

Knowledge Transfer Success Factors in IT Outsourcing Environment

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Abstract:- Due to the advancement of technology, organizations depends more and more on information technology in order to stay competitive. Thus, there is an increase of IT outsourcing (ITO) activities especially for a non IT companies. There are many types of IT outsourcing namely complete outsourcing, facility management outsourcing and system integration outsourcing. Many of these outsourcing projects are reported facing with risk due to the technology and market shift when exercising ITO. This include loss of knowledge when the outsourcing consumer (OSC) are left with little or no knowledge on the product developed, implemented and maintained by the outsourcing service provider (OSP). Thus, this paper addresses the importance to protect and ensure the organizational knowledge is transferred and shared throughout the organization in order to stay competitive. In doing so, some influencing factors were identified in the success of knowledge transfer processes (KTP) within the context of ITO environments. Seventeen attributes are proposed based upon the predetermined key factors. The key factors are Knowledge provider (vendor), Knowledge to be transfer, Knowledge Receiver (client) and the Knowledge Infrastructure. In order to validate the framework, data are collected using survey and later statistically analyzed. The refined framework incorporating best practices yielded four key factors with two influencing attributes specified for the first factor, three influencing attribute for the second factor, two attributes for the third factor and six attributes for the fourth factor. This framework can be seen as an integration of several important elements involved in KTP, which need to be considered as an important aspect in facilitating KTP in an ITO environment.

Keywords: - IT Outsourcing; Knowledge Transfer; Knowledge Provider; Knowledge Receiver; Outsourcing Provider; Outsourcing Consumer

1 Introduction

Outsourcing refers to procurement of goods or services from an outside vendor [25]. Outsourcing is simply a result of maturing markets, the next step in the evolution of a truly global market place [13, 17]. Information Technology Outsourcing (ITO) is the choice of many organizations to sell or contract out its IT resources such as workers, IT assets and or the organization's activities to a third party or outside vendor that will manages their IT resources within a given period of time with an agreed amount of payment [6,17]. [27] states that, the most popular types of IT outsourcing are complete outsourcing, facility management outsourcing and systems integration outsourcing. However, it is reported in numerous studies that organizations are faced with risk due to the technology and market shift when exercising ITO [21, 39,32].

IT Outsourcing can be categorized into two types of dependencies which are: dependence for capacity

and dependence for knowledge [13]. Depending for knowledge is far more risky for the outsourcing consumer (OSC) than depending for capacity [13]. From a user's point the disadvantages and risks of ITO is the loss of knowledge in the IT outsourcing activities because they want to focus on their core competencies, difficulty in selecting the best or reliable outsourcing vendor as the technology is rapidly changing and also the potential that the information leakage as some information need to be disclosed in the outsourcing activities [18]. In addition, because of this dependency, the IT outsourcing activities will not achieve it main objective and also the most valuable information such as the specialized knowledge of the outsourcing vendor will not be transferred successfully to the outsourcing organization [16]. Potentially, the failure to employ an adequate knowledge transfer strategy and poor understanding of what knowledge management (KM) can prohibit IT organization from

acquiring the expertise to solve new problems by reusing the same knowledge [7, 29].

Thus, it is important to make sure that there is knowledge transfer between OSP to OSC. Although knowledge transfers have been widely discussed by many academics and practitioners, there is relatively little information on factors influencing knowledge transfer especially in ITO. Therefore, the objectives of this paper are to propose the process of knowledge transfer in ITO and its factors based upon related works and best practices to manage knowledge successfully in ITO projects.

2 Related Works

The market for ITO services is growing rapidly and costs associated with external IT services are rising in most business and public organizations. It has become a trend among organization nowadays. This is because many organizations have been forced to control their in-house IT operational cost and at the same time they feel the need to have high quality information systems that made them to consider IT outsourcing activities [40]. Furthermore, it has become one of a critical success factor for any viable strategy in an increasingly global economy. It has widely been understood as one of the major means of improving the competitiveness and effectiveness of organizations [25].

The working definition of IT outsourcing for this proposed research is the use of an outside company or professional to manage or develop a function or system formerly carried out inside a company, to manage a client organization's information technology assets, people and/or activities to a required standards over an agreed time period [15, 17]. Outsourcing of IT covers a range from communication network management, hardware/software maintenance, application management, information system management and business processes [36].

In addition, there are onshore and offshore outsourcing activities. Onshore outsourcing is where the outsourcing organization and outsourcing vendor are located in the same country, whereas, offshore outsourcing is the condition where both the outsourcing organization and outsourcing vendor located in a different locations or countries [35]. Basically, there are four types of IT outsourcing, which are total outsourcing, multiple supplier or

selective outsourcing, joint venture or strategic alliances outsourcing and in-sourcing [14]. Outsourcing offers several advantages, such as cost reduction, cost savings, time savings, greater flexibility, greater productivity, core activities and key objectives focusing and process re-engineering. Managers outsource when they expect the market to be more cost efficient or when they believe skills, knowledge or experience are available via the market that are not available in-house [24].

However, the area of organizational competencies such as loss of IT expertise, loss of innovative capacity, loss of control of the activity and loss of competitive advantage appears to be quite vulnerable in the outsourcing context [5, 26]. The ability to align IT with the firm's strategy might also be hampered, thus affecting the firm's ability to maintain competitive advantage, and to use IT in an innovative fashion [12]. Whether outsourcing results in an increase or decrease in the overall risk profile of an organization will depend on the significance of the outsourced activity, the effectiveness of controls over outsourcing risk. Therefore there is a need to manage IT outsourcing especially the dependency over knowledge. In addition, [8] identify the most critical factors that may influence the success of any IT outsourcing activities is knowledge transfer. At the end of any outsourcing activities, organization expects that they will gain advantage from the IT outsourcing activities. However, they should consider all the factors that may influence the success of the IT outsourcing activities especially when it related to knowledge acquisition from the IT outsourcing vendor.

Davenport et al. [10] cites that knowledge transfer is the process of transmitting or presenting or sharing knowledge to a potential recipient. Meanwhile, [23] defined knowledge transfer as "the process of moving useful information from one individual to another person". Besides that, knowledge transfer could refer to the process of transmitting knowledge such as experience, lesson learn from others and communication between people [41]. Therefore organization should recognize and understand the effective ways in transferring knowledge inside or from outside the organization. In addition, there are many factors that may influence the transfer of knowledge in any organization. These factors will determine the effort and resources of the knowledge transfer and education. The barriers to transfer of knowledge maybe caused by communication problem,

language problems, interpretation problems and technologies and techniques used in transferring the knowledge [41].

Absorptive capacity is defined as the ability to use or apply the knowledge received by the receiver [9, 2]. The transfer of knowledge is usually accompanied by an additional phase of knowledge application or practicing by the recipient. This additional phase is often fundamental to acquire those tacit and contextual aspects of knowledge that is not transmitted or acquired from the first phase of knowledge transfer [37]. In this context, knowledge is viewed as what the individual knows: the facts, information's skill and understanding that one has gained especially through learning and experience [3]. Knowledge resides in several different locations or reservoirs, they encompass people, including individuals and groups; artifacts, including practice, technologies and repositories; and organizations entities, including organizational units, organizations and inter-organizational networks [20].

In ITO environment, knowledge is recognized as a fundamental asset for improving the competitiveness and effectiveness of organizations [4, 28, 34]. Meanwhile, KM can be defined as performing the activities involved in the management of knowledge source and actionable resources so as to enhance the efficiency, effectiveness, and innovativeness of organizational business processes [3, 11, 19, 22, 38]. From the theoretical framework it is found that there are several important issues in knowledge transfer that needs to be addressed namely absorptive capacity, distribution, reception and adaptation. In mapping these issues with existing models and ITO environments, several models were studied and the details are as follows:

Table 1: Knowledge Transfer Model and its description

Model	Description	Ref
SECI model	Spiral model of organization knowledge creation is relevant to the activities of generation, distribution & transfer. Knowledge internalization, the last quadrant identified as the model to represent absorptive capacity since internalization is related to learning by doing.	30, 31

Szulanski's knowledge transfer model	This model examine the stages of knowledge transfer namely initiation, implementation, ramp-up and integration.	38
KM solution framework	This model discusses on the infrastructure that includes organization culture and structure, people and technology	20

SECI model developed by Nonaka and Takeuchi [31] that support the knowledge transfer between the instructor and the learner. This model is a process of knowledge creation between tacit and explicit knowledge, and comprises socialization (tacit-to-tacit), externalization (tacit-to-explicit), combination (explicit-to-explicit), and internalization (explicit-to-tacit). Meanwhile Szulanski's [38] states that knowledge transfer model includes four stages that are initiation, implementation, ramp-up and integration. As knowledge can be gained through learning experiences from individual's memory, the success of knowledge transfer does not depend solely on the source and knowledge recipient but there are other factors that could influence this process. Therefore, the knowledge transfer process could be improved if these factors were given high priority in dealing with it during the knowledge transfer process.

Finally, referring to table 1, the KM solution refers to the variety of ways in which KM can be facilitated. KM solutions are divided into 4 broad levels that are KM processes, KM systems, KM mechanism and technology and KM infrastructure. KM processes are discovering, capturing, sharing, and applying knowledge. KM systems are the integrations of KM technologies and mechanism that are develop to support the above KM processes. KM mechanism and technology are use in KM system utilizing the combinations of multiple mechanisms and multiple technologies. Lastly, KM infrastructure which reflect the long term foundation for KM. KM infrastructure include four major components which are Organization Culture, organization structure, people and technology

3 Research Methodology

Towards realizing the survey, a set of questionnaire was prepared. A pilot survey was conducted earlier

with ten organizations to confirm the validity and the understanding of the questionnaire. The results of the pilot survey confirmed that the questionnaires were appropriate and valid. The questionnaires were then refined and the final questionnaire were then distributed. A sample size of 150 from 10 organizations where 130 questionnaires were retrieved, resulting in an 86.7 per cent response rate. Of the retrieved questionnaires, 101 questionnaires were usable. The surveys were divided into two sections; project's characteristics and Knowledge Transfer in IT Outsourcing practices with 18 hypotheses to address 18 attributes.

4 Knowledge Transfer in IT Outsourcing Framework

In an outsourcing relationship, the vendor and the client need to transfer exchange and develop knowledge on continuous basis [17]. If this knowledge exchange is poorly structured, then misunderstandings leading to a poor service quality will occur [1, 20]. Basically, the process of knowledge transfer occurs between individual, groups and organizations [30, 33, 39].

Referring to Table 2, this research gears to knowledge internalization therefore the framework highlight four key factors involved in knowledge transfer process (KTP) [20, 30, 31, 38]. These factors are knowledge provider or OSP which represents the owner of the knowledge, knowledge receiver or OSC represents the person who receives the knowledge, knowledge to be transferred describes the explicit knowledge in which reside in people, artifact and organization entities and finally knowledge infrastructure represents all the enablers in facilitating the process of knowledge transfer. These factors are recognized as the main factor of effective KTP in ITO environment. The model also identifies five significant stages of learning process including the interaction between the knowledge provider (OSP) and receiver (OSC).

The KTP processes requires OSC to acquire knowledge that would be transferred by the OSP through KM infrastructure which ever convenient and fast communication technology. This information would then need to be interpreted and absorbed by the OSC members so that knowledge transfer can be accomplished successfully through the interaction of both the OSP experts and OSC technical groups or

users. With respect to this framework, several attributes are identified to measure the commitment of each factor in realizing KTP. These attributes and its description are as shown in table 2.

Table 2: Attributes for each factor

	Factor	Attribute
Effective KTP in ITO	Knowledge Provider/OSP	• Distribution capacity
		• Sharing motivation
	Knowledge Receiver/OSC	• Absorptive capacity
		• Perceived Benefits
		• Self Motivation
	Knowledge to be transfer	• Quality
		• Reliable
		• Timelines
		• Accurate
	KM Infrastructure/ Enabler	• Sharing culture
		• Management support for KM
		• Document confidential status
		• Communication flow
• ICT Infrastructure		
• Posting		
• Training		
• Trust		
• Building design		

Referring to table 2, knowledge transfer in the ITO environment is about the transfer of knowledge from OSP as the knowledge provider to the client. Without focusing on the OSP and the aptitude of the OSP, knowledge transfer would not happen. In this category, the knowledge providers is measured based on the ability to facilitate knowledge transfer, the ability to deliver the knowledge to the focus client and the willingness to share knowledge. The definitions of its attributes are as given below:

- Distribution capacity is define as the ability to facilitate and deliver the knowledge to the client, to help client explore and exploit the knowledge. This includes the use of some specific tools for delivering knowledge transfer which provide the comprehensive solution to help client organization value the knowledge.
- The second attribute is self motivation or self willing to deliver the knowledge. This attribute is proposed to make it align with the Push Model of KTP as described earlier.

The next factor which is knowledge receiver/OSC is measured based on the ability to use the knowledge and assimilate new knowledge, estimate how much the receiver has gained from the knowledge and also the attitude towards the knowledge in terms of the self-motivation to acquire and receive the knowledge. The explanation of its attributes is as discussed below:

- Absorptive capacity is the ability to identify, accumulate, value, assimilate, transform and exploit knowledge resources to enable learning [9]. Many researcher claims that, absorptive capacity has huge influence in determining effective process of knowledge transfer.
- In this research, Perceive benefit refers to how much do the receiver benefited from the experiences of knowledge transfer process between OSP and OSC. It is believe that this attribute can gives wider indication on the process effectiveness as a whole.
- The third attribute for this factor is self motivation or self willing to acquire and receive the knowledge in ITO relationship. This attribute is proposed to align with the pull model of KTP as described earlier. Without processing this attitude, the receivers as the users cannot possibly achieve the desired expectation.

From the literature, many of the researchers believe that the characteristics of the knowledge is important in determine the effectiveness and the efficiency of the knowledge transfer between knowledge provider and the receiver. In the third category, the knowledge providers is measured based on the quality of the content and the presentation appearance, the reliability of the knowledge, the ability to provide knowledge within the required time, and the accuracy of the knowledge. Further understanding of each attribute is as described below:

- The next proposed attribute for the knowledge to be transfer factor is the quality of the content and the presentation appearance. This quality content is measured in terms of how the content is useful to OSC to accomplish their task, solve problem, and innovate their carrier which may lead to motivate OSC to learn and how the content is displayed and presented that may have lead to the ease of reading and understanding.
- Reliability attribute refers to stability, which explains the extent to which the measure,

procedure or instrument yields the same result or repeated trial. In this case, its explains the extent to which the knowledge document is reliable in terms of whether it is sufficiently provided to fulfill the need of understanding about the system or application that had been outsource through the contract time frame.

- Next the timelines is defined as the ability of an entity to provide service within the required time. In this research, timelines is measured to determine whether the content of the knowledge document is being updated regularly in accordance to the current needs.
- Subsequent attribute is the accuracy of the knowledge document. Accuracy is understood as the quality of nearest to the truth or the true value. It simply brings the meaning the extent to which the knowledge document is relevant to the user need and expectation.

In this study, knowledge infrastructures are defined as the set of all enablers and facilities that represent a supportive knowledge environment for OSP to transfer their knowledge to OSC. These knowledge infrastructures consist of 4 main dimensions which are organization culture, organization structure, people and technology. Two attributes were identified relevant in representing organization culture as presented below:

- Knowledge sharing culture is defined as how ready OSP to share their knowledge from client point of view. Most OSP see knowledge as power, as a guarantee of continued employment, therefore reluctant to share.
- Management support for knowledge transfer is seen as to what extent does the management support knowledge sharing in ITO.

Organization structure represents the communication flow and documentation of project deliverable such as planning, technical specification, project report, manual, and system coding and effect to creation and transfers of knowledge. For this particular factor, the identified attributes and its description are as stated below:

- Document confidential status - The status of the documentation has an implication for the sharing of knowledge. Therefore it is believe that the status of documents has a positive relationship with the effectiveness of knowledge transfer

- Communication Flow – In many organizations there are many layers of managers where formal reporting structures are more detailed at the top than at the bottom. Decision making flow from up to down, this decision making can significantly slow organizational processes. This organization structure can constrain reporting between OSP and OSC.

Meanwhile information technology is based on the use and the availability of ICT Infrastructure. Finally, the last few attributes of the final factor suggested relevant to knowledge transfer is People. The attributes and its description for this factor are as described below:

- Staff Posting - Employees bring to an organization their prior education, experience, knowledge and skills and will be value added to the organization, This aspect is important, as knowledge is likely to be transferred easily if employee are placed in the right position.
- Training – knowledge gained by employees through learning or training will enable them to translate their knowledge into organization routine, competencies, job descriptions and business processes, plan, strategies and culture. Therefore it is important for the organization to have a proper training program to enable employees to gain knowledge and contribute to the creation and transfer in the organization.
- Trust – Szulanski et al. [38] contend that "trustworthiness of the source enhances knowledge transfer." In addition, Cohen et al. [9] argue that trust is the "magic ingredient" leading to knowledge transfer. When a source is perceived as untrustworthy, the recipient may consider the knowledge to be unreliable, and as a result, the recipient is less likely to internalize the knowledge communicated by the source [38].

Finally, the last factor physical environment within the organization usually taken for granted however it is an important foundation of KM as described below:

- Physical Environment - In this study, key aspect of the physical environment include the design of buildings and the separation between them; the location, size and type of offices; the type, number and nature of meeting room and so on. Physical environment can foster knowledge

transfer by providing opportunities for employees meet to meet and shares ideas.

5 Findings and Discussions

In this study, ten (10) organizations were identified that practice the knowledge transfer into ITO environment. However, some attributes were found not significant.

5.1 Demographic profile

The survey respondents profile with regard to ICT Staff, involvement in IT outsourcing project and length of involvement in IT outsourcing activities as shown in Table 3.

Table 3: Respondents' Profile

Respondent Profile		Percent
Staff Designation	IT manager	27.7
	IT Officer	40.6
	IT Assistant Officer	25.7
	Other IT staff	5.9
Involvement	yes	91.1
	No	8.9
Duration	not involve	8.9
	Less then 1 year	17.8
	1 to 2 years	27.7
	3 to 4 years	20.8
	5 and more years	24.8

5.2 Knowledge Transfer in ITO environment Practices

Based on the inferential findings as shown in table 4, with respect to the effective factor influencing KTP in ITO as presented in Table 2, some conclusions could be made as discussed below.

Table 4: Correlation between factors and attributes

Key Factors	Attributes	Pearson Correlation	Sig. \ (2-tailed)
Knowledge Provider/OSP	Distribution Capacity	.225	.024
	Sharing Motivation	.617	.000
Knowledge	Absorptive	.818	.000

Receiver/OSC	Capacity		
	Perceived Benefit	.225	.024
	Self Motivation	.106	.293
Knowledge to be transfer	Quality	.815	.000
	Reliability	.255	.010
	Timelines	.116	.249
	Accuracy	.351	.000
KM Infrastructure/ Enabler	Management Support	-.001	.993
	Sharing Culture	.426	.000
	Communication Flow	.538	.000
	Document Status	.898	.000
	ICT Infrastructure	.965	.000
	Staff Posting	.649	.000
	Training	.945	.000
	Trust	-0.51	.612
Building Design	0.38	.709	

Note: P-value at 0.05

Table 4 indicates that, there is a weak positive correlation (0.225) between the knowledge provider factor and the distribution capacity. Since the P-value is equal to $0.024 < 0.05$, thus confirm that there is significant correlated between distribution capacity and the knowledge provider factor. This shows that there is a minimum effort taken by vendor to facilitate knowledge transfer to client. The sharing motivation is define as the degree of the provider's willingness to share and deliver the knowledge. Table 4 shows moderate positive correlation (0.617) between the knowledge provider factor and the sharing motivation. This show's that, most of the vendor are wiling to share their knowledge with client but there is minimum initiatives been taken in order to make sure the focus client be knowledgeable. This may be due to the fact that vendor apprehend loss of customer if the client are more knowledgeable then the vendor. Hence, it can be summarized that both attribute are significantly correlated with knowledge provider factor with sharing motivation attribute having more influence in an effective KTP with value matrix (0.617) compare to distribution capacity attribute.

As for the second factor, Knowledge Receiver, it is found that two attributes have an influence in KTP attributes which are Absorptive Capacity (0.818) and

Perceived Benefit (0.225). Self motivation seemed to have almost no correlation with the knowledge receiver factor. This might be driven by several causes. First, self motivation is very subjective and so much close to one's attitude. Second, the vendor might refuse to share their knowledge which demotivated client to learn.

Knowledge to be transfer factor shows that out of four influencing measurement attributes proposed, only three are significantly correlated with the knowledge to transfer factor. The attribute are quality, accuracy and reliability of the knowledge document. The highest correlation value matrix is between knowledge to be transfer factor with quality (0.815) followed by accuracy (0.351) and reliability (0.255). This implies that quality is the predominant influencing attribute of the knowledge to be transfered. Meanwhile, timelines has no influences to KTP in ITO. This may due to the fact that most of document is not updated and the delivery delay of project documentation at the end of the contract period.

Finally, KM infrastructure factor indicates that there is no significant correlation between organizations culture factor and management support. This may suggest that some management still have not realized the important of knowledge management in an organization. There is a significant positive moderate correlation (0.538) between organization structure and communication flow. This shows that complexity of communication flow influence the effectiveness of KTP. Besides that, the result shows that, there is a significantly positive high correlation (0.898) between organization structure and document status. This suggests that, documents status highly influenced the effectiveness of KTP.

As for ICT infrastructure, the result shows that, there is a significantly positive highly correlation (0.965) between Information technology factor and ICT infrastructure. This shows IT is the most important enabler to facilitate KTP in ITO environments. The result exhibited that, there is a significantly positive moderate correlation (0.649) between people factor and staff posting. This shows that staff posting influence the effective of KTP. There is a significantly positive extremely high correlation (0.945) between people factor and training. This shows training is an important initiative to make sure that knowledge is transfer effectively in ITO. There is a no significantly correlation between people factor and trust. This could be that the client

believed they could get the knowledge from any sources without the need to consider the validity of the knowledge source.

The last attribute shows that there is no significant correlation between physical environment and knowledge transfer. Thus it shows physical environment is not a factor influencing KTP in ITO.

6 Conclusion

Knowledge transfer is a very important initiative in IT outsourcing activities. The KTP within the context of ITO environments can be interpreted as a phenomenon composed of two related component: knowledge delivering and knowledge receiving or acquiring. It is essential to determine the effective factor influencing the process of delivering and receiving of knowledge in ITO, so that action is possible to spur the knowledge transfer to the client for improving organization productivity. This research addressed problem by developing the theoretical framework integrating the key factors influencing KTP in ITO environments through investigating existing studies on knowledge transfer, knowledge sharing and knowledge management in different and similar domain. Eighteen attributes are defined based on the predetermined key factors, which are knowledge provider/OSP, knowledge receiver/OSC, knowledge to be transfer and the knowledge infrastructure or enabler. Consequently, it was clear that there is a significant relationship between the four main factors together with thirteen attributes (out of eighteen) evidently indicated the importance of these factors in influencing and ensuring successful KTP in ITO. This study is intended to help practitioners and researchers to visualize the process of knowledge transfer in IT outsourcing projects.

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