The antecedents of process integration in business process outsourcing and its effect on firm performance

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ABSTRACT

As service processes become candidates for outsourcing, interest in the global business process outsourcing (BPO) industry has grown considerably. In this study, drawing on information processing theory, we examine the role of integration in BPO and its effect on BPO firm performance. BPO Integration is concerned with the overall coordination of business processes and activities across different units within the outsourced environment. It involves both internal process integration – effective integration of task execution within the BPO and external process integration – effective integration between the BPO and their clients. Using survey data gathered from 205 Indian BPO service providers, we analyze the antecedents of process integration and its impact on BPO performance. The antecedents we examine are task complexity, task security, end customer orientation of the client and IT capability of the BPO. Among other results, we find that both internal and external process integration partially mediate the impact of the antecedents on performance. We draw managerial implications of our research to practicing BPO and client managers on how BPO outsourcing can be made successful.

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1. Introduction

Continuous improvements in telecommunications and information technology (IT), along with the availability of a skilled global workforce and reduction in international trade barriers have spurred the breakdown of service delivery value chains (Apte and Mason, 1995; Metters, 2008; Mithas and Whitaker, 2007). Many firms have now shifted from a strategy of ownership of assets to a strategy of outsourcing some or all the components of a service to offshore locations to reduce cost, improve cycle times and to gain innovation capabilities (Kulkarni, 2008). These services, given their reliance on information technology for delivery, are labeled information technology enabled services (ITES). In particular, the offshoring of service work from developed countries to emerging market economies has gained significant public attention (Metters and Verma, 2008). This trend is part of a larger emerging phenomenon of business processes outsourcing (BPO) to a third party service provider. These BPO organizations play an important role in a buying firm's strategy by allowing clients (outsourcer) to special-

ize in their core competencies and serve as the client's extended enterprise (Aron and Singh, 2005).[1] The BPO market over the past few years has grown significantly and the spending for IT–BPO services is estimated to be about $976 billion (NASSCOM, 2009). Further, the BPO component of this spending grew the highest at 12% in 2008 underscoring the importance of this sector (NASSCOM, 2009).

Notwithstanding any substantial potential savings, a number of firms are unable to realize the benefits of offshoring. Some practitioners have noted that BPO problems are related to "dark underbelly of integration failures" (Cioni, 2007, p. 1). For example: (a) Alster (2005) predicted that during 2005–2008, 60% of organizations outsourcing customer facing services would face customer defections and incur hidden costs that may nullify savings; (b) Aron and Singh (2005) indicated that half the firms that shifted processes offshore failed to generate expected financial benefits; and (c) Robinson et al. (2008) indicated that more than 75% of

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[1] Consistent with Sako (2006), outsourcing occurs when a firm opts to "buy" rather than make things "in-house." Further, *Offshoring* occurs when the firm moves any of its activities overseas that are then conducted by third party service providers or by their wholly owned subsidiaries. Therefore *offshore outsourcing* occurs when a firm does both.

service providers they interviewed felt that clients were ill pre-pared for the outsourcing initiative and lacked a well-developed strategy and understanding of how outsourcing would work. These anecdotal findings suggest that the BPO firm's performance may not be aligned with the expectations of the client. Past literature suggests that an important reason for this problem could be the inability of the service providers and their clients to manage the interdependencies of the processes, thus leading to their failure in offshore environments (Mani et al., 2007; Aron and Singh, 2005; Cioni, 2007). Effective process integration, both within the service provider and with their client, may alleviate poor performance.

While researchers have long articulated the requirement for a close, integrated relationship between supply chain partners (e.g., Armistead and Mapes, 1993), only recently has there been a call for a systematic approach to study supply chain integration. Increas-ingly, global competition has caused several firms to rethink the need for cooperative, mutually beneficial partnerships and the joint improvement of inter-organizational processes has become a high priority (Zhao et al., 2008). In particular, as BPO firms (also referred to as service providers) work on diverse processes, effective process integration could become an important prerequisite to executing complex tasks (Espinosa et al., 2007). The ability to integrate pro-cesses from multiple contexts can provide the BPO firm with unique capabilities that are non-imitable and non-substitutable, enable them to transition processes quicker, reduce risks of process failure, improve customer service levels and consequently performance.

Our paper differs from past work in the BPO environment and in the area of supply chain integration in multiple ways. First, integra-tion in the context of supply chain management has been examined in the past by multiple researchers (e.g. Frohlich and Westbrook, 2001; Mitra and Singhal, 2008; Narasimhan and Kim, 2002). How-ever, research on integration in the context of services is scarce. Roth and Menor (2003) in setting the agenda for research on ser-vice operations suggest integration as an important and critical issue. BPO operations are characterized by additional complexi-ties that go beyond traditional services making integration more important. The contents of BPO services (e.g., technical advice, legal services, consulting reports, market research, etc.) are hard to define. Further, organizations that outsource cannot just supply service providers with specifications and expect them to perform well (Aron and Singh, 2005). Until service providers can manage these tasks well, they may make more errors and execute tasks inefficiently when compared to onshore employees. Additionally, a BPO operation may often require a quick turn-around time from the offshore employees. Further, associated risks of failure for BPO firms may be higher as they are bound by contractual obligations to their clients. Effective integration may dispel these problems. This is an important area to explore because failure to effectively integrate in a service environment may lead to poor performance. Our paper contributes broadly by investigating the issue of both external and internal process integration in BPO service operations.

Second, many of the BPO functions require embedded, com-plex knowledge components (Youngdahl and Ramaswamy, 2008). Therefore, tasks may vary in their range of complexity and con-sequent execution. The quality of these services may often depend on the coordination between each process and sub-process shipped offshore (Aron and Singh, 2005). We contribute to the understand-ing of BPO performance drivers by arguing that integration within the service provider and between the client and service provider are important elements in service execution that improve perfor-mance.

Third, recent work in the BPO domain has examined various issues underlying BPO operations and management (e.g. Levina and Vaast, 2008; Youngdahl and Ramaswamy, 2008; Ellram et al., 2008; Tanriverdi et al., 2007). However, this literature has not examined the role of process integration in driving performance of a BPO firm.

We examine the drivers of BPO firm performance by taking the service provider's perspective. As the BPO industry becomes more prominent, examining the drivers of BPO performance may enable clients to take more informed decisions on managing offshore pro-cesses.

Finally, we contribute to the relatively scarce but emerging area of research in international service operations. While most of the international work in the context of services (e.g. McLaughlin and Fitzsimmons, 1996; Voss et al., 2004; Roth et al., 1997) focus on the individual consumer effects, our research focuses on the "pro-duction of services" (Metters, 2008, p. 199) in business to business settings where the role of integration may assume greater promi-nence. Against the backdrop of the above discussion, we answer the following research question: *What are the key antecedents to BPO internal and external process integration and how does process integration affect BPO firm performance?* We present a theoretical framework anchored on information processing theory (IPT) and analyze survey data collected from 205 India-based BPO service providers. Based on our analysis, we draw insights on drivers of BPO performance and BPO process integration. The rest of the paper is organized as follows. In Section 2, we discuss the conceptual model and present our hypotheses. In Section 3, we describe the research design, sample and scale validation. In Section 4, we present our analysis and results. In Section 5, we discuss the managerial impli-cations of the research findings. Finally, in Section 6, we conclude with the research limitations and future opportunities.

2. Theoretical framework and research hypotheses

2.1. Information processing theory

The conceptual model that we develop and test in this paper draws upon information processing theory (Galbraith, 1973). The basic function of any organization is to create an appropriate con-figuration of processes, structure and information technology to facilitate the collection, processing, exchange and distribution of information (Galbraith, 1973). Information processing in organi-zations is defined as the gathering of data, the transformation of data into information, and the communication and storage of infor-mation (Galbraith, 1973; Tushman and Nadler, 1978). Further, for effective control leading to successful firm performance, informa-tion processing requirements should be aligned with information processing capabilities of both internal and external process control mechanisms (Galbraith, 1973; Daft and Lengel, 1986). IPT suggests that the most effective organizational design strategies are those that recognize an appropriate fit between an organization's abil-ity to handle information and the required information (Egelhoff, 1982; Huber, 1990). While IPT shares with the transaction cost economics the importance of cost saving in information process-ing, more importantly, it sheds light on the information processing mechanisms and capabilities furnished by inter-organizational design and relationships.

2.1.1. BPO process integration

BPO process integration is concerned with the overall coor-dination of business processes and activities in the outsourced environment. This involves effective division of tasks across units and consequent coordination to execute the tasks within the orga-nization and with the client (Van de Ven et al., 1976). Further, when uncertainties are high, considerable amount of mutual adjustments are accommodated by the diverse groups (Van de Ven and Delbecq, 1974). The literature suggests that greater the extent to which work is distributed, the larger the effort that is required to coordinate and integrate these tasks (Hui et al., 2008; Espinosa et al., 2007). Inte-gration can be both external and internal to the firm (Rosenzweig
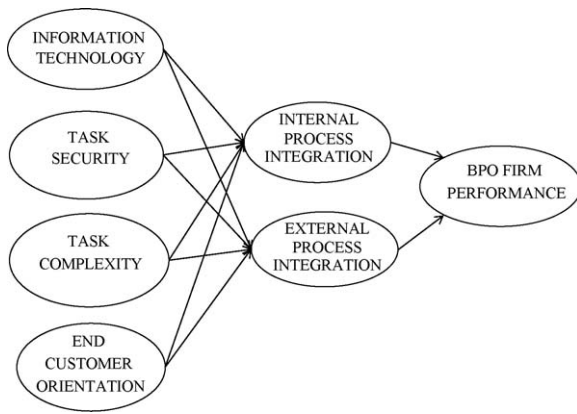
Fig. 1. Hypothesized model (M1).

et al., 2003; Flynn et al., 2010) and is important for firm success (Rosenzweig et al., 2003; Koufteros et al., 2005).

Internal process integration refers to the degree of overall harmonization of processes within the BPO firm. Most processes are composed of a set of sub-processes. Interaction between diverse constituent sub-processes is necessary to effectively execute tasks (Aron and Singh, 2005). Often, these constituent tasks may require coordination between multiple teams and functions (Haynes and Thies, 1991). In discussing BPO process integration, the multiple departments and functional areas within the service provider represent entities in which internal process integration should occur. Further, the supply chain literature suggests that achieving internal integration is a first step toward achieving overall process integration (Handfield and Nichols, 1999; Swink et al., 2002).

External process integration refers to the degree of interdependence between the processes of the service provider and the client. Tightly coupled systems tend to exhibit a high degree of dependency/interdependency (Ettlie and Reza, 1992). Increased coupling is also associated with increased responsiveness (Ettlie and Reza, 1992; Orton and Weick, 1990). For such coupling to occur, the interaction between the client and the service provider and their degree of cooperation should be high (Luo, 2002c). Effective workflow between the client and service provider is also a critical aspect of service execution in BPO firms (Aron and Singh, 2005). Fig. 1 presents the research model. We now motivate our hypotheses and the choice of antecedent variables.

2.2. Hypotheses development

IPT states that organizations are structured around information and information flows in an effort to reduce uncertainty (Bensaou and Venkatraman, 1996). Further, task uncertainty and environmental uncertainty are among the primary sources of uncertainty for the organization (Bensaou and Venkatraman, 1996). Hence, to cope with these types of uncertainties, organizations pursue integration to increase information processing capabilities (Van de Ven and Delbecq, 1974; Stock and Tatikonda, 2008). Task uncertainty refers to the degree of interdependence among the task and the extent to which the knowledge of the task is previously known (Thompson, 1967; Bensaou and Venkatraman, 1996). Further, complexity of tasks has been cited as an important component of task uncertainty (Van de Ven et al., 1976). Task complexity has an important bearing on the degree of coordination required (Van de Ven et al., 1976; Malone, 1987). More complex tasks may have higher uncertainty and greater information processing needs (Bensaou and Venkatraman, 1996). Task complexity introduces uncertainty related to the intensity of interdependence (Bensaou and Venkatraman, 1996; Van de Ven and Delbecq, 1974), the nature

of skills required and the predictability of outcomes (Galbraith, 1973). Additionally, in a BPO environment, task uncertainties may arise due to client needs for security (Mouhalis, 2006; Narayanan and Swaminathan, 2007). Increased need of task security may create uncertainties that hinder effective coordination and impair effective information processing in BPO transactions (Click and Duening, 2005). Accordingly we examine the role of task complexity and task security in a BPO environment.

Environmental uncertainty is defined as the "homogeneity–heterogeneity" of the elements in the population that the organization has to deal with (Bensaou and Venkatraman, 1996, p. 453). Unfamiliar environments (due to incomplete knowledge) may make it difficult for firms to predict how services may be delivered (Beckman et al., 2004; Milliken, 1987). BPO has a significant potential to involve the client's "customer" into the operation of the service provider. Increased focus on end customers can bring in additional uncertainties that are a source of variability that organizations need to manage. We refer to this focus as end customer orientation. This view is consistent with the service operations literature wherein high customer involvement is an important source of variability (Larsson and Bowen, 1989; Chase, 1981).

Finally, past research in the area of services has suggested the importance of technology in coordinating the diverse elements of services (Haynes and Thies, 1991; Roth and Menor, 2003). Technology is often suggested as a tool to improve the information processing capabilities of the firm according to IPT (Bensaou and Venkatraman, 1996). Accordingly, we examine the role of information technology on integration and consequently performance. In developing our hypotheses, first, we focus on sources of uncertainty generators that include task complexity, task security and end customer orientation. Second, we focus on information technology. Information technology is a tool that improves the organization's ability to handle information (Bensaou and Venkatraman, 1995). Third, we develop our hypotheses relating to process integration and BPO performance. Finally, we develop the hypotheses to argue that integration is an important element in BPO operations that may help an organization mitigate the impact of uncertainty and enable the organization to exploit information technology in order to achieve higher performance.

2.2.1. Relationship between task characteristics and BPO process integration

Bensaou and Venkatraman (1996) identified task uncertainty as an important attribute of IPT. In this research study, we examine task complexity and task security as sources of task related uncertainties. Guided by IPT, we argue that BPO task characteristics including task complexity and task security determine information processing requirements. Central to IPT is the idea that firms must develop information processing capacity in order to cope with uncertainties (Galbraith, 1973; Tushman and Nadler, 1978).

2.2.1.1. Task complexity and BPO process integration.
We define task complexity as the degree of customization and knowledge intensity of the tasks the firm undertakes. Task complexity concerns the extent to which the BPO task is sophisticated and difficult to standardize, requiring a great deal of specialized knowledge to undertake the task. This definition is consistent with past literature that suggests that complex tasks are interdependent (Mohr, 1971; Bensaou and Venkatraman, 1996), require a high degree of specialization to solve problems (Perrow, 1967) and have unpredictable outcomes (Galbraith, 1973). Further, complex tasks are characterized as those in which the paths to a goal are unclear and are dependent on the number of subtasks that need to be performed (March and Simon, 1958; Terborg and Miller, 1978). These subtasks may often be interdependent and require information seeking and collation in their execution (Byström and Hansen, 2005). Fur-

ther, sub-tasks may be characterized by multiple outcomes and contain number of interrelated and conflicting elements that need to be coordinated (Campbell, 1988). Taking an information processing perspective, Schroder et al. (1967) suggest that complex tasks have higher information load, higher information diversity and higher information exchange.

Coping with increased task uncertainty requires increased coordination and customization (Scharl et al., 2001; Espinosa et al., 2007; Galbraith, 1973). According to the IPT, increased task complexity can be handled through better formalization of systems and procedures, and through appropriate work division and allocation allowing for greater clarity in execution of task (Daft and Lengel, 1986). Further, increased complexity may require greater coordination between multiple departments in order to execute the interdependent tasks. Process integration in this context can help in seamless coordination between the client and the service provider and within the operations of the service provider.

Increased task complexity may not just increase coordination within the firm, but may also increase the requirement of coordination with the client. This is consistent with past research in services that suggest that complex services have intensive client involvement (Larsson and Bowen, 1989; Slocum and Sims, 1980). Despite the complexity in execution, deliverables in offshore processes often need to be distinctive (Aron and Singh, 2005). Further, processes also need to be responsive to client needs and to the uncertainties stemming from any changes. Such dialectical systems that are distinctive and responsive are often tightly coupled (Orton and Weick, 1990). As clients outsource a variety of tasks that involves processes that are complex, and require intensive coordination, tighter coupling of these processes becomes important as well. Such outputs are more likely to be synchronized with the client's requirements. Therefore, we hypothesize:

H1A. An increase in the global BPO firm's task complexity has a positive impact on the level of internal process integration within the BPO service provider.

H1B. An increase in the global BPO firm's task complexity has a positive impact on the level of external process integration between the BPO service provider and its global client.

2.2.1.2. Task security and BPO process integration. Security of information has been an important focus of discussion for client firms. The tort law in the US suggests that firms are liable for information security lapses via four possible means: duty, negligence, damage and cause (Click and Duening, 2005). This requires firms to often meet regulatory compliance and establish policies and procedures (Click and Duening, 2005). More importantly, clients particularly from the US and Europe that offshore their processes are equally liable for loss of data as much as the BPO firms under the theory of negligent entrustment (Rustad and Koenig, 2007). Further, BPO firms face legal liabilities if there is a breach of security on outsourced processes. Therefore, both clients and service providers have a heightened sensitivity to task security issues (Rustad and Koenig, 2007). Stronger information sharing laws at the client country in the context of outsourced processes may impact coordination of the process.

The heightened security issues often make the firms put in place multiple levels of security controls including physical checks and logical controls on information transfer through IT (Click and Duening, 2005). Increased need for task security has multiple effects on the internal process integration of the BPO firm. First, increased task security prevents departments from sharing information with one another – at times to the detriment of task execution. Also, clients specify data security clauses and any breach carries stringent penalties (Mishra and Chandran, 2005). Second, to enhance data security, operations in BPO firms sometimes orga-

nize tasks in silos that are intended to protect data security and give access to only the exact information that each employee needs. Such measures may prevent cross functional coordination and make client and service provider overlook execution of interdependent processes and make each functional silo self sufficient resulting in poor information flow. Thus the need for task security may have a negative influence on the level of internal integration. Therefore, we hypothesize:

H2. An increase in task security for a global BPO firm has a negative impact on the level of internal process integration within the BPO service provider.

In contrast to the impact of the task security on internal process integration, increased needs of task security may not have a significant influence on external process integration given that the service provider may have better monitoring and control of the deliverable when process coupling is higher. In particular, when external integration is high, the client also has a significant control over receiving the deliverables. Therefore, task security may be less of a concern.

2.2.2. Relationship between end customer orientation and BPO process integration

End customer orientation refers to the overall uniqueness of service the BPO delivers to the end customers of its client. The service operations literature suggests that high customer contact increases uncertainty (Mills and Moberg, 1982; Larsson and Bowen, 1989). IPT posits that uncertainty is characterized by high information processing needs (Galbraith, 1973). In the context of BPO, this uncertainty can arise due to the environment. These uncertainties may happen due to the increased diversity of "end customers" and consequent requirements that the BPO firm may have to contend with. Uncertainties in environment may be caused because BPO firms have to comply with strict regulatory infrastructure (Click and Duening, 2005; Wulf, 2006). Examples include the development of rules to safeguard consumer information by the US Federal Trade Commission (FTC) for domestic firms (Click and Duening, 2005), and the Sarbanes–Oxley act that instituted laws to curb financial reporting irregularities (Wulf, 2006). Notwithstanding such regulations, direct interaction with end customers might have other unique needs which might create uncertainties in executing the tasks. Finally, when clients are highly focused on their end customers, the BPO firms are expected to be highly responsive to the needs of the end customers since customer satisfaction issues assume prominence.

In order to meet these uncertainties, practitioners note that in industries where the service providers come in direct contact with the end customers of the clients, the service providers have to make considerable infrastructure investments (Read, 2008). For example, in case of the contact center industry, sophisticated end customers have an array of channels that prevent firms from reaching them. An example is the "do not call" list in the USA that is popular among many customers (Read, 2008). This evolution of the end customers for the BPO firms is a "paradox" as "BPOs cannot afford to invest in the latest tools without strong assurance that clients will want and pay for them, yet clients will not do business with these BPOs unless they have those tools" (Read, 2008). Investment in such sophistication may be important to pursue integration objectives. Convergys, a firm that provides contact center services, has implemented several value added services that include speech recognition, business intelligence and other important additions to help their clients in retaining end customers (Read, 2008).

Such investments in resources and infrastructure are also consistent with the prescription of IPT that increased implementation of information technology can better enable the organization to meet the information processing needs generated by customer

uncertainty (Bensaou and Venkatraman, 1996). Within the BPO firm, such coordination may require different work groups to gather information that the client needs in a timely manner, or to respond to changes in the client's regulatory environments (Wulf, 2006). With the client, increased responsiveness can be achieved through tighter process coupling that can allow the BPO firm to be responsive to client needs and offer higher service levels. Based on these arguments, we hypothesize:

H3A. The higher the level of end customer orientation for a global BPO firm, the higher the level of internal process integration within the BPO service provider.

H3B. The higher the level of end customer orientation for a global BPO firm, the higher the level of external process integration between the BPO service provider and its global client.

2.2.3. Relationship between information technology capability and BPO integration

The use of information technology forms a cornerstone for information processing capabilities (Bensaou and Venkatraman, 1996; Fairbank et al., 2006; Brynjolfsson et al., 1994). The information technology infrastructure of an organization is determined by its hardware and software resources that facilitate exchange of data through formal means (Weil, 1992). This facilitates increased information sharing with the outsourcing partners and enables better coordination (Fairbank et al., 2006).

The presence of strong IT infrastructure facilitates recording and retrieval of information about organizational processes making process formalization more viable (McAfee, 2002; Mithas and Whitaker, 2007). Formalization also helps manage inter-organizational process dependencies in order for the individual processes to function in unison (Bardhan et al., 2007; Davenport and Short, 1990). Efficient coordination of processes is enabled by information technology. This would then enable better utilization of scarce resources and as a result would reduce cost (Fairbank et al., 2006). Bensaou and Venkatraman (1996) further assert that efficient use of IT functionality facilitates inter-organizational coordination and the information processing capability of a client-service provider relationship will increase with greater intensity and scope of the use of technology between the two organizations.

Overall, effective information technology enables reduction of coordination cost that is imposed due to increased uncertainty and improves information flow (Soh and Markus, 1995). For example, IT deployment for outsourced production of the Xbox 360 system enabled Microsoft to improve its data integration processes with their suppliers and also helped the firm standardize the data exchange interfaces (Pande et al., 2006). Finally, evidence from the business process reengineering literature suggests that improved information infrastructure has been a cornerstone for improved process integration (Davenport, 1993). Hence we hypothesize:

H4A. A BPO service provider's information technology capability has a positive impact on its level of internal process integration.

H4B. A BPO service provider's information technology capability has a positive impact on its level of external process integration with its global client.

2.2.4. Relationship between process integration and firm performance

In accordance with IPT, as the task and environmental uncertainties increase, so does the requirement for integration within the firm and with its partners (Galbraith, 1973). Grinter et al. (1999) report that all the outsourced projects they examined experienced problems in coordination, and in each of the projects, employees at various locations often lacked the expertise they needed to do their work. For example, when work was distributed

by functional area, employees at each site did not have critical knowledge about other functional areas. Hence, in coherently executing the task, each of the internal constituents seeks integration with other project teams or members to gain the required information, and to minimize task uncertainty. Integration across functional areas reduces uncertainty by improving communication and harmony across functional areas (Barki and Pinsonneault, 2005). Further, the nature of the inter-unit decision making is an important constituent of the information processing capacity and determines the exchange of information between different sub units (Galbraith, 1973; Stock and Tatikonda, 2008). The more complex the interdependencies, the deeper the integration between respective individuals involved in coordinating the tasks (Espinosa et al., 2007). Typical mechanisms to coordinate members of work teams and promote inter-organizational relationships include policies and procedures, work plans, personal contact and meetings (Van de Ven et al., 1976; Duncan, 1972; Tushman and Nadler, 1978). Finally, effective coordination between the client and their service providers is important to lower overall costs and mitigate the risks inherent in external sourcing (Handley and Benton, 2009).

The primary attribute that makes integration an important capability in BPO context is the level of uncertainty that is involved in transitioning the processes offshore, stabilizing the process execution offshore, establishing a metrics program and finally coupling the processes with their clients (Narasimhan et al., 2010). Further the "the more customized the service, the more unique (highly differentiated) the interdependencies between the actions of the divided service work" (Larsson and Bowen, 1989, p. 219). Increased process coupling with the client enables the BPO firm to handle increased level of uncertainty (Chase and Tansik, 1983; Larsson and Bowen, 1989). Additionally, the increased coupling may also enable the organization to be highly responsive to customer needs (Ettlie and Reza, 1992). Effective integration in this context may lead to better BPO performance. Therefore, we hypothesize:

H5A. For a global BPO service provider, a higher level of internal process integration within the firm is likely to result in higher firm performance.

H5B. For a global BPO service provider, a higher level of external process integration with its global client is likely to result in higher BPO firm performance.

2.2.5. Relationship between antecedents, process integration and BPO performance

The IPT suggests that a "fit between information processing needs and information processing capabilities is a strong determinant of task effectiveness, or performance" (Bensaou and Venkatraman, 1996, p. 453). In particular under conditions of high task and environment uncertainty, a firm requires higher information processing capacity in order to effectively coordinate activities both within the firm and externally with its clients. Increased information processing capacity stems from a better ability to collect, process, exchange and distribute information when systems work effectively together (Bensaou and Venkatraman, 1996; Galbraith, 1973).

BPO firms that work on tasks that are complex and require increased security may be faced with higher task uncertainty. Further, working on tasks of increased complexity and security may also enable the BPO firms to perform better as an increased ability to work on more complex tasks may be indicative of a higher level of capability that might be possessed by the BPO firms. This in turn might contribute to increased performance. In addition, despite increased environmental uncertainty, BPO firms that interact with end customers might demonstrate higher performance due to the potential to contribute increased value to their clients and facili-

tate cost reductions. Further, these firms may even exploit unique knowledge of customers in a specific setting in order to expand their operations further. From the BPO firm standpoint, it might be crucial to effectively manage these sources of uncertainties. Process integration in these settings may serve a boundary spanning role to help mitigate these sources of uncertainties through increased coordination, monitoring and control, i.e., effective internal process integration within the firm may act as a mechanism to cope with task and environmental uncertainties enabling the BPO to become more responsive to the needs of the client. At the same time, external process integration may also be critical in meeting these uncertainties. Increased coupling may enable the service provider to better predict the nature of incoming tasks from the client due to increased visibility into the clients' processes and activities. This allows the service provider to be responsive to client needs as the service provider can develop deeper knowledge about the nature and type of incoming task and be better prepared to handle the incoming task. Therefore, a higher level of process coupling between the client and the service provider can mitigate the effects of uncertainty in variation of incoming tasks from the client and its consequent execution. Further, higher visibility into processes due to coupling can in turn help in establishing the standards, procedures, and policies that govern delivery and coordination (Thompson, 1967). This can enable a reduction in operating costs and administrative overheads, improved service quality, and enhanced customer responsiveness. All these help achieve higher customer service standards, and consequently higher performance (Das and Teng, 1998).

Finally, literature on information technology has associated information technology investments to improved firm performance (Harris and Katz, 1991; Bharadwaj, 2000). In particular, Harris and Katz (1991, p. 287) note that information technology investments also enable the organization to be "sophisticated in gathering and processing information" and enable them to quickly respond to changes. This may be particularly true in business process outsourcing since these processes rely on effective implementation of information technology by the BPO. Such gain in responsiveness and coordination may be accrued both within the firm and also with the client. Overall internal and external integration may act as "intervention" mechanisms (Venkatraman, 1989, p. 438) on the impact of the antecedent variables on BPO performance and hence play a mediating role on the impact of antecedents on performance. Accordingly, we hypothesize:

H6. For a global BPO service provider, the impact of the antecedent variables on BPO firm performance is mediated by its level of internal and external process integration.

2.3. Control variables

In addition to examining the hypothesized effects, we control for three variables that may impact the performance of a BPO firm. First, we control for size in terms of the total number of employees (we use the natural log of employees as our measure). Large firms tend to have access to more resources and enable economies of scale (Pfeffer and Salancik, 1978). Second, we control for the number of different client countries (geographic dispersion) that the BPO firm expanded to. Geographical dispersion of clients and the lines of engagement may be indicative of the different markets where the firm gains its business and can ultimately influence performance. Finally, we also control for whether the BPO firm possessed offshore delivery centers in other countries – *Reverse Outsourcing* (considered as a categorical variable). Reverse outsourcing may allow BPO firms to be more responsive to their client needs as the firm may have a better understanding of the client's market.

3. Research methodology

3.1. Survey instrument development

Our data collection was initiated though a research alliance with a leading BPO consulting firm in Bangalore, India. This consulting firm assisted us with survey administration and data collection from BPO service firms located in India. The consulting firm has over 10 years experience in outsourcing consultancy and has serviced various large BPO customers. Before the development of the instrument, we endeavored to gain a qualitative understanding of the BPO industry landscape. In order to do this, we interacted with a set of BPO firms with different processes to obtain a thorough understanding of their operations.[2] One of the research team members first traveled to India and spoke with the CEO and (or) COO of the BPO firms in order to first understand the key issues facing these firms. These respondents had a very high level of knowledge about the business environment and the issues of interest in this study. Miller and Roth (1994) indicate that high ranking informants tend to be a more reliable source of information. During these interactions, the managers shared a number of documents such as process maps and frameworks that each firm used to facilitate seamless transition of the process offshore and included issues such as the key objectives and principles during transition, detailed business process description, client-service provider responsibilities to set-up and stabilize review metrics and monitor daily operations. These interactions provided us with a working knowledge of the key managerial issues in the BPO industry. Along with a review of current academic work, this helped us generate the initial items for the questionnaire. This procedure is consistent with the deductive item generation procedure described in Hinkin (1998).

To establish face validity of measures related to a construct, we followed a three-phase iterative procedure. Specifically, the second author visited India for a second time and spoke with the COO of five BPO firms to validate the survey instrument. Each COO not only met face-to-face with the research team member, but also indicated any difficulty they experienced in responding to items and offered suggestions that they deemed appropriate. Based on their feedback, we modified some items in the survey questionnaire.

In the second phase of pretests, the scales for all the constructs were presented to three academics with research interests in the outsourcing domain who were asked to evaluate the items from the standpoint of domain representativeness and face validity. Based on the feedback, some of the items were further revised. Third, the refined items were presented to three senior managers of BPO firms. These managers were asked to complete the survey questionnaire. We further refined the items in the content and language based on feedback from these managers. Our final item list after the pre-tests consisted of three items on each antecedent variable and integration constructs.

In order to administer the survey, the enlisted consulting firm had developed a database that consisted of 900 service firms in India offering various types of outsourcing services to clients that were located globally. These 900 firms were listed with NASSCOM (National Association of Software and Services Companies) as of the end of the year 2006.[3] Out of these 900 firms, we chose about 300 firms that had been in the market for a minimum of 2 years of BPO service offering so that they had some level of maturity. Upon finalization of the instrument, the enlisted consulting firm got in touch with the CEO/COO of these 300 BPO firms to enlist their support for completing our survey questionnaire. Senior man-

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[2] None of these firms were included in our survey data.
[3] NASSCOM® is the premier trade body and the chamber of commerce for the IT-BPO industries in India.

Table 1
Results of confirmatory factor analysis.

Construct	Item code	Standardized loadings	t-Values	Item mean	S.D.
Performance (PERF)	PERF1	0.820	Fixed	3.0	1.2
	PERF2	0.816	12.178	2.8	1.2
	PERF3	0.790	11.810	3.2	1.3
Internal process integration (INT$_{INT}$)	INT$_{INT}$1	0.778	Fixed	3.8	0.9
	INT$_{INT}$2	0.859	13.163	3.6	1.1
	INT$_{INT}$3	0.869	13.338	3.7	1.1
External process integration (EXT$_{INT}$)	EXT$_{INT}$1	0.668	Fixed	3.5	1.1
	EXT$_{INT}$2	0.797	10.592	3.2	1.3
	EXT$_{INT}$3	0.892	13.554	3.6	1.1
Task complexity (TCOMP)	TCOMP1	0.792	Fixed	3.2	1.2
	TCOMP2	0.847	12.191	3.4	1.1
	TCOMP3	0.723	10.446	3.2	1.2
Task security (TSEC)	TSEC1	0.853	Fixed	4.3	0.8
	TSEC2	0.908	15.292	4.2	0.9
	TSEC3	0.785	13.154	4.4	0.8
End customer orientation (ENDO)	ENDO1	0.924	Fixed	3.6	1.2
	ENDO2	0.878	17.801	3.6	1.2
	ENDO3	0.686	11.729	3.9	1.1
IT capability (ITCAP)	ITCAP1	0.828	Fixed	3.8	0.9
	ITCAP2	0.843	11.907	3.9	0.9

Fit indices: $\chi^2 = 247.84$; d.f. = 149; NNFI = 0.981; CFI = 0.985; GFI = 0.893; SRMR = 0.048; RMSEA = 0.056; NFI = 0.965;IFI = 0.985; sample size (n) = 205.

agers from 205 BPO firms agreed to participate in this survey. The consulting firm then put together a team of senior personnel who had experience in the BPO sector to visit each of the BPO firms that had agreed to respond and administered the survey questionnaire to the CEO/COO of the firm face-to-face. All the firms that had agreed to participate in the study responded to all the questions that appeared in the survey questionnaire. Overall our response rate was 68.33%. Note that our response rates are well above the average response rates of 32% in other OM studies as reported by Frohlich (2002). Additionally, we compared the age and size of randomly drawn set of 40 firms from the responding and non-responding datasets (Wouters et al., 2009). Our t-test for mean differences between the age of these firms suggested that they did not differ significantly from one another ($p = 0.756$). Further, the average number of employees between these two samples also did not differ significantly ($p = 0.793$). Therefore, we believe that our results may be robust to response bias. The final set of responses represented all the geographical regions of India and encompassed 83 different service domains. Further, about 43% of our sample firms were from southern India, 31% were from northern India, 15% were from western India, 6% were from Eastern India and the remaining were located in central India. The firms in the sample had an mean of 1217.85 employees (standard deviation = 5228.28), clients for these firms came from a mean of 4.45 countries (standard deviation of 4.56) and had an average age of 6 years. Additionally, 30 firms from our sample of 205 firms had established a base in the country where their major client was located. The majority of clients

originated from countries including the United States, the United Kingdom, Germany and Canada.

3.2. Measurement instrument validation

The items used to measure each construct are shown in Appendix A and the descriptive statistics pertaining to the items are in Table 1. All the measures are based on a five point Likert scale. In order to examine unidimensionality, we use confirmatory factor analysis (CFA) (O'Leary-Kelly and Vokurka, 1998). The CFA approach allows hypothesis testing for unidimensionality when a prior association for the latent variables and their associated empirical indicator is specified (Anderson and Gerbing, 1988). The hypothesis test offers a stricter interpretation of the quality of the overall factor structure (Hinkin, 1998). We conducted the CFA using Lisrel 8.8 (Jöreskog and Sörbom, 2006). While a majority of our items had high loadings, one of the IT capability items had to be dropped due to cross loading (please see Appendix A for details on the dropped item). After dropping this item the final model contained three items in all of our constructs except for IT capability that contained two items. The overall RMSEA of the model was 0.056 ($p < 0.05 = 0.182$). The χ^2 value (degrees of freedom) for the model was 247.84 (149). Past literature suggests that RMSEA values less than 0.08 represent reasonable fit (Browne and Cudeck, 1993). In addition, the ratio of χ^2 to degrees of freedom for the CFA model is below two indicating good fit (Segars and Grover, 1993). Other fit indices such as the CFI (0.985), NFI (0.965), IFI (0.985) and

Table 2
Inter-factor correlations.

	INT$_{INT}$	EXT$_{INT}$	ITCAP	TSEC	TCOMP	ENDO	PERF
INT$_{INT}$	**0.836**						
EXT$_{INT}$	0.761	**0.791**					
ITCAP	0.690	0.665	**0.836**				
TSEC	0.340	0.408	0.554	**0.850**			
TCOMP	0.721	0.636	0.571	0.336	**0.789**		
ENDO	0.723	0.742	0.571	0.353	0.713	**0.836**	
PERF	0.640	0.595	0.581	0.285	0.538	0.476	**0.809**
Composite reliability	0.874	0.832	0.822	0.886	0.831	0.872	0.850

Note: (1) Numbers in bold indicate the square root of variance extracted; (2) sample size (n) = 205.

GFI (0.893) were also satisfactory. We also examined the construct to item R-square loadings in the CFA. All the R-square values were above 0.5. All of these tests suggest a robust measurement model. Table 1 provides all these values.

In order to assess the reliability of the constructs, we computed the composite reliability by the method suggested by Fornell and Larcker (1981). All the reliability values were above 0.80 suggesting that the reliability of the constructs was high (see Table 2). Next, we assessed the convergent validity in the items by examining the standardized parameter loadings of the items on their respective constructs. The maximum standardized loading was 0.924 and the minimum standardized loading was 0.668. Further, the minimum t-value of the loadings was 10.446 and the maximum t-value was 17.801. This provides a strong evidence of convergent validity (Anderson and Gerbing, 1988). We also examined the discriminant validity using the method suggested by Fornell and Larcker (1981) in order to examine the average variance (AVE) extracted for each construct. The overall values were all well above the 0.5 suggested for each construct (Fornell and Larcker, 1981). Further, the square root of the AVE was larger than the correlation with other constructs (Chin, 1998; Fornell and Larcker, 1981). Table 2 shows the square root of the average variance extracted for each construct along the diagonals. These suggest that the measurement model had good statistical properties.

3.3. Common method bias

The survey data for this study was collected from a single respondent. Therefore the results being driven by common method bias may be a source of concern. However, multiple reasons associated with this study mitigated any potential effects of method bias. First, we surveyed the CEO of each firm that was knowledgeable about their operations. Such high level managers are recognized to be reliable sources of information in order to respond at the firm level hence minimizing any issue of common method bias (Miller and Roth, 1994; Phillips, 1981). Second, during administration of the questionnaire, we interspersed the dependent variables between the independent variables. This minimizes method bias by controlling the retrieval cues that are prompted by the context of the question (Podsakoff et al., 2003). Third, in order to assess the degree of method bias in the data, we performed the Harman's single factor test using a confirmatory approach (e.g. McFarlin and Sweeney, 1992). This test yielded an RMSEA of 0.168 and a χ^2 value of 1158.75 (d.f. = 170), considerably worse than the CFA model fit. Finally, we checked for the impact of method variance by using the least correlation among the manifest variables as the marker variable and computed the adjusted correlation matrix (Lindell and Whitney, 2001). The maximum difference in correlations between the raw correlation matrix and adjusted matrix was 0.052. This suggested that the method effect was not serious. Further, Malhotra et al. (2006) suggest using adjusted correlation matrix as input to the path diagram. Our path analysis results with the adjusted correlation matrix as the input were substantively the same as those presented in Table 3.

4. Analysis and results

Fig. 1 displays the conceptual model. Our SEM analysis was performed using Lisrel 8.8 software using maximum likelihood estimation (Jöreskog and Sörbom, 2006). The results of the analysis and the fit indices are shown in Table 3 (Model M1). As seen in Table 3, the RMSEA value of the estimated model was 0.055 and the CFI (Comparative Fit Index), an index that compares the relative improvement in fit of the proposed model in comparison to the

Table 3
Estimates for structural equation model.

Path	Coeff. (S.E.) M1	Coeff. (S.E.) M2	Hypothesis
$INT_{INT} \rightarrow PERF$	0.544*** (0.135)	0.420** (0.190)	H5A
$EXT_{INT} \rightarrow PERF$	0.410*** (0.134)	0.371** (0.178)	H5B
$ITCAP \rightarrow PERF$		0.276 (0.184)	
$TSEC \rightarrow PERF$		−0.010 (0.118)	
$TCOMP \rightarrow PERF$		0.096 (0.125)	
$ENDO \rightarrow PERF$		−0.139 (0.118)	
$TCOMP \rightarrow INT_{INT}$	0.231*** (0.070)	0.226*** (0.070)	H1A
$TSEC \rightarrow INT_{INT}$	−0.106 (0.070)	−0.106 (0.070)	H2
$ENDO \rightarrow INT_{INT}$	0.204*** (0.058)	0.216*** (0.059)	H3A
$ITCAP \rightarrow INT_{INT}$	0.401*** (0.088)	0.388*** (0.088)	H4A
$TCOMP \rightarrow EXT_{INT}$	0.084 (0.072)	0.081 (0.073)	H1B
$ENDO \rightarrow EXT_{INT}$	0.306*** (0.066)	0.317*** (0.067)	H3B
$ITCAP \rightarrow EXT_{INT}$	0.365*** (0.082)	0.351*** (0.081)	H4B
$CLIENT\ DISPERSION \rightarrow PERF$	−0.287*** (0.084)	−0.260*** (0.085)	
$FIRM\ SIZE \rightarrow PERF$	0.051 (0.039)	0.034 (0.040)	
$REVERSE\ OUTSOURCING \rightarrow PERF$	0.519*** (0.169)	0.570*** (0.181)	
d.f.	200	196	
χ^2	326.374	318.770	
RMSEA	0.055	0.055	
CFI	0.982	0.982	
NNFI	0.977	0.977	
GFI	0.878	0.881	
SRMR	0.050	0.049	

Notes: (1) * $p \le .10$; (2) sample size (n) = 205; (3) Model M1 is the hypothesized model; Model M2 includes direct paths from each of the antecedent variables to PERF in order to test mediation of integration on PERF; (4) coefficients shown in the table are unstandardized coefficients; (5) numbers in parentheses are standard errors.

** $p \le .05$.
*** $p \le .01$.

null model, was observed to be 0.982. Further, the non-normed fit index (NNFI) was 0.977. These measures are above the minimum value of 0.95 suggested by Schumacker and Lomax (2004). Note that the NNFI measure is independent of the sample size (Marsh et al., 1988). Finally, for the overall model, the ratio of chi-square to degrees of freedom was 1.63 and indicated a good fit (Segars and Grover, 1993). Overall these results indicate that the model fits the data well. Next, a high proportion of variance in internal process integration (71.1%), external process integration (67.5%) and BPO performance (51.9%) was explained by the model (see Table 4). Finally, all of the items (except two) explained at least 50% of the variance in the underlying latent variable and suggested that the measurement model was quite robust (Table 4). We now summarize the results of our hypotheses.

Task complexity (H1): The path coefficient from task complexity to internal process integration is significant (β = 0.231, $p < 0.01$, Table 3, M1). Further, contrary to our hypotheses, task complexity has an insignificant impact on external process integration (β = 0.084, $p = 0.506$, Table 3, M1). Focusing on the indirect effect of task complexity on performance we find that the indirect effect

Table 4
R-squares for items and endogenous constructs.

Construct	Item code	Item *R*-square	*R*-Square for endogenous constructs
PERF	PERF1	0.691	0.519
	PERF2	0.649	
	PERF3	0.619	
INT$_{INT}$	INT.INT1	0.601	0.711
	INT.INT2	0.734	
	INT.INT3	0.765	
EXT$_{INT}$	EXT.INT1	0.435	0.675
	EXT.INT2	0.643	
	EXT.INT3	0.784	
TCOMP	TCOMP1	0.636	
	TCOMP2	0.707	
	TCOMP3	0.518	
TSEC	TSEC1	0.726	
	TSEC2	0.821	
	TSEC3	0.619	
ENDO	ENDO1	0.860	
	ENDO2	0.761	
	ENDO3	0.472	
ITCAP	ITCAP1	0.678	
	ITCAP2	0.701	

Notes: (1) sample size (*n*) = 205.

Table 5
Estimates for indirect effects.

Path	Coeff. (S.E.)
TCOMP → PERF	0.152*** (0.052)
TSEC → PERF	−0.037 (0.026)
ENDO → PERF	0.219*** (0.047)
ITCAP → PERF	0.269*** (0.052)

Notes: (1) $^{*}p \leq .10$; $^{**}p \leq .05$; (2) *n* = 205.
*** $p \leq .01$.

of task complexity on performance is significant ($\beta = 0.152$, $p < 0.01$, Table 5).

Task security (H2): The path coefficient from task security to internal process integration is $\beta = (-)0.106$, albeit insignificant (Table 3, M1). However, as hypothesized, the direction of the impact of task security on internal process integration is negative. Further, the indirect impact of task security on performance is insignificant and negative ($\beta = (-)0.037$, insignificant, Table 5). This suggests that

overall the impact of task security on performance is not significant, i.e. H2 is not supported.

End customer orientation (H3): The path coefficient from end customer orientation to both BPO internal process integration ($\beta = 0.204$, $p < 0.01$, Table 3, M1) and to BPO external process integration is significant ($\beta = 0.306$, $p < 0.01$, Table 3, M1) (both H3A and H3B are supported). In addition, the indirect effect of end customer orientation on performance is significant ($\beta = 0.219$, $p < 0.01$, Table 5).

Information technology capability (H4): The path coefficient from information technology capability to both internal process integration ($\beta = 0.401$, $p < 0.01$, Table 3, M1) and external process integration is significant ($\beta = 0.365$, $p < 0.01$, Table 3, M1). Therefore, information technology capability positively influences both internal and external process integration (H4A and H4B are supported). Focusing on the indirect effect of information technology capability on performance, we find that the net indirect effect of information technology on performance is significant ($\beta = 0.269$, $p < 0.01$, Table 5).

BPO firm performance (H5): Focusing on the direct influence of process integration on BPO firm performance, we find that
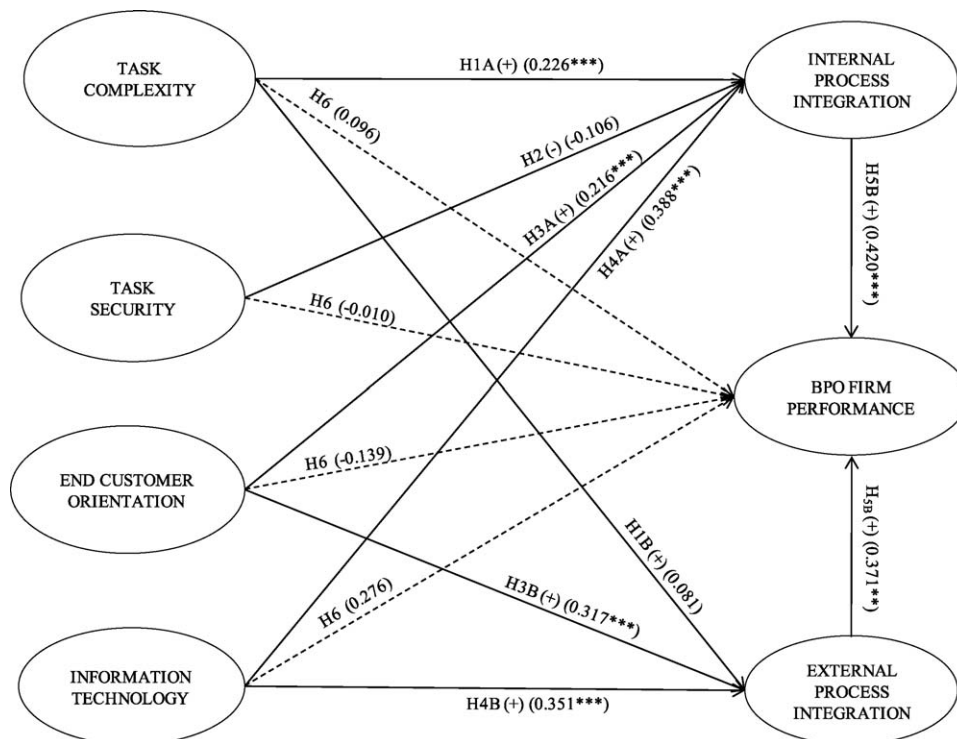
Fig. 2. Mediation test validation model (M2). *Notes*: (1) $^{*}p \leq .10$; $^{**}p \leq .05$; $^{***}p \leq .01$; (2) numbers in the paths are coefficient estimates shown in Table 3 (Model 2), signs the direction of the hypothesized effects; (3) H6 indicates the path coefficients for the direct effects in Table 3 from antecedents to performance corresponding to the mediation hypotheses; (4) sample size (*n*) = 205.

increased internal and external process integration results in increased BPO firm performance. The path coefficient from internal process integration to firm performance is significant ($\beta = 0.544$, $p < 0.01$, Table 3, M1) and the coefficient from external process integration to firm performance is significant ($\beta = 0.410$, $p < 0.01$, Table 3, M1). Therefore, both internal process integration and external process integration drive BPO firm performance (H5A and H5B are supported).

Mediation test (H6): As seen in Table 3 (M1), five of the seven hypothesized paths from the antecedents to the integration constructs are significant. Further, both of the paths from internal process integration and external process integration to BPO performance are also significant as seen in Table 3. Next, as shown in Table 5, the indirect effects of task complexity, end customer orientation and information technology capability on BPO performance through internal and external integration are significant. Further, the indirect effect of task security on performance through internal integration is insignificant. When both direct and indirect paths linking antecedents and the final dependent variable are significant, it suggests that intervening variables partially mediate the relationship between the antecedent and dependent variable (Venkatraman, 1989). We examine the existence (or strength) of partial mediation effect with three robustness checks.

First, we analyze a model by including only direct paths from the antecedent variables to BPO performance. We label this model M2 (Fig. 2). We find that all the direct paths from antecedents to BPO firm performance are insignificant (Table 3). Because M2 is nested in M1, we can use a χ^2 difference test to compare whether the two models are statistically significantly different from each other (Shah and Goldstein, 2006). Because the χ^2 difference between M1 and M2 is insignificant (χ^2 difference = 7.60; d.f. = 4, $p = 0.104$), we can conclude that the two models are not statistically significantly different from each other. Next, we examine multiple fit indices to compare model parsimony. These are (a) the akaike information criterion (AIC), (b) parsimony normed fit index (PNFI) and (c) parsimony goodness of fit index (PGFI). While a chi-square test is applicable to nested models, the AIC, PNFI and PGFI are applicable to non-nested models too (Shah and Goldstein, 2006; Schumacker and Lomax, 2004). AIC is a measure of overall model fit and is used to compare non-nested models. A lower value of AIC indicates a more parsimonious model (Schumacker and Lomax, 2004).
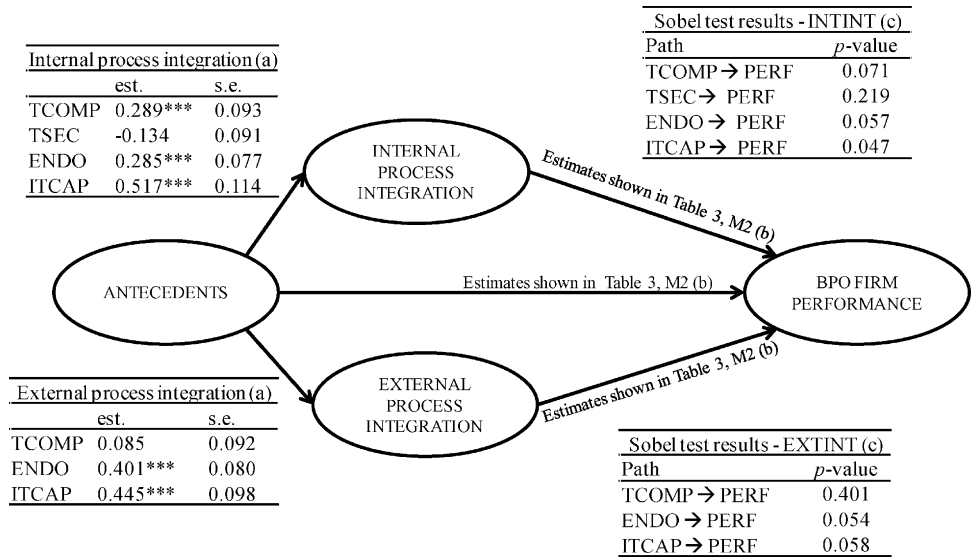
Table 6
Fit measures for model comparisons for the mediation tests.

Model	PNFI	PGFI	AIC
Model M1	0.755	0.637	478.37
Model M2	0.740	0.626	478.77
Model M3	0.711	0.602	483.38
Model M4	0.747	0.621	541.63

The PNFI and the PGFI are modifications to the NFI and the GFI respectively that penalize for model complexity (Schumacker and Lomax, 2004; Byrne, 1998). While there are no agreed upon cut-off values for PNFI and PGFI in the literature (Kelloway, 1998), values greater than 0.5 have been recommended in the past literature (Byrne, 1998; Mulaik et al., 1989) to indicate a more parsimonious model. Table 6 shows a comparison of the parsimony fit measures for M1 and M2. The comparison suggests that M1 is superior to M2 providing some evidence of mediation (Iacobucci et al., 2007).

Second, we conducted the Sobel test to examine the significance of the mediation effect of each integration construct, an approach recommended by Baron and Kenny (1986) and Iacobucci et al. (2007) using the interactive tool provided by Preacher and Leonardelli (2003). Fig. 3 shows the structure of the decomposed mediation models used to perform the Sobel tests. In particular, we drew our estimates from the following two models: (i) a model that links the four antecedent variables to the two integration variables without the performance variable and (ii) the model shown in Fig. 2. The results of the Sobel test for each antecedent construct via internal process integration and external process integration respectively are summarized in Fig. 3. The p-values of the Sobel test in Fig. 3 support the result of partial mediation.

Third, we investigated two alternative model specifications of M1 (Iacobucci et al., 2007). Specifically, we estimated a model (M3) where all of the antecedent variables and the integration variables were loaded directly on BPO firm performance (i.e., the BPO firm performance construct had six antecedents) (Baron and Kenny, 1986). In M3, the direct effects of each of the four antecedent variables on BPO performance were insignificant while the direct effects of both internal process integration and external process integration on BPO performance were significant. Note that model M3 is not-nested in M1. Alternate models that are not nested can be

Internal process integration (a)

	est.	s.e.
TCOMP	0.289***	0.093
TSEC	-0.134	0.091
ENDO	0.285***	0.077
ITCAP	0.517***	0.114

Sobel test results - INTINT (c)

Path	p-value
TCOMP → PERF	0.071
TSEC → PERF	0.219
ENDO → PERF	0.057
ITCAP → PERF	0.047

External process integration (a)

	est.	s.e.
TCOMP	0.085	0.092
ENDO	0.401***	0.080
ITCAP	0.445***	0.098

Sobel test results - EXTINT (c)

Path	p-value
TCOMP → PERF	0.401
ENDO → PERF	0.054
ITCAP → PERF	0.058

INTERNAL PROCESS INTEGRATION — Estimates shown in Table 3, M2 (b)

ANTECEDENTS — Estimates shown in Table 3, M2 (b) → BPO FIRM PERFORMANCE

EXTERNAL PROCESS INTEGRATION — Estimates shown in Table 3, M2 (b)

Fig. 3. Models used to examine the mediating role of process integration on firm performance. *Notes*: (1) (a) indicates the estimates for the direct effect of antecedents on both external and internal process integration; (b) indicates estimates for model as described in M2, Table 3; (c) indicates the p-value of Sobel test; (2) coefficients reported are unstandardized; (3) $^*p \le .10$; $^{**}p \le .05$; $^{***}p \le .01$; (4) sample size (n) = 205.

compared using PNFI, PGFI and AIC (Shah and Goldstein, 2006; Hair et al., 1998). The comparison suggests that our hypothesized model M1 was more parsimonious and superior to the alternative model M3 (i.e., AIC is lower for M1 than M3; PNFI and PGFI are higher for M1 than M3, see Table 6). Finally, we estimated a model (M4) where the paths from internal process integration and external process integration to BPO performance were both reversed in direction from what was hypothesized in model M1 while keeping the links between the antecedent and process integration constructs directionally the same as in Fig. 1. Such a model where the path between the dependent variable and the mediating variables are reversed was recommended by Iacobucci et al. (2007). Again, we find that M1 is superior to M4 on measures of AIC, PNFI and PGFI (i.e., the AIC is lower for M1 than M4; PNFI and PGFI are higher for M1 than M4). To summarize, the results indicate that process integration mechanisms partially mediate the impact of antecedents on BPO firm performance.

Control variables: Focusing on the results of control variables, first, we find that BPO firms that engaged in reverse outsourcing performed significantly better than BPO firms that did not undertake reverse outsourcing. This suggests that reverse outsourcing may allow BPO firms to be more responsive to client needs as these firms may have a better understanding and knowledge about the client's local market needs. BPO firms that establish operations in the client's country performed significantly better than BPO firms that do not. Further, BPO firms that had a presence in a greater number of client countries performed poorer than firms that had their operations in a fewer number of client countries. One possible reason could be that higher geographical expansion may require greater investments particularly in early phases of the BPO firm's expansion. A more mature presence in a particular country may enhance a firm's profitability in the long-run. Finally, the overall size of the BPO firm (log employees) did not have an impact on firm performance.

5. Discussion and managerial implications

Our research has numerous implications for managers of global BPO firms and clients that outsource their activities to these service providers. First, our analysis is consistent with the information processing view that increased task complexity increases the need for process integration. More importantly, our analysis suggested that when task complexity is higher, integrating within the firm may be important to improving performance.

Second, our results suggest that task security has a weak negative impact on integration and does not have a significant impact on performance. While managing the security of outsourced processes is an important issue, our results suggest that increased security requirements may not significantly influence performance. One reason is that often security is always taken very seriously by both the client and their service providers. For example, Boomer (2003) suggests that the Indian firms the author had visited had better security infrastructure than many of the other firms based out of United States. Often security requirements may occur at multiple levels. These include close circuit television cameras, a ban on cell phones, pens, notebooks, and any kind of data storage device (Engardio, 2004; Boomer, 2003). Employees are also prohibited from accessing their systems as soon as they leave the firm (Engardio, 2004). NASSCOM (National Association of Software Services Companies), a premier umbrella organization for software and BPO firms in India actively works to strengthen the regulatory infrastructure under the 4-E framework involving engagement (with all stakeholders including BPO firms), education (on issues of security), enactment (legal framework) and enforcement (Karnik, 2007). Hence, our result for the insignificant impact of security on firm performance may not be surprising because of extensive efforts already expended by both clients and their service providers to safeguard information.

Third, our results suggest that the end customer orientation is an important factor that drives both internal and external process integration and consequently performance. BPO firms that serve end customers have a critical need to integrate in order to improve performance. This is consistent with anecdotal evidence found in the practitioner literature (Cioni, 2007; Read, 2008). Further, these results are also consistent with past service operations literature that suggest that uncertainty increases due to customer contact (Larsson and Bowen, 1989; Chase, 1981) and the consequent need for higher integration (Larsson and Bowen, 1989).

Fourth, we find that increased emphasis on information technology is critical to improved process integration. While past literature has suggested that effective information technology capability in firms improve performance (Bharadwaj, 2000), our results suggest that process integration mediates the impact of information technology capability on firm performance. Our work corroborates with that of Chatfield and Bjorn-Andersen (1997) who found in their case study of an airline firm that effective re-engineering efforts were enabled by the presence of IT infrastructure. Further, these results are also consistent with previous work on information technology being an antecedent to process re-engineering efforts in firms (Grover et al., 1999). From a managerial view point, it emphasizes the role of IT in business process outsourcing and its role in enabling integration and consequently firm performance.

Fifth, our results suggest that process integration is a critical component of BPO performance. Our results on the partially mediating influence of process integration suggest that managers may not be able to improve performance of BPO firms by ignoring process integration within the firm and between the client and their service providers. Past research argues that organizations should develop effective coordination mechanisms in order to cope with this uncertainty (Van de Ven et al., 1976). Our paper demonstrates this may be valid in the BPO context. Further, our results underscore the importance that BPO firms should focus on process integration both within the firm and with their client. These results are also consistent with recent observation of Aron and Singh (2005) who suggest that managing coordination is an important element of success in a BPO environment.

Finally, there are important insights to be gained from our control variables as well. Our results that reverse outsourcing increases BPO performance suggests that BPO firms that focus on responsiveness – by locating delivery centers closer to the client, perform better than BPO firms that do not. Note that BPO firms that move closer to the client may potentially be sacrificing cost related advantages for responsiveness. One example of this is the Indian firm "Wipro" that recently announced setting up a shared services delivery unit to serve a leading brewery, AmBev's Latin American markets from delivery centers set up in Brazil – closer to customers (www.tradingmarkets.com, 2008). It is possible that taking the firm closer to customer locations may involve trade-offs between cost vs. the ability of the firm to be culturally closer to the customer thereby offering an increasing level of service and responsiveness. We believe that this also holds potential for future research on organization of service supply chains.

While many of our results hold for managers of BPO firms, the insights may also be useful to client managers. For example, client managers should pay close attention to integration capa-

bilities of the service provider when outsourcing the process to the service provider. In particular, processes that are offshored need to be carefully decomposed into various constituents that will allow the firms to integrate. Further, the client also needs to pay careful attention to a provider's ability to integrate internally when processes are decomposed. Such skills may be critical for complex processes. Sinha and Van de Ven (2005) note that when processes and products are broken down into sub-components, a supplier's ability to change process design and integrate becomes critical. Taking a client's perspective, our results may suggest that information technology capability in an offshore environment is a critical component of success in service delivery. Finally, our results also confirm that the location of the service provider may influence a service provider's responsiveness and overall performance.

6. Conclusions and limitations

This study is the first to examine process integration issues in a BPO environment taking the service provider's perspective for this investigation. This contributes to the operations and supply chain literature in multiple ways. We first present an outsourcing model that identifies the key antecedents to both internal and external process integration and the consequences to such integration on BPO firm performance. The model is grounded in theory and identifies specific factors associated with higher levels of firm performance that real-world practitioners should consider when making outsourcing decisions. Second, a rigorous multi-stage methodology was used to refine and validate scales for various constructs used in this study. We also utilized a thorough empirical methodology to establish key prescriptions for managing outsourcing engagements between a client and its service provider.

This study also contributes to and provides empirical evidence of the importance of both internal and external process integration in the context of service operations. Our analysis also raises many areas for future research. For example, performance of global BPO firms can also be impacted by the diverse structural, administrative and relational governance mechanisms that the BPO firm might employ with its client. The role of these governance control mechanisms in improving BPO performance need to be examined. In addition our research raises the important question of the role of cultural sensitivity in driving BPO firms to move closer to the customer market.

As with any study, our research also has limitations. First, while our inferences are drawn from cross sectional data, longitudinal data can help unearth causal inter-relationships better. Second, our data is collected from a single country. Future studies could examine the issue of process integration in multi-country settings where examining cross-cultural differences in the relationship between antecedents, process integration and firm performance would be a fruitful area of research. Third, like the majority of survey research, we were constrained to get data from a single respondent in the supplier firm. Future studies can broaden the scope by collecting data from both the client and their service providers. There are often significant employee related issues and challenges that arise with outsourcing that might complicate the implementation of any sourcing arrangement. This notion offers rich avenues for exploration. Fourth, our work premises that integration at the level of the BPO's leading client will impact BPO firm performance. While in some cases that is not necessary, a large part of our sample of BPO firms relied heavily on their largest client for business. Therefore, such a linkage seems reasonable. Finally, some of our research hypotheses were unsupported. Future research could examine the possible conditions under which these hypotheses may be supported.

Appendix A. Scale items for constructs

PERFORMANCE (PERF): Please rate your company's current performance compared to your close domestic competitors. 1 = lowest 20% in the industry; 2 = second lowest 20% in the industry; 3 = middle 20% in the industry; 4 = second highest 20% in the industry; 5 = highest 20% in the industry. Adapted from Liu et al. (2009)
  Profit level
  Market share
  Cost reduction
For each of the following two constructs, the respondents indicated their agreements with the statement on a 1 to 5 scale with respect to their leading client. (1) indicated very low and (5) indicated very high

Internal process integration (INT$_{INT}$) (adapted from Luo, 2002c; Haynes and Thies, 1991)
  a. Task cooperation and support across departments during implementation
  b. Joint monitoring and quality control via cross-departmental efforts
  c. In-house process integration via cross-functional team(s)

External process integration (EXT$_{INT}$) (adapted from Luo, 2002c; Ettlie and Reza, 1992)
  a. Process coupling between your company and the client is so high that if your services are inferior, the client's entire business will be hurt
  b. If your company stops your services, there will be no way for the client to quickly fix the problem
  c. We follow the same protocols and standards specified by the client
For each of the following constructs, the respondents indicated their agreements with the statement on a 1 to 5 scale with respect to their leading client. (1) indicated not true/very low and (5) indicated very true/very high

Task security (TSEC) (adapted from Child and McGrath, 2001; Choudhury and Sabherwal, 2003; Kirsch, 1997)
  a. The client always attaches the utmost importance to information security
  b. Security is our overriding priority in training, services and policy making
  c. We have strict and stringent rules in safeguarding customer information

Task complexity (TCOMP) (adapted from Child and McGrath, 2001; Byström, 2002; Campbell, 1988)
  a. BPO task is always sophisticated that we have to a deploy large workforce from different units to work on it
  b. BPO task fulfillment requires a great deal of specialized knowledge in different disciplines
  c. It is extremely difficult to standardize processes and procedures for my company's BPO projects

End customer orientation (ENDO) (adapted from Luo, 2002a, 2002b; Jiang, 2009)
  a. Our global client targets high-end customers demanding sophisticated services
  b. Our global client seeks premium and specialized services for their end customers
  c. Our global client prioritizes total customer satisfaction over cost or volume

Information technology capability (ITCAP) (adapted from Luo, 2002c; Fairbank et al., 2006; Han et al., 2008)
  a. To what extent you're satisfied with the current IT infrastructure within the firm
  b. To what extent do you think the firm's information flow system is effective
  c. To what extent you spend more in intranet and internet than competitors (item dropped)

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