Systems Engineering for Effective Supply Chain Coordination for Knowledge Process Outsourcing

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Abstract. India is emerging as a service provider for Knowledge Process Outsourcing (KPO). Many global client organizations have already developed relationships with the Indian service provider organizations. KPO is a form of outsourcing, in which knowledge-related task is carried out by experts of a different organization. Unlike the outsourcing of manufacturing, this typically involves high-value task carried out by highly skilled staff. Nowadays, KPO is treated as an industry but its characteristics are different from conventional industries in all respect. The Supply chain management is a tool for increasing the overall productivity of whole supply chain. Supply chain coordination is essential for achieving the above said targets. KPO can be understood as if all inputs are entering towards the brain of specialist and the output is well-defined product in terms of thoughts. Multiple radial input- single radial output system (MRI-SRO) is well suited to the KPO.

Keywords: Knowledge Process Outsourcing, Supply Chain Management, Supply Chain Coordination, Systems Engineering, System Modelling, System Synthesis.

1. Introduction

The type of outsourcing, in which knowledge-oriented work is carried out by the experts of a different organization, which may be in the same country or in an offshore location to save cost, is known as Knowledge Process Outsourcing (KPO).

The Management tool, which is applied to enhance the overall productivity of all members of the supply chain instead of improving just the individual performance, is known as Supply Chain Management (SCM). In the KPO related Industry, the application of SCM is possible and feasible because the KPO is also a product of an industry.

Every system can be defined as a ‘Representation of System’, in which input is converted into output by a suitable transformation process. In some cases the output is known while input is fixed. In such cases system synthesis may be defined as one of the problems related to systems to find out the optimum transforming process to convert the given input into the desired output.

In this paper, input and output parameters are defined for a KPO and the Supply Chain member, especially for KPO is also identified with their respective productivity index and then the optimum transforming process, i.e. System Synthesis is found for the said Supply Chain System.

2. Knowledge Process Outsourcing

It is said that nowadays industries try to outsource such type of work which is of less importance and simple, but this is not always true. Nowadays when within the organization, competency and skill for required work is not available or it seems to be more costly, such tasks are also outsourced. And recently outsourcing in the Research & Development (R&D) sector is also becoming very popular.

Few salient features of KPO related Industry is:

- Human-resource oriented.
- Products as thoughts.
- Interfacing between the service users and the service provider is highly essential.

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More retention of employees should be there.
R&D environment should be made available to the employees.
High level of satisfaction should be there in all respects.
Motivation must be provided to employees to work with earnest.

3. Supply Chain of KPO and Supply Chain Coordination

The fruitful role of the supply chain is brought together by SCM. Sequences of operations, which may be done at the same place or different places, are needed to produce a product in the conventional supply chain. In the KPO, a thought, which is supposed to be applicable somewhere, is the product. Now to develop a good product, here in this case, a useful thought is the responsibility of the whole supply chain. And many attributes are required for generating a revolutionary thought. According to the definition of SCM, all the providers of such type of attributes are the supply chain members because it is mental work and are mostly done by an expert of the related field. So influencing factors for generating thought are:

- Knowledge of the Political environment of the country for which solution is to be produced.
- Advanced knowledge of the required domain field.
- Healthy and peaceful environment at home.
- Motivational environment at work place.
- Attitude and approach of expert.

The above mentioned five parameters are the supply chain members of the KPO and these act radially inwards on the mind of the expert. All these factors are like the assembly of many parts for producing a product.

A lack of coordination in the KPO is related to low quality of product therefore the supply chain coordination is very essential among all the members by coordination mechanism. A System synthesis is used here for analyzing coordination so that a friendly environment is provided to expert for good quality of result.

4. Literature Review

Offshoring of business services and processes has become an increasingly accepted strategy (Vivek, Richey, & Dalela, 2009). India is a leading provider of such services (Dossani & Kenney, 2003). Industry-based evidence suggests that the human resource offshoring market is fragmented and lacks cohesiveness (Rowan, 2008; Sako & Tierney, 2005) because many differences occur in the size, culture and service provision. Human resource offshoring (HRO) firms can make an additional contribution to the competitive differentiation of human capital assets through enhancement of the organization’s social capital, absorptive capacity and strategic innovation (Collins & Smith, 2006; Minbaeva, Pedersen, Bjo¨rkman, Fey, & Perk, 2003).

Knowledge process outsourcing refers to performing “high end knowledge or judgment services” (Larkey, 2006). Due to the intricate nature of the services involved, KPOs pose considerable technical challenges. As the practice of outsourcing evolves from standard, non-core functions and processes to more complex and multidimensional processes, governance of such outsourced processes are bound to become increasingly complicated. By its very nature and definition, knowledge work, may not necessarily be accomplished successfully by following a set of predefined procedures. Moreover, an organization’s core competency may be interwoven with the outcome of a knowledge process as opposed to commodity processes typically included in BPO (Business Process Outsourcing) contracts. Finally, the end result of a knowledge process may be subjective.

The outsourcing phenomenon that began with standard IT infrastructure and software development followed by IT-enabled Business Process Outsourcing, KPO is just its progression. When outsourcing standard processes, outsourcing literature has provided ample guidelines for achieving success. However, it has also been suggested that only the ‘standard’ processes outsourced (Willcocks et al. 1996). As indicated by some of the unique difficulties associated with KPO, a ‘knowledge’ process aimed at outsourcing will pose unique challenges for researchers.
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 mean “how” work is done rather than “what” work is done (Davenport, 1993). Business processes can be identified with the following characteristics: recurrent, replicable, consequential, and coordinated (Keen, 2004). These characteristics may be identified in the context of three main knowledge processes that encompass a large portion of knowledge related activities: generation, codification and transfer (Davenport and Prusak, 1998).

Innovation, specifically R&D activity, is viewed as an organization’s significant source of knowledge. Because an outside supplier lacks the incentive to innovate for the buying firm, outsourcing, especially in terms of knowledge assets, is not considered as a means to innovate. 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). Even there are many partnering relationships whose goal is the generation of knowledge and innovation (Mol, 2005). When to accomplish the encouragement of innovation in knowledge outsourcing, feedback systems should be specified to and share knowledge in both directions (Quinn, 1999).

Rapid liberalisation of markets and global linkages, have created a changed outlook towards Human Resource policies and practices in India (Budhwar & Bhatnagar, 2009; Budhwar & Singh, 2007; Budhwar & Varma, 2010).

The social and economic context of India comprising numerous cultural norms, beliefs and values including respect for seniority, status and group affiliation (Biswas & Verma, 2007) man dates this approach. The experience of human resource management in Business Process Outsourcing (BPO) organizations in India may also be considered distinct from practices in other sectors (Khandekar & Sharma, 2005, 2006).

5. Methodology

To achieve the objectives related to the KPO it becomes necessary to connect everything systematically with the surroundings. An Input-Output model can be applied to any system. Symbolically, any system can be represented as\( T: I \rightarrow O, \) where

\[ T \text{ is Transforming Process} \]

\[ I \text{ is Raw Material or Input} \]

\[ O \text{ is Output or Products} \]

For the given input and output, the transforming process can be found out by a System Synthesis (SS) which is one of the problems solving technique related to systems.

6. Modelling

Multiple radial input- single radial output system (MRI-SRO) is well suited to the KPO. The transforming process is mind of the expert and the inputs are different type of influencing factors and the output is thought or opinion about the given problem.

As each parameter is directly connected to the end product i.e. thought in the KPO related industry, therefore the System Synthesis is applied as follows separately for each parameter that is listed earlier as an influencing factor on generating thought.

6.1 System synthesis for knowledge of political environment

Knowledge of political and cultural background is very essential as the KPO is related to strategic decision making and for the type of tasks,

Here the political and cultural environment of customer is the input and thought is the output. The followings are few solutions of the System Synthesis:

- Expert’s visit at onshore.
- Adequate knowledge provided by the customer about the application environment of solutions.
- Model testing should preferably be done at small level.
- Fulfillment of specification should also be targeted.
• The customer representation should be given to a responsible person who knows about each and every thing.

6.2 System synthesis for advanced knowledge of the domain field
The involvement of a lot of professionals like PhD holders, Chartered accountants, lawyers and doctors in the KPO related Industries as experts is an essential requirement for the KPO. India has emerged as a good KPO provider as it has a very high ratio of English speaking professionals.

In this case, the expert’s knowledge of application field is the input and the product of KPO related firm is the output i.e. thought. Now, the following points cover the solution of the System Synthesis for this parameter:
• To be up to date with the latest research of the Domain field.
• Enjoy a good professional relationship with the customer representative.
• Optimize the various possible solutions
• Consider every solution with Pros and Cons.
• Show a sense of belongingness to the customer to evaluate further consequences.

6.3 System synthesis for healthy environment at home
The family bonds are very strong in India. To educate their children, parents are willing to invest their full savings. Responsibility is also felt by the children to take care of their parents at old age. Therefore old age homes are very few in India.

Two types of the responsibilities are generally upon the shoulders of the young generation. Firstly, towards their parents who wish:
• Proper respect.
• Fulfillment of their daily requirements.
• Attention when ill.
• To celebrate all occasions together with their children
And secondly towards their children:
• For good health.
• To provide job oriented education
• To give them education related to culture and etiquettes.
• Planning for their marriage.

In cultural scenario of India the earning generation gives full respect to their previous generation. The Earning generation also secures their own future by giving good care to their children in all dimensions. Thus the family bonding is very strong in India.

In this case, the input is the relationship with family members and the output is the product i.e. thought. Solutions for the System Synthesis may be applied as followed:
• To provide health insurance for all the family members including parents.
• To celebrate with family members on all possible occasions.
• Taking duty leave to attend parents-teacher meeting (PTM) for their children.
• Taking duty leave for attending medical requirements of parents.
• Home loan, car loan, education loan for children, loan for marriage of their children may be looked after by the organization.

6.4 System synthesis for motivational environment at workstation
Freedom of working and thinking is an important part of KPO related firm. One has to believe in the employee about the quality of his work for such type of product i.e. thought, which is not easily quantified or rated. KPO work being a human oriented task, therefore solution for System Synthesis is as follows when the working environment is the input and the output is thought:
• If it suits the nature of assignment ‘work at home’ culture may be adopted
• Promotion and all other motivational tactics must be applied to retain the employees and involve them fully in assigned work.
• Employees who commit mistakes need not be punished because learning new concepts or adopting new trends involves incurring some failure and failures are part of design.
• Hygienic conditions should be maintained to foster thinking and learning environment.
• Nature’s beauty must be used to inspire the employees of KPO related firm to produce new thought.

6.5 System synthesis for attitude of expert
Leadership quality, positive attitude and adaptability towards new projects all are essential qualities for an expert involved in generating a product for KPO. It is an important parameter at the time of recruitment for selection of a candidate but in a short duration, one cannot judge anyone.

In this case, personality of expert is the input and output is though. Solutions for System Synthesis are applied in the following manner such that the desired goal is achieved:
• Physical exercise should be included in the daily schedule of the expert.
• Improving concentration through techniques like meditation and yoga.
• Proper personality development program for enhancement of self confidence, leadership quality, responsibility sharing should be arranged in one form or another.
• Inculcating human values in the employees of KPO firm.
• Professional ethics must be sincerely followed by each expert.

7. Analysis
It is done in two stages first establish hierarchy along horizontally and then vertically. To satisfy the client organization, it is important to achieve maximum satisfaction of the expert. It is also true that every demand cannot be fulfilled. Therefore it is decided by the KPO organization to fulfill the maximum satisfaction that they can. However, since every expert has different types of the requirement and the KPO environment is human resource oriented, so the demand of individuals are given topmost priority. It is always better that the right kind of environment is decided by the expert and the numbers of benefits are decided by the organization as much as they can. How these benefits are selected depends on the expert and the criterion is as follows: for example maximum five benefits can be given by the organization and section of these benefits depends on the experts as listed in Table 1.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Category</th>
<th>Sub-category</th>
</tr>
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<tr>
<td>1</td>
<td>A</td>
<td>a1, a2, a3, a4, a5</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>b1, b2, b3, b4, b5</td>
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<tr>
<td>3</td>
<td>C</td>
<td>c1, c2, c3, c4, c5</td>
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<tr>
<td>4</td>
<td>D</td>
<td>d1, d2, d3, d4, d5</td>
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<tr>
<td>5</td>
<td>E</td>
<td>e1, e2, e3, e4, e5</td>
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Now in this case, the total benefits are twenty five and suppose selection is done for only five benefits with the help of the expert. It is complicated to select the benefits in one step; therefore the following steps may be helpful for selecting the best benefits for the expert.

STEP 1: All benefits are categorized on the basis of related field and one category can have maximum five benefits.

STEP 2: Within each category, the hierarchy will be made by the expert by giving his/her preferences as first choice, second choice etc.

STEP 3: Out of the first choices in each categories, the expert is supposed to choose only one.

STEP 4: Selected benefit replaced by next on hierarchy in that category and again one is selected from the first choices.

STEP 5: Repeat step 4 till all benefits are selected.

8. Conclusion
The solutions for the System Synthesis are based on the observations and the practices adopted by various successful KPO related organizations. No doubt, many examples are drawn related to Indian scenario and the Indian people because the maximum KPO related organizations are located in India.
The organization cannot fulfill every demand of the expert due to limited resources. Therefore a few number of benefits based on the choice of expert are given by the organization to the expert.

It also depends on the time and conditions in which analysis is done hence it is desirable to choose most favorable time and conditions for optimum selection of benefits. Also the choices will not remain same for the whole duration of service therefore selection of time interval, in which reevaluation of choices occurs becomes also important.

References


