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MANAGING FLEXIBILITY IN OUTSOURCING

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Managing Flexibility in Outsourcing

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ABSTRACT

In recent years, outsourcing has gained considerable management attention. However, the benefits of outsourcing are not without concessions. One major risk is losing the flexibility to change the extent, nature, or scope of the outsourced business services. This paper seeks to clarify the multi-dimensional notion of flexibility in outsourcing, examining its four dimensions as robustness, modifiability, new capability and ease of exit. Adapting from Evans (1991), this paper proposed a portfolio framework of pre-emptive, protective, exploitive, and corrective maneuvers to manage flexibility in outsourcing. These strategic maneuvers mapped well to traditional notions in coordination theory, both in advanced structuring through loose coupling and dependency diversification, and in dynamic adjustment through proactive sensing and reactive adapting. A set of propositions were put forward to hypothesize the relationships between the various strategic maneuvers and the different dimensions of flexibility, and subsequent impacts on outsourcing success. In the second part of this thesis, the paper developed empirical insights on proposed framework by operationalizing the conceptual constructs and carrying these propositions into empirical validation. A survey of 171 outsourcing projects in Singapore was conducted. The findings bear evidence of the importance of flexibility in outsourcing, given its strong association with outsourcing success. The results also suggest a need for organizations to be clear about their desired flexibility profiles as different flexibility maneuvers contribute differently to different dimensions of outsourcing flexibility. The findings also indicate the relative effectiveness between traditional contractual provision and the various flexibility maneuvers for robustness, modifiability, new capability, and ease of exit. It is hoped that the deeper understanding will not only contribute to the effectiveness of outsourcing management but also spawn a new research agenda on outsourcing flexibility.

Keywords: *flexibility, outsourcing, coordination theory, outsourcing success*

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MANAGING FLEXIBILITY IN OUTSOURCING

CHAPTER 1. INTRODUCTION

Flexibility is widely recognized as a pivotal pillar of contemporary business strategy. It enables organizations to respond in a timely and cost effectively manner to situation that may capriciously deviate from prior anticipations (Hart, 1937; Evans, 1991). The globalization of markets, rapid technological change, shortening of product life cycles, and increasing aggressiveness of competitors have radically accelerated the rate of change in today's business environments. In addition, Flexibility is especially critical in inter-organizational arenas because production, manufacturing process, markets, and distribution channels are typically across competitive boundaries when they are moved from centralized hierarchy to outright market. Added to this complexity is multiple and conflicting organizational agendas with individual participants in cooperative alliance.

Consequently, flexibility has become an important, some argue, essential requirement for organizations. Flexibility is even more challenging in the outsourcing context, where organizations subcontract part or all of their business functions to an external outsourcing vendor. Data center operations, system development, payroll processing and account receivables are all typical examples of business functions that can be outsourced individually or collectively (McFarlan & Nolan, 1995). Among the most advocated advantages of outsourcing are cost reduction, service quality improvement, and an increased ability to focus on the "core business" (Quinn & Hilmer, 1994). Yet, as many researchers have pointed out, outsourcing may expose

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organizations to the opportunism of vendors and limit organizations' ability to develop valuable competencies. Other outsourcing risks affecting customers' bottom lines are costly contractual amendments, unexpected transition and management costs, fierce and time consuming renegotiation or even disputes over service scope. Added to these complexities are high switching costs associated with outsourcing decisions (Heide and John, 1990). All this can be essentially attributable to lack of flexibility orientation when organizations approach outsourcing arrangements.

Considering the above, this thesis addresses the following primary question that has not yet been answered clearly in the literature: *How should client organizations that outsource IT and Business Process service provision manage flexibility in order to ensure the success of their outsourcing arrangement?* Thus the general objectives of this study are to investigate the phenomenon of flexibility in the context of outsourcing and provide a clear definition which enables empirical operationalisztion and measurement. Furthermore, this paper systematically portrays organizational practices which contribute to the management of flexibility and ultimately to outsourcing success. The following sections outline the progression of outsourcing and help in underscoring the critical role that flexibility plays in outsourcing relationships.

1.1 The Progression of Outsourcing

Outsourcing has gained considerable attention in recent years. Many non-core IT activities, ranging from desktop support, call center, to application development, have been outsourced to external service vendors which offer similar products and

guaranteed service levels at lower cost. Extending beyond IT outsourcing, the new wave from application service provision (ASP) to business process outsourcing (BPO) involves the farming out of non-core yet mission critical business processes (e.g., finance and accounting, human resources, and customer support) to third party service providers, sometimes located at offshore locations (Linder 2004). The provision of such services is largely IT-enabled, with web-based interfaces, extensive application support (e.g., package software like SAP, Oracle, Ariba), and reliable network connection. Many organizations have been jumping onto the bandwagon with the promise of cost reduction, process streamlining, and strategic repositioning. For example, the outsourcing of its finance and accounting function by British Petroleum to Accenture has helped to speed up its post-merger integration in its acquisition of Amoco and Arco. According to a Gartner Group forecast, the current BPO market is estimated to be worth between $100-$200 billions and will continue to grow at 10%-15% per annum.

1.2 Research Motivation

The promise of outsourcing benefits is not without concessions. One major issue is the potential loss of organizational flexibility - an increasingly strategic capability in today's competitive and dynamic business environment (Suarez et al. 1995). As evidenced by Barthelemy (2001), and Lacity and Willcocks (2001), many outsourcing arrangements have to be renegotiated due to their inabilities to accommodate environmental uncertainties, disappointment (e.g., project cost overruns, poor service) or even disasters (e.g., the demise of the pharmaceutical giant, FoxMeyer, attributed to

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failures by its technology consultants) when theories would possibly predict and expectations apparently indicate otherwise (Hui et al. 2006). One study even estimates one in eight outsourcing deals is prematurely terminated as an expensive failure (Kern and Willcocks 2000).

The issue is even more crucial in the context of BPO as such arrangements carry a great deal more complexity, given the mission criticality of the business processes and their tight coupling to other processes in organizations. The escalation of complexity is attributed to the simultaneous outsourcing of technological, workflow, and human resources. In addition, there is constant struggle to balance process customization to meet the specific needs of organizations against the vendors' scale efficiency derived from standardized process delivery. Furthermore, in most cases, offshoring outsourcing services also introduces greater management and coordination complexities due to geographical dispersion and cultural differences. Thus, while the benefits from outsourcing are compelling, the challenges of managing successful outsourcing are equally daunting (Feeny et al. 2003), especially in today's business environment that frequently requires organizations to be agile and flexible in response to changing competitive pressures.

This thesis thus seeks to clarify the notion of flexibility in outsourcing. Adapting from Evans (1991), it strives to develop a conceptual framework to classify existing best practices in managing outsourcing flexibility. The study goes beyond contractual provision to surface a portfolio of strategic maneuvers in managing outsourcing flexibility. In the following sections, the author discusses the dimensions of outsourcing flexibility and the conceptual framework for managing flexibility. The

author also puts forward a set of propositions hypothesizing relationships between the various strategic maneuvers and the different aspects of flexibility, and how the outsourcing flexibility impacts outsourcing success. It is our hope that the greater conceptual clarity will not only contribute to the effectiveness of outsourcing management but also spawn a new research agenda on outsourcing flexibility.

1.3 Organization of the Dissertation

This thesis investigates alternative strategies for managing outsourcing flexibility beyond conventional contracting. Besides comprehensive flexibility provisions in contracts, are there other mechanisms that organizations can deploy to enhance outsourcing flexibility? If so, how do they contribute to different dimensions of flexibility? In the following chapter, the author clarifies the multi-dimensional notion of flexibility in outsourcing. The author then introduces the conceptual framework proposed by Evans (1991), and elaborate on it in light of coordination theory (March and Simon 1958; Gosain et al. 2004) to surface a portfolio of strategic maneuvers to manage outsourcing flexibility in chapter 3 & 4. In chapter 5, the author maps managerial practices from the outsourcing literature onto the conceptual framework, to hypothesize about the relationships between these strategic maneuvers and flexibility and in turn to outsourcing success. In the second part of this thesis the author empirically tests the proposed research framework after presenting research design in chapter 6 and demonstrating adequate construct validity in chapter 7. Test results are discussed against individual hypotheses, with additional validation techniques followed in chapter 8. Finally the author draws the conclusions and implications for

theory and practice in the last two chapters, highlighting theoretical contributions and methodological limitations.

CHAPTER 2. LITERATURE OVERVIEW

This chapter starts with a summary of outsourcing issues that have been studied in prior research, and then focuses on research studies concerned flexibility management in outsourcing literature, categorized into three broad perspectives. The review serves as the foundation for an in-depth understanding of the research question presented earlier. Gaps in the existing research are highlighted, which lead to a brief overview of flexibility notion on various fronts. The outsourcing flexibility is subsequently conceptualized into four dimensions as a result of consolidating the flexibility literature.

2.1 Importance of Flexibility in Outsourcing

The term "outsourcing" has been defined in a number of ways, for instance, by Chaudbury et al. 1995; Cheon et al. 1995; Fitzgerald & Willcocks 1994; and Willoocks & Lacity 1998, etc. Broadly defined, outsourcing is the *contracting with one or more third party vendors for the provision of some or all of an organization's internal functions*.

The trend in outsourcing has featured long-term, mega deals such as Royal Mail's deal with CSC (ten year contract of support services outsourcing totaling US$2 billion). According to Gartner-Dataquest, at year-end 2005, at least 14 IT outsourcing mega-deals longer than five-year period were signed, close to twice the nine mega-deals in 2001, worth $15.1 billion in total. While it makes perfect sense for organizations to seek longer engagement to recoup investment and secure benefits, outsourcing arrangements also run the risk of being rigid or unresponsive to

unexpected circumstances. Though in many cases the move to outsourcing is part of a wider drive to free up resources and allow for increased flexibility, a few studies have revealed loss of flexibility as a result of outsourcing (e.g., Adler 2003; and McKeen & Joglekar 2002). In the following sections the author will review literature on flexibility management in outsourcing, and highlight the deficiencies.

2.2 Overview of Outsourcing Literature

The literature in IT outsourcing revolves around five basic questions that organizations engaged in a decision-making process regarding sourcing options might ask themselves:

- <u>Why do organizations outsource</u>? Organizations outsource for two general reasons. One, they are influenced by determinants, or factors that give rise to a desire for change in some aspect of the IT function (Loh and Venkatraman 1992; Cheon et al. 1995; McFarlan and Nolan 1995). Two, they want to attain certain benefits that are perceived to result from outsourcing (Aubert et al. 1998; Grover et al 1996).

- <u>What functions do they outsource</u>? The basic answer to this question is grounded in Quinn and Hilmer's (1994) suggestion that organizations should keep core competencies in-house, and outsource all other activities. Subsequent research extended or refined this proposition. In general, the literature suggests that generic IT functions may be outsourced, while ramifications of outsourcing idiosyncratic functions should be carefully evaluated. (Lacity et al. 1995; 1996; Earl 1996).

- <u>How do organizations outsource</u>? A few principles have been suggested by various authors to achieve strategic focus in outsourcing: concentrate on core

capabilities, constantly innovate, develop flexibility, and leverage resources (Quinn and Hilmer 1994; McFarlan and Nolan 1995; Saunders et al. 1997; Currie 1998; Sabherwal 1999).

➢ Vendor selection and evaluation. Huber (1993) offered two recommendations regarding vendor selection and evaluation. First, hire outside experts to assist in the process. This includes identifying potential vendors, evaluating them in terms of stability and quality, and preparing a Request for Proposal. Second, utilize a formal process to evaluate vendor responses in comparison to previously determined internal criteria. Variations of these points were also mentioned by Lacity and Hirschheim (1993), as well as Cross (1995), Earl (1996), and Lacity et al. (1995).

➢ Implementation issues. These issues focus on performance standards, retention of in-house IT capabilities, and cost/benefit analysis. Studies in this area emphasize the necessity of resolving these issues prior to signing the contract. This includes not only carefully defining performance standards and benchmarks, but also establishing formal mechanisms and processes for managing the outsourcing arrangement, along with detailed roles and responsibilities of the participants (Cross 1995; McFarlan and Nolan 1995; Lacity and Hirschheim 1993; Huber 1993; Saunders et al. 1997; Willcocks and Kern 1998).

Hidden in the different themes are the issues of flexibility in management. As comprehensive as the outsourcing literature appears to be, flexibility as a strategic concern has been under-researched. Traditionally, works on outsourcing flexibility are limited to the following three approaches, usually in an unrelated manner.

2.2.1 Contractual Provision to Provide Flexibility

All outsourcing engagements are essentially contractually based relationships. A number of researchers have commented on the importance of the contract and recommended specific contract-negotiation strategies (Currie 1998; Lacity and Willcocks 1998). Traditionally, careful contracting is the primary mechanism for managing outsourcing flexibility, as management is often advised to craft short-term, airtight contracts to control for anticipated changes (Lacity et al. 1995; Fitzgerald and Willcocks 1994; Saunder et al. 1997).

Much of the literature that deals with flexibility in outsourcing arrangement emphasizes careful upfront contractual provision to facilitate adaptations to changing circumstances. For example, perspectives from the agency cost theory have suggested the need for proper incentive alignment in the contract to enable flexibility over time, e.g., variable pricing, benchmarked pricing, and risk sharing incentives. Recommendations from transaction cost economics (TCE), on the other hand, have suggested the incorporation of hierarchical elements and bilateral adjustment mechanisms into the outsourcing contracts (e.g. Ang & Beath, 1993; Fitzgerald & Willcocks, 1994; Saunders, Gebelt, & Hu, 1997), e.g., renegotiation/ arbitration clause, premature termination conditions and innovation requirements (Harris et al. 1998; Chen & Bharadwaj, 2006). Recent work by Koh and Ang (2006) even suggest the need to incorporate psychological contract elements, i.e., the organization's and vendor's mutual beliefs and attitudes, into outsourcing contracts.

Harris et al. (1998), in particular, refer to the notion of contractual flexibility, i.e.,

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the extent to which a contract contains bilateral adjustment mechanisms that allow ongoing adaptation based on changing circumstances. Such a contract is typically characterized by variable pricing, short contract duration, modular contract structure[1], inclusion of a renegotiation/arbitration clause, premature termination conditions, and innovation incentives (see Table 1). The contract functions as a mutually agreed tolerance zone by clarifying ways of dealing with issues like transactional variability, modifiability, addition of new capabilities, and the ability to exit (Michell and Fitzgerald 1997; Harris et al. 1998). More comprehensive contractual provisions should serve to enhance outsourcing flexibility.

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[1] Dividing major contract terms into separate components such that changes in one part will not affect the others, and demand less time and effort for ongoing adjustments. Such contracts should comprise a constellation of components (SLA, strategic objective statement, etc.) affixed to a standard set of master terms and conditions.

TABLE 1: Flexible Contractual Provision in Outsourcing

Contractual provision	Clause	Description
Adjustment mechanisms	Pricing	Original contract price may be changed through (de)escalation mechanisms (benchmarking, indexing, open pricing, etc.).
	Renegotiation	Renegotiation clause enables some aspects of the contract to be changed during the life of the contract.
	Contract duration	The parties may opt for a short or long contract. Shorter contracts are more flexible.
	Early termination	A clause permitting premature termination of the contract, usually triggered by prescribed situations.
	Dispute resolution	In case of dispute, parties may resort to arbitration or litigation. Arbitration is more flexible.
	Incentive contracting	Links vendor payment to performance of the organization; is conducive to flexibility.
Modular contract structure	Separated contract terms	Modular contract comprises a constellation of components (SLAs, strategic objective statements, continuous improvement mechanisms) affixed to a standard set of "master terms and conditions."

Adapted from Harris et al. 1998

However, given the static nature of contracts, there are limitations to using contracts as the sole means to achieve flexibility. This is partly due to the problem of incomplete contracting (Richmond et al. 1992), i.e., the inability to anticipate all changing conditions due to bounded rationality. In a constantly evolving environment, the cost of creating contracts with complete contingencies to respond to evolving technology or shifting economic conditions is prohibitively high, if not impossible, Furthermore, the practical execution of these contractual provisions may still be disputed or contested given the opportunistic interpretation or exploitation of such clauses by vendors. In some cases, organizations are even better off leaving some

contractual parameters unspecified (Van Mieghem, 1999).

Consulting reports have typically shown that contract drafting and negotiation constitute a considerable portion of the time and efforts invested in outsourcing. Even then, the effectiveness of contracting provision is questionable as the terms and conditions of a typical outsourcing contract (ranging anywhere from 3 to 15 years) are often not responsive to the dynamic business environment. Many scholars have blamed rigid contracts as one primary reason for the high failure rate in outsourcing (Lacity and Hirschheim 1993; Peisch 1995). A well-crafted contract can only address the foreseeable flexibility required at the point of contracting but not the unanticipated business dynamism that emerges subsequently (see Figure 1).

FIGURE 1: Contribution of Flexibility Maneuvers Beyond Careful Contracting

Environmental Uncertainty

Foreseeable change

Unforeseeable change

Foreseeable change

Unforeseeable change

Foreseeable change

Unforeseeable change

<u>Poorly-crafted contract</u>
with no alternative flexibility
maneuvers

<u>Well-crafted contract</u>
with no alternative flexibility
maneuvers

Well-crafted contract
with <u>alternative flexibility
maneuvers</u>
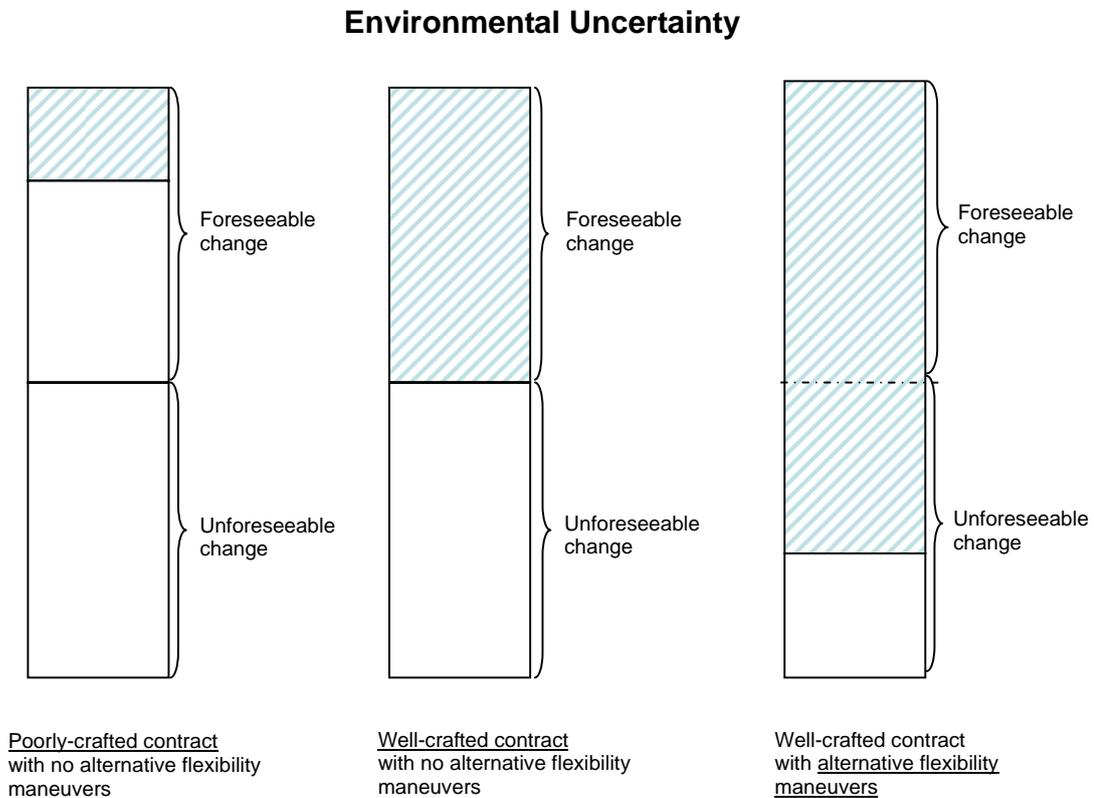
2.2.2 Relational Governance to Provide Flexibility

Contracts are important management tools, but they cannot anticipate every contingency, and are thus insufficient to guide through outsourcing evolution and growth. This is noteworthy because, even though clear and thorough definitions of performance standards, processes, and responsibilities are desirable at the beginning of the outsourcing arrangement, over time events occur in the environment that will necessitate changes is these areas. The relationship element therefore plays vital role in enabling the continued functioning of the outsourcing arrangement when the contract becomes inapplicable or in dispute.

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Since outsourcing involves repeated inter-organizational exchanges that become socially embedded over time, a sound relationship becomes an important safeguard mechanism mitigating external and internal hazards and overcoming adaptive limits of contracts, as suggested by Social Exchange Theorists (Poppo and Zenger 2002). The simultaneous use of both contractual and cooperative mechanisms has proven to be particularly critical to outsourcing arrangement with highly specific investment or in an uncertain environment (Grover et al. 1996; Kern 1997; Lee and Kim 1999). In fact, some research has gone so far to suggest that ongoing partnership is more important than initial contract designs when an inter-organizational exchange (in this case, outsourcing) involves long-term, complex, and uncertain activities (Ghoshal and Moran 1996). As a result, the relational elements represent a necessary complement that overcome a long-term contract's constraints in stiffness and becomes an important vehicle that nourishes flexibility when changes and conflicts arise.

2.2.3 Flexibility as a Dimension of Outsourcing Success

Studies that empirically examine outsourcing success are, for the most part, based on the premise that firms outsource to gain some degree of organizational advantage, typically from a set of economic, technological, or strategic benefits (Grover et al. 1996). Conventional wisdom therefore follows that outsourcing success can be measured in terms of the extent to which an organization attains its desired benefits, including flexibility (Lee and Kim 1999).

Flexibility is often subsumed under the dimension of user satisfaction (Saunders et al. 1997) or service quality (Grover et al. 1996; Lee and Kim 1999) to measure

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outsourcing success, purportedly to gain a complete picture. For example, Grover et al. (1996), in a survey of 193 top IS executives, lumped flexibility under the degree of satisfaction with gained benefits as the dependent variable in a study linking outsourcing success with service quality, partnership, and extent of outsourcing. The research, however promising, underplayed the flexibility phenomenon and left flexibility as only an indicator of success measure. In fact, flexibility should not be considered an ultimate benefit but rather a continuous process through which outsourcing success is achieved. The improper mixture of flexibility with success outcome thus brought about serious conceptual misunderstanding. These two notions are conceptually different and therefore should be treated as separate constructs.

The literature review so far brought to light three noticeable deficiencies related to flexibility management or measurement in the existing body of outsourcing research. All of this research shares a similar characteristic – it represents a piece-meal understanding of the flexibility issue in outsourcing. It is often insufficient to put an outsourcing contract upfront and then buttress the contract enforcement with a good relationship. Other critical factors, such as process characteristics, organizational in-house capabilities, and involvement of top management also come into play. There is an obvious lack of integrated strategy to manage flexibility in outsourcing. In view of these limitations, it is necessary to provide a wider perspective on the pivotal notion of outsourcing flexibility by first revisiting flexibility literature in multiple domains, consolidating and ultimately distilling it into the context of outsourcing.

2.3 Flexibility Overview

Flexibility has recently once more received renewed attention from researchers, management consultants and practitioners, as evidenced amply by the studies on flexibility imperative (Goolsby 2002; Harris, et al. 1998; Hoffman 1996; Lacity et al. 1995; McFarlan and Nolan 1995; McGee 1998). However the flexibility notion is still poorly understood and calls for a thorough review of the flexibility literature.

Intuition would suggest that flexibility, which roughly means mobility, responsiveness, agility, suppleness, or litheness, is important and desirable. Yet an intuitive understanding alone is insufficient for rigorous analysis and design. We may still rightfully ask ourselves if flexibility is used as a magic word or belongs to a new business fad. What does flexibility mean? Is flexibility required by every organization as some new 'one best way'? What makes an organization flexible? In contrast with the importance of such questions, the meaning of flexibility and its relation to the functioning of an organization is at best ambiguous. Even worse, the definition of flexibility remains illusive (Suarez et al. 1995; Adler 1988), as illustrated by the proliferation of flexibility definitions in literature. As a result, we still cannot conclude with a grand overarching conceptualization. For instance, Sanchez (1995: p138) defines a firm's flexibility as "a firm's abilities to respond to various demands from dynamic competitive environments"; Carlsson (1989) defines as "firm's positioning itself in such a way that it can deal with the occurrence of foreseeable events and make good use of the newly disclosed opportunities"; D'Aveni (1994) and Volberda (1996) describe it as "a firm's capacity for responding to unpredictable changes in its competitive environment"; Upton (1994) simply put it as "the ability to change or

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react with little penalty in time, effort, cost or performance". This confusion is caused partially in that flexibility is a concept open to broad interpretation, colored with inevitable contextualization, and involved with inherent trade-off among itself. The capabilities which enable a particular form of flexibility in one situation need not be the same as, transferable to, or appropriate, for the provision of flexibility in other situation. To date, flexibility-related research has been explored in the following three streams of literature. Table 2 summarizes the key literature in the respective domains (See table 2).

TABLE 2: Conceptualizations of Flexibility in Multiple Domains

Flexibility dimensions	Information systems	Manufacturing	Strategic management
Robustness	● System robustness (Rosenhead et al. 1986) ● Infrastructure flexibility (Duncan 1995; Byrd and Turner 2000; Weill et al. 2002) ● Open system (Allen and Boynton 1991; Chau and Tam 1997)	● Equipment flexibility (Parker and Wirth 1999) ● Material flexibility (Jordan and Graves 1995; Carlsson 1989) ● Volume flexibility (Jack and Raturi 2001) ● Delivery flexibility (Sethi and Sethi 1990) ● Program flexibility (Upton 1994)	● Operational flexibility (DeGroote 1994; Tushman and Anderson 1986)
Modifiability	● Technology flexibility (Brown and Hagel 2003; Prager 1996) ● Software reusability (Nidumolu and Knotts 1998)	● Mixed flexibility (Jack and Raturi 2001; Suarez et al. 1995) ● Rerouting flexibility (Upton 1994) ● Changeover flexibility (Koste and Malhotra1999) ● Process flexibility (Graves and Tomlin 2003)	● Tactical flexibility (Carlsson 1989) ● Resource flexibility (Sanchez 1995; Gargiulo and Benassi 2000)
New capability	● Software development flexibility (Nelson and Cooprider 2001)	● New product development flexibility (Gupta and Goyal 1989; Sieger et al. 2000)	● Strategic agility/flexibility (Volberda 1996; Eppink 1978) ● Dynamic capability (Teece et al., 1997)
Ease of exit	● Inter-organizational system flexibility (Venkatraman 1994; Clark et al. 1995; Harrison 1994)	● Market flexibility (Gerwin 1993, Sethi and Sethi 1990) ● Partnering flexibility (Gosain et al. 2004)	● Partnership adaptability (Venkatraman and Henderson 1998; Zaheer and Zaheer 1997) ● Exit flexibility (Ybarra and Wiersema 1999; Harrigan and Newman 1990)

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Early research in *manufacturing flexibility* from operations management pays particular attention to demand uncertainty and associated market imperfections. Economists have examined the impact of business oscillations on production processes (Hart 1937; Kindleberger 1937; Knight 1921). As such, much of the manufacturing literature is directed at the technologies that could be deployed to achieve flexibility in the production process, i.e., flexible manufacturing system (e.g., Upton 1994; Parthasarthy and Sethi 1992), JIT implementation (Jordan and Graves 1995; Yusuf et al. 2003). In relation to the production system, a series of flexibility concepts have been investigated, such as machine flexibility (types of operations that the machine can perform), material flexibility (tolerance to deviations in input specifications), volume flexibility (adaptation to demand fluctuation), mix flexibility (ability to switch easily between different products), process flexibility (ability to make minor design changes), product flexibility (ability to introduce new parts/products), etc. (Gerwin 1993; Jack and Raturi 2001; Milgrom and Roberts 1990). In a comprehensive review, Sethi and Sethi (1990) identified more than 50 different terms covering various aspects of flexibility. They also concluded that the manufacturing literature, which focuses largely on technological equipment and its potential for flexibility in terms of both breadth of input materials and output products, routing of throughput, and batch size, has contributed most to the present concepts of flexibility.

Research in flexibility has also extended into *information systems* and focuses on two major issues: underlying technology and system-development methodology. Technologies based on open systems and industry standards (e.g., relational databases and Object-Oriented technology) are inherently flexible and "future proof" (Prager 1996;

Gabrani et al. 2003; Rosenman and Wang 2001). In particular, IT infrastructure acquisition or adoption, a foundation for rapid response to changing market, is well investigated in terms of compatibility, connectivity, and modularity (Duncan 1995; Byrd and Turner 2000; Chung et al. 2003). The other specific area is the enhancement of system robustness or system-development flexibility. Because conventional software design methods are usually weak at coping with possible changes to applications, the "adaptive maintenance" was introduced by Eardley (1997) to overcome this drawback. Moreover, software engineering approaches advocate the use of modular structure to permit changes and allow new functionality to be added (Allen and Boynton 1991; Rosenhead et al. 1986). In a similar vein, Nelson and Cooprider (2001) explored and defined software-system flexibility as comprising structural flexibility and process flexibility, highlighting the importance of module reuse or reconfiguration.

Lastly, on the *strategic management* front, researchers have discussed the importance of organizational flexibility in rapidly changing environments, and generally defined it as the degree to which an organization has a variety of managerial capabilities, and the speed at which they can be activated to increase the control capacity of management and improve the controllability of the organization (Volberda 1996; Evans 1991). Similarly, the related notion of veracity or operational flexibility (DeGroote 1994; Tushman and Anderson 1986) both refers to the ability of a firm's business process to accomplish speed, accuracy, and cost economy in the adjustment to the unexpected consequences. Others refer to flexibility as the entrepreneurial action of discovering and exploiting market opportunities (Gargiulo and Benassi 2000), or strategic agility of resource reconfiguration and innovations in product and process to achieve a competitive edge or exploit a first

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mover advantage (Yusuf et al. 1999; Sambamurthy et al. 2003). Yet another camp discussed "partnership agility" or exit flexibility in situations where a firm needs to modify or adapt its existing partnership or enterprise network (Venkatraman and Henderson 1998; Choudhury and Xia 1999; Zaheer and Zaheer 1997; Dyer and Singh 1998). Based on this work, Ybarra and Wiersema (2003) went on and unpacked strategic alliance flexibility into modification flexibility and exit flexibility. In short, management studies tend to treat flexibility as variety or malleability of organizational abilities through broad, heterogeneous skills, competencies of workforce, organic administrative systems, and so on (Sanchez 1995, 1996).

2.4 Conceptualization of Outsourcing Flexibility

The preceding brief overview reveals some views of flexibility. Anchored in different disciplines, these studies address several key concepts which are often used synonymously with flexibility. Nevertheless, central to the flexibility notion is the capability to react or generate variety so that options are available to do things differently or do something else if the need arises. In that sense, although the diversity of research focuses on different aspects (structure, technology, process, product, etc) and are at different levels of analysis (operational, tactical, strategic, organizational, inter-organization, etc), they share a common understanding of the ability to respond to deviations from predefined plans or leverage on emergent changes in the business environment. Drawing on traditional flexibility notions (e.g., Sanchez 1995; Carlsson 1989; Volberda 1998), this study defines flexibility in the context of outsourcing as *an organization's ability to respond to the changing needs and requirements outside the*

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provision of the outsourcing contract.

More recently, Bahrami and Evans (2004) have synthesized the literature and distilled these multiple notions into three key dimensions of flexibility. The first dimension of flexibility is **robustness** - the ability of an organization to allow operational changes exceeding projected capacity on existing service delivery. This notion relates to situations in which a system has built-in capacity to address uncertainty that may exist for varying levels of demand, product mix, and resource availability (Carlsson 1989). Such changes could arise from service volume fluctuation, variations in standard user requests, urgent or special case processing, and exception handling. For instance, flexible manufacturing systems with a wide range of parameters or pre-programmed operations are designed to accommodate daily fluctuations in production (Sethi and Sethi 1990).

Apart from robustness, **modifiability** is another way of being flexible within the current system. Modifiability refers to the ability of an organization to allow alteration of attributes of its existing services in addressing changing business requirements. In contrast to robustness, modification requires incremental but essential changes to the existing system, e.g., new configuration setup, alteration of processing workflow or business rules, new reporting requirements, and reference data updates (Jordan and Graves 1995).

The third dimension of flexibility relates to radical changes that deviate substantially from the existing projection of events. **New capability** refers to the ability of an organization to allow the addition of entirely new services to address radical changes or shifts in business paradigms. Such "competence-destroying" discontinuities (Tushman and Anderson 1986) may stem from new government regulations, technological revamps,

functional breakthroughs, and process innovation. It involves a radical transformation from the existing system to react to novel situations, to redefine a posture in the light of new imperative, or to proactively precipitate a new state of affairs (Sambamurthy et al. 2003; Venkatraman and Henderson 1998), e.g., when a firm is engaged in new product development where existing knowledge is irrelevant.

The author believes that this three-dimensional conceptualization of flexibility also applies in the outsourcing context. As Lacity and Willcocks (2001) pointed out, three commonly-stated triggers that demand flexibility beyond the contractual baseline are:

- exceeding projected volume on existing services

- changing the composition of baseline services, or

- demanding entirely new services

Outsourcing arrangements, for example, will need to build in sufficient capability to tolerate, absorb or endure transactional variation without the need for significant redeployment of resources. Similarly, an outsourced process is susceptible to modification when there are requests for change in service composition to meet the changing needs of organizations, e.g., new configuration setup, alteration of existing process workflow and business rules. Moreover, where an entirely new set of conditions arises, it is also important that an outsourcing arrangement is able to provide new service capability, e.g., massive revamp to the existing outsourced process, introduction of new software from technological or process innovation. For example, midway in its outsourcing deal with EDS, the UK Inland Revenue was pressured by the parliament to implement a self assessment tax scheme. It was the biggest single tax reform of UK tax administration and required a new set of supporting functionalities from EDS (Lacity and

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Willcocks 2001).

The perspectives of robustness, modifiability, and new capability thus help us clarify the different aspects of flexibility in outsourcing. However, these notions relate to an existing relationship with an outsourcing vendor, which in itself could emerge as a flexibility issue. Given the inter-organizational context of outsourcing, this study thus includes a fourth dimension of flexibility, i.e., **ease of exit** - the extent to which an organization can easily replace a current vendor with a comparable one or bring the outsourced services back in-house, possibly due to premature termination, vendor instability, or pricing disagreement or dispute (Venkatraman and Henderson 1998; Ybarra and Wiersema 2003). Gosain et al. (2004) termed this ease of exit "partnering flexibility". It is different from the response to a volume spike, a service feature change, or a new function, as it requires efforts to assess other new vendors and build a new outsourcing relationship / in house capability.

The four flexibility dimensions display different characteristics. Robustness, modifiability, and new capability typically arise within an outsourcing relationship but ease of exit requires the establishment of a new relationship outside the existing outsourcing contract. The extent of predictability also differs. While robustness can often be anticipated and modifiability deals with making system changes on the fringe, new capability requires acquisition of new skills and knowledge which are very different from the existing operating paradigms. Managing flexibility in outsourcing thus requires conscious efforts to achieve a high degree of robustness, modifiability, readiness for new capability, and ease of exit.

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In summary, the author believes a combination of the four dimensions has encapsulated the different aspects of past research and thus provides a holistic view of flexibility in outsourcing. This integrated definition also facilitates empirical operationalization that this research carries out in later sections. Ideally, organizations want to be able to manage the outsourcing arrangement to achieve a high degree of robustness, modifiability, readiness for new capability, and ease of exit. Table 3 summarizes these dimensions of outsourcing flexibility.

TABLE 3: Dimensions of Flexibility in Outsourcing

Flexibility Dimension	Meaning in outsourcing	Description
Robustness	Variability of service capacity	The ability of an outsourcing relationship to allow operational changes exceeding projected capacity on existing service delivery, i.e., service volume fluctuation, variations in standard user requests, urgent or special case processing, and exception handling
Modifiability	Alternation of service attributes	The ability of an outsourcing relationship to allow alternation of attributes of its existing services in addressing changing business requirements, e.g., new configuration setup, alternation of processing workflow or business rules, new reporting requirements, and reference data updates.
New capability	Addition of innovative capability	The ability of an outsourcing relationship to allow the addition of entirely new services to address radical changes or shifts in business paradigms, e.g., new government regulations, technological revamps, functional breakthroughs, and process innovations.
Ease of exit	Switch to another vendor or in-sourcing	The ability of an outsourcing relationship to allow transfer of services to other vendors, or to be brought in-house, e.g., premature termination, vendor instability, or pricing disagreement or dispute.

Informed by these well-defined flexibility dimensions, the study will then go on to investigate alternative strategies in managing outsourcing flexibility, i.e., besides comprehensive flexibility provision in contracts, are there other mechanisms that organizations can deploy to enhance flexibility in outsourcing arrangements? Specifically, is there an intuitively appealing and theoretically grounded framework that can help us understand the nature of these mechanisms?

In the next few sections, this study introduces the flexibility maneuvers framework proposed by Evans (1991) and elaborates it in light of coordination theory (March and Simon 1958; Gosain et al. 2004). The study then maps the existing managerial practices identified from the outsourcing literature to the conceptual framework and makes a series of hypotheses between these strategic maneuvers and the dimensions of flexibility they

relate to. The author also discusses the impacts of such flexibility maneuvers on outsourcing success, before concluding with implications for theory and practice.

CHAPTER 3. RESEARCH FRAMEWORK

Evans (1991), in his field research on high-technology firms, developed a conceptual framework that encapsulates the maneuvers for strategic flexibility. Specifically, he proposed an archetypal framework that is based on the temporal and intentional dimensions of flexibility. Temporal measures range from ex-ante to ex-post options available in responding to environmental change. This dimension suggests that flexibility can be managed in advance for some future transformation or as after-the-fact adjustments once a contract is sealed (Carlsson 1989). On the other hand, the intentional dimension relates to the degree to which organizations take an offensive or defensive stance towards flexibility (i.e., creating and seizing an initiative proactively, or guarding defensively against predatory moves or correcting past mistakes). This approach acknowledges that, while change in the environment is inevitable, organizations are not helpless. Those who take an offensive role, attempt to control changes in the environment in such a way that they can gain competitive advantage. Conversely, defensive organizations strive to react to changes to minimize the impacts. Such attempts to manage flexibility have also been described as active or passive (Eppink 1978; Volberda 1998).

The conjunction of these two distinct yet interwoven dimensions produces four archetypal maneuvers that Evans (1991) categorized as "pre-emptive", "protective", "exploitive", and "corrective" (as shown in Figure 2).

FIGURE 2: Theoretical Foundation behind Flexibility Maneuvers
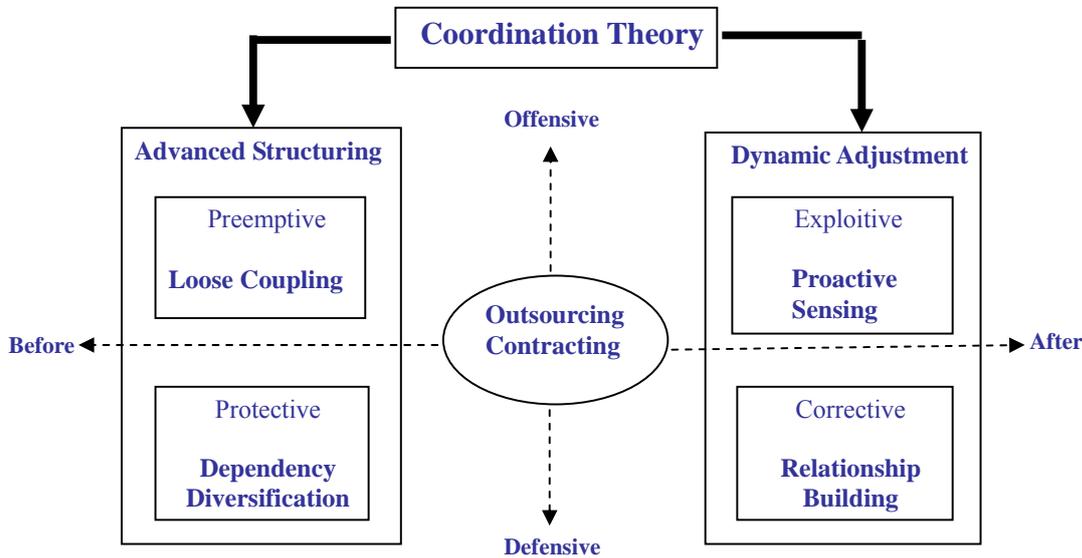
For example, when embarking on a pre-emptive maneuver, organizations can equip themselves with the required dexterity, which is developed before the nature of the contingency is known. Such measures are proactively deployed before predictable events to precipitate transformations by consciously creating a range of options before they are needed (Rosenhead et al. 1986). Organizations can also infuse redundancy mechanisms in an ex-ante sense, such as insurance or resource buffers, as protective measures to guard against potentially damaging situations such that a strategy can remain viable in spite of changes in the environment. Equally important, ex-post possession of managerial capability to exploit or capitalize on unexpected opportunities through constant scanning of the business horizon or the possession of a recuperative disposition to recover from infliction and to ameliorate the impacts of an accident or a mistake are also critical to achieve flexibility.

While the framework is probably more empirically-driven as acknowledged by Evans himself (1991, p.76), the insights are not inconsistent with the theoretical arguments in coordination theory (March and Simon 1958; Gosain et al. 2004). Outsourcing can be seen as a complex coordination problem that requires the management of an aggregation of diverse activities, resources, and systems to produce the desired outcomes (Malone and Crowston 1994). In such situations of interdependence, concerted actions come about through coordination. Organizations seek to consciously lay out prescribed activities by planning in advance and meanwhile supplement by spontaneous and unplanned ongoing adjustment to cope with unforeseen scenarios (Beekun and Glick 2001). Coordination may thus be based on *advanced structuring* - coordination by plan, and *dynamic adjustment* - coordination by reaction.

Advanced structuring can be achieved by either reducing process interdependency through loose coupling or mitigating resource dependency through diversification of resource allocations (March and Simon 1958). Loose coupling, for example, reduces the need for coordinating information exchange and flow in a dyadic relationship, while dependency diversification generates alternative options to mitigate overdependence on critical resources. On the other hand, dynamic adjustment is achieved by enhancing reactive capability in a changing environment through sensing and adapting (Sambamurthy et al. 2003). It can also be seen as a bi-polar strategy. The first emphasizes more on developing the sensing capability. Through feedback, quick learning and constant environmental scanning (IT-supported or otherwise), organizations will have more time and be more informed to adapt. The second emphasizes more on developing the adapting relationship. Upfront sensing may be limited, but the greater focus is to build

a strong relational partnership to enhance the ability to adapt quickly or to ease recovery from external shocks if necessary.

The advanced structuring and dynamic adjustment notions of coordination theory are consistent with the temporal dimension in Evans' flexibility maneuver framework with respect to ex-ante and ex-post. In addition, the author would argue that the various approaches under coordination theory can also be categorized by the intentional orientation, i.e., while loose coupling and proactive sensing are proactive and forward looking, dependency diversification and relationship building are generally passive or reactive to protect or to correct if necessary, thus mapping back to the offensive-defensive differentiation in Evans' framework (Alexander 1995). To this end, a combination of coordination theory and Evans' framework forms the basis of our research model, with coordination concepts (loose coupling, dependency diversification, proactive sensing, relationship building) forming the key themes for pre-emptive, protective, exploitive, and corrective maneuvers respectively (see Figure 2).

CHAPTER 4. FLEXIBILITY MANEUVERS

Building on the conceptual model presented in Chapter 3, this section closely examines how an outsourcing client organization can deploy different strategic maneuvers identified from the outsourcing literature to enhance flexibility in an outsourcing arrangement. Besides anchoring on the preceding research model that combines coordination theory and Evans' framework, the following hypothesizing process also seeks to draw on relevant theoretical perspectives to solidify the theoretical underpinnings and strengthen the argument. The integration of pertinent theories thus helps to better understand how those strategic maneuvers impact outsourcing flexibility and fit into the four clusters delineated by timing and intentional dimensions.

4.1 Loose Coupling as Pre-emptive Maneuvers

Loose coupling is a dialectical concept in organization theory that emphasizes the simultaneous existence of rationality and indeterminacy in a system (Orton and Weick 1990). Loose coupling between systems implies the existence of elements that are linked (coupled) to preserve some degree of determinacy. At the same time, these elements are subject to spontaneous change, leading to some degree of independence (looseness). Loose coupling reduces interdependencies in an outsourcing engagement, allowing organizational components to more easily deal with change. It also makes it easier for them to be disentangled and recombined into new configurations. The primary basis for realization of flexibility outcomes is the planned structuring of information and process linkages yielding loose coupling among interacting components (Gosain et al. 2004;

Beekun & Glick 2001). A review of the outsourcing literature reveals three strategies that manifest such characteristics. These strategies are also theoretically rooted in transaction cost economics and agency cost theory respectively.

4.1.1 Minimizing Customization

The need for customization arises when there are non-trivial incompatibilities between an outsourcing vendor's offerings and a client organization's idiosyncrasies (specific assets). Some organizations have to customize their vendors' generic process templates to fulfill organizational specificity and to differentiate themselves (Quinn and Hilmer 1994; Zaheer and Venkatraman 1995), resulting in the need for complex information exchange with vendors. Minimizing customization is thus important in structuring relationships between companies, as it reduces the extent to which market exchange is personalized and the scope for opportunistic behavior (Williamson 1985). Adherence to a standardized vendor platform provides a common technical interface to couple with the vendor.

The benefits of minimal customization are also supported by transaction cost economics (TCE). The theory, introduced by Coase (1937) and later developed by Williamson (1985), considers the relative advantages of handling transactions through internal (hierarchy) or external (market) organizational forms. TCE maintains that activities that are highly asset-specific, encounter high uncertainty, or occur with high frequency are more appropriate for internal organization. Yet many organizations are pushing the boundary of outsourcing by raising the level of complexity in outsourcing, e.g., moving from IT outsourcing to IT-enabled business process outsourcing, many of which are high-frequency and mission-critical applications. From the TCE perspective,

one way of achieving outsourcing flexibility is to incorporate elements common to hierarchical governance in contracting (Ang and Beath 1993, Koh and Ang 2006). However, as the study has highlighted earlier in the difficulty of contracting, such contractual provisions are often crude and incomplete in dealing with the dynamic business environment, and they demand substantial negotiation efforts.

Relative to the other dimensions (i.e., uncertainty in the environment and transactional frequency, which are bundled in an organization's decision to outsource), the more manageable aspect of TCE for flexibility is asset specificity, i.e., degree to which the transaction will produce an asset that is dedicated to a special purpose with poor alternative uses (Cheon et al. 1995). While there is still an aspect of asset specificity that is inherent in the nature of the task itself, this study is not referring to such a notion. Rather, the author is talking about the portion of asset specificity that is in some way "controllable" by the client in minimizing customization. Client organizations will consciously "live" with the generic or standard offering of vendors where possible.

In line with TCE, loose coupling thus allows for effective management of interdependencies, making the infrastructure more flexible and capable of supporting change. Conversely, heavy customization hinders a firm's ability to leverage the production cost advantage or common resources residing with the vendor (Levina and Ross 2003; Ybarra and Wiersema 1999). The customization issue is particularly pertinent considering the general reluctance of vendors to accede to individual organizational change requests. Lacity and Willcocks (2001), for example, highlighted the outsourcing deal between British Aerospace (BAe) and Computer Science Corporation (CSC), where CSC had been contractually prevented from standardizing the datacenters and distributed

computing platforms to cater to the idiosyncratic service requirements of each division of BAe. The customized solution, however, hampered BAe's and CSC's ability to respond quickly to changes, as each new service request was subject to excessive charges and slow delivery.

4.1.2 Enhancing Process Maturity

Process maturity refers to the extent to which embedded knowledge in managing, operating, and controlling a process has been captured or made explicit (Harter et al. 2000). Reflecting the progressive notions of the capability maturity model in software development (Paulk et al. 1993), McCormack and Johnson (2001) proposed a process maturity model representing a continuum of increasing maturity, from being "anecdotal," "planned and tracked," "defined and measured," "standardized and automated," to "continuously improved." This model helps assess how well management consciously surfaces, rationalizes, and routinizes embedded knowledge in processes before outsourcing them.

Agency cost theory (Jensen & Meckling 1976) offers a complementary perspective to illustrate the cost benefits of process structuredness. According to agency theory, outsourcing involves a client (principal) delegating the performance of tasks/services to an external vendor (agent), thereby introducing agency costs, i.e., bonding cost (incentive misalignment), monitoring cost (information asymmetry), and residual loss (risk aversion). Bonding costs to align incentives are often managed via flexible pricing in the contracts (e.g., through variable pricing, benchmark or performance-based pricing, or profit sharing schemes). Again, as noted earlier, such contractual mechanisms are hard to

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design, and the alignment of interest often loosens over time. The author sees other aspects of agency theory that may potentially contribute to achieving outsourcing flexibility.

Ensuring clear scoping of the outsourced process with programmable tasks and measurable outcomes thus can reduce information asymmetry related to the cost of monitoring the outsourced vendors. The better the embedded knowledge of the processes is captured through either documentation or automated routines, the easier it is to transfer such knowledge to other parties, and the faster a process can be modified or reconfigured to respond to external changes. The best candidates for outsourcing are therefore the processes at the top of the maturity spectrum, as they are understood well enough to be standardized, automated, or digitized to easily "plug and play" with other processes or connect to external partners (Tas and Sunder 2004).

4.1.3 Leveraging Vendor's Interoperability

An organization's interoperability represents the capability of its information infrastructure to match and to adjust to multiple operating needs (Chung et al. 2003). In an outsourcing deal, the extent of interoperability is primarily achieved via the vendor's IT infrastructure through modularity, connectivity, and compatibility (Byrd and Turner 2000; Gosain et al. 2004). High interoperability is often enabled by advanced technologies, industry standards, or use of an open system architecture (e.g., relational databases and object-oriented technology) that minimizes component interdependency, maximizes functional reusability, and enhances changeability (Humphrey 1989; Levina and Ross 2003).

Interoperable architectures create information structures that provide the "glue" that

holds loosely coupled parts of independent components together. For instance, open system architectures such as PC-based plug-and-play platforms, Common Object Request Broker Architecture (CORBA), Web Services (e.g., Microsoft, .NET) and Extensible Markup Language represent an approach to implement a suite of interface standards between software/hardware and communications systems for compatibility purposes (Chau and Tam 1997). Such technologies are inherently "future proof" and enable outsourcing firms to build, modify, or apply IT quickly and appropriately (Prager 1996; Gabrani et al. 2003). As a result, when screening the outsourcing vendors, an organization may want to select a vendor with an IT platform that is based on common standards, modular and scalable process design, and structured data connectivity for high interoperability. Carefully selecting vendors with highly inter-operable IT platforms would also reduce subsequent switching costs, given the pool of alternative vendors available for client organizations to reestablish service delivery linkages.

4.2 Dependency Diversification as Protective Maneuvers

While the above maneuvers are pre-emptive in facilitating future coordination in outsourcing, more can be planned ex-ante as defensive maneuvers to guard against potentially damaging consequences from unexpected variations. One strategy is to avoid becoming subservient to dependency on other organizations (Alexander 1995; Henry 1974) since dependency introduces constraints or contingencies. Organizations may seek to minimize the dependencies by maintaining alternative sources (Thompson 1967). Supported by resource dependency theory (RDT) (Pfeffer & Salancik 1978), this strategy, structured in advance of unpredictable events, is a form of contingency planning that

seeks to limit the damage caused by unforeseen events by affording a choice of options that may be called upon (Eardley et al. 1997). By the same token, Eppink (1978) invokes the concept of "organizational slack" to serve as buffer between an organization and environmental discontinuities. The argument is also in line with the notion of residual loss (risk aversion) proposed by agency cost theory (Jensen and Meckling 1976). To this end, outsourcing client organizations may diversify their dependency on a vendor by developing both external and internal alternatives, i.e., practicing multiple sourcing and retaining in-house competency.

4.2.1 Practising Multiple Sourcing

Lacity, Willcocks and Feeny (1995) and Huang, Miranda and Lee (2004) define the notion of multiple sourcing as several suppliers being contracted under one outsourcing contract. Given the increasing criticality of outsourced IT and business processes to most businesses, the imbalanced power arising from over-dependence on the vendor is a significant concern to the client organization (Kern and Willcocks 2000). When the organization is overly reliant on an outsourcing vendor, it is likely to be locked into the relationship. Outsourcing to a single vendor may thus create a condition of overdependence, limiting an organization's choices in adverse situations (Currie and Willcocks 1998; Saunders et al. 1997).

Reflecting the same spirit, resource dependency theory (RDT) argues that all organizations are dependent, to varying degrees, on some elements in their external environments (Pfeffer and Salancik 1978). This external dependence arises from the external control of some resources that an organization needs, and in the case of

outsourcing, they could be specific business services and the related resources in producing these services. The theory stresses the necessity of adapting to environmental uncertainty and actively managing resource flows because external organizations that provide scarce and critical resources acquire power in an exchange relationship. Vendors would have little motivation to accommodate change requests from client organizations if such organizations were locked into the relationship. The primary concern of RDT in managing outsourcing flexibility is to mitigate the possibility of over-dependence on vendors, arising from the small number of alternative suppliers and the high cost of switching suppliers. Following this logic, one flexibility maneuver is to engage multiple outsourcing vendors to avoid over-dependence on any single vendor.

Multiple sourcing is also recognized by Cullen, Seddon and Willcocks (2005) as one of the configuration choices for defining and designing outsourcing arrangements. The notion of multiple sourcing in the thesis can take the form of both "best-of-breed" and "panel suppliers," as suggested by Cullen et al. (2005). As contended by resource dependency theory, both options can function to reduce over-dependence on external vendors arising from a small number of alternative suppliers and the high cost of switching suppliers. On the other hand, the "prime contractor" approach, where many supplier interfaces to the organization are under the control of the head contractor, is essentially a dyadic relationship from the control perspective. Thus, the author argues that "prime contractor," despite the potential benefits of best-of-breed subcontracting, is indeed a sole-supplier relationship in nature in the sense that there is only a single point of accountability.

4.2.2 Retaining In-house Competency

Gainey and Klass (2003) noted that outsourcing can create a significant flexibility pitfall unless some internal technical skills are retained. The infusion of such buffers or slack resources may not be cost efficient, but it makes perfect sense if the need for dependency mitigation is crucial. Typically, such maneuvers involve retaining a team of in-house staff performing similar tasks to help an organization keep abreast of process knowledge, stay on top of changing technology, and more importantly, to backup for unpredicted variations and even to bring the operations in-house in case of vendor non-performance (Lacity et al. 1995). By the same token, agency theory also introduced the cost of residual loss, i.e., the remaining cost due to uncertainty in agent performance, as discussed in Section 4.1.2. Despite the bonding and monitoring mechanisms, there is still a risk that an agency may not deliver. Such risk can be averted through the retention of in-house competence (Cross 1995).

While these internal resources may not be cost-efficient for routine operations, they help to address non-performance issues by outsourcing vendors. P&G, for example, continued to retain 10-15 break-and-fix-jobs IT people in its outsourcing deal with HP to balance cost benefits and business agility.

4.3 Proactive Sensing as an Exploitive Maneuver

Both pre-emptive and protective flexibility maneuvers require advanced planning prior to outsourcing. In contrast, an exploitive flexibility maneuver, as an approach to ex-post dynamic adjustment, seeks to help organizations learn to adjust quickly to diverse information sources.

Haeckel (1999) and Alexander (1995) postulate that organizations may actively seek to detect meaningful signals by the sense-and-adapt approach in dealing with change. The concept is consistent with what Sambamurthy, Bharadway and Grover (2003) and Miller (1983) suggested as "alertness to opportunity" or "proactive learning." Following this logic, proactive sensing in this thesis thus refers to proactive efforts by client organizations to discover and exploit market opportunities for outsourcing innovation.

The author also extends the concept of entrepreneurial actions into the context of outsourcing. Entrepreneurial action, as a theoretical perspective, springs from earlier work by economist Joseph Schumpeter (1883-1950) who argued that the main agents of economic growth are the entrepreneurs who introduce new products, new methods of production, and other innovations that stimulate economic activities (Schumpeter 1936). He described entrepreneurship as a process of "creative destruction" in which the entrepreneur continually displaces or destroys existing products/methods with new ones. As a behavioral phenomenon, the conceptualization of entrepreneurship as an organizational capability has been observed in many studies, e.g., 3M with its long history of entrepreneurial initiatives (Covin and Slevin 1988).

The premise is that client organizations might possess imperfect knowledge and information about the real market opportunities available to them (Kirzner 1973). The entrepreneurial action perspective thus suggests that organizations enhance their ability to proactively sense the dynamics of external environment. Organizations develop such capabilities through their executives' intuition/experience in seeking variation and their ability to connect such foresights to specific outsourcing contexts through selective retention (Campbell 1965). Such maneuvers aim at positioning organizations to anticipate

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or even to instigate change rather than merely react to it. Timely sensing allows organizations to capitalize on such knowledge to proactively adjust to emerging opportunities and risks.

4.4 Reactive Adaptation as a Corrective Maneuver

Yet another means of ex-post dynamic adjustment to uncertainty is through enhancing reactive adaptation capacity in dealing with outsourcing vendors. In outsourcing, the ex-post adaptation is manifested through partnership quality (Gupta and Goyal 1989). Grover et al. (1996) highlighted the notion as "relationship-specific assets" or "voluntary transactions" that serve as a supplementary means to modify a market-based relationship. The bilateral relationship evolves over time as these organizations mutually and sequentially demonstrate their trustworthiness (Blau 1964; Emerson 1962). This approach is corrective in nature because it reduces the residual risk of inadequate contractual provision (Jurison 1995) to stem unanticipated losses and repair damage.

Social exchange theorists also argue that inter-organizational exchanges are embedded in social relationships (Blau 1964). The enforcement of obligations, promises, and expectations occurs through social processes, e.g., commitment to joint actions and willingness to share information. An outsourcing arrangement can therefore be considered a social relationship that needs careful management attention (Kirshore, Rao, Nam, Rajagopalan and Chaudhury 2003). Such relationships involve frequent communication between organizational partners, development of shared goals, and cultivation of mutual respect (Gittell 2002). A strong partnership is an important vehicle that nourishes flexibility when the need to respond to unexpected changes arises.

4.5 Summary

In light of coordination theory, Evans' conceptual framework (1991) thus provides a basis for us to consolidate and cluster the different maneuvers identified from the literature in managing flexibility in outsourcing. Extending from the framework, the author also draws on relevant theories to anchor these flexibility maneuvers and place them into an integrated framework of flexibility maneuvers in outsourcing. In particular, the author argues that increased flexibility to change the extent, nature, or scope of business services delivered and to exit an outsourcing relationship in the event of uncertainties can be achieved by minimizing the loss of control in outsourcing. Such loss of control can be restricted by reducing the transaction costs, agency cost, resource dependency, or enhancing entrepreneurial actions and partnership quality in managing outsourcing. The author also argues that the different maneuvers have different characteristics and thus potentially contribute to different aspects of the outsourcing flexibility (robustness, modifiability, new capability and ease of exit). These propositions will be elaborated in the following sections.

CHAPTER 5. DEVELOPMENT OF RESEARCH PROPOSITIONS

5.1 Pre-emptive (Loose Coupling) Maneuvers and Outsourcing Flexibility

<u>Minimizing Customization</u>

Coordination theory suggests that loose coupling allows for effective management of interdependencies, making the process linkages more flexible and capable of supporting change (March and Simon 1958; Gosain et al. 2004). Likewise, TCE also argues that minimizing customization reduces asset specificity and hence avoids hefty transaction cost in making future changes. As such, there is less need to coordinate information exchange and complex task interdependencies, allowing loosely coupled task components to deal with change more easily. In terms of minimizing customization, this argument is analogous to the case of package software adoption (e.g., ERP, CRM), where a "plain vanilla" approach is strongly encouraged to reduce potential problems in future maintenance and upgrade (Holland et al. 1999).

Minimizing customization to enable flexibility in outsourcing is applicable across robustness, modifiability, and ease of exit. Adhering to a vendor's standard offerings enables an organization to leverage the vendor's economies of scale, as well as their scope for scalability, thus enhancing robustness. Minimal customization also simplifies the modification effort in an outsourcing relationship. The vendor just needs to make necessary modification based on its existing technical platform, without having to understand and keep track of an organization's unique requirements and specific past customization. Substantive customization also creates a dependent relationship, allowing the vendor to hold the organization "economic hostage" in future negotiations

(Williamson 1985). As a result, the ability of an organization to exit the outsourcing relationship decreases because premature termination under such conditions becomes economically undesirable due to high switching costs (Young-Ybarra and Wiersema 1999).

However, low customization is not expected to enhance an organization's outsourcing flexibility in acquiring new capability. TCE discusses the transaction costs within an existing operating paradigm. Yet the need for new capability arises from radical or discontinuous changes, which require either entirely different operating assumptions (e.g., change to goods and service tax from income tax) or different service scope (e.g., addition of compensation and benefits over recruitment planning in HR outsourcing). The low asset specificity afforded through minimizing customization thus becomes irrelevant outside the existing operating paradigm. The loose task interdependencies and the ease of information exchange in the current context do not help when new knowledge and actions are demanded.

Hypothesis 1a: Lower customization is positively associated with an organization's outsourcing flexibility in terms of robustness

Hypothesis 1b: Lower customization is positively associated with an organization's outsourcing flexibility in terms of modifiability

Hypothesis 1c: Lower customization is positively associated with an organization's outsourcing flexibility in terms of ease of exit

Enhancing Process Maturity

Similarly, as suggested by agency cost theory (Jensen and Meckling 1976), high process maturity facilitates the management of flexibility in an outsourcing relationship.

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Capturing and managing embedded knowledge in outsourced processes allows an organization to challenge a vendor's reluctance to scale or modify existing operations on the pretext of configuration complexity. A mature process with established practices and parameterized variance tends to be more robust to external disturbances, as the clarity of operational rules makes it easy to adjust while remaining optimal. A well-understood process is also easier to modify because the vendor can learn about process routines with less difficulty. The 1997 outsourcing deal between DuPont–CSC and Andersen Consulting (AC) is a case in point (Lacity and Willcocks 2001). Prior to outsourcing, DuPont's IT department consciously engaged in continuous improvement, significantly enhancing process maturity though re-engineering, value-added refocusing, and eliminating redundancy. The considerable process rationalization, standardization, and consolidation not only enabled more competitive negotiation, but also paid off in speedier handling of service and change requests that DuPont later enjoyed.

In addition, greater maturity implies that such processes can be readily disconnected from an existing outsourcing relationship and reconnected to a new one, thus rendering client organizations less likely to be held hostage by the outsourcing vendors. In India, IT processes with CMM (capability maturity model) level 5 certification are becoming so common in the software outsourcing business that they are already showing signs of commoditization (Davenport 2005).

Similar to the earlier argument about the relationship between minimizing customization and new capability, the author does not expect higher process maturity to enhance an organization's outsourcing flexibility in acquiring new capability. Agency theory also operates within the context of an existing operating paradigm. The more

balanced information symmetry between client and vendor organizations is irrelevant when new knowledge and actions are demanded.

> *Hypothesis 2a: Higher process maturity is positively associated with an organization's outsourcing flexibility in terms of robustness*
>
> *Hypothesis 2b: Higher process maturity is positively associated with an organization's outsourcing flexibility in terms of modifiability*
>
> *Hypothesis 2c: Higher process maturity is positively associated with an organization's outsourcing flexibility in terms of ease of exit*

<u>Leveraging Vendor Interoperability</u>

In the same vein, highly interoperable infrastructures of the outsourcing vendors also give organizations the ability to scale up and down (e.g., connectivity among applications) or to modify existing applications (e.g., reusable modules) quickly and easily. Likewise, the effect of interoperability on ease of exit is also expected to be positive. Structured data connectivity and system compatibility reduce coordination cost in exchanging information between partners, enabling swift response to changes (Chung et al. 2003, Gosain et al. 2004). With a modular architecture, change of outsourcing vendors can be accomplished easily, as interface linkages are re-established. The loose coupling eases partnering across various delivery platforms (Alexander 1995). An interoperable infrastructure based on common technical standards significantly improves an organization's exit flexibility. Open EDI system or XML-based data interchange, for example, facilitates coordination by reducing the specificity in outsourcing partners and broadening the available partnerships (Gosain et al. 2004; Sanchez 1995).

Vendor interoperability improves outsourcing flexibility in terms of robustness,

modifiability, and ease of exit. However, the author would argue that such maneuver does not contribute to responses to external changes that demand new capabilities. Arising from radical, discontinuous, or "competence-destroying" changes, new capabilities are not simply service-line extensions, geographic expansions, or technological improvements in the course of existing business (Govindarajan and Trimbel 2005). Rather, they represents significant departures from existing paradigm, so interchangeability facilitated by current technical structure is not likely to contribute to the creation of new capabilities. In that sense, loose coupling through pre-emptive maneuvers only enables adaptation within the context of current system or thinking. A different form of strategic maneuvers would be necessary for the development of new capabilities.

> *Hypothesis 3a: High vendor interoperability is positively associated with an organization's outsourcing flexibility in terms of robustness*
>
> *Hypothesis 3b: High vendor interoperability is positively associated with an organization's outsourcing flexibility in terms of modifiability*
>
> *Hypothesis 3c: High vendor interoperability is positively associated with an organization's outsourcing flexibility in terms of ease of exit*

5.2 Protective (Dependency Diversification) Maneuvers and Outsourcing Flexibility

Practising Multiple Sourcing

Following the argument of resource dependency theory, increasing the number of alternative suppliers through multiple sourcing should thus contribute to outsourcing flexibility (Lacity, Willcocks and Feeny 1995; Huang, Miranda and Lee 2004). However,

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this flexibility maneuver is not without disadvantages. Gains from enhanced bargaining power may be well offset by the coordination cost and communication problems arising from managing a network of vendors. The primary risk is the difficulty in managing the work and relationships with several suppliers (Lacity et al. 1995). Cross (1995) referred to the difficulty of implementing a "framework agreement" with suppliers in the outsourcing experience of British Petroleum. Another problem is the diffusion of accountability and responsibility, particularly if the sub-processes are highly interdependent (Loh and Venkatraman 1992; Huang et al. 2004).

Given the high costs typically associated with multiple sourcing, the author argues that such maneuvers are typically tapped not for routine fluctuation issues (e.g., transaction fluctuation) but only upon a decision to exit an outsourcing engagement. The flexibility resources are generally passive or inactive for daily operation and thus are more often advocated by organizations to minimize switching cost or as "exit strategies" (Emerson 1962; Currie and Willcocks 1998; Lacity and Willcocks 2001). For example, British Petroleum allocated its upstream and downstream accounting processes to SEMA, Syncordia, and SAIC respectively. Similarly, JP Morgan signed a seven-year $US 2.1 billion contract with four major suppliers. By doing so, these companies safeguarded themselves against being dependent upon a single supplier and had alternatives to exit if necessary. Furthermore, the competitive nature among the vendors also prevents free flow of resources from one vendor to another to meet unexpected needs of an organization. Therefore, the author argues that multiple-sourcing maneuvers are not intended to augment operational robustness, modifiability, or new capability generation, given the substantial coordination efforts required. Rather, their primary focus is to gain

ease of exit when the need arises.

Hypothesis 4: Multiple sourcing is positively associated with an organization's outsourcing flexibility in terms of ease of exit

Retaining In-house Competency

Inspired by agency cost theory, the author argues that the retention of in-house capabilities can also be viewed as a protective flexibility maneuver. Many organizations do not deploy pure or idle slack resources (e.g., costly redundant back-up data center). One cost-efficient mechanism often noted is to segment a process into two logical sections and retain a team of in-house staff to perform one section, while the other section is outsourced. The strategy enables organizations to retain and continuously build up process expertise based on ongoing experience (Lacity and Willcocks 2001). Important systems knowledge and IT competencies do not simply disappear with the switch of vendors or when vendors go bust. For instance, a large British bank outsourced the non-sensitive part of its network maintenance to IBM while keeping the sensitive network service in-house. Apart from security concerns, the main rationale of the process segmentation was to preserve internal competency, prepare for unpredicted variations, and even back-source in case of vendor non-performance.

Since such resources are not idle (they normally have other responsibilities), they remain passive unless it is absolutely necessary. Invoking such in-house resources to enhance robustness and modifiability in daily operation would be both cost-inefficient and functionally ineffective. Likewise, the need for new capability should also be delivered by the outsourcing vendor rather than initiated from within and defying the

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purpose of outsourcing in the first place. Accumulation of expertise and knowledge internally through the retention of in-house competence are not likely to be useful when new capability is sought. Again, the in-house resources are activated as a last resort. Therefore, they are considered to be contingency measures for ease of exit but do not contribute to robustness, modifiability, and new capability generation.

Hypothesis 5: Retaining in-house competence is positively associated with an organization's outsourcing flexibility in terms of ease of exit

5.3 Exploitive (Proactive Sensing) Maneuver and Outsourcing Flexibility

Proactive Sensing

Exploitive maneuvers aim to develop an organization's ability to sense and respond to market uncertainty in a rapidly changing environment. Specifically, proactive sensing in outsourcing management maintains vigilance by constantly scanning the environment (e.g., the landscape of outsourcing vendors' market and potential leverage on novel technology) to anticipate the need for creating or generating new capabilities. To this end, it requires strong managerial initiatives for external knowledge acquisition, the boldness to adopt the best practices available, and a willing open-mindedness to experiment with new ideas (Cohen and Levinthal 1990; Teece et al. 1997). Likewise, Miller (1983) also suggests that the development of proactive sensing capabilities emphasizes the assimilation of continuous scanning, early feedback, and quick learning.

In searching for meaningful signals, managers systematically look for early indications of new ideas, capabilities, or trends through environmental scanning and regular communications with outsourcing vendors. They can nurture continuous

innovation in outsourcing by exerting market pressure or scanning the competitive landscapes of outsourcing vendors (e.g., benchmarking against alternative vendors, economics of off-shoring) to strengthen their negotiating power. Organizations may also attempt to redefine market uncertainty by championing and partnering with outsourcing vendors to develop new service capabilities or technical advancements (Eardley, Avison and Powell 1997). Vigilance allows organizations to leverage business intelligence not only to anticipate market discontinuities and the corresponding need to create new capabilities, but also to keep abreast of dynamics in vendors' markets with heightened awareness of alternative opportunities to ease possible exit. As a result, intimate familiarity with the vendor's market and alternative opportunities is hypothesized to strengthen an organization's ability to innovate and readiness for exit if necessary.

Unlike retaining in-house competence, however, the strategic and external orientations of such maneuvers focus on information feedback outside routine operation, and hence, they are not expected to affect robustness or modifiability.

> *Hypothesis 6a: Proactive sensing is positively associated with an organization's outsourcing flexibility in terms of new capability*
>
> *Hypothesis 6b: Proactive sensing is positively associated with an organization's outsourcing flexibility in terms of ease of exit*

5.4 Corrective (partnership) Maneuver and Outsourcing Flexibility

Partnership Quality

Since outsourcing normally involves repeated inter-organizational exchanges, sound dyadic relationships embedded socially over time is an important corrective maneuver

that enhances outsourcing flexibility (Poppo and Zenger 2002). In the literature of inter-organizational relationships, there has been a consistent argument that the existence of a strong partnership has a positive impact on an organization's ability to adjust to changing environmental demands or unintended problems (Gargiulo and Benassi 2000; Ybarra and Wiersema 1999). A sound relationship functions as a lubricant, facilitating "on-the-fly" adaptation. With such relationship investments, vendors are more likely to give and take to accommodate requests to cope with transactional fluctuations, to modify standard offerings, and to collaboratively create new capabilities spurred by radical changes (Young-Ybarra and Wiersema 1999).

While partnership contributes to flexibility in the traditional view of social capital, the embedded mutual obligations of a cohesive partnership become a liability that hinders an organization's subsequent ability to pursue new opportunities outside of this relationship (Portes and Sensenbrenner 1993). Partnering organizations are constrained by the set of actions available within a dyadic relationship. In addition, the expectation of continuity that accompanies partnership tends to minimize the parties' motivation or preparation to exit the current outsourcing relationship (Gupta and Goyal 1989; Kern and Blois 2002). Thus, the author argues that strong partnership as a corrective maneuver enhances outsourcing flexibility in terms of robustness, modifiability, and new capability, but it inhibits an organization's ease of exit.

Hypothesis 7a: Strong partnership is positively associated with an organization's outsourcing flexibility in terms of robustness

Hypothesis 7b: Strong partnership is positively associated with an organization's outsourcing flexibility in terms of modifiability

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Hypothesis 7c: Strong partnership is positively associated with an organization's outsourcing flexibility in terms of new capability

Hypothesis 7d: Strong partnership is negatively associated with an organization's outsourcing flexibility in terms of ease of exit

The preceding section identifies a set of strategic maneuvers placed in different temporal/intentional quadrants, suggesting a portfolio of coherent actions that organizations can take to enhance outsourcing flexibility. Table 4 summarizes the series of our research hypotheses.

TABLE 4: Strategic Maneuvers and Dimensions of Outsourcing Flexibility

	Robustness	Modifiability	New capability	Ease of exit
Minimize customization	**H1a (+)** • Standard process allows organization to leverage vendor's economy of scale/scope • Standard process reduces opportunistic vendor behavior to hold organization ransom for process specificity	**H1b (+)** • Standard process reduces the need for knowledge exchange in modification • Standard process reduces opportunistic vendor behavior to hold organization ransom for process specificity	**N/A** ● Standard process is irrelevant to new innovation or out-of-the-box thinking in "competence-destroying" discontinuity	**H1c (+)** ● Standard process reduces switching costs and speeds up transition process ● Standard process reduces opportunistic vendor behavior to hold organization ransom for process specificity
Enhance process maturity	**H2a (+)** • Parameterized process enables easy scalability • Well-defined process facilitates routine adjustment and knowledge transfer	**H2b (+)** • Well-documented and codified routines simplify knowledge exchange between parties • Process rationalization, standardization and consolidation facilitate modification of service delivery	**N/A** • Accumulated routines impose knowledge inertia on process change • Knowledge about matured process is irrelevant to new innovation or out-of-the-box thinking in "competence-destroying" discontinuity	**H2c (+)** • Well defined process interface enables loose coupling with vendor operation • Ease of knowledge transfer enables nimble "unplu and replug" in case of unfavorable development
Leverage vendor inter-operability	**H3a (+)** ● Common platform and interface reduce interdependence and coordination costs ● Wider compatibility and connectivity enable process scability and adaptability	**H3b (+)** ●Common platform and interface simplify knowledge exchange between parties ●Reusable and modular architecture allows localized reconfiguration and faciliates functional add-ons	**N/A** ●Vendor interoperability is irrelevant to new innovation or out-of-the-box thinking in "competence-destroying" discontinuity	**H3c (+)** ●Common platform and interface reduces specificity in outsourcing partners and broaden the pool of available vendors.

	N/A	N/A	N/A	H4 (+)
Practice multiple sourcing	● Resources across multiple vendors are passive and not available to one another for operational fluctuations, due to high coordination costs	● Resources across multiple vendors are passive and not available to one another for service modifications, due to high coordination costs	● Resources across multiple vendors are passive and not available to one another for "competence- destroying" innovation or creation of new capabilities, due to high coordination costs	● Multiple sourcing mitigates resource dependency on single vendor and reduces lock-in hazard ● Competitive knowledge from multiple sourcing augments an organization's bargaining power
	N/A	N/A	N/A	H5 (+)
Retain in-house competence	● Given the high cost of dedicated redundancy, in-house competence is a passive resource for operational fluctuations. It is triggered only in extreme situation of exiting outsourcing	● Given the high cost of dedicated redundancy, in-house competence is a passive resource for service modifications. It is triggered only in extreme situation of exiting outsourcing	● Given the high cost of dedicated redundancy, in-house competence is a passive resource for "competence- destroying" innovation or creation of new capabilities. It is triggered only in extreme situation of exiting outsourcing	● In-house competence builds up buffer mechanism to reduce dependency, hence easing exit in case of non-performance by vendors
	N/A	N/A	H6a (+)	H6b (+)
Promote proactive sensing	● The strategic and external orientations focus on information feedback outside routine operation; hence, are not expected to contribute to operatioinal fluctuations	● The strategic and external orientations focus on information feedback outside routine operation; hence, are not expected to contribute to service modifications	● Proactive sensing develops organization alertness to new opportunities and innovative technologies ● Strategic, external, and open mindset is conducive to experimentation with new ideas	● Proactive sensing keeps management vigilant on performance of outsourcing vendor ● Proactive sensing enables familiarity with vendor's market and awareness of alternative opportunities, strengthening readiness to exit.
	H7a (+)	H7b (+)	H7c (+)	H7d (–)
Foster partnership quality	● Willingness to accommodate operational fluctuations or transactional variations based on shared goals and mutual trust	● Willingness to accommodate requests for modifications based on shared goals and mutual trust	● Willingness to accommodate requests for new capability based on shared goals and mutual trust	● Relational investment leads to expectation of business continuity, reducing incentives to exit ● Social embeddness increases switching cost and inhibits the parties from exiting

5.5 Outsourcing Flexibility and Outsourcing Success

The above arguments suggest that different flexibility maneuvers contribute to different aspects of flexibility. In today's dynamic environment, flexible response is necessary for the basic survival of the business, and even imperative to facilitate developing new performance-enhancing features and exploiting first-mover advantages (Eardley et al. 1997). As technological revolution and increasing globalization have radically transformed the competitive landscape, a high turbulence environment has been becoming a norm rather than an exception, especially in banking and high-tech industries (Volberda 1998). Nadler and Tushman (1999) made a similar argument when they noted that the fierce competition will drive firms to outsource non-core processes while not surrendering flexibility, even at additional cost.

That being said, the notion of flexibility is often indiscriminately seen as a "good thing" in outsourcing literature (Avison et al. 1995; McFarlan and Nolan 1995). Few formal studies have examined flexibility conceptualization, let alone empirical validation. Other studies simply include flexibility as one of a few dimensions (e.g., as responsiveness) to measure outsourcing success, typically defined as an organization's satisfaction with benefits gained from outsourcing (e.g., Lee and Kim 1999; Grover et al. 1996). As pointed out by Clark et al. (1995) and Lacity & Willcocks (2001), flexibility should be investigated as a central notion instead of as a hidden variable under success or relationship metrics. Given the prevailing volatile business environment, the author would expect that outsourcing flexibility leads to outsourcing success. Therefore,

Hypothesis H8a: Robustness in an outsourcing relationship is positively associated with outsourcing success.

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Hypothesis H8b: Modifiability in an outsourcing relationship is positively associated with outsourcing success.

Hypothesis H8c: New capability in an outsourcing relationship is positively associated with outsourcing success.

Hypothesis H8d: Ease of exit in an outsourcing relationship is positively associated with outsourcing success.

5.6 Summary

This chapter has sought to improve understanding of how to manipulate flexibility when organizations engage in outsourcing initiatives. Based on coordination theory and Evans' flexibility framework, the natures and roles of individual maneuvers are described in relation to outsourcing flexibility and success. Figure 3-1 summarizes these maneuvers and the theoretical perspectives from which they are derived, while Figure 3-2 represents a conventional research model with antecedents, mediators, and outcome. Incorporating these elements into an integrated model of flexibility research offers the opportunity to advance the academic community's understanding of outsourcing, while at the same time providing useful insight to practitioners. Subsequent chapters of this dissertation undertake the collection, analysis, and interpretation of data relevant to evaluating the proposed model. The next chapter will focus on research design, construct operationalization, and empirical validation of the proposed research framework.

FIGURE 3-1: Conceptual Model on Management of Outsourcing Flexibility

*Portfolio of Flexibility Maneuvers
with Supporting Theories*

Pre-emptive Maneuvers
- Minimize customization (**TCE**)
- Enhance process Maturity (**Agency Theory**)
- Leverage vendor interoperability

Exploitive Maneuvers
- Promote proactive Sensing (**Entrepreneurial Action**)

Protective Maneuvers
- Practice multiple Sourcing (**Resource Dependency Theory**)
- Retain in-house competence (**Agency Theory**)

Corrective Maneuvers
- Foster partnership Quality (**Social Exchange Theory**)

Offensive / *Defensive* / *Ex-ante* ← → *Ex-post*

H1-H7 →

Outsourcing Flexibility
- Robustness
- Modifiability
- New capability
- Ease of exit

H8 →

Outsourcing Success

FIGURE 3-2: Research Model on Management of Outsourcing Flexibility

Antecedent

H1: Minimize customization
H2: Enhance process maturity
H3: Leverage vendor interoperability
H4: Practice multiple sourcing
H5: Retain in-house competence
H6: Promote proactive sensing
H7: Foster partnership quality

H1-H7 →

Mediator
- Robustness
- Modifiability
- New capability
- Ease of exit

H8 →

Outcome
Outsourcing Success

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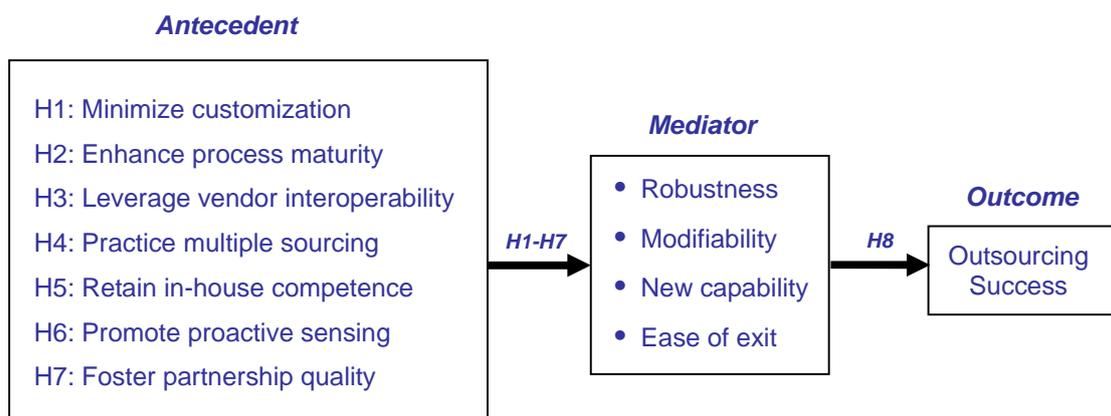
CHAPTER 6. RESEARCH DESIGN

As the second phase of this study, this research seeks to investigate empirically the notion of outsourcing flexibility from an outsourcing client's perspective. In doing so, the research model presented in the previous chapters is empirically tested through a large-scale survey. In this chapter the author describe methodological issues related to the survey participants, their selection and data collection process, the instrument development and construct validation procedure, as well as the analytical strategy employed.

6.1 Sample and Sampling Procedure

The data for this study were collected through a mail survey in Singapore. The procedures and protocol to conduct survey by Dillman (1991)'s total design method was adopted. For the list of phone numbers and postal addresses of participant organizations, the author accessed the database of Singapore Top 1000 organizations (mainly including large high-tech organizations and manufacturers), the Association of Banks in Singapore, and Government Directories of Singapore. Those organizations are more likely to engage in outsourcing activities, given their functional complexity and competitive environment. A key informant survey research strategy was employed in this study (Campbell 1955). Key informants in outsourcing organizations were sought who occupied roles that made them knowledgeable about the nature of the outsourcing engagements and the capabilities of their vendors. Three top executives in each of the organization were selected, namely CIO/outsourcing manager (for IT outsourcing), CFO/financial controller (for finance and

accounting outsourcing), and HR director/manager (for HR outsourcing). After deleting duplicated and incomplete records, the author started by telephoning the remaining organizations listed in the three databases. From this, the author identified a total of 310 organizations that are engaged in outsourcing. Questionnaire surveys (each survey packet containing cover letter, survey booklet, and stamped envelope) were mailed to each of these organizations. The participants were also assured about the confidentiality and voluntariness of their individual responses and promised an executive summary of the study results.

Two weeks after, a follow-up phone call was placed to each potential respondent to check 1) if they had already received the questionnaire; 2) if it was not already done, encourage them to fill it out. At the end of the research, 198 questionnaires were returned, and 171 were deemed complete and valid, corresponding to an effective response rate of 18.4%. Although the author sent questionnaires to multiple respondents within each organization, the author only received multiple responses from four organizations. While the response rate is not very high, it compares well with response rates of other surveys in IS studies. For example, Byrd and Turner (2000) obtained a response rate of 20.7 percent for a similar survey using senior IT executives in large organizaitons, and Slater and Narver (2000) obtained 17 percent for IT industry research.

6.2 Sample Characteristics

As illustrated in table 5, the single largest component of respondents in the sample is CIO/CTO /IT Manager (32%), followed by outsourcing/contract manager (23%), CFO/Finance Manager (17%), and HR Director/Manager (15%). The majority of the

outsourced processes were IT functions accounting for 67% (functional components include desktop support, data center, telecom/network integration, application development & maintenance, IT planning & change management)[2]. HR processes account for 21% (payroll, compensation & Benefit, helpdesk/call center, recruitment, HRIS, e-Learning, etc.), and Finance & Accounting processes (financial operations, cost or management accounting, treasury management, audit & risk management, financial reporting, etc.) the remaining 12%. On average, the outsourcing contracts in the sample last for 3.19 years (s.d. = 2.26), the majority of the relationships (72%) lasted less than four years and others went from four to ten years. The contract value represents a wide spectrum of contract size (mean = 2.32, s.d. = 1.42), with 42% of the contracts costing less than 0.5 million Singapore dollars and 3% ranging up to more than one billion. Dispersion of organization types across the population of interest was reasonably normal, representing a variety of the nature of the organizations, out of which MNC (40%) is dominant. With respect to the type of outsourced process, 115 firms contracted out conventional IT process, while the remaining 56 firms engaged in business process outsourcing (HR or F&A process).

6.3 Non-Response and Late Response Biases

As a common practice, the author conducted tests of non-response bias and common methods variance to check for potential bias in the self-report survey data. First, by comparing the distribution of organization type of the returned questionnaires to the population distribution using a chi-square one-sample test. The author confirmed that the

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[2] The IT support functions, such as desktop support, data center, and telecom/network integration, takes up 58% of outsourced IT process, while the more complex ones, namely application development & maintenance, IT planning & change management account for 42%.

distributions were consistent and therefore sample was considered representative of the whole population ($\chi2$ = 18.76, p = ns).

The second assessment was to examine early verses late survey respondents for systematic differences (the first 75 percent of the returned questionnaires were defined as early responses and the remaining 25 percent as late responses and thus deemed representative of firms that ultimately did not respond to the survey). There were not significant differences in terms of job designation ($\chi2$ = 25.27, p = ns), type of organization ($\chi2$ = 36.92, p = ns), and type of process outsourced ($\chi2$=18.76, p=ns).

Seddon and Scheepers (2006) pointed out that "a common technique for attempting to establish representativeness is to compare early and late responses. What seems not to be well understood is that it is essential that variables relevant to the study are compared, not just any old factors that happen to be available". Following their recommendation, a series of independent-sample T-tests (equal variance not assumed) were also performed to compare key variables central to the propositions of the research. Again no significant differences between early and late responses were found for robustness (t = .275, df = 99.4, p = ns), modifiability (t = .301, df = 87.7, p = ns), new capability (t = .916, df = 113.7, p = ns), ease of exit (t = -.116, df = 68.3, p = ns), and outsourcing success (t = 1.01, df = 71.7, p = ns). Thus, the results provide reasonable evidence that the sample was adequately representative of the population in which the sample was drawn.

In addition, the author also used Harman's one-factor test to check for the presence of common method variance, as suggested by Podsakoff and Organ (1986). The logic underlying the single factor test is that if method variance is largely responsible for the covariation among the measures, factor analysis should find a single (method) factor

fitting the data. To test for this potential threat to validity, the author entered the variables in the study into a factor analysis (principal component analysis) and examined the results of the unrotated factor analysis to determine the number of factors that were necessary to account for the variance. The test yielded 12 factors with eigenvalues greater than one, and no single factor was dominant (the first factor accounts for 12.65% of variance). Further analysis using confirmatory factor analysis similarly showed that a single factor model did not fit the data well, and that the expected 12-factor model was a significantly better fit than a single-factor model ($\Delta \chi2$ (66df)=4939.07, p<.001). Average variance extracted (AVE) of all 12 measures were greater than 0.50 (ranging from 0.66 - 0.84), providing further evidence of the discriminant validity among the measures. In sum, results showed that common method bias is not a significant problem in the data.

TABLE 5: Survey Respondent Characteristics

Type of Respondent	Frequency	Percentage	Type of process	Frequency	Percentage
COO/Operation Manager	18	11%	IT	115	67%
CIO/CTO/IT Manager	54	32%	HR	35	21%
CFO/Financial Controller	30	17%	F&A	21	12%
HR Director/Manager	27	15%	**Total**	171	100%
Outsourcing/Contract Manager	38	23%			
Others	4	2%			
Total	171	100%			

Contract Value(S$)	Frequency	Percentage	Type of organization	Frequency	Percentage
<500K	72	42%	Sole Proprietorship	12	7%
500K-1million	51	30%	Local Private Limited	27	16%
1-10million	21	12%	Local Public Listed	53	31%
10-50million	10	6%	MNC	69	40%
50-100million	6	4%	Government	7	4%
100-500million	4	2%	Others	3	2%
500-1billion	2	1%	**Total**	171	100%
>1billion	3	2%			
Not specified	2	1%			
Total	171	100%			

6.4 Instrument Development

A survey instrument was developed to measure respondents' perceptions of outsourcing success, the outsourcing flexibility dimensions, as well as the strategic maneuvers. The author reviewed relevant bodies of literature on information systems (especially outsourcing studies), strategic alliance, and manufacturing to surface all measures related to the constructs in the research model. These measures were then closely examined to ensure compatibility to outsourcing context. Whenever possible, existing scales were adopted for this study.

Prior to administration of the survey to our targeted organizations, peer reviews and pilot interviews were undertaken to purify the initial instrument. Firstly a preliminary version was reviewed for content validity by three IS faculty members conversant with the constructs and knowledgeable in survey design. Upon completing the reviews the faculty were asked to describe their interpretation of the questions. After modifying the initial scales to reflect their comments, an interview-based pilot test followed. The author conducted interviews with five managers in local outsourcing organizations (these organizations are excluded from the subsequent survey, and the positions of these individuals mirrored well the job titles of the respondents that the author later surveyed) to solicit their inputs on the survey. Each manager was briefed on the purpose of the study and asked to critique the items for completeness, understandability, terminology, and ambiguity. The author also elicited informal verbal descriptions of interviewees' outsourcing engagements and associated contracts, which sharpened our understanding of how the theoretical constructs occurred in practices, allowing us to define and operationalize them accurately. The interview process resulted in further refinement and

deletion of some questionnaire items. The final survey is presented in the appendix and operationalizaitons of the individual variables are followed. Except demographic variables, all items were measured on Likert scale, with1 = strongly disagree and 7 = strongly agree. "R" indicates reverse scoring for the analysis.

6.4.1 Dimensions of Outsourcing Flexibility

<u>Robustness</u>

In developing the scales for the four flexibility dimensions, this study drew heavily on existing flexibility concepts in other disciplines, and adapted these to the outsourcing context. For the first flexibility dimension, robustness, five items were adapted from Braglia and Petroni (2000)'s manufacturing flexibility and Nelson and Cooprider (2001)'s software system flexibility to assess the outsourcing service variations in transactional volume, resource utilization and delivery mode.

1. Our outsourcing vendor is usually able to handle variation in service volume with no detrimental effect on process efficiency and quality
2. Our outsourcing vendor can easily switch between different deliverables without loss of process performance
3. Our outsourcing vendor can respond to process exceptions without significant cost escalation
4. The outsourced process contains built-in capacity for transactional variation
5. Our outsourcing vendor can handle transactional variation in a timely and error-free manner

<u>Modifiability</u>

Two items of modifiability were adapted from Narasimhan and Das (1999)'s alliance flexibility to assess the extent to which an outsourcing relationship allows change

accommodation in service composition. The other item was derived from the construct of strategic flexibility from Nidumolu and Knotts (1998) to assess the required cost and time to attain the level of accommodation to changes in outsourcing service.

1. The outsourced process can be modified as easily as needed in response to new opportunities
2. The outsourced process can be rapidly modified without incurring prohibitive cost
3. Changes in key process attributes can be managed in a timely and error-free manner

New Capability

The measures of new capability draw on the same source as modifiability. Three items were adapted to gauge outsourcing vendor's capability to deliver innovation service or product.

1. New capability can be added to the outsourced process as easily as needed in response to new opportunities
2. New capability can be rapidly added to the outsourced process without incurring prohibitive cost
3. Addition of new capability can be managed in a timely and error-free manner

Ease of Exit

The three-item instrument for ease of exit is modified from Johnson (1999)'s work on vendor dependency to measure client's perception of the replaceability of their current outsourcing vendor, i.e., the extent of dependency on vendor's business.

1. If our outsourcing relationship were discontinued, we would have difficulty finding a replacement for the outsourcing vendor (R)
2. Changing our outsourcing vendor would significantly affect our future operating performance (R)
3. We are heavily dependent on this outsourcing vendor (R)

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6.4.2 Antecedents of Flexibility

Extent of Customization

Four items were adapted from Ang and Cummings (1997)'s measure of asset specificity to assess the overall extent of customization with the outsourced process. Respondents were asked to indicate the extent to which their IT facilities, services, and business knowledge required relatively unique technical skills, and the extent to which the vendor modified its process significantly to cater to their needs.

1. Compared to our peer organizations, our IT facilities and services require technical skills that are relatively unique (R)
2. To provide IT service, external service providers would have to make substantial investments in equipment tailored to our needs (R)
3. Extensive business knowledge that is specific to our business environment is required to manage our IT operations (R)
4. We requested the vendor to modify its process significantly to adapt to our unique operational routines and requirements (R)

Process Maturity

Drawing on the software process-maturity model (Paulk et al. 1993) and general process maturity model (McCormack and Johnson 2001), the author developed five items to measure the extent to which outsourcing organization is knowledgeable and sophisticated in managing, controlling and continuously improve its processes.

1. The process is well-defined and institutionalized
2. The key process indicators are quantitatively measured
3. The process boundary is clearly demarcated
4. The execution of the process is highly automated and requires minimal manual

intervention

5. The process is regularly subject to evaluation for continuous improvement

<u>Vendor Interoperability</u>

Vendor interoperability was employed to measure the extent to which the vendor's capability of tailoring its services to match the individual needs and contexts for outsourcing clients. The four-item instrument was derived form two studies on IT infrastructure flexibility and reworded to measure outsourcing vendor's physical attributes (Byrd and Turner 2000; Chung et al., 2003). Specifically, the first two items, adapted from Chung et al (2003), deal with the extent to which software modules can be easily modified from the existing outsourcing vendor's process, and readily reapplied across multiple platforms; the last two items, adapted from Byrd and Turner (2000) measure the vendor's ability to share any type of information across any technology platform with minimum adjustment.

1. The application platform provided by our outsourcing vendor offers a wide variety of information to end users through multiple channels
2. The software application provided by our outsourcing vendor is compatible and inter-operable across multiple platforms
3. The application platform provided by our outsourcing vendor is electronically linked and seamlessly connected with the end users in our organization
4. Software modules can easily be added to, modified, or removed from the application platform provided by our outsourcing vendor

<u>Multiple Sourcing</u>

A three-item scale was used to measure the employment and management of multiple outsourcing vendors. Since the previous research typically either assumed the concept is

self-evident (Currie 1998) or used the number of outsourcing vendors to measure the extent of multiple sourcing (Huang et al 2004), the author adapted two items from Huang et al (2004) to assess the extent of engaging multiple vendors and developed another item to measure the clients' relationship with multiple vendors.

1. For the specific outsourced process, we have a policy of contracting with multiple outsourcing vendors
2. We have partitioned the process and outsourced different components to different vendors
3. We have built up relationships with a few outsourcing vendors to contract out our process

In-house Competency

In-house competency refers to a reservation of equivalent process competency (typically slack resources, IT staff, etc.) internally to guide against outsourcing dysfunctions. While the construct was previously emphasized in operation management literature, no attempt has been made to formally describe and validate the construct so far. Based on several theoretical studies investigating this notion (Evans 1991; Carlsson 1989; Gerwin 1993), this study crafted three items to collectively measure the extent to which the clients' reserved IT abilities backup the outsourced process.

1. We have a team of in-house staff who are able to replicate and expand the outsourced process if necessary
2. We continue to retain internal competency to backup the outsourced process
3. We can easily bring the outsourced process in house if necessary

Proactive Sensing

Four items measuring proactive sensing were adapted from the construct of

"entrepreneurship" developed by Hult et al. (2003) and Covin and Slevin (1988) respectively. The first two items measure the extent to which the clients kept up with outsourcing market dynamics to exploit outsourcing opportunities, and the other two items measure the extent to which the clients encouraged their vendor to explore new opportunities and innovative ideas.

1. Our executives always update themselves about the dynamics of the outsourcing vendor's market to take advantage of new opportunities
2. Our executives always initiate actions to which our outsourcing vendor responds
3. Our executives are fast to alert our outsourcing vendor when new products and services are offered in the marketplace
4. Our executives always encourage our outsourcing vendor to explore new opportunities and innovative ideas

Partnership Quality

For partnership quality, this study adopted the validated five-item compound measure used by Lee (2001), which was in turn a shortened version of the same scale developed by Lee and Kim (1997). The first two items related to trust building and mutual business understanding in inter-organizational relationship. The third items measured bilateral benefit and risk sharing, while the fourth and fifth item measured conflict and commitment respectively. They collectively represent process-oriented mechanisms for flexibility: fostering a cooperative relationship to build up latitude for on-the-fly adjustments.

We and our outsourcing vendor…

1. make decisions that are mutually beneficial
2. share the benefits and risks in our outsourcing arrangement
3. have compatible culture and policies

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4. perform our agreements and promises very well

6.4.3 Outsourcing Success

In this study, outsourcing success was defined as satisfaction with benefits from outsourcing gained by outsourcing clients as a result of deploying an outsourcing strategy (Grover et al. 1996). Validated measurements of this construct are available from Grover et al. (1996) and Lee and Kim (1999), and have been increasingly perceived to be the best surrogate for capturing both cognitive and affective components of human actions (Wang 2002; Lee, Miranda, and Kim 2004). Eight items assessing the degree to which clients are satisfied with outsourcing outcome were adopted from Lee and Kim (1999).

As a result of outsourcing…

1. We have increased control of our expenses
2. We have achieved substantial cost saving
3. We are able to refocus on core business
4. The risk of technological obsolescence is reduced
5. Our access to key information technologies is increased
6. Our access to skilled personnel is increased
7. Service level performance is consistently met
8. We are satisfied with the overall benefits from outsourcing

6.4.4 Control Variables

In order to avoid confounding effects, this study also controlled a few factors that may influence flexibility management, as suggested by prior literature. Specifically, this study controlled the impacts of contractual provision, contract value, and type of outsourcing.

Contractual Provision

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Prior research and industry practices suggest that flexibility can also be built into an outsourcing contract. Contractual provision thus refers to the extent to which an outsourcing contract contains clauses that allows adjustments based on changing circumstances of the parties (Singh and Walden 2003). Common adjustment mechanisms in an outsourcing contract include i) variations in contract duration, ii) pricing structure, iii) dispute resolution, iv) renegotiation, and v) continuous improvement (Fitzgerald and Willcocks 1994; Kern and Willcocks 2000; Harris et al. 1998; Goo et al. 2004). Each of these five contractual dimensions was coded as a dummy variable with 1 indicating a flexible provision, and 0 inflexible provision. Specifically, for contractual duration, 1 corresponded to short contract that are less than 3 years, and 0 corresponded to contract longer than 3 years. The selection of "3 years" as the cut-off point was because outsourcing practitioners normally cannot define their requirements past a three-year time horizon (Lacity and Willcocks 1998). The pricing structure was differentiated between market verses non-market based pricing systems (1=variable pricing, including index and profit-sharing pricing, 0=fixed pricing), as suggested by Ang and Beath (1993). Similarly for dispute resolution, 1 indicated informal mechanisms (through third party arbitration or joint steering committee), while 0 indicated legal remedies (through litigation) (Ang and Beath 1993). For renegotiation, 1 indicated the presence of negotiation clauses while 0 indicated absence of them. The last contractual element is provision for continuous improvement, which essentially is a way to mitigate uncertainty and realign rules and operating procedures (Smith and Smith 2003). Periodic review for improvement was coded as 1 because it brings opportunities for both parties to monitor and re-specify performance standard and improvement necessity. No review for improvement was

considered outcome-based measurement and therefore coded as 0. As the last step the five dimensions were averaged to create a single index reflecting the average number of such flexibility provisions in the outsourcing contract (1 = flexible contractual provision; 0 = inflexible contractual provision). The study therefore control the effect of different contractual clauses in analyzing the main impacts upon flexibility.

Contract Value

Contract value, which is among the mostly researched variables in outsourcing studies (Loh and Venkatraman 1992; McFarlan and Nolan 1995), inherently manifests the economic stake or relative bargaining power an organization possesses: if the outsourcing contract value is high, then the vendor becomes dependent on the organization (Zaheer & Venkatraman 1995). Vendors may therefore have higher motivations to cater to the scope changes raised by organizations. Outsourcing client with significant power (for example, BP, Kodak, and Dell) have pressed vendors to do additional modification and continuously offer more value for their money. Hence, this study are also controlling for this possible confounding. The amount of contract value was treated as categorical variable in eight categories, with 1 = less than S\$ 500k, and 8 = more than S\$ 1 billion.

Type of Outsourcing

While much of the management principles can be extended from conventional IT outsourcing (ITO), technology enabled business process outsourcing (BPO) arrangements carry a great deal more complexity due to the mission criticality of business processes and their tight coupling to other processes. Unlike more standardized service in ITO, the

inherent uniqueness associated with BPO normally requires customized approach to meet organization-specific needs. This uniqueness naturally goes against the premise of flexibility. Adler (2003), in a case study of human resource management outsourcing, highlights the key issue in BPO is the susceptibility of losing flexibility. As a result, the difference between ITO and BPO may have significant implications for developing and maintaining flexible outsourcing relationships. In this research, outsourcing type was controlled and measured on 0-1 basis, with 0 = ITO and 1 = BPO.

CHAPTER 7. CONSTRUCT VALIDATION

Factor analyses were applied sequentially to assess construct validity by determining and verifying the underlying dimensions of outsourcing flexibility and the other constructs. The author started off with exploratory factor analysis (EFA) through SPSS to let the latent factors emerge and therefore confirm whether the number of dimensions conceptualized can be verified empirically (construct discriminant validity and internal reliability). The author also performed confirmatory factor analysis for the evaluation of convergent and discriminant validity. Additionally, the data were examined by structural equation modeling in LISREL 8.0 in order to establish a clean measurement model. Finally, a series of nested models of flexibility were developed and compared to arrive at the best fit on flexibility measurement.

7.1 Initial Measurement Assessment by EFA

Following Anderson & Gerbing (1988), the author conducted a comprehensive item-level analysis and deleted items with (i) low correlated item-total correlations; (ii) items correlating substantially less with their own scale than with the other scales; and (iii) items with small standard deviations or extreme means. Kline (1998) also suggested a rough guideline that reliability coefficients higher than 0.70 as sufficient for exploratory research. Exploratory factor analysis was then conducted by using all the remaining items. This EFA helped ascertain the dimensionality and construct structure for each concept. That is, EFA examined the underlying patterns for each concept – which items load onto which latent construct (Churchill 1979). In running EFA (principal components factor

analysis with Varimax rotation, using the eigenvalue cutoff of 1.00 to determine the number of factors), our criteria for screening items were (i) that the items exhibiting adequate factor loadings (higher than .50); (ii) that the items load on the expected factors and (iii) that the loading on the primary factor must be substantially greater (a difference of .30 or more) than the loading on any other factor.

7.2 Further Measurement Assessment by CFA

The dimensionality and the construct structure resulted from EFA provided the prior specifications for measurement models of structural equation modeling (SEM). The measurement model was then validated by a model fit test referred to as confirmatory factor analysis (CFA). The analytical framework of CFA provides an appropriate means of assessing the efficacy of measurement among scale items and the consistency of a pre-specified structural equation model with its associated network of theoretical concepts (Segars and Grover 1998). Therefore, the author used CFA to provide evidence that the indicator (or manifest) variables are actually measuring the latent variables to which they are assigned (Byrne 1994).

Specifically, the author used structural equation modeling (LISREL 8.0) to refine the measurement model and estimate the fit between the proposed measurement model and the data. Five indices were reviewed. First the non-normed fit index (NNFI), the comparative fit index (CFI), and GFI were examined. These indices are generally preferred when dealing with small samples (i.e., less than 200 observations) (Kline 1998) because they are less likely to produce biased estimates. As a general guideline, values over 0.90 for the three indices indicate an acceptable fit. Next, the standardized root mean

residual (SRMS), and the root mean square error of approximation (RMSEA) were also examined. Hu and Bentler (1998) recommended values of SRMS less than 0.05, and values of RMSEA less than 0.08 indicate a fair fit. In addition, Klien (1998) also suggested using the ratio of chi-square statistics to sample degree of freedom as one the fit indices, with an agreed-upon cut-off value of less than 2.0. Besides fit indices, the significance of each loading (The loading is significant at the $p = 0.05$ level if its t-vale is greater than 1.96), the magnitude of each loading (complete standardized loadings), the proportion of explained variance (R^2), and the modification indices were also examined. Items were deleted with (a) low or non-significant factor loadings; (b) low R^2; (c) extremely high modification indices (MacCallum, 1986). Lastly, the author also examined the composite reliability and average variance explained for each of the latent construct to ensure an acceptable level of validity (Fornell & Larcker, 1981).

7.3 Assessment of Convergent and Discriminant Validity

With respect to the results from EFA and CFA, two critical challenges that are normally applied testing psychometric properties of measurement constructs are reliabilities and validities (convergent and discriminant) (Churchill 1979). Based on the assumptions of the domain sampling model, Churchill (1979) recommended the use of coefficient alpha as the measure of the internal consistency, followed by item-to-total score correlation to eliminate the items that perform poorly in capturing theoretical constructs.

Convergent validity means the construct must correlate with items designed to measure that same construct. In other words, different items of the same construct should converge on a common construct not to other constructs (Anderson and Gerbing 1984). It

characterizes that the measures of the same construct should be highly intercorrelated among themselves and uniform in the pattern of intercorrelations. On the other hand, differentiation in constructs is a characteristic that the cross-construct correlations among measures of causally-related variables should be highly intercorrelated, but should correlated at a level lower than that of the within-construct correlations (Bagozzi 1981). Nunally (1978) advocated that CFA affords a stricter interpretation of convergent validity than can be provided by traditional methods such as item-to-total correlation or variance explained in EFA. Convergent validity in CFA is evidenced by acceptable overall model fit, the significant factor loadings for latent variable, and large AVE values (must be higher than 0.50) (Fornell and Larcker 1981).

Discriminant validity is indicated by predictably low correlations between the measure of interest and other measure that are supposedly measuring different constructs (Churchill 1979). Fornell and Larcker (1981) suggested two tests of discriminant validity: (i) Corelations within construct measures must be significantly larger than any correlations between measures of different constructs, (ii) Average variance extracted (AVE) should be larger than the squared correlations between constructs. Construct discriminant validity was thus assessed via CFA by examining the factor loadings of the indicator variables. A non-significant factor loading (i.e., a factor loading with a t-value less than 1.96) indicates that the indicator variable is doing a poor job measuring the latent variable and should be dropped (Hatcher 1994). Next, the residual matrix and the correlation matrix were examined, too. If the measurement model provides a relatively good fit, entries in the residual matrix are expected to be around zero. Values over 2.00 generally signify that the relationships between indicator variables are underrepresented

in the measurement (Hatcher 1994).

7.4 Flexibility Scale Assessment

Given the dearth of empirical precedent of flexibility studies, the bulk of the flexibility scales had to be written from scratch or adapted from pertinent constructs. As discussed in previous sections, a few studies have clearly demonstrated that flexibility is a multi-dimensional notion, however, precise conceptualization and operationalization have not come to a conclusion. As such, one of the key objectives of this study was to develop a set of psychometrically sound measure for flexibility.

Once the measurement model was established through EFA and CFA validations, a series of nested models were constructed against previous studies and premises (See figure 4). These models were then compared using the LISREL to substantiate and confirm the dimensionality of the resulting flexibility scale. It is of particular importance to closely examine the flexibility scale and rule out other possible competing models.

Given that the flexibility scale was designed to reflect the hypothesized four distinct dimensions of outsourcing flexibility, one-factor two-factor, and second-order models were assessed against the four-factor base model with respect to common fit indices in LISREL. Major indices such as AGFI, NFI, RMSEA, plus the degree of freedom adjusted chi-square difference (ΔX^2) were examined pair-wise to ascertain the model with best fit.

1. **Orthogonal model**: as opposed to the base model, where the four flexibility dimensions are assumed inter-correlated, an orthogonal model was developed to restrain the four dimensions from correlating. This comparison was to test the strength of correlations between flexibility dimensions.

2. **One-factor model**: for the single factor model all indicators from the four sub-scales were forced on to one latent variable. The one-factor model was constructed to examine the possibility that flexibility is a unidimensional construct. The procedure is in keeping with Hu and Bentler's (1998) recommendation for testing construct dimensionality.

3. **Two-factor model I**: the first two-factor model was built by forcing the indicators in the first three dimensions on to a single latent variable, based on Ybarra and Wiersema's empirical research (1999) that the first three dimensions of flexibility were factors within outsourcing relationship whereas the last dimension represented the ability to switch outsourcing vendors. Their study suggested that flexibility could possibly be a two-factor model with robustness, modifiability, and new capability collapsed into one dimension.

4. **Two-factor model II**: an alternative two-factor model was constructed by combining indicators of robustness and modifiability versus those of new capability and ease of exit. This model was based on the assumption that robustness and modifiability are common requirements for incremental changes in outsourcing deal, whereas new capability and ease of exit represent dramatic changes, sometimes outside of existing paradigm. Therefore, the split was to test another possible conceptualization of flexibility.

In the above four models, the four dimensions were positioned at same level, or one unidirectional arrow away from the observed variables, and therefore served as first-order models. However, it may be the case that there is an underlying flexibility factor explaining all of the covariance among lower order dimensions. As suggested by a

Volberda (1998), Clark et al. (1995), and Gosain et al. (2004), two possible second-order models were examined as follows.

5. **Second-order model I**: the first second-order model was conducted to test the proposition that a latent flexibility variable accounts for the first three dimensions of robustness, modifiability, and new capability, with a stand-alone fourth dimension of ease of exit.

6. **Second-order model II**: similarly, another second-order model was conducted to test the proposition that the four dimensions share flexibility as the overall higher order latent variable.

FIGURE 4: Nested Models of Flexibility Scale

4-1. Orthogonal Model

Robustness	Indicator 1
	Indicator 5
Modifiability	Indicator 6
	Indicator 7
	Indicator 8
New Capability	Indicator 9
	Indicator 10
	Indicator 11
Ease of Exit	Indicator 12
	Indicator 13
	Indicator 14

4-2. One-factor Model

Flexibility → Indicator 1, Indicator 2, Indicator 3, Indicator 4, Indicator 11, Indicator 12, Indicator 13, Indicator 14

4-3. Two-factor Model I

Robustness + modifiability + new capability → Indicator 1, Indicator 2, Indicator 3, Indicator 10, Indicator 11

Ease of Exit → Indicator 12, Indicator 13, Indicator 14

4-4. Two-factor Model II

4-5. Second-order Model I
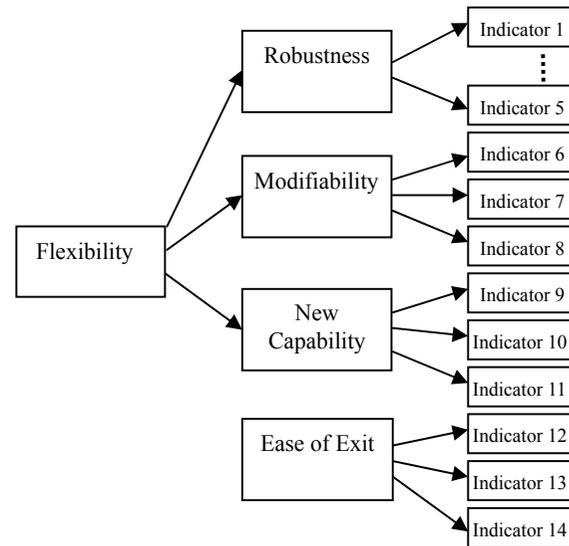
4-6. Second-order Model II
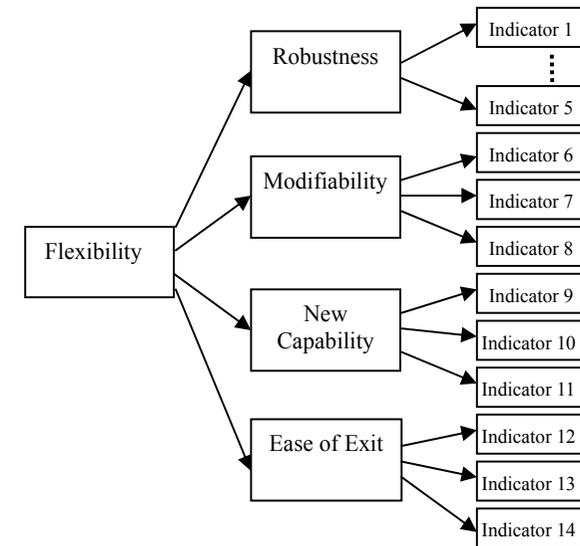
7.5 Validation Results

The factor loading of EFA presented in table 6 suggested acceptable results (item loading ranged from 0.70-0.93; cumulative percentage of variance 78.32%). Items in all 12 variables loaded well onto the expected factors.

Based on results of the Cronbach's alpha, the item-to-total score correlation, and EFA as well as EFA results, 14 items were dropped from further analysis. The CFA results with remaining items suggested that the measures were valid. As shown in table 7, all items loaded as intended. Overall, the NNFI was 0.85, CFI equalled 0.87, and RMSEA was 0.069. The factor loadings ranged from 0.70 to 0.95 (t values all higher than 1.96, $p < 0.05$), composite reliability ranged from 0.81 to 0.94, and AVE from 0.61 to 0.84. These indices are well in line with the cut-off values suggested by (Klien 1998; Bagozzi 1981), and thus provided additional evidence that the fit between the measurement model and the data was acceptable.

TABLE 6: Factor Loadings of Exploratory Factor Analysis

Items	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
Custom1	-0.11	0.12	0.02	0.07	0.03	0.11	**0.80**	0.07	0.02	0.04	0.10	-0.03
Custom2	0.05	0.07	-0.12	0.00	0.06	0.03	**0.87**	0.09	0.15	-0.03	0.02	0.01
Custom3	0.03	0.01	0.02	0.03	0.04	0.04	**0.83**	-0.01	0.12	-0.05	-0.10	0.16
Custom4	0.14	0.18	0.12	0.03	0.06	0.08	**0.83**	0.05	0.06	0.01	-0.07	0.10
Maturity1	0.24	0.19	**0.77**	0.01	0.10	0.09	-0.02	0.07	0.05	-0.07	-0.08	0.08
Maturity2	0.23	0.04	**0.81**	-0.02	-0.04	0.05	0.01	-0.05	0.03	-0.03	0.05	-0.02
Maturity3	0.13	0.15	**0.84**	0.01	0.00	0.06	-0.08	0.09	-0.05	-0.07	0.01	-0.05
Maturity4	0.12	0.03	**0.79**	-0.05	0.06	0.00	0.08	-0.05	0.07	0.05	0.08	-0.02
Maturity5	0.16	0.06	**0.70**	-0.03	0.03	-0.02	0.06	-0.06	0.00	0.03	0.21	0.25
Opera1	0.06	0.01	-0.01	0.07	0.09	**0.83**	0.01	0.05	0.10	-0.04	-0.06	0.18
Opera2	0.04	0.09	0.00	0.06	0.10	**0.86**	0.02	0.01	0.18	0.10	0.01	0.04
Opera3	0.03	0.16	0.06	0.15	0.03	**0.83**	0.06	-0.03	0.08	0.05	0.04	-0.01
Opera4	0.02	0.07	0.10	0.01	0.09	**0.87**	0.17	0.02	0.03	0.04	-0.01	-0.07
Multi1	-0.02	0.07	0.04	0.00	-0.02	0.01	0.01	0.14	0.10	**0.85**	-0.07	0.02
Multi3	0.00	0.00	-0.06	0.10	0.02	0.07	0.01	0.07	0.06	**0.91**	-0.01	0.05
Multi4	0.14	0.08	-0.07	0.11	-0.07	0.07	-0.04	0.16	0.05	**0.84**	0.10	-0.04
Inhouse1	0.01	0.00	0.05	0.13	0.03	0.04	0.10	**0.92**	0.13	0.13	-0.02	0.02
Inhouse2	-0.03	-0.01	0.03	0.12	-0.04	0.07	0.06	**0.93**	0.10	0.12	-0.01	0.06
Inhouse3	-0.07	0.07	-0.08	0.08	-0.05	-0.06	0.04	**0.86**	0.14	0.13	0.07	-0.02
Proact2	-0.01	0.10	0.02	**0.82**	-0.07	0.06	0.00	0.11	0.19	0.08	0.08	0.03
Proact3	0.07	0.06	-0.01	**0.89**	0.03	0.07	0.07	0.04	0.13	0.06	0.10	-0.01
Proact4	0.02	0.04	-0.09	**0.86**	0.08	0.05	0.02	0.13	0.10	0.02	0.10	-0.03
Proact5	0.06	-0.03	0.01	**0.86**	0.07	0.11	0.05	0.07	0.10	0.05	0.03	0.12
Part1	0.14	0.06	-0.08	0.13	**0.86**	0.10	0.07	0.04	0.11	-0.09	0.05	0.13
Part3	0.08	0.15	0.07	-0.04	**0.89**	0.11	0.04	-0.02	0.03	-0.02	0.08	0.08
Part4	0.15	0.13	0.07	-0.07	**0.83**	0.08	0.09	-0.11	0.06	0.10	-0.02	-0.09
Part5	0.23	0.06	0.08	0.12	**0.84**	0.04	0.01	0.02	0.03	-0.07	0.07	0.10
Robust1	0.20	**0.76**	0.12	-0.02	0.12	0.11	0.07	0.04	0.07	-0.04	0.13	0.06
Robust3	0.27	**0.80**	0.14	0.06	0.11	0.06	0.13	0.07	0.12	-0.02	0.15	0.15
Robust4	0.28	**0.75**	0.08	0.01	0.07	0.06	0.16	0.03	-0.06	0.11	0.08	0.26
Robust5	0.25	**0.75**	0.12	0.11	0.06	0.15	0.08	-0.01	0.03	0.07	0.19	0.10
Robust6	0.23	**0.81**	0.08	0.06	0.12	0.03	0.06	-0.05	0.16	0.11	0.11	0.12
Modify1	0.25	0.36	0.11	0.08	0.09	0.09	0.09	0.15	0.03	0.00	0.19	**0.70**
Modify3	0.26	0.26	0.10	0.01	0.17	0.08	0.13	0.06	-0.02	-0.01	0.24	**0.75**
Modify4	0.30	0.20	0.01	0.06	0.03	0.03	0.12	-0.08	0.09	0.06	0.20	**0.74**
Newcap1	0.31	0.22	0.08	0.13	0.01	0.02	-0.03	-0.03	0.08	-0.10	**0.79**	0.18
Newcap3	0.28	0.19	0.14	0.12	0.12	-0.05	0.00	0.03	0.04	0.04	**0.79**	0.23
Newcap4	0.20	0.26	0.08	0.14	0.09	-0.01	-0.05	0.05	0.07	0.04	**0.80**	0.16
Exit1_R	0.08	0.11	0.04	0.22	0.10	0.13	0.16	0.19	**0.85**	0.07	0.06	0.03
Exit2_R	0.08	0.09	-0.02	0.16	0.08	0.16	0.19	0.19	**0.87**	0.07	0.00	0.03
Exit3_R	0.07	0.08	0.09	0.24	0.06	0.15	0.07	0.06	**0.81**	0.12	0.11	0.03
Over1	**0.77**	0.12	0.09	-0.01	0.00	0.11	0.08	0.09	0.06	0.01	0.20	0.10
Over2	**0.76**	0.05	0.15	-0.06	0.09	0.08	0.01	0.03	-0.01	0.04	0.16	0.08
Over3	**0.75**	0.18	0.04	0.09	0.13	0.00	0.04	-0.04	0.03	0.06	0.07	0.08
Over4	**0.81**	0.11	0.07	-0.04	0.03	0.04	-0.01	-0.03	-0.04	-0.01	0.10	0.07
Over5	**0.84**	0.14	0.20	0.03	0.07	0.02	-0.01	-0.02	0.09	0.06	0.12	0.10

Over6	**0.79**	0.19	0.13	0.10	0.10	-0.05	-0.03	-0.08	0.06	0.04	0.01	0.11
Over7	**0.80**	0.24	0.24	0.05	0.15	-0.01	0.04	-0.02	0.05	-0.02	0.05	0.08
Over8	**0.84**	0.19	0.15	0.07	0.15	0.00	0.02	-0.02	0.06	-0.05	0.05	0.09
% of Variance	12.65	7.89	7.04	6.80	6.56	6.40	6.19	5.55	5.05	5.00	4.86	4.32
Cumulative %	12.65	20.54	27.58	34.38	40.94	47.34	53.54	59.08	64.13	69.13	74.00	78.32

TABLE 7: Factor Loadings of Confirmatory Factor Analysis

Constructs	Indicators	Complete Std Loadings [a]	Theta-Delta	Item Reliability	Composite Reliability	AVE
Customization	Custom1	0.75	0.44	0.56	**0.94**	**0.84**
	Custom2	0.83	0.31	0.69		
	Custom3	0.81	0.35	0.66		
	Custom4	0.83	0.31	0.69		
Process Maturity	Maturity1	0.81	0.34	0.66	**0.89**	**0.61**
	Maturity2	0.84	0.3	0.71		
	Maturity3	0.83	0.31	0.69		
	Maturity4	0.73	0.47	0.53		
	Maturity5	0.70	0.51	0.49		
Vendor Interoperability	Opera2	0.77	0.4	0.59	**0.90**	**0.70**
	Opera4	0.87	0.24	0.76		
	Opera6	0.82	0.32	0.67		
	Opera8	0.87	0.24	0.76		
Multiple Sourcing	Multi1	0.79	0.38	0.62	**0.87**	**0.70**
	Multi3	0.88	0.23	0.77		
	Multi4	0.84	0.30	0.71		
In-house Competency	Inhouse1	0.95	0.09	0.90	**0.94**	**0.83**
	Inhouse2	0.97	0.06	0.94		
	Inhouse3	0.8	0.36	0.64		
Proactive Sensing	Proact2	0.83	0.32	0.69	**0.92**	**0.75**
	Proact3	0.92	0.15	0.85		

	Proact4	0.86	0.26	0.74		
	Proact5	0.85	0.27	0.72		
Partnership Quality	Part1	0.86	0.25	0.74	**0.92**	**0.74**
	Part3	0.91	0.17	0.83		
	Part4	0.81	0.34	0.66		
	Part5	0.84	0.29	0.71		
Robustness	Robust1	0.78	0.39	0.61	**0.93**	**0.72**
	Robust3	0.92	0.15	0.85		
	Robust4	0.85	0.27	0.72		
	Robust5	0.82	0.32	0.67		
	Robust6	0.86	0.25	0.74		
Modifiability	Modify1	0.86	0.25	0.74	**0.87**	**0.69**
	Modify3	0.88	0.23	0.77		
	Modify4	0.73	0.46	0.53		
New Capability	Newcap1	0.89	0.21	0.79	**0.92**	**0.80**
	Newcap3	0.92	0.16	0.85		
	Newcap4	0.88	0.23	0.77		
Ease of Exit	Exit1	0.95	0.09	0.90	**0.81**	**0.74**
	Exit2	0.97	0.06	0.94		
	Exit3	0.82	0.33	0.67		
Overall Success	Over1	0.73	0.46	0.53	**0.94**	**0.84**
	Over2	0.71	0.49	0.50		
	Over3	0.72	0.48	0.52		
	Over4	0.74	0.45	0.55		
	Over5	0.86	0.25	0.74		
	Over6	0.84	0.3	0.71		
	Over7	0.94	0.12	0.88		
	Over8	0.94	0.11	0.88		
Fit Indices	X^2(d.f.)	GFI	NNFI	CFI	SRMR	RMSEA
	2776.82 (1061)	0.67	0.85	0.87	0.057	0.069

a: the t-values associated with completed standardized loadings are all significant (t > 1.96)

7.6 Flexibility Scale Assessment

Given that the flexibility scale was designed to reflect four separate dimensions, the author conducted a series of nested models to test the dimensionality of the flexibility scale. Results of the confirmatory factor analyses are presented in table 8. As expected,

the four-factor base model demonstrated the best fit to the data (Model 0: χ^2 (71df) = 187.72, GFI = .86, NNFI = .95, CFI = .96, SRMR = .046, and RMSEA = .095 (p<.05). Specifically, the base model demonstrated superiority over model 1 (orthogonal model) ($\Delta\chi^2$ (10df) = 151.73, p<.001), confirming strong presence of inter-correlations between flexibility dimensions. The base model also had better fit than model 2 of one factor model ($\Delta\chi^2$ (6df) = 868.77, p<.001), suggesting that flexibility is not a uni-dimensional construct. In addition, the base model prevailed over the two two-factor models (model 3: $\Delta\chi^2$ (5df) = 417.35, p<.001; model 4 $\Delta\chi^2$ (5df) = 626.91, p<.001), indicating that flexibility indeed consists of four distinct dimensions. Furthermore, the base model was a better fit than the alternative second order model 6 ($\Delta\chi^2$ (3df) = 11.95, p<.01). There is however, no significant difference between base model and the second order model 5 ($\Delta\chi^2$ (2df) = 3.61, p = n.s.). This suggests a possibility that a latent flexibility variable may exist to account for the first three dimensions of the outsourcing flexibility. Nonetheless, the base model is still superior to model 5 with respect to fit indices (SRMR and REMEA of the base model are lower that those of the model 5). On this ground, the study still concluded that the results provided sufficient justification for the hypothesized four distinct dimensions of flexibility.

Together, the fit indices, factor loadings and t-values, and correlation matrix all provided evidence of both the convergent and discriminant validity of the indicators as well as the overall fit of the measurement model. As a result, 49 items for 12 constructs that demonstrated the strongest psychometric properties were retained. The author then moved to the next step to examine the causal relationship against hypotheses in the structure model.

TABLE 8: Comparing the Fit of Alternative Nested Models of Flexibility

	Flexibility Models	**Fit Indices**							**Model Comparison Test**		
		χ^2	df	GFI	NNFI	CFI	SRMR	RMSEA	Comparison	$\Delta\chi^2$	Δdf
0	**Base Model** (four distinct flexibility dimensions)	187.72	71	.86	.95	.96	.046	.095			
	Alternate nested models										
1	**Orthogonal model** (four distinct dimension without inter-correlations)	339.45	77	.77	.90	.91	.30	.14	B vs A	151.73***	10
2	**One factor model** (all items loading on a single factor)	1056.49	77	.52	.62	.67	.17	.28	C vs A	868.77***	6
3	**Two factor model_1** (robustness, modifiability and new capability combined versus ease of exit)	605.07	76	.62	.79	.82	.11	.22	D vs A	417.35***	5
4	**Two factor model_2** (robustness, modifiability combined versus new capability, ease of exit combined)	814.63	76	.61	.71	.75	.17	.23	E vs A	626.91***	5
5	**Second-order model_1** (test for 2nd-order factor accounting for robustness, modifiability, and new capability)	191.33	73	.86	.95	.96	.052	.096	F vs A	3.61	2
6	**Second-order model_2** (test for 2nd-order factor accounting for the four dimensions)	199.67	74	.86	.95	.95	.12	.097	G vs A	11.95**	3

CHAPTER 8. HYPOTHESES TESTING

It has been suggested that the estimation of structural equation models by maximum likelihood methods be used only when sample sizes are at least 200 (Byrne, 1994). Since the sample size of this study is only 171, this study used regression not SEM to test our measurement model. Hierarchical regression was chosen as a primary test of the hypotheses, with the presence of the three control variables. Other post hoc analysis, such as, usefulness analysis and robustness check with limited SEM were also introduced to examine whether the structural model truly tests what it intends to test and exhibits stability across methodology. This chapter provides and discusses the results of structural model through hierarchical regression, LISREL, and additional analyses.

8.1 Construct Validation

The correlation matrix (table 9) reports the means, standard deviations, intercorrelations, and reliabilities (Cronbach's alpha) for all variables. The multiitem scales' reliabilities, were acceptable, all exceeding the 0.70 value recommended by Nunnally (1978). The range of responses on all of the variables was broad, avoiding a restriction of range problem in the data. The means ranged from 3.20 to 4.81, with multiple sourcing and new capability were the lowest two. Outsourcing success across the respondent organizations averages at the mean of 4.50 (SD= 1.14). The various dimensions of outsourcing flexibility also varies, with the respective mean of 4.54 (SD= 1.03) for robustness, 4.12 (SD= 1.02) for modifiability, 3.31 (SD= 1.09) for new capability, and 4.39 (SD= 1.35) for ease of exit. The inter-correlations among the four flexibility constructs are moderate

(from 0.23 to 0.56), which was expected because they are conceptually related constructs. The deployment of the various flexibility maneuvers is also different. Except for multiple sourcing (mean= 3.20, SD= 1.63), the means of other maneuvers all ranges 4.15 and above (with SDs spanning 0.97 to 1.48). The correlation matrix shows statistically significant correlations in the direction expected between antecedents and flexibility dimensions. Meanwhile the inter-correlations among independent variables were generally low (0.28 at top), thereby minimizing the problem of multicollinearity. In particular, table 10 summarized the correlations of contractual provision and its sub-dimensions.

TABLE 10: Correlations of Contractual Provision and Sub-dimensions

		Mean	SD	0	1	2	3	4	5
0	**Contractual Provision**	**0.69**	**0.22**						
1	Contract Duration	0.72	0.45	.43**					
2	Pricing Structure	0.53	0.50	.53**	-.04				
3	Dispute Resolution	.71	.46	.45**	.01	.09			
4	Renegotiation	.79	.41	.52**	.06	.09	.05		
5	Innovation clause	.68	.47	.51**	.05	.07	-.05	.17*	

a N = 171

* p<.05   ** p<.01   *** p<.001

b Coding for contract duration, pricing structure, dispute resolution, renegotiation, and innovation clause : 0= inflexible provision, 1= flexible provision.
c Contractual Provision is the mean of contract duration, pricing structure, dispute resolution, negotiation, and innovation

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TABLE 9: Means, Standard Deviations, Scale Reliabilities, and Inter-Correlations

	Scales	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Outsourcing Success	4.50	1.14	(.84)														
2	Robustness	4.54	1.03	.52**	(.91)													
3	Modifiability	4.12	1.02	.52**	.56**	(.85)												
4	New Capability	3.31	1.09	.49**	.49**	.54**	(.90)											
5	Exit of Exit	4.39	1.35	-.05	.00	.08	.07	(.85)										
6	Minimal Customization	4.51	1.31	.11	.26**	.26**	.02	.22**	(.87)									
7	Process Maturity	4.81	0.99	.38**	.29*	.20*	.22*	0.11	.05	(.86)								
8	Vendor Interoperability	4.19	1.34	.13	.25**	.20*	.10	.03	.20**	.12	(.89)							
9	Multiple Sourcing	3.20	1.63	.09	.16*	.09	.09	.12	.01	-.04	.10	(.87)						
10	In-house Competence	4.24	1.48	-.01	.06	.07	.03	.39**	.13	.01	.09	.27**	(.92)					
11	Proactive Sensing	4.15	1.17	.15	.15*	.13	.27**	.38**	.14	-.01	.16*	.17*	.25**	(.90)				
12	Partnership Quality	4.57	1.24	.32**	.32**	.32**	.26**	-.01	.18*	.13	.20*	-.01	.02	.10	(.91)			
13	Contractual Provision	0.69	0.22	.33**	.24**	.33**	.34**	.05	-.06	.03	.06	.17*	.12	.12	.19*	-		
14	Contract Value	2.14	1.44	.21**	.33**	.24**	.31**	-.03	.06	.22*	.05	.20*	.05	.15	.05	.23**	-	
15	Outsourcing Type	0.32	0.47	-.24**	-.28**	-.23**	-.15	-.07	-.08	.01	-.07	-.08	-.15	.00	-.11	-.22**	-.11	-

8.2 Regression Results

This study employed hierarchical regression analysis to test the hypotheses. For each hypothesis, this approach allowed the researcher to regress every single flexibility dimension (robustness, modifiability, new capability, and ease of exit) against a set of control variables and then add the seven managerial maneuvers (Hypothesis 1-7) into the equation to test whether the incremental change in R^2 was statistically significant. The control variables included contractual provision, contract value, and outsourcing type. To assess the impact of the four flexibility dimensions on outsourcing success (Hypothesis 8), this study conducted a linear regression with the four flexibility dimensions (robustness, modifiability, new capability, and ease of exit) as predictors and outsourcing success as the dependent variable. The author interpreted results by examining the change in F (ΔF) at step two and by assessing individual parameters based on t-values. The regression results are shown in table 11 and table 12 separately, and table 13 summarizes the results by hypothesis. The value of VIF under collinearity statistics were all close to 1.00 (from 1.058 to 1.195), suggesting that multicollearnity was not an issue.

8.2.1 Antecedents of Flexibility

For each hypothesis the author tested the control variables in step one before hypotheses 1 to 7 were validated to examine how the seven post-contractual mechanisms marginally affect each of the four flexibility constructs. The top of Table 11 displays the results of the multiple regression analysis with the seven predictor variables. Throughout the four flexibility models (robustness, modifiability, new capability, and ease of exit), contractual provision was significantly associated with modifiability ($\beta = .25$, $p<.001$) and new

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capability (β = .22, p<.001). Contract value was significantly associated with robustness (β = .21, p<.001) and new capability (β = .20, p<.01). Outsourcing type was only negatively associated with robustness (β = -.18, p<.01). More importantly, adding the strategic maneuvers in step two significantly increased explained variance in all four flexibility dimensions: robustness 16% (adjusted R^2 = .31, ΔF = 5.21, p<.001), modifiability 12% (adjusted R^2 = .24, ΔF = 3.89, p<.01), new capability 9% (adjusted R^2 = .21, ΔF = 2.60, p<.05), and ease of exit 28% (adjusted R^2 = 31, ΔF = 9.09, p<.001).

Specifically, for robustness, the model accounts for 36% of the variance (F = 8.16, p < 0.001), and addition of the seven independent variables was significant too (ΔR^2 = 0.16, ΔF = 5.21, p < 0.001). Three of the four paths leading to robustness were significant: the extent of customization (β = 0.20, p < 0.001), process maturity (β = 0.18, p < 0.01) and partnership quality (β = 0.17, p < 0.05). Contrary to our expectation, vendor interoperability was not significant (β = 0.11, p = ns). In terms of modifiability, the model accounts for 28% of the variance (F = 5.86, p < 0.001), and addition of the seven variables was significant as well (ΔR^2 = 0.12, ΔF = 3.89, p < 0.01). Similar to the effects on robustness, three of the four hypothesized paths were significant: the extent of customization (β = 0.21, p < 0.01), process maturity (β = 0.18, p < 0.05) and partnership quality (β = 0.16, p < 0.05). Again, vendor interoperability was not significant (β = 0.08, p = ns). In terms of new capability, the model accounts for 26% of the variance (F = 5.20, p < 0.01), and addition of the seven variables was significant as well (ΔR^2 = 0.09, ΔF = 2.60, p < 0.05). The two hypothesized paths were both significant: proactive sensing (β = 0.23, p < 0.01) and partnership quality (β = 0.17, p < 0.05). For the last flexibility dimension, namely ease of exit, the model accounts for 36% of the variance (F = 8.21, p

< 0.001), and addition of the seven variables was significant as well ($\Delta R^2 = 0.28$, $\Delta F =$ 9.09, $p < 0.001$). In terms of individual paths, four hypothesized relationships were significant: the extent of customization ($\beta = 0.20$, $p < 0.01$), vendor interoperability ($\beta = 0.16$, $p < 0.05$), in-house competency ($\beta = 0.19$, $p < 0.01$), and proactive sensing ($\beta = 0.25$, $p < 0.01$). On the other hand, process maturity ($\beta = 0.06$, $p = $ ns), multiple sourcing ($\beta = 0.08$, $p = $ ns) and partnership quality were not significantly associated with ease of exit as expected. ($\beta = 0.07$, $p = $ ns).

Across the four flexibility models, the results present an interesting pattern with respect to individual hypothesis. Hypotheses 1 to 3 state that the three pre-emptive maneuvers (minimal customization, process maturity, and vendor interoperability) are positively associated with robustness, modifiability, and ease of exit. Results showed support for Hypothesis 1, with lower customization significantly predicting robustness, modifiability and ease of exit. Hypothesis 2 was partially supported, with process maturity significantly predicting robustness, modifiability, but the relationship with ease of exit was not significant. Similarly, hypothesis 3 was also partially supported, with vendor interoperability predicting ease of exit, but the relationships with robustness and modifiability were not significant. As expected, the relationships between these pre-emptive maneuvers and new capability were not significant.

Against expectation, H4 prediction that the level of multiple sourcing positively impacts ease of exit was not supported. Similarly, H5 predicted that the extent to which the outsourcing client committed in-house competency positively influence its ease of exit and received support in the data. H6 suggested that the extent to which the outsourcing client promoted proactive sensing positively influence its outsourcing

flexibility in terms of new capability and ease of exit. Both of them were strongly supported by the results. Finally, H7 predicted that the extent of the quality of the outsourcing partnership positively influences the first three types of flexibility and negatively influence the last one, ease of exit. The results suggested that partnership was a significant predictor for robustness, modifiability, and new capability, but was not negatively associated with ease of exit.

TABLE 11: Results of Hierarchical Regression Analysis: Independent Variables

Variables	Robustness		Modifiability		New Capability		Ease of Exit	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Contractual Provision [b]	.16*	.13	.28***	.25***	.27***	.22***	.15^t	.11
Contract Value [c]	.28***	.21***	.16*	.12^t	.24***	.20**	.14^t	.07
Outsourcing Type [d]	-.21***	-.18**	-.15*	-.12	-.06	-.07	-.12	-.08
Minimal Customization		.20***		.21**		-.04		.20**
Process Maturity		.18**		.18*		.10		.06
Vendor Interoperability		.11		.08		.00		.16*
Multiple Sourcing		.08		.08		-.04		.08
In-house Competence		-.04		-.01		-.04		.19**
Proactive Sensing		.03		.04		.23**		.25**
Partnership Quality		.17*		.16*		.17*		.07
F	12.64***	8.16***	10.28***	5.86***	10.49***	5.20**	4.50	8.21***
ΔF		5.21***		3.89**		2.60*		9.09***
R^2	.20	.36	.17	.28	.17	.26	.08	.36
ΔR^2		.16		.12		.09		.28
Adjusted R^2	.18	.31	.15	.24	.15	.21	.06	.31
Usefulness Analysis								
ΔF		8.75***		7.55***		7.27***		2.14**
ΔR^2		0.11		0.11		0.11		0.03

a Model statistics are standardized betas

b Contractual Provision measured on a 0-1 scale (0 = inflexible, 1 = flexible)

c. Contract value classified into eight categories (1 = < 500K, 8 = > 1 billion)

d. Outsourcing Type measured on a 0-1 scale (0 = IT outsourcing, 1 = Business Process Outsourcing)

t $p < .10$ * $p<.05$ ** $p<.01$ *** $p<.001$ (Two-tailed)

8.2.2 Effects of Flexibility on Outsourcing Success

Grover et al. (1996) and Aborz et al. (2005) have proven strong associations between partnership and ITO success, consistent with findings in this research (the correlation between Partnership Quality and Outsourcing Success being 0.32**, Table 9, p.101). The author thus employed hierarchical regression again to flesh out incremental contributions by flexibility constructs to outsourcing success. Therefore, partnership quality was entered in the first step as a control variable, and the four flexibility constructs were entered in step 2.

Table 12 presents results related to the impact of flexibility on outsourcing success. The model accounts for 36% of the variance ($F = 17.96$, $p < 0.001$), and addition of the four flexibility constructs was significant too ($\Delta R^2 = 0.25$, $\Delta F = 15.63$, $p < 0.001$). In line with expectation, partnership quality was significantly associated with outsourcing success in both steps, but more so in the first step ($\beta = 0.33$, $p < 0.001$). Beyond the control variable of partnership quality, the hypotheses (H8) that flexibility leads to greater outsourcing success were largely supported. There are positive associations between outsourcing success and robustness (H8a, $\beta = 0.26$, $p < 0.001$), modifiability (H8b, $\beta = 0.19$, $p < 0.05$), and new capability (H8c, $\beta = 0.19$, $p < 0.05$). Contrary to our expectation, the negative effect of ease of exit on success was not supported (H8d, $\beta = 0.01$, $p = ns$). However, the results showed that variance explained by the flexibility variables dropped considerably after controlling for the effect of partnership quality (F values dropped from 20.19 to 17.96).

TABLE 12: Results of Hierarchical Regression Analysis: Dependent Variable

Flexibility Dimensions	Outsourcing Success [b]	
	Step 1	Step 2
Partnership Quality	.33***	.14*
Robustness		.26**
Modifiability		.19*
New Capability		.19*
Ease of Exit		.01
F	20.19***	17.96***
ΔF		15.63***
R^2	.11	.36
ΔR^2		.25
Adjusted R^2	.10	.34

a Model statistics are standardized betas

b. Outsourcing success measured on a 7-point scale (1=strongly disagree, 7=strongly agree)
*[t] p < .10   * p<.05   ** p<.01   *** p<.001   (two-tailed test)*

8.3 Summary of Regression Results

Throughout the four flexibility models, the results suggested that, except multiple sourcing, the other six maneuvers were all significant predictors (at least partially) for flexibility dimensions, which in return determine the level of outsourcing success. Overall there are 15 supported out of 21 hypotheses, as summarized in Table 13.

TABLE 13: Results by Hypothesis from Hierarchical Regression

Hypothesis	Results	Supported	
		Yes	No
H1a	Customization minimization → greater robustness	X	
H1b	Customization minimization → greater modifiability	X	
H1c	Customization minimization → greater ease of exit	X	
H2a	Process Maturity → greater robustness	X	
H2b	Process Maturity → greater modifiability	X	
H2c	Process Maturity → greater ease of exit		X
H3a	Vendor interoperability → greater robustness		X
H3b	Vendor interoperability → greater modifiability		X
H3c	Vendor interoperability → greater ease of exit	X	
H4	Multiple Sourcing → greater ease of exit		X
H5	In-house competency → greater ease of exit	X	
H6a	Proactive sensing → greater new capability	X	
H6b	Proactive sensing → greater ease of exit	X	
H7a	Partnership quality → greater robustness	X	
H7b	Partnership quality → greater modifiability	X	
H7c	Partnership quality → greater new capability	X	
H7d	Partnership quality → lower ease of exit		X
H8a	Robustness → greater outsourcing success	X	
H8b	Modifiability → greater outsourcing success	X	
H8c	New capability → greater outsourcing success	X	
H8d	Ease of exit → greater outsourcing success		X

8.4 Robustness Check with LISREL

Due to the limited sample size (n = 171), this study could not employ a full structural equation model where both the structural and measurement parameters were simultaneously estimated. Since our research model involves multiple dependent variables, however, it is helpful to use the limited strategies to test the structure model in LISREL (Bollen 1996; Fan et al. 1999). Specifically, a composite single-indicator model was constructed with the measurement error parameters fixed based on reliability estimates gained from the formula for Cronbach's alpha. This study included this analytic technique because this reflects the commonly used regression approach where the researcher assumes that a single infallible scale can adequately assess the scores of individuals on a construct (see figure 5 for a graphic presentation of the path coefficients). Results are tabulated in table 14, consisting of common fit indices, standardized path coefficients, standard errors, t-values and hypothesis testing. The values of GFI and CFI were higher than 0.90, and SRMR was 0.041, indicating an acceptable structural model. The results for individual paths largely corroborated the regression analysis in preceding section. However, H1b, the impact of customization on modifiability was not supported, likely due to high error term and/ or insufficient sample size.

FIGURE 5: Graphical Presentation of Result from Structural Equation Modeling
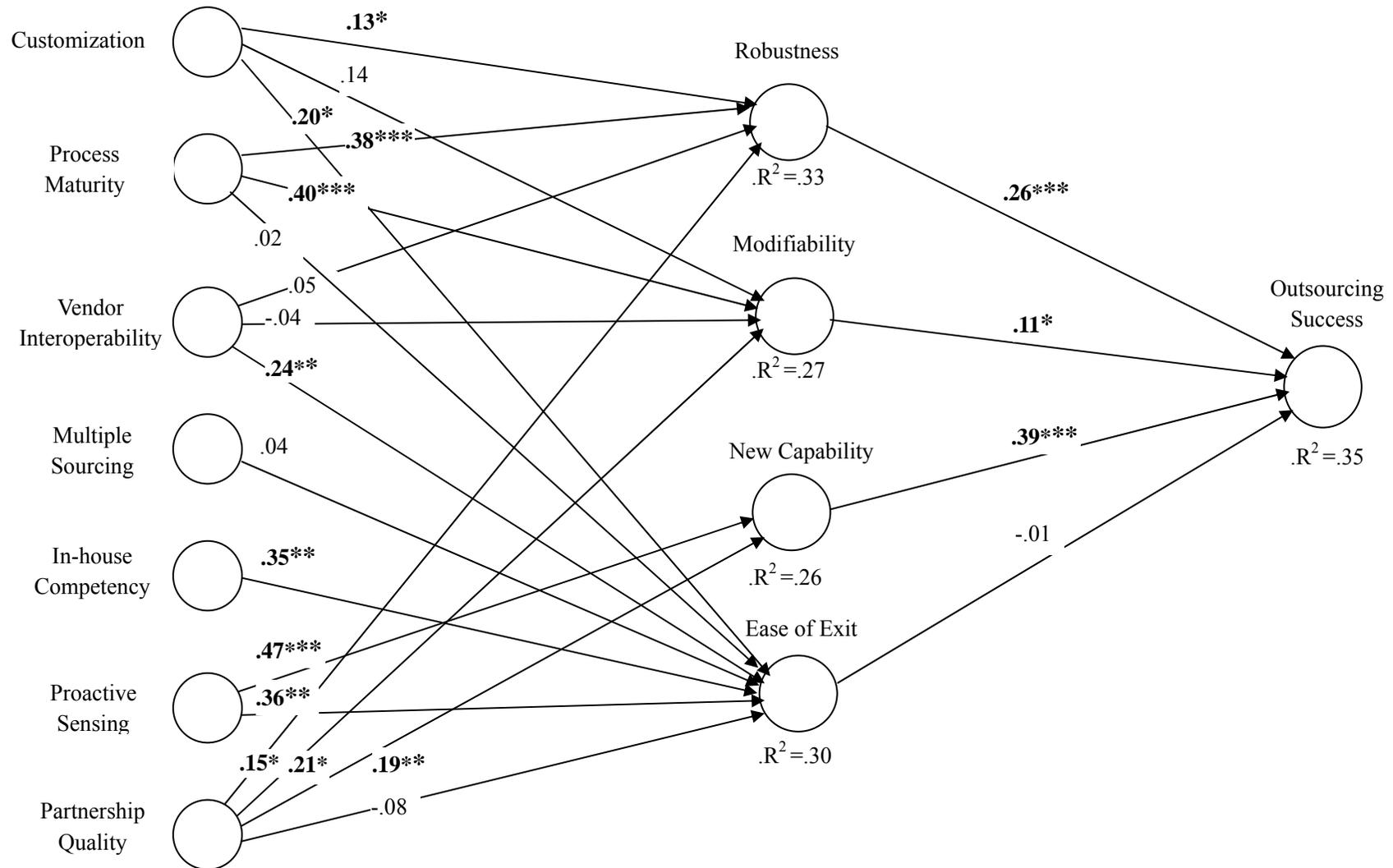
TABLE 14: Results by Hypothesis from Structural Equation Modeling (LISREL)

Hypothesis		Std. Path Coefficients	Std. Errors	t-value	Supported	
					Yes	No
H1a: Customization minimization → Robustness		.13*	.08	1.72	X	
H1b: Customization minimization → Modifiability		.14	.10	1.45		X
H1c: Customization minimization → Exit		.20*	.10	2.02	X	
H2a: Process Maturity → Robustness		.38***	.09	4.00	X	
H2b: Process Maturity → Modifiability		.40***	.12	3.22	X	
H2c: Process Maturity → Exit		.02	.12	.16		X
H3a: Interoperability → Robustness		.05	.08	.61		X
H3b: Interoperability → Modifiability		-.04	.10	-.36		X
H3c: Interoperability → Exit		.24**	.10	2.36	X	
H4: Multiple Sourcing → Exit		.04	.05	.69		X
H5: In-house → Exit		.35**	.15	2.27	X	
H6a: Proactive → New capability		.47***	.10	4.47	X	
H6b: Proactive → Exit		.36**	.15	2.45	X	
H7a: Partnership → Robustness		.15*	.08	2.01	X	
H7b: Partnership → Modifiability		.21*	.10	2.11	X	
H7c: Partnership → New capability		.19**	.07	2.67	X	
H7d: Partnership → Exit		.08	.10	.84		X
H8a: Robustness → Success		.26***	.07	3.57	X	
H8b: Modifiability → Success		.11*	.06	1.81	X	
H8c: New capability → Success		.39***	.09	4.43	X	
H8d: Exit → Success		-.01	.05	-.18		X
Fit Indices	χ^2(d.f.)	GFI	NNFI	CFI	SRMR	RMSEA
	93.31/16	0.92	0.45	0.92	0.041	0.19

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8.5 Usefulness of Flexibility Mechanisms as Predictors

Beyond controlling for the effects from contractual provision, contract value, and outsourcing type, this study also ran usefulness test to determine if the seven managerial mechanisms collectively made significantly incremental contribution to explaining the variance in each of the four flexibility models. The bottom of the table 11 reports the results of testing our hypotheses with a usefulness analysis (Darlington, 1968). A usefulness analysis examines a predictor's contribution to unique variance in a criterion beyond another predictor's contribution. When the author entered the three control variables in step one and enter additional seven mechanism variables in step two, the changes in explained variance were all marginally significant in terms of robustness (ΔR^2 = 16%), modifiability (ΔR^2 = 12%), new capability (ΔR^2 = 9%), and ease of exit (ΔR^2 = 28%). In contrast, when the author switch the sequence by entering the seven mechanism variables first and then the three control variables, the addition of the control variables produced less amount of incremental explained variance in terms of robustness (ΔR^2 = 11%; F = 8.75, p < 0.001), modifiability (ΔR^2 = 11%; F = 7.55, p < 0.001) and ease of exit (ΔR^2 = 3%; F = 2.14, p < 0.01), except for new capability (ΔR^2 = 11%; F = 7.27, p < 0.001). The results largely attested that the seven mechanism variables collectively are stronger predictors in accounting for the model variances than contractual provision and contract value.

To sum up, the usefulness analysis plus the SEM one-indicator test jointly complement the main results from regression analysis, suggesting that the structural model is statistically valid and robust across organizational contexts and research tools. Discussion of the results is presented in the next chapter.

CHAPTER 9: DISCUSSION

The purpose of this study was to validate conventional wisdom about outsourcing flexibility by using an integrative model that was developed from the outsourcing and flexibility literature, a large sample exploratory survey, and structured interviews. A set of managerial mechanisms was explored as determinants of flexibility, helping to understand how management harnesses flexibility in their favor, which ultimately affects the success of outsourcing engagements. The following sections present key observations regarding the major pieces of the model. The author first discuss the flexibility instrument development, the control variables, and then explore the findings from the perspectives of the respective flexibility maneuvers as well as each dimension of outsourcing flexibility, before discussing the relationship between flexibility and outsourcing success.

9.1 Flexibility Measures

Methodologically this study developed and validated an outsourcing flexibility instrument with sound psychometric properties. Prior researchers, such as Gosain et al (2004) and Ybarra & Wiersema (1999) proposed a two-dimensional measure of flexibility (continuance and exit flexibility). From the correlation table (table 9), robustness, modifiability and new capability are moderately inter-correlated ($p = 0.49$-0.56), while their correlations with ease of exit are much lower ($p = 0.00$- 0.07). This result is consistent with the two-dimensional flexibility that Gosain et al.'s (2004) proposed. Nonetheless, in this study the author went one step further to demonstrate that flexibility actually comprises four statistically correlated but conceptually distinct dimensions

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(robustness, modifiability, new capability, and ease of exit), each of which calls for different types of management practices. Additionally, the author also demonstrated that the notion of flexibility is not hidden behind partnership or outsourcing success measures. Rather, it is a multi-faceted concept linked to partnership and outsourcing success. This four-dimensional approach gives researchers a new theoretical lens to approaching flexibility. This model also gives researchers an empirical starting point for examination of outsourcing flexibility.

9.2 Control Variables

The control variables in outsourcing, i.e., contractual provision, contract value and types of outsourcing, show significant associations with the different dimensions of flexibility. The significant and positive correlations of contractual provision with modifiability and new capability are in line with literature (Harris et al. 1997), indicating that adjustment mechanisms   (shorter duration, variable pricing, dispute resolution mechanism, renegotiation provision, continuous improvement clause) reflected in contractual provision are effective in enabling outsourcing flexibility. As people are probably more familiar with robustness and exit measures, these can be well anticipated and spelled out in a standard contract without much adjustment. On the other hand, provisions for modifiability and new capability must be built into the contract carefully and with explicitly written adjustment mechanisms as illustrated above.

Despite the conventional beliefs that higher contract value can boost an organization's bargaining ability to negotiate flexibility, contract value was only shown to positively influence robustness and new capability within an outsourcing arrangement.

The findings suggest that big contracts do not necessarily imply easier negotiation for modifiability. Vendors may be more willing to be scalable on the generic platform or even to introduce new capabilities that they can leverage across other clients, but they are reluctant to modify their standard service delivery offerings to meet the firm-specific change requests. Higher contract value also does not necessarily make it easier for exit, a situation which client outsourcing firms with exit intention may regard as irrelevant in subsequent decision making.

As shown by the negative coefficients, business process outsourcing (finance/accounting/HR) also seems more demanding than conventional IT outsourcing. The relative difference is particularly significant for robustness. BPO is generally more complex as it involves a simultaneous outsourcing of technology, workflow, and organizational expertise, thus making it harder to provide for scalability for transaction variations relative to IT outsourcing. On the other hand, BPO and ITO may share similar mechanisms when it comes to alterations of service attribute, new capability generation and negotiation for alliance dissolution.

9.3 Flexibility Maneuvers

With the presence of a nomological framework revolving around flexibility, the author demonstrated that a portfolio of managerial mechanisms can be utilized pragmatically to yield a more complete view of the flexibility phenomenon. Our regression analyses lend support to some of the hypothesized causal links in the strategic-flexibility approach (Sanchez 1995). The structure model serves as an empirical starting point for examination of outsourcing flexibility.

Results for preemptive strategies (minimize customization, enhance process maturity, and leverage on vendor interoperability, i.e., H1 to H3) seem to suggest that the extent of customization is a significant predictor of the outsourcing firm's flexibility in terms of robustness, modification, and new capability. As firms standardize their process in outsourcing, the flexibility effect is apparently stronger. In other words, the investment of specific assets was found to have a detrimental impact on the flexibility of alliance relationship (Ybarra and Wiersema 1999). This finding is also consistent with what suggested by Transaction Cost Economy (TCE).

Similarly, ensuring that outsourced processes are sufficiently mature helps in enhancing robustness and modifiability in outsourcing. Such processes are understood well-enough to be scalable and modified. The lack of significant relationship with ease of exit indicates that process maturity (with the business rules surfaced, rationalized, and routinized), only offers flexibility within an existing outsourcing relationship. Although the transfer of process knowledge may be easier, significant time and efforts (e.g., in contractual negotiation) may still be required to structure a new outsourcing relationship with alternative vendors. Thus, the contribution to ease of exit may be limited.

Although this study suggested that the third route to preemptively enhance outsourcing flexibility is to exploit vendor's interoperability, the results show support for ease of exit only. It appears that even though vendor interoperability promises to offers easy "plug and unplug," the open platform is largely just technical inter-operability, which is not sufficient to offer robustness and modifiability. The purpose for a vendor's generic infrastructure is to cater to a large number of outsourcing clients simultaneously. As clients outsource more unique processes, however, the vendor still has to build up

specific knowledge in designing and implementing client's individual needs, and align them with its own technical platform to achieve client's expectation for transaction variations and requests for change. On the other hand, outsourcing firms do benefit from vendor's interoperable infrastructure when they intend to decouple with vendor's system, as opposed to a unique, proprietary system.

With respect to the influence of protective maneuvers for outsourcing flexibility, this study does not find support for the widespread perception that the presence of multiple vendors provides greater ease of exit (H4). The contradiction may be explained by prior studies, which have demonstrated that firms may deploy multiple outsourcing vendors for other reasons apart from contingency. The primary objective is argued to be cost reduction (Lacity and Willcocks 1995), especially when outsourcing is based on commodity-like mature processes. In addition, when large firms outsource complex process, they normally contract several vendors in hope of assembling best practices across vendors and complement with each other in the case that one vendor has resource shortfall (Currie and Willcocks 1998; Willcocks and Lacity 2001). The separation of domain expertise among multiple vendors and deepened relationships with individual vendors for each critical process make the presumed transition impractical, as outsourcing firms may ultimately find out that one vendor can only excel in certain process or service scope. Additional, firms may even create ongoing competition among existing vendors to encourage optimal performance and dissuading opportunism (Cross 1995; Huang et al 2004). Under such situation the flexibility benefit may be a secondary concern at best. When firms structure their outsourcing deals involving agendas away from flexibility goal, the benefits may not come about naturally to the extent that firms

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seek to swiftly switch among the contracted vendors.

In contrast, the empirical findings of H5's hypothesis confirm that firms do use internal buffer to mitigate dependency and guide against potential damage associated with exit (Eardley 1997; Eppink 1978). As effective as it is an exit strategy, the in-house competence is only supposed to be a passive resource. Its lack of significant relationship with robustness, modifiability and new capability affirms that the retention of in-house competence is not used as dedicated resources to support outsourcing on an operational basis.

Consistent with our predictions in H6a and H6b, proactive sensing as an exploitive maneuver contributes to flexibility in terms of new capability generation and ease of exit. Through constant management vigilance to scan the environment, to assimilate business intelligence for innovation, and to keep abreast with dynamics in vendor's market, organizations are able to capitalize on early indications of new ideas, capabilities, and trends to guard and strengthen their positions continuously in an outsourcing relationship (Alexander 1995; Haeckel 1999). Not only does proactive sensing bolster the resilience of the outsourcing organization, but it also creates a competitive advantage in the marketplace as the organization can sense threats and respond to them quickly when the need for a new relationship arises. (Sheffi and Rice 2005). The strategic and external orientations of proactive sensing maneuver, however, do not affect robustness and modifiability at the operational level, as expected.

The corrective flexibility maneuver, fostering strong partnership, also seems effective. As hypothesized in H7a to H7c, strong partnership is positively related to robustness, modifiability, and new capability, lending support to social exchange theorists. Contrary

to expectation of the negative association in H7d however, the social embeddedness of partnership does not prevent firms from exiting an undesirable relationship. The findings can be interpreted in several ways. Firms may take a transactional view of the established partnership and exchange-specific investment as sunk cost and therefore are willing to relinquish it when necessary. Equally possible, when a partnership confronts dramatic changes indicating that the alliance should be dissolved, partners may simply break up the existing alliance but work together to form a new one (Mody 1993). This result is actually not inconsistent with those researchers who have argued for the role of partnership in developing adaptable arrangements (Ybarra and Wiersema 1999). The flexibility may go so far as to allow partners to dissolve the current relationship in favor of a later more effective arrangement.

9.4 Outsourcing Flexibility and Outsourcing Success

The survey results bear evidence of the importance of flexibility for outsourcing success. Other than ease of exit, the three dimensions flexibility – robustness, modifiability, and new capability, were shown to contribute significantly to outsourcing success. However, the impacts of the different dimensions are unequal. Planning for robustness is crucial as operational changes in service delivery (i.e., transactional fluctuations) are often the most commonly recurring requirements in the establishment of service level agreement in outsourcing. Modifiability and new capability are also important for success, but probably less common in an outsourcing arrangement, unless they have been consciously negotiated and provided for (evident in the descriptive statistics in table 9, the respective means are robustness= 4.54, modifiability= 4.12, and new capability= 3.31).

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Although ease of exit turned out not to relate significantly to outsourcing success, the author is hesitant to conclude that it is unimportant. It seems that the existing measure of outsourcing success is defined within the scope of an existing outsourcing relationship. Yet, an outsourcing relationship can be very successful but highly restrictive in terms of ease of exit. Ease of exit offers flexibility more as a contingent risk-management buffer where its value would only be recognized when an outsourcing arrangement fails. The empirical findings suggest that ease of exit may escape management attention, given the apparent lack of relationship with outsourcing success. There may be a need to develop alternative effectiveness measures for ease of exit in outsourcing (e.g., vendor risk mitigation). A more balanced perspective where ease of exit is assessed in tandem with the rather limited "short-term" notion of outsourcing success may be useful.

CHAPTER 10. IMPLICATIONS

10.1 Research Contribution

This study extends existing outsourcing research along three main avenues. First, the integration of the various concepts of flexibility anchored in multiple disciplines advances our understanding of the flexibility issue in outsourcing. Specifically this study presents the notion of flexibility with four key dimensions as robustness, modifiability, new capability and ease of exit. Second, recognizing the inadequacy of using the contract as a sole means to manage flexibility in outsourcing, the author proposed a portfolio-management approach based on a holistic framework in terms of intentional and temporal aspects (Evans 1991), in light of coordination theory. Last but not least, the author strove to populate this framework by consciously surfacing "best practices" of flexibility management in outsourcing. The natures of the respective maneuvers are elaborated and hypotheses on their relationships to the different aspects of outsourcing flexibility are put forth. Finally, the author also proposed a positive impact of flexibility dimensions on outsourcing success.

10.2 Research Implication

The need for flexibility is imperative in outsourcing engagement as oftentimes outsourcing organizations tend to underestimate potential changes to service provision, a common problem reported by Currie and Willcocks (1998). When organizations do prioritize flexibility, they tend to view it as a single concept and utilize inadequate managerial approaches (for example, take a plain vanilla process, cultivate sound

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partnership, etc.). However, our results suggest that management that desires overall outsourcing flexibility, but only considers conventional type of flexibility (typically robustness or modifiability), may experience disappointment. This study thus presented a systematic conceptualization of flexibility management in outsourcing context. The empirical findings also suggested the importance of other variables that are currently treated as control variables. Contractual provision was found still to be a key mechanism in building in modifiability and new capability, which are the two dimensions of flexibility that apparently receive less management attentions than others. Similarly, outsourcing contracts of higher value appear to be better able to negotiate robustness and new capability.

Upon establishing a rigorous flexibility instrument, the author also reviewed the outsourcing literature, identified and validated a set of strategic maneuvers underlying the four different pathways that organizations can use to enhance flexibility with their outsourcing vendors. These maneuvers map into coherent actions that firms can take with respect to process design, resources allocation, strategic envision, and relationship management. Specifically, by minimizing customization and enhancing process maturity, organizations can consciously put preemptive maneuvers in place to reduce interdependencies and information processing needs to response to competitive changes. In parallel, retaining in-house competency as a protective maneuver can be defensively planned up-front to "backup" the current outsourcing operation in case of extreme situations. Moreover, once an outsourcing contract is sealed, exploitive maneuver can be instituted, e.g., through proactive sensing to enhance the organizational alertness to take advantage of emerging opportunities in outsourcing. Finally, outsourcing flexibility can

also be attained through corrective maneuver. The reactive adaptation capability of an organization can be improved via stronger partnership.

The empirical findings also highlighted some proposed flexibility maneuvers that are ineffective in enabling flexibility. Vendor interoperability for example, appears to offer little to boost robustness and modifiability. While such a flexible infrastructure may facilitate upgrade and maintainability for vendors, the benefits may not necessarily be translated to organizations. Similarly, the strategy of multiple sourcing does not seem to contribute to outsourcing flexibility either – highlighting that such practice could be adopted for other reasons such as competitive bidding or best sourcing of specialized expertise. Interestingly, strong partnership quality is also found to have no negative effect in hindering ease of exit, suggesting a non-obligatory transactional market exchange even within a good relationship. Such findings certainly do not invalidate the proposed research framework, but they suggest that deeper theorizing may be required (e.g., to clarify outsourcing flexibility for organizations and vendors, to differentiate flexibility maneuvers for small and large value outsourcing contracts, etc.).

Placed in different temporal/intentional quadrants, this portfolio approach can complement the traditional contracting governance. This set of strategic maneuvers, in conjunction with careful deployment of contractual practices (e.g., contractual provision, accumulating the value of outsourcing contracts), will significantly augment an organization's ability to adapt to dynamic changes throughout outsourcing life cycle. The strategic maneuver framework also helps organizations to clarify the dimensions of flexibility that they seek, as different maneuvers contribute differently to different aspects of outsourcing flexibility. For example, preemptive and protective maneuvers are

irrelevant to the "out-of-box" thinking to develop new capability. Similarly, while proactive sensing enhances flexibility in terms of new capability and ease of exit, the external orientation of dynamic adaptation does not concern robustness and modifiability within the context of daily operation.

Since the deployment of these maneuvers yields different aspects of flexibility, consideration of the portfolio of strategic maneuvers, individually or collectively, has to be addressed with respect to the level of uncertainty in the surrounding business environment and stakeholder preferences in a given time. Thus, operationalizing the need for flexibility by contrasting the portfolio of flexibility maneuvers in outsourcing between a stable and a dynamic business environment may tease out the relative deployment of contractual provision, and the portfolio of preemptive, protective, exploitative, and corrective maneuvers. For example, in a stable and high trust environment (low need for flexibility in terms of new capability and ease of exit), organizations may build up standardized outsourcing architecture and work closely with outsourcing vendors to address the need of robustness and modification flexibility. On the other hand, in a highly turbulent environment, organizations would need to enforce dependency diversification strategy and enhance proactive sensing to keep abreast with changing condition. The strategic-maneuver framework thus provides a holistic view towards managing flexibility in outsourcing, enabling organizations to consider the portfolio of maneuvers to best meet their needs.

Future research may also pursue the cost effectiveness of the various flexibility maneuvers. Although the hallmark of a flexible response is the juxtaposition of several parallel actions, Evans (1991) also points out that long-term strategic postures

(pre-emptive and protective maneuvers) must be in place for reactive or responsive (exploitive and corrective) maneuvers to be successful, suggesting that advanced structuring is of paramount importance for the activation of ex-post adjustment. Firms only have limited capacity to adapt to changes after a triggering event, as opposed to extra options in reducing uncertainty beforehand. Furthermore, exploitive maneuver, representing the ability to exploit uncertainties with imaginative and improvising strategies, has been largely overlooked in outsourcing literature. Without it a firm simply becomes a follower in its industry.

Finally, the clarification of the various flexible maneuvers also allows us to see the value of information technologies in facilitating flexibility management in outsourcing. Consistent with the thinking from Boynton (1993), Quinn & Baily (1994), and Kogut & Kulatilaka (1994), the author proposes that the value-added role of IT lies in establishing an inter-organizational business infrastructure that shapes a firm's capacity to launch frequent and varied outsourcing actions. Specifically, IT can enable seamless communication between outsourcing parties, capture and digitize work routines and process knowledge as organizations move up successively the level of process maturity, and provide a customizable and an interoperable IT infrastructure on which process services are delivered. Consequently, organizations concerned with flexible outsourcing should thus carefully assess and benchmark their IT investments with an explicit flexibility orientation.

10.3 Limitation

This study is subject to the usual limitations inherent in cross-sectional research designs

employing single respondents and subjective measures. In this study the author focused on the current level of the variables without reference to the historical context. The cross-sectional nature of the study precludes us from detecting 'lag effects'. For example, this study failed to detect a link between vendor's interoperability and firm's robustness and modifiability. There is a possibility that recently introduced interoperable architectures may not be able to exert adequate support, as it takes time both to implement the systems and to learn how to manage them effectively. This research thus represents a description of actual antecedents, contributing variables, and outcomes of outsourcing flexibility among middle-to-large organizations at the time of the study, as opposed to a test of the potential, future benefits that firms may gain from introducing a new flexible architecture. An extension of this research could be longitudinal studies that link changes in antecedents to changes in flexibility and outsourcing success.

The resulting model contains many variables and interrelationships. One may thus question the theoretical parsimony of the model. However, the author was faced with a trade-off between focus and inclusiveness. One of goals at the outset of this research was to heed the calls for more active management of flexibility that consider interactions between the firm's technological resources, organizational behavior, and competitive context (Barney and Zajac 1994). This is also important because the flexibility literature itself makes many predictions that go across levels that traditionally have been studied in isolation, such as process structure, top management issues and risk allocation strategy. On the other hand, what it means is that more variables need to be included in the model. Further research could look at interactions among components of the model. For instance, it would be intriguing to investigate the effects of ex post maneuvers on flexibility with

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the presence (or absence) of ex ante maneuvers.

There are also limitations related to the measures that this study used. Because this study formulated an integrated model with a large set of variables, the author were limited in the number of items that could use to access each variable due to restrictions on the length of the questionnaire. This aspect probably reduced construct validity somewhat compared to more complete scales. The dearth of existing measures also meant that the author had to develop new items tapping the flexibility construct residing in a variety of contexts. The factor analysis indicated satisfactory internal consistency, but the flexibility scale obviously needs refinement in future research. Also, as the data were collected in Singapore, the findings might simply reflect different ways of conducting business in different cultures and market conditions. Generalization of the results from this study must be made cautiously along with further investigation.

Despite all the limitations of the present investigation, however, this research has made progress toward a better understanding of the set of factors influencing firms' efforts to achieve more "flexible" outsourcing. Firms engaging in outsourcing endeavors share a common understanding that flexibility is crucial in a turbulent business environment. Yet the current outsourcing literature lacks an integrative framework to guide decisions on flexibility management. This paper demonstrates how Evans' archetypes of flexibility maneuvers can be usefully employed to frame the strategic management of outsourcing flexibility, beyond the use of contractual governance. It points to the need to consider flexibility outcomes in addition to transactional efficiency and relationship management (Poppo and Zenger 2002), as flexibility imperatives are increasing in importance. Surfacing and incorporating these maneuvers into an

integrative framework offer valuable insights to researchers and practitioners alike.

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APPENDIX QUESTIONNAIRE ITEMS AND SOURCES

The items used to test the model are shown below, with their sources, if any. Except as noted, each question used a Likert scale: 1 = strongly disagree to 7 = strongly agree. "R" indicates reverse scoring for the analysis and "*" indicates that the item was dropped.

Construct	Items	Source
Extent of Customization	1. Compared to our peer organizations, our IT facilities and services require technical skills that are relatively unique (R)	adapted from Ang and Cummings 1997 (original construct asset specificity and applied in banking industry)
	2. To provide IT service, external service providers would have to make substantial investments in equipment tailored to our needs (R)	
	3. Extensive business knowledge that is specific to our business environment is required to manage our IT operations (R)	
	4. We requested the vendor to modify its process significantly to adapt to our unique operational routines and requirements (R)	
Process Maturity	1. The process is well-defined and institutionalized	adapted from Paulk et al. 1993 (original construct software process maturity)
	2. The key process indicators are quantitatively measured	
	3. The process boundary is clearly demarcated	
	4. The execution of the process is highly automated and requires minimal manual intervention	
	5. The process is regularly subject to evaluation for continuous improvement	
Vendor Interoperability	1. The application platform provided by our outsourcing vendor offers multiple interfaces or entry points (e.g., web access, EDI) to share all kinds of information *	adapted from Chung et al 2003 (original construct IT infrastructure flexibility and applied in strategic alignment and application implementation)
	2. The application platform provided by our outsourcing vendor offers a wide variety of information to end users through multiple channels	
	3. The software application provided by our outsourcing vendor is compatible and inter-operable across multiple platforms	
	4. The application platform provided by our outsourcing vendor offers access and support to a large variety of data types (including text, voice, and graphics) *	

	5. The application platform provided by our outsourcing vendor is electronically linked and seamlessly connected with the end users in our organization	adapted from Byrd and Turner 2000 (original construct IT infrastructure flexibility and applied in general organizations)
	6. The application platform provided by our outsourcing vendor utilizes the technology standard that is commonly used in the industry *	
	7. The application platform provided by our outsourcing vendor employs reusable software modules and pre-packaged modular tools to create new applications *	
	8. Software modules can easily be added to, modified, or removed from the application platform provided by our outsourcing vendor	
Multiple Sourcing	1. For the specific outsourced process, we have a policy of contracting with multiple outsourcing vendors	adapted from Huang et al. 2004 (original construct dual sourcing and applied in IT outsourcing)
	2. We have a few outsourcing vendors working together to implement the outsourced process *	
	3. We have partitioned the process and outsourced different components to different vendors	self-developed
	4. We have built up relationships with a few outsourcing vendors to contract out our process	
In-house Competency	1. We have a team of in-house staff who are able to replicate and expand the outsourced process if necessary	self-developed
	2. We continue to retain internal competency to backup the outsourced process	
	3. We can easily bring the outsourced process in house if necessary	
	4. Bringing the outsourced process in house again is absolutely unimaginable (R) *	
Proactive Sensing	1. Our executives are bold in their efforts to exploit outsourcing opportunities *	adapted from Hult et al. 2003 (original construct Entrepreneurship and applied in cross-sectional organizations)
	2. Our executives always update themselves about the dynamics of outsourcing vendor's market to take advantage of new opportunities	adapted from Covin and Slevin 1988 (original construct Entrepreneurial style and applied in Cross-sectional business firms)
	3. Our executives always initiate actions to which our outsourcing vendor responds	
	4. Our executives are fast to alert our outsourcing vendor when new products and services are offered in the marketplace	

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	5. Our executives always encourage our outsourcing vendor to explore new opportunities and innovative ideas	
Partnership Quality	We and our outsourcing vendor… 1. make decisions that are mutually beneficial 2. understand each other's business and management objectives * 3. share the benefits and risks in our outsourcing arrangement 4. have compatible culture and policies 5. perform our agreements and promises very well	adopted from Lee 2001 (original construct partnership quality in IS outsourcing)
Robustness	1. Our outsourcing vendor is usually able to handle variation in service volume with no detrimental effect on process efficiency and quality 2. Our outsourcing vendor can easily handle a range of deliverables without modifying its original arrangement * 3. Our outsourcing vendor can easily switch between different deliverables without loss of process performance 4. Our outsourcing vendor can respond to process exceptions without significant cost escalation	adapted from Braglia and Petroni 2000 (original construct Manufacturing flexibility and applied in manufacturing firms)
	5. The outsourced process contains built-in capacity for transactional variation 6. Our outsourcing vendor can handle transactional variation in a timely and error-free manner	adapted from Nelson and Cooprider 2001 (original construct Software system flexibility and applied in software systems projects)
Modifiability	1. The outsourced process can be modified as easily as needed in response to new opportunities 2. The outsourced process can be easily modified to fulfill our changing business needs *	adapted from Narasimhan and Das 1999 (original construct alliance flexibility and applied in inter-firm relationship)
	3. The outsourced process can be rapidly modified without incurring prohibitive cost 4. Changes in key process attributes can be managed in a timely and error-free manner	adapted from Nidumolu and Knotts 1998 (original construct strategic flexibility and applied in strategic alliance)
New Capability	1. New capability can be added to the outsourced process as easily as needed in response to new opportunities	adapted from Narasimhan and Das 1999 (original construct alliance flexibility and

	2. New capability can be easily developed based on the outsourced process to fulfill our changing business needs *	applied in inter-firm relationship)
	3. New capability can be rapidly added to the outsourced process without incurring prohibitive cost	adapted from Nidumolu and Knotts 1998 (original construct strategic flexibility and applied in strategic alliance)
	4. Addition of new capability can be managed in a timely and error-free manner	
Ease of Exit	1. If our outsourcing relationship was discontinued, we would have difficulty finding a replacement for the outsourcing vendor (R)	adopted from Johnson 1999 (original construct vendor dependency and applied in strategic integration of inter-firm relationship)
	2. Changing our outsourcing vendor will significantly affect our future operating performance (R)	
	3. We are heavily dependent on this outsourcing vendor (R)	
Outsourcing Success	As a result of outsourcing… 1. We have increased control of our expenses 2. We have achieved substantial cost saving 3. We are able to refocus on core business 4. The risk of technological obsolescence is reduced 5. Our access to key information technologies is increased 6. Our access to skilled personnel is increased 7. The service level performance is consistently met 8. We are satisfied with the overall benefits from outsourcing	adopted from Lee and Kim 1999 (original construct outsourcing success and applied in IS outsourcing)