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# KNOWLEDGE PROCESS OUTSOURCING: IDENTIFYING POTENTIAL RESEARCH AGENDA BASED ON INDUSTRY TRENDS

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## ABSTRACT

*Knowledge process outsourcing (KPO) is experiencing rapid industry growth and is projected to be the next significant wave of outsourcing. The emergence of this new wave in outsourcing poses considerable administrative and governance related challenges. In this research, we identify and discuss the difficulties associated with KPOs and compare these difficulties to the previous models of outsourcing of functions and processes. Our aim is to explore the potential impact of knowledge process outsourcing on interorganizational relationships and subsequently investigate the appropriate governance structure. These difficulties include the appropriate identification of knowledge processes that can be outsourced and the need to constrain the potential knowledge loss to an organization that has chosen to participate in the KPO market. Based on the difficulties identified, we propose a set of guidelines based on theory that are essential for creating successful Service Level Agreements (SLAs) to facilitate a KPO. We conclude with a proposed methodology to achieve our objective of identifying candidate processes that can be outsourced with minimal knowledge loss to the outsourcing organization.*

*Keywords: Knowledge Outsourcing, Knowledge Sharing, Knowledge Integration, Knowledge Loss, Service Level Agreement (SLA)*

## 1. INTRODUCTION

Outsourcing has long been practiced as a means of cost reduction and efficiency by delegating non-core activities to third-party service providers. As the outsourcing industry matures, more complex processes are being offered as services by providers. The recent wave in the evolution of the dynamic outsourcing market is Knowledge Process Outsourcing (KPOs). Knowledge process outsourcing refers to performing “high end knowledge or judgment services” (Larkey, 2006). According to Outsourcing.com, a professional information institute, the KPO market is currently estimated anywhere from \$1-3 billion and is projected to reach USD 17 billion by 2010. Potential candidates in the KPO marketplace are services as complex and varied as - pharmaceuticals, biotechnology, data search, integration and management services, financial services, research and analytics, technology research, computer-aided simulation and engineering design, and professional services such as business research and legal services.

KPOs pose considerable administrative and technical challenges due to the intricate nature of the services involved. Client organizations participating in the outsourcing marketplace have achieved sporadic success and realized that success at obtaining sustainable value from an outsourcing arrangement requires a thorough understanding (of the outsourced process/function) (Aron et al. 2005) and considerable governance related effort (in terms of monitoring and performance evaluation) (Mani et al. 2006). This realization also brought a services orientation to outsourcing in contrast to a task orientation (Lee et al. 2003). As the practice of outsourcing evolves from standard, non-core functions and processes (e.g. infrastructure, payroll) to more complex and multidimensional processes, governance of such outsourced processes are bound to become exponentially complicated. Knowledge work, by its very nature and

definition, cannot necessarily be accomplished successfully by following a set of predefined procedures. Moreover, the outcome of a knowledge process (e.g. research and development) may be interwoven with an organization's core competency and/or long term sustainability, as opposed to commodity processes typically included in BPO (Business Process Outsourcing) contracts. Finally, the outcome of a knowledge process may be subjective (rather than objective), thus rendering performance evaluation extremely difficult.

In light of the emergence of KPO practices and their associated governance and administrative difficulties, the objective of the current research is threefold. Initially, this research identifies differences inherent between standard business process outsourcing and the new wave of knowledge process outsourcing. Secondly, we investigate the impact criteria of knowledge process outsourcing on inter-organizational relationships and the corresponding governance structures available to minimize organizational risk. Finally, we propose a research agenda to identify candidate processes that can be outsourced with minimal impact/knowledge loss to the organization and subsequently investigate the appropriate contract structure(s) to facilitate such outsourcing.

Inherent difficulties in outsourcing knowledge processes exist since creation of knowledge and its subsequent accumulation is associated with any activity (Willcocks et al. 2004). As such, outsourcing decisions affect the knowledge base resident within an organization (Becker et al. 2003)., This impact is more critical for those processes associated with the generation and use of knowledge. As a knowledge related function or process is delegated to an external entity, loss of knowledge concerning these functions or processes can occur and may have implications as to the allocation of learning opportunities from which organizational knowledge can be increased. It can be reasonably argued that for standardized and non-core processes (e.g. payroll, human resources, call center), the effect of such knowledge loss will be minimal to the organization. However, when a knowledge intensive process, such as research and development, is outsourced, the impact of any organization knowledge loss is much greater.

Knowledge process outsourcing is a natural progression of the outsourcing phenomenon that started with standard IT infrastructure and software development [KODAK] followed by IT-enabled Business Process Outsourcing. Outsourcing literature, both academic and practitioner, have provided ample guidelines for achieving success when outsourcing standard processes. However, it has also been suggested that only the 'standard' processes/functions be outsourced (Willcocks et al. 1996). As indicated by some of the unique difficulties associated with KPO, a 'knowledge' process targeted for outsourcing will, by its very nature, pose unique challenges that remain unanswered and would benefit from an academic research agenda.

A business process is defined as "a set of logically related tasks performed to achieve a defined business outcome" (Davenport and Short, 1990). Business processes describe "how" work is done rather than "what" work is done (Davenport, 1993). Business processes can be identified with the following characteristics: recurrent (the process is performed over and over), replicable (can be transferred to multiple contexts), consequential (affects other processes or outcomes), leverageable (integrates with other processes), and coordinated (Keen, 2004). These characteristics of a business process can be identified in the context of three main generic knowledge processes that encompass a large portion of knowledge management activities: generation, codification and transfer (Davenport and Prusak, 1998).

These knowledge processes are seen as embedded in an organizations business processes. For example, knowledge generation refers to activities related to the creation of knowledge either internally or externally to the organization. Knowledge codification refers to activities designed to place organizational knowledge into a form accessible to others. Finally, knowledge transfer refers to the activities designed to facilitate interaction between and among people as well as the interaction with repositories and KM systems. Individuals benefiting or participating in these activities are referred to as knowledge workers.

These knowledge processes meet the characteristics of a business process in that they are recurrent, replicable, consequential, leveragable and coordinated.

Since knowledge processes are embedded in organizations business processes and have similar characteristics, a knowledge process can be differentiated as a set of logically related tasks performed by knowledge workers for the purpose of creating, making presentable or transferring knowledge within and organization to achieve a defined business outcome. With a working definition of knowledge processes and since our final aim is to explore the impact of KPO on interorganizational relationships and the corresponding appropriate governance structure, we will need to further identify the challenges associated with this new wave of outsourcing.

## 2. CHALLENGES IN KNOWLEDGE PROCESS OUTSOURCING

*Dependence on core competency* - Outsourcing implies organizations shifting risk to the supplier. This, however, does not eliminate all risk from an organization. The customer can become dependent on the supplier. The level of dependency or risk incurred by the customer can be assessed by how much the outsourced process impacts other organizational outcomes/processes. This level of dependency can be viewed as the distinction between knowledge partitioning and task partitioning indicated by Takeishi (2002). The partitioning helps clarify the level of ownership retained by the customer and/or the supplier. E.g. if the outsourcing arrangement is a temporary increase in design capacity, the ownership of the process remains with the customer. However, if component design and manufacturing is outsourced, not only is a greater dependency incurred on the supplier in terms of long-term design innovations, but greater effort is required to obtain and retain the knowledge required to successfully deliver components that seamlessly fit within the overall design.

*Knowledge loss*: All organizations must choose between internal knowledge (IK) and external knowledge (EK) sources to assist in the decision of whether to outsource knowledge (Gavious, 2003). The factors identified as essential in this decision are: 1) IK - learning curve, holding cost, value deterioration rate, future value and 2) EK cost to purchase. The model focuses on the timely optimal control of the knowledge make-or-buy decision and illustrates the practical dynamics of preserving IK versus knowledge outsourcing.

*Incentive to innovate*: (for the provider) Innovation, specifically R&D activity, is viewed as a significant source of knowledge for an organization. Outsourcing, especially in terms of proprietary knowledge assets, is not considered a means to innovate because an outside supplier lacks the incentive to innovate for the buying firm. This view is reinforced when an organization considers that they will receive only the codified results of R&D externalization and not the accumulated person-embodied skills (Narula, 2001). However, there are many partnering relationships whose goal is the generation of knowledge and innovation (Mol, 2005). When organizational goals align, it is recommended to consider: 1) asset specificity, 2) technological uncertainty, 3) appropriability, 4) vertical integration and 5) the amount of tacit knowledge in the process. The relational view posits that much of a firm's innovation is accomplished in conjunction with outside suppliers. This position is based on the belief that sufficient access to relevant capabilities should encourage innovation in knowledge outsourcing partnerships. To accomplish the encouragement of innovation in knowledge outsourcing, feedback systems should be specified in order to leverage and share knowledge in both directions (Quinn, 1999).

*IP, legal issues and security*: Security and confidentiality of data, customer information and proprietary intellectual property will pose considerable challenges in managing KPO relationships. For example, who will own the outcome of an R&D effort if the process itself is outsourced? When information related to the core competency of an organization is outsourced, security will be an issue.

*Measurability of outcome* – The outcome of a knowledge process may often be fuzzy. However, much of the success of an outsourcing relationship depends on periodic performance evaluation and provider's delivering agreed upon level of service. In a KPO, the deliverables being knowledge items, it is often difficult to come up with precise measurable outcomes.

*Integration of knowledge from disparate sources* - For knowledge outsourcing, an emphasis must be placed on knowledge integration with the design to reduce the knowledge loss (Becker, 2003). Since degree of knowledge dispersion increase with outsourcing arrangements, the uncertainty regarding where the knowledge resides increases. Customers must create conditions to integrate knowledge dispersed across the supply chain.

### **3. Service Level Agreement (SLA) REQUIREMENTS for KPO**

SLAs are formal written agreements developed by the provider and customer specifying details of the service to be provided, the desired service level in measurable terms, penalties (rewards) for failure (exceeding) to meet service level expectation. The objective of the SLAs is to provide a communication tool to help manage expectations, clarify responsibilities, and provide an objective basis for assessing service effectiveness. The challenge of creating an effective SLA for knowledge processes is the fact that performance evaluation is subjective and imperfectly measured compared to the traditional outsourced process. Arguably, without definitive objectives, relational aspects between the provider and customer play a significant role. The agreements should be structured in a way that the outsourcing arrangement yields value for both participants beyond cost reduction (for the customer) and revenue (for the provider). For the customer, this translates to the ability to retain and nurture knowledge elements required to effectively utilize the benefits from outsourcing the particular process. For the provider, the outsourcing arrangement should create both contextual and generic knowledge. Hence, we classify the factors determining knowledge outsourcing SLAs into two broad domains – customer side factors and provider side factors. Within each domain, we identify major sources that have direct impact on the quality of service.

#### **A. Customer Side Factors**

In a knowledge outsourcing arrangement, the customer delegates the responsibility and/or ownership of the process and information infrastructure to the provider. Agency theory (Jensen et al. 1976) posits that such delegation may lead to opportunistic behavior if 1) the outcome of the agent's (service provider) effort cannot be measured directly (outcome uncertainty), and/or 2) the principal (customer) does not have the necessary resources/abilities to evaluate the action(s) taken by the agent (information asymmetry). Academic literature in the information systems field has cited (Lacity et al. 1993; McFarlan et al. 1995) information asymmetry as the major source of opportunistic behavior in any kind of IT outsourcing context.

Organizations subscribing to the knowledge outsourcing services must have appropriate mechanisms in place in order to mitigate the risks arising from information asymmetry. The customer's role in ensuring service quality is to bridge the information gap as much as possible by having appropriate governance mechanisms. Implications from research in agency theory and recent outsourcing literature help identify the set of customer side actions/variables that would lessen the chance of delivering substandard service by the provider.

#### *Detailed Contractual Agreement:*

Contracts serve as the basic instrument for communication in any exchange relationship. The importance of communication has been underscored in buyer-supplier relationship research (Cannon et al. 2001). Although, research in contracts (Hart et al. 1988) suggest it is never possible to foresee all future

contingencies at the time of contracting, the customer's efforts should be directed at making the contract as detailed and complete as possible. This poses a challenge in the case of knowledge outsourcing because of the inherently fuzzy nature of such processes- e.g. the clarity in defining objectives, performance measure, and customer expectation (do the customers know what they want and how does it change with time?). One option is to include a communication aspect in the contract where requirements, performance and expectations are revisited on a periodic basis. Additionally, expected value derived from the knowledge outsourced should be detailed for both the provider and customer to benchmark progress for both partners.

#### *Performance Measurement Metrics*

Although service quality in knowledge outsourcing process is imperfectly measurable, it is still worth negotiating clearly formulated business objectives. The difficulties in measuring performance are exacerbated by the fact that some of the outsourced services may be dependent on other services, e.g. the effectiveness of communication between the participants may be affected by the network infrastructure. Performance degradation in one service area often has a ripple effect on other areas, thus rendering performance measurement even more difficult. To effectively evaluate provider's performance, two things are necessary – 1) measurement metrics in terms of business objectives and 2) incorporating the notion of interdependencies among services in the evaluation process.

#### *Performance Based Incentive Mechanism*

Literature on agency theory cites outcome based incentives as a governance mechanism where actual effort level put by the agent is immeasurable. Agency theory suggests that a variable portion of the total compensation over and above a base compensation works as a motivation to excel. In the present context, penalties/rewards associated with the services would stimulate the provider to encourage its employees to put in their best efforts. Service level agreements document the expected service levels. Penalty/reward schemes would be inspire the provider to meet the quality standards. The challenging issue here is quantifying the appropriate "level" of service since the goal for this type of SLA is to reduce the knowledge loss for the customer. The lack of clarity associated with the knowledge gained by the provider and lost by the customer can be makes it difficult to derive optimal incentives for these fuzzy outcomes.

#### *Knowledgeable Resources*

The customer organization's ability to make proper judgment of the client's service is critical in ensuring successful relationship. Crafting service level agreements to cater to the unique organizational knowledge needs is a non-trivial task, and much of the success of the service provisioning model is dependent upon the preciseness of the agreements. This is not possible without having personnel, from both sides, with in-depth knowledge about knowledge process being outsourced. Coming up with the proper performance measurement metrics, implementing them, and monitoring the provider's performance continuously are significant activities for the customer. This is more important in the knowledge outsourcing context than traditional contexts. However, the challenge arises in the cost associated with the retention of such resources, as the primary skills of such resources may seem to be less relevant to the organization as it outsources its knowledge process.

### **B. Provider Side Factors**

In any outsourcing context, the service provider has the ultimate responsibility to deliver the desired product/service. The success of the relationship depends primarily on customer satisfaction, which is a function of the quality of service provided and is based on the customer's perception. A provider's ability to supply quality service is largely dependent on two factors – 1) the competence of the organization to perform the desired function(s) 2) efficient resource allocation to meet customer demand. While the

former ensures superior performance, the later makes sure that that the right services are delivered to the right customer at the right time. Based on these arguments, the following provider side factors are posited to be of significance.

#### *Skill Level and Reputation*

Provider's competence, which is a precursor of improves service level, is a function of the skill level and knowledge of its employees. In the dynamic environment of knowledge outsourcing, it is imperative that the provider's workforce consist of highly skilled employees with up-to-date knowledge. Expertise of the service provider leads to better performance, which in turn, builds reputation. For knowledge outsourcing, determining the appropriate skill levels would prove to be challenging since the customer requirements may be too context specific, fuzzy, and/or time varying. However, since the customer requirements focus on stemming any knowledge loss due to outsourcing, quantification of knowledge gains will become critical aspects that enhance a knowledge provider's reputation and provide evidence of attaining contract goals.

#### *Communication*

Services literature has recognized it as an intangible concept. While knowledge outsourcing is no exception, user perception of the provider's performance is one significant component. Feedback systems are critical for less obvious services involved with knowledge outsourcing. Without these systems, end-users will systematically underestimate the provider's performance. The periodic reviews become crucial to evaluate the customer's perception of the provider's performance, renegotiate any gaps in the process and ensure the knowledge integration necessary for both partners.

## **4. Methodology**

A cross-sectional survey methodology is used to investigate the proposed research questions and develop the model for testing the effectiveness of KPO on an organization. An instrument is in the process of being constructed to measure the level of knowledge process outsourcing that currently exists within an organization and the knowledge processes that could potentially be considered for outsourcing. The knowledge processes currently identified for measurement would include KPs associated with the generation of new knowledge and KPs associated with the transfer, sharing or use of existing knowledge. KPs associated with the generation of new knowledge would include, but are not limited to, research & development, data mining, biotechnology research, etc. KPs associated with the transfer, sharing or use of existing knowledge would include legal services, data analysis, equipment control, manufacturing solution monitoring, network management etc. The importance of each of these KPs to the organizations core competencies will be accounted for in the instrument in order to provide a starting point for assessing the potential knowledge loss associated with the outsourcing arrangement. A KP that has been selected for outsourcing which is not central to an organization's core competency will have reduced organizational knowledge loss when compared to a KP that is more central to an organization's core competency.

In addition to the measurement of existing KPs within an organization, any organization currently outsourcing any of the identified KPs will be asked to provide an indication of the success of the outsourcing agreement. The success of the outsourcing agreement will be measured in terms of the customer and provider side factors, but from a customer side perspective. The customer side is the perspective of interest since the continued relationship is dependent on the satisfaction of the customer and the customer's organizational success is dependent on a successful outsourcing arrangement. The evaluation of customer-provider relationship is time dependent. The perceived risk assumed by the customer is, at agreement initiation, higher due to the transfer of responsibilities outside the organization.

This perceived risk is mitigated by the skill level and reputation of the provider. However, as the relationship continues, the communication level maintained by the provider can continue to reduce the perceived risk of maintaining the relationship and result in a continuance of the outsourcing agreement. The customer side factors also contribute to a reduction of perceived risk and a willingness to continue the outsourcing agreement. These contributing factors begin with a level of satisfaction with the initial outsourcing agreement and the proposed performance metrics. Communication with provider can continue to reinforce the adequacy of the performance metrics and achievement of the performance based incentives will also continue to reduce the perceived risk of continuing the outsourcing agreement. Integral to the success of these factors is the knowledge resources dedicated by the customer to ensure the outsourcing arrangement does not damage the organization.

The instrument construction will be designed to allow a comparison of KPO agreements and provide an indication of the structure that would facilitate a successful customer-provider relationship. The comparison will be between different KPs as well as across KPs. The success of the agreement will be measured by several outcomes critical to organizational success. Decisions for continuing the KPO agreement are dependent on the perceived risk involved with the relationship. A low perceived risk would be considered a successful relationship. The customer and provider factors also impact the satisfaction of the customer. A high level of satisfaction would be considered a successful relationship. Both of these success measures, perceived risk and satisfaction, are perceptual measure of the customer and can impact various financial measures of the organization. The selection of participant organizations for this study is critical to accumulate the necessary financial measures to evaluate this final relationship.

The unit of analysis is at the organizational level as viewed by one or more senior management members that may include the CKO, CEO, CIO etc. The similarity of KPs within industry sectors indicates that this initial investigation could benefit from targeting selected sectors that are already be involved with a certain level of KPO. Some of these industry sectors identified as participating in KPO include: Oil & Gas, Refining, Power Generation, Chemicals, Powder Processing and Building (<http://www.kpsplc.com/>). Other areas that have been identified as having significant potential for KPO include: Pharmaceuticals, Biotechnology, Financial services, Engineering design, Legal services etc. ([http://www.outsource2india.com/why\\_india/articles/KPO.asp](http://www.outsource2india.com/why_india/articles/KPO.asp), [http://www.cyfuture.com/knowledge\\_process-ousourcing.htm](http://www.cyfuture.com/knowledge_process-ousourcing.htm)). Publicly held organizations selected within these sectors would allow access to financial data to test the relationships of the KPO structure to organizational effectiveness.

Since KPO is a new area of research, portions of the instrument development process will require validation from industry and academic experts in knowledge process and business process outsourcing. A series of focus groups will be assembled to provide guidance for the construction of the KPO structure and enhance the measurability of the instrument. The industry experts will be members of senior management that would be part of the target respondents of this investigation. The series of focus groups will provide both content and face validation of the final instrument. Where possible, the instrument will use prior research constructs that have already been validated. The final instrument will be constructed as a web interface for ease of use. Target organization will be requested to participate via email notification.

## **5. CONCLUSION**

An SLA has historically been constructed with well defined outcomes and an emphasis on cost reduction by the customer. With the advent of knowledge outsourcing, the goals of the customer shift to include a stemming of the potential knowledge loss in addition to the sought after cost reductions. This goal necessitates a type of SLA partnership commitment by the customer that: 1) Details the expected supplier knowledge value gains, 2) Identifies potentially “fuzzy” knowledge outcome gains by the supplier, 3) Insures high quality personnel to assess the knowledge flows and 4) Incorporates knowledge erosion



prevention methods. From the supplier perspective, the SLA provides an information asymmetry for both party's that will impact both the knowledge gains of the supplier and the evidence that knowledge erosion has not occurred for the customer organization. An SLA can assist in structuring a partnership agreement to facilitate the outsourcing of knowledge that will not be detrimental to an organizations long term health.

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