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# A FRAMEWORK TO SUPPORT KNOWLEDGE TRANSFER IN THE SERVICE SECTOR.

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## A FRAMEWORK TO SUPPORT KNOWLEDGE TRANSFER IN THE SERVICE SECTOR

Keywords: knowledge transfer, knowledge process, service sector,

Abstract: This paper introduces a framework for supporting and analysing knowledge transfer in the service sector, which centres on the individual in the process. It argues that the individual is at the centre of the transfer process and, as such, needs to be catered-to within both teams and organisations. Furthermore, the authors hope that a clear understanding and accurate identification of the factors that impact the knowledge transfer process for individuals can have an impact on the knowledge transfer process in teams and organisations, as teams and organisations are made up of individuals. The development of a suitable approach to support knowledge transfer for improved transfer of knowledge among these groups in the service sector is achieved using technology where appropriate, through the knowledge transfer framework which is presented.

### 1 INTRODUCTION

Business has become more service-oriented. The service sector has grown faster over the past few years than any other sector in the global economy. It now contributes a sizable percentage to the gross domestic product of most countries (CREST R&D in services Working Group, 2009, Eurostat, 2010). However research interests have mainly remained focused on the generation of products and associated areas, rather than on innovations in the service sector (CREST R&D in services Working Group, 2009, Eurostat, 2010). The service sector is one of the most knowledge-intensive sectors of the economy. It is based on the generation, representation, accessibility and transfer of knowledge between individuals, teams and organisations. Effective and efficient transfer of knowledge can assist the service sector in the control of cost, time and improving the quality of the services provided.

Knowledge transfer is seen as crucial to the management of knowledge in an organisation (Almeida and Kogut, 1999, Argote and Ingram,

2000b, Lahti and Beyerlein, 2000). During the past number of years researchers have carried out numerous studies on the effects of knowledge transfer, both internally and externally of the organisation (Gilbert and Cordey-Hayes, 1996, Moreland and Mayaskovsky, 2000, Paulus and Yang, 2000). In these studies, efficient and effective knowledge transfer has been recognised as being one of the critical success factors to successful knowledge management (Lahti and Beyerlein, 2000). In particular, the use of structural mechanisms to facilitate the transfer of knowledge; these include: personnel movement (Gruenfeld *et al.*, 2000); training (Bassi, 1997, Moreland and Mayaskovsky, 2000, Thompson *et al.*, 2000); communication (Lasswell, 1948, Levine *et al.*, 2000, Rulke, 2000, Stasser *et al.*, 2000, Lapré and Van Wassenhove, 2001); and observations (Nonaka, 1991) between individuals, teams and organisations (Grant, 1996, Spender, 1996, Argote and Ingram, 2000b, Sveiby, 2001).

The service sector is particularly dependent on the effective and efficient transfer of knowledge.

This sector of the economy is focused on people interacting with people. The products of the service sector are intangible, experience-based, and the product is provided through personal interaction (Kidd, 1994, Straub and Karahanna, 1998, Davis, 2002). The challenges for knowledge transfer in the service sector lie in the areas of effective acquisition (Zaltman *et al.*, 1973), communication (Levine *et al.*, 2000, Rulke, 2000, Stasser *et al.*, 2000), application (Chou, 2005) and assimilation (Zucker, 1977), as the knowledge transfer process is unique to each individual.

At the same time, it is increasingly recognised by government bodies that knowledge management, and in particular knowledge transfer, is one of the key factors in achieving sustainable growth and development in the economy (Enterprise Strategy Group, 2004, Inter Departmental Committee on Science Technology and Innovation, 2004, Irish Academy of Engineering and Engineers Ireland, 2005, Department of Enterprise Trade and Employment, 2006, National Competitiveness Council, 2007). Within the economy the service sector is seen as being an area of critical importance for the deployment of effective and efficient knowledge transfer (CM International, 2006, Service Strategy Group, 2008). The service sector is made up of knowledge workers. These knowledge workers use their knowledge to provide services to business and to the general public. Their knowledge is gathered from various sources and applied by them to provide a particular service (Kidd, 1994, Straub and Karahanna, 1998, Davis, 2002). During the performance of the service, knowledge is transferred between the service provider and the receiver and vice versa.

The main objective of the research is to improve the effectiveness of the knowledge transfer process in the service sector, firstly by providing a holistic understanding of the knowledge transfer processes in relation to the factors that have an impact on the process, and secondly by facilitating the effective and efficient transfer of knowledge between both the sender and receiver in the process to identify and analyse the needs and requirements, and adaptations necessary to meet them. In particular the research will provide guidance and support to individuals in the transfer process with regard to the needs and requirements of the sender and recipient. These requirements have been identified as:

- Individual-centred approach to knowledge transfer;
- Informed decision-making;
- Effective use of information and knowledge;
- Effective mechanism for knowledge transfer;

- Effective use of technology to support knowledge transfer.

Support is to be provided to both the sender and recipient in the knowledge transfer process through the knowledge transfer framework.

## 2 SERVICE SECTOR

The service sector is a vast sector of the economy it includes public service (healthcare, education), private service (transportation, energy providers) and voluntary service. The manufacturing sector produces goods, while the service sector creates services. A strong service sectors tend to be found in developed countries. The sectors primary input is information; as such the service sector produces less tangible products. The value chain in the service sector is virtual in nature and the customer is involved in both the production and delivery of the products produced by the sector. The performance measurements used in the service sector tend to be more qualitative in origin compared to the manufacturing sector which is more quantitative (Tien and Berg, 2003). The rise of service sector can be explained by the increased mechanisation of the manufacturing sector which has resulted in greater emphasis being paid to the supporting service functions (Encyclopaedia Britannica, 2010). These supporting services are made up of knowledge workers.

Knowledge work is described by Davis (2002) as being “cognitive rather than physical”. The knowledge workers are professionals, accountants, managers, programmer or lawyer. They provide evaluations, instructions, or arguments. This is achieved through the mental capabilities of the worker to develop information and knowledge from various sources and applying it to a particular area. In completing this form of work the knowledge worker accesses data from various sources. This may include information and knowledge sources that are gathered through personnel movement (Gruenfeld *et al.*, 2000); training (Bassi, 1997, Moreland and Mayaskovsky, 2000, Thompson *et al.*, 2000); communication (Lasswell, 1948, Levine *et al.*, 2000, Rulke, 2000, Stasser *et al.*, 2000, Lapré and Van Wassenhove, 2001); and observations (Nonaka, 1991) between individuals, teams and organisations (Grant, 1996, Spender, 1996, Argote and Ingram, 2000b, Sveiby, 2001).

The emerging services sector has been shown to be based more on electronic co-production compared to the more tradition physical mediums due to advancements in information and communication technology (ICT) (Kidd, 1994,

Drury and Farhoomand, 1999, Davis, 2002). There is also a shift towards more information driven services compared to data driven ones that are more adaptive to customer needs (Ducatel *et al.*, 2001). Hence the shift to more real-time decision making and mass customisation in the products that are offered by the service sector. To support this change in the service sector there is a need for effective and efficient knowledge transfer that can assist in providing services that are adaptive and flexible to meet the needs of the customer.

### 3 KNOWLEDGE TRANSFER

Knowledge transfer is also known as knowledge exchange, or sharing (Adler, 1990, Ontario Regional Knowledge Transfer and Exchange Workshop, 2006, Mitton *et al.*, 2007). Knowledge transfer is of particular importance due to the knowledge growth potential that occurs during the transfer of knowledge from one individual to another, and also from one organisation to another (Argote and Ingram, 2000b, Argote and Ingram, 2000a, Levine and Moreland, 2000, Sveiby, 2001). The transfer of knowledge is facilitated by meetings, personal contact and training as a means of diffusing and building knowledge (Nonaka, 1991, Argote and Ingram, 2000b, Gruenfeld *et al.*, 2000, Levine *et al.*, 2000, Moreland and Mayaskovsky, 2000, Rulke, 2000, Stasser *et al.*, 2000, Thompson *et al.*, 2000, Sveiby, 2001).

Knowledge transfer is part of a continuous learning process (Gilbert and Cordey-Hayes, 1996, Sveiby, 2001). Explicit knowledge can be transferred through books, databases and groupware technology. Tacit or implicit knowledge requires personnel interaction for the knowledge to be understood, transferred and developed further (Lahti and Beyerlein, 2000). Knowledge transfer of tacit or implicit knowledge occurs more free within an organisation than outside of it, as within the organisation there is a common understanding. Explicit knowledge is transferred more easily, as it can be codified and transferred in written or verbal form (Lahti and Beyerlein, 2000, Sveiby, 2001). Some of these problems include the inability to recognise the transfer potential of knowledge, inappropriate mode of communication used to transfer knowledge, the learning gap between source and recipient of knowledge, and—as each environment in which knowledge is applied is unique—the acquired knowledge needs to be adapted to the application (Cyert and March, 1963, Zaltman *et al.*, 1973, Ounjian and Carne, 1987, Pisano, 1996, Argote and Ingram, 2000b, Argote and

Ingram, 2000a, Levine and Moreland, 2000, Szulanski, 2000).

#### 3.1 Knowledge Transfer Process

The knowledge transfer process can be broken down into stages. Gilbert and Cordey-Hayes (1996) propose a four stage process towards achieving learning from knowledge transfer. The stages are “acquisition, communication, application and assimilation” see Figure 1 (Gilbert and Cordey-Hayes, 1996). Acquisition is the gathering of knowledge from various sources. Communication is the distributing of this knowledge. Application is the applying of knowledge so that it is retained. Assimilation is the result of applying the knowledge. Knowledge transfer is not an easy process to achieve; it is hindered at each stage in the process (Argote and Ingram, 2000b, Darr and Kurtzberg, 2000, Levine and Moreland, 2000, Szulanski, 2000). These stages are summarised below:

- Acquisition

Acquisition is the gathering of knowledge from various sources. These may include either or implicit and explicit sources of knowledge. The knowledge may be acquired from codified sources, from person to person communication, observations and training. (Cyert and March, 1963, Zaltman *et al.*, 1973, Walton, 1975, Ounjian and Carne, 1987, Gilbert and Cordey-Hayes, 1996, Lahti and Beyerlein, 2000)

- Communication

The communications stage involves the distribution of knowledge. In distributing knowledge the source needs to evaluate the recipient to ensure the effective transfer of the communicated message. To achieve this there are various communication models that have been developed over the years. (Shannon and Weaver, 1949, Rice and Rogers, 1980, Gilbert and Cordey-Hayes, 1996, Pisano, 1996, Szulanski, 2000)

- Applications

Application involves the applying of knowledge so that it is retained. This is also affected by the absorptive capacity of the individual, team or organisation. Knowledge has to be built on existing knowledge. If the existing knowledge that the new knowledge is based upon is insufficient, the application of the new knowledge will be greatly hampered. (Adler, 1990, Gilbert and Cordey-Hayes, 1996, Chou, 2005)

- Assimilation

Assimilation is the result of applying the knowledge and analysing the impact that it has had on the individual, team and organisation. To achieve this, knowledge needs to be institutionalised. The results of applying the new knowledge also need to

be recorded. (Berger and Luckman, 1971, Zucker, 1977, Gilbert and Cordey-Hayes, 1996)

These stages in the knowledge transfer process are used to dissect the transfer process into specific stages for the analysis that is undertaken in the knowledge transfer framework.

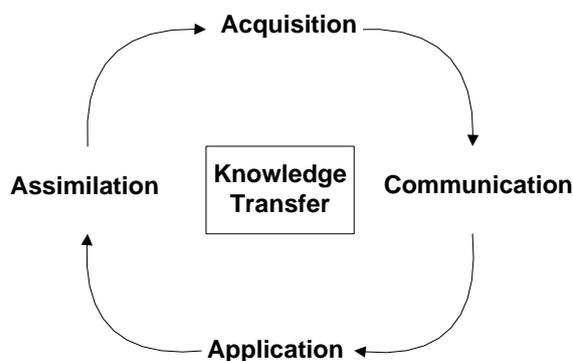


Figure 1: Knowledge transfer process.

## 4 RESEARCH METHOD

A research approach developed by Cormican and O’Sullivan (2003) was followed. It contains five distinct phases; foundation, induction, iteration, presentation and verification.

**Phase 1: Foundation** - A review of literature relating to knowledge transfer was carried out. The scope of the review was literature in relation to knowledge transfer definitions, concepts, scenarios and applications. A summary of the findings of the review can be found in section 3. The objective of the knowledge transfer framework is to assist the sender and receiver in the knowledge transfer process. This is accomplished through the framework supporting analysis, design, development and implementation in the process.

**Phase 2: Induction** - After an evaluation of the various definitions, concepts, scenarios and applications on knowledge transfer, brainstorming sessions were held to further refine some of the initial ideas from the foundation phase. The brainstorming session was focused on knowledge transfer features, characteristics and technologies. Initial solutions were formulated in relation to the case studies.

**Phase 3: Iteration** – Foundation and induction phases were repeated a number of times to refine and develop the initial framework. The outcomes of the brainstorming sessions and following discussions

were then used to develop the initial framework outlines. The ideas generated from the brainstorming sessions were analysed and refined until the components of the framework that are illustrated in section 4 were developed.

**Phase 4: Presentation** – The knowledge transfer framework is presented, explained and discussed in section 5. These initial tools will be presented to the case studies and will be used to provide a systematic approach to analysing the knowledge transfer process.

**Phase 5: Verification** – As is highlighted previously the framework will be evaluated and verified within a service sector case study. This is being completed through empirical testing of the framework tools during the acquisition, communication, application and assimilation stages of the knowledge transfer in the case study.

## 5 KNOWLEDGE TRANSFER FRAMEWORK

Following the review of various knowledge transfer methods and techniques along with classification systems, a framework for supporting the transfer process is presented. This framework is called the Knowledge Transfer (KT) Framework. The KT framework applies a systems approach to analysing, designing, developing and implementing knowledge transfer in processes. The framework is made up of both theoretical structures and practical techniques to enable more effective and efficient knowledge transfer. The KT framework is made up of a suite of tools. These tools include (see Figure 2) an implementation methodology that is supported by best practice, typologies and taxonomies, scorecards, key performance indicators, and system support architecture.

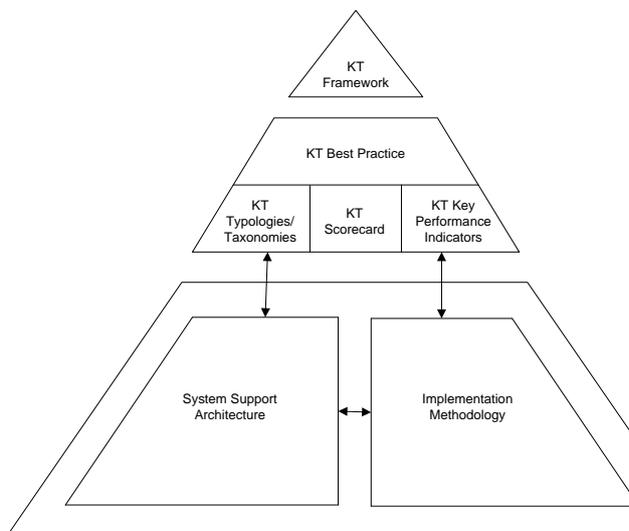


Figure 2 Knowledge transfer framework

## 5.1 Best Practice

The best practice element of the tool set incorporates findings from numerous areas of research. These include cognitive psychology, organisational strategy, and organisational behaviour and technology innovation in the area of user-centred development. The knowledge transfer process is cyclical and is constantly occurring. The findings from the literature are incorporated to create a best practice document that will provide guidelines for effective and efficient knowledge transfer. The best practice document is examined with regard to the following areas: acquisition, communication, application and assimilation.

## 5.2 Typologies and Taxonomies

Typologies and taxonomies are classification techniques. Classification is the act of placing order on units to form groups and classes purely on the basis of similarity (Bailey, 1973, Rich, 1992, Bailey, 1994). It lays the foundation for language, speech, mathematics, statistics, data analysis and conceptualisations (Bailey, 1973, Rich, 1992, Bailey, 1994). In essence it is both the process and the end result. Typologies and taxonomies are used to assist the understanding of complex processes and systems. A typology may also be known as a taxonomy or classification. The Oxford English Dictionary (2005) defines a typology as “classification according to general type... the study and interpretation of types and symbols”. Typologies are therefore groupings of models, which describe

different aspects of the same characteristics. The models create a visual representation of the key areas that need to be considered in the process and also represent the level of interaction and overlap between them (Gill and Cormican, 2008). The typologies and taxonomies examine three areas: individual knowledge management; technology innovation for supporting knowledge transfer; and knowledge transfer for individuals, teams and organisation.

## 5.3 Scorecard

There are numerous factors that can affect the success of the knowledge transfer process. Understanding the sender and recipient in the process assists in evaluating the quality and effectiveness of the knowledge that has been transferred. An understanding of the acquisition, communication, application and assimilation during the knowledge transfer process must also be realised. The human, process, and technical environment, need to be considered with regard to a successful knowledge transfer process. A set of four indicators are suggested by the author to assist in a successful knowledge transfer process. They can also be used to assess the absorptive capacity of the individual, and to identify the areas where the knowledge transfer process was deficient. The four key stages include acquisition, communication, application and assimilation. Each of these stages is further evaluated under need, habit, emotion, context awareness, individual centred, sensitive and responsive, and intuitive and adaptive.

## 5.4 Key Performance Indicators

The key performance indicators can be used to quantify knowledge transfer performance in assessing the effectiveness and efficiency of the process. In developing the performance indicators, a combined structural and procedural framework is applied. This combined approach incorporates the various elements of the best practice, typologies and taxonomies, as well as the scorecard. In developing the performance indicators Thorndike and Hagen (1977) three steps for test measurement have been followed:

1. Identify and define the quality or attribute to be measured.
2. Determine a set of operations by which the attribute may be made manifest and perceivable.
3. Establish a set of procedures or definitions for translating observations into quantitative statements of degree or amount.

In adhering to these three principles it is hoped that this will protect the validity of the measurement process, particularly when attempting to measure some aspect of human behaviour in areas where “there is no single universally accepted test” (Thorndike and Hagen, 1977).

## 5.5 System Support Architecture

A system support architecture is needed to provide a systematic approach to knowledge transfer for individuals, teams and organisations. The architecture needs to be designed to incorporate best practice, typology and taxonomy, check sheet and scorecard, and the key performance indicators. The ARIS house is used to incorporate these tools. The ARIS house (Scheer, 1998) incorporates five elements, organisation, data, control, function and output.

## 5.6 Implementation Methodology

The methodology incorporates the tools outlined above in a unified approach that can be applied in the services sector of the economy in a structured approach.

# 6 IMPLICATIONS AND NEXT STEP

Knowledge is viewed by organisations as a significant resource that can be utilised to achieve a competitive advantage in the market place. To achieve this requires the effective and efficient management of knowledge. This can be achieved through:

- Improved economic management

The amalgamation of knowledge within the organisation can lead to better utilisation of capital, resources, and labour (Bassi, 1997, Demarest, 1997, Hansen *et al.*, 1999, Iansiti, 2000).

- Improved visibility of customer requirements

Through the integration of knowledge from customer inputs with organisational knowledge, the products and services offered by the organisation can be better designed to meet the needs and requirements of the customer (Miner *et al.*, 2001, Ulwick, 2002).

- Improved visibility of future trends

Effective and efficient knowledge management can provide insight into future trends. These trends can be used by businesses to take advantage of opportunities before their competitors do. (Nonaka,

1991, Iansiti and MacCormack, 1997, Blake, 1998, Khurana, 1999)

- Improved traceability and learning through previous experience

Tracking of past experience that resulted in both positive and negative results adds to the organisation’s knowledge base. This information and data can be comprehensively captured and integrated from previous processes, projects and components, for example. This knowledge can be accessed by future individuals and teams to improve collaboration across the organisation, and to assist in a reduction in the time needed to solve problems as they arise. (Iansiti and MacCormack, 1997, Hansen *et al.*, 1999, Miner *et al.*, 2001)

- Improved communication across geographically distributed offices and the supply chain

Knowledge management can assist the transfer and distribution of knowledge throughout an organisation and its subsidiaries. This can help in adapting to changes both positive and negative in the market place, and also more rapidly take advantage of new trends in the global market. (Kotnour and Proctor, 1996, Almeida and Kogut, 1999, Tiwana, 2002)

- Improved absorption of tacit knowledge

Tacit knowledge is the knowledge that as individuals we retain. It is not easily transferred or retained by an organisation. The transfer and retention ability of tacit knowledge can be facilitated through application, integration and collaboration of knowledge. (Christensen *et al.*, 1998, Alavi and Leidner, 2001)

- Improved informal culture of knowledge transfer

Traditional information technology systems do not support an informal cultural of knowledge creation and transfer. Knowledge management needs sharing to occur in an informal environment (over coffee or tea, for example) (Brown and Duguid, 1991, Grant, 1997, Lapré and Van Wassenhove, 2001).

The benefits of knowledge management are achieved through the efficient and effective management of the knowledge process. These potential benefits can be facilitated through improved support prior to, during, and after knowledge transfer. The framework that has been described in this paper needs to be applied and validated in a case study. Then the potential benefits need to be evaluated against achieved gains.

# 7 CONCLUSIONS

Knowledge transfer is the process of transferring knowledge from one individual to another, whether that person acts alone, in a team, or in an organisation. Most individuals understand the importance of knowledge transfer. However, the process is not always analysed, designed, developed or implemented—keeping in mind the needs and requirements of the sender and recipient in the transfer process. Knowledge transfer has two main issues that need to be considered. First the processes involved in knowledge transfer, and the factors that impact on it need to be understood. Secondly the factors and issues that impact on the transfer of knowledge being effective and efficient for both the sender and the receiver in the knowledge transfer process, need to be identified and analysed. A clear understanding and accurate identification of the factors that impact the knowledge transfer process for individuals can have an impact on the knowledge transfer process in teams and organisations, as teams and organisations are made up of individuals. The development of a suitable approach to support knowledge transfer for improved transfer of knowledge among these groups in the service sector, is achieved through the knowledge transfer framework. The framework includes a suite of tools that assist in supporting the knowledge transfer process at an individual level. This allows for an evaluation of the process at various stages, which provides for more effective adaptation to changes as they occur.

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