT value. As a result, the article provides a method for deciding on IT applications for a selective ASO approach.

## **4.5 Article V: Practices for Application Services Outsourcing: Current Use and Future Direction in Large German and Swiss Enterprises**

### **4.5.1 Publication facts**

Title: Practices for Application Services Outsourcing: Current use and future direction in large German and Swiss Enterprises

Authors: Saskia Zelt

Organ: Institute for Information Management, University of St.Gallen, 2014

### **4.5.2 Classification in the scope of the dissertation**

As outsourcing motives vary, different outsourcing strategies have to be considered (Smith and McKeen 2004). This article describes how different ASO practices complement the objectives of application portfolio planning, development and operation. Thus, the work views ASO from the perspective of outsourcing motives as the trigger for strategy determination (*RQ3*). Furthermore, the practices include different internal design configurations for each chosen ASO strategy (*RQ2*). The article represents the required work as a sole authorship.

### **4.5.3 Abstract**

ASO can be driven by various motives such as cost savings, access to skills or technology, transformation of the application landscape or even the desire to innovate existing IT applications for achieving added value and competitive advantages. Previous research has revealed that these goals are better achieved with different ITO arrangement configurations. Considering the particulars of ASO, four practices were identified, which differ in the manner outsourcing complements application services delivery, namely, ‘Support’, ‘Optimise’, ‘Transform’ and ‘Innovate’. The paper describes and discusses how these ASO practices vary in the applied outsourcing strategy, structure of the AM and vendor management. Additionally, insights into the intended practice shift are presented to reveal the future direction of ASO development.

## **4.6 Article VI: Application Services Outsourcing in the Banking Industry – Current Strategies and Challenges**

### **4.6.1 Publication facts**

Title: Application Services Outsourcing in the Banking Industry – Current Strategies and Challenges

Authors: Saskia Zelt, Jochen Wulf, Falk Uebernickel and Walter Brenner

Organ: Banking and Information Technology (BIT), Volume 15, Issue 2, 2014

### **4.6.2 Classification in the scope of the dissertation**

ITO differs not only in IT functions but also across industries (Dibbern et al. 2004; Lacity et al. 2009). This article provides a granular view on applied ASO strategies and their challenges in the banking industry. Hence, the work contributes to the research by providing an additional dimension of motives, the industry, to the complex construct of success with ASO strategies (RQ3).

### **4.6.3 Abstract**

Even though the banking industry constitutes a vast share of the ITO market, the industry is known for its risk-averse outsourcing behaviour. The events of the recent past have forced banks' IT organisations to rethink their strategic direction and, thus, alter their outsourcing strategy. Only a few scholars have addressed outsourcing specifically in the banking industry and especially ASO. The results of currently applied and intended ASO strategies in the banking industry reveal that the banks analysed intend to increase their outsourcing volume. Furthermore, we discovered six categories of different challenges banks currently face, which might hamper or decelerate ASO in the industry.

## 5 Conclusion and Outlook

The following chapter concludes the results of the dissertation by emphasising the major points of the dissertation and by closing with a reflection on the limitations of this dissertation as well as potential future research directions.

### 5.1 Conclusion

The present research seeks to understand how organisations design their AM and vendor management in order to succeed with different ASO strategies. Therefore, the research project reveals the salient factors (*RQ1*) and their varying roles (*RQ2*) for different ASO strategies. The dissertation furthermore investigated how outsourcing motives impact the choice of ASO strategies (*RQ3*). Motivated by the continuing failures in ITO (Han et al. 2008) and ASO in particular (Lacity et al. 2009), the present dissertation supposes the perspective of configuration and strategic fit (Cullen et al.; Lee et al. 2004) in order to cope with the variety of outsourcing strategy choices and organisational circumstances (Lacity et al. 2010).

The findings of the dissertation contribute to the theoretical gap in explaining the impact of ITO strategy on performance (Chadee and Raman 2009). Suggesting that there is no single best way to succeed in ASO, the work is based on the ITO strategy gestalts by Lee et al. (2004) as ideal strategy configurations, which are proven to outperform other configuration options in the sense of contractual governance. The present research enhances the work of Lee et al. (2004) on ITO gestalts in the sense of outsourced IT functions and inter-organisational factors moderating the outsourcing success. As a result, the developed contingency model as the centrepiece of the dissertation identified three broad categories of internal factors moderating outsourcing success in different ASO strategies: organisational structure, application portfolio and IS capabilities.

Since each strategy gestalt implies a different market situation, the requirements toward the organisational structure differ. Thus, each ASO strategy requires a different degree of centralisation, formalisation and specification. The results moreover provide a more comprehensive view of the impact of the application portfolio on the success of different ASO strategies, including the application portfolio structure, the characteristics of single applications and APM as a capability. The model moreover allows the alignment of previous findings in one model, such as the better feasibility of standard software for outsourcing (Gable et al. 2001) or the outsourcing of highly integrated application portfolios performing better applying the gestalt ‘embedded’ (Barthelemey and Geyer 2004). The consideration of the application lifecycle in the selection of IT application allows for more differentiated options. The importance of APM for selecting IT applications for outsourcing and controlling the vendor relationship as suggest-

ed by McKeen and Smith (2010) is further investigated and explained by the dissertation.

The findings furthermore underscore previous scholars claiming that ITO requires an investment in IS capabilities as IT functions change rather than being eliminated (Carr 2003; Han and Mithas 2013). But instead of investigating demanded IS capabilities for ITO in general (Han et al. 2008; Willcocks et al. 2006), the dissertation provides a differentiated view on the particular level of IS capabilities needed for different ASO strategies. Thus, organisations are able to carry out a more purposeful development of IS capabilities.

Beyond that, the dissertation contributes toward the need to view ITO from the perspective of multifaceted motives by considering different forms of success (Blaskovich and Mintchik 2011; Lee et al. 2004). Depending on the chosen strategy, different outsourcing outcomes, such as efficiency, are more likely to be realised. The discovered ASO practices furthermore allow the derivation of the ASO strategy from a firm's objectives. The strategy shifts intended by the cases confirm that organisations do not always follow a linear approach to achieving ITO maturity, as suggested by Jayatilaka and Hirschheim (2009). The findings reveal that ASO strategies change with the adoption of outsourcing motives or institutional changes (Jayatilaka and Hirschheim 2009), as shown in the investigation of the banking sector currently undergoing a change in the industry environment.

## **5.2 Research limitations**

Overall, the research is limited by the nature of case study research (as the predominant research method), the scope of the unit of analysis and the characteristics of the contingency perspective. Case study research, as well as the focus group method, are restricted by the respective case size and sensitivity and is challenged by the integrity of the researchers performing the data collection and analysis (Merriam 2009). To keep the limitation of the latter issue to an absolute minimum, investigator triangulation was employed during data collection and analysis (Patton 2002).

The unit of analysis is concentrated on the internal perspective of firms utilizing ASO, ignoring the influence of vendor characteristics on ITO success (as investigated for example by Plugge and Bouwman (2012)). The geographical focus might also have neglected cultural and location-based differences, which may affect the results because previous scholars have demonstrated the impact of geographical differences on outsourcing decisions (Dibbern et al. 2012).

Furthermore, the specifics of more recent contract forms such as Software as a Service (SaaS) as for example investigated by Winkler et al. (2011) are not included owing to the focus on the ITO strategy dimension, as given in Lee et al. (2004). The use of the contingency perspective in particular leads to the adoption of a narrow definition of

strategic fit and success, which can lead to a simplification of decision complexity (Weill and Olson 1989).

### 5.3 Further research potential

In order to cope with the limitations mentioned above, the results could be validated empirically by conducting large-scale surveys. A quantitative approach could strengthen the external validity of the developed contingency model (Weill and Olson 1989). The results could also benefit from including different geographical perspectives. Enhancing the model by vendor-driven factors such as vendor capabilities as investigated in the contingency model by Plugge and Bouwman (2012) could provide a more comprehensive view on succeeding in ASO strategies as well as support practitioners not only in designing their organisation internally but also in choosing vendors matching their ASO strategy and internal context. The identified insights regarding ASO strategy challenges for the banking industry could serve as a starting position for in-depth research.

As data were collected at one particular point of time, time lags responsible for the success of ASO arrangements might have been overlooked (Weill and Olson, 1989). Although the present dissertation investigated planned strategy shifts and the motives behind them, the findings do not discuss in detail the development of ASO strategies over time as done by Jayatilaka and Hirschheim (2009). Thus, the findings could be enhanced by longitudinal studies and an investigation of path-interdependencies.

With the adoption of ASO strategy approaches, the development of IS capabilities could be seen in the light of dynamic capabilities (Teece et al. 1997) or research in the field of ITO maturity (Adelakun and Wabash 2004; Fisher et al. 2008). Based on the revealed reciprocal effects between ASO and APM, future research could investigate how APM development alters ASO decisions. A further investigation of application characteristics against the influence of outsourcing feasibility could provide practitioners with better instruments for ASO decisions. Lastly, more recent contracts from the ASO field, such as SaaS, could be included in research pertaining to the internal determinants of success with ASO strategies.

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## Appendix A.1

Title	Authors	Publication outlet
Strategies for Application Management Services	Brenner, Walter; Wulf, Jochen; Zelt, Saskia; Györy, Andreas; Heym, Micheal, Warnke, Achim	University of St. Gallen, 2012
Managing Global IT Delivery Networks: A Literature Review from the Supplier's Perspective	Zelt, Saskia; Uebernickel, Falk; Brenner, Walter	Proceedings of the 46th Hawaii International Conference on System Sciences (HICSS), 2013
Fixed and Mobile Broadband Substitution in the OECD Countries – A Quantitative Analysis of Competitive Effects	Wulf, Jochen; Zelt, Saskia; Brenner, Walter	Proceedings of the 46th Hawaii International Conference on System Sciences (HICSS), 2013
The Varying Role of IS Capabilities for Different Approaches to Application Services Outsourcing	Zelt, Saskia; Wulf, Jochen; Uebernickel, Falk; Brenner, Walter	Proceedings of the 19th Americas Conference on Information Systems (AMCIS), 2013
The Role of Application Portfolio Management in Application Services Outsourcing: Explicating Variations in Application Portfolio Management among Outsourcing Gestalts	Zelt, Saskia; Wulf, Jochen; Neff, Alexander A.; Uebernickel, Falk; Brenner, Walter	Proceedings of the 24th Australasian Conference on Information Systems (ACIS), 2013
Explicating Performance Impacts of IT Governance and Data Governance in Multi-Business Organisations	Neff, Alexander A.; Schosser, Maximilian; Zelt, Saskia; Uebernickel, Falk; Brenner, Walter	Proceedings of the 24th Australasian Conference on Information Systems (ACIS), 2013
Towards an Application Life-Cycle Approach for Selective Outsourcing	Zelt, Saskia; Wulf, Jochen; Neff, Alexander A.; Uebernickel, Falk; Brenner, Walter	Proceedings of the 47th Hawaii International Conference on System Sciences (HICSS), 2014
Succeeding in Application Services Outsourcing Strategies – A Contingency Perspective	Zelt, Saskia; Wulf, Jochen; Neff, Alexander A.; Uebernickel, Falk; Brenner, Walter	Proceedings of the 22nd European Conference on Information Systems (ECIS), 2014
Application Services Outsourcing in the Banking Industry – Current Strategies and Challenges	Zelt, Saskia; Wulf, Jochen; Uebernickel, Falk; Brenner, Walter	Proceedings of the Multikonferenz Wirtschaftsinformatik (MKWI), 2014
Application Services Outsourcing in the Banking Industry – Current Strategies and Challenges	Zelt, Saskia; Wulf, Jochen; Uebernickel, Falk; Brenner, Walter	BIT - Banking And Information Technology (15:2) 2014
Practices for Application Services Outsourcing: Current Use and Future Direction in Large German and Swiss Enterprises	Zelt, Saskia	Institute for Information Management, University of St. Gallen, 2014

Table 6: Complete list of publications from the author





## **Part B   Imprint of Articles**

<b>Article I</b>	
Title	Succeeding in Application Services Outsourcing Strategies – A Contingency Perspective
Authors	Saskia Zelt, Alexander A. Neff, Jochen Wulf, Falk Uebernickel and Wal-ter Brenner
Outlet	Proceedings of the 22nd European Conference on Information Systems (ECIS), Tel Aviv, Israel, 5-13 June 2014
Status	Published
Abstract	<p>Prior research has revealed that succeeding in application services outsourcing (ASO) is more complex than the outsourcing of other information technology (IT) functions. This complexity results from the closeness to business processes and lower degree in the standardisation of ASO. The present research endeavour explored the relationship between specific strategy configurations, the so-called ‘gestalts’, and the success in ASO. By deriving a contingency model, we identified the internal factors which moderate the relationship between a particular outsourcing gestalt and its success. We conducted comparative case study research with 20 large German and Swiss enterprises. Basing on the notion of literal and theoretical replication, we identified the salient contingency factors and the forces amongst them. We were able to show that the success of the different gestalts is moderated by distinct sets of contingencies, considering the organisational structure, application portfolio structure and the information systems (IS) capabilities implemented. The results contribute to a more differentiated understanding of outsourcing contingencies and support an anticipatory assessment of outsourcing configurations in ASO.</p>

# SUCCEEDING IN APPLICATION SERVICES OUTSOURCING STRATEGIES – A CONTINGENCY PERSPECTIVE<sup>1</sup>

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## Abstract

*Prior research has revealed that succeeding in application services outsourcing (ASO) is more complex than the outsourcing of other information technology (IT) functions. This complexity results from the closeness to business processes and lower degree in the standardisation of ASO. The present research endeavour explored the relationship between specific strategy configurations, the so-called 'gestalts', and the success in ASO. By deriving a contingency model, we identified the internal factors which moderate the relationship between a particular outsourcing gestalt and its success. We conducted comparative case study research with 20 large German and Swiss enterprises. Basing on the notion of literal and theoretical replication, we identified the salient contingency factors and the forces amongst them. We were able to show that the success of the different gestalts is moderated by distinct sets of contingencies, considering the organisational structure, application portfolio structure and the information systems (IS) capabilities implemented. The results contribute to a more differentiated understanding of outsourcing contingencies and support an anticipatory assessment of outsourcing configurations in ASO.*

**Keywords:** *Application Services Outsourcing, Outsourcing Gestalt, Outsourcing Success, Outsourcing Strategy.*

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<sup>1</sup> A first version of this article was submitted to an international conference without subsequent publication. In order to ensure full access to all material utilised for the master's thesis of Lea Prantl, which developed a questionnaire for the empirical validation of the contingency model of the present publication, this first version was published in the appendix of the master's thesis of Lea Prantl. This original version was developed further and resulted in the present publication in the proceedings of the European Conference on Information Systems (ECIS) 2014.

## 1 Introduction

Although information technology outsourcing (ITO) is ‘a commonly accepted and growing practice’, only a few enterprises have realized sustainable success (Han et al. 2008). As a consequence organizations suffer from a loss of essential capabilities and/or business failures (Loh and Venkatraman 1992; Ngwenyama and Bryson 1999). One explanation for some of the outsourcing failures is the complexity of ITO decisions (Lacity and Hirschheim 1993; Loh and Venkatraman 1992; Ngwenyama and Bryson 1999). Based on prior work identifying the determinants of outsourcing success, Lee et al. (2004) furthermore identified three ideal outsourcing strategy configurations, which they refer to as outsourcing gestalts.

In addition, Lacity et al. (2009) emphasised that there are differences in succeeding with the outsourcing of distinct IT functions and that in the past, the outsourcing of application development and maintenance was less successful than the outsourcing of, e.g., infrastructure services. One fundamental difference, according to Abbas et al. (2010) and Fisher et al. (2008), is the degree of standardisation: Whereas IT infrastructure largely represents a commodity, most of the applications are closely tied to business functions.

Nevertheless, the increasing pressure on IT organisations to increase efficiency or modernise the application landscape leads to the intention to increase the amount of their application services outsourcing (ASO) (Britz et al. 2012). When deciding on the scope of outsourcing, the particular set of conditions an organisation is facing has to be accounted for (Watjatrakul 2005). Therefore, the determinants for succeeding in ASO need to be better understood. Practitioners also suggest that the success of different ASO configurations is influenced by specific internal attributes. For example, Gliedman (2004) underlines that application portfolio management can support the selection process of applications for outsourcing as well as the overall management of the outsourcing contract.

While the outsourcing gestalts derived by Lee et al. (2004) guide ITO decision makers in terms of the outsourcing scope and contractual aspects, the specific internal determinants that influence the success of applying a gestalt to ASO remain unaddressed. In order to identify these distinct factors – which determine the success of outsourcing configurations for application services – we analyse the gestalts identified by Lee et al. (2004). Therefore, we have applied a case study design to investigate 20 large German and Swiss enterprises across various industries. We use the theory of multiple contingencies (Gresov 1989) in order to analyse their individual and mutual effects. Hence, our research addresses the following research questions:

- What are internal factors that moderate the success of application services outsourcing strategies?
- How do these factors vary in different gestalts applied for application services outsourcing?

The remainder of the paper is structured as follows: The next section presents a brief introduction in the field of ASO, outsourcing success, outsourcing strategies and gestalts. The following section describes the applied research design. After deriving the model, including the specific characteristics for each contingency influencing the success of a particular gestalt, these results are discussed and reflected in light of prior research findings. Finally, the conclusion section discusses limitations and the possible future research agenda.

## 2 Theoretical Foundation

In the following, we conceptualise ASO using the lens of outsourcing strategy gestalts. In Schwarz et al.’s (2009) definition, application services include ‘all services associated with the acquisition, development, and deployment of an IT application’. Building on the research questions, we aim to develop a contingency model covering the ASO-specific factors influencing success with a particular

outsourcing gestalt. Therefore, we build on the following major constructs from the contingency model by Lee et al. (2004): (1) *outsourcing success* and (2) *outsourcing gestalts*, which are ideal configurations of outsourcing strategy dimensions that have been empirically proven to be more likely to succeed.

Success as an outcome variable of ITO is a frequently investigated matter in outsourcing (Dibbern et al. 2004). Gonzales et al. (2010) state that satisfaction is the most suitable variable for measuring success, as it factors in the costs and benefits of outsourcing and appears to be the most valid measure available. Most commonly, satisfaction is determined in terms of the outsourcing objectives achieved (Dibbern et al. 2004). These include constructs regarding strategic, economic and technological benefits, as well as outsourcing implications, information systems (IS) recognition and the overall relationship (Dibbern et al. 2004). Based on the six strategic foci introduced to explain desired outsourcing benefits by Lacity and Willcocks (2001), Lee et al. (2004) measured outsourcing success as satisfaction with three different possible outsourcing outcomes, specifically *strategic competence*, *cost efficiency* and *technology catalysis*. Strategic competence comprises an organisation's desire to redirect 'the business and IT into core competences' (Lacity and Willcocks 2001). The objective cost efficiency includes 'improving the business' financial position' (Lacity and Willcocks 2001). Finally, technology catalysis is defined as 'strengthening resources and flexibility in technology services to underpin business' strategic direction (Lacity and Willcocks 2001).

Analysing previous literature, Lacity et al. (2009) identified the following three broad categories of determinants for outsourcing success: ITO decisions, contractual governance and relational governance. Rather than investigating the determinants of success as a single relation, Lee et al. (2004) further included the interrelation between ITO decisions and contractual governance determinates with the aim of identifying the ideal configuration types most likely to result in success in outsourcing. Therefore, they developed a research model which applied the constitution of fit in ITO strategies. Based on the residual rights theory, they determined three dimensions as part of outsourcing strategy, as follows: *the decision scope* (relating to the degree of integration), *the contract type* (relating to the allocation of control) and *the contract duration* (relating to the performance period). The decision scope is defined as "the proportion of IT function in- or out-sourced" which results in minimal outsourcing (less than 20% of the IS budget), selective outsourcing (between 20 and 80% of the IS budget) and comprehensive outsourcing (more than 80% of the IS budget) (Lacity et al. 1996). The contract type defines who possesses authority over the processes, and its sub-dimensions are buy-in, fee-for-service and partnership. While with a buy-in contract the client retains authority over the process and hires workers on a hourly-base, a fee-for-service contract includes an authority transfer to the outsourcing provider for the contracted part of IT functions with resources belonging to the provider necessary for fulfilment (Lacity and Willcocks 1998). Within a partnership, the authority for most of the IT functions are transferred to the provider based on an unspecified contract and a continuous alignment between the client and provider to ensure service delivery (Ang and Beath 1993). The contract duration specifies 'the period of time to which both parties are committed to interacting with each other' (Lee et al. 2004). The contract duration is operationalised as short, medium or long term.

Using Miller's (1981) contingency approach to identify organisational gestalts as well as the three forms of governance, that is, hierarchy, market and networks (Williamson 1995), Lee et al. (2004) determined three gestalts which they anticipated to be more likely to succeed in a particular outsourcing outcome (see Table 1).

Gestalt	Governance form	Decision scope	Contract type	Contract duration	Anticipated Outcome
<b>Independent</b>	Hierarchy	Minimal	Buy-in	Short-term	Strategic competence
<b>Arm's-length</b>	Market	Selective	Fee-for-service	Medium-term	Cost efficiency
<b>Embedded</b>	Network	Comprehensive	Partnership	Long-term	Technology catalysis

Table 1. Outsourcing gestalts introduced by Lee et al. (2004).

So far, analysis against the background of a comprehensive view on ASO is relatively rare (Ross and Beath 2006). We employed the contingency model by Lee et al. (2004) with the three outsourcing gestalts as a starting point for an ideal outsourcing strategy to investigate the specific internal factors that moderate the success of each gestalt in ASO.

### 3 Research Methodology

Our research intends to explain how internal variables influence the allocation of outsourcing strategies for applications services. As no model with established hypotheses exist, we chose case study research (Benbasat et al. 1987; Paré 2004; Yin 2003) with a multiple holistic design (Yin 2003) to derive a contingency model. Thus, the constructs and measures emerge in the course of the analysis (Eisenhardt 1989). Prior to data collection, however, the research design should be guided by theoretical propositions in the sense of a hypothetical story about why acts, events, structures and thoughts emerge (Sutton and Staw 1995; Yin 2003). Our study is guided by the general proposition that different internal variables are crucial components for the fit or misfit of a chosen or targeted outsourcing gestalt in ASO. Thus, we are able to predetermine and measure constructs, which possess the potential to affect the outsourcing success, based on prior research findings. Additionally, the possibility that new constructs and measures occur in the course of our investigation was included (Eisenhardt 1989; Paré 2004).

We chose to derive a contingency model, as the theory suggests that there is no single best way to achieve fit among organisational factors (Galbraith 1973). Hence, the success of an organisation depends upon its ability to cope with different conditions in the internal and external environment. The systems approach to contingency theory (Drazin and Ven De Ven 1985) calls for a holistic consideration of many context factors and contingencies in order to better understand the interrelationship of strategy and performance.

#### 3.1 Data acquisition

For the data collection, we used a theoretical sampling strategy (Eisenhardt 1989; Glaser and Strauss 1967). Furthermore, we concentrated on large German and Swiss organizations with a turnover of 50 million euros or more (OCED 2005). We choose no industry focus, in order to ensure the generalisation of the results without the influence of industry specific peculiarities. We started out with a literature review (vom Brocke et al. 2009) to identify the gestalts, success and potential constructs of outsourcing strategies and application services-related contingencies.

The constructs were then included in an interview guideline with standardised, open-ended questions (Patton 2002) and a questionnaire with closed-ended questions. Thus, data from the closed questions can facilitate the qualitative data analysis as well as the interpretation of findings (Eisenhardt 1989). The guideline and the questionnaire were pretested by two chief information officers (CIOs). Furthermore, external data about the companies were collected and consolidated in company factsheets. In a preparation call, the answered questionnaire was jointly reflected upon; notes were taken about the statements in the interviews at this time.

Initially, we provided a questionnaire to 37 companies and conducted phone interviews. After an initial analysis of the questionnaire results and phone interviews, we selected the firms matching the gestalts by Lee et al. (2004). We then looked at the outsourcing success for the gestalts in relation to particular outsourcing outcomes; these were determined by questions derived from those introduced by Lee et al. (2004) and verified by the data from the phone interviews.

To include the same number of organisations with successful and unsuccessful outsourcing arrangements, we selected equal groups of firms per gestalt for the final data analysis. We ended up with a case base of 20 firms, eight for the independent approach, eight for the arm's-length strategy and four for the embedded design. An overview of the cases is given in Table 2.

Revenue	100–1,000 MM EUR (2)		1,000–2,000 MM EUR (5)	2,000–10,000 MM EUR (8)	10,000–50,000 MM EUR (2)	≥ 50,000 MM EUR (3)	
IT budget	1–50 MM EUR (5)		50–200 MM EUR (7)	200–1,000 MM EUR (4)	>1,000 MM EUR (3)	N/A (1)	
Industry	Banking & financial services	Manufacturing (4)	Information & communication (2)	Transportation & logistics (3)	Pharmaceutics & chemicals (2)	Retail (3)	Utility (1)
Position of interviewee	CIO (6)		Direct report to the CIO (11)	IT manager (10)	Technical IT staff (1)	Central function (2)	
Data base	Interview transcript (20)		Preparation call minutes (20)	Questionnaire (20)	Factsheets (external info) (20)	Internal documents (7)	

Table 2. Characteristics of enterprises, interview partners and data sets.

Following the snowball sampling strategy, the initial interview partners were asked to invite additional colleagues (Dubé and Paré 2003; Goodman 1961). During the interview, one of the two interviewers guided the interview while the other kept the minutes (Dubé and Paré 2003; Eisenhardt 1989). Data validity of the interview protocol was ensured by a final review from the interviewee(s).

### 3.2 Data analysis

Data analysis was performed as an iterative process (Miles and Huberman 1994). To structure our open coding, we were inspired by the principles of Glaser's "six C's" family coding (Glaser 1978). Initially, we coded context factors (determined by the environmental factors of the organisation), contingency factors (defined as contingencies directly related to the application management organisation and the resources including the application portfolio and capabilities) and covariances (determined by the chosen outsourcing gestalt as the operationalisation of the outsourcing strategy), as well as consequences (in the sense of success for a particular outsourcing outcome). Even though, the hypothesis that the embedded approach outperforms the other gestalts in achieving strategic competence was not fully supported by the study of Lee et al. (2004), we included the success measure for an anticipated outsourcing outcome due to theoretical reasoning. For simplification, in the final model, we included the context factors in the group of contingency factors.

During coding, we triangulated interview data using the survey data, factsheets, notes and internal documents provided by the interviewees after the interview (such as organisational charts and process documentation). First, we derived the context and contingency factors through the identification of factors influencing the success of outsourcing found in the data. Second, we searched for cross-case patterns, which comprised within-group similarities (Eisenhardt 1989) determined by the gestalts. Therefore, each factor was reflected in the literature in order to determine an adequate and reliable

measurement of each factor and to generalise the statements across the cases. This allowed the comparison of characteristics within and across gestalts. We then recoded the data by scoring each variable (in most cases with a three-point scale, i.e., low, medium, high) to prepare the case comparison. The assessment allowed the identification of salient characteristics of the contingency factors for each gestalt presented in the contingency model.

To indicate the inter-rater reliability, an additional researcher coded the data following a coding scheme. This researcher was initially not involved in the research project, but familiar with the field of research. To measure inter-rater agreement, we used the Cohen's kappa index of inter-rater reliability. The Cohen's kappa coefficient turned out to have a substantial value at 0.65 (Landis and Koch 1977).

During the entire research project, two senior researcher jointly carried out data collection and analysis. This limited the risk of bias in data collection and inconsistency of the obtained data (investigator triangulation) (Patton 2002).

## 4 Research Results

The contingency model was derived based on the results of the coding, as shown in Figure 1. The number with each factor illustrates the code frequency.

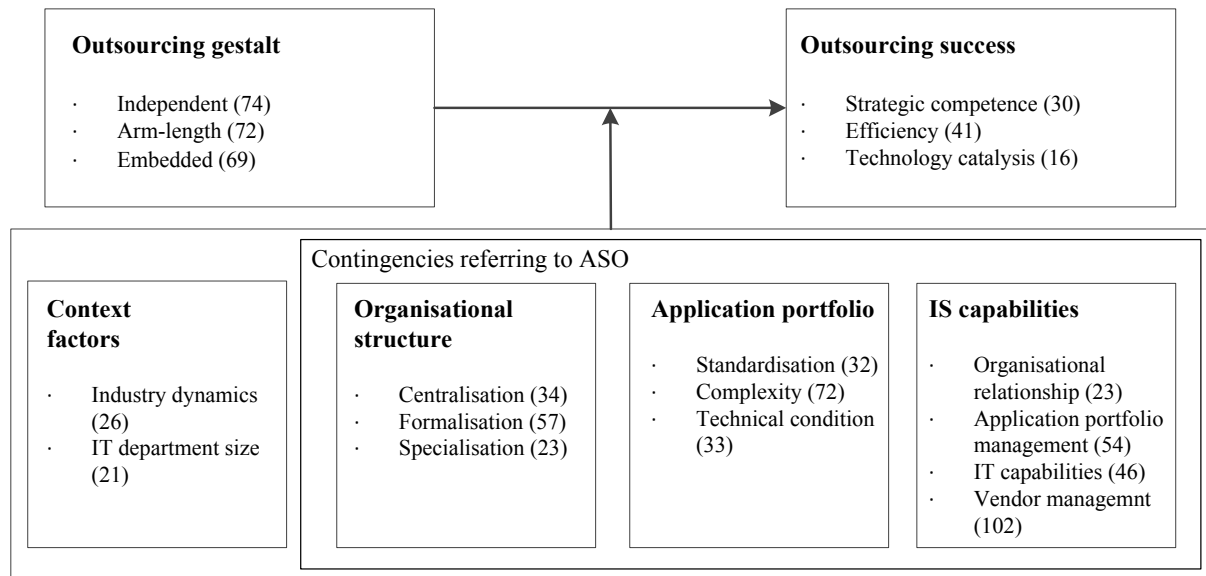


Figure 1. Extended contingency model for ASO strategies based on Lee et al. (2004).

Within the model, we differentiated between four groups of contingencies, as follows: (1) context factors, (2) organisational structure, (3) application portfolio and (4) IS capabilities. In the following, we introduce the model items with their reinforcing or dominating characteristics which influence the outsourcing success of a gestalt. Inspired by Sambamurthy and Zmud (1999), we distinguish between dominating contingencies, which are vital for high performance, and reinforcing contingencies, which reinforce a positive or negative effect on outsourcing success in combination. Further, Table 3 summarises the results and presents the salient characteristics of the contingency factors for each gestalt.



<b>Gestalt</b>	<b>Independent</b>	<b>Arm's-length</b>	<b>Embedded</b>
<b>Contingency</b>			
<b>Context factors</b>			
Industry dynamics	N/A	N/A	N/A
IT department size	Small (r)	Large (r)	Small (d)
<b>Organisational structure</b>			
Centralisation	Medium (r)	High (r)	High (r)
Specialisation	Low (r)	High (r)	N/A
Formalisation	Low (r)	High (d)	N/A
<b>Application portfolio</b>			
Standardisation degree	N/A	High (r)	Low (r)
Portfolio complexity	N/A	Low (r)	High (r)
Technical condition	N/A	Healthy (d)	N/A
<b>IS capabilities</b>			
Organisational relationship	N/A	N/A	N/A
Application portfolio management	Low (r)	High (d)	N/A
Managerial IT capabilities	N/A	N/A	N/A
Technical IT capabilities	High (r)	Medium (r)	Low (r)
Informed buying	N/A	High (d)	Medium (r)
Contract facilitation	N/A	High (d)	High (d)
Contract monitoring	N/A	High (r)	High (r)
Vendor development	N/A	High (d)	High (d)
Contingency forces: d = dominating; r = reinforcing N/A: No clear results could be derived from the data or the factor did not seem to influence the success of the gestalt			

Table 3. Salient contingency forces for the gestalts in ASO.

#### 4.1 Context factors

As we aimed to extend the contingency model derived by Lee et al. (2004), we also included the context factors, industry and size from the original model. During coding, two aspects seemed to have particular potential to influence the success of a gestalt, specifically *industry dynamism* and *IT department size*.

*Industry dynamism* can be described as the intensity of changes relevant to the firm's environment (Randolph and Dess 1984). Organisational science has demonstrated the importance of industry dynamism in decision making (Child 1972). Nevertheless, our analysis did not reveal any clear impact of industry dynamism as an influencing factor for the success of any of the three gestalts. The IT department size can best be defined and measured by the number of IT employees in an organisation (Teo et al. 2003). We also included the IT budget, as the number of IT employees decreased with the degree of outsourcing. The independent approach seems to benefit from a small IT department size as a reinforcing factor. For the embedded approach, a small IT department size was even revealed to be a dominant factor, as all successful organisations had a small IT department and all unsuccessful ones

had a large IT department. In contrast, three of the four successful companies adopting the arm's-length approach had a large IT department and only one had a small IT department; unsuccessful companies showed the reverse pattern (three small, one large). Hence, we considered a large IT department to be a reinforcing factor for the arm's-length strategy.

## 4.2 Organisational structure

Studies taking organisational structure into account (e.g. Damanpour 1991; Pugh et al. 1968)) identified different important design elements which are relevant for the unit of analysis. During the coding, we identified only three dimensions of organisational structure responsible for delivering application services with had a potential influence on the outsourcing success of a chosen gestalt. These were as follows: *centralisation*, *formalisation*, and *specialisation*.

*Centralisation* describes the extent to which decision authority is dispersed or focussed within the organisation (Pfeffer 1981). For our model, we suggested that the degree of centralisation could influence the manner of selecting the outsourcing scope and facilitates and controls the outsourcing relationship. While for the independent approach, we mainly detected a medium degree of centralisation, the arm's-length and embedded approaches seemed to benefit from a high degree of centralisation. Nevertheless, the factors were not dominant as we also detected a low and medium degree of centralisation for the arm's-length approach and one high degree of centralisation for the arm's-length and embedded approaches.

*Formalisation* is related to the use of rules and procedures. While high formalisation is determined by explicitly documented and standardised approaches, low formalisation relates to an organic structure with individual approaches (Aiken and Hage 1971; Blau and McKinley 1979). Successful organisations within the group using the independent strategy tended towards low formalisation. Successful organisations using the arm's-length and embedded approaches appeared to exhibit high formalisation: 'We have a highly formalized incident management process for nearly all applications. This is also used by all our vendors in order to guarantee a hitch-free problem solving' (Direct to the CIO, Case L, arm's-length/successful).

*Specialisation* describes the extent to which the department and staff are functionally specialised in their tasks and skills (Burns and Stalker 1961; Plugge and Bowman 2008). Specialisation leads to subunits with staff that have specialised, less universal skills (Lawrence and Lorsch 1967). In the case of application services, high specialisation typically refers to a separation of development, maintenance and operations and related tasks into different teams. The data revealed that successful organisations utilising the independent strategy benefit from a low degree of specialisation: 'Even though each employee is assigned to a dedicated team, each employee is able to fulfil development and maintenance tasks for several technologies. This enables a flexible allocation to projects, as well as the ability to work with and to supervise external personnel in a joint team' (Direct to the CIO, Case A, independent/successful). For the arm's-length approach, a high degree of specialisation seems reinforcing: 'We separated application development and maintenance into different teams. This also allows a separation in outsourcing which enables us to exploit competitive forces between the vendors' (CIO, Case I, arm's-length/ successful).

## 4.3 Application portfolio structure

Application portfolio characteristics range from the complexity of an application landscape (Simon et al. 2010) to technical quality (Weill and Vitale 1999). From the study data, we identified three major application portfolio characteristics with potential influence on the outsourcing success of an outsourcing gestalt, specifically *standardisation*, *technical condition* and *complexity*. For the

independent approach, we were unable to derive a clear result regarding whether and how the application portfolio structure influences success.

The *standardisation* of an application portfolio refers to the degree of standard software installed (Gable et al. 2001). For the arm's-length approach, a high degree of standardisation was found to be a reinforcing factor. As one informant noted, 'Our application portfolio is based on up to 90% standard software' (CIO, Case I, arm's-length, successful). In contrast, the embedded approach seemed to benefit from a low degree standardisation in the application portfolio in a dominant way: 'Our outsourcing arrangement works because we found an individual way with the provider which is not based on leveraging benefits due to standards in the portfolio across multiple organisations' (CIO, Case R, embedded/ successful).

The *technical condition* of an application portfolio is determined by the technical quality of its applications (McKeen and Smith 2010). This covers the applications' source code quality, maintainability, compatibility, degree of documentation and architectural fit (Simon et al. 2010). The data revealed a healthy technical condition of the portfolio as a dominating factor to succeed in the arm's-length gestalt. As one interviewee stated, 'After an analysis of the application portfolio, we consolidated a huge amount of applications by retiring out-dated and obsolete applications. This dramatically decreased the operational effort for applications, and for some applications, enabled the outsourcing' (CIO, Case J, arm's-length/successful). For the embedded approach, an unhealthy portfolio condition can even trigger the decision to apply the approach.

*Portfolio complexity* involves the number of applications, the number of interfaces, systems with redundant functions and data and the technical complexity of applications (McKeen and Smith 2010). The arm's-length approach seems to benefit from a low complexity. For the embedded approach, a high portfolio complexity was detected for both successful organisations: 'Our application portfolio consists of a complex structure of individual software. Our outsourcing partner understands this complexity by managing all applications together' (CIO, Case R, embedded/successful).

#### 4.4 IS Capabilities

We categorised the identified capabilities based on the work of Willcocks and Feeny (2006), as well as Han et al. (2008), who discuss the major IS capabilities required for outsourcing in general. Out of these capabilities, we identified four categories with potential influence on the success in ASO, as follows: *organisational relationship capabilities*, *IT capabilities*, *application portfolio management capabilities* and *vendor management capabilities*.

*Organisational relationship capabilities* cover the ability to align IT and business in order to make effective decisions on IT issues (Han et al. 2008). All companies possessed high organisational relationship capabilities, so no particular influence on success was detected in relation to the gestalts.

*Managerial IT capabilities* involve the knowledge of where and how IT (and in our research, applications in particular) is installed and guarantees that business objectives are met efficiently and effectively (Han et al. 2008). For this group of capabilities, we detected a similar result as for organisational capabilities. *Technical IT capabilities* are defined as the technical knowledge and skills required to develop, maintain and operate applications (Han et al. 2008). The data revealed that technical IT capabilities could actually be outsourced depending on the strategy used. In terms of the independent approach, organisations aimed to maintain all technical IT capabilities internally, and these were only sourced on a short-term basis in order to close a knowledge gap. Thus, high technical IT capabilities are a reinforcing factor. For the arm's-length approach, technical IT capabilities were kept internally if the capability possesses a critical strategic or business impact. For the embedded approach, we detected low technical IT capability; as most of the IS budget is outsourced to the vendor, the technical knowledge is mainly located with the outsourcing partner: 'We don't actually do

IT; we are managing IT. Thus, pure technological skills are very rare in our IT organisation' (CIO, Case R, embedded/ successful).

The capability of 'designing a technical architecture' (Willcocks et al. 2006) with regard to ASO refers to *application portfolio management (APM) capabilities* which enable an 'on-going management process of categorization, assessment, and rationalization of the IT application portfolio' (McKeen and Smith 2010). Based on the application portfolio management maturity model by Simon et al. (2010), which allows the determination of the capabilities' implementation status, we detected different maturity levels for each gestalt. Our data revealed that all organisations successfully applying the independent approach held a low maturity in APM capabilities as a dominating force. In contrast, organisations succeeding in the arm's-length approach possessed high maturity in APM capabilities as a dominant force: 'Our application management enables our lifecycle-oriented outsourcing of application with the goal of outsourcing all end-of-lifecycle applications, as well as applications with a "maintain" status' (IT Manager, Case K, arm's-length/successful). The results regarding the embedded approach are twofold. One successful organisation had a high application portfolio maturity, the other possessed low maturity. 'The decision over a single outsourcing partner to carry out a portfolio modernisation was enabled by our comprehensive portfolio analysis and planning' (CIO, Case Q, embedded/successful). Nevertheless, one interviewee from the second successful organisation stated, 'We do not possess a detailed documentation of the application landscape as this is part of our outsourcing provider's duties' (CIO, Case R, embedded/successful). In the unsuccessful organisation, APM capabilities were low; thus, no clear conclusion could be derived.

*Vendor management capabilities* include four capabilities. *Informed buying* is the ability to analyse the market with regard to business and technology needs, as well as outsourcing selection options (Willcocks et al. 2006). *Contract facilitation* ensures the ability to guarantee fair and effective solutions to problems with the IT service provider(s) (Willcocks et al. 2006). *Contract monitoring* is defined as the ability to hold the vendor account to the fulfilment of contracts and the development of performance standards of the services market (Willcocks et al. 2006) and reduce contractual risks (Chen and Bharadwaj 2009). Finally, *vendor development* includes the identification and development of potential added value through the vendor (Willcocks et al. 2006). For the independent strategy, we were not able to identify the need for explicit vendor management capabilities. For the arm's-length approach, all four vendor management capabilities were found to be essential: 'We introduced a vendor evaluation process in which we allocate suppliers to different categories to support our multi-vendor strategy. [...] Our vendor management possess clear interfaces and formalised handover processes' (CIO, Case I, arm's-length/successful). Contract facilitation and vendor development are dominant factors here: 'We have strict service level agreements for the performance measurement of our vendors' (CIO, Case J, arm's-length, successful). The ability to develop the vendor relationship is a dominating force for the embedded strategy: 'We continually have to develop our partnership to ensure the improvement of our IT organisation' (CIO, Case R, embedded/successful).

## 5 Discussion

Although our data did not reveal a significant impact of industry dynamism on the success of a particular gestalt, prior research has discussed the influence of this factor on the use and success of outsourcing. Contrary to Qu et al. (2011), Mahnke et al. (2005) state that companies with a low industry dynamic have more to gain from IS outsourcing, as the transaction costs for negotiating and maintaining outsourcing arrangements are expected to be higher in dynamic environments. Lee et al. (2004) found that for industries with a lower dynamic, selective outsourcing was significantly more effective than minimal and comprehensive outsourcing (Lee et al. 2004). While Lacity et al. (2011) did not uncover any size pattern regarding outsourcing decisions, Barthélemy and Geyer (2004) found that large organisations are less likely to consider total outsourcing. Large IT departments have the potential to better leverage economies of scope in outsourcing in the case of selected IS functions and

applications (Barthélemy and Geyer 2004). Our results confirm these findings, as small organisations are more likely to succeed with the independent and embedded approaches, and large IT organisations cope better with the arm's-length approach.

In order to deal with different market situations, different types of organisational structures are required (Morgan 1986). In their contingency model used to evaluate the fit of ITO supplier capabilities with outsourcing performance, Plugge and Bouwman (2012) identified the organisational structure as the leading moderating variable. While centralisation allows top-down optimisation and high information intensity at high management levels, decentralisation enables middle management to optimise its output (Dewett and Jones 2001). This appears to explain our finding that the independent approach is more successful in loose structures, as it allows organisations the flexibility to integrate external staff on a daily basis. In contrast, the arm's-length and embedded approaches seem to benefit from central mechanisms to better facilitate the outsourcing arrangement. Formalisation seeks to avoid ambiguity and enhance efficiency (Perrow 1986). High formalisation can support centralisation, but limits flexibility and autonomy (Plugge and Bouwman 2012). Our study revealed that the arm's-length and embedded approaches rely on a high degree of formalisation. Formalisation can limit flexibility (Plugge and Bowman 2008); in a low degree, it enables the flexibility needed for the independent approach to involve short-term internal staff in a more efficient way. An organisation which is able to share its resources across services (specialisation) can achieve economies of scope, resulting in lower costs (Teece 1980). Thus, the arm's-length approach benefits from a high specialisation.

In terms of outsourcing, asset specificity (Coase 1937) refers to the uniqueness of an organisation's hardware and/or software and the skills of the IS staff (Cheon et al. 1995). Applications based on standard software have more potential to be customised, deployed and maintained by the market (Gable et al. 2001). Application portfolios with a high degree of standardisation generally exhibit higher outsourcing potential. Our data extended these findings, as for the arm's-length approach, high standardisation was found to facilitate the outsourcing arrangement. In contrast, for embedded strategies, a high degree of standardisation provides no benefits. Heterogeneous, non-transparent and vast application portfolios result in increasing costs for maintenance and support (Simon et al. 2010). A poor technical condition often has its roots in mergers and acquisitions and rapid company growth (Caruso 2007) in combination with the missing ability to retire old or redundant applications (McKeen and Smith 2010). This makes the outsourcing of applications or application clusters less promising against the background of efficiency increase through outsourcing. Thus, for the arm's-length approach, an unhealthy technical condition lessens the chance of success. In contrast, the embedded approach is better to achieve technology catalysis, and thus, outsourcing can benefit from the modernisation and improvement of the entire portfolio (or a vast part of it) driven by the outsourcing partner. Prior research discussed the role of comprehensive outsourcing partnerships in enabling organisations to transfer their application portfolios in terms of modernisation, consolidation and harmonisation of applications and functionalities (Ross and Beath 2006). Prior research has also shown that highly integrated application landscapes increase the complexity and the extent of interactions with IT service providers. Therefore, organisations should consider comprehensive outsourcing approaches instead. (Barthélemy and Geyer 2004) Further, Hui et al. (2008) argue that spanning activities that are highly interdependent from one another affects the efficiency of controlling and coordinating the activities. This emphasises our findings that the success of the arm's-length approach is limited by high complexity in the application portfolio, whereas the embedded approach might benefit from such complexity.

Various studies in the literature have addressed IS capabilities in general (Barney 1991; Bharadwaj 2000; Wade and Hulland 2004): Willcocks and Feeny (2006), for instance, determine nine core IS capabilities crucial for outsourcing success. Beside the transfer of too much control to the outsourcing provider, uncontrollable complexity and the lack of required internal capabilities cause outsourcing failures (Rouse and Corbitt 2003). Prior research revealed that IS capabilities have varying roles in different types of allocation of control to the vendor, with fee-for-service contracts having the highest

requirement in the sense of IS capabilities installed (Zelt et al., 2013). Strong APM capabilities enable an organisation to select the IT functions and applications for outsourcing. Thus, these represent a dominant force in the arm's-length strategy. Further, APM seeks to reduce complexity and improve the technical condition of the application portfolio, which influences the success of this gestalt, as shown above. The reason for the low success of organisations with APM capabilities using the independent approach seems to lie in the changed perceptions and expectations brought about by mature APM capabilities. Vendor management capabilities become more important with the transfer of responsibility (Zelt et al., 2013). This explains why the data analysis did not reveal explicit vendor management capabilities for the independent gestalt. Moreover, the relationship quality has an individual basis and the individual fit between internal and external staff members.

## **6 Conclusion**

To address the research questions, we derived a contingency model pointing out the contingencies influencing ASO success allocated to context factors, the organisational structure delivering application services, the condition of the application portfolio and the IS capabilities of an organisation. Furthermore, we determined the salient contingency factors for each gestalt through a case comparison. The arm's-length gestalt turned out to be the most demanding strategy in the sense of requirements. Particularly, the portfolio condition and strong APM capabilities are vital for success in this strategy.

Our contribution to the field is threefold. First, we have enlarged the existing contingency perspective of outsourcing gestalts (Lee et al. 2004) in terms of factors specifically influencing the success of ASO. Furthermore, we have made a contribution to the knowledge base of understanding the complexity of outsourcing decisions, as well as its success (Lacity et al. 2010). From a practitioner's perspective, our contribution deepens the understanding of critical requirements for specific ASO strategies: These results help to assess whether critical requirements have been fulfilled and the targeted arrangement is likely to succeed prior to implementing an outsourcing strategy. Moreover, they cover different degrees of integration and allocations of control. Enterprises can therefore equally consider outsourcing and back-sourcing approaches (Whitten and Leidner 2006).

The external validity of the results is limited by the scope of the unit of analysis, the nature of the contingency perspective and the characteristics of cross-sectional case study analysis. With respect to the unit of analysis, this research focussed on the client's perspective concerning ASO; the vendor's characteristics, which complementarily determine outsourcing success, were not included (e.g. Plugge et al. 2013). Furthermore, the geographical concentration might cause limitations in the sense of transferability to other countries, as other research has demonstrated geographical differences in outsourcing decisions (e.g. Dibbern 2012 et al.). The contingency perspective naturally adopts a narrow definition of fit/misfit and performance, which often simplifies the complexity of economic decision making (Weill and Olson, 1989). A combination of quantitative approaches could extend the external validity of the contingency model (Weill and Olson 1989).

Due to the nature of cross-sectional research, we did not analyse dynamic aspects like the planned or on-going transition from one to another gestalt (Jayatilaka and Hirschheim 2009). Therefore, we have potentially overlooked a time lag responsible for the success of the outsourcing arrangement (Weill and Olson 1989) and the dynamic effects of continuously changing organisations (Zajac et al. 2000) ), from a perspective, for example, of dynamic capabilities (Teece and Pisano 1994). Thus, the results of the derived contingency model could further be investigated from a longitudinal research perspective.

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<b>Article II</b>	
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Abstract	<p>The literature on IT outsourcing contains several works on IS capabilities required to succeed in outsourcing. This capability perspective does not only take into account the capabilities to manage vendors, but also includes internal relationship-related, managerial as well as technical IT capabilities. Prior research, however, does not differentiate between the employment of IS capabilities in different outsourcing approaches. Such approaches vary not only with respect to the ratio of the IT budget allocated externally, but also with respect to the extent of control transferred to the vendor. In order to analyze the IS capabilities required for different outsourcing approaches, a comparative case study research with eight large enterprises from various industries in Germany and Switzerland has been conducted. The results allow propositions about the variance of required IS capabilities, which imply that organizations need to carefully coordinate their IS capabilities with the outsourcing strategy and capability development initiatives.</p>

# The Varying Role of IS Capabilities for Different Approaches to Application Services Outsourcing

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## ABSTRACT

The literature on IT outsourcing contains several works on IS capabilities required to succeed in outsourcing. This capability perspective does not only take into account the capabilities to manage vendors, but also includes internal relationship-related, managerial as well as technical IT capabilities. Prior research, however, does not differentiate between the employment of IS capabilities in different outsourcing approaches. Such approaches vary not only with respect to the ratio of the IT budget allocated externally, but also with respect to the extent of control transferred to the vendor. In order to analyze the IS capabilities required for different outsourcing approaches, a comparative case study research with eight large enterprises from various industries in Germany and Switzerland has been conducted. The results allow propositions about the variance of required IS capabilities, which imply that organizations need to carefully coordinate their IS capabilities with the outsourcing strategy and capability development initiatives.

## Keywords

Application Services Outsourcing, IS Capabilities, Outsourcing Approach, Full Outsourcing, Selective Outsourcing, Body-shop, Transfer of Responsibility, Extent of Control, Case Study Research.

## INTRODUCTION

Even though information systems (IS) outsourcing is a common practice in organizations, only a few report appropriate success (Han, Lee and Seo, 2008). These failures are caused by the complexity of IS outsourcing decisions (Lacity and Hirschheim, 1993; Loh and Venkatraman, 1992; Ngwenyama and Bryson, 1999). An outsourcing decision mainly covers the degree of outsourcing (Lacity, Willcocks and Feeny, 1996), the contract design (Lacity, Khan, Yan and Willcocks, 2010), and furthermore the outsourced IS functions (Grover, Cheon and Teng, 1996).

Therefore, different outsourcing approaches exist, varying in the extent of IS budget and control transferred to a third party from total insourcing to total outsourcing (Straub, Weill and Schwaig, 2008). Several studies demonstrate that the risk of failure of full outsourcing strategies is higher compared to selective outsourcing strategies (Gonzalez, Gasco and Llopis, 2004). This is explained by the need to retain key knowledge in-house (Gonzalez et al., 2004). Nevertheless, there are studies illustrating that a full outsourcing approach can be successful under certain circumstances (Barthélemy and Greyer, 2004). The degree of outsourcing can therefore not be considered to be an antecedent of outsourcing success. The decision about which information technology (IT) assets, functions and/or services to outsource and to whom, however, requires considerable attention (Lacity et al., 1996).

Comparing the share of global spending on IS outsourcing with the share of internal expenditures for infrastructure services and application services, a noticeable disproportion occurs. According to Gartner Inc., only 16 percent of the IS outsourcing spending are related to application services (Britz, Young, Jester, Tramacere, Blackmore, Tenneson, Sawai, Petri, Silva, Bell, Ng and Roy, 2012). Looking at the IS budget, well over 35 percent of the expenditures are spent on application services (Capgemini, 2012). This dissimilarity might be caused by the different nature of infrastructure and application services outsourcing. While infrastructure services outsourcing is mainly standardized and a commodity to organizations, application services are much

more individual to organizations due to their close interrelation with business processes (Abbas, Silva and Komada, 2010; Fisher, Hirschheim and Jacobs, 2008). Thus, the outsourcing of application services affects an organization's competitive capacity (Abbas et al., 2010; Fisher et al., 2008) and should therefore be carefully evaluated towards a suitable outsourcing approach.

Besides a careful selection of the outsourcing scope (Lactiy et al., 1996), the availability of essential capabilities (Baldwin, Irani and Love, 2001) is a critical determinant for a successful outsourcing decision (Fisher et al., 2008). Hitherto, there is a discussion of essential IS capabilities required to succeed in outsourcing in general (e.g., Han et al., 2008; Willcocks, Feeny and Olson, 2006). But there is no distinct view whether these IS capabilities are required amongst all outsourcing approaches equally in the field of application services outsourcing. A differentiated view on IS capabilities with regard to the outsourcing approach enables organizations to include their internal IS capabilities when choosing an outsourcing approach. The purpose of this research is to analyze the potentially varying role of IS capabilities for the success of different approaches in application services outsourcing.

## RELATED WORK

### Outsourcing Approaches and the Transfer of Responsibility

Kern (1997) defines IS outsourcing as “a decision taken by an organization to contract-out or sell the organization's IT assets, people, and/or activities to a third party vendor, who in exchange provides and manages assets and services for monetary returns over an agreed period of time.” Over the last 20 years the IT outsourcing phenomenon has been studied extensively (Dibbern, Jayatilaka, Gales and Hirschheim, 2004; Gonzalez, Gasco and Llopis, 2006; Lacity, Khan and Willcocks, 2009; Lacity et al., 2010). Han et al. (2008) state that IT outsourcing is “a commonly accepted and growing practice”. Nevertheless, only a few organizations report real success with their outsourcing arrangements (Han et al., 2008). The outsourcing decision is a very complex process and its motivation as well as its outcome are different for each organization. Wrong decisions can lead to a loss of essential capabilities and/or business failures (Loh et al., 1992; Ngwenyama et al., 1999). Therefore, the scope of outsourcing has to be selected very carefully considering the particular set of conditions an organization is facing (Watjatrakul, 2005).

Lacity and Hirschheim (1995) differentiate between three modes of IS outsourcing determined by the percentage of IS budget invested externally. Total out- and insourcing describe the decision to transfer more than 80 percent or less than 20 percent of the IS budget to a single third party vendor. Selective outsourcing is characterized as the transfer of selected IS functions to external provider(s) while keeping the internal responsibility for 20 to 80 percent of the total IS budget. Selective outsourcing, in most of the cases, includes the contracting of multiple vendors, known as multi-sourcing, in order to foster competition between providers, reduce costs or mitigate risks (Currie, 1998). Taking into account the range of responsibility transferred to the vendor, Lacity and Hirschheim (1993) introduce three different types of outsourcing. *Body-shop* is defined as the hiring of external resources, e.g. contract programmers, which are managed by the organization's personnel in order to stratify a short-term demand of resources. *Project management* refers to the outsourcing of a specific project or portion of work, e.g. the development of a new system. *Total outsourcing* is applied when the third party takes over the responsibility for a significant part of the IS work. Lacity and Hirschheim (1993) characterize this approach as “turning over the keys to the kingdom” (Lacity et al., 1993). Based on the resource dependency theory, Straub et al. (2008) conceptualize the *extent of internal control* over IT resources as the main subject of the outsourcing decision. Total insourcing and total outsourcing are therefore the respective ends of a continuum (Straub et al., 2008).

For our research we differentiate three outsourcing approaches based on the definitions above:

*Body-shop* involves the hiring of external staff managed by internal resources. Apart from the actual tasks undertaken by the external personnel, no responsibility is transferred to the third party.

*Selective outsourcing* includes the outsourcing of one or more particular IS functions, for one or a cluster of applications to one or multiple third parties, which take over the responsibility for determined parts of the IS function, project or portion of work. This type can vary heavily in the percentage of the IS budget spent for external services.

*Full outsourcing* is applied when a significant part of the IS functions is outsourced to a single vendor. This implies that, for the most part, the vendor takes over the control of the tactical and operational application services.

While infrastructure management functions are seen as “classic outsourcing candidate functions” (Fisher et al., 2008), the outsourcing of application services is more complex. As applications have a closer interaction with the actual business process, the application management potentially affects an organization's competitive capacity (Abbas et al., 2010; Fisher et al., 2008). The following investigations focus on application service outsourcing. Application services generally cover “all services associated with the acquisition, development, and

deployment of an IT application” regardless of whether they are provided internally or externally (Schwarz, Jayatilaka, Hirschheim and Goles, 2009).

### IS Capabilities Required for Outsourcing

Bharadwaj (2000) defines an organization’s IS capability as “its ability to mobilize and deploy IT-based resources in combination or copresence with other resources and capabilities”. Various literature addresses the central role of IS capabilities for organizations in general (Barney, 1991; Bharadwaj, 2000; Wade and Hulland, 2004). Willcocks et al. (2006) define nine core IS capabilities, which are crucial for outsourcing success. These IS capabilities are less focused on technical skills but emphasize the business orientation required for outsourcing (Willcocks et al., 2006). Based on the work of Willcocks et al. (2006) as well as Han et al. (2008), who extract the major IS capabilities required for outsourcing based on prior literature, we defined the following IS capabilities required for application services outsourcing as shown in Table 1.

IS Capability	Description of IS capability
<i>Organizational relationship capabilities</i>	“The ability to coordinate between IT and business groups [which] is needed to allow the business to engage effectively in IT issues.” (Han et al., 2008)
<i>Designing technical architecture</i>	“Creating the coherent blueprint for a technical platform which responds to present and future business needs.” (Willcocks et al., 2006)
<i>Managerial IT capabilities</i>	“Implies knowledge of where and how IT is deployed effectively and profitably to meet strategic business objectives.” (Han et al., 2008)
<i>Technical IT capabilities</i>	“Involves technical knowledge and skills needed to develop [maintain and operate] applications.” (Han et al., 2008)
<i>Informed buying</i>	“Analysis of external market [...] [and] selection of sourcing strategy which meets business needs and technology issues.” (Willcocks et al., 2006)
<i>Contract facilitation</i>	“Ensuring the success of existing contracts with IT service providers. [...] ensures that problems and conflicts are seen to be resolved fairly.” (Willcocks et al., 2006)
<i>Contract monitoring</i>	“Holding suppliers to account for both existing service contracts and the developing performance standards of the services market.” (Willcocks et al., 2006)
<i>Vendor development</i>	“Identifying and developing of potential added value of IT [...] service providers.” (Willcocks et al., 2006)

**Table 1. IS capabilities relevant for application services outsourcing (based on Han et al. (2008) and Willcocks et al. (2006))**

Retention of essential capabilities (Baldwin et al., 2001) as well as careful selection of the outsourcing scope (Lacity et al., 1996) are seen as major success factors in the decision of “what to outsource” (Fisher et al., 2008). With regard to the discussion of core capabilities, the literature has to date not differentiated between the different outsourcing approaches introduced above. Many researchers find the selective outsourcing approach to be the most successful in terms of performance and cost savings achieved (Lacity and Willcocks, 1998). Nevertheless, outsourcing failures are not only caused by transferring too much control to the vendors(s), but also by an uncontrollable complexity induced by outsourcing (Rouse and Corbitt, 2003). Some organizations with a highly integrated application landscape can experience complex and extensive interactions between IT service providers and the organization (Barthélemy et al., 2004). Therefore, companies should also consider current IS capabilities available to the organization when deciding on the outsourcing approach. These considerations motivate the following research question:

*How do IS capabilities, which are critical for outsourcing success, vary with a company’s outsourcing approach, i.e., body-shop, selective outsourcing and full outsourcing?*

### RESEARCH METHDOLOGY

We chose a case study research design (Benbasat, Goldstein and Mead, 1987; Paré, 2004; Yin, 2003) in order to generate propositions (on the role of IS capabilities for outsourcing approaches) rather than to test hypotheses that were already established. Following an inductive, case-oriented process proposed by Eisenhardt (1989), we specified potentially important variables prior to using replication logic to generate propositions. Yin (2003)

discusses five design components with a high importance for the design of case study research. The study's question (1) is deduced from the research problem, in our case the limited knowledge about IS capabilities in different outsourcing approaches. Due to limited scientific knowledge, no a priori propositions (2) are formulated. Yin (2003) argues that studies with an exploratory nature should however state a clear purpose and success criterias. This study aims to derive propositions on the contributions of IS capabilities to the success of different outsourcing approaches. The unit of analysis (3) is the IS outsourcing practice of a firm and the IS capabilities employed. We matched and compared capability patterns to link the data to the propositions we developed (4) and to interpret the findings (5).

### Data Collection

Since the units of analysis are the company specific IS capabilities as well as the selected outsourcing approach, we chose a research design with multiple holistic case studies (Yin, 2003). Rather than statistically sampling the cases from a chosen population, we pursued a theoretical sampling strategy (Eisenhardt, 1989; Glaser and Strauss, 1967). We focused on large German and Swiss enterprises with a turnover of 50 million euros and higher (OECD, 2005) in order to limit inter case differences due to firm size and cultural reasons. Furthermore, we chose a mix of firms from different industries in order to obtain results which are generalizable and not bound to a specific industry. We ended up with a case base of eight firms with two or three firms per outsourcing approach. This allowed the identification of constructs and causal relationships based on the logic of literal as well as theoretical replication (Yin, 2003). An overview of the cases is given in Table 2.

Company	Revenue [Mio EUR]	Industry	IT Budget [Mio EUR]	Outsourcing approach	Position of interview partner [number]
Alpha	≥ 50 000	Manufacturing	>1000	Selective	Direct Report to the CIO (1)
Beta	100-1000	Banking & Financial Services	50-200	Full	CIO (1)
Gamma	2000 – 10 000	Manufacturing	1-50	Body-shop	Direct Report to the CIO (1)
Delta	≥ 50 000	Utility	>1000	Selective	Direct Report to the CIO (1)
Epsilon	10 000 – 50 000	Pharmaceutics & Chemicals	>1000	Body-shop	CIO (1)
Zeta	≥ 50 000	Banking & Financial Services	50-200	Body-shop	Direct Report to the CIO (2) Central function (1)
Eta	1000 -2000	Retail	1-50	Full	CIO (1) Direct to the CIO (1) IT Manager (1)
Theta	1000 -2000	Manufacturing	n.a.	Selective	CIO (1) Direct Report to the CIO (1)

**Table 2. Characteristics of companies and interview partners**

The constructs identified in the literature were included in an interview guideline with standardized open-ended questions (Patton, 2002) and a questionnaire with closed questions (Eisenhardt, 1989). During the interview one of the two interviewers made notes while the other conducted the interview (Dubé and Paré, 2003; Eisenhardt, 1989). In order to guarantee data validity the interview protocol was then again validated by the interviewee(s).

### Data Analysis

The data analysis was carried out in an iterative process (Miles and Huberman, 1994). We initially used the three outsourcing approaches and eight IS capabilities derived from previous literature in order to identify the different characteristic manifestations of the IS capabilities for each approach. Based on the findings, we dimensionalized each IS capability on a three-point scale (strong, medium, weak) to prepare the case comparison. We then again coded all interviews with a refined coding scheme including the three dimensions. During coding, we triangulated interview data with the survey data and internal documents provided by the interviewees after the interview (such as organizational charts and process documentations). After coding we searched for cross-case patterns that are within-group similarities and cross-group differences (Eisenhardt, 1989). In order to indicate the inter-rater reliability, a researcher who initially was not involved in coding and is well familiar with the field of research, was provided with a description of the coding scheme and coded a randomly selected sample (10

percent) of the data set (Webster, 1998). The inter-rater reliability was at 88 percent. Data collection and analysis were jointly conducted by two senior researchers and thus limiting the risk of bias in data collection and assessing the consistency of the obtained data (investigator triangulation) (Patton, 2002).

## RESEARCH RESULTS

Table 3 lists exemplary citations, which describe the employment of IS capabilities in the different outsourcing approaches. We furthermore added the dominating dimension (strong, medium, weak) of each capability possessed at the companies within each outsourcing approach. The citations in Table 3 are exemplary but not exhaustive. As stated in the last row, the outsourcing approaches differ with respect to the role of certain IS capabilities.

Due to size limitation, we focused on the IS capabilities with a high interclass variance and deduced propositions, which describe their criticality for outsourcing success.

The capability *designing technical architecture* varies strongly between the outsourcing approaches, particularly with respect to IT application portfolio management (McKeen and Smith, 2010). The investigated companies using the body-shop approach did not have a comprehensive and documented application portfolio. As in these cases the external resources work directly under the control of internal personnel, who manages the required knowledge implicitly. Companies applying full outsourcing did also not possess a detailed documentation of their application portfolio. “We expect our vendor to possess a detailed overview of the interfaces between applications.” (Beta) For selective outsourcing the clear documentation and a structured portfolio planning represented a major enabler. “The selective outsourcing was enabled through a central application portfolio management.” (Delta)

*Proposition 1: Selective outsourcing requires strong capabilities for designing technical architecture, whereas the body-shop and full outsourcing approaches do not explicitly depend on these capabilities.*

While the companies applying body-shop possess the full range of *technical IT capabilities* required to develop, maintain and operate applications, the organization in the cluster of selective outsourcing only keep technical capabilities for functions or application not selected for outsourcing. “Sourcing is dominantly motivated by the fact that pure development tasks are not a core competence of our IT organization.” (Alpha) The full outsourcers have very little or nearly no technical capabilities. “There is only a small portion of application development and maintenance functions that is not transferred to the provider.” (Beta)

*Proposition 2: The body-shop approach requires technical IT capabilities, whereas full outsourcing only requires the capabilities to a very small extent. For selective outsourcing the need for technical IT capabilities depends on the extent of control transferred to the vendor.*

Within the body-shop approach *contract facilitation* was not managed actively. Selective outsourcing approaches possessed clear interfaces between the internal organization and the vendor. “The maturity of the interaction plays an important role as you only get what you demand for.” (Theta) This also includes a clear separation of IS sub-functions. “We clearly separated all functions for managing SAP applications in order to enable the outsourcing of selected maintenance tasks.” (Theta) The companies applying full outsourcing also possess clear and formalized interfaces. “At the beginning we experienced a big chaos, which we were able to overcome with stringent standards for vendor coordination.” (Eta)

*Proposition 3: Selective and full outsourcing require the capabilities for contract facilitation, whereas the body-shop approach does not rely on these capabilities.*

The *contract monitoring* within the body-shop approach is limited to the individual control of internal managers. Companies applying selective outsourcing obtain stringent service level agreements (SLA) and key performance indicators (KPI) in order to measure the performance of vendors. “For the contract monitoring, we implemented the role of the service delivery manager, who is responsible for the controlling of the performance agreed in the contract.” (Theta) The two companies with a full outsourcing approach stated that the ability to control the performance of the vendor is essential and needs to be improved continuously.

*Proposition 4: Selective and full outsourcing require the capabilities for contract monitoring, whereas the body-shop approach does not rely on these capabilities.*

*Vendor development* was also positioned on a personal level within the body-shop approach. “In the selection of external resources, we put emphasis on the individual skills of the person working with our team. Therefore, we also rely on prior experiences.” (Gamma) The organizations in the group of selective outsourcing regularly evaluated vendors towards the leverage of cost reduction and the potential for added value. “Once a year we benchmark the available vendors and assess their potential to provide added value.” (Alpha) Within the full outsourcing approach, company Eta pointed out the importance of a joint identification and development of mutual benefits.



Capability	Body-shop	Selective outsourcing	Full outsourcing	Interclass variance
<i>Organizational relationship capability</i>	<p>“The IT organization delivers a clear value to the differentiation of the company.” (Gamma)</p> <p><b>Dominant dimension: strong</b></p>	<p>“One of the most important aspects within our application management is a clear business alignment.” (Alpha)</p> <p>“It is important to strengthen the awareness of IT within the business units.” (Theta)</p> <p>“Even though the business currently focuses on costs saving, we need to consider innovations for future business needs.” (Delta)</p> <p><b>Dominant dimension: strong</b></p>	<p>“One major core competence is the alignment with the business.” (Beta)</p> <p>“The sourcing strategy is fully aligned with the business targets.” (Eta)</p> <p><b>Dominant dimension: strong</b></p>	low
<i>Designing technical architecture</i>	<p>“We only possess a rough overview of the most important systems in the application landscape stored in de-central Excel lists.” (Epsilon)</p> <p>“We don’t have a company-wide responsible for the application architecture. The knowledge is in the heads of the employees.” (Gamma)</p> <p><b>Dominant dimension: weak</b></p>	<p>“We possess a portfolio map which reveals the status-quo and a plan of the future application landscape.” (Alpha)</p> <p>“All applications and interdependencies are documented. Our portfolio plan also includes the costs for each application available from a business-process-view.” (Delta)</p> <p><b>Dominant dimension: strong</b></p>	<p>“There is no detailed portfolio documentation.” (Beta)</p> <p>“We don’t have a detailed portfolio planning. We only provide software and architecture guidelines.” (Eta)</p> <p><b>Dominant dimension: weak</b></p>	high
<i>Managerial IT capability</i>	<p>“We established business partners which ensure a close communication with the business.” (Epsilon)</p> <p>“Our process consulting is oriented towards business processes covering all applications.” (Gamma)</p> <p><b>Dominant dimension: strong</b></p>	<p>“One of our major core competencies is the transformation of business needs into the applications.” (Alpha)</p> <p>„Our employee development accelerates the enhancement of business skills.“ (Delta)</p> <p>“The IT organization considers itself as a partner of the business [...] This also includes the ability to transfer business needs into technology.” (Theta)</p> <p><b>Dominant dimension: strong</b></p>	<p>“We consider ourselves as translator of business requirements.” (Beta)</p> <p>“Most of the business know-how is bound to the vendor. [...] There is a direct communication about business requirements between the business unit and the vendor.” (Eta)</p> <p>“The business know-how is the most important element for our IT organization. Therefore, we need to retain these skills on the long-term with special employee development programs.” (Beta)</p> <p><b>Dominant dimension: not obvious</b></p>	low
<i>Technical IT capability</i>	<p>“Our development is allocated towards technologies.” (Zeta)</p> <p>“Our employees are able to perform each function for their assigned applications. Thus, there is no loss in knowledge about the source code and interdependencies.” (Gamma)</p> <p><b>Dominant dimension: strong</b></p>	<p>“Support services or pure development tasks are no core competencies and capable for outsourcing.” (Alpha)</p> <p><b>Dominant dimension: medium</b></p>	<p>“All application development and maintenance tasks are outsourced.” (Eta)</p> <p>“Nearly all of the development and maintenance is outsourced.” (Beta)</p> <p><b>Dominant dimension: weak</b></p>	high
<i>Informed buying</i>	<p>“In order to close the skill shortfalls we need to work with external resources.” (Zeta)</p> <p>“The sourcing of SAP skills is much easier than finding resources capable to handle our individual applications.” (Epsilon)</p> <p><b>Dominant dimension: medium/strong</b></p>	<p>“We seek to gain cost transparency in order to aim competitive prices.” (Theta)</p> <p>“We follow a multi-vendor strategy enabled through a dedicated supplier evaluation process, assigning vendor to different vendor categories” (Alpha)</p> <p><b>Dominant dimension: strong</b></p>	<p>“For the provider selection we developed a procedure which enables us to validate whether a provider possess the required capabilities.” (Beta)</p> <p>“We currently develop a sourcing strategy in order to validate whether to stick with the current model or to back-source some functions.” (Eta)</p> <p><b>Dominant dimension: medium/strong</b></p>	low
<i>Contract facilitation</i>	<p>“We do not really manage sourcing relationships since we source on a time and material basis.” (Epsilon)</p> <p><b>Dominant dimension: weak</b></p>	<p>“The close cooperation with the vendor along professionalized processes is essential for the outsourcing.” (Alpha)</p> <p>“We possess formalized handover processes between development and maintenance.” (Theta)</p> <p><b>Dominant dimension: strong</b></p>	<p>“A very large part of our effort goes into the definition of requirements and the communication with the vendor.” (Eta)</p> <p><b>Dominant dimension: strong</b></p>	high
<i>Contract monitoring</i>	<p>“One internal employee is able to manage four external resources.” (Gamma)</p> <p><b>Dominant dimension: weak</b></p>	<p>“We strictly measure our vendors towards agreed SLAs.” (Delta)</p> <p><b>Dominant dimension: strong</b></p>	<p>“We are constantly thinking about improving our monitoring ability.” (Eta)</p> <p><b>Dominant dimension: strong</b></p>	high
<i>Vendor development</i>	<p>“The selection of a vendor is often individual-related.” (Epsilon)</p> <p><b>Dominant rating: weak</b></p>	<p>“As cost reduction is one of the sourcing targets, we try to promote competition between vendors.” (Alpha)</p> <p>“Providers which are preliminary orientated towards technology will fail in the future.” (Delta)</p> <p><b>Dominant rating: medium/strong</b></p>	<p>“As 100 percent standard was not suitable for us, we jointly developed an individual outsourcing model.” (Eta)</p> <p>“Underpinning service contracts are also managed by the vendor.” (Eta)</p> <p><b>Dominant rating: strong</b></p>	high

Table 3. Overview of the variance of IS capabilities regarding different outsourcing approaches

Beta similarly formulated the desire for further development of the cooperation with the vendor: “While the outsourcing concentrates on cost savings today, we would like the vendor to develop innovations in order to generate additional value.” (Beta)

*Proposition 5: The body-shop approach does not require explicit vendor development capabilities, whereas for the selective and the full outsourcing approach, it represents a core capability.*

## CONCLUSION

In order to identify variances in the criticality of an IS capability required for the chosen outsourcing approach differing in the extent of control transferred to the vendor, i.e., body-shop, selective outsourcing and full outsourcing, we conducted case study research with eight German and Swiss companies from various industries. Based on the results, we developed five propositions about the role of IS capabilities within different outsourcing approaches. Overall we were able to identify five significant interclass variances: (1) The selective outsourcing approach more strongly relies on the capabilities for designing technical architecture. (2) The more responsibility is transferred to the vendor, the less technical capabilities are required. (3) The capabilities for contract facilitation (3), contract monitoring (4) as well as vendor development (5) are essential to succeed in selective and full outsourcing, but not for the body-shop approach.

Our research contributes to the understanding of the complexity of outsourcing decisions. As this decision is unique to each company, decision makers have to carefully consider the distinct circumstances of their organization (Watjatrakul, 2005). As former research suggested to build distinct IS capabilities to succeed in outsourcing in general (Han et al., 2008; Willcocks et al., 2006), our research enlarges the current knowledge base with a differentiated perspective of IS capabilities required for specific outsourcing approaches in the field of application services outsourcing. The chosen extent of control therefore not only influences the outsourcing outcome itself, but also determines the need to build certain capabilities. Considering application portfolio management (McKeen and Smith, 2010) as a critical requirement for the selective approach, draws potential to further evaluate the outsourcing decision and its outcome. These insights can support practitioners in developing IS capabilities critical to the chosen outsourcing approach. Furthermore, companies can evaluate whether they currently possess the critical IS capabilities for a preferred outsourcing approach.

Due to the low sample size the research is limited to the insights into the eight companies. Furthermore, the sample size for each outsourcing approach is not even, which also causes uncertainties in the results. The research is also regionally focused. A broader theoretical grounding in combination with a large-scale survey (e.g. to apply hypothesis testing) must provide empirical evidence for the propositions generated. The application of common resource theories (Dibbern et al., 2004), for example, could further explain the discovered patterns. A dynamic perspective on the reciprocal effects between the adoption of an outsourcing approach and the development of critical IS capabilities could further be grounded by the theory of dynamic capabilities (Teece, Pisano and Shuen, 1997) as well as research in the field of outsourcing maturity (Adelakun, 2004; Fisher et al., 2008).

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<b>Article III</b>	
Title	The Role of Application Portfolio Management in Application Services Outsourcing: Explicating Variations in Application Portfolio Management among Outsourcing Gestalts
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Abstract	<p>Prior research identified different outsourcing strategy types most likely to succeed, described by the outsourcing extent, the contract type and duration. Each of the strategy types serves a particular outsourcing outcome. Since application portfolio management pursues to improve and optimize the application landscape, it supports and enables decisions in the field of application services outsourcing. The aim of our research is to investigate the varying role of application portfolio management (APM) for different application services outsourcing strategies. Therefore, we conducted case study research with eleven large German and Swiss companies. In order to identify the varying role of APM, we compared the behaviour of the companies successfully applying particular strategy types. Therefore, we analysed the differences in APM capabilities, application portfolio structure and the influence of application characteristics. The results reveal that the companies applying different strategies vary in the extent APM is implemented in an organization.</p>

# **The Role of Application Portfolio Management in Application Services Outsourcing: Explicating Variations in Application Portfolio Management among Outsourcing Gestalts**

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## **Abstract**

*Prior research identified different outsourcing strategy types most likely to succeed, described by the outsourcing extent, the contract type and duration. Each of the strategy types serves a particular outsourcing outcome. Since application portfolio management pursues to improve and optimize the application landscape, it supports and enables decisions in the field of application services outsourcing. The aim of our research is to investigate the varying role of application portfolio management (APM) for different application services outsourcing strategies. Therefore, we conducted case study research with eleven large German and Swiss companies. In order to identify the varying role of APM, we compared the behaviour of the companies successfully applying particular strategy types. Therefore, we analysed the differences in APM capabilities, application portfolio structure and the influence of application characteristics. The results reveal that the companies applying different strategies vary in the extent APM is implemented in an organization.*

## **Keywords**

Application Portfolio Management, Application Services Outsourcing, Outsourcing Strategies, Application Portfolio Management Capabilities, Application Portfolio Structure

## **INTRODUCTION**

Today, companies struggle with historically grown application landscapes which are laden with obsolete information technology (IT) systems, unfinished or long-lasting and therefore out-dated projects and applications no longer satisfying business requirements. Besides large-scale rationalization and modernization projects to solve this problem, IT decision makers change the way of viewing development projects. While in the past the “building of an application” and the “maintaining of an application” was mostly separated, today a life-cycle approach is required considering the lifetime. Thus, maintainable applications are developed instead of simply finding a solution for a current problem. (Capgemini 2012) In order to achieve such a life-cycle view, organisations implement application portfolio management (APM) as a sub-process of IT governance to balance business requirements and IT investments (De Haes and Van Grembergen 2009). By maintaining and improving the application landscape to better meet business demands, APM seeks to decrease costs and to reduce application portfolio complexity (Caruso 2007). Today’s complex application landscapes furthermore require a comprehensive portfolio understanding of the inherent relations and dependencies between applications (Simon and Fischbach 2013).

In the past, research has called for a comprehensive view on outsourcing decisions along all IS functions (Mahnke et al. 2005). Nevertheless, there are IS functions such as infrastructure services seen as “classic outsourcing functions” with standard approaches available (Fisher et al. 2008), which can largely be decided upon separately. The application services outsourcing (ASO) decision, including “all services associated with the acquisition, development and deployment of an IT application” (Schwarz et al. 2009), on the contrary is a complex and individual decision for organisations due to its close relation to business processes (Fisher et al. 2008). Although there are standard approaches available in the field of IS development outsourcing (Dibbern et al. 2004), the outsourcing decision should be seen in the context of the whole IT application life-cycle. Especially as a large amount of lifetime costs of an application are already determined within the development phase (Kramer et al. 2011).

Between ASO and APM exists a symbiotic relation to achieve IS targets. Practitioners agree that APM enables “better outsourcing agreements” (Gliedman 2004). APM provides a clear picture of the application landscape which supports the selection of the outsourcing scope and triggers the improvement of the outsourcing relationship (Gliedman 2004). Lacity et al. (1996) already pointed out the importance of well-considered, incremental, and selective approaches in order to achieve efficiency. But outsourcing decisions are not only motivated by cost reduction, but also through access to skills, concentration on core competencies or innovation (Dibbern et al. 2004). Besides the outsourcing scope, outsourcing decisions cover the outsourcing degree and the contract design (Lacity et al. 1996). Lee et al. (2004) derived three dominant outsourcing strategy types, which they refer to as outsourcing gestalts, most likely to succeed in different outsourcing outcomes, e.g. cost efficiency. Based on this general assumption to configure outsourcing strategies, we seek to understand how application portfolio management guides and enables ASO strategies. Therefore, we carried out case study research with eleven large German and Swiss companies. Our study shows that while research does not deal with this issue in depth, practice already established methods to use APM in different ways to enable, support and ensure different ASO strategies.

The reminder of the paper is structured as follows: The next section gives an overview of prior research explaining outsourcing strategies and ASO as well as research implying the interrelation of APM and ASO. The subsequent section describes the research methodology including data collection and analysis. The results are presented along APM capabilities, the application portfolio structure, and application portfolio characteristics addressing the varying role for each outsourcing gestalt. The paper closes with the conclusion including the limitations and potential for future research.

## RELATED WORK

### Application Services Outsourcing Strategies

Kern (1997) describes IS outsourcing as “a decision taken by an organisation to contract-out or sell the organisation’s IT assets, people, and/or activities to a third party vendor, who in exchange provides and manages assets and services for monetary returns over an agreed period of time.” The outsourcing decision is very complex and unique to each organisation (Cheon et al. 1995) and mistakes can lead to outsourcing failures such as the loss of essential capabilities and/or business damages (Loh and Venkatraman 1992). The view on IT functions ranges from a broad to a more detailed categorization as well as from a pure technical to an offering oriented view. Grover et al. (1996) differentiate between “application development and maintenance, system operation, networks/telecommunication management, end-user computing support, system planning and management, and purchase of application software”. More recently, Mahnke et al. (2005) divides IT functions based on established industry offerings into infrastructure, applications and business processes. In accordance with Mahnke et al. (2005), we defined ASO as the outsourcing of “all services associated with the acquisition, development, and deployment of an IT application” (Schwarz et al. 2009).

Scholars identified different outsourcing typologies to specify outsourcing strategies. Most popular is the typology by Lacity and Hirschheim (1995) introducing three outsourcing types varying in the IS budget transferred to one or multiple vendors: (1) total insourcing (less than 20 per cent of the IS budget), (2) selective outsourcing (between 20 and 80 per cent of IS budget), and (3) total outsourcing (more than 80 per cent of the IS budget). Prior research by Lacity and Hirschheim (1993) also addressed the range of responsibility transferred to the vendor to define a typology. Body-shop therefore refers to the hiring of external staff managed internally and thus resulting in nearly no responsibility transfer (Lacity and Hirschheim 1993). When transferring a specific project or portion of work, Lacity and Hirschheim (1993) refer to project management. The last type of responsibility transfer called total outsourcing includes the turning over of a significant part of the IS work (Lacity and Hirschheim 1993). Straub et al. (2008) claims that the extent of control over IT resources as the dominant aspect of the outsourcing decision. Several other strategy dimensions were added by further research, e.g. such as contract durations (Pinnington and Woolcock 1995).

Lee et al. (2004) furthermore empirically proofed that distinct configuration of these strategy dimensions are more likely to lead to outsourcing success. Deduced from the residual rights theory, Lee et al. (2004) used three strategy dimensions to describe an outsourcing strategy: (1) the degree of integration, (2) the allocation of control, and (3) the performance period. The degree of integration, described as “the proportion of IT functions outsourced” measured by the IS budget, is classified into minimal outsourcing (less than 20 per cent of the IS budget invested externally), selective outsourcing (between 20 und 80 per cent of the IS budget invested externally) and comprehensive outsourcing (more than 80 per cent of the IS budget invested externally). The allocation of control refers to the contract type and thus the extent of control transferred to the vendor, which can either be buy-in (no authority transfer), fee-for-service (authority transfer for distinct part of IT functions with detailed specifications), or partnership (comprehensive authority transfer with an unspecific contract). The performance period describes the contract duration either being short-, medium, or long-term. Lee et al. (2004)

conclude with three configurations of outsourcing strategies, they refer to as gestalts, most likely to succeed in outsourcing. The outsourcing gestalts are furthermore related to a particular outsourcing outcome, i.e. strategic competence, cost efficiency, and technology catalysis (Lee et al. 2004). The three outsourcing gestalts are determined as follows (Lee et al. 2004):

- *Independent* – minimal outsourcing, buy-in contract, short-term contract duration, outcome: strategic competence
- *Arm's-length* – selective outsourcing, fee-for-service contract, medium-term contract duration, outcome: cost efficiency
- *Embedded* – comprehensive outsourcing, partnership contract, long-term relationship, outcome: technology catalysis

While the independent as well as the arm's-length approach include the outsourcing to multiple vendors, known as multi-sourcing (Currie 1998), the embedded approach implies the outsourcing to one major external vendor, a spin-off, a company owned as a subsidiary, or in the form of a joint venture (Dibbern et al. 2004).

### **Application Services Outsourcing in the Context of Application Portfolio Management**

APM is responsible for the evaluation of existing, new and potential applications in order to enable the determination of the business value of an application. Thus, APM supports decisions about the replacement, retirement, or further investment in applications. The implementation of APM seeks to improve the business IT alignment and an optimal deployment of IT. (McKeen and Smith 2010) Enterprise architecture scholars consider APM as a process in enterprise architecture management (Hafner and Winter 2008). Reviewing the literature, we structured APM into three categories: (1) APM capabilities, (2) application portfolio structure, and (3) application characteristics. APM capabilities are the ability to analyse, plan, improve and monitor the application portfolio in order to align the application landscape with business requirements (Simon et al. 2010). The application portfolio structure refers to the condition of the portfolio, e.g. the complexity or technical condition (McKeen and Smith 2010). The target of APM is to achieve a healthy portfolio structure by reducing costs and complexity of the portfolio as well as eliminating and avoiding redundancies (McKeen and Smith 2010). APM literature reveals various application characteristics from a more technical (Weill and Vitale 1999) to a more economic (Ward 1990) view. Examples for such characteristics include the source code quality (Weill and Vitale 1999) or the strategic importance to the business (Ward 1990). Thus, research dealing with APM predominantly covers analytic approaches to classify applications, the condition of the portfolio as well as initiatives improving the application landscape. The three identified categories support structuring the literature of outsourcing in the context of APM. It furthermore guides the data analysis as well as the discussion of the results.

Only scant research views ITO or ASO in the context of APM or aspects of it. Table 1 summarizes the scanned literature towards their coverage for the three APM categories and whether the research refers to one or all strategy gestalt(s). Research dealing with APM capabilities underlines the importance of APM to facilitate the selection of applications for outsourcing as well as the ability to monitor the vendor's deliverables (McKeen and Smith 2010). Based on the work of Willcocks et al. (2006) introducing nine core IS capabilities, Han et al. (2008) investigated the impact of IS capabilities on outsourcing success. Both managerial IT capabilities as well as organisational relationship capability include the ability to understand, transform and align IT with business needs (Han et al. 2008), which is a major task of APM. Ross and Beath (2006) furthermore present how outsourcing following an embedded approach can be used to harmonize and modernize the application portfolio and therefore improve the application portfolio structure. Looking at the influence of application portfolio structure, research mainly concentrates on the impact of the structure to fit with certain outsourcing strategy types. Barthélemy and Geyer (2004) suggest that organisations with a highly integrated application landscape profit more from total outsourcing than from selective approaches as the interaction with multiple vendors is too complex and extensive. Thus, possessing the transparency over an application portfolio and the dependencies between applications, e.g. by an application scorecard, enables the determination of the degree of outsourcing (Prahald and Krishnan 2002). Besides the overall portfolio structure and the dependencies between the applications, an application-portfolio scorecard also contains the application characteristics determining whether an application is suitable for outsourcing or not (Prahald and Krishnan 2002). APM scholars declare various technical and economic application characteristics (Simon et al. 2010). In the lights of the resource based view outsourcing literature addresses the strategic impact of IT assets (including IT applications) and its influences on the choice of the outsourcing scope for selective approaches (Lacity et al. 1996). Based on the principles of transaction costs theory, asset specificity is a major indicator for the outsourcing feasibility (Cheon et al. 1995; Saarinen and Vepsäläinen 1994). Gable et al. (2001) discuss how the software source influences the possibility



to outsource the development and the maintenance of an application. Furthermore, Schwarz et al. (2009) suggested to consider ten attributes when outsourcing an application to an application service provider.

Table 1. Overview major research combining outsourcing with aspects of APM

Source	APM category*			Outsourcing strategy**			
	APMC	APS	AC	I	A	E	n.a.
Barthélemy and Greyer (2004)		X			X	X	
Cheon et al. (1995)			X				X
Gable et al. (2001)			X				X
Han et al. (2008)	X						X
Lacity and Willcocks (1996)			X		X		
McKeen and Smith (2010)	X	X	X				X
Prahald and Krishnan (2002)		X	X				X
Ross and Beath (2006)	X	X				X	
Saarinen and Vepsäläinen (1994)			X				X
Schwarz et al. (2009)			X		X		
Willcocks et al. (2006)	X						X
* APMC=APM Capabilities, APS=Application Portfolio Structure, AC=Application Characteristics							
** I=Independent, A=Arm's-length, E=Embedded, n.a.=not applicable							

Thus, outsourcing should not be viewed outside its organisational context (Jayatilaka and Hirschheim 2009) and in the case of ASO outside the context of APM. Based on these assumptions we see the need to view ASO strategies in the lights of APM, asking the following research question:

*How does the role of application portfolio management vary for different gestalts of application services outsourcing?*

## RESEARCH METHODOLOGY

The intent of our research is to expose explanations (in the sense of how and why different outsourcing strategies are influenced, enabled and supported by APM) rather than a testing of already established hypothesis (Benbasat et al. 1987; Paré 2004; Yin 2003). Thus, we chose a holistic multiple case study research design (Yin 2003) to study the research object in its context. In contrast to hypothesis testing, constructs and measures are not determined upfront and developed in the process of the case study research (Eisenhardt 1989). Nevertheless, study design is guided by prior research findings to structure the approach (Sutton and Staw 1995; Yin 2003). Our research study is based on the general propositions derived by Lee et al. (2004) considering three outsourcing gestalts, representing the outsourcing strategy types, as well as prior assumptions towards APM. Following the principles of case study research, we remain open for new constructs and measures emerging during data acquisition and analysis (Eisenhardt 1989; Paré 2004).

Multiple case studies allow for better generalisation of the research findings (Benbasat et al., 1987). In order to limit inter case differences due to firm size and cultural reasons, our target group consists of heterogeneous large German and Swiss enterprises with a turnover of 50m euros and higher (OECD, 2005). The interview guideline with standardized open-ended questions (Patton, 2002) and a questionnaire with closed questions (Eisenhardt, 1989) were based on the findings identified within the literature review on APM and the different outsourcing gestalts by Lee et al. (2004). To pre-test the questionnaire and the interview guideline two CIOs were consulted before starting the data acquisition. Before the face-to-face interview was carried out, the questionnaire was provided to the interviewees and analysed. During a preparation call the questionnaire was verified regarding understanding and missing information. The face-to-face interview was carried out by one researcher while a second was taking notes (Dubé and Paré, 2003; Eisenhardt, 1989). Data validity was guaranteed by an additional validation of the interview protocol by the interviewee(s). In addition, external data was collected and recorded in fact sheets. Out of the originally 37 companies we received a completed the questionnaire from, we selected eleven companies which predominantly apply one of the gestalts introduced by Lee et al. (2004) and which are successful due to the answers in the questionnaire in the chosen gestalt. Five of these companies approach the independent, four the arm-length, and two for the embedded strategy. The interviews were carried out with a total of 18 interviewees. The industry coverage ranged from Banking and Financial Service (1), Manufacturing (2),

Information and Communication (2), Transportation and Logistics (2), Pharmaceuticals & Chemicals (2), Retail (1), to Utility (1).

Following Miles and Huberman (1994), we analysed the data in an iterative process. We started with a coding scheme including the outsourcing gestalts and the three categories of APM identified by prior literature (see above). During analysis we further specified the attributes describing the APM capabilities, application portfolio structure and application characteristics in more detail by triangulating interview with the survey data and the fact sheets as well as extant literature. After coding we looked for within-group similarities (Eisenhardt 1989) to evaluate the varying role of APM for different outsourcing gestalts. In order to limit the risk of bias data acquisition and analysis were jointly accomplished by two senior researchers (Patton 2002).

## RESEARCH RESULTS

During data analysis we investigated the variance between the outsourcing gestalts regarding the role of APM in the three categories APM capabilities, application portfolio structure, and application characteristics. Therefore, we derived attributes further specifying the three categories. In the following these attributes are explained for each category of APM. Subsequently, the expressions of the characteristics for every outsourcing gestalt are compared.

### APM Capabilities

McKeen and Smith (2010) introduced three APM capabilities. The capability *strategy and governance* refers to the ability to define an application portfolio strategy and to determine and to implement “a set of policies, procedures and rules that guide decisions and define decision rights in an organisation”. *Inventory management* includes capabilities to provide a documentation of the application portfolio based on comparable and similar application descriptions including general application information or the technical condition of an application. *Reporting and rationalization* is the capability to control and to continuously improve the application landscape. (McKeen and Smith 2010) In order to analyse the extent to which the APM capabilities are implemented in an organisation, we used the *Application Portfolio Management Maturity Model* developed by Simon et al. (2010), differentiating between five maturity levels. *Application portfolio obscurity* (Level 0) describes the situation in which no application portfolio management is implemented. *Application portfolio understanding* (Level 1) refers to a documented application inventory. *Application portfolio intelligence* (Level 2) is related to the capabilities to analyse the application portfolio. After implementing capabilities necessary to optimize the portfolio *application portfolio quality* (Level 3) is reached. *Application portfolio excellence* (Level 4) describes the comprehensive institutionalization of APM. (Simon et al. 2010)

The data analysis of the APM capabilities in the different outsourcing gestalts reveals a significant variance of the extent to which APM capabilities are implemented in organisations. The companies applying the independent strategy possess a low level of maturity in APM capabilities (Level 1). “Even though we carried out a comprehensive portfolio analysis to document the landscape, the transparency to understand how to gain more efficiency is missing.” (Direct to the CIO, ID 1). Nevertheless, data reveals that explicit and institutionalized APM capabilities are not required to succeed with the independent approach. The work delegated to the third party is determined and controlled by staff with knowledge about the relevant applications. However, the approach limits the tasks which can be transferred externally. It demands for monitoring on an individual level constrained to single employees as well as good knowledge about the skills of the external staff. In contrast, firms making use of the arm-length strategy showed a high maturity in APM capabilities (Level 3 and Level 4). “Our selective sourcing approach was enabled through our central portfolio management.” (CIO, ID 6) An appropriate APM is necessary to guarantee that all externally developed applications fit into the portfolio and the maintenance of the application works efficient and smooth. Especially as the applications are outsourced to multiple vendors. The two companies with the embedded approach possess a high and a low maturity in APM capabilities (Level 3 and Level 0). One of the companies used the APM competence to determine the suitable outsourcing partner to transform and modernize the application landscape. “After the portfolio analysis and the development of a comprehensive portfolio plan, we were able to search for and to decide on a single outsourcing partner to carry out the planned application landscape modernization.” (CIO, ID 10) These findings correspond with those of Ross and Beath (2006) to use an outsourcing partnership to transform the application landscape. The other firm in contrast trust to the capabilities of the IT service provider. “We do not have a detailed and documented overview over the application landscape. These capabilities are provided by our exclusive outsourcing partner.” (CIO, ID 11) Thus, the company relied on the vendor’s capabilities that possess a high risk of a lock-in effect. Even though the APM capabilities are not implemented to the internal organisation, the provider needs to hold these capabilities in order to create benefits compared to total insourcing.

### Application Portfolio Structure

The application portfolio structure describes the dependencies between the applications to gain a comprehensive view of the overall portfolio configuration. During the data analysis we identified three relevant characteristics for the application portfolio structure, namely the *application portfolio standardization degree*, the *technical condition of the portfolio*, and the *application portfolio complexity*. The standardization degree of an application portfolio refers to the penetration of standard software in a portfolio (Gable et al. 2001). The technical quality of an application determines the technical condition of the portfolio (McKeen and Smith 2010) including the source code quality, the maintainability, the compatibility, the documentation quality, and the architectural fit (Simon et al. 2010). The portfolio complexity is specified by the number of applications, the number of redundant applications, the number of interfaces between applications, and the technical complexity (McKeen and Smith 2010).

The data analysis showed that for the independent approach complex, unhealthy and individual portfolio structures are suitable as the whole responsibility for the portfolio stays internal. Thus, the portfolio and its complex dependencies remain cohesive as a separation of responsibility leads to an inefficient management effort. The application portfolio structure for the cases with the embedded approach also mainly possessed a high complexity. For the embedded strategy nearly the whole responsibility is transferred to the outsourcing partner. This also leaves the responsibility for the portfolio to one instance, the outsourcing partner. Furthermore, the firms in the group of the embedded approach predominantly obtained an unhealthy technical portfolio condition as well as a low standardization degree. "A high degree of standardization is not possible for our specific situation. Therefore, we set up an individual approach to work with our exclusive outsourcing partner." (Direct to the CIO, ID 11) Barthélemy and Geyer (2004) already pointed out the better applicability of total outsourcing for complex portfolios. As the arm's-length approach best suits to achieve efficiency, the firms implementing this strategy benefit from application portfolios with a low to medium complexity, a healthy technical condition and a high standardization degree. As part of the portfolio complexity, the number of applications does not seem to be a salient determinant hindering the outsourcing. However, it does increase the potential for the complexity induced by the interrelation between and the integration of applications. Even though not all of the organisations fulfil every criterion, at least two were met at organisations succeeding in this outsourcing approach. A healthy technical portfolio condition was met by all four companies. A low portfolio complexity, especially regarding dependencies and redundancies between applications, allows the separation of applications and IT functions such as application development and maintenance. The possibility to separate application development and maintenance enables better competitive situations and lowers the risk of lock-in effects (Currie 1998). "We separate the outsourcing of application development and maintenance to exploit competitive forces between service providers." (CIO, ID 6) Organisations nevertheless need to guarantee a life-cycle view to ensure maintainability and long-term business satisfaction. A high standardization degree positively influences the possibilities of outsourcing (Gable et al. 2001). "80 percent of our portfolio is based on SAP today. There is still a tendency to eliminate individually developed applications." (CIO, ID 6) The low portfolio complexity, the healthy technical condition and the high standardization degree are a result of the high maturity level in APM capabilities achieved by the companies approaching the arm's-length strategy as these aspects are major targets of APM (Simon et al. 2010).

### Application Characteristics

There are numerous application characteristics describing an application by a classification of applications from a technical, economic and business perspective (Simon et al. 2010). In total the application characteristics of all application within the portfolio determine the application portfolio structure. Looking at the characteristics of a single application nevertheless allows the determination of the impact an application possesses on the organisation and to decide about the future development (McKeen and Smith 2010). Analysing the data, five major characteristics were salient within the outsourcing decision: the *strategic impact*, the *business criticality*, the *software source*, and the *life-cycle stage* and the *economic perspective*. The strategic impact refers to the positioning of a firm (Lacity et al. 1996). An application with a high strategic impact creates sustainable competitive advantage (Pati and Desai 2005). Applications that business operations strongly depend on contain a high business criticality (Ward 1990). The asset specificity refers to the transferability of an application to a third party (Cheon et al. 1995). For an application, we consider the software source of an application as characteristic of specificity which can either be "custom", "hybrid", or "packaged" (Gable et al. 2001). The perspective of an application life-cycle is twofold. The function-oriented life-cycle based on the definition of Information Technology Infrastructure Library (ITIL) (Cannon et al. 2007) is subdivided into the stages "design", "build", "deploy", "operate" and "optimize". The economic perspective on the life-cycle refers to the contribution of an application to the business as well as the technical quality of an application and can be classified into "upgrade", "nurture", "question", and "consolidate or eliminate" (Weill and Vitale 1999).

In this category it is interesting that only for the arm's-length approach the characteristics of a single application influence the outsourcing decision. For the independent approach all responsibility remains within the internal

organisation. Only in case of standard software, required external staff is easier to acquire from the market, as more skills are available for standard software. This is in conformity with prior findings in outsourcing research which state that the higher the asset specificity the less applicable and useful outsourcing might be (Cheon et al. 1995). Nevertheless, the primary target of this approach is the access to skills. “Our IT organization is growing faster than the company itself. In order to satisfy the requirements we need to source external knowledge.” (IT Manager, ID 2) The application characteristics of the single application do not matter for the embedded strategy neither as the responsibility for the major part of the portfolio is transferred to the vendor. For the arm-length approach however, the characteristics of the applications determine whether an application is outsourced and to whom. Prior literature proved that a high strategic impact as well as a high business criticality leads to the decision to keep an IT asset, in the case of ASO an application, internally (Lacity et al. 1996). During the data analysis we discovered that applications with a high strategic impact or a high business criticality are outsourced depending on the life-cycle stage from a functional perspective. While the strategic impact is a salient determination to keep the development of an application in-house, the maintenance of this application was nevertheless outsourced. Applications with a high strategic impact enable competitive advantages whose creation is seen as a core competence of the organisation. Applications with a high business criticality in contrast were outsourced for the development, but implemented internally or back-sourced for the application maintenance. “We outsource the maintenance of non-critical applications while critical applications remain internal.” (CIO, ID 7) For business critical applications a stable operation needs to be guaranteed to avoid damage to the business. Applications with the combination of high strategic impact and business criticality were in all cases kept in-house. The software source influences the outsourcing decision as standard software is more feasible for outsourcing (Gable et al. 2001). Looking at the economic life-cycle perspective we discovered the practice to outsource applications in the phase of “nurture“ and “eliminate”. “We concentrate the outsourcing of applications in the maintain and reduce life-cycle stage. To outsource applications in the reduce stadium helps to size down our IT organization.” (IT Manager, ID 8) In the case of outsourcing an application which has reached its elimination phase, outsourcing is used to free-up resources for strategic and business critical applications. To transfer the staff or services of an application to the external provider furthermore intentionally creates a distance between the IT staff and the users and the application. “With the outsourcing of an application which should be retired, we are able to get our IT staff and users out of the comfort zone.” (IT Manager, ID 8)

### Cross case comparison

Table 2 structures our cross-findings according to the outsourcing gestalts and the attributes of the different APM categories. Comparing the expressions of characteristics for the three outsourcing gestalts, our findings reveal that the arm’s-length approach requires the highest extent to which APM is implemented in an organisation.

Table 2. Significant group characteristics for outsourcing gestalts

<i>Outsourcing gestalt</i>	Independent	Arm’s-length	Embedded
<i>APM category</i>			
APM capabilities	<ul style="list-style-type: none"> <li>• APM Maturity Level 1</li> <li>• Knowledge about applications is implicit and bounded to individuals</li> </ul>	<ul style="list-style-type: none"> <li>• APM Maturity Level 3 or higher</li> <li>• APM capabilities enable the selection of applications as well as a smooth and efficient vendor management</li> </ul>	<ul style="list-style-type: none"> <li>• Varying APM Maturity Levels (high and low)</li> <li>• Vendor with high APM Maturity Level required</li> <li>• Outsourcing to transform application landscape</li> </ul>
Application portfolio structure	<ul style="list-style-type: none"> <li>• High complexity</li> <li>• Unhealthy technical condition</li> <li>• Low standardization degree</li> </ul>	<ul style="list-style-type: none"> <li>• Medium to low complexity</li> <li>• Healthy technical condition</li> <li>• High standardization degree</li> </ul>	<ul style="list-style-type: none"> <li>• High complexity</li> <li>• Unhealthy technical condition</li> <li>• Low standardization degree</li> </ul>
Application characteristics	<ul style="list-style-type: none"> <li>• Salient characteristics for outsourcing decision: software source</li> </ul>	<ul style="list-style-type: none"> <li>• Salient characteristics for the outsourcing decision: strategic impact, business criticality, software source, life-cycle stage (functional and economic)</li> </ul>	<ul style="list-style-type: none"> <li>• Application characteristics not salient for the outsourcing decision as nearly all the applications are outsourced to one outsourcing partner</li> </ul>

The independent approach does not necessitate a high maturity in APM capabilities and can even be applied with a complex and unhealthy technical portfolio condition and a high individualization degree of the portfolio. Since nearly no responsibility is transferred to the vendor, the application characteristics are no major driver for deciding towards outsourcing. Only for the availability of skills on the market the software source can influence

the decision. For the embedded approach a high extent in APM capabilities is required. However, these capabilities can be provided by the vendor as part of his responsibility. In this case organisations need to consider the lock-in effect. Especially for complex portfolio landscapes with a low standardization degree and an unhealthy portfolio condition, as such a structure often leads to a vendor relationship with a high management effort (Barthélemy and Geyer 2004). As mostly the complete application portfolio is outsourced the characteristics of a single application are out of scope for the outsourcing decision. The arm's-length strategy in contrast requires a high maturity level in APM capabilities internally. The approach benefits from a low portfolio complexity, high standardization degree and requires a healthy portfolio condition. The salient application characteristics influencing the outsourcing decision are the strategic impact, the business criticality, the software source and the application life-cycle stage (functional and economic view). Nevertheless, outsourcing is not an end on itself. It is rather an instrument to achieve a dedicated target. Therefore, companies need to choose the right strategy matching with their goals. As each outsourcing gestalt better fits another target, the IT organization needs to consider the requirements of the outsourcing gestalt matching with the current targets. "We consider changing our outsourcing towards the arm-length approach to gain cost reduction. But we know that the internal change management process is the key to succeed in the new outsourcing strategy." (CIO, ID 5)

## CONCLUSION

Our research seeks to evaluate how the role of APM varies for different outsourcing gestalts identified by Lee et al. (2004) in the case of application services outsourcing. Therefore, we performed holistic multiple case study research with eleven large German and Swiss companies successful in predominantly applying one of the outsourcing gestalts. The results reveal that the arm's-length strategy requires the highest extent of implementation of APM, while the independent and embedded approach only demand for certain implementation aspects. The independent approach is applicable with a low maturity level in APM capabilities and for a complex, unhealthy and individual portfolio structure. The strategy is used to access skills and knowledge from the market that are more likely available for market standards. The arm's-length strategy targets efficiency. Therefore, a high maturity of APM capabilities is required to identify the leverage provided by the current portfolio status and planned initiatives with the support of outsourcing. To apply the selective outsourcing approach and thus the splitting of the outsourcing volume across multiple suppliers, IT organizations benefit from a non-complex, healthy and standardized portfolio structure. In order to select the applications for outsourcing, several application characteristics are salient and need to be available for the decision. The embedded strategy however is applicable for complex, unhealthy and individual portfolio structures. On the one hand, an outsourcing partner can take over the entire responsibility in an individual agreement to meet the corporate specifics of the organization. On the other hand, outsourcing can be applied to transform and modernize the application landscape through the outsourcing partner. Our research extends the scientific knowledge base with the perspective on requirements for outsourcing strategies in the field of application services outsourcing. Practitioners can use the findings to evaluate their own outsourcing strategy towards the requirements and to initiate necessary actions.

Nevertheless, our research is limited to requirements of APM and thus to internal IS requirements. It does not include the market perspective and therefore external factors such as the influence of the vendors' capabilities on outsourcing success (Plugge and Bouwman 2012). The findings are also limited to the eleven cases and should be considered to be tested in a large scale survey to provide more empirical evidence. Jayatilaka and Hirschheim (2009) furthermore investigated the drivers and outcomes of changing outsourcing arrangements. The change in outsourcing strategies over the time is based on the fact that organisations are subject of constant change. In the light of APM and strategies for application services outsourcing it could be interesting to understand how APM evolves with the changes and how APM can support these changes. The research could therefore benefit from longitudinal study approaches.

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<b>Article IV</b>	
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Abstract	Selective outsourcing has been proven to be more likely to succeed in archiving efficiency targets. For application services outsourcing (ASO), selecting applications to outsource is critical for successful outsourcing. Thus, the implementation of application portfolio management (APM) is essential, in order to provide the necessary transparency throughout the entire life-cycle of an application. APM enables the classification of applications which guides the outsourcing decision. Furthermore, the application life-cycle perspective allows a differentiated and comprehensive view, which is required for selecting applications for ASO. In combination with common selection criteria identified by prior research, we studied the decision to in- or outsource an application. We evaluated outsourcing decisions in a comparative cross-case study with 37 German and Swiss companies. Our research revealed that the life-cycle perspective allows a differentiated view on outsourcing decisions.



# Towards an Application Life-Cycle Approach for Selective Outsourcing

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## Abstract

*Selective outsourcing has been proven to be more likely to succeed in archiving efficiency targets. For application services outsourcing (ASO), selecting applications to outsource is critical for successful outsourcing. Thus, the implementation of application portfolio management (APM) is essential, in order to provide the necessary transparency throughout the entire life-cycle of an application. APM enables the classification of applications which guides the outsourcing decision. Furthermore, the application life-cycle perspective allows a differentiated and comprehensive view, which is required for selecting applications for ASO. In combination with common selection criteria identified by prior research, we studied the decision to in- or outsource an application. We evaluated outsourcing decisions in a comparative cross-case study with 37 German and Swiss companies. Our research revealed that the life-cycle perspective allows a differentiated view on outsourcing decisions.*

## 1. Introduction

Outsourcing is a common accepted practice and applied in various forms to archive different targets. Previous scholars proved that selective outsourcing is most likely to aid efficiency [1, 2]. The selective outsourcing approach implies the outsourcing of particular parts and functions of information systems (IS) [3]. Even though selective outsourcing could possess several advantages such as flexibility or risk mitigation, deciding which IS assets, functions, and/or services to outsource, however, must be well considered [4]. Looking at the decision on application services outsourcing (ASO), today many companies are confronted with historically grown application landscapes that are now “cluttered with obsolete information technology (IT) systems and

applications that no longer deliver full value to the business” [5].

To counteract this phenomenon, companies implement IT portfolio management (IT PM), a IT governance process that balances business requirements and IT investments [6]. As a pillar of IT PM, application portfolio management (APM) aims to improve and maintain the application landscape to better meet business demand by categorizing, assessing, and rationalizing the application portfolio [7]. Thus, APM continuously plans, controls, and manages applications throughout their life-cycle from initial design to decommissioning [7]. According to Forrester Research, APM supports “better outsourcing agreements” by providing transparency over the application inventory and thus establishing the selection and improvement of outsourcing arrangements [8]. Hence, APM enables the selection of applications feasible for outsourcing.

Thus far, analyses against the background of ASO decisions are relatively rare [9]. Furthermore, insight into how to improve the decision process is needed [10]. In the case of selective ASO, the criteria driving the decision to outsource a particular application contain a major leverage for improvement. Looking from an APM perspective, the application life-cycle allows a comprehensive and long-term view to assess an application’s evolution, which is particularly important for the outsourcing decision for two major reasons: (1) Outsourcing options can be viewed more differentiated for one application taking the life-cycle stage into account to allow shorter contract durations and smaller application packages. This facilitates more flexibility and mitigates lock-in effects [11]. (2) Selective outsourcing is not a “one-shot decision” but rather an ongoing series of decisions as part of a process maximizing the value of IT [12]. Therefore, we studied the decision to in- or outsource different degrees of an application’s strategic impact and business criticality, as prior identified application characteristics crucial for selective outsourcing, in

each life-cycle stage to broaden the options of selective outsourcing based on APM. This motivates the following research question:

*How does the application life-cycle affect the selective outsourcing decision?*

The remainder of the paper is structured as follows: In the next section, we provide an overview of related literature, place the subject of this research in the general APM context and its relation to ASO, and describe the application life-cycle concept. In the following section, we describe the research methodology, including the data collection and evaluation processes. Subsequently, the results of the data analysis are presented, followed by the final section, which includes the conclusion.

## **2. Related work**

### **2.1. Application Services Outsourcing and Application Portfolio Management**

IS outsourcing is “a decision taken by an organization to contract-out or sell the organization’s IT assets, people, and/or activities to a third party vendor, who in exchange provides and manages assets and services for monetary returns over an agreed period of time” [13]. Lacity and Hirschheim [3] distinguish between three types of IS outsourcing described by the percentage of the IS budget transferred to the vendor. *Total out- and insourcing* is defined as the purchase of more than 80% or less than 20% of the IS assets, licenses, staff, and management for the IS services from a single third-party vendor. The transfer of between 20% and 80% of the IS budget by sourcing selected IS services from external multiple providers is *selective outsourcing*. Moreover, Lacity et al. [4] state that prior research studies proved that companies that use a well-considered, incremental, and selective approach to outsourcing are more successful, particularly when they outsource to improve efficiency [2]. Furthermore, outsourcing varies in the outsourced IT services (e.g., [14, 15]). As the subject of the study is the organization’s applications as part of APM, our research focuses on outsourcing application services, defined as “all services associated with the acquisition, development, and deployment of an IT application” [16].

As part of enterprise IT governance, IT PM is a “prioritization process for IT investments and projects in which business and IT is involved” [17].

As one of the most effective IT governance processes (4.13/5), IT PM is assigned to the minimum baseline, i.e., one of the top 10 IT governance practices [6]. APM, in turn, is an important pillar of IT PM focusing on assessing and developing the application landscape. Assessing the health of the application portfolio allows IS managers and business managers to determine the value of the portfolio, and therefore leads to a “greater shared understanding and purpose between IS and its business unit customer” [18]. Through evaluating existing, new, and potential applications, the “portfolio perspective” helps determine the business value of an application and supports decisions about replacing, retiring, or further investing in applications throughout their entire life-cycle [7]. Application portfolio models are defined as an instrument to leverage the improvement from information systems investments [21]. Simon et al. [22] furthermore divide the APM process into four major sub-processes: data collection, analysis, decision-making, and optimization. APM enables to achieve a greater alignment between business and IT and to ensure the optimal deployment of IT [7]. Research that refers to APM predominantly includes portfolio analysis for classifying applications, identifying the portfolio condition, and determining actions to improve the portfolio condition (e.g., [18-20]). This enables the selection of applications feasible for outsourcing.

Research combining outsourcing with aspects of APM is scant. Existing scholars address the influence of the portfolio structure as the sum of all applications in terms of their interactions regarding the outsourcing decision (e.g., [23]). Furthermore, prior researchers investigated the application characteristics that influence the decision to outsource or not (e.g., [4]). Prahald and Krishnan [24] introduced an application scorecard that determines the degree of outsourcing based on the application characteristics and the interdependencies between applications. McKeen and Smith [7] state that selecting which applications to outsource is facilitated by the portfolio transparency and planning provided by the APM. Therefore, we investigate application characteristics that drive the ASO decisions identified by prior scholars and examine the characteristics in light of the application life-cycle.

### **2.2. Explored application characteristics salient for ASO decisions**

APM provides various characteristics to describe an application, ranging from economic to technical attributes [22]. We concentrate on the major

characteristics related to business value proven by previous studies to influence outsourcing.

Prior outsourcing research identifies two application-specific criteria that dominantly guide the decision to outsource: (1) strategic impact and (2) business criticality [4, 25, 26]. Pati and Desai [25] see the main objective of IT in the deployment of IT systems for “the support of organizational processes in order to create operational, tactical, and strategic business value.” They define the strategic business value of an IT system as “the value that can create sustainable competitive advantages for an organization.” Their definition is based on Mata et al.’s [27] resource-based sustainable competitive advantage framework, which defines “a competitive advantage as a capability that is valuable, dissimilarly distributed across the competing firm, and cannot easily be imitated, acquired or stolen.” Ward [26] defines a *strategic application* as “critical to sustaining the future business needs.” In the following, this characteristic is called *strategic impact*.

Ward [26] introduces a comprehensive typology, which structures the contribution of systems to the business. *Turnaround and high potential* applications might be important for future business success. *Support applications* are valuable but not critical for success. *Factory and key applications* are systems “the organization currently depends on for success.” Lacity et al. [4] define two criteria for selecting outsourcing candidates: (1) the contribution of IT activities to business operations and (2) the contribution of IT activities to business positioning. The second criterion represents the strategic impact, and the first criterion addresses the degree of availability and stability required for business operations. Applications, on which business operations strongly depend, are business critical and belong to Ward’s *factory and key applications* [26]. Therefore, we consider the strategic impact and business criticality the most important application characteristics related to business value in selective outsourcing decisions to evaluate in the application life-cycle.

### **2.3. Life-cycle orientation in APM and outsourcing decisions**

The life-cycle concept originally stems from product marketing and manufacturing [28-30]. Within APM, an application’s life-cycle is seen from different perspectives. One perspective involves determining the life-cycle stage according to the strategic importance or business contribution provided by an application (e.g., [18, 31]). Another

perspective is oriented toward the applied functions in each phase (e.g., [32]). In the following, we use the second perspective of the application life-cycle, as selective outsourcing mainly results in separate outsourcing of IT functions, for one or multiple applications supporting the same business process or based on the same technology [4].

For software development, various models structure the activities of application management such as the Waterfall Model [33], the V-Model [34], and the Spiral Model [35]. These models have drawbacks [36]: They focus on the developer’s involvement in different phases and barely emphasize maintenance and retirement. The Information Technology Infrastructure Library (ITIL) introduced an application management life-cycle, an iterative process consisting of six equally crucial phases: *Requirements* (1), *Design* (2), *Build* (3), *Deploy* (4), *Operate* (5), and *Optimize* (6). In the *Requirements* phase (1), the organization’s business needs are translated into different types of requirements, which are collected in a product requirements document. In the *Design* phase (2), a detailed functional specification of the application and the environment the application has to run in are created. These specifications contain detailed descriptions of the required application and systems architecture. The *Build* phase (3) covers coding, acquiring, integrating, and testing applications and system environments. The *Deploy* phase (4) encompasses installing the new environment and the application in the existing IT environment. This is managed during the release and deployment management process and includes testing and early life support. In the *Operate* phase (5), the application delivers IT services. Application performance is continually monitored against the service levels. In the *Optimize* phase (6), the service performance is analyzed and acted upon. Potential courses of action include initiating improvements through a life-cycle iteration and retiring applications [36].

Zarnekow and Brenner [37] show that for a typical application with a life period of five years approximately 80% of the total life-cycle costs are incurred during the operation and further development phases. The authors criticize that the assessment of new applications is limited to the non-recurring costs of developing the application and neglects the recurring operational costs. McKeen and Smith [7] emphasize the importance of a life-cycle perspective in application portfolio management, i.e., the “ongoing management process of categorization, assessment, and rationalization of the IT application portfolio.” They propose considering the life-cycle

status for managing inventory and as decision input for rationalizing the application portfolio.

Even though the application life-cycle is a well-accepted concept in application management, life-cycle-oriented outsourcing decisions have rarely been studied. Some authors discuss ASO in terms of specific life-cycle phases. Saarinen and Vespäläinen [38], for example, focus on the build stage of the application life-cycle and investigate how the specificity and uncertainty of an application influence the outsourcing decision. Gable et al. [39] concentrate on the maintenance of large packaged applications such as ERP systems. Their research emphasizes the importance of an application life-cycle-wide view but does not include the specifics of each life-cycle stage. In summary, the importance of the application life-cycle perspective for application management has been widely acknowledged. The combined effect of an application's life-cycle stage with other application characteristics (strategic impact and business criticality) on the outsourcing decision has not been satisfactorily studied.

### 3. Research design, methodology, and data collection

We chose a multiple holistic case study research design for the following reasons [40-42]: Our

decisions) rather than testing already established hypotheses. Whereas in hypothesis testing research the constructs and measures must be specified a priori, they emerge during the course of the analysis in case study research [43]. Before data is collected, the research design should be guided by theoretical propositions [40, 44]. Our research design is guided by the general proposition that the life-cycle stage of an application combined with other (and already well-discussed) application characteristics is a crucial component of the decision for ASO. This proposition helps us predefine and explicitly measure the constructs, which most likely are considered within an outsourcing decision, based on prior literature [42, 43].

For the case study design, we used the five design components introduced by Yin [40]. The research question (1) was derived from limited knowledge about the role of an application's life-cycle in the outsourcing decision. We did not formulate a priori propositions (2), however. Our exploratory research had a clear purpose and success criteria. We aim to clearly understand how the combination of an application's life-cycle stage with other application characteristics affects a firm's tendency to outsource selectively. We chose the decision that considers application characteristics as the unit of analysis (3). To link our data to the general proposition (4), we match and compare decisions patterns and use

**Table 1: Characteristics of companies, interview partners, and data sets**

<b>Revenue</b> (in € Mio.)	100-1000 (5)		1000-2000 (7)	2000 -10 000 (12)	10 000 -50 000 (9)		≥ 50 000 (4)
<b>Industry</b>	Banking & Financial Services (9)	Manufacturing (7)	Information & Communication (6)	Transportation & Logistics (5)	Pharmaceuticals & chemicals (4)	Retail (3)	Utility (3)
<b>IT Budget</b>	1-50 Mio. EUR (8)		50-200 Mio. EUR (9)	200-1000 Mio. EUR (8)	>1000 Mio. EUR (5)		n.a. (7)
<b>Position of interview partner</b>	CIO (13)		Direct Report to the CIO (29)	IT Manager (4)	Technical IT Staff (4)		Central Function (3)
<b>Data base</b>	Interview transcript (37)		Preparation call minutes (37)	Questionnaire (37)	Factsheets (37)		Internal documents (6)

research subject, the application of life-cycle-oriented sourcing decision, is a contemporary phenomenon, which cannot be studied outside its context. Behavioral events cannot be controlled. Furthermore, we seek explanations (in the sense of how and why the life-cycle stage is relevant for outsourcing

available literature to interpret these findings (5) [42].

#### 3.1. Data collection

To collect data, we pursued a theoretical sampling strategy rather than statistically sampling the cases

from a chosen population [42, 43, 45]. To limit inter-case differences due to firm size and cultural reasons, we focused on large German and Swiss companies with a turnover of €50 million or more [46]. Furthermore, we selected companies from various industries to generalize the results. We ended up with a case base of 37 companies shown in Table 1.

For the data collection and analysis process, we began with a literature review to identify the relevant constructs regarding application characteristics and application life-cycle models (see above). Based on these constructs, we deduced an interview guideline with standardized open-ended questions [48] and a questionnaire with closed questions. We chose a

The coding included the interview protocol, the minutes of the preparation call, the factsheets, the notes and internal documents (such as organizational charts and portfolio documentation provided by the interviewees). After the initial coding, we searched for cross-case patterns [43] to repeat the coding with an adjusted coding scheme. The results were also validated by a senior researcher, who is familiar with the field of research but who was not initially involved in analyzing the data. Therefore, we provided a description of the coding scheme for the researcher to code a randomly selected sample (10%) of the data set [56]. The inter-rater reliability was 87%. The risk of bias in data collection was limited

**Table 2: Applied coding scheme**

Criteria	Description	Possible values	# of coded items
<i>Life-cycle stage</i>	The stage describes the current assignment of an application within the application life-cycle. [36, 37]	Requirements, Design, Build, Deploy, Operate, Optimize	114
<i>Strategic impact</i>	Strategic application support to gain or even create a competitive advantage for the organization. [4, 25, 26]	High, Low	91
<i>Business criticality</i>	An application's business criticality is determined by the contribution to operations critical to the success of an organization. [4, 26]	High, Low	89
<i>Sourcing mode</i>	The sourcing mode determines the location of responsibility for IT assets, people, and/or activities. [47]	Insource, Outsource	151

survey and a face-to-face interview because data from the closed questions facilitates the analysis of qualitative data and can support the findings [43]. We pretested the guideline and the questionnaire with two CIOs. Before the face-to-face interview, we provided the interviewees the questionnaire with closed questions and then collected it. We also collected external data about the companies and consolidated it in company factsheets. In a preparation call, we discussed the questionnaire and explained the scope of the face-to-face interview. During the preparation call, we took notes about. We then asked the interviewees to invite colleagues to the interview following the principles of snowball sampling [49, 50]. At least two researchers participated in each interview: One moderated the interview, and the other took notes [43, 49]. The interview protocol was again reviewed by the interviewee(s) to ensure data validity.

### 3.2. Data analysis

The data was analyzed in an iterative mode [51]. We initially used constructs of outsourcing types and decision criteria derived from previous literature (see above) to create the coding scheme shown in Table 2.

as two senior researchers jointly collected and analyzed the data (investigator triangulation) [48].

## 4. Research results

In the following section, we present and discuss the patterns detected during the data evaluation during the application life-cycle stages *Requirements*, *Design and Build*, *Deploy*, *Operate*, and *Retire* using two different values (high and low) in strategic value and business criticality. For 14 of the 37 cases, we discovered patterns aligning the ASO decision with the application life-cycle. The remaining cases did not show such patterns for various reasons. In some companies, we identified a lack of APM maturity, which made a decision based on application characteristics impossible. Other participating companies had a selection scheme oriented toward the IS functions only and did not consider the application characteristics.

### 4.1. Requirements

To define the *requirements*, business needs are translated into a system's characteristics. The data

showed a broad consensus to maintain full responsibility for this activity in-house. “Even though the development and maintenance of an application is planned to be outsourced, the understanding of business requirements stays a core competence of the organization” [CIO, ID 7]. Studies have shown that the definition of *requirements* in an outsourcing relationship stays with the internal organization [13].

## 4.2. Design and Build

According to DIN 69901-5, the definition of functional specifications is the responsibility of the instance that also implements the software [52]. Thus, we merged the stages *Design* and *Build* into one stage in the evaluation model. When an application has a high strategic impact, companies always kept development in-house. “The development of software creating a differentiation advantage for the organization will remain internally, while we seek to outsource the rest of the development” [Direct to the CIO, ID 4].

Whereas the strategic impact is a dominant factor, high business criticality is not relevant to the outsourcing decision: “Even though the core system supporting the sales force is business critical, the system contains no differentiating value. Thus, there is no need to develop the software internally instead of purchasing the standard software available on the market” [CIO, ID 34]. Developing business-critical applications internally does not create value for the organization per se, especially when standards are available. Nevertheless, organizations carefully evaluate whether the external market can design and build an application, and meet business needs for lower costs: “An application specific to our company often needs deep business know-how, and thus, the business case for outsourcing is not valuable” [Direct to the CIO, ID 10].

## 4.3. Deploy

We discovered companies tended to rely on planned or performed outsourcing during the stages *Design and Build* stages as well as the *Operate* stage. Furthermore, the deployment in some cases is an integrated part of operations: “As time-to-market gets more and more important, testing is in some cases part of the operations” [Direct to the CIO, ID 5]. When a business-critical application was operated and managed internally, most companies chose to deploy systems with internal resources even though the development was external. “While the new core systems rely on standard software customized

externally, the deployment and the operations will be conducted internally” [CIO, ID 33]. Thus, in this case there is a correlation between the business criticality and insourcing due to the internal operations of business-critical application. The decision to conduct the deployment internally therefore is crucial due to access to critical running systems and the knowledge required for stable operations as application downtime can cause essential damage to the business. In the case of strategic impact, we discovered both the internal and external deployment, as for operations, the strategic impact was not a salient criterion, as further described in section 4.4. In some cases, the deployment was nevertheless carried out internally as the design and build were conducted internally and thus relied on the decision in the *Design and Build* phase.

Nevertheless, in several cases, the sub-activity testing was considered for outsourcing. “In order to leverage external offshore capabilities within development projects, we installed a testing environment with artificial data” [CIO, ID 31]. Even in the case of internal development and maintenance, testing is transferred to an external provider as testing can be executed highly standardized. “One of our business units, which has a high degree of internal individual development, does outsource the testing” [Direct to the CIO, ID 2]. The factor that influences the outsourcing decision in this case is the high standardization degree of the testing that is required to decouple the decision to outsource the testing from the outsourcing decision due to the strategic impact and business criticality of an application.

## 4.4. Operate

During the *Operate* stage, business criticality is the most important criterion for the sourcing decision. “The maintenance of applications critical to the business, e.g., if in the event of a systems failure lives are in danger, it remains internally” [Direct to the CIO, ID 29].

Nevertheless, one company outsourced the operations of business-critical applications because the software was highly standardized and the company trusted the vendor to deliver the required quality. “This can also mean that we outsource business-critical application if we believe that the quality of the service provider is better than our internal quality” [CIO, ID 22]. Business-critical applications do not always but require a high degree of firm-specific knowledge. Thus, highly standardized and professionalized services can be available on the market.

Strategic impact alone nevertheless not drive insourcing. “In our business domain, the CRM is highly strategic, but not business critical. Thus, we outsourced the operations of the system in order to reduce maintenance costs” [IT Manager, ID 6].

#### 4.5. Retire

The *Retire* stage replaces the *Optimize* phase of the ITIL definition in our evaluation model. *Optimize* has two major activities: (1) deciding about the further evolution of an application, which can lead to an enhancement and iteration within the life-cycle or the application to be retired, and (2) managing the retirement of applications. In outsourcing, managing the retirement of an application is the actual function, which can be outsourced in this phase. However, just because an application is retired, the functionalities supporting the business process do not have to become obsolete. “Outsourcing offers the opportunity to transfer the retirement of legacy systems to a third party” [CIO, ID 31]. In this case, outsourcing the retirement of an application can create a desirable distance between the application and its necessity and IT staff as well as users. “IT staff therefore is available for other tasks or could be transferred to the service provider to slim down the IT organization” [Direct to the CIO, ID 25]. With less availability and lower service times, cost can be decreased, and users “can get out of the comfort zone without blaming the internal organization” [IT Manager, ID 25].

APM objectives such as reducing complexity, eliminating redundant functionality across applications, and modernizing application landscapes can be supported by outsourcing during this phase. In our interviews, application retirement was often linked to replacement with standard software. “Our portfolio strategy targets an increase in the use of standard software for replacing the individual developed core system (high criticality). This also includes that half of the modules having redundant functionalities were obsoleted and retired” [CIO, ID 33]. Business-critical applications, which are planned to be retired, are mostly replaced by new applications due to the business need for the functionality. “In order to implement a new and single group-wide core system, we transfer the old system to a third party to support the system transformation” [CIO, ID 4]. The outsourcing decision of this phase can be combined with the decision to outsource designing and building the new application. With the outsourcing of the “old” application, the whole transformation toward the “new” application is combined to guarantee a smooth transformation. Thus, outsourcing is an

instrument for APM for a transformation in terms of modernizing and reducing complexity.

However, we could not clearly identify the influence of the strategic impact as one case included a strategic and critical application whose retirement was managed internally. No application with a high strategic impact and a low business criticality appeared in the interviews.

#### 4.6. Cross-case results and extant literature

The cross-case analysis reveals characteristic sourcing patterns in the different life-cycle stages, which are depicted in Figure 1.

The model describes the dominant or feasible in- and outsourcing choices discovered from the data coding for four combinations of values for strategic impact and business criticality in relation to the application life-cycle stage. The case comparison provides five main implications: keeping *requirements* specifications in-house (1), the varying influence of the strategic impact (2) and business criticality (3) on the phase-specific sourcing decisions, the use of outsourcing for modernizing and transforming the application landscape (4), and the general influence of the standard software, which may overrule the decisions (5). The data clearly shows that there is a broad agreement to carry out the *requirements* activities in-house (1). These activities require a core IS capability that Feeny and Willcocks [53] refer to as business systems thinking: the understanding of the link between business processes and technology. Due to the business specificity of such knowledge, it is usually kept in-house. The strategic impact of an application (2) influences the outsourcing decision particularly in the *Build and Deploy* phase. In the case of a high strategic impact business, systems thinking represents a core competency that drives an application’s value contribution through a business-oriented functional design [54]. The business criticality (3) strongly influences the outsourcing decision in the *Operate* phase, in which the capability “making technology work” plays a major role [53]. The more critical an application, the higher the dependency on this application [39], which explains the companies’ tendency to keep these applications in-house. During the *Retire* phase, outsourcing can modernize and transform the application landscape as a target of APM (4) supported by the outsourcing partner, often related to standard software. This confirms the results provided by Ross and Beat [9], who investigated outsourcing as an instrument for transforming the application landscape to increase architectural maturity.

We also detected that standard software (5) may overrule the decision. This is due to the availability of development and operations know-how for such applications on the market. Here, outsourcing is used to avoid a competitive disadvantage [15].

Overall, applications with low strategic impact and business criticality, such as software supporting shared functions, are most likely to be selected for outsourcing. This can also result in outsourcing the end-to-end responsibility to an application service provider responsible for all life-cycle stages. “For our

legacy application, outsourcing can transfer management of the retirement to a third party so the organization can concentrate on strategic functions. Additionally, we found a positive correlation between standard software and outsourcing, which overruled the decision intended in some cases. Gable et al. [39] introduced the standardization degree of an application as a criterion to decide whether to in- or outsource parts of the functions necessary to develop, implement, and maintain an application or to outsource the responsibility.

Life cycle stage \ Sourcing option	Insource	Outsource
Require	① ② ③ ④	
Design & Build	① ②	③ ④
Deploy	① ② ③	② ④
Operate	① ③	② ④
Retire*	①	③ ④

**Legende**

① Strategic impact: high  
Business criticality: high

② Strategic impact: high  
Business criticality: low

③ Strategic impact: low  
Business criticality: high

④ Strategic impact: low  
Business criticality: low

\* Not statements for case ② available from the interviews.

**Figure 1: Outsourcing selection patterns of applications with different values in strategic impact, business criticality and software**

travel expenses, we purchase a Software-as-a-Service solution” [Direct to the CIO, ID 30]. “An extreme case for the reduction of internal added value regarding commodity systems was the transfer of mail and calendar functions to Google Mail” [IT Manager, ID 27].

## 5. Conclusion

In order to evaluate the impact of an application’s life-cycle stage on the outsourcing decision as an APM activity, we analyzed the outsourcing decision chosen or planned by 37 German and Swiss companies. To do so, we examined application characteristics related to the business value already validated in prior research: the strategic impact and the business criticality. Although during the *Design and Build* phase the strategic impact of an application is the crucial factor that keeps an application in-house, the business criticality strongly influences the outsourcing decision during the *Operate* stage. Identifying *requirements* is a core competence of IT organizations and largely kept in-house. To *retire* a

Compared to prior outsourcing decision principles based on application characteristics related to the business value, the perspective of the application life-cycle provides a differentiated and comprehensive view of the potential of outsourcing to increase efficiency and deploy resources over the lifetime of an application. These insights not only support organizations in making outsourcing decisions as part of portfolio planning. Since many companies seek to evaluate their current sourcing portfolio and the possibility of back-sourcing [55], the pattern could help identify applications or application clusters to reintegrate into the organization.

Nevertheless, the research ignores the perspective of available outsourcing partnership models above selective outsourcing for efficiency reasons, such as strategic alliances. Ross and Beath [11], for example, addressed how outsourcing can support the harmonization and modernization of an application landscape. Our research does not involve the overall structure of the outsourcing portfolio in terms of the complexity caused by intensive interfaces between applications, for example. The complexity of a



portfolio structure can influence the suitability of outsourcing strategies in general [23, 24]. A large-scale survey could provide empirical evidence for the patterns identified. To create knowledge for practitioners, further application criteria could be evaluated in terms of importance in the decision to define a criteria catalogue that supports selecting ASO packages. Investigating path interdependencies between the application life-cycle phases could also provide interesting insights for outsourcing decisions.

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<b>Article V</b>	
Title	Practices for Application Services Outsourcing: Current use and future direction in large German and Swiss Enterprises
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Abstract	<p>Outsourcing can be driven by various motives, such as cost savings, access to skills or technology, the transformation of the information technology (IT) landscape or even the desire to innovate. Previous research has revealed that these goals are better achieved with different collaboration models. In cases of application services, out-sourcing (ASO) the decision is even more unique, as applications possess a closeness to business processes and in many cases a higher specificity than the IT infrastructure. In order to better understand the utilisation of ASO in today's IT organisations, case study research with 37 large German and Swiss enterprises was carried out. As a re-sult, four stereotypes of ASO practices were identified which differ in the manner the outsourcing complements the application services delivery. This paper describes and discusses how these practices vary in the applied outsourcing strategy, the structure of the application management (AM) and the vendor management design. Additionally, the case studies revealed intended practice shifts as ASO develops further.</p>

## **Practices for Application Services Outsourcing: Current Use and Future Direction in Large German and Swiss Enterprises**

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White Paper

Chair: Prof. Dr. Walter Brenner

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## Abstract

*Outsourcing can be driven by various motives, such as cost savings, access to skills or technology, the transformation of the information technology (IT) landscape or even the desire to innovate. Previous research has revealed that these goals are better achieved with different collaboration models. In cases of application services, outsourcing (ASO) the decision is even more unique, as applications possess a closeness to business processes and in many cases a higher specificity than the IT infrastructure. In order to better understand the utilisation of ASO in today's IT organisations, case study research with 37 large German and Swiss enterprises was carried out. As a result, four stereotypes of ASO practices were identified which differ in the manner the outsourcing complements the application services delivery. This paper describes and discusses how these practices vary in the applied outsourcing strategy, the structure of the application management (AM) and the vendor management design. Additionally, the case studies revealed intended practice shifts as ASO develops further.*

*Keywords: Application services outsourcing, outsourcing strategy, application management, vendor management, outsourcing practices*

# 1 Introduction

Today companies rely on the support of one or in most cases multiple third parties to develop, maintain and operate their information technology (IT) (Smith and McKeen 2004). Even after more than 30 years of IT Outsourcing (ITO), failures are still present to a non-negligible extent (Han et al. 2008). In order to understand and avoid ITO failures, research has extensively analysed the complexity of outsourcing decisions (Dibbern et al. 2004). Research on outsourcing success investigated various variables – for example, in the fields of contractual governance, client firm characteristics, supplier capabilities and environmental influences (Lacity et al. 2010).

Furthermore, research has revealed that the outsourcing of application development and maintenance has thus far been less successful than the outsourcing of other IT functions such as infrastructure services (Lacity et al. 2009). Application services outsourcing (ASO) includes the outsourcing of ‘all services associated with the acquisition, development, and deployment of an IT application’ (Schwarz et al. 2009). While infrastructure services outsourcing has become a commodity with time, the major part of ASO still presents a gap in standard approaches (Abbas et al. 2010). Additionally, the closeness of application to business processes makes ASO a unique decision for each enterprise (Fisher et al. 2008). Moreover, IT organisations still struggle with the complexity of today’s application landscapes with more applications than the business actually requires (Capgemini 2014).

Thus, different motives drive organisations to utilise ASO to complement the application service delivery. Besides ‘classic’ outsourcing motives such as cost savings, the access to specific skills and technologies or the focus on core competences (Dibbern et al. 2004), ASO also addresses distinct challenges of organisations’ application landscapes. Hence, ASO can be used to accelerate the retirement of applications or even to modernise the entire application portfolio (Ross and Beath 2006). The research aims to understand how ASO supports the IT organisation. Thus, the present endeavour is guided by the following research question:

*How do IT organisations design ASO practices to complement their application services delivery?*

The paper is structured as follows: The next section describes in more detail the problem of selecting and implementing an ASO strategy. After explaining the applied research design, the results are presented. The next section reflects the results in light of prior research and discusses the results from the practitioners’ perspective. Finally, a conclusion and potential future research areas are outlined.

## 2 The Challenge

An outsourcing strategy is defined as ‘the logic visible in a firm’s portfolio of IT outsourcing decisions’ (Lee et al. 2004). When forming the ASO strategy, organisations have to choose from various opportunities in scope and extent. The common investigated dimensions of outsourcing strategies include the variables of the contractual governance such as contract size, contract type, contract duration and contract mechanisms (Lacity et al. 2010) as well as the decision on the number of providers (single vs. multi sourcing), the sourcing location (offshore discussion) and the outsourced IT function (Dibbern et al. 2004). In addition, new forms of outsourcing delivery concepts such as Software as a Service (SaaS) have arisen (Winkler et al. 2011). Instead of analysing the influence of a single dimension on outsourcing success, Lee et al. (2004) furthermore investigated the interrelation of the strategy dimensions and its impact on outsourcing success. As a result, Lee et al. (2004) identified three ideal outsourcing strategy types, so-called *gestalts*, described by the contract size, the contract type and the contract duration, which outperform other strategy configurations.

While Lee et al. (2004) view a successful outsourcing strategy mainly from the perspective of contractual governance, Jayatilaka and Hirschheim (2009) emphasise that outsourcing decisions should also consider the organisational context. Considering ASO, this implies that besides specific vendor management capabilities (Han et al. 2008), the application management (AM) design needs to be taken into account. For the present work AM is defined as the responsible instance for the planning and the controlling of the application portfolio and of all services, including the acquisition and deployment of applications (van der Pols and Backer 2006). Even though outsourcing changes the character of the work within an IT organisation, it does not eliminate its function totally or turn it into a utility (Carr 2003). The further an IT organisation relies on outsourcing to operate and develop their IT, the more skills in the areas of systems thinking, architectural understanding and strategic awareness are required (Smith and McKeen 2004). Practitioners have already pointed out the importance of application portfolio management (APM), as one function of AM, for the selection of the outsourcing extent in ASO arrangements (Gliedman 2004).

Furthermore, Smith and McKeen (2004) discussed the role outsourcing can play in an IT organisation. They reflected this role of IT outsourcing in the light of outsourcing drivers, outsourced IT functions and contract types. In summary, they found out that while outsourcing started as a ‘straightforward mechanism for reducing operational costs’, today outsourcing is also utilised for tactical and strategic reasons and delivers added value (Smith and McKeen 2004). Thus, different outsourcing strategies are needed in order to enable a particular role for outsourcing (Smith and McKeen 2004). Therefore, different drivers for ASO need to be taken into account, which can range from an increase in efficiency of the AM organisation to the transformation of application portfolio structures.

As the knowledge about the role of ASO, the specific usage of outsourcing strategies and the requirements for the internal organisation is limited, the present work aims at identifying practices for the concrete utilisation of ASO. Following the definition of Jarzabkowski et al. (2007) a practice helps ‘to understand how strategic activity is constructed’ (Jarzabkowski et al. 2007, p. 9). This includes the description of the motives and the execution as well as the alternation of these ‘patterns of use for shaping praxis at different levels’ (Jarzabkowski et al. 2007, p. 10). Thus, our research is guided by the general proposition that practices for ASO differ in terms of the outsourcing strategy, the design of AM and vendor management and therefore in the strategic relevance for an IT organisation.

### **3 Research Design**

The research was guided by the design principles of case study research (Benbasat et al. 1987; Eisenhardt 1989; Paré 2004; Yin 2003). The research question was derived from the limited knowledge about comprehensive ASO practices in today’s enterprises (Yin 2003). A multiple holistic case study approach was applied as the research object could not be investigated outside its context (Yin 2003). Instead of testing a detailed a priori proposition, the study was guided by the general proposition that ASO can take on different roles in IT organisations, and thus various practices are required. This general proposition supported the structuring and measuring of results by including prior literature in the analysis (Eisenhardt 1989; Paré 2004). To enable investigator triangulation, two senior researchers performed data collection and analysis (Patton 2002). An extended research team, comprising two further senior researchers and two practitioners with experience of more than 20 years in the fields of IT management and outsourcing, accompanied the study. The members of the extended research team supported the project in different phases with their experience in research and practice.

#### **3.1 Data collection**

Data collection included 37 enterprises from various industries to enable a generalisation of the results. The companies belong to the following industries: banking and financial services, manufacturing, information and communication, transport and logistics, retail and utilities. The research project furthermore focused on large enterprises with a minimum turnover of 50 million EUR (OECD 2005). At the beginning, a closed questionnaire which was developed based on an extensive literature review (Vom Brocke et al. 2009) and reviewed by two Chief Information Officers (CIOs) was submitted to the enterprises. Subsequently, the research team carried out telephone interviews with representatives of the companies, documented by one of the researchers. Within these calls, the questionnaire was completed if necessary, the general organisational structure as well as an overview of the ASO arrangements was discussed and the scope of the subsequent face-to-face interview was explained. The research team furthermore encouraged the interview partner(s) to invite colleagues following the snow-



ball sampling principles (Dubé and Paré 2003; Goodman 1961). The face-to-face interviews were carried out using a semi-structured interview guideline and lasted 90 minutes or longer. Two members of the research project (at least one of the core research team) attended the interview. While one was responsible for the questioning, the other took notes (Dubé and Paré 2003; Eisenhardt 1989). Additionally, the research team gathered data from external sources (e.g. press releases or annual reports) and received further internal documents (e.g. organisation charts or application portfolio plans).

### **3.2 Data Analysis**

For data analysis the research team followed the principles of qualitative data analysis in an iterative process (Miles and Huberman 1994). First, the purpose of the outsourcing arrangement to determine the categorisation for the ASO practices was analysed. As a result, the research team identified four ASO practices. Based on these, a cross-case pattern analysis was carried out in order to identify within-group similarities (Eisenhardt 1989). Then, the applied outsourcing strategy configuration (using Lee et al.'s (2004) outsourcing gestalt), the structure of the AM and the vendor management and the intended strategic impact (derived by DiRomualdo and Gurbaxani 1998; Smith and McKeen 2004) were analysed. In order to allow generalisation and replication, the findings were critically reflected upon via literature in the fields of AM, IT management and client-vendor-relationship and in a broader context with organisational theories.

This furthermore allowed a dimensionalisation of the characteristics (three-point scale with high, medium, low) for cross-case comparison. The final coding scheme as well as a description of the relevant attributes (see Table 1) is presented in the 'Results' section. To ensure the effectiveness of these practices, only successful organisations were included for the deduction of the practices. The unsuccessful organisations were used as a control group. Whether an enterprise was successful with ASO was asked in the questionnaire and verified during the interviews. The success was measured by satisfaction, which is the most common and reliable success measure used in the outsourcing research field (Gonzalez et al. 2010). In order to evaluate the findings, a focus group methodology was applied (Kitzinger 1994; Stewart et al. 2007). The results were presented and discussed in two workshops at which more than 30 per cent of the study participants were present. Thus, the focus group method was used in a confirmatory manner (Tremblay et al. 2010).

## 4 Research Results

### 4.1 Significant characteristics for describing ASO practices

Table 1 gives an overview of the significant attributes and their dimensions applied for the coding, which allows a description and classification of the identified ASO practices.

Attribute	Description	Dimensions	Major references
Outsourcing strategy gestalt	A fit of outsourcing strategy dimensions which results in an ideal strategy configuration outperforming other configuration options.	Arm's length, independent, embedded	Lee et al. 2004
Vendor management institutionalisation	The extent of institutionalisation of vendor management capabilities.	High, medium, low	Han et al. 2008; Willcocks et al. 2006
AM professionalisation	Describes the degree of professionalisation within the AM organisation taking the degree of centralisation, the degree of formalisation and the APM maturity into account.	High, medium, low	Sobol and Apte 1995; Blau and McKinley 1979; Simon et al. 2010
Strategic impact	Describes the level of contribution ASO to deliver value of the IT organisation or the business.	Capacity compensation, IS improvement, business impact	DiRomualdo and Gurbaxani 1998; Smith and McKeen 2004

*Table 1: Final coding scheme of the characteristics to describe and compare ASO practices*

Based on Lee et al.'s (2004) *outsourcing gestalts*, the applied outsourcing strategy was determined. Lee et al. (2004) differentiate between three outsourcing gestalt, which are ideal strategy configurations outperforming other configurations of the decision scope, contract type and contract duration. The first gestalt, called *independent*, describes a strategy for which less than 20 per cent of the IT budget (minimal outsourcing) is outsourced using buy-in contracts (hiring staff on a hourly-basis) on a short-term basis. While this gestalt does not include any responsibility transfer to the outsourcing provider, the *arm's length* approach (second gestalt) involves fee-for-service contracts with an authority transfer for a selected part of IT functions with a high level of detail in the contract specification. The selected outsourcing scope covers between 20 and 80 per cent of the IT budget, and the contract possesses medium-term duration. The third gestalt, named *embedded*, is described as a transfer of more than 80 per cent of the IT budget to mainly one outsourcing partner. The contract is designed as a partnership with less contract specification, forming a long-term relationship of risks and benefits sharing. (Lee et al. 2004) This outsourcing approach often also includes spin-offs or joint ventures (Dibbern et al. 2004).

Vendor management capabilities can be described as ‘the extent to which a client organisation is able to effectively manage outsourcing suppliers’ (Lacity et al. 2010). Thus, vendor management capabilities are essential for each outsourcing arrangement. Nevertheless, the extent to which a vendor management is institutionalised in the organisation can differ depending on the outsourcing design. In order to measure this varying extent, Willcocks et al.’s (2006) explication of vendor management capabilities was utilised. Depending on the institutionalisation of the capability in the organisation, the capability was rated as *low*, *medium* or *high*. As an example, one company stated that the supervisor working with external resources individually measures the monitoring of delivered quality. Even though the organisation implicitly possesses the capability to monitor the contract by the use of the supervisor’s assessment, the missing institutionalisation leads to rating the capability as low for our analysis. Including all vendor management capabilities, the degree of institutionalisation of the overall vendor management was measured.

For the AM, the organisational structure and the process design as well as the management of the application landscape were investigated. Data analysis revealed that the practices differ in the way organisations professionalise their AM. Therefore, the measure *AM professionalisation* was developed, which includes the characteristics that have a significant impact on the practices during data analysis. Thus, AM professionalisation is composed of the degree of *centralisation* and *formalisation* as well as the level of *APM maturity*. For centralisation, the definition by Sobol and Apte (1995), who describe IS department centralisation as the concentration of decision-making, was used. Formalisation refers to the implementation of documented and standardised approaches (Aiken and Hage 1971; Blau and McKinley 1979). APM includes a continuous categorisation, assessment and rationalisation of the application landscape (McKeen and Smith 2010) which targets a better understanding of the portfolio and alignment with business requirements (Weill and Vitale 1999). In order to identify an organisation’s APM maturity level and to classify a high, medium or low dimension for the cross-case comparison, the APM maturity model by Simon et al. (2010), differentiating between five maturity levels, was applied. The maturity model describes different levels from no implemented APM, APM as the capability to analyse and improve the portfolio to achieving application portfolio excellence when the APM is institutionalised comprehensively (Simon et al. 2010).

The characteristic *strategic impact* was based on the widely cited work of DiRomualdo and Gurbaxani (1998) on the strategic intent of outsourcing as well as Smith and McKeen’s (2004) approaches to outsourcing. Nevertheless, the work of these authors does not include the case of the independent approach. Smith and McKeen (2004), for example, include only fee-for-service and partnership as a contract type and do not take buy-in contracts into account. This might have its root in the fact that, in some definitions, outsourcing has to involve the transfer of responsibility (Dibbern et al.

2004) or the minor strategic contribution of this particular outsourcing approach (Lee et al. 2004). Based on the findings of DiRomualdo and Gurbaxani (1998), the definition of the strategic impact was defined as the level of contribution of ASO to deliver value of the IT organisation or the business. During data analysis, three dimensions were identified: capacity compensation (which was added to the definitions from data analysis), IS improvement and business impact (original dimensions). The case of commercial exploitation was not in the scope of the observed cases.

## 4.2 Practices for ASO

The data revealed that the observed organisations utilised four different ASO practices to complement their application service delivery, namely: ‘Support’, ‘Optimise’, ‘Transform’ and ‘Innovate’. Based on the characteristics introduced above, Figure 1 presents a comparison of the four practices in terms of the characteristics. In the following, each practice is explained in further detail.

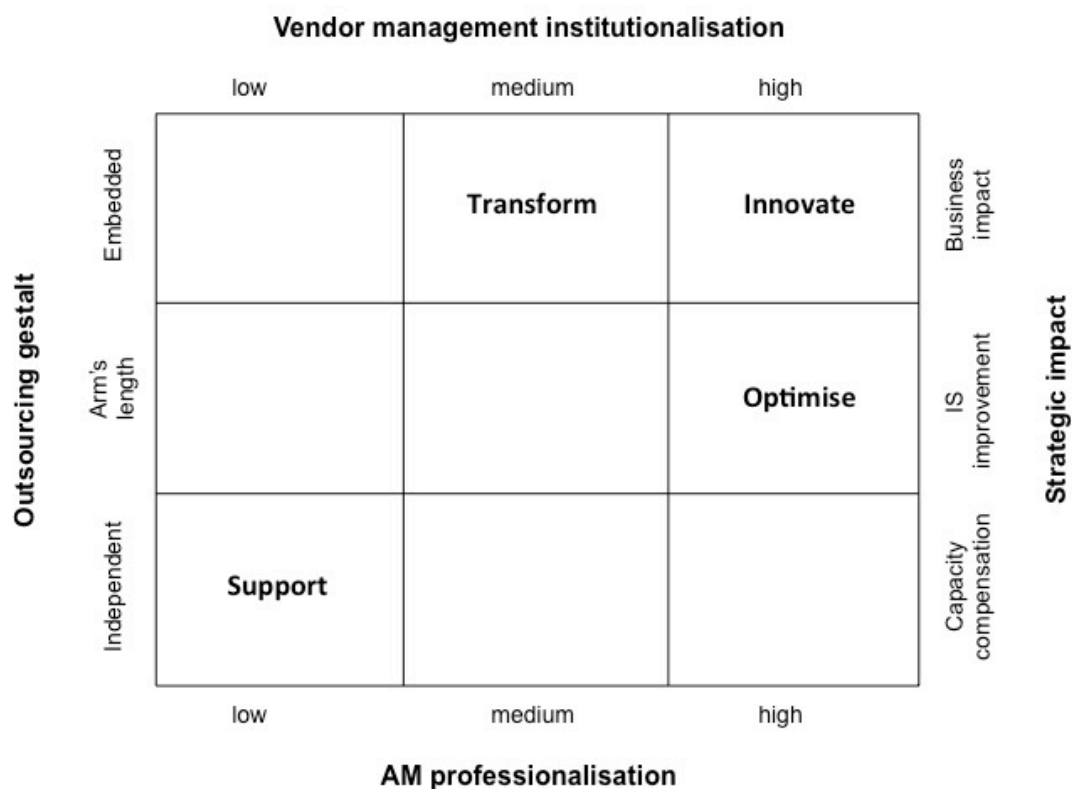


Figure 1: Strategy matrix for ASO practices

Overall, the findings show a correlation between the applied outsourcing gestalt and the strategic impact of the ASO arrangement as well as the degrees in vendor management institutionalisation and AM professionalisation.

### 4.2.1 Support

For the first practice, the ASO endeavour is predominantly motivated by the access to skills. Thus, outsourcing supports the IT organisation in delivering the required application management services in time and in a quantity that is subject to absorptive capacity constraints and/or short-term knowledge gaps. The IT organisation, and in the case of ASO the AM organisation, possesses full control over IT-related knowledge and the execution of AM services. Interestingly, organisations satisfied with their outsourcing possess a low degree of AM professionalisation; especially in the field of APM, all of them possess a low degree of maturity. *‘Most of the knowledge about our applications is in the head of the responsible experts. The application documentation is not up-to-date and not in use in daily business’* (IT manager, ‘Support’). Furthermore, centralisation and formalisation were not considered as necessary to enable the outsourcing arrangement. In line with this, the vendor management institutionalisation was also low. Vendor management capabilities are more implicit. *‘A lot of our external staff is hired again as our internal team were satisfied with their work and the daily rate’* (CIO, ‘Support’). The strategic impact of ASO is low for this particular practice and intended to close capacity gaps.

### 4.2.2 Optimise

When the observed organisations utilise ASO for optimisation, the predominant target is efficiency in the sense of cost reduction and/or in the sense of concentration on core competences. This approach also includes motives such as head count reduction targets set by the organisation or the desire to enhance cost transparency. In contrast to the practice ‘Support’, this practice reveals a high degree of AM professionalisation as well as a high degree of vendor management institutionalisation. A high level of APM maturity enables the selection of the applications. *‘Our strong application portfolio management capabilities enable the selection of application suitable for outsourcing’* (CIO, ‘Optimise’).

The ASO approach even supports the APM in distinct objectives. Thus, some of the observed organisations utilised ASO to transfer the responsibility of an application which they intend to retire to an outsourcing provider. With the outsourcing of such applications, resources can be set free to concentrate on important or new projects. Furthermore, the outsourcing can create a distance between the application users and the services for this application(s) to force the users out of their comfort zone. Thus, the outsourcing supports the rationalisation of the application portfolio. *‘Our application services outsourcing is driven by our life-cycle-oriented application portfolio planning. Thus, each application reaching the ‘maintain’ and ‘reduce’ status is taken into consideration for outsourcing’* (IT manager, ‘Optimise’). A high degree of centralisation and formalisation fosters control over the outsourcing relationship. For this practice, a high degree of specialisation was also detected, which comprises specialisa-

tion of tasks and skills (Burns and Staker, 1961). A high degree of specialisation in the case of AM refers to the separation of development, maintenance and operations tasks into different teams and facilitates the outsourcing of particular AM functions. *‘The high level of specialisation in our application management organisation allows a clear separation of functions for outsourcing’* (Director to the CIO, ‘Support’).

The practice also requires a high degree of institutionalisation in all vendor management capabilities. Due to the outsourcing of selected applications or AM functions to multiple providers, the vendor management requires clear standard procedures and rules. A high degree of institutionalisation of the *contract monitoring*, for example, is important as the efficiency of the outsourcing is the major factor. Therefore, for example, distinct service-level agreements need to be installed. A high degree of institutionalisation of the capability *informed buying* ensures the right match of outsourcing providers in the portfolio. *‘The vendor selection process is highly formalised and follows a distinct rating system for all preferred and potential vendors’* (CIO, ‘Support’). The strategic impact of this practice is at a medium level as the outsourcing endeavour targets IS improvement in terms of cost reduction and/or the concentration on core competences of the IT organisation. The practice can furthermore support the rationalisation of the application portfolio by outsourcing particular applications.

#### 4.2.3 Transform

The third category is induced by the organisation’s intent to redesign or modernise the application landscape or the overall application services delivery structure. Thus, the outsourcing endeavour implies a large-scale transformation which an organisation is not able or willing to accomplish. Therefore, the practice serves as a change catalyst. These transformations are often driven by the need to modernise or consolidate the application landscape. The AM professionalisation as well as the vendor management institutionalisation for this practice was at a medium level. With a medium APM maturity level, the organisation was able to decide on the actions that rationalise its application portfolio. This enables the selection of the outsourcing partner who will execute the application landscape or application service delivery transformation. *‘Before we were able to decide on an outsourcing partner to execute our large application landscape transformation, we carried out a comprehensive portfolio analysis’* (CIO, ‘Transform’).

While the ability to precisely control the outsourcing partnership in any detail and with a high degree of formalisation is less important due to the nature of the unspecified contract, the vendor development capabilities are more important as the internal organisation needs to ensure the continuous improvement of the vendor during the transformation process. *‘The development of our relationship to the outsourcing partner is a continuous process. Thus, we can ensure that our application management and application landscape improves by the outsourcing’* (CIO, ‘Transform’). The strategic im-

pact of the practice is at a high level as the contribution to the business value delivered by the outsourcing entails a better alignment with business needs and in most cases an improvement in business processes.

#### 4.2.4 Innovate

Finally, data analysis also brought forth that ASO can also be utilised as a practice to enable innovation. Thus, the outsourcing partner develops and deploys innovative applications enhancing the enterprise's business operations, supporting production innovations or even delivering a competitive advantage. Even though the use of outsourcing for innovation is well discussed in the outsourcing literature, none of the observed companies extensively utilised this practice. This practice was nevertheless included as several organisations are currently gathering experience with this practice or intend to develop their outsourcing endeavour toward this approach. *'In some projects, we have already developed certain IT-related product features with the support of our suppliers. This requires a strong and well considered partnership'* (CIO, 'Support' and 'Innovate').

A high degree of vendor management institutionalisation is vital for this practice as a clear approach for the vendor selection and the relationship management as well as the vendor development are essential. This is supported by a high degree of AM professionalisation. *'The way we do business with our customers has become more and more digital the last few years. Thus, we need to consider how to transform our application landscape that innovations in the field of e.g. mobile devices would fit in. This also forced us to rebuild skills in planning the application portfolio, even though the largest part of our applications is developed, maintained and operated by our outsourcing partner'* (CIO, 'Transform' and 'Innovate'). The strategic goal of this practice is business impact as innovations tend to have a high impact on the business value.

#### 4.2.5 Future direction of the use of ASO practices

Even though practices can be combined in the organisation to a certain degree, companies possess a dominating approach. Figure 2 gives an overview of the shifts the organisations intend to make.

When asking about the future direction in outsourcing practice, a shift from the predominant use of ASO as 'Support' toward 'Optimise' (1) was observed most frequently. Different drivers motivate this shift. Firstly, the observed IT organisations are still confronted with tremendous cost pressure, and cost reduction is still the most important motive for outsourcing. Secondly, an increase in the outsourcing volume also forces some organisations to consider new approaches. *'With our current outsourcing mode ['Support'], one internal is needed to supervise four externals. As we target to increase our outsourcing degree up to 40 per cent, we need to consider the transfer*

toward *fee-for-service contracts*’ (IT manager, ‘Support’). In addition, the observed companies increase their AM professionalisation by implementing APM or formalising their AM structure and processes. In alignment with that, expectations toward outsourcing have also changed. While developing the organisation toward efficiency, the outsourcing practice has to be adjusted as well. This might explain why organisations predominantly utilising the practice ‘Support’, while possessing a high degree of AM professionalisation, are not satisfied with their outsourcing. Thus, internal development of the AM organisation also evokes change in the ASO practice.

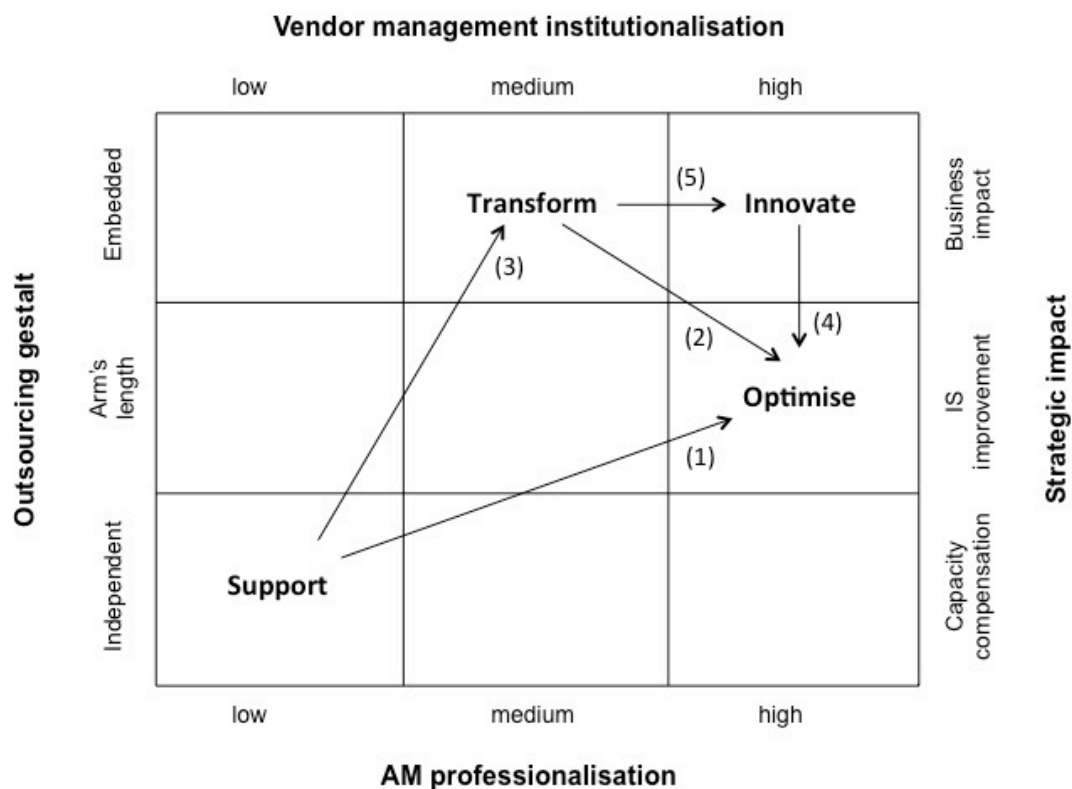


Figure 2: Intended shifts in ASO practices

Another shift toward the predominant use of ‘Optimise’ as an outsourcing practice was observed by one company relying on the application services delivery by one outsourcing service provider, which happens to be a spin-off of this company (2). This spin-off was founded in order to transform the application landscape and the application service delivery toward a more efficient and centralised approach. The exclusive, company-owned service provider also operated in the third market to generate additional revenue. Nevertheless, the company decided to include additional vendors in the application service delivery in order to utilise competitive forces and to gain cost reduction. ‘In order to gain competitive prices, we decided to include further outsourcing services provider to our application service delivery’ (IT manager, ‘Transform’). That primarily includes the use of offshore resources. Therefore, the retained organisa-



tion in the company is currently developing more skills in the field of APM and vendor management in order to enable the multiple vendor strategy.

Another case describes the shift from ‘Support’ to ‘Transform’ as the intended outsourcing practice (3). Interestingly the company already postponed this step twice. Once, the organisation was faced with several restructuring programmes, which hindered the transition toward the outsourcing project. Another time the outsourcing project was postponed ‘last-minute’ during the preparation phase. The organisation and the outsourcing partner disagreed on too many points. This outlines the massive change this involves, especially in the case of shifting from an outsourcing degree of approximately ten per cent to a comprehensive outsourcing approach with more than 80 per cent of the application service delivery operated externally. Not only does the selection of the outsourcing partner need to be carefully considered, but also the change toward the required skills within the internal organisation. *‘This outsourcing project requires a massive change in the organisation – in the sense of cultural changes as well as different job profiles’* (IT manager, ‘Support’). Currently, the organisation is professionalising their AM and is working on the development of a suitable vendor management to start the outsourcing endeavour within the next year. The decision to continue with the outsourcing project is driven by the assumption that the outsourcing partner will be able to modernise and professionalise the application service delivery toward a more standard and competitive application landscape. The company trusts in the competence and experience of the outsourcing partner to leverage economies of scale and offshore delivery after the transition phase.

The shift toward the ‘Innovate’ practice ((4) and (5)) was discussed in several interviews. Nevertheless, none of the observed organisations has a concrete plan for such a shift. The discussion often led to a reflection of the role of outsourcing service providers. Some did not even believe at all in the innovation capabilities of today’s outsourcing providers. *‘Looking at the offering and capabilities vendors currently provide in the market, we don’t believe that these companies could drive IT-related innovations for our company’* (CIO, ‘Support’). Others see the need of the IT service providers to develop in this direction or even consider collaborating with smaller more specialised IT providers in the field of innovation. *‘In the automotive sector, for example, a lot of innovation for the car is driven by suppliers. This developed from a situation where the added value by the core production got smaller and smaller. We also need this development within the IT sector’* (CIO, ‘Optimise’). Furthermore, the motives behind the practice ‘Innovate’ are very different from the motives that drove the outsourcing in the past for the observed organisation. *‘When we wanted to be the first company in our sector to do business by a mobile app, we needed to change our mind set in finding a partner to develop this application. The most important thing was time and innovativeness. Thus, costs did not matter at all’* (IT manager, ‘Support’).

Interestingly, there is no organisation currently utilising the ‘Optimise’ practice which intends a shift toward ‘Support’ or ‘Transform’. Overall, the observed companies intend to predominantly use the ASO practice ‘Optimise’ in the future. The practices of ‘Support’ and ‘Transform’ did not seem to be stable ASO practices as on the one hand organisations intend to professionalise their outsourcing approach and on the other hand avoid being bound to one outsourcing partner to avoid lock-in effects and to mitigate risks.

## 5 Discussion and Related Work

The correlation between the aspired strategic impact of outsourcing and the contractual configuration, constituted by the outsourcing gestalt in the present work, has already been discussed in prior research. The findings are in line with the results of DiRomualdo and Gurbaxani (1998) and Smith and McKeen (2004). They addressed the fact that IS improvement through outsourcing requires contracts with a high degree of specification and that business impact is achieved by outsourcing arrangements relying on partnerships.

Our results reveal that the ASO practice ‘Support’ applying the independent gestalt is used to close capacity gaps in most of the cases. As shown by Lee et al. (2004), it was also observed that the arm’s length approach is successfully applied in gaining cost reduction. Our findings also align with the prior results of Lacity and Willcocks (1998), stating that selective outsourcing outperforms other outsourcing forms in gaining efficiency. Thus, the practice ‘Optimise’ is well-established in research and practice.

Lee et al. (2004) furthermore showed that the embedded approach is better to reach technology catalysis. Linder (2004), Ross and Beath (2006) and Lacity et al. (2004) emphasise the use of outsourcing in order to achieve a large-scale transformation. Ross and Beath (2006), for example, revealed that comprehensive outsourcing partnerships could be utilised to modernise, consolidate or harmonise applications and functionalities. Another reason to choose such a contractual governance structure is the fact that organisations targeting a transformation with outsourcing are confronted with complex portfolio structures. In the case of outsourcing, such a complex structure increases the coordination effort of vendor management in a multiple supplier approach (Hui et al. 2008). Thus, applying the embedded outsourcing gestalt with the practice ‘Transform’ leads to a better performance. This also applies to the practice ‘Innovate’.

The applied degree of vendor management institutionalisation and AM professionalisation, as well as the correlation between these two dimensions, can be explained by the influence of organisational structure on outsourcing and the concept of ‘outsourcing readiness’. Plugge and Bouwman (2012) identified organisational structure as a moderating variable of outsourcing. A high level of centralisation allows an overall optimisation (Plugge and Bouwman 2012) and thus allows better control and man-

agement of outsourcing. Formalisation supports centralisation (Plugge and Bouwman 2012) and therefore enables a clear approach to working with single or multiple suppliers. The present results also agree with Plugge and Bouwman (2012) in that centralisation and formalisation facilitate efficiency in the outsourcing arrangement. Thus, the practice 'Optimise' requires a high degree of AM professionalisation. The findings furthermore emphasise that the practice 'Innovate' also benefits from a high level of AM professionalisation as it correlates with the ability to maintain the vendor relationship. Another part of AM professionalisation is the APM maturity. The concept of outsourcing readiness has to various degrees already been applied by research (e.g. Cullen, Seddon and Willcocks 2005) and enables an organisation to evaluate the internal requirements and adjustments necessary for the outsourcing endeavour.

Looking closer at the AM professionalisation, previous research revealed that APM maturity influences and supports the outsourcing in certain ways. The transparency of the application portfolio enables an organisation to define the outsourcing scope (Prahalad and Krishnan 2002). McKeen and Smith (2010) emphasised the importance of APM in selecting applications for outsourcing and the ability to control the quality of the outsourcing partners. The results reveal that especially the ASO practices 'Optimise' and 'Innovate' rely on these capabilities. Firstly, the 'Optimise' practice requires well-considered application selection and vendor monitoring. Secondly, for the practice 'Innovate', the organisation needs to possess a comprehensive portfolio plan to trigger the innovation together with the outsourcing partner. In the case of the application of the practice 'Transform', the organisation at least needs a good portfolio understanding and a distinct idea of what the transformed portfolio or application service delivery requires (medium level of APM maturity).

The retention of essential skills remains one of the major outsourcing success factors (Baldwin et al. 2001). In addition to the professionalisation of the internal AM structures and capabilities, distinct skills to manage the outsourcing relationship are required. Thus, outsourcing failures are also caused by the uncontrollable complexity of the outsourcing arrangement (Rouse and Corbitt 2003). Willcocks et al. (2006) and Han et al. (2008) determined the IS capabilities which are essential for outsourcing success. Besides the discussed vendor management capabilities, these include IT capabilities as well as capabilities to align with the business. Nevertheless, they did not differentiate between outsourcing approaches. Our research gives more insight into the variation of the institutionalisation of vendor management capabilities for different ASO practices. While the practice 'Support' requires the lowest institutionalisation, 'Optimise' and 'Innovate' require a high degree of vendor management institutionalisation as the client-vendor relationship of these practices is more complex and based on mutual dependencies.

An external perspective and the access to world-class skills can enrich the innovation potential of a firm (Quinn 1999). In research, the approach to enable innovation and

thus add value through outsourcing is often called strategic outsourcing (Smith and McKeen 2004). In practice, nevertheless, only a few organisations consider outsourcing to trigger innovation, and those who do have been ‘commonly disappointed’ with achieving innovation through outsourcing (Weeks and Feeny 2008). In order to enable innovation through outsourcing, certain factors within the organisation, the outsourcing provider and the client-vendor relationship have to be adjusted in comparison to other outsourcing approaches (Weeks and Feeny 2008). Therefore, an organisation needs to build a distinct outsourcing maturity (Whitley and Willcocks 2011). The findings of the present study reveal that the ASO practice ‘Innovate’ requires a high level of vendor management institutionalisation and AM professionalisation. Thus, the present research especially contributes to the previous findings by adding the dimensions of vendor management institutionalisation and AM professionalisation in order to better understand the internal design and specifics of outsourcing practices for application services.

Looking at the second part of our results, the concept of outsourcing maturity models provides some explanations for the changes in ASO practices the observed enterprises intend. IT outsourcing maturity models focus on different aspects of outsourcing such as process maturity and relationship maturity (Adelakun and Wabash 2004; Gottschalk and Solli-Sæther 2006; Kronawitter et al. 2013; Whitley and Willcocks 2011). The maturity models by Gottschalk and Solli-Sæther (2006) as well as by Adelakun and Wabash (2004) present a stage model by which to determine different maturity levels. These stages are based on the assumption that organisations shift their focus and that, along with this, the outsourcing relationship matures with time (Adelakun and Wabash 2004). Gottschalk and Solli-Sæther (2006) developed a stage model with three stages: the cost stage, resource stage and partnership stage. Their stage model implies that over time and with a growing maturity the outsourcing relationship develops toward a relationship delivering a high strategic impact (Gottschalk and Solli-Sæther 2006). The observed practice shift in our study also showed a tendency toward increasing the strategic impact delivered by the outsourcing endeavour. Thus, the shifts from the ASO practice ‘Support’ toward ‘Optimise’ or even ‘Transform’ or the shifts toward ‘Innovate’ could be explained by the growing maturity the organisations experience with their outsourcing. Adelakun and Wabash (2004) stated that at higher stages of outsourcing maturity, organisations implement norms and procedures (stage 4) as well as clear methods (stage 5) in order to enable more than just cost savings. This also matches the findings that the more responsibility that is transferred and the more strategic impact that the ASO practice intends to provide, the more AM professionalisation and vendor management institutionalisation are required.

Jayatilaka and Hirschheim (2009) reasoned that the shifts of outsourcing arrangements within companies are mostly non-linear and not as stage-level-like as proposed by the maturity models introduced above. Their research revealed that the outsourcing deci-

sion is bounded to the orientation of an organisation. Organisations are confronted with instant change, which also forces them to adjust their outsourcing behaviour – which could also include going back to lower levels in the terms of maturity model (Jayatilaka and Hirschheim 2009). These findings support the understanding of the observed shifts in two ways. Firstly, they explain the shift from the practice ‘Transform’ to ‘Optimise’ as the objective of the company changes toward efficiency. Secondly, they explain why the success of an outsourcing arrangement can change over time due to organisational change. The most common and reliable measure for outsourcing success is satisfaction (Gonzalez et al. 2010). Satisfaction is measured by meeting expectations and ‘depends on a firm’s orientation toward IT, rather than on the IT-sourcing arrangements themselves (Jayatilaka and Hirschheim 2009). Thus, an organisation that increases AM professionalisation changes expectations toward efficiency and might therefore be dissatisfied with the ASO practice ‘Support’. A change in objectives, internal practices or priorities induces organisations to change their outsourcing arrangements (Jayatilaka and Hirschheim 2009).

Overall, cost savings are still driving most of the outsourcing decisions in the observed organisations, and thus most of the enterprises are applying or intend to utilise the ASO practice ‘Optimise’. A recent study by HfS Research also revealed that companies predominantly outsource to decrease costs and do not rely on their outsourcing providers to gain business outcomes or innovation (HfS Research 2013).

## 6 Conclusion and Outlook

Addressing the research question, the research endeavour identified four practices for ASO observed within 37 large German and Swiss enterprises. The data analysis revealed that the four practices, namely ‘Support’, ‘Optimise’, ‘Transform’ and ‘Innovate’, differ in the applied outsourcing strategy and strategic impact delivered by the outsourcing arrangement. Furthermore, the degree of AM professionalisation and vendor management institutionalisation varies across the practices. Overall, the practices ‘Optimise’ and ‘Innovate’ are the most demanding practices in terms of internal requirements within the AM and vendor management. Looking at the intended shifts in outsourcing practices, most of the companies aim to implement the practice ‘Optimise’. This shows that IS improvement and primarily cost savings drive organisations to outsource particular parts of their application development, maintenance and operations to multiple suppliers. Outsourcing in the light of innovation and creation of business impact is still not a focus for most of the companies included in the study. This might imply that on the one hand companies are not ready to outsource for innovation and/or on the other hand outsourcing services providers do not possess the capabilities to provide innovation to their clients.

The research contributes to practice and academia. As organisations are confronted with continuous change, which triggers a shift in outsourcing arrangements (Jayatilaka

and Hirschheim 2009), the results can support practitioners in deciding on a suitable ASO practice. The findings not only support the understanding of increasing outsourcing but also help to prepare the organisation for back-sourcing (Whitten and Leidner 2006) – for example, in the case of a shift from the ASO practice ‘Transform’ to ‘Optimise’. Decision makers could use the findings to assess the organisation’s outsourcing readiness and to determine necessary actions. From a scientific perspective, the findings regarding the success of outsourcing gestalts (Lee et al. 2004) and the impact of the role of outsourcing (DiRomualdo and Gurbaxani 1998) are extended to the specifics of ASO. The results furthermore give insights into the change of outsourcing arrangements over time (Gottschalk and Solli-Sæther 2006; Jayatilaka and Hirschheim 2009).

Due to the nature of case study research, the results are limited to 37 cases. With the focus on Germany and Switzerland, cultural effects are possible and might limit the transferability to other countries (as e.g. observed by Dibbern et al. 2012). From the contractual perspective, new forms of outsourcing such as Software as a Service (SaaS) offerings were not included (Winkler et al. 2011). Vendor capabilities, which also have an influence on outsourcing success (Plugge and Bouwman 2012), were not included in the research design as the focus was on internal determinants. Furthermore, the interviews focus on representatives from IT organisations. The perspective of the business might also deliver important insights, especially for practices, which intend to provide business impact.

Thus, the results could be validated by a large-scale survey. The research could also benefit from longitudinal studies based on concepts such as the dynamic effects of continuously changing organisations (Zajac et al. 2000) or dynamic capabilities (Teece et al. 1997). Furthermore, the internal AM structure required to succeed in different outsourcing strategies could be studied in more detail.

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<b>Article VI</b>	
Title	Application Services Outsourcing in the Banking Industry – Current Strategies and Challenges
Authors	Saskia Zelt, Jochen Wulf, Falk Uebernickel and Walter Brenner
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Abstract	Globalization, raising competition, shrinking client loyalty, and recently the impact of the financial crisis have led to an increasing number of regulations and caused a tremendous loss of bank clients and liquidity. The events from the recent past have forced banks' IT organizations to rethink their strategic direction and thus to alter their outsourcing strategy. Only a few scholars have addressed outsourcing specifically in the banking industry, especially application services outsourcing. To better understand applied and intended application services outsourcing strategies in the banking industry, we conducted holistic multiple case study research with five German and Swiss banks. The results reveal that the interviewed banks intend to heavily increase their outsourcing volume. Furthermore, we discovered six categories of different challenges banks currently face.

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# Application Services Outsourcing in the Banking Industry – Current Strategies and Challenges

Globalization, raising competition, shrinking client loyalty, and recently the impact of the financial crisis have led to an increasing number of regulations and caused a tremendous loss of bank clients and liquidity. The events from the

recent past have forced banks' IT organizations to rethink their strategic direction and thus to alter their outsourcing strategy. Only a few scholars have addressed outsourcing specifically in the banking industry, especially application services outsourcing. To better understand applied and intended application services outsourcing strategies in the banking industry, we conducted holistic multiple case study research with five German and Swiss banks. The results reveal that the interviewed banks intend to heavily increase their outsourcing volume. Furthermore, we discovered six categories of different challenges banks currently face.

## 1 Introduction<sup>(1)</sup>

Information Technology (IT) has a differentiating role in the banking industry, since financial products are intangible and information-intensive. Furthermore, IT in the banking industry enables competitive advantage [Ang/Beath 1993]. For the last decade, the financial industry has been dealing with the consequences of globalization, intensifying competition, and declining client loyalty [Geiger/Hürzeler 2003]. Banks are continuously forced to lower vertical integration, which is comparable to the transformation the automotive sector experienced in the 1980s [Lamberti/Poehler 2004; Lammers et al. 2004]. Outsourcing not only reduces costs but also enables financial entities to focus on their core capabilities to realize competitive advantages [Baldwin et al. 2001]. Consequently, organizations outsource non-critical activities and gain access to capabilities not available within the

organization [Quinn/Hilmer 1994]. Even though the financial industry is responsible for a huge share of the global IT outsourcing expenses [Deloitte Research 2005], the sector is also known for its risk-averse outsourcing behavior [Baldwin et al. 2001]. This is reflected by the fact that banks are more likely to outsource application development and to keep application maintenance in house [Baldwin et al. 2001]. Furthermore, up to a certain point, IT outsourcing is restricted by regulations [Lopez 2004]. More recently, the financial crisis not only increased the number of regulations but also caused a tremendous loss of clients, trust in the banking system, and bank liquidity [Özbay et al. 2011].

Prior research revealed that institutional influences such as successful outsourcing by other organizations, financial reporting standards, and regulations lead to changes in IT outsourcing arrangements [Jayatilaka/Hirschheim 2009]. Thus, a shift in the outsourcing strategy is even more influenced by external factors than internal considerations

(1) The present work was also published in the proceedings of the Multikonferenz Wirtschaftsinformatik (MKWI) 2014 due to its presentation and discussion on the conference.

Table 1:  
Description of  
outsourcing strategy  
dimensions

Outsourcing strategy dimension	Sub-dimensions	References
Decision scope	<i>Minimal</i> (< 20%), <i>selective</i> (20-80%), and <i>comprehensive</i> outsourcing (> 80%), measured by the share of the IS budget outsourced	Lacity/Hirschheim 2009, Lee et al. 2004
Contract type	<i>Buy-in</i> (no responsibility transfer, hiring on a daily basis), <i>fee-for-service</i> (responsibility transfer for the outsourced service/function, high specification), and <i>partnership</i> contracts (full control to the vendor, unspecified)	Ang/Beath 1993, Lacity/Willcocks 1998, Lee et al. 2004
Contract duration	<i>Short-, medium-, long-term</i>	Lee et al. 2004
Number of service providers	<i>Single</i> and <i>multiple</i> provider strategy	Currie 1998, Willcocks et al. 1995
Sourcing location	<i>Onshore</i> (outsourcing performed inside the client's home country) and <i>offshore</i> (outsourcing performed outside the client's home country)	King/Torkzadeh 2008, Lacity et al. 2010
Outsourcing IT function	<i>Infrastructure</i> , <i>applications</i> (development and maintenance), and <i>business processes</i>	Grover et al. 1996, Mahnke et al. 2005

[Jayatilaka/Hirschheim 2009]. We believe that the described adjustment of institutional processes in the banking industry has led to a shift in banks' outsourcing strategies today.

Thus, our research aims to determine the direction of the impact of outsourcing strategies in the banking industry by investigating current and intended outsourcing strategies. By identifying current challenges, we will also distinguish potential starting points for future research. We focus on application services outsourcing, including the outsourcing of all services to develop and maintain an application. Due to its closeness to business processes, application services outsourcing is more likely influenced by industry specifics than infrastructure outsourcing [Fisher et al. 2008]. Based on these assumptions, the following research questions (RQs) guided our research:

RQ1: What are applied and intended outsourcing strategies within the banking industry?

RQ2: What are current challenges in application services outsourcing in the banking industry?

## 2 Related Work

### 2.1 IT Outsourcing Strategies and Application Services Outsourcing

Following Kern's definition [Kern 1997], outsourcing implies the decision „to contract-out or sell the organization's IT assets, people, and/or activities to a third party vendor [...] over an agreed period of time.“ Each outsourcing decision is complex and unique [Cheon et al. 1995], and wrong decisions can result in the loss of essential capabilities and/or business failures [Loh/Venkatraman 1992]. Every outsourcing decision starts with the question of „why“ and „what“ to outsource [Dibbern et al. 2004] and thus the determination of an outsourcing strategy. Lee et al. [2004] defined an outsourcing strategy as „the logic visible in a firm's portfolio of IT outsourcing decisions.“ Following Lee et al. [2004], an outsourcing strategy consists of three strategic dimensions deduced from residual rights theory: the decision scope (degree of integration), the contract type (allocation of control), and the contract duration (performance period). The decision scope can be differentiated by the percentage of the IT budget spent externally. The contract type designates the location of responsibility

Table 2:  
Overview of prior  
research on IS  
outsourcing mo-  
tives, strategies,  
and challenges  
in the banking  
industry

Reference	Research focus	Country	Research methodology
Adeleye et al. 2004	Risk management practices in IT outsourcing	Nigeria	Case study (multiple cases)
Ang and Straub 1998	Comparison of relative effects of production and transaction costs on the degree of outsourcing	USA	Field study (n=243)
Baldwin et al. 2001	Outsourcing motives and implications for outsourcing decision making	UK	Case study (single case)
Gewald and Dibbern 2009	Risk-benefit model for BPO and identification of path dependencies of BPO decisions	Germany	Field study (n=126)
Gonzalez et al. 2013	Peculiarities of IT outsourcing in the banking industry and development of a decision-making framework for IT outsourcing	–	Literature review
Gregory et al. 2009	Challenges in offshore outsourcing in application development	Germany	Case study (single case)
Martensson 2004	Outsourcing choice patterns in application development outsourcing	n.a.	Case study (multiple cases)
Qin et al. 2012	Framework for risk identification and mitigation based on risk factors and resulting losses	China	Case study (multiple cases)
Suhaimi et al. 2007	Outsourcing motives as well as approaches and challenges of outsourcing implementation	Malaysia	Case study (single case)

over the processes [Lee et al. 2004]. Other dimensions have been considered by researchers, such as the number of service providers [Willcocks et al. 1995], the sourcing location [Lacity et al. 2010], and the outsourced IT function [Grover et al. 1996]. Table 1 shows the sub-dimensions of each strategy dimension.

Our research focuses on outsourcing application functions since applications are closer to the business processes than infrastructure services [Fisher 2008]. Thus, application services outsourcing has more potential of being affected by industry-specific differences. Application services outsourcing includes all services „associated with the acquisition, development, and deployment of an IT application“ [Schwarz et al. 2009].

However, the dimensions of the outsourcing strategy were not the only interest of prior research studies. Scholars also investigated the impact of strategy configurations on outsourcing success on particular outsourcing targets. Lacity

et al. [1996], for example, stated that a selective outsourcing approach is more appropriate for achieving efficiency targets. Lee et al. [2004] also studied the suitability of particular constellations of strategic dimensions to be more likely to succeed in a specific outsourcing target. Even though outsourcing is „a commonly accepted [...] practice“ [Han et al. 2008] and outsourcing has been extensively studied over the last few decades, there is still a need to better understand outsourcing decisions [Dibbern et al. 2004].

## 2.2 IT Outsourcing in the Banking Industry

Prior research on IT outsourcing in the banking industry mainly addressed outsourcing motives (e.g., [Baldwin et al. 2001]) and risks (e.g., [Gewald/Dibbern 2009]). The studies focused on investigating the influence factors on a particular strategy dimension such as the decision scope [Ang/Straub 1998] or the decision scope combined with the contract type [Martensson 2004]. Martensson [2004] and Gregory et al. [2009] investigated decisions regarding application development. Gewald and

Table 3:  
Description of  
case companies

Case	Type of bank	IT budget [EUR mn.]	Interview partner
<i>Alpha</i>	Universal bank	> 100	Direct to the CIO (2), manager central function (1)
<i>Beta</i>	Private bank	> 250	Direct to the CIO (1)
<i>Gamma</i>	Universal bank	> 1000	Direct to the CIO (1), manager central function (1)
<i>Delta</i>	Universal bank	> 250	IT Manager (1)
<i>Epsilon</i>	Universal bank	> 1000	IT Manager (1)

Dibbern [2009] surveyed the influence of perceived risks and benefits of adopting business process outsourcing (BPO). Suhaimi et al. [2007] investigated the motives, approaches, implementation strategies, and challenges of IT outsourcing in a Malaysian bank. Table 2 gives an overview of the motives, outsourcing strategies, and risk or challenges of IT outsourcing discussed by scholars in the banking industry.

Gonzales et al. [2013] recently published the results of a comprehensive literature analysis that revealed the peculiarities of IT outsourcing in the banking industry and developed a decision framework for choosing the IT outsourcing configuration and for mitigating outsourcing risks. Gonzalez et al. [2013] highlighted three peculiarities of IS outsourcing in the financial sector: IT importance for financial services (1), IT outsourcing suitability for financial services (2), and special IT outsourcing issues and risks for financial services (3). The first peculiarity (1) refers to the information-intensive nature of financial products and the relevance of IT in creating a competitive advantage [Ang/Straub 1998]. The second peculiarity (2) is grounded in the fact that financial services are based on information, which makes IT outsourcing easier [Bradley et al. 2012]. The banking industry is one of the most regulated industries in the world, and protecting the privacy of clients' financial information is essential [Lopez 2004]. This is reflected in the third peculiarity (3). Baldwin et al. [2001] also emphasized the risk-averse organizational culture of banks. This leads to the decision „not to outsource (or outsource a very small portion) of their IT/IS services including security, architecture/design, maintenance and stra-

tegic planning.“ However, other IT functions such as development and operations are more likely to be outsourced [Baldwin et al. 2001].

As the decision framework presented by Gonzalez et al. [2013] was mainly based on general IT outsourcing literature without a banking focus, they call for more in-depth research in the banking sector and to reveal insights by investigating outsourcing strategies and occurring risks.

### 3 Research Methodology

We designed our research based on the principles of a holistic multiple case study [Yin 2003] for the following reasons. The current outsourcing strategies and the related challenges against the background of recent changes in the banking sector are a contemporary phenomenon, which cannot be studied outside its context [Yin 2003]. Following Gonzalez et al.'s [2013] call for in-depth research on outsourcing in the banking industry, we seek explanatory insights into outsourcing strategies and their challenges in the banking industry [Benbasat et al. 1987; Paré 2004]. The data collection and analysis were directed by the general proposition that shifts in outsourcing strategies are even more influenced by external changes than changes within the organization [Jayatilaka/Hirschheim 2009].

To design the case study, we followed Yin's five design principles [Yin 2003]. The research question was deduced by the research problem to identify the outsourcing strategy shift in financial institutions and the challenges that arise. Yin [2003] argued that exploratory studies should state a clear purpose and success criteria, even though no a

priori propositions are formulated. This study aims to deduce propositions concerning the status quo of and the shift in outsourcing strategies as well as current challenges in application services outsourcing in the banking sector. The unit of analysis is therefore the application services outsourcing strategy. We linked the data to the general proposition of changing circumstances in application services outsourcing in the banking industry and used extant literature to develop criteria for the reflection and interpretation.

### 3.1 Data Collection

Since multiple case studies enable better generalization of the research results, we investigated a case base of five German and Swiss banks described in Table 3. To collect data, we reviewed the literature to identify relevant outsourcing strategies and to cover the current general challenges of outsourcing. Based on the results, we created a questionnaire with closed questions [Eisenhardt 1989] and an interview guideline with standardized open-ended questions [Patton 2002]. The questionnaire covered the strategy dimensions (see Table 1), the outsourcing target, organizational context factors, and questions for generic outsourcing risks [Benamati/Rajkumar 2008] to guide the discussion of challenges the industry faces. We chose to combine the questionnaire with a face-to-face interview, because data from the closed questions facilitate the analysis of qualitative data and can support the findings [Eisenhardt 1989].

Before the face-to-face interview, we provided the interviewees the questionnaire. We also prepared a fact sheet, which gathered available external data. To verify the questionnaire and to explain the scope of the interview, we conducted a preparation call. The call lasted at least 30 minutes, and notes were taken. As a result of the preparation call, additional interview partners were identified following the principles of snowball sampling [Dubé/Paré 2003; Goodman 1961]. Each interview lasted between 90 and 120 minutes. At each interview, at least two researchers were present: one moderated the inter-

view, and one took notes [Eisenhardt 1989; Dubé/Paré 2003]. The face-to-face interview allowed us to deepen the results of the previously answered closed questions about the pursued outsourcing strategies. The interview also helped us identify possible challenges arising from certain outsourcing strategy decisions and from industry specifics. In addition, the interview partners provided internal data such as organizational charts and application portfolio landscapes. In the last step, the interviewee(s) reviewed the protocol to ensure data validity.

### 3.2 Data Analysis

We carried out closed coding for the dimensions of outsourcing strategies (see the section, Table 1) as well as open coding to further explain the outsourcing strategy shift and to identify current challenges in application services outsourcing for the case companies. The coding was carried out in an iterative process [Miles/Huberman 1994] by two senior researchers. The applied coding scheme involved the two major areas of interest: the applied and intended outsourcing strategy and the challenges of application services outsourcing in the banking industry. In the closed coding, we determined the design of the outsourcing strategy dimensions (see the section „Related Work“). After the initial coding, we searched for cross-case patterns in order to generalize and to synthesize the major challenges affecting all five cases [Eisenhardt 1989]. We then coded the data again with an adjusted coding scheme that included the classes of challenges identified in the first coding iteration. Thus, we identified 60 challenges, out of which we generated six categories. During the coding, we triangulated the interview data with the survey data, fact sheets, notes, and internal documents provided by the interviewees during and after the interview.

## 4 Research Results

In the following sections, we present the results in two ways: First, we describe the status quo as well as the future intention toward the application

Table 4:  
Current and  
intended  
outsourcing  
strategies of case  
companies

Case	Application services outsourcing strategy							
	Current/ Intended	Decision scope (% of budget)	Contract type (predominant)	Contract duration (predominant)	Application function outsourced	Multiple / single vendor	Use of offshore	Outsourcing goal (predominant)
Alpha	current	1-20%	Buy-in	Short-term	Dev.*	Multiple	No	Costs
	intended	20-40%	Fee-for-service	Medium-term	Dev. & Main.	Multiple	No	
Beta	current	21-40%	Buy-in	Medium-term	Dev.*	Multiple	Yes	Skills and Trans- formation
	intended	41-60%	Fee-for-service	Medium-term	Dev. & Main.	Multiple	Yes	
Gamma	current	21-40%	Fee-for-service	Medium-term	Dev. & Main.	Multiple	No	Costs, flexibility
	intended	41-60%	Fee-for-service	Medium-term	Dev. & Main.	Multiple	No	
Delta	current	1-20%	Buy-in	Short-term	Dev.*	Multiple	No	Skills
	intended	1-20%	Buy-in	Short-term	Dev.*	Multiple	No	
Epsilon	current	21-40%	Buy-in	Medium-term	Dev.*	Multiple	Yes	Costs
	intended	41-60%	Fee-for-service	Medium-term	Dev. & Main.	Multiple	Yes	
* Maintenance only outsourced for a very small amount of highly standardized commodity applications (e.g., applications for travel expenses) Dev.: Development, Main.: Maintenance								

services outsourcing strategy of each case company. Second, we present the identified challenges arising from the current and intended outsourcing strategy. We then reflect the results with the organizational context to better understand the particular challenge.

#### 4.1 Status Quo of the Application Services Outsourcing Strategy in the Case Companies

To better understand the application outsourcing behavior of the observed banks, we analyzed the applied outsourcing strategy. We also investigated the intended outsourcing strategy in order to identify strategy shifts. Table 4 shows an overview of the applied and intended outsourcing strategy attributes.

Looking at the degree of integration measured by the percentage of the IT budget dedicated to application services, more than half is performed in house. Two of the interviewed banks even apply a minimal outsourcing strategy (less than 20%). This shows that the internal added value for the observed banks is relatively high. Interestingly, the future intention reveals that all companies except one (Delta) plan to increase their degree of integration. „We intend to increase our outsourcing degree to

enable a breathing operations model” (Alpha). Two companies even plan to outsource more than half their application services in the future, which implies a major shift in their outsourcing strategy as well as the structure of the IT organization. „We aim to fundamentally reduce pure technology know-how in our organization. This implies that, for example, we will employ the architect in house but outsource all development tasks” (Epsilon). The allocation of control mainly appears to be realized by buy-in contract types. Only Gamma predominantly applies fee-for-service contracts. In the future, four of the five banks intend to shift their allocation of control to using fee-for-service contracts. „We target a shift of most of our buy-in arrangements to service-based contracts” (Alpha). The contract duration is short- and medium-term, which reflects the ongoing trend of shorter periods of outsourcing arrangements in order to improve flexibility. The interviews reveal that most outsourcing occurs in development projects. Four of the five observed companies predominantly focus on outsourcing application development. „We predominantly outsource development projects. The proportion of the outsourcing of application maintenance is negligible” (Epsilon). In the future, nevertheless, three banks will also try to outsource parts of their



application maintenance. All companies apply a multiple supplier strategy. Only two of the interviewed banks use offshore capacities in their outsourcing arrangement. The use of offshoring is limited due to regulations, which will be discussed in more detail in the section 4.2. However, Delta does not use offshore models due to the bank's corporate strategy. „Our bank has a local sourcing strategy as part of our trade mark. Our customers trust us that all services are produced in the country“ (Delta).

Three banks mainly reduce costs by using outsourcing. This also explains the shift in the banks' outsourcing strategy. Prior research proved that the selective outsourcing approach is more likely to succeed in achieving efficiency targets [Lacity et al. 1996]. Furthermore, as already shown by Lee et al. [2004], the selective outsourcing approach performs better with the predominant use of fee-for-service contracts. Thus, the three companies will increase their degree of integration and convert most of their outsourcing arrangements into fee-for-service contracts. Bank Delta nevertheless is satisfied with the current outsourcing strategy as the outsourcing mainly targets access to qualified skills. This is also consistent with Lee et al.'s [2004] findings of matching strategy configuration with the outsourcing outcome. Bank Beta targets access to skills as well as the support by vendors to transform particular parts of the application portfolio. A shift in the outsourcing strategy always involves significant costs for altering the strategy [Jayatilaka/Hirschheim 2009]. In the following, we present the challenges that currently occur at the banks due to the change in their outsourcing strategy and specifics caused by the banking industry.

## 4.2 Challenges of Application Services Outsourcing in the Banking Industry

Overall, we identified 60 single challenges mentioned by one or several interview partners, which we consolidated into six categories. The six categories of challenges were covered by all five cases. In the following section, each category is discussed,

and a detailed extract of the challenges is provided. Even though not all challenges seem to be specific to the banking industry at first glance, we detected industry-specific causes or forms of the outsourcing challenges. In some cases, the challenges also might be more present or have more importance than in other industries.

### 4.2.1 Lack of experience and/or required skills and processes for the intended outsourcing strategy

Four out of the five observed banks intend to alter their outsourcing strategy. Even though Delta does not plan to change their outsourcing strategy in the near future, the interview partner described challenges that could arise with a shift in strategy. In particular, the increase in the decision scope, the contract type, and the outsourcing of application functions not previously outsourced will evoke challenges due to the lack of experience and/or required skills and processes for the intended outsourcing strategy. „The shift toward fee-for-service contract requires new skills and a change in our corporate culture“ (Gamma). Since only development projects are outsourced, the organizations need to gather experience before outsourcing critical parts of application maintenance. „Outsourcing application maintenance is new territory for our bank. For a start, we plan to outsource the maintenance for a cluster of small non-critical applications“ (Alpha). Implementing fee-for-service contracts requires different skills and processes for facilitating the outsourcing arrangement. „In order to enable the use of fee-for-service contracts, the relationship with vendors needs to become closer and more specified during the processes“ (Alpha). This includes organizational adjustments. „In order to outsource development and maintenance separately, we divided these functions into separate teams“ (Alpha). Furthermore, fee-for-service contracts imply a decrease in suppliers in order to reduce the complexity of the vendor management. „Today, we have ten strategic partners we prefer contract with. In the future, we want to reduce the number to three strategic partners“ (Gamma). Delta stated

that they have currently avoided shifting their outsourcing strategy because such a change would imply significant costs due to the necessary initiatives in skills and process maturity. Furthermore, some strategic decisions are restricted due to considerations regarding economies of scale. „IT offshoring pays off only for large projects” (Gamma).

#### **4.2.2 Performance measurement of the outsourcing arrangement**

The interviews revealed that in application maintenance no satisfying key performance indicators (KPIs) for estimating effort and monitoring contracts are currently available. „The performance measurement for application maintenance is not mature enough. Together with other banks, we are currently working on concepts to develop better KPIs to measure the productivity of application maintenance” (Alpha). In light of outsourcing to multiple vendors, standardized KPIs are needed to make objective comparisons and to improve contract monitoring. „There is a need for an industry standard to measure the performance of application management. This improves the comparability and validity of the contract scope” (Gamma). Gamma also stated that calculating the efficiency loss and hidden costs in offshoring is still challenging.

#### **4.2.3 Availability of specific know-how and software on the market**

Even though the interview partners claim to increase the degree of standard software, they also emphasize that for some parts no standard software is available or does not fulfill the organization’s specific needs. „If we are not able to leverage economies of scale with the standard system, an implementation is not efficient” (Beta). As a result, in many cases, implementing standard software and customizing it would increase costs than an individual solution. Furthermore, a major part of the core applications requires particular knowledge of the business processes. „In some cases, external staff with the required know-how is more expensive than the internal employment of staff with the knowledge” (Epsilon). To outsource

legacy systems and additional applications to be replaced, outsourcing is a reasonable instrument for freeing up resources. „We favor the outsourcing of applications we like to retire, but sometimes the skills for this application are not available or too expensive” (Alpha). The interviews show that the use of software as a service offers will be increased, but this is currently challenged by the low usefulness in supporting current business processes. The IT manager at Epsilon furthermore stated: „Today’s required skills are changing faster and faster. It is important that the vendor continuously develops the skills.”

#### **4.2.4 Dependence on the provider and loss of knowledge**

The fear of becoming dependent on the vendor and losing essential knowledge is a common challenge of IT outsourcing [Benamati/Rajkumar 2008]. A multi-vendor strategy is known as an appropriate instrument for avoiding dependencies [Currie 1998]. „We reduce the risk of dependency by applying a multiple vendor strategy” (Gamma). The loss of knowledge can be prevented by at least minimal internal coverage of the required skills. „Even though we plan to outsource pure technology knowledge, a minimal base of technical knowledge will be covered” (Epsilon).

#### **4.2.5 Complex and individual application portfolio structure and lack in application portfolio management capabilities**

A high degree of individual developed applications and a highly integrated application portfolio structure intensify interactions with vendors [Barthélemy/Geyer 2004]. All observed banks possess a high degree of individualization as well as extensive interaction between the applications. „Our front-office system has more than 150 interfaces” (Alpha). Recent and ongoing mergers and acquisitions have increased the complexity of the portfolio structure. „Due to merger and acquisitions, we are in the middle of a consolidation process. Today we are confronted with a not fully transparent ‘zoo’ of applications” (Beta). These portfolio consolidations

and even modernization not only address the decrease in applications but also aim at modularizing and disintegrating the application landscape. „We initiated the simplification of existing applications by separating functionalities from a huge complex system to simple and small applications. Furthermore, we target the reduction of interfaces between applications“ (Epsilon). To select applications for outsourcing, mature application management capabilities are required [McKeen/Smith 2010]. „A clear transparency over application characteristics and interdependences between applications as well as our long-term portfolio strategy enables our future selective outsourcing approach based on the application life-cycle stages“ (Gamma).

#### 4.2.6 Increasing regulation and industry-specific risk aversion

„The financial crises changed the business model of the bank. We confronted a situation where regulations dictate daily business. This also causes frequent changes in our IT systems“ (Epsilon). The extensive regulations in the banking industry restrict application services outsourcing. Due to the regulations, maintaining certain applications is not feasible. „The feasibility of outsourcing the maintenance of an application depends on the personal data involved. This makes the outsourcing of an application in the investment field more feasible than several applications for private banking“ (Epsilon). The question of the sourcing location has a specific importance in outsourcing in the banking industry as some regulations restrict the location of data to the bank's home country. „Access to operational data of the core banking system has to be performed within the home country. Thus, several functions are not applicable for offshoring“ (Epsilon). Outsourcing in the banking industry is also constrained by a risk-averse organizational culture [Baldwin et al. 2001]. „Compared to other industries, the need for security is very high. This limits the options and creativity in outsourcing arrangements“ (Epsilon). However, this over-concern might be justified by the sensibility of a client's personal financial information [Gewald/Dibbern 2009].

## 5 Conclusion, Limitations and Future Research

The banking industry is experiencing events that have fundamentally changed the industry [Özbay et al. 2011]. As organizations' outsourcing strategies change as external factors change [Jayatilaka/Hirschheim 2009], we suggest that outsourcing in the banking industry is on the move. The results of our research reveal that the observed banks currently apply outsourcing strategies that outsource a maximum of 40% of the IT budget for application services with the use of buy-in contracts. Furthermore, the banks focus on outsourcing application development. In the future, the banks intend to increase their outsourcing up to 60% of the dedicated IT budget, to shift toward fee-for-service contracts, and to include application maintenance in the outsourcing scope. These shifts create several challenges. The fear of becoming dependent on the vendor and losing essential knowledge is a common, industry-nonspecific challenge. The unavailability of required skills and software, nevertheless, is caused by banking process and business model specifics. Although the banking industry is a pioneer in outsourcing application development, the observed banks are mainly inexperienced in outsourcing application maintenance. The interview partners stated that the complex and individual portfolio structures common in banks and the lack of application management portfolio capabilities complicate application outsourcing endeavors. Increasing regulations hinder the outsourcing of particular applications and the use of certain outsourcing models such as offshoring. The risk-averse culture of banks also challenges changing outsourcing strategies.

Due to the nature of exploratory cases studies, our research results are limited by the case size of five banks and are applicable only to the geographic area of Germany and Switzerland. A large field survey based on our findings could further deepen our understanding of outsourcing behavior in the banking industry. Nevertheless, our results reveal a shift in the outsourcing strategy of the ob-

served banks. The challenges could provide a starting point for in-depth research, for example, on the mechanism for dealing with the increasing regulations or industry-specific risk aversion to decrease the vertical integration of banks [Lamberti/Poehler 2004]. Furthermore, longitudinal studies could provide more understanding of outsourcing strategy shifts [Jayatilaka/Hirschheim 2009].

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Prof. Dr. Walter Brenner holds a chair for information management and the position of the managing director of the Institute for Information Management at the University of St.Gallen. His research activities focus on the industrialization of information management, the management of IT service providers, customer relationship management, applications of new technologies and design thinking. He also works as an independent consultant on information management issues and the readiness of companies for the digitized, networked world. In these positions, Prof. Dr. Brenner can look back on more than 20 years of experience also in the banking industry.

## Curriculum Vitae

### Personal Data

Name	Saskia Zelt
Date of birth	October 24, 1982
Nationality	German

### Academic Education

2010 – 2015	<b>Doctoral studies in Information Systems, University of St.Gallen</b> , Chair Prof. Dr. Walter Brenner, St. Gallen
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2003 – 2008	<b>Graduate studies in Business Administration</b> (degree: Diplom Betriebswirt), <b>University of Mannheim</b> , Mannheim
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### Employment

Since 2015	<b>Co-founder and CEO, baufindo GmbH</b> , Frankenthal
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Since 2015	<b>CEO, My Baufi AG</b> , Frankenthal
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2010 – 2013	<b>Research associate, Competence Center Industrialized Information Management (CC IIM)</b> , Institute for Information Management, University of St.Gallen, Chair Prof. Dr. Walter Brenner, St. Gallen
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2008 – 2011	<b>Strategy consultant, T-Systems Enterprise Service GmbH</b> , ICT Operations, Operations Development/ Strategy Development & Implementation, Darmstadt
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2006 – 2008	<b>Management consultant, INTEGRA e.V.</b> , student management consultancy of the University of Mannheim (member of the BDSU), Mannheim
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2007 – 2008	<b>Working student</b> (master thesis), <b>Daimler AG</b> , Daimler Trucks, Quality Management, Mercedes-Benz Werk Mannheim, Mannheim
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2005 – 2007	<b>Various internships</b> in Germany and abroad (e.g., intern at <b>Burex Mfg Ltd.</b> , Dunleer, Ireland)
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2006 – 2006	<b>Junior research assistant, University of Mannheim</b> , Chair of Prof. Dr. Stefan Minner, Mannheim
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