Organizational Learning and Capabilities for Onshore and Offshore Business Process Outsourcing

JONATHAN WHITAKER, SUNIL MITHAS, AND M.S. KRISHNAN

JONATHAN WHITAKER is an assistant professor at the Robins School of Business, University of Richmond. He earned a Ph.D. in business information technology at the Ross School of Business, University of Michigan. Before pursuing a Ph.D., he worked for ten years in technology strategy consulting and professional services with A.T. Kearney and Price Waterhouse, and earned his MBA at the University of Chicago. His primary research focus is the use of IT to reshape the operating characteristics of firms, with resulting implications for firms, employees, and consumers. His research has been published in *Information Systems Research, Journal of Management Information Systems, Communications of the Association for Information Systems,* and *Production and Operations Management,* and he has been profiled in the *Wall Street Journal* and *MIT Sloan Management Review.*

SUNIL MITHAS is an associate professor at the Robert H. Smith School of Business, University of Maryland. He has a Ph.D. in Business from the Ross School of Business at the University of Michigan and an Engineering degree from the Indian Institute of Technology, Roorkee. Before pursuing a Ph.D., he worked for about ten years with the Tata Group. His research focuses on strategic management and the impact of IT resources and has appeared in *Management Science, Information Systems Research, MIS Quarterly, Marketing Science, Journal of Marketing,* and *Production and Operations Management.* His research has earned best paper award and best paper nomination recognition and has received coverage in practice-oriented publications such as *Harvard Business Review, Sloan Management Review, Bloomberg, Computerworld,* and *InformationWeek.*

M.S. KRISHNAN is the Joseph Handelman Professor of Business Information Systems and Innovation, area chairman, and professor of business information technology at the Ross School of Business, University of Michigan. Dr. Krishnan is also a co-director of the Center for Global Resource Leverage: India, located at the Ross School of Business. He received his Ph.D. in information systems from the Graduate School of Industrial Administration at Carnegie Mellon University. Dr. Krishnan's research interests include corporate IT strategy, business value of IT investments, management of distributed business processes, software engineering economics, metrics and measures for quality, and productivity and customer satisfaction for the software and IT industries. His research articles have appeared in *Management Science, Information Systems Research, MIS Quarterly, Strategic Management Journal, IEEE Transactions on Software Engineering, Decision Support Systems, Harvard Business Review,* and *Sloan Management Review.* He also co-authored, with C.K. Prahalad, the book *The New Age of Innovation: Driving Co-Created Value with Global Networks* (McGraw-Hill, 2008).

Journal of Management Information Systems / Winter 2010–11, Vol. 27, No. 3, pp. 11–42.

0742–1222 / 2011 $9.50 + 0.00.
DOI 10.2753/MIS0742-1222270302

ABSTRACT: This paper identifies and analyzes firm-level characteristics that facilitate onshore and offshore business process outsourcing (BPO). We use organizational learning and capabilities to develop a conceptual model. We test the conceptual model with archival data on a broad cross section of U.S. firms. Our empirical findings indicate that firms with experience in onshore information technology (IT) outsourcing and capabilities related to IT coordination applications and process codification are more likely to engage in BPO, and firms with experience in internationalization are more likely to engage in offshore BPO. We also find that IT coordination applications have a greater impact on onshore BPO than on offshore BPO, and the effect of process codification is partly mediated through IT outsourcing.

KEY WORDS AND PHRASES: business process outsourcing, offshoring, organizational capabilities, organizational learning, outsourcing.

> Rather, therefore, than ask the question "What is the best generic mode (market, hybrid, firm, or bureau) to organize X?" which is the traditional transaction cost query, the question to be put instead is "How should firm A—which has pre-existing strengths and weaknesses (core competencies and disabilities)—organize X?" [92, p. 1103]

> Experience, learning and adaptation can bring about improvement, or even an approximate local optimization, with respect to . . . the determination of the firm's boundaries at the micro level of a make-or-buy decision. [93, p. 177]

FIRMS ARE INCREASINGLY USING ONSHORE AND OFFSHORE business process outsourcing (BPO) to manage their operations and achieve their strategic objectives [5]. In BPO, a firm delegates one or more business processes to be delivered by an external vendor. Gartner estimates that the worldwide BPO market grew from $65 billion in 2001 to $110 billion in 2009 and forecasts growth to $130 billion in 2013 [94]. Offshore BPO is growing at a particularly rapid pace—Gartner estimates that 2008 revenue grew 24 percent for Indian BPO vendors and 33 percent for Chinese BPO vendors [71].

Although the growth of onshore and offshore BPO is recognized by practitioners and researchers, there is only a partial understanding of the factors that drive this growth. Prior research has shown that information technology (IT) reduces the coordination cost and lowers the transaction risk of outsourcing by facilitating deeper relationships with a smaller number of suppliers [28]. While research suggests that differences in levels of outsourcing and returns to outsourcing may be based on differences in managerial and technical capabilities [47], these managerial and technical capabilities need to be more fully articulated and elaborated. Recent research has called for further firm-level work to understand the factors that drive outsourcing and offshoring [6, 24]. For example, Arora and Forman asked, "some firms are systematically more capable in offshoring than others. . . . What is it that makes a firm more or less capable?" [6, p. 99].

The current partial understanding of factors that drive outsourcing and offshoring can be illustrated by the following quotation on Wachovia Bank (now owned by Wells Fargo):

> Wachovia chief executive Ken Thompson initially expressed reluctance about offshoring but joined the trend after a trip to India in 2005. The company now partners with a number of outside vendors. . . . After first shifting some technology functions to vendors, Wachovia teamed with Genpact in 2005 to handle a variety of back-office processes . . . including loan review functions, collections and investment banking analysis. . . . Wachovia's latest offshoring venture is a call center in the Philippines. . . . It's the bank's first customer-service operation overseas. [76, p. 1A]

The types of questions that can be asked are as follows: Why did Wachovia initially not engage in offshoring? How did Wachovia overcome this initial state? How did Wachovia progress from a state of no offshoring to a state of offshoring some IT processes, to a state of offshoring back-office processes, to a state of offshoring customer-facing processes?

Williamson suggests that these types of questions on firm-specific decisions can be studied using theory on organizational capabilities: "One possibility . . . is that transaction cost economics informs the *generic* decision to make-or-buy while competence brings in *particulars*" [92, p. 1097]. While prior information systems (IS) research has developed insights on outsourcing and offshoring, primarily using theory from organizational economics, there is a need to supplement this research with "particulars" at the firm level. How do firms learn to engage in BPO? What are the capabilities to engage in BPO? Do these capabilities differ between onshore and offshore BPO?

This paper complements and extends prior outsourcing research using organizational economics by using organizational learning and capabilities to explain firm-level BPO. We use prior theory to develop a conceptual model for the following research question:

> *RQ: What are the firm-level systems and process capabilities that facilitate outsourcing and offshoring?*

We argue that firms use organizational learning to develop capabilities, and we articulate the relevant capabilities for onshore and offshore BPO. There is also managerial value to understanding the characteristics of firms that engage in onshore and offshore BPO.

We test the conceptual model by conducting an empirical study using archival data on a broad cross section of firms publicly traded in the United States. Our findings validate the manner in which firms develop capabilities through learning and experience and provide insights on the incremental experience necessary for offshore BPO as compared with onshore BPO. We demonstrate the roles of systems and process capabilities in BPO, and we perform additional analysis to show the differential effects of systems and process capabilities for onshore and offshore BPO.

Theory and Research Model

Prior Literature

TABLE 1 CATEGORIZES PRIOR IS OUTSOURCING RESEARCH based on two dimensions—level of analysis and theoretical perspective. We include level of analysis as one dimension because the adoption of procurement and outsourcing strategies and the establishment of buyer–supplier relationships are frequently driven by factors at various levels [31, 51]. The highest level of analysis is the economy or industry level, as outsourcing and offshoring can be driven by economy-wide factors and different industries can experience differential returns to outsourcing [34, 47]. A second level is the organization level, at which firms engage in outsourcing relationships [2, 60]. A third level is the process or project level, at which firms structure buyer–supplier outsourcing contracts. The lowest level of analysis is the occupation level, at which managers make day-to-day decisions related to outsourcing and offshoring [68].

In Table 1, the theoretical dimension suggests that most IS outsourcing research has used theory from organizational economics such as transaction cost economics, incomplete contracts theory, and agency theory [10, 27], along with perspectives from competitive strategy [55]. The level-of-analysis dimension suggests that research at the lower levels is relatively more recent compared with research at the higher levels [75]. The lack of research at some intersections of levels of analysis and theoretical perspectives suggests potential research opportunities. For example, while recent IS outsourcing research has incorporated a capabilities view at the process/project level [63] and a learning-based view at the firm level [24], there has not yet been the use of capabilities to explain firm-level outsourcing and offshoring decisions as called for in prior research [6, 92]. The contribution of this paper is to complement research on organizational economics by using organizational learning and capabilities to define firm-level systems and process capabilities that enable firms to engage in onshore and offshore BPO.

Organizational Learning

Organizational learning enables firms to create capabilities, and capabilities in turn form the basis for competitive strategies [17, 42]. Organizations learn by evaluating their past activities and using their past activities to guide present and future activities [50]. As a firm gains experience with an activity, the firm develops routines associated with the activity. The firm gains confidence and expertise in the routines, which increases the probability that the firm will repeat the routines in the future [44]. For example, as a firm gains acquisition experience, the firm is more likely to make subsequent acquisitions, and a firm that makes a particular type of acquisition is more likely to make the same type of acquisition in the future [1].

Organizational learning also applies to the interfirm context, as illustrated by the literature on alliances and sourcing. As with BPO, in alliances, critical resources span firm boundaries through interfirm processes and complementary resources of partners

Table 1. Theoretical Perspectives and Levels of Analysis in IS Outsourcing Research

	Level of analysis			
Theoretical perspective	Economy/industry	Organization/firm	Process/project/ buyer–supplier dyad	Occupation
Transaction cost economics/ incomplete contracts		Ang and Straub [2] Bakos and Brynjolfsson [10] Clemons et al. [28]	Mithas et al. [69]	
Agency theory		Chaudhury et al. [25] Gurbaxani and Whang [45]		
Competitive strategy		Loh and Venkatraman [60] Palvia [72] Smith et al. [84] Teng et al. [89]	Lacity and Willcocks [55]	Slaughter and Ang [83]
Theory of production	Han et al. [47]			
Systems dynamics	Dutta and Roy [34]			
Service disaggregation/ modularity			Arora and Forman [6] Tanriverdi et al. [88]	Apte and Mason [3] Mithas and Whitaker [68] Tambe and Hitt [87]
Learning view			Cha et al. [24] Ramasubbu et al. [75]	
Capabilities view		This paper	Levina and Ross [59] Mani et al. [63]	

Note: This list of representative research is not intended to be all-inclusive (see Dibbern et al. [33] for a more extensive review).

[85]. Once a firm begins to collaborate with alliance partners, the firm develops experience in cooperation and partnering. Based on this experience, the firm develops the knowledge to identify alliance opportunities, form alliances, manage alliance relationships, and transfer information to and from alliance partners [35].

Like alliances, sourcing experience contributes to development of routines that enable firms to collaborate with a range of partners [57]. Experienced firms can more effectively identify and select trustworthy suppliers, negotiate and organize relationships, monitor and enforce terms, and anticipate and respond to contingencies based on learning from prior sourcing engagements [95]. Firms with greater sourcing experience are more likely to outsource because they have learned the administrative routines that enhance their abilities to engage in successful sourcing partnerships.

We extend the concept of organizational learning from the interfirm alliance and sourcing contexts to the interfirm BPO context. BPO requires the client firm to perform a set of routines. The client firm must identify and negotiate with a qualified vendor and monitor and exchange information throughout the BPO relationship. Because business processes are highly interconnected and interdependent, BPO requires extensive communication and coordination to manage outsourced processes across firm boundaries and to transfer process outputs from the vendor to the client's internal operations [24]. These activities are particularly important for BPO, because of the extent to which BPO vendors interact directly with the client firm's customers and suppliers. Any breakdown in service quality can negatively impact the client firm's ability to maintain and expand its customer base, and directly hinder the client firm's ability to accomplish its strategic objectives [62]. Organizations with experience in outsourcing another corporate function will have learned to perform these activities for BPO.

BPO shares some characteristics with IT outsourcing (ITO), including the need to coordinate a vendor relationship and the nature of potential benefits and risks [36, 91]. Another shared characteristic is that ITO and BPO can be delivered via domestic or international resources [23, 75]. These common characteristics suggest that client firms can apply learning from ITO to engage in BPO.

Our arguments are supported by case examples such as General Motors (GM) and Prudential Financial. GM was one of the first large North American corporations to engage in wholesale ITO when it spun off and outsourced all IT operations to EDS in 1996. As GM learned to coordinate with its ITO vendor, GM was able to apply this knowledge to engage in large-scale BPO for other business processes. For example, in 1999, GM engaged Sitel to perform customer service, marketing, and dealer support for all GM brands, using 2,000 agents based at three U.S. call centers [82]. GM also engaged in BPO of its financial and accounting functions with Arthur Andersen in a 10-year $250 million contract, including payroll, billing, accounts receivable, accounts payable, and fixed asset accounting [7]. Affiliated Computer Services (ACS, now owned by Xerox) acquired the BPO business from Arthur Andersen and signed a new 10-year contract with GM in 2002.

Prudential Financial is another firm that gained outsourcing experience through ITO, signing a five-year $350 million contract with IBM in 1996 [70]. The contract called

for IBM to provide maintenance for customer information and database applications related to insurance, mutual funds, annuities, and securities. After this ITO contract, Prudential Financial then engaged in a 10-year $700 million BPO contract with Exult (now owned by Hewitt) for human resources (HR) services, including payroll, benefits, HR call center, and employee data and records management [40]. Consistent with the discussion and examples above that firms apply learning from ITO to engage in BPO, we hypothesize that

> *Hypothesis 1 (Onshore ITO Influence on BPO Hypothesis): Firms that are engaged in onshore ITO will be more likely to engage in (a) onshore BPO and (b) offshore BPO.*

While organizational learning in the domestic context supports future domestic and international partnerships [35], for offshore BPO, further learning is required to overcome differences between the domestic and international contexts. Differences and distance between countries pose obstacles to the flow of information and transfer of knowledge between partner firms, which can impact the governance of interfirm relationships [13]. In the same way that differences between countries present challenges in the interfirm context, these differences are not yet fully understood in the offshore outsourcing context and present unique financial, legal, and managerial risks compared with onshore outsourcing [53].

To internationalize, or transfer processes and technologies from one country to another country, a firm must develop routines for information processing and control to coordinate activities across national boundaries [13]. Firms that operate in international markets encounter a diversity of potential suppliers and partners that are initially unfamiliar. As the firm gains familiarity and experience with international partners, the firm learns to overcome cultural distance and communication barriers and improve governance of relationships. The firm's accumulated experience with international partners helps the firm recognize and bridge the cultural, administrative, geographic, and economic differences between countries [39]. The firm's experience in hiring local employees through international subsidiaries also helps reduce the cultural distance to partners in those countries. Learning enhances the firm's ability to explore international partnership opportunities, seek partners, coordinate and allocate activities, and resolve conflicts. The firm establishes specialization in international partnerships, which enables the firm to develop and apply coordination routines in internationalization [56].

Once a firm learns to coordinate internationally based on its experience with international partners, the firm is able to establish future international operations more smoothly and manage those operations more efficiently, and this knowledge influences the firm's future decisions [90]. While onshore ITO experience helps the firm learn cooperation and collaboration in a partnership setting, offshore ITO gives the firm experience with the partnership *and* international dimensions necessary to establish further international operations such as offshore BPO.

The application of organizational learning from international experience to offshore BPO is evidenced by the cases of Aetna and Microsoft. The health insurance firm

Aetna learned to coordinate international vendors through an offshore ITO contract with Infosys Technologies. In 1999, Aetna engaged Infosys to standardize IT platforms, migrate applications, centralize data, and develop Internet-based health-care and financial services offerings [43]. Aetna planned to have 300 Infosys personnel involved on its account by the end of 2000 and to save $12 million on its 2000 IT budget. Within two years, Aetna was able to apply this learning in the management of international vendors to engage in an offshore BPO contract with ACS to process medical and dental claims data [38].

Microsoft learned to coordinate international employees by opening the Microsoft India Development Center (MIDC) in Hyderabad in 1998. The MIDC began with a $3 million investment and 20 employees, growing to 40 employees the next year and 200 employees in 2003. In 2002, Bill Gates visited India and announced that Microsoft would invest $75–$100 million to grow the MIDC to 500 employees and would also establish a .NET lab in Bangalore with 100 Microsoft employees and 250 outsourced personnel [81]. Microsoft's learning on international coordination is illustrated by this quotation from the MIDC general manager: "The Microsoft India Development Center is an extension of the product teams in Redmond [Microsoft headquarters] and we are focused on ensuring that we integrate with our product development activity in progress around the world" [22, p. 1]. Microsoft applied this learning to engage in a BPO contract with Sykes Enterprises for customer service processes, and Sykes fulfilled this contract largely through offshore call centers [11]. Consistent with the discussion and examples above that firms apply learning from internationalization to engage in offshore BPO, we hypothesize that

> *Hypothesis 2 (Internationalization Influence on Offshore BPO Hypothesis): Organizations that are engaged in coordination of (a) offshore ITO vendors, (b) international business operations, or (c) offshore IT employees will be more likely to engage in offshore BPO.*

Organizational Capabilities

By developing, accessing, and integrating knowledge, an organization develops capabilities that are the basis for competitive strategies. Researchers have placed knowledge-related organizational capabilities into two categories—systems capabilities and process capabilities [41]. *Systems capabilities* involve the technology-oriented facets of knowledge transfer, including technical infrastructure and IT systems that bridge time and space in the exchange of knowledge between dispersed entities. *Process capabilities* involve the people- and process-oriented facets of knowledge transfer, including the routines, procedures, and coordination that facilitate knowledge exchange.

This categorization of systems versus process capabilities is widely echoed in the literature [66]. For example, IT assets *(systems)* along with workplace organizational practices *(process)* influence firm productivity and performance [4, 19]. The sophistication of modern software *(systems)* plus standardization of business processes *(process)* are among the motivators for increased external partnering [20]. IT integration capabil-

ity *(systems)* and process capability *(process)* enable firms to manage activities with supply chain partners [74]. Information intensity *(systems)* and codification *(process)* facilitate the global disaggregation of occupations [68]. Building on this literature, we discuss the role of systems capabilities and process capabilities in facilitating BPO.

IT systems enhance communication and coordination within the firm and between a firm and its partners [45, 61]. Firms with stronger IT systems capabilities are more focused, less hierarchical, and more likely to engage in external partnering with other firms [21, 49]. IT systems serve as standard interfaces for business processes, which reduces monitoring and enforcement costs and allows firms to efficiently exchange with multiple partners [28, 77]. "Digitization technologies have . . . enabled the creation of atomized and modular business processes that . . . can be accessed from anywhere through electronic interfaces, greatly enhancing their reach" [78, p. 247]. Process-level research calls for more work on firm-level characteristics that can facilitate process modularity [88]. IT coordination applications can be viewed as a strategic option that gives a firm the capability to deploy an outsourcing strategy [15, 26].

Cisco Systems is an example of a firm that first established systems capabilities and then applied these capabilities to engage in BPO. After Cisco's rudimentary IT systems failed and shut the company down for two days in 1994, over the following two years Cisco implemented a new enterprise resource planning (ERP) system and replaced nearly all of its existing technology [65]. These IT applications enabled Cisco to build out its Internet resources, including an intranet for employees, online ordering and technical support for customers, and supply chain automation and management for suppliers. In addition to enabling Cisco to coordinate and integrate with customers and suppliers, these systems capabilities enabled Cisco to coordinate and integrate with BPO vendors, as Cisco outsourced order-processing work to Infosys and customer call center support to Convergys [37]. Because IT systems represent a firm-level capability that provides a standard interface and facilitates communication, monitoring, and enforcement, we hypothesize that

> *Hypothesis 3 (Systems Capabilities Influence on BPO Hypothesis): Organizations with systems capabilities related to IT coordination applications will be more likely to engage in (a) onshore BPO and (b) offshore BPO.*

While IT systems provide a standard interface to facilitate the exchange of knowledge, the knowledge must be recorded in a suitable form for knowledge transfer to take place. Codification is the compression of knowledge and experience into a structure, involving the use of codes and models to translate rules and actions into procedures, guidelines, specifications, and documents [80]. Codification is a process capability that facilitates the capture, transformation, storage, and retrieval of knowledge and the transmission of knowledge across units, firms, and locations, which contributes to modifying the spatial organization and division of labor [29]. Codification contributes to outsourcing by making it possible for buyers and sellers to enter into contractual relationships because codification provides a representation of the services the buyer can expect the seller to provide [58]. Codification enables an improved specification of roles, goals, operating procedures, and contractual obligations to facilitate the

coordination of complex activities and the split of business processes across business units and firm boundaries.

Harvard Pilgrim Health Care, a $2.5 billion health-care insurance plan, illustrates the relationship between process capabilities and BPO. In 2000, Harvard Pilgrim performed an extensive analysis of its capabilities in various processes, such as customer service, product development, actuarial services, contracting, and sales and marketing [67]. This analysis enabled Harvard Pilgrim to place its business processes into four categories—activities that should be kept in house, activities that could be shared with other divisions in the firm, activities that could be automated, and activities that could be outsourced. Based on the analysis, Harvard Pilgrim outsourced some business processes, including pharmacy benefits management and claims processing. "With the benefit of the capabilities-analysis results, the company could spell out precisely what it expected its dozens of contractors to deliver in terms of quality, cost, volume, and cycle time—and then could closely track their success" [67, p. 78].

Process capabilities are relevant in both the domestic and international contexts. Codification facilitates the globalization of local knowledge and reduces the time to transfer knowledge internationally [54]. "The move abroad, therefore, is likely to involve organizational functions that trade in well codified information" [18, p. 152]. Occupation-level research reinforces that codification facilitates disaggregation across locations [68]. Because codification of business processes represents a firm-level capability that facilitates the transfer of business processes across vendor and geographic platforms, we hypothesize that

> *Hypothesis 4 (Process Capabilities Influence on BPO Hypothesis): Organizations with process capabilities related to codification will be more likely to engage in (a) onshore BPO and (b) offshore BPO.*

Above we argued that systems and process capabilities help firms to engage in BPO. We now posit that the relationship of systems and process capabilities with BPO is mediated by outsourcing experience. Capabilities enable firms to identify and select qualified vendors and monitor and manage outsourcing relationships [62]. Firms develop these capabilities through learning based on experience, and the capabilities in turn enable the firm to engage in further outsourcing [57]. Firms are likely to develop outsourcing experience through functions where outsourcing is a more mature business practice [88], consistent with our case examples of GM and Prudential Financial above and with the substantial body of IS outsourcing literature [33]. Process capabilities facilitate ITO, and systems capabilities are required to interface with systems that are outsourced. Therefore, in addition to considering the direct effects of systems capabilities and process capabilities on BPO, we also consider the indirect effects of systems capabilities and process capabilities on BPO mediated through ITO:

> *Hypothesis 5 (ITO Mediation Hypothesis): Onshore ITO and offshore ITO mediate the effect of (a) IT coordination applications and (b) process codification on onshore BPO and offshore BPO.*

Figure 1 shows a conceptual model based on the discussion above.

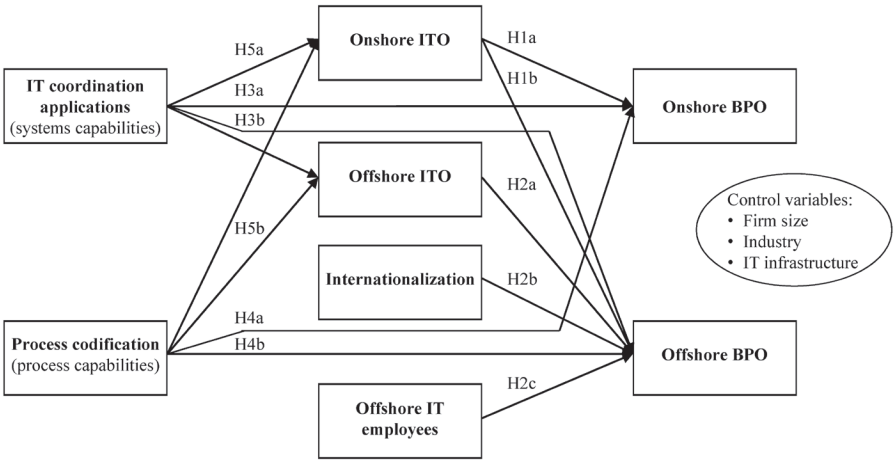


Figure 1. Conceptual Model
Notes: For Hypothesis 5a, onshore and offshore ITO mediate the effect of IT coordination applications on onshore and offshore BPO. For Hypothesis 5b, onshore and offshore ITO mediate the effect of process codification on onshore and offshore BPO.

Research Design and Methodology

This study is based on data from the 2004 *InformationWeek* 500 survey [30]. *InformationWeek* is a leading and widely circulated IT publication, and previous academic studies have used *InformationWeek* data [16, 79]. The *InformationWeek* 500 survey is an annual benchmarking survey that targets top IT managers in large firms and collects data on the IT department and operations, along with an overview of major IT initiatives. In administering the survey, *InformationWeek* makes efforts to ensure that respondents are in appropriate management positions with sufficient knowledge of the firm's IT department and operations [86]. Two hundred fifty-five firms that are publicly traded in the United States responded to this survey and provided complete responses to the variables of interest. Of the 255 firms, 122 represent Fortune 500 companies. Our empirical model uses the *InformationWeek* survey data on BPO, ITO, internationalization, IT coordination applications, and process codification. We complement the *InformationWeek* data with revenue and industry data from Compustat and Dun & Bradstreet.

Variable Definitions

The following are dependent variables in the study:

- *Onshore BPO:* Binary variable that indicates whether the firm engages in onshore BPO (1 = yes, 0 = no). This variable is from the *InformationWeek* 500 survey.
- *Offshore BPO:* Binary variable that indicates whether the firm engages in offshore BPO (1 = yes, 0 = no). The variable is from the *InformationWeek* 500 survey. In the *InformationWeek* 500 survey, offshore BPO is a separate response option from

onshore BPO. This provides a degree of richness, enabling the data to identify whether a firm engages in only one form of BPO, both forms, or neither form.

The following are explanatory and mediator variables in the study:

- *Onshore ITO:* Binary variable that indicates whether the firm engages in onshore ITO (1 = yes, 0 = no). We use this variable as a proxy for prior experience with onshore IT outsourcing. This variable is from the *InformationWeek* 500 survey.
- *Offshore ITO:* Binary variable that indicates whether the firm engages in offshore ITO (1 = yes, 0 = no). We use this variable as a proxy for prior experience with offshore ITO. This variable is from the *InformationWeek* 500 survey. In the survey, the responses for onshore and offshore ITO are separate from each other, and also separate from the responses for onshore and offshore BPO.

The following are explanatory variables in the study:

- *Internationalization:* Four-item summative index that indicates the extent to which the firm has internationalized its business operations. Items covered by the index are workers or subsidiaries in foreign countries, direct purchase from foreign suppliers, reliance on global distributors, and reliance on joint ventures with global suppliers. These items are summed together to create a variable that ranges from 0 for firms that have none of these indicators to a value of 4 for firms that have all four indicators. This variable is from the *InformationWeek* 500 survey. In the survey, the response for each indicator is separate from the response for the other three indicators. The richness of this variable responds to a call from researchers for a more sophisticated measure of internationalization compared with the traditional measure of international revenue, which does not fully reflect the degree of internationalization for a firm [48].
- *Offshore IT Employees:* Proportion of the firm's IT employees based outside of the United States. The value of this variable ranges from 0.00 to 1.00. This variable is from the *InformationWeek* 500 survey and provides additional information on the internationalization of the firm.
- *IT Coordination Applications:* Nine-item summative index that indicates whether the firm has widely deployed each of nine IT coordination applications. These applications relate to the coordination of operations within the firm and across business partners [77]. IT coordination applications covered by the index are ERP, supply chain planning, customer relationship management (CRM), business intelligence (BI), business process management (BPM), business performance management, mobile commerce, content management, and product life cycle management (PLM). These items are summed together to create a variable that ranges from 0 for firms that have not widely deployed any IT coordination applications to 9 for firms that have widely deployed all nine IT coordination applications. This variable is from the *InformationWeek* 500 survey. Our variable construction differentiates coordination applications from infrastructure technologies (see description of control variables below), consistent with recent IS research indicating that IT consists of various types of assets and is not a monolithic concept [4].

- *Process Codification:* Two-item summative index that indicates the extent to which the firm has codified business processes. Codification is indicated by whether the firm defined its business processes and modeled business processes using CASE (computer-aided software engineering) or a related tool. These items are summed together to create a variable that ranges from 0 for firms that have not defined or modeled business processes to 2 for firms that have defined and modeled business processes. This variable is from the *InformationWeek* 500 survey.

The following are control variables in the study:

- *IT Infrastructure:* Nine-item summative index that indicates whether the firm has widely deployed each of nine IT network and storage infrastructure technologies. IT network and storage infrastructure technologies covered by the index are data warehouse, networked storage, Web services, Windows server, wireless fidelity (WiFi), voice-over Internet protocol (VoIP), content filtering/antispam, intrusion detection, and grid computing. These items are summed together to create a variable that ranges from 0 for firms that have not widely deployed any IT infrastructure technologies to 9 for firms that have deployed all nine IT infrastructure technologies. This variable is from the *InformationWeek* 500 survey. As discussed above, our variable construction differentiates coordination applications from infrastructure technologies.
- *Firm Size:* Natural log of annual firm revenue. Firm size may influence a firm's propensity to outsource or offshore. This variable is from Compustat and Dun & Bradstreet.
- *Industry Sector (finance, services, trade and logistics, other industrial):* Binary variable (1 = yes, 0 = no) for the finance, services, trade and logistics, and other industrial sectors, based on the North American Industry Classification System (NAICS) code for each firm. The manufacturing sector is the base category. These five sectors represent substantially all industries in the United States and are similar to sectors used in other IS research [21]. The NAICS data are from Compustat and Dun & Bradstreet, and the sector groupings are based on the NAICS codes (www.census.gov/naics/).

The relevant questionnaire items from the *InformationWeek* 500 survey are included in the Appendix. We use summative indices for internationalization, IT coordination applications, and process codification because we view each of these variables as a composite of formative indicators in our data [32]. The routine tests for reliability of variables are not applicable for summative indices [9].

Summary Statistics

Table 2 provides descriptive statistics for all firms in the sample, and for the subgroups of firms that engage in onshore BPO, firms that engage in offshore BPO, and firms that do not engage in BPO. Table 3 provides zero-order correlations for the variables in our study.

Table 2. Descriptive Statistics

		(1) All firms $n = 255$				(2) Onshore BPO $n = 87$		(3) Offshore BPO $n = 43$		(4) No BPO $n = 159$	
		Minimum	Maximum	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
1	Onshore BPO	0.00	1.00	0.34	0.48	1.00	0.00	0.79	0.41	0.00	0.00
2	Offshore BPO	0.00	1.00	0.17	0.38	0.39	0.49	1.00	0.00	0.00	0.00
3	Onshore ITO	0.00	1.00	0.55	0.50	0.77	0.42	0.91	0.29	0.41	0.49
4	Offshore ITO	0.00	1.00	0.53	0.50	0.59	0.50	0.86	0.35	0.50	0.50
5	Internationalization	0.00	4.00	1.83	1.38	1.99	1.48	2.42	1.42	1.72	1.31
6	Offshore IT employees	0.00	0.94	0.17	0.21	0.15	0.18	0.20	0.19	0.18	0.22
7	IT coordination applications	1.00	9.00	5.07	1.95	5.62	1.88	5.88	2.06	4.77	1.91
8	Process codification	0.00	2.00	1.05	0.66	1.23	0.60	1.42	0.63	0.94	0.67
9	IT infrastructure	0.00	9.00	6.20	1.60	6.48	1.32	6.58	1.67	6.07	1.70
10	Firm size	6.23	12.13	8.48	1.18	8.89	1.15	9.18	1.33	8.25	1.12
11	Finance	0.00	1.00	0.12	0.33	0.20	0.40	0.26	0.44	0.08	0.26
12	Service	0.00	1.00	0.21	0.41	0.20	0.40	0.19	0.39	0.21	0.41
13	Trade and logistics	0.00	1.00	0.17	0.38	0.15	0.36	0.12	0.32	0.18	0.38
14	Other industrial	0.00	1.00	0.11	0.31	0.11	0.32	0.09	0.29	0.11	0.32

Note: The total number of firms in columns 2, 3, and 4 is greater than 255 (column 1) because 34 firms in the sample engage in both onshore and offshore BPO.

Table 3. Correlations

All firms (n = 255)		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Onshore BPO	1.00													
2	Offshore BPO	0.43*	1.00												
3	Onshore ITO	0.33*	0.33*	1.00											
4	Offshore ITO	0.08	0.30*	0.42*	1.00										
5	Internationalization	0.08	0.19*	0.13*	0.20*	1.00									
6	Offshore IT employees	–0.08	0.06	0.11	0.18*	0.28*	1.00								
7	IT coordination applications	0.20*	0.19*	0.13*	0.15*	0.25*	0.06	1.00							
8	Process codification	0.19*	0.25*	0.17*	0.18*	–0.02	–0.01	0.13*	1.00						
9	IT infrastructure	0.13*	0.11	0.16*	0.12	0.20*	–0.05	0.46*	0.08	1.00					
10	Firm size	0.25*	0.27*	0.23*	0.26*	0.19*	0.19*	0.21*	0.14*	0.05	1.00				
11	Finance	0.16*	0.19*	0.20*	0.06	–0.15*	–0.07	–0.05	0.10	0.03	0.14*	1.00			
12	Service	–0.02	–0.02	–0.09	0.01	–0.22*	–0.09	–0.06	0.07	0.01	–0.17*	–0.19*	1.00		
13	Trade and logistics	–0.04	–0.06	–0.09	–0.04	0.01	–0.17*	–0.04	–0.07	0.08	0.03	–0.17*	–0.23*	1.00	
14	Other industrial	0.01	–0.02	–0.03	–0.15*	–0.20*	–0.07	–0.08	0.08	–0.10	0.03	–0.13*	–0.18*	–0.16*	1.00

* Correlation significant at $p < 0.05$.

Column 1 of Table 2 shows that for our sample of firms, 34 percent of firms use onshore BPO, 17 percent use offshore BPO, 55 percent use onshore ITO, and 53 percent use offshore ITO. These mean values suggests that onshore BPO is a more common business practice than offshore BPO, and ITO is a more common business practice than BPO. Columns 2, 3, and 4 of Table 2 show that the means of onshore ITO, IT coordination applications, and process codification for firms that engage in onshore BPO and offshore BPO are above the means of those variables for firms that do not engage in BPO. The means of offshore BPO and internationalization for firms that engage in offshore ITO are above the means for firms that do not engage in BPO.

Table 3 shows that onshore BPO is positively correlated with offshore BPO, onshore ITO is positively correlated with onshore BPO and offshore BPO, and offshore ITO is positively correlated with offshore BPO, suggesting that some firms use multiple forms of outsourcing. Internationalization is positively correlated with offshore BPO, offshore ITO, and offshore IT employees, suggesting that some firms internationalize along multiple dimensions. IT coordination applications and process codification are positively correlated with onshore BPO and offshore BPO. Together, the mean values and correlations suggest that there may be some relationship of ITO, systems capabilities, and process capabilities with onshore and offshore BPO, and that there may be some relationship between international experience and offshore BPO.

Empirical Model

In our data set, the dependent variables onshore BPO and offshore BPO appear as binary choices. The ordinary least squares (OLS) approach for modeling binary dependent variables is not appropriate because of heteroskedastic error distribution, and a linear model may result in predicted probabilities below zero or above one. To overcome estimation problems in the OLS approach, we conducted our analysis using a bivariate probit model [8]. A bivariate probit model enables us to account for two binary response variables (onshore BPO and offshore BPO) that vary jointly and to estimate the coefficients needed to account for this joint distribution. The functional form of our empirical model can be written as

Onshore BPO

$$y_1^* = \beta_1 X_1 + \varepsilon_1, \qquad y_1 = 1 \text{ if } y_1^* > 0, \text{ 0 otherwise} \tag{1}$$

Offshore BPO

$$y_2^* = \beta_2 X_2 + \varepsilon_2, \qquad y_2 = 1 \text{ if } y_2^* > 0, \text{ 0 otherwise} \tag{2}$$

$$\rho = Cov(\varepsilon_1, \varepsilon_2), \tag{3}$$

where y_1 and y_2 are the observable counterparts to the two latent variables y_1^* and y_2^*, Xs are variables such as IT coordination applications and process codification, βs are parameters for the respective variables, and ρ measures the correlation between the error terms. A nonzero and statistically significant ρ indicates that the two likeli-

hoods are jointly determined and a bivariate probit model is more appropriate than two separate probit models.[1]

For our mediation analysis, we used the procedure described by Baron and Kenny [14]. We tested whether the independent variables (IT coordination applications and process codification) are correlated with the dependent variables (onshore BPO and offshore BPO). We then tested whether the independent variables are correlated with the mediator variables (onshore ITO and offshore ITO) and whether the mediator variables are correlated with the dependent variables in a model that also includes independent variables. Finally, we assessed the extent of mediation.

Empirical Results

Table 4 provides results from empirical estimation of the bivariate probit model using Equations (1) and (2). Table 5 provides parameters for the mediation analysis, and Table 6 provides results of the mediation analysis.

Hypothesis 1a predicted a positive association of onshore ITO with onshore BPO, and Hypothesis 1b predicted a positive association of onshore ITO with offshore BPO. These hypotheses are supported for onshore BPO ($\beta_{11} = 0.898$, $p < 0.000$) and offshore BPO ($\beta_{21} = 0.913$, $p < 0.001$). Hypothesis 2a predicted a positive association of offshore ITO with offshore BPO, Hypothesis 2b predicted a positive association of internationalization with offshore BPO, and Hypothesis 2c predicted a positive association of offshore IT employees with offshore BPO. Offshore ITO ($\beta_{22} = 0.451$, $p < 0.042$) and internationalization ($\beta_{23} = 0.217$, $p < 0.010$) are positively associated with offshore BPO, providing support for Hypotheses 2a and 2b. Hypothesis 2c is not supported, perhaps because offshore IT employees and offshore BPO may be substitutes rather than complements [46].

Hypothesis 2 addresses some differences between onshore and offshore BPO, in that organizational learning from international experience is expected to relate with offshore BPO but not onshore BPO. In addition to international experience, we also want to study whether other explanatory variables have differential relationships with onshore and offshore BPO. Figures 2a–d show the relationship of four explanatory variables with onshore BPO and offshore BPO. Figure 2a compares the effect of onshore ITO, Figure 2b compares the effect of offshore ITO, Figure 2c compares the effect of IT coordination applications, and Figure 2d compares the effect of process codification.

Figure 2a shows that onshore ITO has a larger effect on onshore BPO (0.312) than on offshore BPO (0.131). Figure 2b shows that offshore ITO has a negative effect on onshore BPO (–0.150) and a positive effect on offshore BPO (0.083). Figure 2c shows that IT coordination applications have a larger effect on onshore BPO (0.303) than on offshore BPO (0.133). Figure 2d shows that process codification has a similar effect on onshore BPO (0.133) and offshore BPO (0.088).

Hypothesis 3a predicted a positive association of IT coordination applications with onshore BPO, and Hypothesis 3b predicted a positive association of IT coordination applications with offshore BPO. These hypotheses are supported for onshore

Table 4. Parameter Estimates for Main Equation

			(1) Onshore BPO (bivariate probit)			(2) Offshore BPO (bivariate probit)
Organizational learning						
Onshore ITO	*H1a*	β_{11}	0.898***	*H1b*	β_{21}	0.913***
			(0.000)			(0.001)
Offshore ITO		β_{12}	–0.376**	*H2a*	β_{22}	0.451**
			(0.036)			(0.042)
Internationalization		β_{13}	0.090	*H2b*	β_{23}	0.217***
			(0.116)			(0.010)
Offshore IT employees		β_{14}	–1.149**	*H2c*	β_{24}	–0.260
			(0.014)			(0.330)
Organizational capabilities						
IT coordination applications	*H3a*	β_{15}	0.106**	*H3b*	β_{25}	0.093*
			(0.026)			(0.088)
Process codification	*H4a*	β_{16}	0.248**	*H4b*	β_{26}	0.449***
			(0.043)			(0.007)
Control variables						
IT infrastructure		β_{17}	0.003		β_{27}	–0.074
			(0.484)			(0.181)
Firm size		β_{18}	0.236***		β_{28}	0.189**
			(0.003)			(0.028)
Financial		β_{19}	0.461*		β_{29}	0.890***
			(0.071)			(0.007)
Services		β_{1-10}	0.299		β_{2-10}	0.763**
			(0.133)			(0.011)
Trade and logistics		β_{1-11}	0.091		β_{2-11}	0.271
			(0.371)			(0.229)
Other industrial		β_{1-12}	0.137		β_{2-12}	0.169
			(0.344)			(0.354)
Constant		β_{10}	–3.723***		β_{20}	–4.868***
			(0.000)			(0.000)
Observations			255			
Wald χ^2			80.69			
Prob > χ^2			0.000			
χ^2 for $\rho = 0$			20.43			
Prob > χ^2			0.000			

Notes: Hypotheses are shown in italics; *p*-values are shown in parentheses. * Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent (all one-tailed).

Table 5. Parameter Estimates for Mediation Analysis

		(1) Onshore BPO (bivariate probit)		(2) Offshore BPO (bivariate probit)		(3) Onshore ITO (bivariate probit)		(4) Offshore ITO (bivariate probit)
Internationalization	β_{31}	0.089	β_{41}	0.235***	β_{51}	0.067	β_{61}	0.105*
		(0.112)		(0.004)		(0.178)		(0.073)
Offshore IT employees	β_{32}	–0.981**	β_{42}	0.006	β_{52}	0.438	β_{62}	0.792**
		(0.022)		(0.496)		(0.165)		(0.041)
IT coordination applications	β_{33}	0.103**	β_{43}	0.096*	β_{53}	–0.007	β_{63}	0.004
		(0.025)		(0.069)		(0.445)		(0.467)
Process codification	β_{34}	0.272**	β_{44}	0.536***	β_{54}	0.268**	β_{64}	0.351***
		(0.024)		(0.001)		(0.021)		(0.004)
IT infrastructure	β_{35}	0.026	β_{45}	–0.031	β_{55}	0.121**	β_{65}	0.054
		(0.347)		(0.348)		(0.024)		(0.186)
Firm size	β_{36}	0.243***	β_{46}	0.250***	β_{56}	0.196***	β_{66}	0.250***
		(0.001)		(0.004)		(0.006)		(0.001)

(continues)

Table 5. Continued

		(1) Onshore BPO (bivariate probit)		(2) Offshore BPO (bivariate probit)		(3) Onshore ITO (bivariate probit)		(4) Offshore ITO (bivariate probit)
Financial	β_{37}	0.630**	β_{47}	1.003***	β_{57}	0.699**	β_{67}	0.101
		(0.019)		(0.002)		(0.014)		(0.369)
Services	β_{38}	0.203	β_{48}	0.590**	β_{58}	–0.176	β_{68}	0.139
		(0.213)		(0.028)		(0.233)		(0.281)
Trade and logistics	β_{39}	0.009	β_{49}	0.128	β_{59}	–0.296	β_{69}	–0.111
		(0.487)		(0.352)		(0.120)		(0.332)
Other industrial	β_{3-10}	0.197	β_{4-10}	0.175	β_{5-10}	–0.083	β_{6-10}	–0.634**
		(0.274)		(0.333)		(0.393)		(0.025)
Constant	β_{10}	–3.627***	β_{20}	–4.883***	β_{50}	–2.702***	β_{60}	–3.027***
		(0.000)		(0.000)		(0.000)		(0.000)
Observations		255				255		
Wald χ^2		58.80				57.26		
Prob > χ^2		0.000				0.000		
χ^2 for $\rho = 0$		25.78				31.80		
Prob > χ^2		0.000				0.000		

Notes: Columns (1) and (2) are parameters for the relationship between independent variables and dependent variables in an equation that does not include the mediator variables. Columns (3) and (4) are parameters for the relationship between independent variables and mediator variables. *p*-values are shown in parentheses.
* Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent (all one-tailed).

Table 6. Mediation Analysis

	(1) Onshore BPO	(2) Offshore BPO
Onshore ITO mediated effect of		
IT coordination applications	ns	ns
Process codification	$p < 0.033$ (partial)	$p < 0.045$ (partial)
Offshore ITO mediated effect of		
IT coordination applications	ns	ns
Process codification	$p < 0.068$ (partial)	$p < 0.074$ (partial)

Notes: Mediation analysis [14] based on parameter estimates in Tables 4 and 5. One-tailed *p*-values, mediation are in parentheses. ns = not significant.

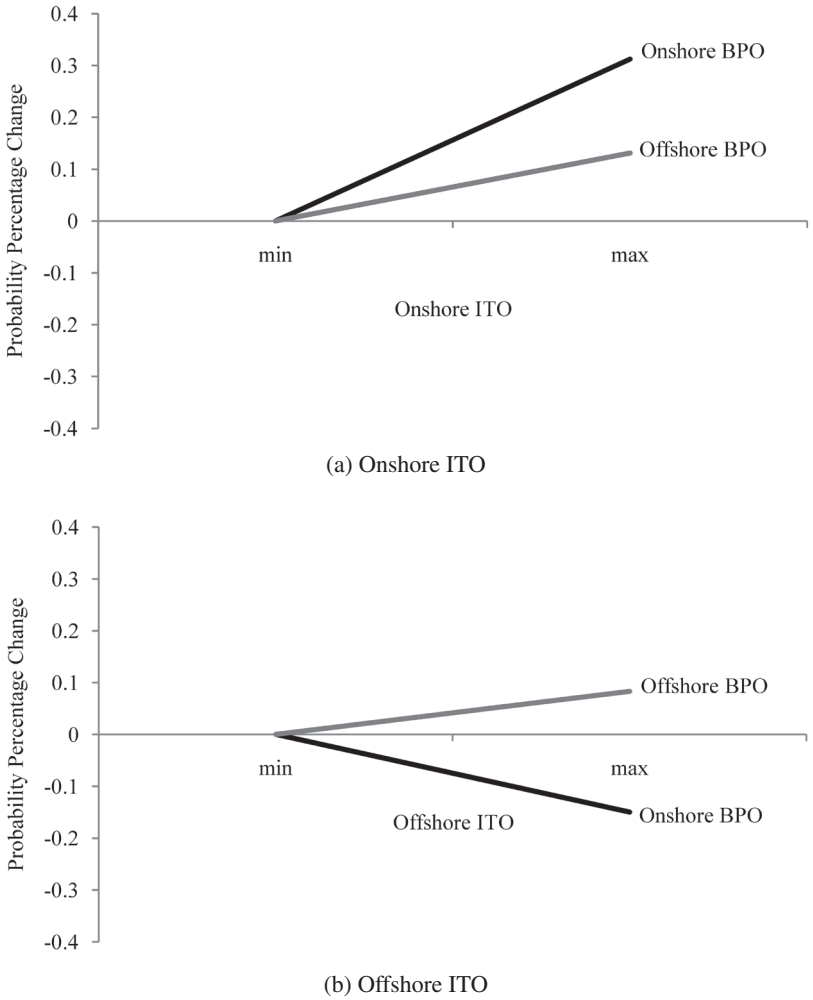
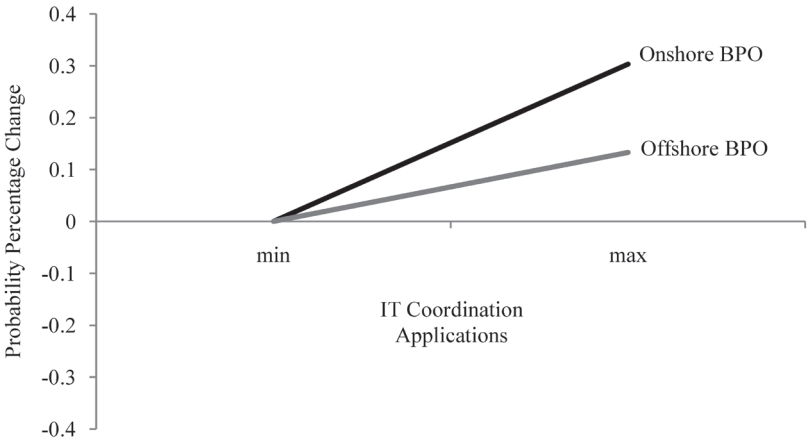
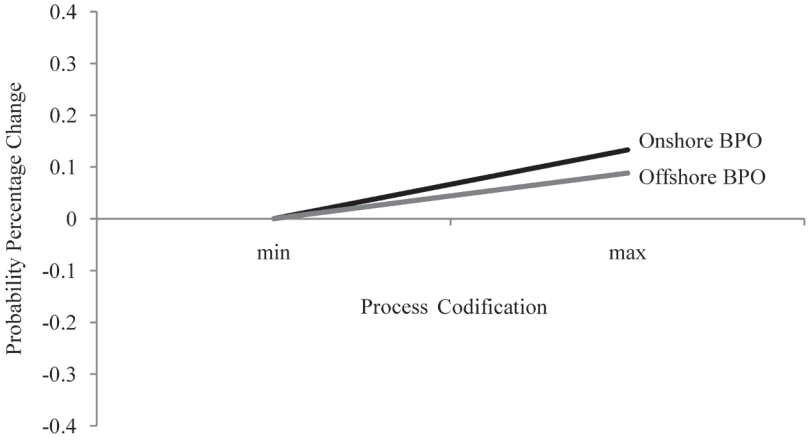


Figure 2. Differential Effects for Onshore BPO and Offshore BPO

(continues)



(c) IT Coordination Applications



(d) Process Codification

Figure 2. Continued

BPO ($\beta_{15} = 0.106$, $p < 0.026$) and offshore BPO ($\beta_{25} = 0.093$, $p < 0.088$), though the relationship with offshore BPO is only moderately statistically significant. Hypothesis 4a predicted a positive association of process codification with onshore BPO, and Hypothesis 4b predicted a positive association of process codification with offshore BPO. These hypotheses are supported for onshore BPO ($\beta_{16} = 0.248$, $p < 0.043$) and offshore BPO ($\beta_{26} = 0.449$, $p < 0.007$).

Hypothesis 5a predicted that ITO would mediate the relationship of IT coordination applications with BPO. This hypothesis is not supported, as Table 6 shows that this relationship is not mediated by onshore ITO or offshore ITO. Hypothesis 5b predicted that ITO would mediate the relationship of process codification with BPO. Table 6 shows that the relationship of process codification with onshore and offshore BPO

is partly mediated through the relationship of process codification with onshore and offshore ITO, which supports Hypothesis 5b.

The results showing the relationship of control variables with BPO also provide useful insights. We find that larger firms are more likely to engage in onshore BPO ($\beta_{18} = 0.236$, $p < 0.003$), consistent with prior research that large firms are more likely to adopt administrative innovations [52]. We also find that financial firms ($\beta_{29} = 0.890$, $p < 0.007$) and services firms ($\beta_{2-10} = 0.763$, $p < 0.011$) are more likely to engage in offshore BPO than are manufacturing firms, consistent with published reports that many large financial firms have engaged in significant offshore initiatives [64].

Discussion and Conclusion

Findings and Implications

This paper uses organizational learning and capabilities to define the managerial and technical capabilities that facilitate onshore and offshore BPO. Consistent with organizational learning theory, we find that firms engaged in onshore ITO, a more established and mature management practice than BPO, are more likely to engage in onshore and offshore BPO. These firms have learned from experience to identify, negotiate with, monitor, and manage IT outsourcing vendors and are able to apply this learning to BPO. We also find that firms with international experience are more likely to engage in offshore BPO. These firms have learned from experience with international partners to overcome cultural distance and communication barriers and are able to apply this learning to govern relationships with offshore BPO vendors.

We also studied the relationship of systems and process capabilities with onshore and offshore BPO. We find that firms with systems capabilities related to IT coordination applications are more likely to engage in onshore and offshore BPO. IT coordination applications, such as ERP, CRM, and SCM (supply chain management), enable firms to better integrate the outcomes of BPO vendors into their core business operations. We also find that firms with process capabilities related to codification are more likely to engage in onshore and offshore BPO. Codification provides firms with a better understanding of their business processes, which in turn enables firms to identify processes as candidates for outsourcing, scope projects, select vendors, and monitor and evaluate vendor performance. IT coordination applications and process codification reduce coordination cost and operational risk as processes are placed with outside vendors, and may give firms increased confidence to proceed with BPO.

We find differential relationships of organizational learning and capabilities with onshore BPO and offshore BPO. For example, we find that onshore ITO has a larger effect on onshore BPO than on offshore BPO. This suggests that there may be significant common elements in onshore coordination across ITO and BPO, and that the learning and capabilities developed in onshore outsourcing are more applicable to the onshore context than to the offshore context. We also find that IT coordination applications have a larger effect on onshore BPO than on offshore BPO. While IT coordination applications can enhance communications to a certain degree, there may

be a difference in distance that is better bridged through international experience than through communication technologies. This is consistent with the notion that there are differences between the offshore and onshore contexts. While onshore ITO and IT coordination applications have a smaller effect on offshore BPO than on onshore BPO, offshore ITO has a larger effect on offshore BPO. Because the IT function was one of the first functions to be performed offshore on a large scale, firms may be able to learn from their offshore IT experience and apply this learning to other functions in the firm. This is similar to the manner in which during the 1990s firms applied learning about process reengineering from the IT function to other functions in the firm.

Process codification has a positive relationship with onshore and offshore BPO, and with onshore and offshore ITO. This suggests that process codification may be a more fundamental capability that facilitates multiple forms of outsourcing and demonstrates the importance of managerial capabilities alongside technical capabilities for firms to develop and implement competitive strategies. The finding that process codification facilitates ITO, which in turn facilitates BPO, is consistent with research showing that outsourcing can provide a firm with flexibility and benefits [12].

This study has two implications for practice. First, from a BPO client perspective, a firm considering BPO must evaluate its IT coordination applications and process codification. A strong IT portfolio would give the firm more confidence that it can successfully connect with the BPO vendor to integrate BPO outcomes back into its core business operations, while a weak IT portfolio would indicate that the firm may need to make some internal investments prior to pursuing BPO. Firms must also evaluate their understanding of the business process to be outsourced. Good documentation and understanding of the business process would give the firm confidence that it can properly identify and scope the BPO project and select and manage the BPO vendor, while a poor understanding of the process may put the firm in a disadvantageous position, where it may not be able to properly identify the project or the vendor and may be subject to suboptimal vendor performance or financial savings.

Second, from a BPO vendor perspective, as vendors make increased investments to deliver BPO services from onshore and offshore locations, they will be competing for the client firms that would establish mutually beneficial relationships. Vendors will want to identify firms that are prepared to field BPO engagements and will need to know the characteristics of these firms. A prepared client firm can reduce problems in the BPO implementation, reduce the workload of BPO vendors, and effect more positive outcomes. Our findings suggest that vendors should focus their marketing efforts on firms with ITO experience and strong IT coordination applications and process codification.

Limitations and Future Research

This study has two primary limitations. The first limitation is that while firms learn and develop capabilities over time, our cross-sectional data set do not allow us to confirm the temporal relationships indicated by the theory. We are not able to confirm whether firms engage in and learn from ITO before they engage in BPO and are not

able to confirm whether firms demonstrate systems and process capabilities before they engage in BPO. We attempt to account for this limitation by taking two steps. First, we use robust case examples of firms such as GM, Prudential Financial, Aetna, Microsoft, Cisco, and Harvard Pilgrim to establish a temporal relationship of ITO and capabilities with BPO. Second, we theorize and test mediation to establish the temporal relationship. We acknowledge the limitation of cross-sectional data to test a temporal theory, and we recommend future research with panel data to enable researchers to better understand how organizational learning and capabilities influence outsourcing decisions and governance of vendor relationships over time.

A second limitation relates to the sample and archival survey instrument design by *InformationWeek*. To evaluate the generalizability of our findings, we compared the distribution of the firms in our study based on two-digit NAICS codes to the distribution of all publicly traded firms in Compustat that reported 2003 net sales. We find that while the distribution is reasonably similar across most two-digit NAICS codes, our sample contains a slightly higher proportion of wholesale trading firms and a slightly lower proportion of financial and information firms than all publicly traded firms in Compustat. For the survey instrument design, while some questions and response items (provided in the Appendix) may not fully capture the theoretical constructs in the most complete manner, future research can address this limitation by designing instruments with questions and response items drawing on the academic literature to more fully capture the desired theoretical constructs.

In addition to the two future research opportunities mentioned above, there are at least two other opportunities to extend this work. While prior research has studied outsourcing and offshoring at the industry, firm, or process level, there is a need for research to incorporate multiple levels of outsourcing and offshoring considerations in the same study. Such a study would require more in-depth data on the characteristics of outsourced processes and the extent to which each process is outsourced, along with data on the relevant firm-level and industry-level characteristics. Future studies can gather a richer description of BPO within a firm, in terms of the number of business processes outsourced and the proportion to which each process is outsourced, by validating a firm's use of onshore and offshore BPO using internal and external sources. Second, while many firms pursue BPO with the belief that BPO will reduce costs and enable the firm to focus on its core business operations, firms may also be able to use BPO to achieve quality and time benefits. There is a need for further research to test the cost, quality, and time outcomes of BPO, and other outcomes, including increased innovation and productivity [12, 47, 73].

To conclude, this paper uses organizational learning and capabilities to develop a conceptual model for onshore and offshore BPO. We test the conceptual model with archival data on a broad cross section of U.S. firms. We find that onshore ITO is positively associated with onshore and offshore BPO, and international experience is positively associated with offshore BPO. We also find that systems capabilities related to IT coordination applications and process capabilities related to codification are positively associated with onshore and offshore BPO, and that ITO partly mediates the relationship between process capabilities and BPO. The theory and findings provide a

better understanding of the managerial and technical capabilities that facilitate onshore and offshore BPO and are important as firms more broadly incorporate BPO into their global sourcing strategies.

Acknowledgments: An earlier version of this paper appeared as Jonathan Whitaker, Sunil Mithas, and M.S. Krishnan, "Organizational Learning and Organizational Capabilities of Firms That Engage in Onshore and Offshore Business Process Outsourcing," in R.H. Sprague (ed.), *Proceedings of the 43rd Annual Hawaii International Conference on System Sciences* (Los Alamitos, CA: IEEE Computing Society Press, 2010). The authors thank *JMIS* special issue editors Robert Kauffman, Eric Clemons, and Thomas Weber, two anonymous reviewers, and seminar participants at the 2010 Hawaii International Conference on System Sciences, 2009 Duke University Research Conference and Workshop on Offshoring, 2009 Global Sourcing Workshop, 2005 INFORMS Conference on Information Systems and Technology, and 2005 International Conference on Information Systems. They thank *InformationWeek* for providing the data for this research. Financial support was provided in part by a STIET (Socio-Technical Infrastructure for Electronic Transactions) fellowship with funding from National Science Foundation grant no. 0114368, the Stephen M. Ross School of Business at the University of Michigan, the Robert H. Smith School of Business at the University of Maryland, and the Michael R. and Mary Kay Hallman fellowship at the University of Michigan Ross School of Business.

Note

1. As a robustness check, we ran two separate probit models for onshore BPO and offshore BPO. Coefficients and significance levels in the separate probit models are virtually identical to those in the bivariate probit model.

For our data set, a bivariate probit equation is more appropriate than a multinomial probit equation, because a multinomial probit model would assume some theoretical difference between one form of onshore or offshore BPO individually and both forms of BPO together. The theoretical difference might imply that both forms of BPO together represent a higher volume of BPO than one form. Our data do not enable us to make a distinction in volume, because volume of BPO is not captured by our data.

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Appendix: *InformationWeek* 500 Questionnaire Items Used for This Study

Onshore and Offshore BPO

What forms of outside consulting or IT services does your organization currently use? (choose all that apply) Selections include:

- Business process outsourcing (onshore)
- Business process outsourcing (offshore)

Onshore and Offshore ITO

What forms of outside consulting or IT services does your organization currently use? (choose all that apply) Selections include:

- Onshore application development or maintenance
- Offshore application development or maintenance

Internationalization

What is the hallmark of your organization's global sourcing strategy? (choose all that apply) Selections include:

- We have workers or subsidiaries in foreign countries
- We buy direct from foreign suppliers
- We rely upon global distributors
- We rely upon joint ventures with foreign suppliers

Offshore IT Employees

Proportion based on responses to two questions:

1. Number of full-time IT employees in your IT organization in the United States.
2. Number of full-time IT employees in your IT organization outside the United States.

IT Infrastructure

Which of the following products or technologies are widely deployed in your organization? (choose all that apply) Selections include (author categories are in parentheses):

- ERP (coordination application)
- Supply chain planning (coordination application)

- CRM systems (coordination application)
- Business intelligence tools (coordination application)
- Business process management software (coordination application)
- Business performance management software (coordination application)
- Mobile commerce applications (coordination application)
- Content management software (coordination application)
- Product life cycle management software (coordination application)
- Data warehouse (infrastructure)
- Networked storage (SANs) (infrastructure)
- Web services (infrastructure)
- Windows server 2003 (infrastructure)
- Wireless fidelity (Wi-Fi) (infrastructure)
- Voice over Internet Protocol applications (infrastructure)
- Content filtering/antispam software (infrastructure)
- Intrusion-detection software (infrastructure)
- Grid computing (infrastructure)

Process Codification

Summative index based on responses to two questions:

What steps has your organization taken to optimize the efficiency of its technology processes in the past 12 months?

- Defined business processes

Which of the following are the most effective technology steps managers in your organization have made in the past 12 months to raise company productivity?

- Modeled business processes using CASE or a related tool