

**A CONCEPTUAL REVIEW  
OF ORGANISATIONAL LEARNING ORIENTATION  
AS AN ANTECEDENT TO KNOWLEDGE TRANSFER  
DURING AN ERP IMPLEMENTATION**

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**Research Assignment**

presented in partial fulfillment of the requirements for the degree of  
Master of Philosophy (Information and Knowledge Management) at  
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## DECLARATION

I, the undersigned, hereby declare that the work contained in this assignment is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Name \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_



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## **ABSTRACT**

This research aims to present a discussion of the relevant literature with regard to the relationship between organizational learning orientation, knowledge transfer and ERP implementations with the purpose of determining whether or not a learning orientation is an antecedent to knowledge transfer in ERP implementations, and could be added to the critical success factors for ERP implementations.

The research strategy selected for this study is a conceptual review. The rationale for using this strategy was to gain an in-depth understanding of the available literature. Thereafter this information was structured to enable solving the problems of identifying the barriers that impact the creation of a learning organization. It was also determined whether there are learning activities and initiatives that foster a learning orientation and whether there are knowledge transfer barriers that prevent the knowledge from being transferred even if the organization has a learning orientation.

The study identified that the literature around organizational learning, knowledge transfer and ERPs was filled with constructs regarding positive correlations between learning, knowledge transfer and technology implementations. However, the review could not conclusively identify any strong correlation to support organizational learning as an antecedent to knowledge transfer in an ERP implementation.

## **OPSOMMING**

Die doel met hierdie navorsing is om 'n bespreking van die relevante literatuur met betrekking tot die verhouding tussen organisatoriese leer-oriëntering, kennisoordrag en ERP-implementerings aan te bied, met die oog daarop om vas te stel of 'n leer-oriëntering kennisoordrag in ERP-implementerings voorafgaan al dan nie, en moontlik bygevoeg kan word by die kritiese suksesfaktore vir ERP-implementerings.

'n Konseptuele oorsig is gekies as navorsingstrategie vir die studie. Die rasionaal vir die gebruik van hierdie strategie was om diepgaande insig in die beskikbare literatuur te verwerf. Daarna is hierdie inligting gestruktureer ten einde dit moontlik te maak om die probleme van identifikasie van versperrings wat 'n impak het op die skepping van 'n leerende organisasie op te los. Verder is ook vasgestel of daar leeraktiwiteite en inisiatiewe is wat 'n leer-oriëntering bevorder, en of daar versperrings vir kennisoordrag is wat verhoed dat kennis oorgedra word selfs al het die organisasie 'n leer-oriëntering.

Die studie het vasgestel dat die literatuur oor organisatoriese leer, kennisoordrag en ERPs wemel van konstruksie met betrekking tot positiewe korrelasies tussen leer, kennisoordrag en tegnologie-implementerings. Die oorsig kon egter nie oortuigend enige sterk korrelasie identifiseer waarvolgens kennisoordrag in 'n ERP-implementering voorafgegaan word deur organisatoriese leer nie.

## **DEDICATION**

To my family for their continued support and encouragement to complete this course. My mum for taking care of my babies. My husband, for performing the night drill and to my sons Karim and Inayat for understanding the need to complete my homework.

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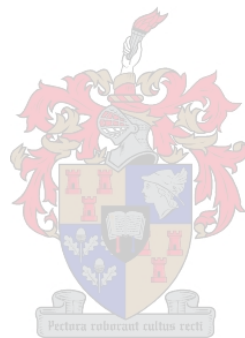
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# Chapter 1

## 1. Introduction

*What is not fully understood is not possessed.  
Johann Wolfgang Van Goethe*

### 1.1 Background to the Research

ERP systems could bring competitive advantage to organizations; however, the high failure rate in implementing such systems is a major concern. (Daveport, 1998). (Kim, Lee, Gosain, 2005:158).

Research studies have indicated that the type of problems and issues that arise from the implementation of ERP systems range from specific issues and problems that can come up during implementation of an ERP, to behavioral, procedural, political, and organizational changes, that manifest subsequent to the installation.

The detail of these studies included user buy-in, commitment (management, team, organization structures), ERP adoption, leadership, organizational culture, stakeholders, organizational learning, organizational effectiveness, business process modeling, ERP development issues and communications (Chwen et al, 2004, Verville and Halington, 2003a, Chang and Snyder, 2000, Everdingen et al, 2000; Lee and Lee, 2000). (Verville, Bernadas and Halington, : 2005:665), as items that contribute to the success or failure of an ERP Implementation.

Kim, Lee and Gosain, (as quoted in Gibson, 1999) argue that an ERP implementation requires a different approach which focuses on business process design, software configuration and project management by de-emphasizing the technical side of implementation.

ERPs differ from other technologies regarding the pervasiveness and extent to which it influences organizational practices. Lee and Lee (2000) indicated that studies of different types of technologies (tomography scanners, CASE tools) showed how the technologies interact with existing organizational values, practices and agents with a



gradual change in the relation. However, these technologies did not specifically govern organizational processes.

In contrast to other IS implementations, the ERP context is different due to the importance and complexity of the systems, the crossing of the firm boundaries, the high degree of asymmetry of the knowledge of participants (Ko, Kirsch, King, 2005:61), and the expectation that the business clients play a larger and more significant role in the ERP implementations.

Around the same period research attention has been directed to the processes of learning and knowledge transfer, especially in the context of technology transfer (Daghfous, 2004:839).

When an ERP system is launched there is an expectation that content and human expertise will be available as an integral package. The team is guaranteed that appropriate expertise is available to help understand content and tailor it to specific need. This is the highest level of *knowledge transfer* as it requires both a judicious mix of synchronous and asynchronous mechanisms to achieve significant gains.

ERP implementation knowledge is both tacit and explicit, embodies those activities associated with configuring and testing ERP modules, installing software and hardware, training client employees in preparation for ongoing operation maintenance and support of a vendor supplied system that is typically customized (Brancroft et al. 1998, Lozinsky, 1998). (Ko, Kirsch, King, 2005:60).

Ko, Kirsch and King (2005), studied the antecedents of knowledge transfer from consultants to clients in information system implementations. In this study they posit that three sets of factors – knowledge related, motivational related- and communication related influence transfer.

Reference to ERP systems are made in this study however, but no details specific to *what is complex* about the ERP system is covered. Secondly, the study assumes that individuals within the organization and organizations themselves are capable of absorbing knowledge transferred without a learning orientation, irrespective of

technology. Additionally, none have actually determined *if organizational learning precedes the knowledge transfer process* that must be undertaken by the project team (hereafter, the senders) and the business at large (hereafter, recipients) during ERP implementations which are complex and chaotic by nature.

Learning both at an individual and organizational level is a complex activity that is influenced by a number of issues and problems. There are numerous studies on *learning, organizational learning* and *the learning organization* that attempt to provide some insight into this complex phenomenon. One aspect which is unanimously agreed upon by all the participants is that learning is fundamentally an interactive social phenomenon

In a study performed by Daghfous (2004), he suggested that different learning activities play a different role under different conditions; for example, when a company is facing high organizational uncertainty companies should implement cross functional teams and establish training programs to increase operational benefits,.

In this paper, literature is examined in order to develop a deeper more practical understanding of the concepts of organizational learning and knowledge transfer as antecedents during ERP implementations. The approach to this study is founded on the basis that organizations are complex, ambiguous and paradoxical and the challenge is to understand and deal with this complexity when implementing ERPs’.

## Chapter 2

### 2. Introduction to the Problem

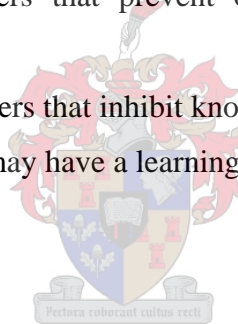
#### 2.1 The problem statement

The purpose of this study is to determine if there is a relationship between *organizational learning orientation* and *knowledge transfer during an ERP implementation*.

#### 2.2 The statement of sub-problems

More specifically the study seeks to address the following sub-questions:

1. are there learning activities or initiatives that contribute to knowledge transfer?
2. are there learning barriers that prevent organizations from developing a learning orientation?
3. are there knowledge barriers that inhibit knowledge being transferred, even though the organization may have a learning orientation?



#### 2.3 The hypothesis

Organizations that have a prior organizational learning capability will be able to accept transferred knowledge which will improve their capability to absorb the business content knowledge embedded in ERP's.

Since symmetrical and asymmetrical knowledge permeates the ERP implementation environment, organizational learning orientation enables the recipients to clearly and logically communicate work processes to the sender. These work processes are both the formal (i.e. standard operating processes) and the informal processes defined by the relationship, communication and co-ordination of the on-the job practices. This knowledge transfer enables the consultants to accurately determine the recipient's needs and configure the ERP correctly, thus, improving the rate of success with regards to these implementations.

## **2.4 Limitations**

Research bias must be taken into account for the following reasons:

- The literature study may not be exhaustive
- The researcher may not have the insight to give an unbiased view of ERP implementations due to her ERP technical background

## **2.5 Structure of the Assignment**

This study begins with a background to the research performed within the ERP, technology, organizational learning and knowledge transfer realm. The problems and sub-problems and the importance of this study is introduced in chapter 2. Thereafter, in chapter 3, the literature review includes an introductory discussion on the various facets within an ERP implementation that contributes to its complexity, thus making it difficult to successfully implement. Included in the literature review is the discussion around knowledge transfer itself and knowledge transfer within the broader context of knowledge management. Particular focus around knowledge transfer literature with reference to technology is debated. Finally, the organizational learning literature is reviewed, resulting in the researcher proposing the relationship of organizational learning orientation as an antecedent to knowledge transfer in ERP implementations.

Chapter 4 describes the research design and the methodology. The techniques used in the research are explained and a schema of the methodology is presented. In chapter 5 the discussion derived from the results of the literature study is discussed. The relevance of the results in terms of the relationship of organizational learning and knowledge transfer is analyzed. Finally, chapter 6 concludes the study and suggestions are made for further topics to research.

## **2.6 The importance of the study**

Despite numerous research activities, companies that embark on ERP's continue to face risky implementations with a high probability of being unable to accept the system and new business processes into the environment. This study attempts to provide an insight and understanding of organizational learning as a component that should be included in the list of critical success factors for ERP implementations.

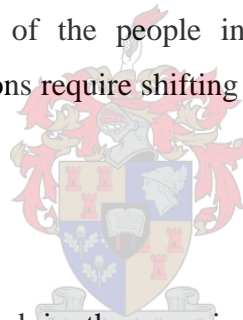
## Chapter 3

### 3. *Literature Study*

#### 3.1 Enterprise Resource Planning (ERP)

##### 3.1.1 The nature of ERP Implementations

Enterprise Resource Systems (hereafter ERP) are enterprise wide application software packages that are implemented as usually large projects in organizations. The benefits espoused by many ERP vendors are improved organizational performance, efficiency, effectiveness, decision making, and profit. However, these implementations face extreme technical complexity and inter-dependency across functional boundaries; that creates benefit achievement risks. These implementations require a shift towards an information based organization and a knowledge creating structure to enable integration of the people involved. (Karsal and Gattschalk, 2003:112). These implementations require shifting the culture from the old paradigm to a new one.



##### 3.1.2 ERP Team Composition

Further complexity is introduced in these projects by the team structures; ERP consultants are highly competent in the product being introduced, however, they lack business contextual knowledge. Business resources on the other hand, have an understanding of the business processes, data, and standard operating procedures, however, they lack knowledge of the new product. The best people in the business should be recruited into the ERP team (Bingi et al., 1999, Wee 2000) (Nah, Zuchweiller, Lau, 2003:12). Crucial to the team composition is having a “cross-functional business knowledge team”. According to various research studies, having competent members in the project team is the fourth most important success factor for IS implementations.

Karlsen and Gottschalk, (as quoted in Dixon), organizations should not replace the members in a project team without careful consideration. Secondly, for strategic type

knowledge transfer, senior managers have to be involved. (Karlsen and Gottschalk, 2003:113).

These projects are usually to be delivered within tight budgets and aggressive timelines. Under these circumstances the high rates of transferring knowledge between consultants and business team members (i.e. the project team) and between the project team and the business at large are necessary.

The team preparation and support are crucial to the implementation success of an ERP.

### **3.1.3 ERP embedded Business Model**

ERP's impose their logic on the business and force employees to think in terms of integrated processes and to change the way business processes were previously executed. It entails using the business models included in the ERP package (Langenwarter, 2000). The business knowledge incorporated in the basic architecture of the software is transferred into the adopting organization. (Karsel and Gottschalk, 2003:281).

The concept of process infers something that is definable, and repeatable. The process must be describable in a standardized business process language and be computationally executed to provide expected outputs in a repeatable fashion (Lee, 2005:31).

Most business processes found within organizations are simply documented in “rules and procedure” manuals that are distributed with an expectation that they will be consistently understood and applied. For ERP implementations this is a dangerous assumption. Firstly, for complex processes the business process designer has the challenge of accurately representing a tacit understanding of the business process intent in their explicit written form. Secondly, those expected to perform the process will internalize their understanding of the written words.

The literature on innovation and technological change (Wieder, Booth, Zoltan, Matolcsy, Ossimitz, 2006), frequently remind us that it is very difficult to *improve a process that is not well understood*, and that it is very important to collect all the relevant and knowable information before addressing uncertainty in product and process innovation.

Ko, Kirsh and King (as quoted in Bohn, 1994) stated that “if workers do not *understand a process* they cannot handle unanticipated situations nor can they do much to improve the process, even if they are motivated”.

The fundamental changes to the business processes enforced by this type of IS implementation is:

- Loss of flexibility (paper based versus automatic), in old systems the people had more flexibility
- No process variations, e.g. centralization of data, people have little choice, people are forced to conform
- Departments can no longer be loosely coupled, changes in one data set will affect the process of other activities
- Imposing embedded ERP business rules in the organizations, which creates conflict in the values of the organization
- No room for error, discipline and conformance are required
- “make a plan” mental models dissipate
- Business language changes over time to terminology used within the ERP package.
- Different types of organizational requirements – roles and responsibilities redistribution
- New knowledge requirements for people in the process and a new knowledge structure in the organization
- High demand for cross functional knowledge of the process is required, users that gain this sort of knowledge is in higher demand

ERP systems developed by the vendors such as SAP, are expected to provide lock-step regimented sharing of data across various business functions, while providing an

unprecedented level of data sharing across internal functions, they straight – jacket the flexibility of information processing for each of the locked in functions. (Kallinikos, 2004).

When it comes to internalizing the ERP processes, the adopted processes conflict with existing business values and rules, and it is the organizational capability to adjust to the conflicts, which provides a process-based competitive advantage.

ERP bring about a change from the traditional total quality management (TQM) to business process re-engineering (BPR) methods. In contrast the traditional emphasized on continuous marginal improvements in existing processes, while the BPR emphasized IT-intensive radical re-design of business processes. A wall-to-wall (that is implementation ERP modules for most of the business value chain), ERPs’ will be veered towards the business process re-engineering method.

Table 3.1 defines the differences between the two approaches.

Entity	TQM	BPR
Level of change	Incremental	Radical
Start from	Existing Processes	Clean Slate
Time Required	Short	Long
Frequency	One time/Continuous	One time
Participation	Bottom Up	Top Down
Typical Scope	Narrow (within)	Cross Functional
Risk	Moderate	High
Primary Enabler	Statistical Control	Information Systems
Type of Change	Cultural	Cultural / Structural

Table 3.1 : TQM versus BPR (Karsel and Gottschalk, 2003:282).

### 3.1.4 ERP Implementation Critical Success Factors

The high failure rate of ERP implementations calls for a better understanding of its critical success factors. An intensive literature review study undertaken by Nah, Zuckweiler and Lau (2003) enabled the compilation of the following 11 critical success factors (CSF) for ERP implementations:



1. ERP teamwork and composition
2. Change Management and Culture Program
3. Top Management Support
4. BPR with minimum Customization
5. Business Plans and Visions
6. Project Management
7. Project Champion
8. Communication
9. Monitoring and Evaluation of Performance
10. Software development, testing and troubleshooting
11. Appropriate business and IT Legacy systems (old system complexity determines the degree of change required)

The study noted that a number of the critical success factors are interrelated.

In addition, in a study conducted by Haines and Goodhue (2003), additional success criteria's relating specifically to the implementation partner was identified. These are:

1. Selection of the implementation partner
2. Extent of the involvement the consultants have
3. The knowledge held by the organization implementing the ERP
4. Knowledge transfer between the Vendor, consultant and implementer
5. Lack of in-house expertise, implementer is dependant on sourcing external consultants
6. Poor employee retention by the implementation partner
7. Difficulties in keeping up with the change in technologies.

Application consulting pre-supposes that experienced consultants would be available at the start of the project and that the consultants would have an understanding of the technical, social and business process skills necessary to configure and deploy the solution. When these skills are not available or the project is manned with consultants that do not have multi-disciplinary skills, the ability to articulate and converse in a business and process language to the business team members is fraught with misunderstandings and miscommunications.

An additional complication to the team composition is created when the implementation partner lacks internal resource in supporting the customer and therefore external consultants are leveraged. Figure 3.1 shows a typical scenario of knowledge and skills exchange between three parties.

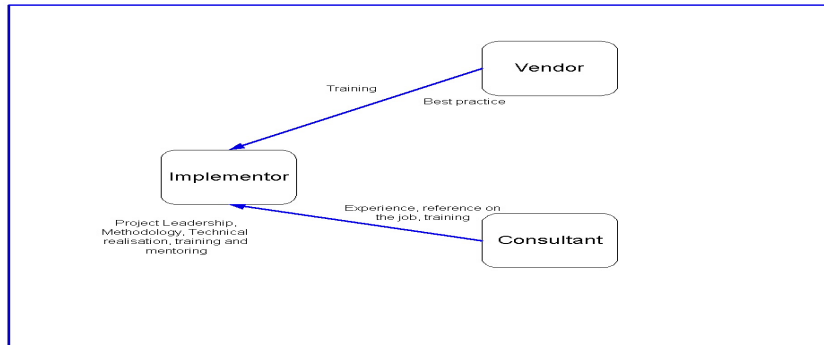


Figure 3.1: Knowledge and Skills transfer (Haines and Goodhue, 2003:26)

In a study conducted by Haines and Goodhue (2003), they discovered that information symmetry and asymmetry (information that everyone can share in and information that is not equally known by the two parties; i.e. the implementer fails to inform the consultant of risks or particular customer centric problems that would affect the consultants ability to deliver, conversely, the consultant over estimates the technical expertise) is a critical component to the success of the ERP implementations.

Their study revealed that 5 out of 9 organizations experienced misrepresentations of ability by the consultants, most were learning by doing, and secondly consultants learn more from the implementation than they contribute to it. Thus, when the team composition is made up of more external consultants the implementers cannot guarantee the outcome or behavior of the external consultant. Furthermore, the team could be exposed to moral hazard, i.e. the goals of the implementer and consultant are not in aligned.

### 3.1.5 Summary of ERP Systems

ERP systems represent a powerful means of segmenting, organizing and carrying out work in organizations. They force organizations into creating distinct work items (eg. centralized master data management) that span throughout the organization. They bring about standardization in input and output data and set up elaborate procedures to be followed with respect to the execution of organizational tasks.

ERP packages are solidified technologies whose complexity transcends the ability of organizations to re-define the logic on which any such packages are based. They construct modes of human involvement as they go about integrating organizational transactions. Human actions are induced and directed along certain lines. They define items and discrete transactional acts and construe relations between them. In so doing they combine them into extended sequences that are vested with a sort of purpose and direction (Kallinikos, 2004:27).

With such a regimented, pervasive flow of transactions, ERP packages demand a high and deep understanding of the business processes embedded in the application and stretches an organization into learning rapidly.

## **3.2 Knowledge Transfer**

During the activities of configuring the ERP solution it is expected that some form of knowledge is flowing from the consultants to the users. However, despite the close interaction of consultant and business user the knowledge transferred is not effective in ERP implementations. In the paragraphs outlined below a discussion of the meaning of knowledge and its position in knowledge management is defined which explains the inherent complexity of knowledge itself.

### **3.2.1 Definitions of Knowledge**

There are many definitions of knowledge;

- Davenport and Prusak (1998) define knowledge as a fluid mix of frame experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experience and information
- Nonaka and Takeuchi describe it as “justified true belief”
- Alavia and Leider (1999), define knowledge management as a “systematic and organizationally specified process for acquiring, organizing and communicating both tacit and explicit knowledge of employees so that others may make use of it to be more effective and productive”

In research undertaken by Bougon, Wieck and Binkhorst, (1977), they highlighted the fact that organizational knowledge is not something that can be objectively recorded and stored in databases. Instead organizational knowing is an active process where people try to make sense of their environment. (Tuomi, 2002:p6).

In current management literature a distinction is made between two kinds of knowledge. Explicit knowledge is knowledge that can be expressed in words and numbers and can be easily communicated and shared in the form of hard data, scientific formula, codified procedures or universal principles. This is the hard and tangible knowledge that can be codified, replicated and readily transferred across the organization. However, just because knowledge has been made explicit does not mean that it is always effective. If an individual's knowledge is articulated within an organization, the ability of individuals outside the organizations to understand the full meaning of the articulated knowledge cannot be presumed. Therefore explicit knowledge is grounded in the context where it originated. (Cope, p32).

While the idea that we should learn from the experience of others is valid, it is difficult to really absorb the deep and rich experience of the senders of knowledge. Often explicit knowledge is grounded in tacit experience and hence cannot be readily transferred. (Cope, p32).

The word tacit comes from the Latin verb "tacere.....to be silent". Tacit knowledge is gained when one part of a community or individual tries new behaviors, sees results and then gradually assimilates that knowledge into one's own behaviors until the individual is not even aware anymore that behavior has changed.

Polanyi's idea is that a large part of human knowledge is subjective and tacit and cannot be easily codified and transmitted independent of the knowing subject. The transfer of this kind of knowledge requires social interaction and development of shared understanding. Knowledge within the firm can reside at the level of the individual or be shared among members of the organization. Individual knowledge is a repertoire of knowledge owned by the individual and can be applied independently

to specific types of tasks or problems. It is also transferable, and move with the person giving rise to potential problems of retention and accumulation.

Since human knowledge is deeply contextual and triggered by circumstances, in understanding what people know we have to re-create the context of their knowing (Firestone and Elroy, 2003:16).

The explicit-tacit, and individual-collective dimensions of knowledge give rise to four categories of knowledge which was initially suggested by Collins (1993), and adapted by Blacker (1995). These are:

1. Embrained; (individual and explicit) is dependant on the individuals conceptual skills and cognitive abilities. It is formal, abstract or theoretical knowledge which is learned through reading books and in formal education.
2. Embodied Knowledge (individual and tacit) is action-orientated; it is learnt through experience and is context specific.
3. Encoded Knowledge (collective and explicit) is shared within organizations through written rules and procedures and formal information systems. This knowledge is inevitably simplified and selective for it fails to capture and preserve the tacit skills and judgment of individuals.
4. Embedded Knowledge (collective and tacit) is the collective form of knowledge residing in organizational routines and shared norms. It is tacit knowledge based on shared beliefs and understanding within an organization which makes effective communication possible. Embedded knowledge is relation-specific, contextual, and dispersed. It is an emergent form of knowledge capable of supporting complex patterns of interaction in the absence of written rules. (Boonstra, p432).

Strategic Alliances, outsourcing and globalization, imply knowledge transfer across organizational cultural and national boundaries. In this type of knowledge transfer, participants often have insufficient background information of each other and lack a shared language and common interests, which significantly limits their ability to assess and share knowledge (Chen, 2005). This example personifies the project team structures of ERP implementations.

One of the key challenges faced when managing knowledge across projects and transferring the outcome of the project into an organization is the construction of a collective knowledge base, as the individuals involved in such situations have different situational understandings. Secondly, in a study conducted by Tillema (2005), knowledge productivity is stymied by problem understanding, perspective shifts and commitment.

For the purposes of this research the definitions of Cope and Polanyi are most relevant to the project teams in ERP implementations. Knowledge is often grounded in an individuals experience, skill, frame of reference, mental models and thus, can never be made totally explicit. Invariably, the essence or context within which the knowledge was gained is missing. To transfer this knowledge requires knowledge being managed at a personal, group and organizational level. This management of knowledge becomes an important notion in *knowledge transfer*.

### 3.2.2 Knowledge Management



Knowledge Management is about encouraging individuals to communicate their knowledge by creating environments and systems for capturing, organizing and sharing knowledge throughout the organization (Bennet and Gabriel in Chetley and Vincent, 2003), (Grimbeek, 2006:42). Pemberton and Stonehouse, (2000) have added that knowledge management is about exploiting core competencies that will yield superior performance. (Grimbeek, 2006:43).

The literature on knowledge transfer (Cummings & Teng, 2003; Daghou, 2004; Gilbert & Cordey-Hayes, 1996), has revealed that there are six attributes to knowledge with must be factored into managing it. These are:

1. Subjectivity (context and individual background shape the interpretation of knowledge).
2. Transferability (knowledge can be extracted and transferred to other contexts)

3. Embeddedness (knowledge is often in a static and buried form that makes it difficult to extract or reformulate)
4. Self-enforcement (the value of knowledge increases instead of decreases when shared)
5. Perishability (knowledge can be outdated)
6. Spontaneity (knowledge can develop unpredictability in a process).

However, the attributes in themselves do not guarantee a successful knowledge managed organization. In a study conducted by Leseure and Brookes (2004), organizations linked the effectiveness of their knowledge management initiatives to discrete events in the evolution of their companies organizational environment. Some of the significant events included are:

- Downsizing and other large re-organizational events
- Termination of a long-term relationship with a supplier
- Departure of an entire project team, high turnover or gaps in the age distribution of a unit
- Significant company growth

These events impact the ability of an organization to successfully develop a system to ensure that knowledge management is a cornerstone of an organization.

### **3.2.3 Transferring Knowledge**

Snowden (as quoted in Stacy, 2001) defined “Knowledge is not a “thing” or a system, but an ephemeral active process of relating”. Knowledge must be managed as a flow, with focus more on context and narrative than on content. The three heuristics of knowledge are:

- knowledge can only be volunteered
- we always know more than we can tell
- we only know what we know when we know it

The issue of content and context which runs through all three heuristics is key to understanding knowledge transfer (Snowden, p5,6).

Simmonds, Dawley, Ritchie and Anthony (2001) have concluded that there are three ways knowledge is transferred; *sources*, *familiarity* and *usefulness*. Details are defined in Table 3.2.

<b>Knowledge Transfer Requirements</b>	<b>Detailed Explanation</b>
Sources (involvement) Order of importance :3	<ul style="list-style-type: none"> <li>• A group codifies its own knowledge in order to make sense of a particular situation</li> <li>• Direct participation in a learning organization</li> </ul>
Sources (association) Order of importance :2	<ul style="list-style-type: none"> <li>• Formal or informal interactions with others in everyday situations, exclusive of a learning organization</li> </ul>
Sources (experience) Order of importance :1	<ul style="list-style-type: none"> <li>• Knowledge acquired through years of interactions with the learner's acquaintances, friends, colleagues</li> <li>• Includes common sense and personnel knowledge</li> <li>• Acquired over time and is unique to each individual</li> </ul>
Sources (Direct Education) Order of importance :4	<ul style="list-style-type: none"> <li>• Training</li> <li>• Can be found structured and recorded in textbooks, research journal and other formal printed sources.</li> </ul>
Familiarity	<ul style="list-style-type: none"> <li>• Specific knowledge someone has about a phenomenon</li> <li>• Stored images or representations are evoked by stimuli or determined whether stimuli attributes match stored images or representations</li> </ul>
Usefulness	<ul style="list-style-type: none"> <li>• Knowledge that is appropriate to the situation in which it is used</li> <li>• The relevance the user attributes to the information determines its usefulness</li> </ul>

Table 3.2: Knowledge Transfer Mechanisms (Simmonds, Dawley, Ritchie & Anthony, p363)

The results of the research undertaken by Simmonds, Dawley, Ritchie and Anthony, (2001) show that sources of knowledge in order of importance is experience, association, involvement and direct education. Secondly, respondents who have learnt through involvement showed a higher than average familiarity rating compared to those who has learned through association.



Dixon, developed a theory of 5 knowledge transfer mechanisms using the following criteria, who is the intended receiver, what is the nature of the task and the type of knowledge to be transferred. (Karlsen and Gottschalk, 2003:113).

Type of Transfer	Definition	Type of Knowledge	Nature of Task	Intervention
Serial Transfer	Same group performs same task one more time by applying their own knowledge	Tacit and Explicit	Frequent and non-routine	Stimulate meetings and contacts between groups
Near Transfer	A group that applies tasks that were previously applied by another group	Explicit	Frequent and routine	Specification manuals
Far Transfer	Workers perform the same task as another group by applying knowledge from this group but in a different context	Tacit (socially transferred)	Frequent and non-routine	Simulate contacts between 2 groups
Strategic Transfer	A one off project that wants to benefit from the experience of others within the same organization. Senior level managers required to define the knowledge required to solve the problem	Tacit and Explicit	Infrequent and non-routine	A project must be initiated
Expert Transfer	When knowledge is transferred from an expert source inside or outside the organization to enable them to solve new problems	Generic and Explicit	Infrequent and routine	Networks where knowledge can be transferred

Table 3.3: Summary of Dixon Study (Karlsen and Gottschalk, 2003:113).

The main finding in Dixon's study is that the project success is positively related to the extent of knowledge transfer. The findings indicated that organizations should not replace the members in the project team without careful consideration. Secondly, for strategic type knowledge transfer, senior managers must be involved.

In a study performed by Lin, Geng and Whinston (2005), they identified two groups of participants in knowledge transfer; senders who are knowledge sellers and receivers who are knowledge buyers. To derive the expected value of the knowledge

transfer, the senders' and receivers' information sets should contain at least the following awareness:

- Is the knowledge explicit or tacit
- Is the knowledge proven or unproven
- What is the senders level of capability
- What is the context in which the knowledge is to be put to use
- The ties between the sender and receiver, such as their frequency of interactions and trust

Lin, Geng and Whinston (2005), additionally introduced the notion of completeness of information sets, in order to determine the value of knowledge transferred. They refer to the completeness or incompleteness of the senders' and receivers' information sets as the information structure of knowledge transfer.

They derived four representative types of information structures in knowledge transfer. This is illustrated in figure 2 – information structures in knowledge transfers.

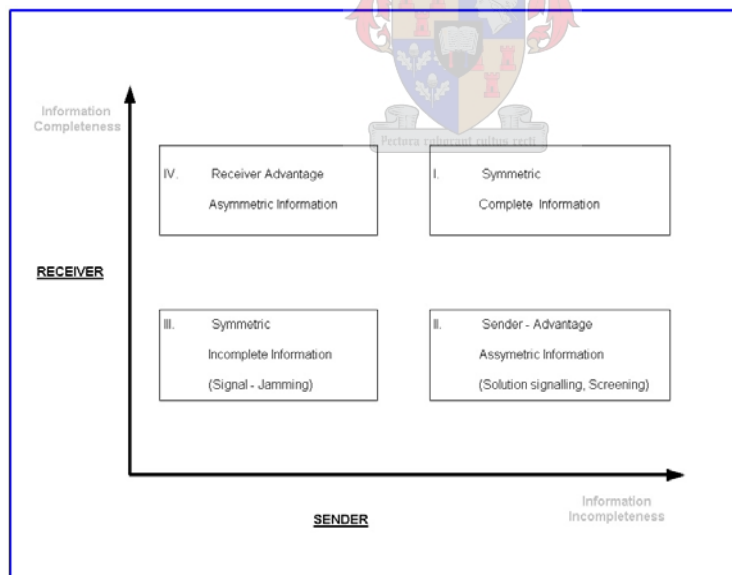


Figure 3.2 – information structures in knowledge transfers (Lin, Geng and Whinston, 2005:201)

Based on the study of, the definitions of the information structure are defined in Table 3.4.

No	Structure	Description
I	Symmetric Complete Information	<p>Knowledge of both the sender and the receiver sets are complete</p> <p>Parties have close contact and frequent connections</p>
II	Sender Advantage	<p>The senders information set is complete, yet the receiver's information set is incomplete</p> <p>Frequently occurs in consulting where clients find themselves in an inferior position to assess the value of the knowledge provided by the consultants</p> <p>The receiver cannot determine the value of the knowledge transferred.</p> <p>Receivers usually ask the senders for more information to enable them to select the best source of knowledge</p>
III	Symmetric Incomplete Information	<p>Both the senders and the receivers information sets are incomplete.</p> <p>This structure is commonly encountered when companies hire experts in emerging technologies to knowledge gaps, where companies often lack technical know-hoe and technical experts often lack understanding of the business context.</p> <p>It can happen that the sender hopes to mislead the receiver in a way that benefits the sender. This distortion in message is referred to as jamming. Rational receivers will expect distortion and thus will try to discount the message received in order to extract useful information.</p>
IV	Receiver Advantage Asymmetric Information	<p>The receivers' information set is complete, while the senders is not.</p> <p>The receiver is an a position of strength and can select the best source from which to acquire knowledge.</p>

Table 3.4 Information Structures

This study enhances our understanding of tacit knowledge, where quality of the knowledge is often unobservable and unverifiable.

In another study by Gilbert and Codey-Hayes (1996), have developed a model that embodies the notion of mutual learning brought about by effective knowledge transfer.

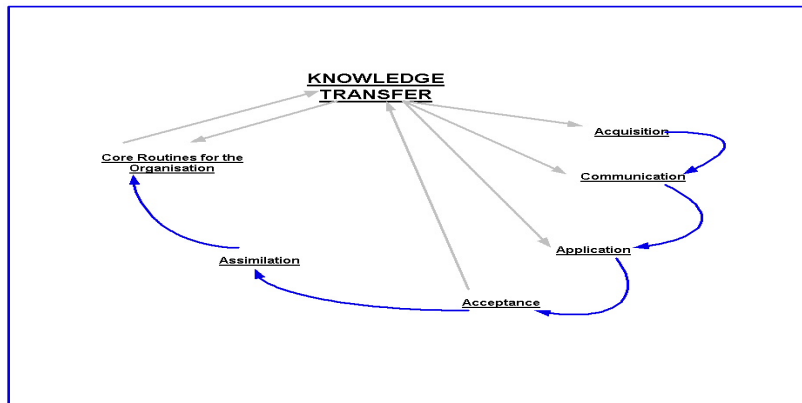


Figure 3.3 –Framework for Knowledge Transfer (Gilbert & Cordey-Hayes, 1996:303)

Each of the steps are defined in the table below and the detailed explanation defines the activities within the process steps.

No	Process Step	Detail Explanation
1	Acquisition	Organizations must obtain knowledge by doing, borrowing and recruiting new individuals The prior knowledge held at the inception or birth of an organization will direct and determine how it must move forward, what it searches for and what it finds and how it interprets knowledge acquired
2	Communication	Written or verbal The effectiveness of knowledge transfer depends to some extent on the strength of the tie between the ease of communication and the overall relationship between source and recipient.
3	Application	It is the results of the application of knowledge that enables the organization to learn, rather than the knowledge itself. Knowledge must be applied for it to be retained
4	Acceptance	The knowledge of individuals must be found to be acceptable to individuals
5	Assimilation	Requires the transfer of the results of history into the routines of the organization It implies a notion of change in individuals, groups and organizations which is manifested as shifts or modification in cognition, attitude and behavior as a direct result of the use of acquired knowledge The cognitive system is a combination of beliefs, attitudes,

		values, opinions, presumptions and memories that governs the way meaning is provided. (Marakas, 1999) sums it up to succinctly by defining knowledge as “meaning made by the mind” (Propp, p 264).
6	Core routines of the organization	Embodies the rituals, and communications methods in organizations

Table 3.5 Explanation of the Framework for knowledge structures

The model of Gilbert and Cordey-Hays indicates that it is only through *acceptance* and then *assimilation* that knowledge has been transferred.

Davenport and Prusak (2000), argued that the knowledge transfer process consists of transmissions and absorption culminating in behavioral changes by the recipient.

Knowledge transfer occurs through a variety of mechanisms:

- Characteristics of relationships among organizations
- Personnel movement
- Training
- Communication
- Observation
- Technology transfer
- Reverse engineering process
- Replicating routine
- Inter-organizational routines
- The information structure process



Often, organizations cannot know in advance what knowledge is necessary, thus Snowden (2000) recommends the following techniques to ensure that relevant knowledge is transferred in time. These are:

- Lessons learn't
- Frequently asked questions
- Allowing knowledge carriers to determine if they want their knowledge to be made public

- Clustering, bringing like minded individuals together
- Swarming, articulating problems from which highly motivated individuals group together to resolve.

By increasing information flows, variety and connectiveness, either, individually or collectively, existing patterns are broken down and new conditions are created which enables knowledge to be transferred. However, organizations, do not necessarily know all that they know. To a large extent, this is because internal transfers of knowledge rather than fluid, are often “sticky” or difficult to achieve (Szulanski, 1996) (Szulanski, 2000:13). Arvidsson (1999) showed that most knowledge transfers simply flowed along existing lines of communication, while those that are new to the group or geographically isolated were essentially shut out of this knowledge, flow loop.

Knowledge transfer is seen as a process in which an organization recreates and maintains a complex, causally ambiguous set of routines in a new setting. The more complex a problem the more likely it is to require a response in the form of additional deliberation, recourse to non-standard skills and senior management involvement. Transferring complex and causally ambiguous knowledge typically requires reconstruction and adaptation at the receiving end.

#### **3.2.4 Transferring Knowledge in a Technology Project**

Transferring technology is often defined as the absorption of new technology or “useful know-how” into a particular environment. Acceptance of technology transfer is made more difficult when the recipients are not involved in the early stages of the product design. In addition, the underlying organizational structure of the business is not conducive to successful technology transfer, especially if it is an activity not considered strategically important to the business as a whole. According to Szulanski, (1996), the “not invented here syndrome” acts as a barrier to knowledge being transferred (Szulanski, 2000:13).

Some researchers have taken the simple exchanges approach by defining knowledge transfer as a dyadic exchange of organizational knowledge between source and a recipient (Szulanski, 2000:28), (Ko, King, Kirsh, 2005:61).

In a study, Szulanski (2000) indicates that the difficulty of transferring knowledge changes along the process continuum. Figure 4 indicates the process for technical implementations

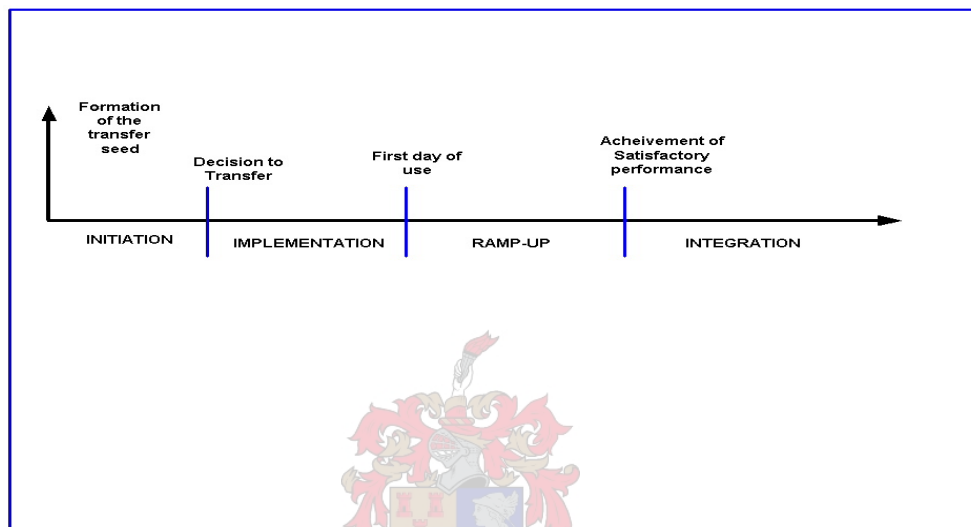


Figure 3.4 – Process of Knowledge Transfer (Szulanski, 2000:13)

During the initiation phase, difficulty arises from trying to identify opportunities to transfer and in acting upon them. Once the decision to transfer knowledge is made, attention shifts to where the challenge is to bridge the communications gap between the source and the recipient and to fill the recipients' technical gap. Bridging this gap requires solving problems caused by compatibilities of language, coding schemes and cultural conventions. (Szulanski, 2000:13).

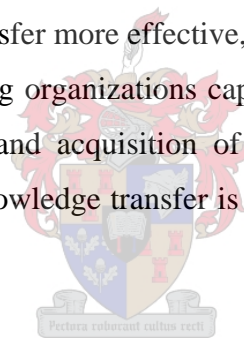
Once the recipient begins using the acquired knowledge the main concern becomes identifying and resolving unexpected problems and the effort to resolve them. Unexpected problems may surface because a new environment where the transferred knowledge is put to use reacts differently than expected, training of personnel turns out to be insufficient or incomplete, trained personnel leave the organization or prove unfit for the new roles, or the new practices involve significant changes in the

language system and in the shared norms or believes underlying the correct interpretation of work directives.

Once satisfactory results are initially obtained the use of knowledge becomes gradually routinised. The new process blends with the objective, however, when difficulties are encountered the new practices may be abandoned and when feasible, reversal to the former status quo may occur. Preserving the use of new knowledge may require disciplining or removing disruptive individuals who do not accept the new power distribution.

Knowledge is often tacit and cannot be transferred through blueprints and documentation. (Leonard-Barton, 1995.) This knowledge is usually transferred through informal processes and communication. (Daghfous, 2004:943).

In order to make technology transfer more effective, some form of investment must be made in the technology receiving organizations capabilities. This could be the form of resources, training of staff and acquisition of high-level skills. According to Arvidsson,(1999), successful knowledge transfer is dependant upon the quality of the people in the organizations.



During a technology transfer the retirement of an expert can create a threatening challenge if the transmission of the experts knowledge is not addressed in due time. In some instances it was noted that the presence of experts led to knowledge laziness in the rest of the employee base. If an expert is always on hand to provide knowledge individuals see it as no reason to acquire that knowledge for themselves.

Transferring knowledge is a crucial activity during an ERP implementation. The project team, which invariably comprises both consultants and business people, must transfer the configured solution into the larger organization. The visible proof that the solution has been transferred is manifested through early adoption and stabilization of the ERP solution and achievement of the ERP objectives begin to emerge. When this take place in an organization, it is safe to assume that the knowledge has transferred.



For the purposes of this study knowledge transfer will be considered to be a process that consists of information transmissions, absorption and abstraction, culminating in behavioral changes by the recipient. For large scale knowledge transfer activities as in the case of an ERP implementations, the notion of organizational learning becomes an important consideration to foster the competence of behavioral change.

### **3.3 Organizational Learning Orientation**

#### **3.3.1 Individual Learning**

Learning is an ancient and interesting word. It means the accumulation of reflection upon and use of the complex attitudes, knowledge and skills by which an individual or group acquires the ability to actively adapt to their changing environments.

Teece et al (1990) defined learning as a process by which repetition and experimentation enable tasks to be performed better and quicker. (Carayannis, 1999:142).

Learning processes are intrinsically social and collective phenomena. Learning occurs not only through imitation and emulations of individuals as with teacher-student or master-apprentice, but also because of joint contribution to the understanding of complex problems. Learning requires common codes of communication.

Peter Senge (1996) describes learning as the means to get to the heart of being human. Through learning we re-create ourselves, we are able to do something we were never able to do, we re-perceive the world and our relationship to it, we extend our capacity to create, to be part of a generative process of life.

Developing a learning organization begins with individual learning and does not start with changes in organizational work practices and structures. Learning begins with intuition and is largely a subconscious process involving perceptions of patterns and possibilities (Crossan et al 1999). The individual is able to bring in new patterns of thinking, which challenges the current norms and assumptions of the organization,

however, if the patterns and possibilities are constrained by routines of the past (i.e. routines are patterns of interactions that represent successful solutions to particular problems. Static routines embody the capacity to replicate certain performed tasks and dynamic routines are directed at establishing new competence, (Carayannis, 1998:143), and the norms and assumptions of the organizations are not questioned, the individual is said to lack moral courage and the confidence to think seriously about how things must be done in future. These individuals suffer from “not invented here syndrome”. Individual learning is enhanced by the nexus between what individuals can do (capability) and what they want to do (motivation) and what they need to do (focus).

Individual learning is the cornerstone for learning at an organization level. Learning is a dynamic and inimitable process that has the ability to integrate and build internal and external competencies to face environmental change. Here learning is a capability. Individuals learn when they participate fully in solving problems and communicate about issues with each other. Individuals can also learn by explicit interventions that are designed to foster self-regulation, which is a process that provides the learner with incentives and motivation to learn and is associated with individual responsibility to accomplish goals (Tillema, 2005:83). It requires active personal involvement in knowledge construction and setting personal standards that can realistically be achieved. Here the individual becomes the manager of his or her own learning.

Argyn's (1978) defines learning as detection and correction of error, and he documents how hard it is for individuals to detect their own errors in difficult interpersonal interactions. (Tjandra & Tan, p530).

The mechanisms for learning are very different from teaching. In teaching there is little ambiguity between teacher and what is being taught. Learning on the other hand is more about providing space and time for new meaning to emerge.

### **3.3.2 Organizational Learning or Learning Organization**

The concept of *organizational learning* was first introduced by Cangelosi and Dill (1965). The general consensus on theories developed in this area is that learning

occurs at multiple levels (Crossan et al, 1995); information is processed and transformed into insights and innovative ideas by *individuals first* (Simon, 1991); then knowledge is shared and mutual understanding is developed among *groups* (Huber, 1991; Cant, 1992; Stata, 1989); and some individual or *group learning becomes institutionalized* as organization artifacts (Crossan et al. 1999, Shrivastava 1983). (Wu and Katok, 2005:2).

Field and Ford (1995) have defined organizational learning as an organization with a well developed capacity for *double-loop learning*, where there is ongoing attention to *learning how to learn*, where the key aspects of organizational functioning support learning. (Tjandra and Tan, p532).

According to Senge (1997), *learning organizations* on the other hand are organizations where people continually expand their capability to *create the results* they desire, where new patterns of thinking are nurtured, where collective aspiration is set free and where people are continually learning *how to learn together*. (Alas, and Sharifi, 2002:317).

According to Gilbert and Cordey-Hayes (1996), a *learning organization* must be adaptive and be able to respond to both internal and external environments and it must be open and able to communicate.

While *organizational learning* is regarded as processes of learning in the organization, the *learning organization* is a form of organization itself (DiBella, 1995, Tsang, 1997), (Ortenblad, p55). (Boonstra, 2004).

*Organizational learning* is a process in which organization members actively use data to guide behavior in such a way as to promote the ongoing adaptation of the organization.

Bell, Whitwell and Lukas (2002), research on organizational learning identified four schools of thought, the economic, the managerial, the developmental and the process school. The process school of thought is characterized by the view that

- Organizations have capability to learn when required

- The constructs of learning (information acquisition, dissemination and utilization) are common to all organizations
- Learning is grounded in the cognitive (i.e. the activity of knowing) and behavioral capabilities of the individual members
- The idiosyncrasies of the individual explain differences in individual learning and that such idiosyncrasies are also likely to translate to learning at the organizational level (Bell et al, 2002) (Dawes, Lee, Midgley, 2005:2).

Organizational learning requires individual learning by single members, as well as a collective learning process by all members of the organization. Most authors who have written about organizational learning agree that both the individuals and the organizations learn. The individuals learn as agents of the organization and the knowledge is stored in the memory of the organization (Huber, 1991). (Sun and Scot, 2005:76). The memory consists of routines, dialogue or symbols (i.e. knowledge is embedded, uncultured and encoded) (Blacker, 1995). (Boonstra, 2004). To make learning real it is not sufficient that one single individual knows and acts. All learning is inherently social and cultural, and organizational learning can only be realized through change in organizational activity and practice.

At the level of the organization, learning is defined as the process that increases the actionable knowledge of the organization and it's members through interpretation, comprehension and assimilation of tacit and explicit knowledge. The purpose is to generate knowledge that can be codified and institutionalized in norms of behavior or organizational routines and work processes. Members actively use data to guide behavior in such a way as to promote the ongoing adaptation of the organization. At this level a shared understanding is translated in organizational systems, structures and procedures.

If an organization is to learn anything then the distribution of its memory, the accuracy of its memory and the conditions under which that memory is treated as a constraint becomes crucial characteristics of organizing. (Carayannis, 1999:146).

For organizational learning to take place, knowledge must be accessible to others beyond individual learners and it must be subject to application, change and adaptation by others in the organization. Organizational learning is a process of acting, assessing and acting again. An ongoing cycle of reflection and action that cannot be taken for granted in organizations noted for their adherence to routine (Edmondson and Moingeon, 1997).

In a study performed by Lyles, van Krogh, Roos and Kleine (1996), they have derived a model of organizational learning, by differentiating learning at a high or low level, this model is based on the premise that organization can learn either within a current frame of reference or can develop a new frame of reference, which are linked to the processes and history of the organization.

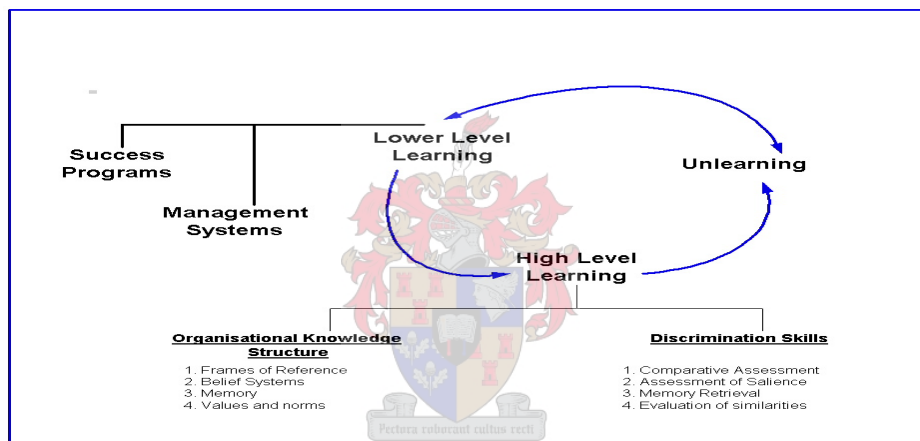


Figure 3.5 – Model of Organizational Learning (Lyles, G van Krogh, J Roos and Kleine, 1996:89)

Low level learning is the result of repetition and routine. This results in management systems and standard operating procedures that handle repetitive unchanging situations. High level learning refers to an adjustment of overall missions and beliefs and norms. It involves developing a new frame of reference, new values and unlearning past success programs as well as enhancing discrimination skills (i.e. ability of organizations to discern differences among situations and to choose different courses of action).

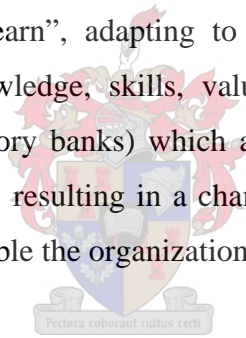
Kline and Saunders however state that a true learning organization learns on its own, quite apart from the many individual learning that will also take place within it. (Kline and Saunders, 1993:134).

Individuals create a new language among themselves that expresses the knowledge they have acquired. Organizational learning is a process of language development. As the implicit knowledge of each learner becomes explicit his or her mental model becomes a building block for the institutional model.(Carayannis, 1999:146).

There needs to be a recognition that an understanding of the context in which an experience occurred is often crucial to determining its replicability in other circumstances.

*Organizational learning* and *the learning organization* are often used interchangeably in the literature and will continue to be used interchangeably in this study.

For the purpose of this study organizational learning orientation is defined as a process of learning “how to learn”, adapting to change, communicating openly, acquiring and transferring knowledge, skills, values and mindsets (i.e. frame of references or organization memory banks) which are cumulated and modified over time, whether observable or not, resulting in a change in the organizations routines, norms and behavior that will enable the organization to achieve the results they desire.



Organizational learning brings about professional confidence, problem solving abilities, ability to work independently, accuracy, speed, and ability to give complete information, personal accountability and people skills.

### **3.3.3 Organizational Drivers that precipitate an Organization Learning Orientation**

The conditions that give rise to learning in an organization, is the understanding that the organizations are complex adaptive human systems not mindless machines. Complex adaptive systems show patterns which cannot be predicted in advance, no matter how familiar the inputs are. (Snowden, 2002). Organizations are subject to constant change and a complex environment will need to deal with this complexity. However, in order to do this managers’ must be able to make sense of it and to create ways of working within it.

Understanding that learning is bred from high-levels of uncertainty; change is a basic component of uncertainty and requires adaptation. To successfully adapt is contingent on effective learning. Uncertainty emerges from two aspects, competitiveness and the other is due to interpersonal relationships.

Understanding, that organizations are driven more by process than structure, where sufficiency comes through combining structural change with human learning processes.

Understanding the difference between first and second order change processes, where first order change are small changes that are initially necessary to facilitate change to both attitude and behavior so as to become comfortable with the notion of change. Second order change is when organizations move from simple notions of organizational change to reach a higher level of change. This level allows for the development of foresight. It allows the organization to reframe its understanding and thus design its own future. Both change processes rely on learning “how” and learning “why”, which is important for avoiding dysfunctional interpersonal relationships and defensive routines (Argyris, 1993 ). (Boonstra, 2004).



Accepting the notion that, ‘events’ are inevitable and disruptive. These events disrupt the learning cycle as we try to make logical patterns from a chaotic world. Organizations that learn have developed systems for being both sensitive to environmental change and having the organizational capability to respond quickly to events to create competitive advantage.

Accepting the professionalism of direction givers. Professionals are evaluated by the extent to which they master and keep abreast of the knowledge (both “knowing that and knowing how”) pertinent to their field.

Poppet & Lipshitz, propose that organizational learning is facilitated by a norm or a mindset of professionalism. Professional’s discuss study and construct conceptual principles and ideas and generate and enact new strategies in their work environment, and above all, they share insights about what they learn.

The key prerequisite is that the organization has developed the capability of individuals to achieve and if necessary question objectives (i.e. learning to learn), to manage themselves (self-organization) and to undertake different tasks (multi-skilling).

A high perceived likelihood of potentially costly but avoidable errors facilitates learning. This proposition is based on research showing that failure stimulates risk seeking and diagnostic behavior (Wong and Wiener, 1981) and that the perceived moderated-sized threats stimulate vigilant behavior (Janis and Mann, 1977). Examples of organizational learning comes from organizations under crisis (e.g. strike, terrorist attack), or from organizational settings in which people routinely face potentially catastrophic errors such as nuclear power plants.

Sitkin (1992:243), claims that 'failure is an essential prerequisite for learning' as it stimulates the sort of experimentation that Campbell (1968), and others (March, 1978; Staw, 1983; Wildavsky, 1988) have advocated as fundamental for sound policy development and management. In contrast, based on an analysis of an organization failure, Clarke and Perrow concluded that 'high technology, high risk systems' do not foster organizational learning (Poppet & Lipshitz, p47). (Boonstra, 2004). Sitkin countered this by conceding that not all failures are equally adept at facilitating learning. The five characteristics that contribute to intelligent failures are (i.e. failures that foster learning):

1. they result from thoughtfully planned actions
2. they have uncertain outcomes
3. are of modest scale
4. are executed and responded to with alacrity
5. take place in domains that are familiar enough to permit effective learning

The learning procedures of organizations are often set in the environmental context of a company.

### **3.3.4 Characteristics of an Organization with a Learning Orientation**



Senge (1990) indicates five learning disciplines, which are components of a system which each develop separately and provide a vital dimension in an organization that can truly learn:

- Systems thinking: A conceptual framework (body of knowledge and tools) that facilitates a clearer understanding of organizational patterns, as well as attaining a vision of how to change these patterns effectively. It is a discipline for seeing the 'structures' that underlie complex situations and for discerning high from low leverage change.
- Personal mastery: the essential cornerstone and spiritual foundation of the learning organization as it continually clarifies and deepens the personal vision of focusing energies, developing patience, and ability to view reality objectively. Personal mastery involves an attitude or belief that you can achieve mastery and that it is important to do so.
- Mental models: the deeply ingrained assumptions and generalizations (eg. pictures, images) that influence their understanding of the world – this subsequently influence how we respond. Of particular importance, is the ability of individuals to articulate their own models, expose their thinking and make the thinking open to influence others. Mental models once formulated endure, which results in individuals remaining unaware that these observed relationships are simply hypotheses rather than facts.
- Building a shared vision: the ability to create the capacity to hold a shared vision of the future, to excel and learn because people want to, and not only for the sake of compliance with the leader's vision. The vision is manifested in a set of principles and guiding practices that fosters genuine commitment.
- Team learning: the ability to afford an opportunity to discover insights that cannot be attained individually. This refers to the synergy achieved from the process where team learning starts with dialogue that can enable the intelligence of the team or group to exceed the intelligence of the individuals in the team.

Senge's core message is that without individuals learning to shift their own ways of thinking about systems, organizations will be ineffective.

Avrice Saint in her study, *Continuous learning within Japanese Organizations*, suggests three essential characteristics of successful learning in the workplace:

- Learning must come through work itself, learning is an inescapable part of work and must be centered around work processes. This characteristic is supported by Marquardt and Reynolds as well. (Ortenbald, p58).
- Learning is not something separate from doing, it is one process – learning/doing.
- Learning means discovery – learning on the line includes improvising, trying out new methods and finding and correcting errors and inventing new and better ways.

Based on various studies, the characteristics outlined below are likely to yield a productive learning environment, if they are embedded in an appropriate culture, a normative system of shared beliefs that shape how organizational members feel, think and behave. The characteristics are:

- Positive thinking, personal excellence, building a positive outlook.
- Reframing; reality is seen in a new light, facts are sorted and positive ideas emerge into clarity. During reframing the situation is not changes, just the quality of your thinking
- Reviewing; seeing the hidden opportunities that lie behind a situation that seems to have gone awry
- Respect; which should flow both up and downwards. A recognition that people are valuable.
- To change, take risks and accept responsibility
- To promote good communications among all employees by operating in an open atmosphere with freedom to share ideas and speak one's mind without fear of reprisals.
- Usage of teams and collaborative processes in generating new knowledge.

- Empowerment of the individuals in an organization to make decisions and take action in their jobs when facing unforeseen events
- Polyvalence; performing different tasks and/or positions that will allow individuals to share tacit and explicit knowledge with other employees of different background thereby increasing their experience, technical and social skill.
- Effective communication, active listening and creating trust and credibility
- Appreciative understanding; members must understand why others see things differently than they do and work to appreciate the differences.
- Integration; members must consider all input, evaluate its value and usability and collaboratively work together to pull the appropriate solutions and outcomes. In as much as organizational learning implies shared knowledge, perceptions, and beliefs, it will be enhanced by the existence of a common language and joint action. A common language favors integration – a crucial aspect in the development of organization learning (Jerez-Gomez, Espedes-lorete, Valle-Cabrera, 2005:717).
- Making critical information accessible and transparent. Learning involves the transformation of data (un-interpreted information) into knowledge (interpreted information). To be productive learning requires complete, undistorted and verifiable information
- Initiating changes in the operations management to make it more flexible.
- Developing higher quality questioning in order to create authentic information
- Learning orientation, in order to generate extraordinary value for its shareholders a company has to learn better than its competitors and apply that knowledge throughout its' business faster and more widely than they do. By encouraging reflection on learning experiences, individuals increase their confidence, enhances their learning and enables them to develop an understanding of their own and others learning.
- Transparency, is the willingness to hold one's self and actions open to inspection in order to receive feedback
- Issue orientation is the evaluation of information strictly on its merit without regard to irrelevant attributes such as the social standing of its source or recipient. Issue orientation is related to democratization, power equalization

and participation which opens communication channels, thereby enhancing innovation and learning (Kanter, 1991) (van Dyk, Nel, Loedolff, Hassbroek, 2001).

- Accountability, hold one's self accountable for the consequences of one's actions. If the basic premise is that we are at fault, it follows that we should find out what went wrong so that the next time we will avoid this error. This is key to constantly learning.
- Managerial Commitment, ensures that the firm understands the importance of learning and takes responsibility for creating an organization that is able to regenerate itself and face up to new challenges.
- Self-directed learning which is supported by the assistance of teachers, mentors and peers, incorporating different methods of learning and catering for the different learning needs of individuals. Peer learning has been valued by all levels of education and more recently by the workplace, as a means of developing competence and life-long learning skills (Goldsmith, 2006:125). Mentoring is mentioned extensively in literature as being beneficial to professional development. The mentor role assists in the socialization of practice, assisting the novice to identify the learning needs as well as the provision of a nurturing, trusting, honest environment in which the individual will grow and develop confidence, self-esteem, independence and the skills necessary for work. (Chenoweth and Lo, 2001, p281) (Goldsmith, 2006:125).

### **3.3.5 Types of Learning in Organizations**

Within an organization various types of learning can be employed and more than one learning type can be employed at the same time. Further to this organizations can institute learning initiatives to foster the development of learning within their organizations. Senge (1990), states that learning has very little to do with taking in information, rather it is a process that enhances the ability to build the capability to create new knowledge, understanding and solutions.

In a study undertaken by Poell (1998), he states that learning behavior of workers is not just determined by organizational structure or management strategy, but that

workers have their own views and interests that influence what they learn and how they learn it.

Generative learning, learning that is created from reflection, analysis or creativity. It is learning that requires an open mentality towards new ideas and a great deal of experimentation.

Action learning where learning builds upon experience and knowledge of an individual and/or a group and upon the skilled new questioning that results in creating new knowledge. Knowledge can therefore be created by observing and reflecting on the experience. Action learning requires producing valid information, free and informed choice in decision making, commitment to decisions made and evaluation of their effect. It is the ability to ask discriminating questions so that they are not swamped by techno-babble of experts.

The basic philosophy behind action and experiential learning is that knowledge can be created by concrete experience and by observing and reflecting on this experience. The process of action learning can involve single- and double loop learning as well as deuterio learning. Action learning should become an integral part of the organisation's culture – using every opportunity to learn from its own practices.

Argyris (1992,1980) makes a distinction between single and double loop learning where single loop is detection and correction of errors that do not require changes in the governing values, whereas double-loop learning requires changes to the governing rules (i.e. mindsets). (van Dyk, Nel, Loedolff, Haasbroek, 2001:128-129).

Adaptive learning coined by Marquardt (1996) uses the principles of single and double loop learning and is depicted as :

Action → Outcome → Results data → Reflection

Deuterio learning involves self-evaluation. Reflecting on past experiences, identifying lessons learn't, what was good, what wasn't, how solutions were introduced. Argyris

and Schon (cited by Marquardt 1996) call this ‘learning about learning’. (van Dyk, Nel, Loedolff, Haasbroek, 2001:128-129).

Kolb (1996), focuses on problem orientated learning, starting from the position that what people have learned must be evident from their actions.

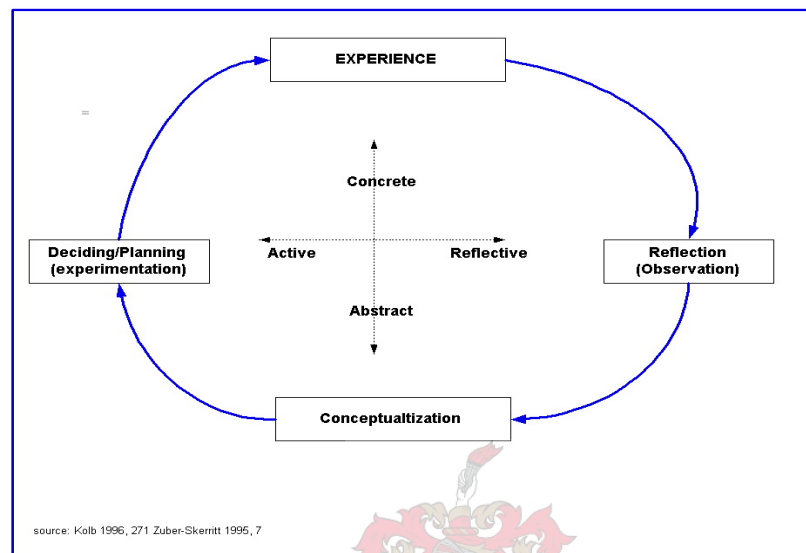


Figure 3.6 – Kolb's learning cycle (Lyles, G van Krogh, J Roos and Kleine, 1996:89)

The cycle starts with experience, leading to reflection, conceptualization, deciding and returning to re-doing. The process can be explained as follows:

- Experience: observing and reflecting on the consequences of action in a situation
- Understanding: forming or reforming understanding of a situation as a result of experience
- Planning: planning actions to influence the situation, based on newly formed or reformed understanding
- Action: acting or trying out the plan in the situation

Kolb argues that in order to learn deeply and generatively we need to be able to:

- notice our experience in a way which engages our full attention
- observe reflectively about the phenomenon we have noticed, this means considering how this experience relates to our mental models
- develop this experience into a conceptual framework which we own

- test our new framework to see how our tentative experience shapes up

In an active learning model, the teacher is not passive (pouring knowledge into the student as a passive vessel and then testing that the knowledge has been retained), but has a much more subtle role of indirectly fostering, enabling and catalyzing learning in the learners. In the active learning methodology, the trigger organization (i.e. the sender of knowledge) would arrange, promote and enable learning experiences on the part of the clients so that the latter would actively re-appropriate the knowledge. The trigger organization's, play a role whereby they strengthen the powers of critical thought and independent inquiry in the clients. In this way the knowledge is then locally owned as well as adapted to local conditions. After all, George Bernard Shaw (1961) quipped: "if you teach a man anything he will never learn it". (Ellerman, Denning and Hanna, 2001:171).

In the indirect method, the sender of knowledge awakens an intrinsic desire for learning on the part of the receiver, who then takes the active role in discovering and appropriating the knowledge. The sender does not transmit knowledge, but transmits or arranges the learning experience that puts the receiver of knowledge into the way of being able to form the receivers own adaptation, guided in detail by the environment. (Ellerman, Denning and Hanna, 2001:173).

In this scenario learning is more a process of exploration and experimentation in which more promising approaches are gradually identified and encouraged, while less promising practices are discouraged.

People have a natural "ownership" over the fruits of their own labor, and thus, by being active participants in the learning process they will have a much greater chance of success and sustainability. Judith Tandler (1975), thesis on organizational ownership states that when suppliers take ownership for the product, it crowds out ownership of the clients and leads to passivity and dependency. The same logic ramifies through every level of educational and developmental organizations. Those who teach (senders of knowledge), must "show results" in order to "do well", so more and more responsibility and ownership is taken over to the detriment of the learner (receiver of knowledge) (Ellerman, Denning and Hanna, 2001:175).

Rapid and pro-active learning has four main elements. These are:

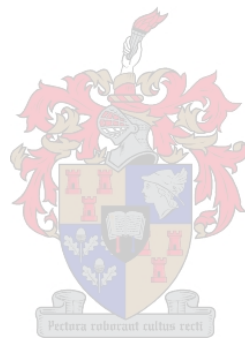
- Information gathering; curiosity, receptiveness and having time for seemingly unrelated areas all seem to part of the culture, continuously challenging the current status quo, and exploiting efforts to remain open to many sources. These activities are used as an inducement for generating energy in an organization.
- Conceptualizing; seeing different perspectives, systems thinking, big picture plans and the ability to cascade the plan and to see how a part fits with and contributes to the whole. Most important of all to reshape the plan when new information comes to light that makes the initial plan inappropriate.
- Action; the urge to make things work, learning by doing, self-initiative among the members of the organization, getting the job done. Taking responsibility and a willingness to get off the beaten part.
- Reflection and Renewal; the capability to revisit what has been completed to draw learning points. The ability to give and take constructive criticism. The ability to review one's behavior and to draw personal behavior and process lesson's from experience.

The diffusion of ERP systems and their expanding organizational involvement forces organizations to become characterized by a specification of rules, and human behavior becomes relatively predictable. Where once, organizations could respond to particular situations, based on vaguely formulated cues and materials, ERP's eradicate this freedom. To adapt to this change in behavior required, organizations embarking on ERP's must firstly, determine if the organization has a learning orientation and secondly, should deploy strategies to either enhance or foster the organization into a learning orientation.

Since ERP implementations are highly tensed environments, with huge volumes of business content to be learned in a short period, rapid and proactive learning as a learning activity can be considered as a strategy for developing a learning orientation.



This activity requires big picture thinking, seeing different perspectives and acting on what has been learn't, enabling behavioral changes and desensitizing the “not invented here syndrome”.



# Chapter 4

## 4. *Research Methodology*

### 4.1 Method

#### 4.1.1 Research Design

A research design is the blueprint for fulfilling objectives and answering questions. For this research a conceptual review was selected.

A conceptual review is a review that aims to synthesize areas of conceptual knowledge that can contribute to a better understanding of problems. A conceptual review aims to provide an overview of the literature in a given field including main ideas (i.e. themes), models and debates. (Petticrew and Roberts, 2006:145).

A conceptual review is a method that is neither qualitative nor quantitative, nor is it a critical review of the literature. Instead, it is based on findings from other researcher's studies and from literature concerning the theory and practice of organizational learning, ERP's, knowledge transfer and especially human dynamics. This method has been expanded to enable the researcher to use both deductive and inductive methods in order to find answers to the questions posed in this study.

The objective of this review is to collect, document and scrutinize current literature on organizational learning, learning itself, knowledge transfer and ERP's with the intent of collating sufficient reviews to enable the a researcher to obtain sufficient information to address the questions:

- are learning activities and initiatives a contributor to knowledge transfer,
- are there learning barriers that prevent organizations from developing a learning orientation,
- are there knowledge barriers that inhibit the knowledge transferred, even though the organization may have a learning orientation?

Further to the above, gaps will be identified in the research literature and recommendations will be made for future research in this field.

#### 4.1.2 Data Collecting Approach

The approach of this study entailed extensive searches of relevant business management and information technology databases, namely; Emerald Full-Text, EBSCO (Econlit), Science Direct. No internet searches were performed as the researcher was concerned about the validity and reliability of the publications posted on the NET.

Searches of online databases using advanced search terms were carried out. This entailed searching for material using the following key words:

- knowledge management
- learning organization
- organizational learning
- learning activities
- barriers to learning
- barriers to knowledge transfer
- antecedents to knowledge transfer
- Information Technology
- Technology
- ERP Implementations
- ERP



During the searches the key words were combined in various permutations, for example, terms were combined such as:

- Learning organization and ERP
- Knowledge transfer and learning and ERP
- Technology and learning
- Learning and knowledge transfer
- Organizational learning, knowledge transfer and ERP

Assistance from a subject matter expert from the University of Stellenbosch, was requested to assist in sourcing documents for this study as well.

The intention was to ensure that as far as possible, all literature in the field was identified while keeping focus on literature of greatest pertinence to the research questions. That is, the ultimate objective was to identify the best evidence for the review.

To further develop the researcher's insight into the concepts of organizational learning, knowledge transfer and ERPs', the researcher made extensive use of relevant books. The search was limited to publications between 1995 and 2006. The review considered publications in the English language from the UK, the USA, Canada, New Zealand, Asia, Australia, Europe, Middle East and Asia.

Even though the literature has been drawn from a wide range of sources, risk of bias exist in that there is a reliance on material written in the English language only, the search terms used to extract material was not comprehensive and exclusions of material produced by the search methods that was not clearly studied or understood.

#### **4.1.3 Results of the Data Collection**

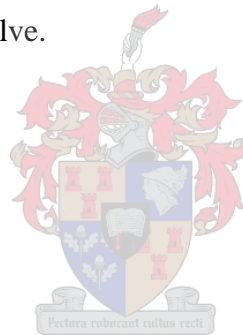
The search did not extract any records from the databases when the, search terms, "learning organization and knowledge transfer and ERP" was combined. However, based on the other search terms the results highlighted a list of 60 extractions from the relevant journals. The abstracts were reviewed and those publications that did not cover the aspects of this study were discarded.

The first analysis then resulted in 39 papers (empirical and opinions) being selected for more scrutiny. Annexure A, provides a detailed list of the 39 publications. Each research paper was subjected to a thorough review, using a standard framework to extract key information about the purpose; design and sampling method and findings of the study.

Amongst the 39 papers there is an overwhelming number from the USA, with the UK and Europe a distant second and third in terms of countries that have submitted publications dealing with the themes within this study.

Out of the second level scrutiny, 27 journal papers were identified which discussed issues pertinent to the research objectives. Annexure B contains the list of the studies relevant to the objectives of this study and includes a synopsis of each paper (i.e. the purpose, country, author, findings and theme). Within the 27 papers there is a strong veer towards studies relating to knowledge transfer barriers and learning barriers with limited studies around the learning activities and initiatives that foster organizational learning.

The findings from these papers as well as information that has been obtained from the books read will be discussed in the following chapter with relation to the problems that this study is attempting to solve.



# Chapter 5

## 5. Discussion

*“In the time of profound change the learners inherit the earth,  
while, the learned find themselves beautifully  
equipped to deal with a world that no longer exists.”  
Al Rodgers*

### 5.1 Activities and Initiatives that foster Organizational Learning

#### 5.1.1 Learning Activities

The literature has highlighted a number of learning activities that enable organizations to develop a learning orientation. These are detailed below.

Competency Acquisition, is aimed at augmenting the skills and knowledge of individuals and teams. According to Tuomi (2002), in the tradition of human capital accounting the hope was to aggregate individual level skills so that they could be linked to the strategic needs of the organization.

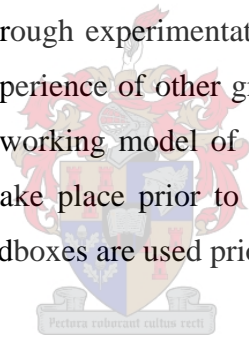
Firms should indicate the strategic intent and commitment to acquire relevant competencies in advance of undertaking a technology project. The problem with this however, is that although the skills and competencies can be described, this skill definition often misses core situational and contextual factors that play an important role in the organizational activity, as many organizational skills are dynamic and are only learned when they become relevant. ERP consulting skills are hard to coagulate down to small chunks of knowledge, and therefore even if organizations display the intent to acquire relevant skills it is difficult for the organization to prepare the individuals or acquire the right skills prior to the implementation.

Prior knowledge, refers to the degree of understanding by the recipient organization of the technical and organizational context of the technological change. Daghfous and White (1994), states that it is very important to collect all the relevant and knowable information before addressing uncertainty in product and process innovation projects. Bohn (1993), suggests ensuring that prior to a process change

initiative, an organization should measure the technical knowledge of the firm about a production process. Whether projects succeed or fail, these experiences offer valuable learning opportunities that is, it leads to insight, understanding and thus adds to the commonly held wisdom of the organization.

Organizations should also institute a lessons learnt activity. That is, learning from past experiences, retaining and recording these lessons, as a means of developing a conscious awareness of prior knowledge in the business. However, for radical projects, an ERP is one such project, prior knowledge may not be relevant enough to be useful.

Experimentation, this activity is often referred to as learning by doing, trying, using trial and error. The higher the levels of technical and organizational uncertainty experienced by the firm in the beginning of the project the more knowledge the organization needs to acquire through experimentation. Experimentation offers the opportunity to learn from the experience of other groups, during technology projects the examination of a full scale working model of the new technology under actual conditions enables learning to take place prior to implementations. In many ERP implementations playpens or sandboxes are used prior to implementation.



Technical and Organizational uncertainty, can be conceptualized as a lack of knowledge about the new technology and its' impact on the organization. Each type of uncertainty captures a specific type of knowledge that the recipient firm lacked during the beginning of the project.

According to Daghfous (2004), learning activities play a different role under different conditions. These conditions relate primarily to the degree and type of uncertainty perceived by the firm at the beginning of the project. A summary of the Daghfous study:

<b>High Technical Uncertainty</b>	<b>High Organizational Uncertainty</b>
<ul style="list-style-type: none"> <li>• Emphasize experimentation</li> <li>• Train cross-functional teams to acquire new skill and knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Training cross functional teams</li> <li>• Enhance skills and acquisitions through acquisitions</li> </ul>

	<ul style="list-style-type: none"> <li>• High level of technical knowledge of existing technologies required</li> </ul>
<b>Low Technical Uncertainty</b> <ul style="list-style-type: none"> <li>• Systematic learning from past experiences</li> </ul>	<b>Low Organizational Uncertainty</b> <ul style="list-style-type: none"> <li>• Lessons learnt</li> <li>• Unlearn counter productive ones</li> </ul>

Table 5.1 : Learning activities under different conditions (Daghfous, 2004)

It is important for firms to determine the type of knowledge the learning activity is intended to create. This understanding as well as the understanding of the level of organizational uncertainty will position the firm to emphasize and enhance the appropriate learning activities to achieve a high degree of learning.

### 5.1.2 Learning Initiatives

Organizations have attempted to increase their effectiveness and efficiency by enhancing their organizational learning through the use of teams, collaborative processes and specific learning initiatives.

Remedios and Boreham (2004) define some of the learning initiatives that organizations have implemented. These are:

- **Systematic Approach**, where employees are encouraged to work independently in teams to solve problems encountered in the workplace, it is initiated by the employee, thus encouraging a more pro-active and participatory approach. This process has hypothesized to produce the most positive motivational experiences because individuals are unlikely to feel pressure to perform well and it is highly likely that problems will be solved.

However, according to Dale (2005), these team processes are not institutionalized so as to gain the full buy in of the organizational leadership. The team preparation and support are inadequate; the teams are adrift as isolated islands of structural change and not linked to other teams, resources and support. Under an ERP implementation scenario, pockets of teams that



are created in organizations do not bode well for the high level of integration understanding required of the ERP.

- The Procedures and Competence Development Methodology, this procedure was brought in to engage the process operators in writing standard operating procedures (SOP's) which specifies how major tasks are carried out. Granebring and Revay (2005) however, state that ERP's require that employees have new technical and human platforms to conquer and during the initial period of the implementation this knowledge does not exist which makes it difficult to engage with process operators under this initiative, thus delivering sub-optimum SOP's to the workforce at large.
- Tasks and Targets (TAT), the line manager set each employee a range of individual objectives in addition to his or her regular duties. These targets are linked to pay. The more targets reached the more money they earn. The manner in which this initiative is implemented may crucially impact on whether the initiative will be taken up by the employees. Employees satisfied with their earnings are likely to take a cost-benefit approach to deciding whether to pursue their targets and may decide the effort is not worthwhile.
- Benchmarking, matching its performance against industry standards. Benchmarking does not necessarily take the domain or context of the organization into account. ERP's are designed on the fundamental basis of best practices, applying them into organizations that do not have the same context can be problematic. Organizational context refers to the local environment (i.e. skills, rites, rituals, language, culture, structure and systems).

These activities and initiatives are likely to contribute to knowledge transfer, even though deploying some of them under an ERP implementation scenario can be rather extraneous. The effectiveness of knowledge being transferred can be determined when learning takes place through the manifestation of new knowledge being created and that there is a noticeable achievement of the objectives.

## 5.2 Learning Barriers

### 5.2.1 Activities that prevent developing a Learning Orientation

When an organization is in a domain of new situations this is the ultimate learning environment. If not, the organization will tend to look at such problems through the filters of past experience. In hindsight, this behavior is easy to identify but at the time the dominant language and belief systems make it far from obvious.

When an organization is alienated from its environment (i.e. an organization is unable to make sense of the changes surrounding it), the organization will focus on survival rather than creativity and collaboration, knowledge hoarding will dominate, learning will be non-existent and the organization will turn in on its self. Organizations that acquire an exquisite fit with the current surroundings may be unable to adapt when these surroundings change.

Most organizations have an informal network of relationships and interrelationships with others in the organization and with external stakeholders. These relationships though not formally charted are powerful and important. It is within this network that people will create, destroy, act and neglect learning. However, these networks can also foster creativity, so it depends largely on how alienated from the environment the organization is.

Organizations that utilize symbolic languages to convey a large amount of knowledge, where each symbol has different meanings according to the combination of symbols that precede it, the language becomes difficult to comprehend. Such languages convey ideas, concepts, values and beliefs at an emotional and intellectual level simultaneously. This problem with this is that if you have not been part of this language for a long time it is an extremely strong barrier to be overcome by the external consultants brought into the company to implement an ERP. It can lead to misunderstandings of requirements and thus impractical and incorrect process designs can be transferred back to the business.

Although human beings are born with an instinct for learning (Kline & Saunders, 1993:134), the following logical barriers sometimes prevent us from doing so:

- when some crucial piece is missing from the presentation of something we have to learn, we are left with no logical way of understanding it.
- when we do not see the relevance of the new information, we have a hard time learning things on command
- when we do not know why we are learning them
- if we are to learn something well, it must pass our personal ethical standards
- when we are uncomfortable with the process initiated to foster learning and we fear it.
- when the cultural mind-set of the organization does not foster a feeling of safety, positive personal relations, respecting individual thinking
- lack of confidence about the unfamiliar and a belief that new information is difficult to master

Individuals, who are embedded in scripted behavior, want to continue in their comfort zone. Comfort zones provide space for the individual to express themselves; it creates a sense of distinctiveness, and enhances a positive view of themselves as a contributing member of the organization. These individuals usually have their interests rooted in the organization they operate in. This means their economic well-being, psychological comfort zone and social status are all tied to the current context of the organization (Seo, 2003). (Sun and Scott, 2005:84). This presents an emotional barrier as it escalates the fear of losing their comfort zones.

Levitt and March (1988), observe that organizations as entities stop actively seeking alternatives once they have built up experience in known routines. This creates built in barriers to adaptations at the organizational level, such as ‘superstitions learning’, that is, viewing desired outcomes as a result of well-reasoned organizational actions, and ‘competency traps’, that is, a belief that the current practices are better than potential alternatives, leading to the continuity of inferior work processes.

According to Garratt (2000), human beings design their behavior based on their interpretations of the environment. Since the interpretation occurs without conscious

awareness, they cannot be easily altered. Secondly, as organizational members share the same tacit assumptions they are unaware of the extent to which their interpretations are subjective. Organizational routines reinforce the validity of shared interpretations creating a self-reinforcing dynamic.

Organization's are characterized by 'defensiveness, self-fulfilling prophecies, self-fueling processes and escalating error. These are difficult to change due to imbedded reinforcing dynamics created by defensive reasoning strategies that individuals are unaware of using. To change these routines Argyn's (1982) argues that individuals must learn an alternative cognitive program. Senge (1996) also views properties of individual cognition as the critical source of leverage for creating effective organizations and for real learning to occur. Both propose that tacit sources of ineffectiveness must be made explicit in order to be changed and maintain that this blindness is unlikely to correct itself without outside intervention.

The responsibility for learning development is vested in the line managers. However, this is not workable as the line managers have no time. In some organizations, the responsibility has been transferred to the individual themselves. The problem with this is that the individuals are too powerless and unskilled in learning to handle devising learning initiatives for themselves.

Another barrier to learning is organizations that do not have continuous training programs that support both highly codified information and soft skills that enable the individuals to gain competence in discriminating questions. This lack of personal development of individuals is exacerbated by, the idealization of past experience, the charismatic influence of other successful managers, the impulse of instant activity (rather than thought), the belittlement of sub-ordinates.

Organizations abound with learning disabilities when people in organizations

- focus only on their positions, with little or no sense of responsibility for the results produced when all positions interact. ERP systems demand a high level of integration. This is a death knell to effectively absorbing ERP's into the organization.

- finding someone or something outside ourselves to blame when things go wrong
- the illusion of taking charge.
- if thinking is dominated by short term events
- when our actions have consequences beyond our learning horizon.
- Skilled incompetence, organizations that are full of people that are proficient at keeping themselves from learning.

Finally, and probably the most important barrier is unlearning. In the same way that we must learn how to learn, we must learn how to unlearn, that is, to let go of knowledge that is no longer useful. The brain doesn't erase memories, it changes connections, renewing some and letting go of others. This is what amplifies the problem of unlearning.

During unlearning it is important to let go of:

- the current models and mental frameworks that were used to make decisions
- discard unwanted and redundant skills and capabilities
- erase the guiding frameworks that implicitly drive how you act and make decisions
- let go of deeply held relationships and passion that are no longer valid in the current world, for example, people are unable to let go of the legacy of past greatness
- let go of ideas that no longer add value.

Unlearning is emotionally difficult because the old way of doing things has worked for a while and become embedded in our beliefs and behaviors. The way we let go of knowledge depends on the content of the new knowledge to be acquired and the context of the situation. Losing knowledge in an organization can be either a forced or voluntary action. When losing knowledge is a forced and unplanned activity, the owner of the knowledge has little warning and the trauma could result in very little unlearning taking place. According to Cope (2004), work is inherently an emotional experience. Emotions are intrinsic to our essence and cannot be artificially segregated

between our personal lives (where feelings are allowed) and professional activities (where cold logic is preferred).

Neurologists recently located emotional processing in certain prefrontal areas of the brain called the amygdale. This amygdale seems to allow emotions to impact upon the strength of storage of information in the short term memory of the brain. Strong feelings of anxiety and anger can create neural static, damaging the ability to manage knowledge contained in the short term memory. (Cope, 2000).

Based on the definition of an organizational learning orientation in this study, each of these barriers can contribute to an organization that is unable to adapt, cannot learn, does not communicate openly and does not transfer or create knowledge. Of dire consequences are the perpetuations of skills and mindsets that will eventually cripple such an organization.

### **5.3 Barriers to Knowledge Transfer**

The literature (Carayannis, 1999; Cummings & Teng, 2003; Lee, 2000) abounds with constructs that act as barriers to knowledge transfers. When these barriers exist either in a team or an organization, knowledge is not transferred and the consequences are either failed objectives or projects.

Some of these barriers that will be discussed are:

- Trust
- Source credibility
- Communication
- Absorptive Capacity and Abstraction
- Arduous relationships
- Shared Understanding
- Commitment
- Motivation

#### **5.3.1 Trust**

Based on the literature studied trust appears in almost all the reviews with knowledge transfer as a theme, however, this is not empirically tested by itself but rather as an embedded element in the sub-these of the various studies (i.e. source credibility, arduous relationship).

Essentially, trust is necessary for building and maintaining a caring and productive relationship. It fosters open communication. When we have a high degree of trust in the other person, we tend to communicate accurate, relevant and complete information and we tend to be willing to share our thoughts, feelings and ideas.

Trust is not an aspect of an individual's personality; it is an aspect of a relationship. It has to do with ethical and morally justified behavior. When you choose to trust another person, the decision involves:

- acknowledging that the decision can lead to a gain or loss
- the behavior of the other person can affect whether you gain or lose
- any lose you suffer will be greater than gain
- the other person will behave in a way that will lead to gain

Trusting involves openness, the sharing of information, ideas, thoughts, feelings, and reactions to the issue being discussed, self-disclosure (revealing how you are reacting to the situation) and sharing.

For trust to develop one person has to let down his or her guard and become vulnerable to see whether the other persons abuses that vulnerability. There are a number of behaviors that will decrease trust in a relationship:

- laughing at the other person
- openly moralizing about the others' behavior
- silent poker-faced or rejecting actions
- evaluating the other in your response
- refusing to reciprocate in openness and sharing

### **5.3.2 Source Credibility**

The senders' credibility refers to the receivers' belief in the trustworthiness of the senders' statements. There are several dimensions that affect the credibility of the sender:

- the reliability of the sender as an information source
- the senders dependability, predictability and consistency
- the intentions of the sender or the senders' motives.
- The senders' relevant expertise on the topic under discussion

A dynamic sender is seen as aggressive, empathic and forceful and tends to be viewed as more credible than a more passive sender.

### **5.3.3 Absorptive Capacity and Abstraction**

Absorptive capacity and abstraction is the ability of a recipient to recognize the importance and value of externally sourced knowledge, the assimilation of the knowledge and the application of it. Absorptive capacity is largely a function of the recipients' existing stock of knowledge prior to the transfer. Many studies have indicated that absorptive capacity is positively related to knowledge transfer.

Davenport and Prusak (2000) argued that the knowledge transfer process consists of transmission and absorption, culminating in a behavioral change by the recipient. They considered a lack of absorptive capacity in the recipient as friction, which slows or prevents transfer. (Daghfous, 2004:940).

Kim (1998), argued that the success of organizational learning depends on the firm's absorptive capacity, which is determined by the firms prior related knowledge.

Bohn (1994) stated that if workers do not understand a process, they cannot handle unanticipated situations, nor can they do much to improve the process, even if they are motivated. (Daghfous, 2004:940).

### **5.3.4 Communication**



To life is to communicate. What prompts communication is our desire for someone else to know what we know and to value what we value and to feel what we feel and to decide what we decide. (Johnson, 2006:123).

Communication requires both the decoding and encoding of messages. Decoding, is the ability to listen, be attentive and respond quickly. Encoding, is the source's ability to express one's ideas clearly, have a good command of the language and be easily understood. Key factors in a communication climate include openness and reliability of information.

Johnson (2006), states that communication can be viewed as a linear process, in which, a sender creates a message and sends it through a channel to a receiver, who interprets the message and replies. This activity takes place simultaneously.

Different people have different perspectives. The same messages can mean two entirely different things to two entirely different people. To phrase your messages effectively you need to take into account the perspectives of the receiver.

In addition, to sending skills, effective communication depends on receiving skills. These skills are paraphrasing, negotiating for meaning, perception checking, taking the senders' perspective in interpreting the message.

The skills in expressing effectively any thoughts or information in your mind, is a crucial skill in drawing the attention of the recipient.

In a study by van der Hoff and de Ridder (2004), communication climate was found to be a crucial variable in explaining knowledge transfer. A positive communication climate was found to positively influence knowledge transfer and affect commitment.

Furthermore, in communication, you tend to be more sensitive to perceiving messages that are consistent with your opinions, beliefs and attitudes. You even learn and remember material that is consistent with your opinions, beliefs and attitudes much better than material that is not. (Johnson, 2006:153).

Communication difficulties between parties can impede efforts to share knowledge and to understand the differing world views, rendering the implementation of technology solutions problematic. (Ko, Krisch, King, 2005:62).

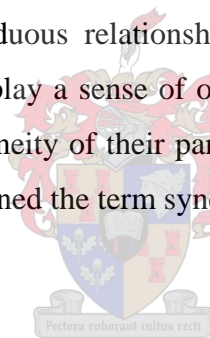
Sol et. al (2000) found that key users, IS personnel and vendors involved in ERP implementations had different knowledge bases, which they found difficult to transfer to each other because of their varied backgrounds and interests. (Ko, Krisch, King, 2005:62).

### **5.3.5 Arduous relationships**

According to Szulanski (1996), an arduous relationship can be defined as an emotionally laborious and distant relationship between a source and a recipient. This will affect the ability of the source to transfer the needed knowledge to the recipient.

Synergy is the antithesis of arduous relationships. Ward a 19<sup>th</sup> century botanist noticed that natural systems display a sense of order, integrity and wholeness which overcomes the obvious heterogeneity of their parts. This however, could only occur in the presence of energy. He coined the term synergy to describe this phenomenon.

### **5.3.6 Shared Understanding**



Shared understanding represents the extent to which the work values, norms and philosophy, problem solving approaches and prior work experiences are similar.

Shared understanding removes the barriers of understanding and acceptance between a source and a recipient and that both participants, thereby enhance their ability to work towards a common goal. Without shared understanding, there is a tendency for the parties to disagree about what they should be doing and why which leads to poor outcomes.

Typically, in an ERP project, the implementers, especially those that use a large component of external consultants, struggle to align the understanding of the project deliverables, as each of the external parties involved have their own diverse

backgrounds, motivations for being on the project and levels of commitment to the project.

### **5.3.7 Commitment**

Meyer and Herscovitch (2001) defined commitment as a force that binds an individual to a course of action that is of relevance to a particular target. According to Cohen (2003) commitment can take various forms and can be directed towards' various targets, or foci. Mowday et. al, (1979) defines organizational commitment as the "relative strength of an individuals identification with and involvement in a particular organization. Meyer and Allen (1997) argue that affective commitment is positively related to individuals' willingness to commit extra effort to their work, to donate and share knowledge. Hall (2001), argues that people are more willing to share their knowledge if they are convinced that doing so is useful. (Meyer, Becker, Vandenberghe, 2004).

An individual who is more committed to the organization has more trust in both management and co-workers, is more likely to be willing to share their knowledge. This conclusion is also drawn by Jarvenpaa and Staples (2001), who state that "greater commitment may engender beliefs that the organizations have rights to the information and knowledge that one has created or acquired. (van der Hoff and de Ridder, 2004:119). In a study by van der Hoff and de Ridder (2004) they showed that commitment to the organization is found to be an influence on knowledge transfer.

However, in situations where fostering commitment is difficult, (for example, because of a history of trust) or because it is undesirable, (for example, flexibility in staffing is required), knowledge transfer becomes impossible and hoarding of knowledge begins to take place.

### **5.3.8 Motivation**

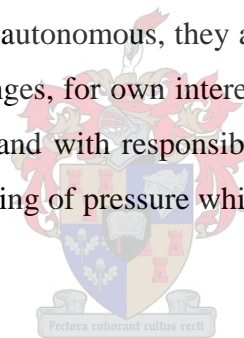
Motivation is defined as an energizing force as it induces actions in employees. At the heart of the motivation process is goal setting. These goals can either be self-

regulated or assigned by others. The review of the literature revealed that there are two main aspects of motivation, namely, intrinsic motivation and extrinsic motivation.

Intrinsic motivated behavior is undertaken purely for individual self-satisfaction and reflects the “inherent tendency to seek out novelty and challenges, to extend and exercise one’s capacities to explore and learn”, (Ryan and Deci, p70). Extrinsically motivated behavior refers to the “performance of an activity in order to attain some separable outcome” (Ryan and Deci, p71). (Meyer, Becker, Vandenberghe, 2004).

In intrinsic motivation people often value the satisfaction derived from giving for reasons of professional affiliation or commitment to a larger cause. When knowledge is transferred the individuals must be motivated to share accurate information on a timely basis. The lack of motivation may result in procrastination, passivity, feigned acceptance, sabotage or out-right rejection of change initiatives. (Szulanski, 2000:12).

Secondly, when individuals feel autonomous, they are intrinsically motivated to learn and seek out novelty and challenges, for own interests and enjoyment, however, with autonomy comes responsibility and with responsibility comes a pressure to perform well and this can stimulate a feeling of pressure which undermines the motivation that individuals initially felt.



Extrinsic motivation, that is the use of reward and punishment can have a powerful impact on behavior, this can lead to negative consequences including lower task satisfaction, lower effort and less persistence.

## Chapter 6

### 6. Conclusion

#### 6.1 Synopsis and Limitations

This research was focused on exploring empirical research studies on activities and barriers that prevent organizations from developing a learning orientation, and to investigate the literature for relationships between organizational learning orientations, knowledge transfer and ERP implementations.

The conceptual review of the literature has highlighted a significant number of studies around the questions posed in this study.

The *first question*, are their learning activities or initiatives that contribute to knowledge transfer? The study details a number of initiatives that is and can be implemented by organizations to foster learning. Augmenting skills in the organization through employment, acknowledgement and the understanding of prior knowledge relating to technology implementations and the understanding of the lessons learn't, providing a platform or tools to enable experimentation and dealing with uncertainly by scanning outside the organization for possible cues or experts to assist with putting in place measures to address the uncertainty all lead to creating a learning orientation.

The *second question*, are there learning barriers that prevent organizations from developing a learning orientation? The barriers identified in the literature reviewed covered the following constructs:

- lack of continuous learning,
- an intense and cryptic symbolic organizational language which makes it difficult for external consultants to interpret the actual meaning,
- when the organization is being asked to learn something which makes no sense,
- individuals caught up in their comfort zones,
- weak human resource support to develop learning programs,

- incorrect interpretation of the environment and,
- finally the inability to unlearn previous skills and knowledge especially if they are rooted in past glory.

The *third question*, is there knowledge barriers that inhibit knowledge from being transferred, even though the organization may have a learning orientation? Organizations' that have a learning orientation are characterized largely by their ability to adapt to the constant change that's inflicted on them as a result of the changing environment in which the organization exists. This ability to adapt requires acceptance that the values, rites, rituals, processes and culture can and must renew itself. It is expected that organizations of this nature should have no problem in receiving knowledge, however the literature has revealed that there are a number of barriers which do exist, these are trust, source credibility, that is, reliability of the sender of knowledge, communication, absorptive capacity and abstraction, arduous relationships, shared understanding, commitment and motivation. Each of these constructs in the literature were evaluated against either technology transfers or projects. The literature reviewed in this study did not conclusively test the ability to transfer knowledge in organizations with a learning orientation.

Finally, with regards to the relationship of organizational learning orientation, knowledge transfer and ERP's, the literature study did not reveal any studies that debated the 3-way construct. Furthermore, the literature between knowledge transfer and organizational learning had overlapping and contradictory discussions, for example, knowledge is transferred when the values and belief systems are altered due to assimilating new knowledge, similarly learning takes place when the values and norms of the organizations changes.

Thus, the association of organizational learning orientations as an antecedent to knowledge transfer in ERP's, could not be confirmed, however, based on this synopsis of the problems addressed in this study one can only infer that without a learning orientation and knowledge transfer, ERP's will continue to present themselves as technology that is fraught with difficulties during implementations

especially as they demand an exponential growth in learning activity during the initial implementation phase.

Clearly developing a learning orientation is not a quick fix, nor is it likely to be achieved without access to power, influence and time. Organizations that are embarking on an ERP system would be wise to first study the organization from the aspects of the ERP critical success factors as well as the knowledge transfer and learning orientations that are deemed necessary. This will guide the organization in developing the correct learning initiatives necessary to be successful.

## **6.1 Future Research**

The literature is clearly not comprehensive and some the research problems that can be studied in future are; is the organizational learning activities a higher contributor to knowledge transfer or is the content of prior learning more important during and ERP implementation. Does the complexity associated with the ERP project affect the transfer of knowledge from the project team to the business even though the organization may have a learning orientation.

Finally, a more focused research effort will be necessary to conclusively determine a relationship between an organizational learning orientation, knowledge transfer and ERP implementations.

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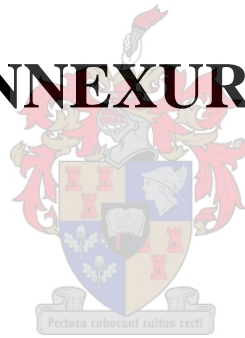
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# ANNEXURES



## ANNEXURE A : SUMMARY OF LITERATURE FROM PUBLICATIONS

No	Author	Country	Purpose	Method and Sample	Findings
1	Alas R Sharifi S  (2002)	UK	Examine the relationship between organizational change and organization learning	137 companies Interviews Qualitative	90% of the companies interviewed transformational change had taken place. Managers underestimate resistance to change and learning and did not understand the cause of resistance.
2	Argote L Ingram P Levine JM Moreland R  (2000)	USA	Puts forward an argument that states that knowledge transfer is important and identifies factors that facilitate the transfer or act as barriers to the transfer of knowledge	Opinion	Barriers to transferring knowledge: <ul style="list-style-type: none"> <li>• Social identities</li> <li>• In-group favoritism</li> </ul> Facilitating factors <ul style="list-style-type: none"> <li>• Learn from the experience of others</li> <li>• Interpreting and combining information</li> <li>• Storing information</li> </ul>
3	Carayannis E.G.  (2005)	USA	Study to identify the presence of multi-level technological learning in high risk and technology intensive business environments	19 Companies, over 2-3 years Interviews	Constructs identified : <ul style="list-style-type: none"> <li>• Learning from experience</li> <li>• Learning how to learn</li> </ul>
4	Chen S  (2005)	Australia	Examines how task participation (outsource versus insource) in a project influences learning and knowledge development	1 Company, 3 projects Interviews and Observation Qualitative	Information flow depends on communication in projects.  Patterns of communication influence the learning process and knowledge that results.  Particular project designs tend to favor particular types of learning and knowledge

					created.
5	Choi B Heeseok L  (2002)	South Korea	Analyses how various KM styles affect performance	Empirical Investigation 100 companies Response rate 63% Questionnaires	Organizational performance differs by KM methods: <ul style="list-style-type: none"> <li>• dynamic (tacit-explicit knowledge),</li> <li>• system-(codify and reuse knowledge),</li> <li>• human-orientated (sharing knowledge), and</li> <li>• passive styles. (no interest in knowledge)</li> </ul>
6	Cummings JL Teng BS  (2003)	USA	Determine what factors positively influence knowledge transfer during R&D projects	15 Industries Hypothesis testing	Successful transfers took when parties share similar knowledge bases, the interactions between source and recipient was high, when it once understood where the desired knowledge resided.
7	Daghfous  (2004)	United Arab Emirates	An investigation of the roles of prior knowledge and learning activities in technology transfer	1 Company., 1 project Questionnaire	A positive relationship was found between learning activities performed by the firm during development and implementation stages. In contrast, prior knowledge of the firm about existing technology was found to have a marginal contribution. The constructs identified : <ul style="list-style-type: none"> <li>• The role of prior technical knowledge</li> <li>• The role of prior organizational knowledge</li> <li>• The role of learning activities</li> <li>• The role of experimentation</li> <li>• The role of competency acquisition</li> <li>• The role of learning from past experiences</li> </ul> <p>Different learning activities were found to play a different role under different conditions.</p>
8	Dale, WL  (2005)	USA	Elaborates a conceptual framework for learning organizations that will define what makes a group a learning team and for the unit to become a learning community	Literature Study	To build a group that makes them effective at learning and then transitioning to a community the design of this group should have the following: <ul style="list-style-type: none"> <li>• Synergy</li> </ul>

					<ul style="list-style-type: none"> <li>• Co-mentoring</li> <li>• Utilize learning resources</li> <li>• Integrate knowledge and create potential solutions</li> </ul>
9	Dawes PL Don YL Midgley D  (2005)	UK	Test a structural model of organizational learning in the context of the purchasing of an expensive and complex product in the information technology area. The key focus of the research is the affect external consultants have on organizational variables, formalization, strategic importance, stakeholding and prior experience.	Quantitative, hypothesis	<p>External IT consultants can contribute both directly and indirectly to organizational learning, however, since consultant come with varying levels of skills it is imperative that organizations embarking on a large IT project search extensively for the right consultant for their particular set of circumstances.</p> <p>Second, prior experience plays a major role when making a large IT investment.</p>
10	Dong-Gil Ko Kirsch, J King WR  (2005)	USA	Examines the antecedents of knowledge transfer in the context of such an interfirm complex information systems implementation environment	Quantitative, hypothesis 80 client organization across industries, 38 consulting firms 96 projects, Survey instrument	<p>Knowledge factors that impede transfer</p> <ul style="list-style-type: none"> <li>• Shared understanding</li> <li>• Arduous relationships</li> <li>• Absorptive capacity</li> <li>• Motivational factors</li> <li>• Communication related factors</li> <li>• Source credibility</li> <li>• Recipients communication decoding competence</li> <li>• Trust</li> <li>• Communication encoding</li> <li>•</li> </ul>
11	Ellerman, D Denning S and Hanna N  (2001)	USA	An essay on promoting the active development of learning in developing countries	None	Projects must be designed with a highly adaptable learning mode as opposed to a blueprint in order to absorb the complexity and uncertainty that work entails
12	Gilbert M and Cordey-Hayes M  (1996)	UK	Presents the development of a conceptual model for understanding the processes of knowledge transfer to achieve successful technological innovation	Qualitative, Questionnaires	A model that defines the process of transferring knowledge.



13	Goldsmith M Stewart L Ferguson L  (2005)	Australia	Providing sufficient quality experience for students to develop competence has been recognized as a problem in skill acquisition. This study evaluates the peer learning approach as a means of developing competence (1 <sup>st</sup> year nurses very paired with 3 <sup>rd</sup> year nurses)	Questionnaire	Found that the experience enabled 3 <sup>rd</sup> year students to reflect strongly on the knowledge they have in order to assist the 1 <sup>st</sup> year. <ul style="list-style-type: none"> <li>• Self reflection and self assessment</li> </ul>
14	Granebring A, Revay P  (2005)	Sweden	To determine the constraints related to establishing an ERP CC.	1 Companies, 3 projects Interviews and Observation Qualitative	ERP CC, must conquer new technical, marketing and human platforms and are thus difficult to establish
15	Haines MN and Goodhue, DL  (2003)	USA	Generates a framework that explains how consultant involvement and knowledge of the implementing organization can impact the outcome of the project	12 Companies, 3 projects Interviews and Observation Qualitative	Choosing the right consultants and using their skills appropriately, as well as transferring and retaining essential knowledge within the organization is essential to overall success of an ERP Implementation.
16	Hoof B Ridder J  (2004)	Amsterdam	Testing the hypothesis regarding the influence of commitment, climate and computer-mediated communication (CMC)	5 Companies, Questionnaire 444 respondents Qualitative	Commitment to the organization positively influences knowledge transfer, with communication being paramount.  In addition, it was determined that the more knowledge a person has the more knowledge they are willing to transfer.
17	Jerez-Gomez P Cespedes-Lorente J Valle-Cabrera R  (2003)	Spain	Develops a measuring scale for assessing the organizational learning capability	415 Companies, Questionnaire 26.75% response rate Qualitative	The scale developed helps reveal the different areas of organizational learning in which managers can act to develop this scale. <ul style="list-style-type: none"> <li>• Trust</li> <li>• Managerial commitment</li> <li>• Systems perspective</li> <li>• Openness and experimentation</li> <li>• Integration and Knowledge transfer</li> </ul>
18	Kallinikos J  (2004)	UK	ERP's are predicated on the understanding of human agency as a procedural affair and of organizations as an extended series of functional or cross-	Literature Study	ERP's work if the procedures are followed robotic like. They have no tolerance for the human element that give rise to cues and materials that help make sense of particular

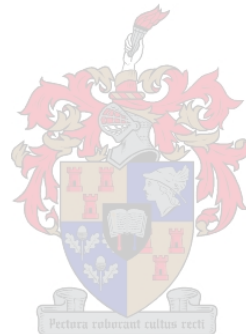
			functional transactions. Argue by the author is that the whole human element is totally underestimated in deploying ERPs'.		situations.
19	Karlsen JT Gottschalk P  (2003)	Norway	Identifies the impacts of knowledge transfer mechanisms on information technology	1072 Companies, response rate 6.5% Questionnaire Hypothesis testing Qualitative	Significant correlation between the extent of serial transfer of knowledge and project success.  Project success is related to the extent of strategic transfer of knowledge  Project success is positively related to expert transfer of knowledge
20	Kim, Y Lee, Z Gosain, S  (2005)	USA	To establish the impediments in ERP Implementations	Questionnaire Qualitative	Most critical impediments are from functional co-ordination problems related to inadequate support from functional units and co-ordination among functional units. These stem from early in the project.
21	Lee Z Lee J  (2000)	USA	Analyzing ERP implementations from a knowledge transfer perspective	Case Study University of Nebraska In-depth interviews, process analysis and documentation analysis.	Organizations adaptive capability, concerning role and responsibility redistribution, the development of new types of required knowledge influence an organization's ability to internalize the business processes and business rules incorporated in the package.
22	Laurence LL  (2005)	Australia	To provide an argument and a practical approach for achieving a balance between business process optimization and the use of human centered business practices.	None	A framework is provided to enable an appropriate balance between process/practice balance for maximum organizational advantage.
23	Leseure MJ Brookes NJ  (2004)		Deals with the knowledge management in project environments and the capability to transfer knowledge across project teams. Specificity around the kernel (generic) and ephemeral (specific)	Interviews Qualitative	There is a correlation between good project management practices and teams exhibiting good practices for managing knowledge.

			knowledge is focused on.		
24	Lin L Geng X Whinston AB (2005)	USA	The goal of this paper is to study why and how information structures affect the effectiveness of knowledge transfer and to suggest a framework to facilitate optimal knowledge transfer	Qualitative	Enhances the understanding of constructs surrounding information asymmetry and the impact it has on tacit knowledge being transferred.
25	Malik K (2001)	UK	Uses a case study to illustrate the problems of managing the transfer of knowledge	Case Study 1 Company, 25 managers Interview Qualitative	Some of the constructs that emerged <ul style="list-style-type: none"> <li>• Formalizing technology transfer processes</li> <li>• Investing in the recipient organizational capabilities</li> <li>• Trust</li> </ul>
26	Meyer JP Becker TE (2004)	Canada	The authors put forward an argument that commitment and motivation are distinguishable albeit related concepts.	Literature Study, conceptual analysis	Integrated the best and the most current elements of both into a single theory. The integrated theory provides insight into the understanding of human behavior in the workplace.
27	Nah FF Lau JL (2003)	USA	Survey on critical success factors in ERP implementations	Qualitative Fortune 1000 companies 54 responses valid out of 76 Survey for CIO's	CIO's rated top management support, project champion, ERP teamwork and composition of team, change management and culture.
28	Poell RF, and Ferd van der Krogt (2003)	UK	A critical examination of Nonaka and Takeuchi theory about knowledge creating companies, concerning two questions : <ol style="list-style-type: none"> <li>1. how is the learning of workers organized</li> <li>2. how is the learning related to work performance</li> </ol>	6 Companies, 16 projects Interview with 96 participants, and studying available project material Qualitative	Different workers employ different strategies in an organizational learning project  Hybrid learning strategies are used  No unequivocal relationships between learning strategy and work types.
29	Remedios R Boreham N (2004)	Scotland	To examine the effects of changing working practices on employees' intrinsic motivation. These working practices relates to the learning activities	18 individuals Petrochemical company Part of the European Framework V research project ORGLEARN	The organizational learning initiatives – systematic approach, procedures and competence development methodology, tasks and targets and Benchmarking did promote

			instituted by the organizations	Mixed qualitative and quantitative	knowledge sharing.
30	Richter FJ Vettel K  (1995)	UK	Describes the constructs for successful knowledge transfer in joint ventures	3 companies	Long-term learning success in joint ventures depends on communication channels and receptivity. In addition, abstraction and absorption capability is necessary.
31	Ruiz-Mercader J, Merona-Cerdan AL Sanchez RS  (2006)	Spain	To provide empirical evidence of the relationship between information technology and learning in small businesses as well as their impact on organizational performance.	253 Companies-small business in IT Interviews with a response rate of 59.9%	The nature of work performed in small business within higher knowledge intensity sectors, require higher level of use of information technology as well as implementation of practices that improve learning. These practices can be polyvalence, open values or individuals have high autonomy levels.
32	Simmonds PG, Dawley DD, Ritchie WJ, Anthony WP  (2001)	USA	The study is an exploratory effort to assess whether the work of the academic community has significantly influenced the practice of management in business organizations.	Focus Groups (5) Questionnaire Response rate on questionnaire 11%	The constructs addressed: <ul style="list-style-type: none"> <li>• familiarity</li> <li>• usefulness</li> <li>• source</li> </ul> <p>The research determined that knowledge is transferred from the academic environments to the practicing managers</p>
33	Szulanski, G  (2000)	USA	Provides a process model of knowledge transfer and defines issues related to this transfer along the process.	Qualitative 8 companies 271 returned questionnaires, 61% response rate	Process thinking offers the possibility of learning to manage organizational learning that is, to plan knowledge transfers more effectively and to “unstuck” sticky transfers. <p>Some constructs evaluated are:</p> <ul style="list-style-type: none"> <li>• Source and Recipient lack of motivation</li> <li>• Source not perceived as reliable</li> <li>• Recipient lacks absorptive capacity</li> <li>• Recipient lacks retentive capacity</li> <li>• Unproven knowledge</li> <li>• Arduous relationships</li> </ul>

34	Tillema, H (2005)	Netherlands	Knowledge productivity is used to investigate the outcomes of collaborative inquiry-oriented activity among professionals.		If the following 3 conditions are met a favorable environment is created for collaborative inquiry: <ul style="list-style-type: none"> <li>• Raising problem understanding</li> <li>• Shifting perspectives</li> <li>• Commitment</li> </ul>
35	Tjandra IK Tan W (2000)	Singapore	Explores the organizational learning practice in the construction firms operating in Jakarta	Qualitative Questionnaires Response rate 7.33%	The four main factors that determine organizational learning is leadership, group dynamics, employee turnover, and lessons learnt.
36	Verville, J Bernadas C Halington A (2005)	USA	Discusses the critical success factor for ERP acquisition	Qualitative 3 companies Semi-structured interview 15 individuals	Ten critical factors identified to acquire ERP's successfully. <ol style="list-style-type: none"> <li>1. Planning and a Structured Process</li> <li>2. Rigorous Acquisition Process</li> <li>3. Definition of all requirements</li> <li>4. Establishment of selection and evaluation criteria</li> <li>5. Accurate information</li> <li>6. Clear and unambiguous authority</li> <li>7. Careful selection of the Acquisition team members</li> <li>8. Partnership approach</li> <li>9. User participation</li> <li>10. User buy-in</li> </ol>
37	Wieder B Booth P Matolcsy ZP Ossimitz ML (2006)	Australia	To determine the impacts ERP systems on organizational performance	Qualitative 8 companies 271 returned questionnaires, 61% response rate	Initially, the ERP system does not offer any significant performance differences, however once the initially investment period was passed slight improvement in performance is visible.
38	Yan Wu D Katok E (2005)	USA	Investigate the learning and communication on the bullwhip effect in supply chains. Test for 4 behavioral hypothesis – bounded rationality, experiential learning, system learning	Hypothesis	Experience enhances learning,  Without communication, learning is stymied.

			and organizational learning		
39	Yin-Tong-Sun P and Scott, JL  (2005)	New Zealand	Provides insight into barriers to knowledge	Empirical research called the Delphi technique (a tool to obtain the opinion from a group of experts) 17 participants	First time the Delphi technique used for identifying barriers.  The barriers identified : <ul style="list-style-type: none"> <li>• Competency</li> <li>• Individual imperative</li> <li>• Team climate, relationships and norms</li> <li>• Organizational climate, relationships, systems and structures</li> </ul>



## ANNEXURE B : REVELENT MATERIAL FOR OBJECTIVES OF STUDY

No	Author	Country	Purpose	Findings	Theme
1	Alas R Sharifi S  (2002)	UK	Examine the relationship between organizational change and organization learning	90% of the companies interviewed transformational change had taken place. Managers underestimate resistance to change and learning and did not understand the cause of resistance.	Learning barriers
2	Argote L Ingram P Levine JM Moreland R  (2000)	USA	Puts forward an argument that states that knowledge transfer is important and identifies factors that facilitate the transfer or act as barriers to the transfer of knowledge	Barriers to transferring knowledge: <ul style="list-style-type: none"> <li>• Social identities</li> <li>• In-group favoritism</li> </ul> Facilitating factors <ul style="list-style-type: none"> <li>• Learn from the experience of others</li> <li>• Interpreting and combining information</li> <li>• Storing information</li> </ul>	Knowledge transfer barriers
3	Carayannis E.G.  (2005)	USA	Study to identify the presence of multi-level technological learning in high risk and technology intensive business environments	Constructs identified : <ul style="list-style-type: none"> <li>• Learning from experience</li> <li>• Learning how to learn</li> </ul>	Learning activities
4	Chen S  (2005)	Australia	Examines how task participation (outsource versus insource) in a project influences learning and knowledge development	Information flow depends on communication in projects.  Patterns of communication influence the learning process and knowledge that results.  Particular project designs tend to favor particular types of learning and knowledge created.	Learning barriers
5	Cummings JL	USA	Determine what factors	Successful transfers took when parties share similar knowledge bases,	Knowledge barriers

	Teng BS (2003)		positively influence knowledge transfer during R&D projects	the interactions between source and recipient was high, when it once understood where the desired knowledge resided.	
6	Daghfous (2004)	United Arab Emirates	An investigation of the roles of prior knowledge and learning activities in technology transfer	<p>A positive relationship was found between learning activities performed by the firm during development and implementation stages. In contrast, prior knowledge of the firm about existing technology was found to have a marginal contribution. The constructs identified :</p> <ul style="list-style-type: none"> <li>• The role of prior technical knowledge</li> <li>• The role of prior organizational knowledge</li> <li>• The role of learning activities</li> <li>• The role of experimentation</li> <li>• The role of competency acquisition</li> <li>• The role of learning from past experiences</li> </ul> <p>Different learning activities were found to play a different role under different conditions.</p>	Learning activities
7	Dale, WL (2005)	USA	Elaborates a conceptual framework for learning organizations that will define what makes a group a learning team and for the unit to become a learning community	<p>To build a group that makes them effective at learning and then transitioning to a community the design of this group should have the following:</p> <ul style="list-style-type: none"> <li>• Synergy</li> <li>• Co-mentoring</li> <li>• Utilize learning resources</li> <li>• Integrate knowledge and create potential solutions</li> </ul>	Learning initiatives
8	Dawes PL Don YL Midgley D (2005)	UK	Test a structural model of organizational learning in the context of the purchasing of an expensive and complex product in the information technology area. The key focus of the research is the affect external consultants have on organizational variables, formalization, strategic importance, stakeholding and prior experience.	<p>External IT consultants can contribute both directly and indirectly to organizational learning, however, since consultants come with varying levels of skills it is imperative that organizations embarking on a large IT project search extensively for the right consultant for their particular set of circumstances.</p> <p>Second, prior experience plays a major role when making a large IT investment.</p>	Knowledge transfer barriers



9	Dong-Gil Ko Kirsch, J King WR  (2005)	USA	Examines the antecedents of knowledge transfer in the context of such an interfirm complex information systems implementation environment	Knowledge factors that impede transfer <ul style="list-style-type: none"> <li>• Shared understanding</li> <li>• Arduous relationships</li> <li>• Absorptive capacity</li> <li>• Motivational factors</li> <li>• Communication related factors</li> <li>• Source credibility</li> <li>• Recipients communication decoding competence</li> <li>• Trust</li> <li>• Communication encoding</li> <li>•</li> </ul>	Knowledge transfer barriers
10	Ellerman, D Denning S and Hanna N  (2001)	USA	An essay on promoting the active development of learning in developing countries	Projects must be designed with a highly adaptable learning mode as opposed to a blueprint in order to absorb the complexity and uncertainty that work entails	Learning barriers
11	Goldsmith M Stewart L Ferguson L  (2005)	Australia	Providing sufficient quality experience for students to develop competence has been recognized as a problem in skill acquisition. This study evaluates the peer learning approach as a means of developing competence (1 <sup>st</sup> year nurses very paired with 3 <sup>rd</sup> year nurses)	Found that the experience enabled 3 <sup>rd</sup> year students to reflect strongly on the knowledge they have in order to assist the 1 <sup>st</sup> year. <ul style="list-style-type: none"> <li>• Self reflection and self assessment</li> </ul>	Learning initiatives
12	Granebring A, Revay P  (2005)	Sweden	To determine the constraints related to establishing an ERP CC.	ERP CC, must conquer new technical, marketing and human platforms and are thus difficult to establish	Learning barriers
13	Haines MN and Goodhue, DL  (2003)	USA	Generates a framework that explains how consultant involvement and knowledge of the implementing organization can impact the outcome of the	Choosing the right consultants and using there skills appropriately, as well as transferring and retaining essential knowledge within the organization is essential to overall success of an ERP Implementation.	Knowledge transfer barriers

			project		
14	Hoof B Ridder J  (2004)	Amsterdam	Testing the hypothesis regarding the influence of commitment, climate and computer-mediated communication (CMC)	Commitment to the organization positively influences knowledge transfer, with communication being paramount.  In addition, it was determined that the more knowledge a person has the more knowledge they are willing to transfer.	Knowledge transfer barriers
15	Jerez-Gomez P Cespedes- Lorente J Valle-Cabrera R  (2003)	Spain	Develops a measuring scale for assessing the organizational learning capability	The scale developed helps reveal the different areas of organizational learning in which managers can act to develop this scale. <ul style="list-style-type: none"> <li>• Trust</li> <li>• Managerial commitment</li> <li>• Systems perspective</li> <li>• Openness and experimentation</li> <li>• Integration and Knowledge transfer</li> </ul>	Knowledge transfer barriers
16	Kallinikos J (2004)	UK	ERP's are predicated on the understanding of human agency as a procedural affair and of organizations as an extended series of functional or cross-functional transactions. Argue by the author is that the whole human element is totally underestimated in deploying ERPs'.	ERP's work if the procedures are followed robotic like. They have no tolerance for the human element that give rise to cues and materials that help make sense of particular situations.	Learning barriers
17	Kim, Y Lee, Z Gosain, S  (2005)	USA	To establish the impediments in ERP Implementations	Most critical impediments are from functional co-ordination problems related to inadequate support from functional units and co-ordination among functional units. These stem from early in the project.	Learning barriers
18	Lee Z Lee J  (2000)	USA	Analyzing ERP implementations from a knowledge transfer perspective	Organizations adaptive capability, concerning role and responsibility redistribution, the development of new types of required knowledge influence an organization's ability to internalize the business processes and business rules incorporated in the package.	Learning barriers
19	Malik K	UK	Uses a case study to illustrate the problems of managing the	Some of the constructs that emerged <ul style="list-style-type: none"> <li>• Formalizing technology transfer processes</li> </ul>	Knowledge transfer barriers

	(2001)		transfer of knowledge	<ul style="list-style-type: none"> <li>Investing in the recipient organizational capabilities</li> <li>Trust</li> </ul>	
20	Meyer JP Becker TE  (2004)	Canada	The authors put forward an argument that commitment and motivation are distinguishable albeit related concepts.	Integrated the best and the most current elements of both into a single theory. The integrated theory provides insight into the understanding of human behavior in the workplace.	Knowledge transfer barriers
21	Remedios R Boreham N  (2004)	Scotland	To examine the effects of changing working practices on employees' intrinsic motivation. These working practices relates to the learning activities instituted by the organizations	The organizational learning initiatives – systematic approach, procedures and competence development methodology, tasks and targets and Benchmarking did promote knowledge sharing.	Learning initiatives
22	Richter FJ Vettel K  (1995)	UK	Describes the constructs for successful knowledge transfer in joint ventures	Long-term learning success in joint ventures depends on communication channels and receptivity. In addition, abstraction and absorption capability is necessary.	Learning barriers
23	Ruiz-Mercader J, Merona-Cerdan AL Sanchez RS  (2006)	Spain	To provide empirical evidence of the relationship between information technology and learning in small businesses as well as their impact on organizational performance.	The nature of work performed in small business within higher knowledge intensity sectors, require higher level of use of information technology as well as implementation of practices that improve learning. These practices can be polyvalence, open values or individuals have high autonomy levels.	Learning barriers
24	Szulanski, G  (2000)	USA	Provides a process model of knowledge transfer and defines issues related to this transfer along the process.	<p>Process thinking offers the possibility of learning to manage organizational learning that is, to plan knowledge transfers more effectively and to “unstuck” sticky transfers.</p> <p>Some constructs evaluated are:</p> <ul style="list-style-type: none"> <li>Source and Recipient lack of motivation</li> <li>Source not perceived as reliable</li> <li>Recipient lacks absorptive capacity</li> <li>Recipient lacks retentive capacity</li> <li>Unproven knowledge</li> <li>Arduous relationships</li> </ul>	Knowledge transfer barriers

25	Tillema, H (2005)	Netherlands	Knowledge productivity is used to investigate the outcomes of collaborative inquiry-oriented activity among professionals.	If the following 3 conditions are met a favorable environment is created for collaborative inquiry: <ul style="list-style-type: none"> <li>• Raising problem understanding</li> <li>• Shifting perspectives</li> <li>• Commitment</li> </ul>	Knowledge transfer barriers
26	Yan Wu D Katok E (2005)	USA	Investigate the learning and communication on the bullwhip effect in supply chains. Test for 4 behavioral hypothesis – bounded rationality, experiential learning, system learning and organizational learning	Experience enhances learning,  Without communication, learning is stymied.	Learning initiatives
27	Yin-Tong-Sun P and Scott, JL (2005)	New Zealand	Provides insight into barriers to knowledge	First time the Delphi technique used for identifying barriers.  The barriers identified : <ul style="list-style-type: none"> <li>• Competency</li> <li>• Individual imperative</li> <li>• Team climate, relationships and norms</li> <li>• Organizational climate, relationships, systems and structures</li> </ul>	Knowledge transfer barriers

