# Inter-Organizational Knowledge Transfer Through Malaysia E-government IT Outsourcing: A Theoretical Review

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*Abstract*—The main objective of this paper is to contribute the existing knowledge transfer and IT Outsourcing literature specifically in the context of Malaysia by reviewing the current practices of e-government IT outsourcing in Malaysia including the issues and challenges faced by the public agencies in transferring the knowledge during the engagement. This paper discusses various factors and different theoretical model of knowledge transfer starting from the traditional model to the recent model suggested by the scholars. The present paper attempts to align organizational knowledge from the knowledge-based view (KBV) and organizational learning (OL) lens. This review could help shape the direction of both future theoretical and empirical studies on inter-firm knowledge transfer specifically on how KBV and OL perspectives could play significant role in explaining the complex relationships between the client and vendor in inter-firm knowledge transfer and the role of organizational management information system and Transactive Memory System (TMS) to facilitate the organizational knowledge transferring process. Conclusion is drawn and further research is suggested.

*Keywords*—E-government, IT Outsourcing, Knowledge Management, Knowledge Transfer

## I. INTRODUCTION

IT outsourcing involves a complex process of problem solving and various agent (e.g. individuals, groups and organization) simultaneously to meet goals, interests and responsibilities that have been agreed in the agreement. Each agent must possess diverse knowledge resources. Telioglu & Wegner [1] viewed IT outsourcing projects as situated activity that takes place in specific locations by people who act from their specific context of knowledge, tools, task, colleagues, idiosyncrasies, organizational memory and history. IT outsourcing projects usually involve the supplier acting as designers and application developers and the customers who act as the project owner or manager to monitor the whole

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process and progress. Designers and developers will covers wide spectrum of activities ranging from relatively specialized technical work involving algorithms, coding to lower-level technical work of customer support call centers and data entry [2]. Client provides the vendor business processes document as well as user requirements to be fulfilled by the supplier. Meanwhile, the end users provide the test or whether the software is acceptable to them or not. These different groups can both provide and require different forms of knowledge and expertise as well as accepting the new knowledge results from the collaboration in every phase of development. Knowledge acquisitions and transfer processes needs effective communication and good cognitive ability between both parties. Blacker [3] have labeled the management of knowledge acquisition, sharing and integration among individuals in IT outsourcing projects as "knowledge intensive" work that requires organizations to increasingly depend on knowledge workers. Recent years, the issue of acquisition and transfer of knowledge through IT outsourcing projects has attracted many researchers (e.g. [4],[5]&[6]) as this situation was also affected by economic globalization and the increasing market value of IT outsourcing from year to year. ITO in Asia was led by India for years. However, due to salaries increment, the industry players started o look at the other countries that offered better value-added outsourcing services.

Malaysia is actively promoting the Shared Services Outsourcing (SSO) program after viewing the IT outsourcing as one of the commodity market that contribute to the country Gross Domestic Product (GDP). According to a joint publication by Outsourcing Malaysia and ValueNotes published in August 2009, revenues from the Malaysian ITO industry are expected to touch $1.1 billion in 2009. The industry is expected to grow at a Compound Annual Growth Rate (CAGR) of 15% to reach $1.9 billion by 2013. Currently, ITO services in Malaysia have a greater share of the overall outsourcing market, followed by Business Process Outsourcing (BPO) services; while knowledge services outsourcing is still in its nascent stage, has a smaller share. Whilst the interest in outsourcing is still growing especially among players in the banking (e.g: CIMB & Maybank), airline (Malaysia Airline System), manufacturing, healthcare, and government sectors, there is very scarce evidence that specifically focus on the knowledge transferring processes during the engagement of outsourcing projects. Indeed, most

of the studies concentrate on the general knowledge management implementation, practices or readiness at public agencies [7], Malaysian SME industries [8], aerospace industry [9], bank [10], telecommunication industry [11], higher education [12], to name a few. Thus far, the past literature related to knowledge transfer provides only few specific solutions to particular knowledge transfer problems in MNC's [13],[14]&[15], knowledge transfer facilitators and barriers [16],[17]&[18] knowledge transfer among team members for globally distributed projects [5],[20]&[21]. It seems that most of the knowledge transfer research was done in MNCs environment. Only a few research exploring knowledge transfer activities in ITO. There is only one work recently done by Mohamed et al. [22] focusing on knowledge transfer in IT outsourcing for Malaysia setting from the vendor perspectives. The authors outlined various knowledge transfer (KT) success factors and developed a theoretical framework for future work. Apparently, those researches never address the need of organizational management information system and Transactive Memory System to support inter-organizational knowledge transfer processes and blend it with organizational learning capabilities. Despite that, ITO is one of the fastest growing areas in IT services and the market is still expected to grow in next few years besides the current world financial crisis. Thus, this study is relevant looking at the current environment in Malaysia.

This paper can enlighten the current practices of IT outsourcing processes in Malaysia specifically the knowledge transfer processes being practices between public agencies and vendors. This paper represents an attempt to investigate some theories and models associated with knowledge transfer besides issues and challenges of inter-organizational knowledge transferring process during the IT outsourcing engagement for future research. This paper is structured as follows. The next section discuss the existing e-government ITO being practiced in Malaysia. Section 3 presents the issues and challenges faced by Malaysia public sector during ITO project execution. Next, the authors identified some basic theories relates to the topic and finally conclude this paper with suggestion for future research.

## II. RESEARCH BACKGROUND

### A. E-government IT Outsourcing Practices in Malaysia

Previous research defined the IT outsourcing from two different perspectives: transactional perspectives and partnership perspectives (e.g. [22]). The first develops through a formal contract in which the rules are well specified and the failure to deliver on commitments by either party is resolved through either litigation or penalty clauses in the contract. The second, in contrast, involves risk and benefit sharing, the need to view the relationship as a series of exchanges without a definite endpoint, and the need to establish a range of mechanisms to monitor and execute its operations. Outsourcing is one way to strengthen public sector delivery, to enable it to meet changing citizen and business expectations. Within Malaysia, IT outsourcing trends from the USA, UK and Australia context are closely reflected. Malaysia

government has also embarked in IT outsourcing for various e-government initiatives. The early Malaysian government's large-scale systems integration projects in 1990s were POS Malaysia Berhad, Amanah Saham Nasional Berhad and Permodalan Nasional Berhad (PNB) [23]. These massive computerization projects were outsourced to one of Malaysian's leading total ICT solution and service provider. Other IT outsourcing project includes the Malaysian Smart Schools (was awarded to Telekom Malaysia Consortium), and the Generic Office Environment (was awarded to Electronic Data Services (EDS) Malaysia [24]. Among the types of outsourcing the usual approach implemented in the Malaysia public sector are BOT (Build, Operate, Transfer), BOO (Build, Operate, Own) and service contract [25]. For *BOT* approach the provider/vendor need to develop the application according to the agencies requirement and manage the system operation for a certain time as stated in the contract. At the end of engagement, agencies may consider whether to provide application and operation system contract to original vendor, other vendor or implemented internally. Example applications for BOT approach that have been implemented are e-procurement (*e-perolehan*) own by Ministry of Finance (MOF) and The Electronic Budget Planning and Control System (e-SPKB) own by National Accountant Department (ANM). In contrast with *BOO* outsourcing approach, the vendor provides and manages ICT services without submitting the property to the agency. Ownership remained with the ICT service provider and it is not an obligation of agencies to purchase or change the ownership of the ICT services (e.g: Preparation of management infrastructure and network disaster recovery center and network infrastructure management and disaster recovery center).The last outsourcing approach is *contract basis service*. For this approach, the owner agency will give a contract to the vendor to develop/maintain the whole ICT devices but the ownership of the device belongs to the agencies not the provider. Example: Maintenance of hardware at agencies such as personal computers, printers and servers.

Malaysia government has outlined six criteria/activities that can be outsource [25]:-(1) activities like data entry, maintenance of computer equipment and provision of web site / portal, (2) activities that are not critical to the mission and core services agencies. However, agencies can still outsourced their critical activities if agencies are unable to implement their own while the supplier can implement better and effective. (3) ICT activities that require more systematic and effective marketing and promotion strategies, (4) activities that require off-site operations, (5) activities that involved the mobilization of resources and fast monitoring system such as help desk or call center, and (6) activities that require specific skills and capabilities, particularly involving the use of new technologies. Example: the use of biometrics, public key infrastructure (PKI). Most of Malaysia public agencies IT outsourcing projects were allocate for network services and software maintenance [26]. Looking at the progress of IT outsourcing projects in Malaysia public agencies, IT outsourcing services is still at the infant stage in Malaysia [27] due to the fact that none of public organization has more than 16 years of outsourcing experience because most of the public

agencies have only conducted outsourcing project within 6-10 years. Infect, public agencies in Malaysia is still struggling on certain issues and challenges in managing successful ITO project especially on the vendor ability to deliver the project goals and increase the project execution speed. Beulen & Ribbers [28] also concluded that generally, Asia's level of experience with the management of IT outsourcing is low compared to the rest of the world. The next section will discuss more on issues and challenges faced by Malaysia public agencies in managing e-government ITO projects.

## III. ISSUES AND CHALLENGES

Outsourcing can fail for a myriad of reasons. Malaysia public organizations have also experienced the failure in IT outsourcing projects. Many organizations in public sector have experienced outsourcer termination or interruption of contracts before all contractual tasks are completed [26]. Switching vendors, especially during the course of contract execution, involves a lot of transition costs including early termination costs, switching costs, redeployment costs, relocation costs, etc [29]. Such failed projects have either overrun budgets/schedules or been unable to meet expected business objectives [30],[31]. According to Tiwana [32], IT projects that exceeded the original schedule is more than 18% while more than 15% exceeded the original budget. Philip et al. [33] also reported that clients tend to have experienced more failures even though there were companies that were involved with outsourcing projects for more than 7 years. Carmel & Beulen [34] argued that unsuccessful knowledge transfer is one of the principal reasons for failures in the first few years of offshore outsourcingThe failures might be resulted from knowledge gaps between vendor and client when either of them lacks the required domain or technical knowledge for implementation besides the project management issues [33]. This is also supported by IDC report published in December 2009. According to IDC, Malaysia in still lagging behind other mature ITO service providers and companies because of inability to address client industry knowledge. When providers are familiar with the client's business industry, they are better able to leverage their knowledge of industry best practices in performing the outsourced function. The business knowledge inherent in the client must be combined with the technical knowledge residing in the vendor for the outsourcing project to succeed. Active knowledge transfer tend to lower barriers to adopting new technology and make it easier for client firms to realize the benefits of adopting outsourcing strategies [35]. Levina and Vaast [36] also affirm that teams involved in outsourcing projects experience so-called "status differences" caused by differences in competences, resources and interpersonal connections which created the boundaries between parties. The outsourcer personnel must possess adequate knowledge regarding the related technologies used in the ICT outsourcing projects and vice versa to the government personnel incharged of the overall project. Government should also assign permanent IT personnel to be part of the project team during the project lifecycle. In addition, knowledge transfer may not be successful owing to staff turnover or staff transfers to other

government agencies. The movement of key project members will further affect the project planning [33]. Karhu et al. [37] further added that establishing knowledge transfer procedures as clearly as with on-shelf IT products compared to customized products is far more difficult. Since most of e-government project is customized applications, therefore the knowledge transfer procedures are more complex and significantly complicate the overall knowledge transfer processes. The implication of knowledge transfer from outsourcing projects should be mirrored by the knowledge that internal staff gained from the outsourcer and the well-developed internal technical staff skills. Apparently, this situation never happens during the outsourcing engagement at Malaysia public agencies [26].

From artefact perspective of knowledge, knowledge can be embedded in a form of project documentation like project specifications, user analysis documentation, contract and manuals to make the company capable of leaning on previous project descriptions [39]. Project documentation process may increase the misunderstandings and errors involved in the process of transferring procedural knowledge which is more tacit in nature towards explicit knowledge for the purpose of project monitoring and control because of different knowledge and skills possessed by business personnel at the client site and technical IT personnel at the vendor site. Besides that, dealing with public sectors, the vendor must obliged with some procedures and policies stated by the government. Although, the government have created general guidelines for IT outsourcing documentation, still a poor documentation in an issue in public agencies IT outsourcing. People working in projects may not always find time or motivation to write down detailed reviews and assessments. They are fully occupied with pressing project tasks, and documenting and reporting is often not considered to be one of them [40]. Poor project documentation shows the lack of outsourcing project management maturity [34]. Many public organizations, suppliers and end-users, have discovered once a contract is underway that the initial requirements have changed. It is imperative that a thorough 'needs analysis' is conducted prior to project commencement so the project can be scoped accordingly. End-user documentation is critical to the user-friendliness of an application, and in this regard, the issue of quality documentation from ICT outsourcing needs considerable improvement. Many vendors are unable to provide complete project documentation. Moreover, documentation provided by some vendors may be difficult to understand (owing to technical terminology used) or fail to meet user requirements. Lack of good documentation will hamper the outsourcer's claim of compliance with the contract and may introduce hidden costs not apparent in the contractual agreement. However, the challenge for preparing a standardize format comes from the lack of expertise from personnel with adequate know-how [27].

Storage of new knowledge relied heavily on reports that the projects contract required [40]. Contract can be viewed as a formal control mechanism that must be precisely specified and enforced. Thus, public agencies should review their contract/service level agreement (SLA) before engaging with any vendor for the IT outsourcing projects. It is also important

that the contract is structured in a flexible way, so if requirements do change, then the contract can accommodate that. Constructing a project contract required skills and past experienced of previous project. The ability to articulate explicitly project milestones, deliverables, cost and schedule for the outsourced projects in the contract at each stage in ITO projects gives significant impact towards project success and increases the effectiveness of knowledge transfer. Tiwana & Keil [41] suggested that the contract should reflect the outcome control only not the process control. Imposing rigid process guidelines can also potentially impede technically skilled vendors from applying their own resourcefulness or idiosyncratic technical skills to the project for fear of being penalized for deviating from the stated process.

## IV. THEORETICAL BACKGROUND

### A. Epistemology perspectives of knowledge

Research in the area of knowledge transfer has been conducted from three different epistemological perspectives [41]: *cognitivistic*, *connectionistic*, and *autopoietic*. The *cognitivistic* stance views knowledge as an object that can be manipulated and shared among individuals [41]&[42]. This stream is often associated with information science and information markets. Von Krogh and Roos [42] refer to this stream as the '*Information Processing Epistemology*'. According to them, what translates that object in a competence is the activity of a cognitive system that interprets and uses the information conveyed by that object. The key focus of this stream is the codification of knowledge into units of information that can be easily moved, sold or attributed value in some form.Within this perspective, specific characteristics of the knowledge sender-receiver, or the knowledge characteristics, prior knowledge or knowledge process rules are not viewed as critical to knowledge transfer under this perspective [6].

On the contrary, the *connectionistic* perspective does not view knowledge as having universal characteristics. Knowledge from this stance has been categorized as embrained, embodied, encultured, embedded, and encoded [6]. This stream combines the individual-collective knowledge concept. Chen & McQueen [43] claimed that embedded knowledge is the most difficult to be transferred because it is owned by a group or community and highly embedded in complex social interactions and team relationships. This second stream of research views knowledge more as a process and is concerned with the behavioural aspects of organizational life and their effect on the retention and transfer of knowledge throughout the organisation. Von Krogh and Roos [42] refer to this as the '*Network Epistemology*'.The *connectionistic* theorists believe that knowledge transfer between knowledge sources and recipients is inherently difficult especially due to the contextualized nature of knowledge, and due to different factors such as the need for shared understanding, and the nature of "connections" through social interactions, ties, or team relationship. Initiatives in this stream usually relate to the effective communication between people around the

organization with the support of collaborative technologies. Thus, organizational information systems often play a central role as supposedly the most cost effective means by which this can be achieved.

Whilst, the *autopoietic* perspective to knowledge transfer owes its origin to the concept of self referential epistemology, knowledge does not characterized as abstract; therefore it is not seen as shareable [42]. The cores of this perspective are the concepts of autonomy, unity, and co-evolution. This view of knowledge is drawn from cognitive science and *autopoietic* theory or organizational in particular. Knowledge is perceived as a process in individuals for creating knowledge which is context-dependent and might be meaningless in different situations [44]. Researchers adhering to this perspective refer to knowledge "conversion" and not knowledge transfer [6]. Joshi et al. [6] claimed that the SECI model suggested by Nonaka& Takeuchi [45] is the best model for this perspective. The logical conclusion therefore is that knowledge cannot be 'transferred' in the information processing sense of moving an object. Rather, knowledge can be shared through the development of consensual domains and the consequent production of congruencies between the respective contexts of individuals [46]. Despite the fact that those perspectives are often connected more than not, the key implication of various views of knowledge is that each perspective indicates a different strategic orientation for managing knowledge [47]. The three research streams described above have given rise to a number of different perspectives on knowledge management, each with its own focus and disciplinary background. There are essentially two distinct dimensions that have been discussed. The first is epistemological in nature and refers to the first two streams of knowledge research: knowledge as an object and knowledge as a process. The second dimension is ontological in nature, with knowledge as a quality of the individual at one extreme and knowledge as a social quality at the other.

However in the context of our study, we believed that the *connectionistic* and *cognitivistic* perspective would be most suitable. This is because the contemporary view of ITO is that it is as one of the most complex problem domains that involve social interaction, cooperation, and learning [48]. IT outsourcing are co-constructed through a process of communication and negotiation among different stakeholders involved, who hold different types of knowledge and further provides the basis for our choice of epistemology in examining knowledge transfer in an IT outsourcing setting. The idea of knowledge transfer, due to the words used, promotes a conceptualisation of knowledge as an object [47]. This particular perspective has limitations, however, due to the information processing focus that emerges. Besides that, the discussion of this study is based heavily on the KM codification strategy which viewed knowledge in the form of object that can be stored, retrieved and utilized in certain ways with the used of technological support to enhance knowledge transfer capabilities. Prencipe & Tell [49] argued that knowledge transfer is more efficient if knowledge is codified. According to them, codified knowledge can reduce the knowledge acquisition cost, instruct machines, reduce asymmetric information and transform knowledge into a

commodity. Therefore it allows firms to purchase knowledge instead developing it internally (e.g. through outsourcing). Codified knowledge can also make organization less vulnerable to knowledge loss. As we will be exploring this topic in the context of ITO, the next section will discuss what the valuable stocks of knowledge and skills possessed by business professionals and IT technical staff that can be transferred during the project execution.

### B. Types of knowledge in IT Outsourcing

A variety of multidisciplinary knowledge and skills is a key ingredient of outsourced IT project (e.g. [4]). In the context of ITO and drawing on the knowledge-based perspective, delivering business value is essentially a set of knowledge-based activities. It involves integrating and coordinating knowledge from many individuals of different disciplines and backgrounds, with varied experiences and expectations, located in different parts of the organization [50]. Chan et al. [51] categorized the knowledge and skills required in IT development into application domain and development methods skills. Whilst, Basselier et al. [52] classified knowledge in IT into two types: "hard" (explicit) component and "soft" (tacit) component. Most of the past research referred explicit IT outsourcing knowledge to technical knowledge, domain knowledge and experience while the tacit IT outsourcing knowledge refers to business functional knowledge related to IT outsourcing project. Tiwana [32] defined technical knowledge as knowledge about the technology used to implement the project (e.g. programming languages, network architecture, security, database architecture). Kang & Hahn [53] argued technological knowledge compensate both procedural and declarative knowledge. Meanwhile, business functional knowledge refers to knowledge about client's business processes, business rules, activities, stakeholder needs, and business objectives for the software. Business requirements are typically derived from expressed or inferred client needs. With such a wide gap between each types of knowledge, even client requirements that appear to be straightforward may become too complex to be grasped by the technical team. Even worse, the complexity and tacitness of some requirements make it difficult for client to convey them precisely to development teams at the design specification stage. On the other hand, much of the knowledge applied in IT outsourcing project is "sticky" in nature. Although some knowledge related to the development can be codified in documents, stored in artifacts such as mock-ups and prototypes, or embodied in development methodologies, other relevant skills, expertise, and perspectives are usually held in the minds of individuals and, hence, are too sticky to be extracted or externalized.

Indeed, there is a growing awareness that technical skills alone are insufficient for success in IT, particularly in today's dynamic, distributed and complex workplace. Therefore, according to Tafti [54], knowledge in IT outsourcing is not only technical and business functional knowledge, but also in other modes of knowledge. The first type is *general knowledge*. These types of knowledge that can be gained through everyday experience and apply without regard to any specific domain. It is applicable in many different contexts and is often possessed by a large number of people, both within and outside a specific work environment [54]. Examples of this knowledge include general knowledge about IT equipment, software and practices. *Domain specific knowledge,* on the other hand is derived through study and experience within specific domain. This is generally improved as the person(s) involved in projects gain more experience. This knowledge explicitly refers to a particular tool, technology or work environment [48]. Organization- specific knowledge, for instance, is the knowledge created and embedded in the context of a specific supply chain in the organization. Bassellier & Benbasat [55] characterized domain knowledge as declarative knowledge. Lastly is *procedural knowledge*. Procedural knowledge frequently referred to as "know-how" is gained from repeated exercising the task within the domain. It is experiential and includes explicit aspects such as fundamental design concepts, criteria, specifications, theoretical tools, practical considerations and design instrumentalities [56]. This type of knowledge is a combination of general knowledge and domain specific knowledge. Procedural knowledge is expected to have steeper learning curve than domain knowledge [53]. In the ITO context, this includes knowledge about the processes and the best practices through which project are accomplished during each phase. Although most of ITO project involved procedural knowledge and domain specific knowledge, the type of knowledge that usually being transferred during ITO is the general knowledge and explicit in nature posses by client and vendor [54]. This involves much of the coding and maintenance functions. Some of the technical-specific knowledge, procedural knowledge is also being transferred especially at the user requirement and design stage. Technical procedural knowledge was ultimately the most difficult knowledge to transfer [57]. The vendor had to hire staff with enough development process knowledge, but these were not usable until the best practices were learnt from previous project. Only then were they able to analyze and design the new application according to the client needs.

Although some inconsistency exist in the terminology used, we argued that personnel that incharged the ITO project must also poses project management knowledge besides technological and domain specific knowledge that have been cited by most researchers. Project management deals with clear business and technical goals, phased development with regular and measurable progress, a systematic approach to addressing high risk factors in the project, maximizing the contributions of all the team members in the project, assuring timely project execution and ensuring proper quality. However, in many ITO efforts, project management becomes an exercise in tracking the efficiency, rather than the effectiveness of the project management effort. Efficiency measures whether you're doing things right, but effectiveness measures whether you're doing the right things. Project management effectiveness is as much needed as meeting milestones and deliverables on time. Based on the integration of various types of knowledge discussed before, shared knowledge develops. In the ITO context, shared knowledge can be defined as "an understanding and appreciation among IS and line managers for the technologies and processes that

affect their mutual performance" [58]. Shared knowledge can create common language since the technical staff and the business domain often speak different technical and procedural languages [59]. Shared knowledge may provide a common conceptual apparatus for evaluating the likely benefits of exchange and combination. Thus, a shared language can facilitate knowledge transfer.

*C. Inter-Organizational Knowledge Transfer: Definition and Concept*

Knowledge transfer (KT) is defined as the application of knowledge acquired in one situation to another situation. The situation in which knowledge is acquired is the learning context, and the situation in which the knowledge is applied is the transfer context. Organizational learning capability is the key success of inter-organizational KT whereby in the learning process should compensate knowledge modification, internalization, innovation and satisfaction between both parties. According Van Wijk et al. [60], inter-organizational knowledge transfer refers to the process through which organizational actors – teams, units, or organizations – exchange, receives and are influenced by the experience and knowledge of others. Inter-organizational knowledge transfer is an implication of strategic alliances, joint ventures or acquisitions [61]. Within a strategic alliance, the context complicates the process of transferring knowledge partly due to the competitive aspects of the alliance [62], whereas the competitive element vanishes from the client-vendor relationship leading to the proposition that a situational setting activates a particular constellation of meanings, which shapes the knowledge sharing practice.

Various scholars have distinguished certain characteristics between intra-organizational knowledge transfers and inter-organizational knowledge transfer. For example, [63] study indicates that intra-organizational knowledge transfer generate more exploitative learning that creates reliability in experience, whereas inter-organizational knowledge transfer processes generate more explorative learning that maintains variety in experience. Different learning dimension gives different impact towards the organization. Similarly, Van Wijk et al. [60] asserted that intra-organization is more likely to transfer knowledge that is relevant and to pursue exploitative innovations that generate short-term results. By contrast, exploratory innovations, the results of which are often uncertain, involve acquiring knowledge from other firms. Van Wijk et al. [60] further argued that intra-organizational knowledge transfer contributes more to performance outcomes than inter-organizational knowledge transfer. The findings of Mason & Leek [64] suggest that intra-organizational information flows are predominantly vertical, while inter-organizational information flows are predominantly horizontal. Previous research has argued that transferring knowledge across different firms is more complicated than transferring knowledge between units within the same organization [65]. Some scholars (e.g. [66]&[67]) viewed intra-organizational transfer was optional, but inter-organizational transfer was essential for competitive advantage especially in the new era of economic globalization that we faced today.

Traditionally, KT has been considered a very structured transfer process, yet there is still unstructured nature of KT that should be considered According to Chen & McQueen [43], structured knowledge transfer is formal, planned and intentional process whereas unstructured knowledge transfer is more informal, unplanned and spontaneous transfer process. Chen & McQueen [43] further suggested Szulanski (1996) four-stages knowledge transfer is the best practices for structured knowledge transfer. This process was best implemented for embrained and encoded types of knowledge and suitable at the novices group whereby they have insufficient similar knowledge bases and norms that the knowledge sender has. However, for unstructured knowledge transfer process, Chen & McQueen [43] have introduced three techniques. The first method is *selective copy*. This method was use extensively by Intel. Selective copy means, the knowledge recipient selectively choose the suitable knowledge to suit their pre-existing knowledge stock. Copy is the basic technique at the survival level task and usually used by advanced beginner group. The recipient needs to repeatedly reuse the acquired knowledge to increase the absorptive and retentive capacities. Organizational knowledge repositories play a critical role in this method. Second method is *adaptation*. This method required more commitment from the recipient and usually the acquired knowledge does not exist in their pre-existing knowledge sources therefore the recipient need to modify the pre-existing knowledge to accommodate the new knowledge. This type evolves more tacit knowledge compared to the first type. Adaptation technique usually use by competence group with an intermediate absorptive and retentive capacity. Embodied and embedded types of knowledge are most preferred for this technique. This technique emphasizes the social interaction and coordination with experts. Third technique is fusion technique. Fusion type of KT occurs when acquired knowledge does not exist in pre-existing resources and not directly applicable to the current environment. Expert group dominantly used this technique whereby most of them have vast experience in their related field and have advanced absorptive and retentive capacities. Collective knowledge was gained through team coordination and the new knowledge was created. In this type of transfer, the recipient must have cognitive tacit knowledge about the processes of developing new knowledge and be able to communicate and absorb other members' tacit and explicit knowledge.

Knowledge transfer can be measured by changes in knowledge, levels of innovativeness, or performance of the recipient firm [60]&[66]. An important challenge is that a significant component of the knowledge that firms acquire may be tacit and not easily measured. Many mechanisms exist for transferring knowledge from one firm to another. Ambos & Ambos [13] asserted that knowledge can be transferred through two mechanisms; firstly by personal coordination mechanism such as personnel motion, training, jobs rotation ([13], interactions with suppliers and customers [67] community of practices and post-project reviews [68]. Through individual interactions, meaning is developed and knowledge created [70]. Secondly, by technology based coordination mechanism such as collaboration software,

distributed learning and business intelligence system. However, technology support mechanisms are insufficient for IT knowledge transfer. Organization needs to blend both mechanisms for effective knowledge transfer processes. Additionally, Sammarra & Biggiero [71] claimed that the organization should provide more infrastructures that can support both formal and informal interactions between individuals and groups of the organizations; then the more likely will be the transfer of multiple types of knowledge occurs. Inter-organizational knowledge transfer also influenced by several factors that can facilitate or impede the process. Thus, the next section will discuss the knowledge transfer determinants cited from the past research.

### D. Knowledge Transfer Factors

Many factors affect the ability to effectively transfer knowledge between organizations. Factors such as organizational characteristics, source and recipient characteristics, type of knowledge being transferred have been suggested as important to effective knowledge transfer, and communication quality factors. Among the factors, source and recipient characteristics was the most factors cited by the past scholars and highly significant to the knowledge transferring processes. The knowledge recipient must be able to use the knowledge that is available or accessible to him or her within the organization. However, a recipient's lack of motivation, absorptive capacity, retentive capacity [72] and receptiveness to new knowledge can all act as barriers to knowledge transfer. The source sometimes resists sharing his or her knowledge. This resistance can be the result of fear of losing ownership, control or a position of privilege. Another reason was some knowledge source has low self-confidence about the knowledge or information they had. They were afraid of making mistakes and/or feared being exposed or ridiculed [74]. Alternatively, the source can be reluctant to dedicate the resources necessary to support the transfer process [72]. When the source does not seem reliable, it is likely that the information will not be taken seriously by the receiver.

Despite the characteristics of source and recipient, the intra-organizational knowledge transfer is related to the type of knowledge and its specific attributes. Knowledge is usually being characterized by its ambiguity, stickiness, complexity, tacitness, explicitness, and specificity [72],[74],[75]&[76]. Organization characteristics such as organizational structure, culture and managerial type [67] also place important factors to effective knowledge transfer. The dynamism of the knowledge transfer process can be increased by the presence of less hierarchical organizational structures and more active management team. The existence of a strong cooperative and collaborative culture, characterized by open exchanges of information, accessibility of coworkers, and cooperative interactions, is a prerequisite for knowledge transfer between both individuals and groups [77]. A proper organizational culture creates generous opportunities for formal and informal interpersonal interaction and the formation of shared values allowing individuals and groups to share knowledge to their mutual benefit. Organization should give more frequent opportunities for staff at all levels to discuss issues. Following the opportunities for frequent meeting, organizational

infrastructure is another important factor in knowledge transfer. Knowledge can become trapped in hierarchical levels, preventing it from being shared with other parts of the organization. Breaking down these hierarchical levels allows horizontal flows and encourages cross-functional collaboration across the organization [77]. It is also important for support structures that use a reward system to base rewards on more than financial success alone, as this tends to increase competition and lack of sharing between teams [73]. Proper support structures and processes are useless unless employees have opportunities to use them. Besides that, organizations also need to allocate reasonable time that can be used to accomplish effective knowledge transfer since organization often do not allow sufficient time to adequately transfer their competencies.

In spite of all factors discussed above, organization information system was also claimed to be an effective tools to support knowledge transfer process. However, most of the organizational knowledge is based on the information stored in legacy information systems which have been developed in an isolated way [78]. Therefore, such information can be inconsistent, redundant and difficult to retrieve and link [79]. The information that ends up in the most organizational information system has a poor structure (e.g., PDF documents), which makes the system unmanageable and chaotic, limiting the possibility to deal with other system requirements, such as information privacy and fast and flexible retrieval methods [78]. It was suggested that the organizational information memory system should have the capability to provide an experts database with points of contact on various topics [73], support both formal and informal knowledge besides the automatic privacy mechanism [78]. Hence, recent scholars have connected organizational information memory system (OMIS) with the Transactive Memory System (TMS) to facilitate the interaction of organizational knowledge [5],[20]&[80]. Transactive Memory System (TMS) has been defined as the combination of individual memory systems and communications (also referred to as "transactions") between individuals [80]. With an integration of TMS concept within OMIS, it encompassed two types of KM strategy which is codification and personalization strategy. The transactions that link between individual memory system was through a series of processes (i.e. encoding, storing and retrieving) whereby the knowledge can be exchanged, in turn, reduces knowledge gaps The encoding process in a TMS facilitates the development of a shared "cataloging" system with commonly-known labels (e.g. keywords used for searching a firm's document portals and expertise directory). This can introduce and encourage the use of a common lexicon between the actors involved in collaborative work and therefore contribute to bridging the syntactic knowledge boundary between organizations. Codified directories implemented in the forms of keywords, and/or rules for storing documents and templates, are in line with Carlile's [81] suggestion of using taxonomies, storage and retrieval technologies. Once labels are attached to knowledge (e.g. documents, role descriptions, expertise areas of individuals), a TMS contains a collection of pointers to the location of actual knowledge (e.g. documents, or people who

have specific expertise). Personalized pointers to the location of knowledge (i.e. information about who knows what) are stored in the memories of individuals. Codified pointers, such as structures of project folders and portals, define a structured and consistent approach to storing and updating documents. Once individuals become familiar with these structures, they know where to find relevant documents.

### E. Knowledge Transfer Models

There are three models dominated research within the knowledge transfer area. Most of the existing KT models were rooted from communication model, group information processing model and knowledge creation model. Communication based model was introduced by [82] and [83] while the second is based from [84] model. The third one is based from Nonaka's [45] knowledge creation model. Within the communication based approach, the transfer of knowledge is regarded as a message encoded in a medium by a sender to a recipient in a given context. The underlying premise of this model is that knowledge is an object that exists independently, valid, complete and has universal applicability [85]. Schramm's [82] communication model initially consisted of simply a *Sender, Recipient* and *Message*. The receiver becomes the "recipient" or "user", since it is the subject who learns or acquires knowledge (not simply the message receiver), while the message becomes the "object", as it can be produced by complex knowledge. Scharmm's [86] later modified the model to include *Media* that is the channels used to communicate the message, mitigate its passage, and enhance its chances of completing a communicative act. Jacobson [83] improvised the basic model developed by Schramm's by considers six factors: *Knowledge source, Message, Knowledge receiver, Channel, Feedback and Environment or Organizational context*. The communication model, which consists of dyadic communication, interactive, interpersonal/organizational communication, helps to explain the failures of the previous knowledge transfer strategies, which are based on unidirectional communication, and dissemination/diffusion models [87].

One of the most cited knowledge transfer model that based from signalling metaphor is Szulanski's Model [72]. Szulanski [72], have listed four stages of a transfer: initiation, initial implementation, ramp-up to satisfactory performance, and integration, i.e., subsequent follow-through and evaluation efforts to integrate the practice with other practices of the recipient. Initiation is events that lead to the decision to transfer. A transfer commences when both a need and the knowledge to meet that need coexist within the organization, possibly undiscovered. When the need is discovered, it triggers a search for potential solution; a search that leads to the discovery of superior knowledge [72]. Implementation begins with the decision to transfer in which resources flow between the knowledge recipient and the source, the transfer-specific social ties between the source and the knowledge recipient are established, and the transferred practice is normally adapted with the objectives to suit the anticipated needs of the recipient to pre-empt problems experienced in a previous transfer of the same practice, and to facilitate the introduction of new knowledge less difficult to the recipient

[72]. Ramp-up commences when the recipient begins to use the transferred knowledge. At this level the recipient's primary concern is to identify and resolve unexpected problems that restrict its ability to match or exceed the transfer performance expectation [72]. Integration starts when satisfactory result is achieved by the recipient from the transferred knowledge and the transferred knowledge is converted into the firm's routine [72].

Subsequently, scholars started to integrate the communication model with group information processing model to enhance the existing KT model. In order for the organization to learn something, the members need to process the data or information that they got to better suit the organization. Hinsz et al. [84] has postulated three components in the information processing model: *encoding* (i.e. forming knowledge representations through interpretation, evaluation and transformation), *storing* (i.e. entering representations in the memory system), and *retrieval* (i.e. accessing and using representations from the memory system). From Nonaka & Takeuchi [45] framework of knowledge generation, the transfer of knowledge is seen as the creation of knowledge through four modes of knowledge conversion of explicit and implicit forms of knowledge: externalisation (from implicit to explicit), combination (from explicit to explicit), socialization (from implicit to implicit) and internalization (from explicit to implicit). Nonaka & Takeuchi [45] visualized the knowledge conversion process as an iterative/spiral process and happens mainly through informal networks of relations in the organization starting from the individual level, then moves up to the group (collective) level and eventually to the organizational level. However, Curseu [89] opined that the best group information processing models should consist of communication based view, knowledge creation based and memory based system. With these three combination of different model, the knowledge transferring process that took place between an individual as the knowledge creator and subsequently the organization as the amplifier of knowledge can synthesize a shared memory system. A review of different KT models and factors developed by past researchers, give us some input on integrating various theories and combine it with organizational learning theory to develop a holistic model for inter-organization KT in ITO context for future research.

## V. CONCLUSION

This review significantly contributes to the existing knowledge transfer and IT Outsourcing literature specifically in the context of Malaysia by reviewing the current practices of IT outsourcing in Malaysia including the issues and challenges faced by the public agencies in transferring the knowledge during the engagement. Besides that, this paper discusses various factors and different theoretical model of knowledge transfer starting from the traditional model to the recent model suggested by the scholars. Even this paper has take into account the perspective of organizational knowledge from the knowledge-based view (KBV) and organizational learning (OL) lens. This review could help shape the direction of both future theoretical and empirical studies on inter-firm

knowledge transfer specifically 1) on how KBV and OL perspectives could play significant role in explaining the complex relationships between the client and vendor in inter-firm knowledge transfer 2) the role of OMIS and TMS to facilitate the organizational knowledge transferring process 3) on how KBV and OL perspectives could be integrated in a holistic model to explain the relationships between the client and vendor, the degree of transferred knowledge and the support of organization information system. Expending in knowledge transfer process is the main objective of contemporary research agendas in outsourcing; however, other learning issues are worth investigating and studying since the transferring process will not succeed until it is learn, innovate and apply; otherwise the process is just a knowledge sharing.

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