

SUSTAINABILITY OF KNOWLEDGE WITHIN ORGANISATIONS

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ABSTRACT: Tacit knowledge is a valuable asset to organisations which is not readily being recognised. Years of experience and understanding of an organisations processes, operations and clients, is being lost on a daily basis through the turnover of employees, whether through natural wastage or in these times of recession a cutting back of the workforce. The loss of this information (tacit knowledge) can be critical to the day to day running of the organisation and in many cases it is irreplaceable. Organisations need to capture this knowledge and turn it into explicit knowledge to enhance the future knowledge capital of the organisation, Chisholm and Holifield (2003), Evans and Holifield (2006). The undertaking of this paper is to explore the relationship between tacit knowledge and explicit knowledge and their interaction when converting tacit knowledge into explicit knowledge. A review is carried out of current methodologies available to organisations for the management of tacit knowledge into explicit knowledge. Cases studies are carried out to test a series of interventions designed to promote understanding of knowledge management and the conversion of tacit knowledge into explicit knowledge. From the findings of the case studies, it can be found that tacit knowledge is not a single entity that can be converted into explicit knowledge, but it can be broken down into elements, which have to be considered independently in order to facilitate the knowledge transfer process. From evaluation of the research a Tacit Knowledge Spectrum Model is developed to represent the elements of tacit knowledge. The Model gives a clear view of the complexity of tacit knowledge and the inter-relationship of the elements that make up tacit knowledge. By creating a better understanding of tacit knowledge and its elements and their interaction with explicit knowledge, organisations will be better placed to manage tacit knowledge and their knowledge capital.

KEYWORDS: Tacit knowledge, explicit knowledge, tacit knowledge spectrum

1. INTRODUCTION

The aim of this research is to develop a model to represent a Tacit Knowledge Spectrum. From the findings of the case studies it became apparent that tacit knowledge transfer had taken place but it was by no means a smooth transition. On analysis of the results obtained in the case studies, it was identified that tacit knowledge could be divided into a minimum of four different elements and was not a single entity as previously expected.

The four elements of tacit knowledge identified were:

1. Tacit knowledge that could easily be recalled and turned into explicit knowledge.
2. Tacit knowledge that needs a trigger for recall.
3. Tacit knowledge that can be transferred into tacit knowledge.
4. Tacit knowledge that is not apparent to the individual and difficult to recall.

From analysis of the case studies, tacit knowledge needs to be recognised as being made up of a number of elements. The development of a Tacit Knowledge Spectrum Model will look at conceptualising the elements of tacit knowledge into an easily recognisable format. The case studies demonstrate that there is a need to develop a model that represents the Tacit Knowledge Spectrum, and identifies the elements of tacit knowledge that can be readably transferred.

2. THE ELEMENTS OF TACIT KNOWLEDGE

An analysis of the study data demonstrated that the actual amount of tacit knowledge transferred from an individual was actually relatively low. Although the company made significant gains in increasing the knowledge capital in an explicit form, the total tacit knowledge capital available to the company was far greater than that actually transferred. This research has demonstrated that the release of tacit knowledge was not in a single form, it was broken down into different elements. Three elements of tacit knowledge were subsequently identified, plus a body of tacit knowledge that was available to the individual but very difficult to identify (figure1).

The identified elements of tacit knowledge have been labelled as:

- The Tacit to Explicit Element
- The Tacit to Tacit Element
- The triggered Response Element
- Unknown Tacit Element

The four elements of tacit knowledge identified by this research are by no means the end to the argument; the Unknown element of tacit knowledge implies that it can be broken down into further elements, this being an area for future research. In order to develop the model, the unknown tacit knowledge will be dealt with as a single entity, with an implied need for further research.

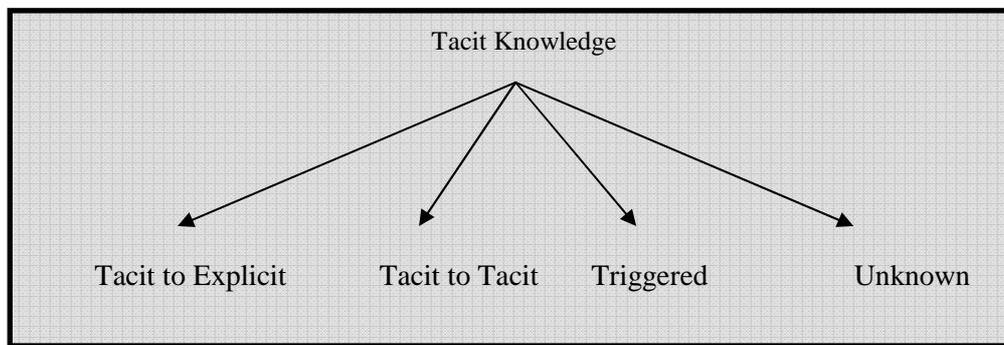


Figure 1. Elements of Tacit Knowledge

3. THE TACIT TO EXPLICIT ELEMENT

The findings of the case studies indicate that an element of an individual's tacit knowledge on a defined subject can be turned into explicit knowledge; this element is referred to as the Tacit to Explicit Element (figure. 2).

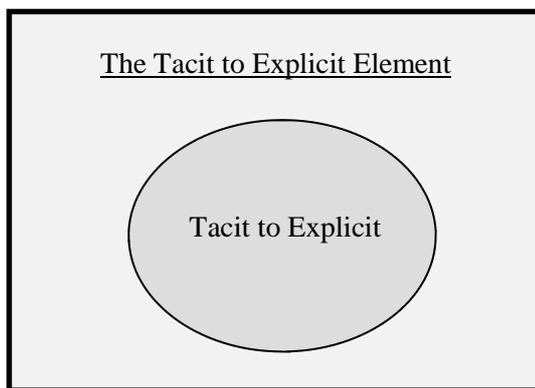


Figure 2. The Tacit to Explicit Knowledge Element

When adopting the reflective practice approach either as an individual or in a group environment, the individual is able to recall information such as a process or working practice about a defined subject. The information is then able to be written down or recorded as explicit knowledge and added to the company's knowledge capital. There is an element of tacit knowledge that can be identified at this point as being suitable for transfer straight to tacit knowledge through experiential teaching; this will be discussed later in this chapter.

In the case of company B this element of tacit knowledge has been illustrated by the retiring employee who developed a set of documentation detailing schematics, operational details and basic fault finding guides. Where this information had been held previously in a tacit form, it was transferred into explicit material and made available to other individuals throughout the organisation.

4. THE TACIT TO TACIT ELEMENT

Through the reflective process, tacit knowledge was identified that was not suitable to be transferred directly into explicit knowledge but straight to tacit knowledge, a Tacit to Tacit Element (figure. 3).

One of the reasons for this type of knowledge conversion was the complexity of the knowledge recalled and the individual's ability to process it into a form that could be used by individuals in an explicit format. It became apparent when analysing the outcomes of the case studies that this information needed to be taught by one individual to another. In certain circumstances, training courses were provided to individuals to

give them a grounding and understanding of the knowledge base, before the tacit knowledge could be transferred. The process of knowledge transfer needed to be completed through demonstration and experiential learning.

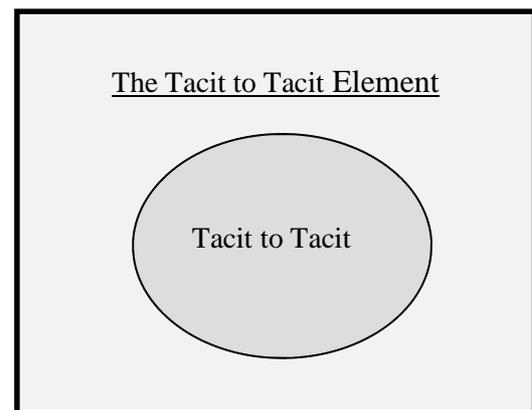


Figure 3. The Tacit to Tacit Knowledge Element

One of the situations identified for this type of knowledge transfer, was the computer programming of production machines in the company B case study. The complexity of the programming in relationship to the machine process, did not allow the information to be captured in a form that was readily usable by other individuals. One to one training was given to individuals by the retiring employee. In some cases, it was found that the individuals knowledge base was not sufficient to take on this information and external training courses were attended so the individuals knowledge base could be increased to allow the information to be processed into tacit knowledge. Individuals learning through this process were by no means attaining the level of expertise of the retiring individual, they were given a fundamental grounding in the subject matter, but it was going to take time and experience to develop their own expertise.

5. THE TRIGGERED RESPONSE ELEMENT

As the case studies progressed, analysis demonstrated that there was an element of tacit knowledge that could only be recalled by the individual through a triggered response, The Triggered Response Element (figure.4). In order for the individual to recall the Trigger Response Element of tacit knowledge, a trigger was needed for the individual to identify the information to be made available. This element of tacit knowledge could then be processed, either into explicit knowledge or straight to tacit knowledge, depending on the complexity of the subject matter. Within the case studies, there were numerous situations where a trigger response was needed for recall; the most obvious case was when dealing with a breakdown scenario. There were many cases of information

coming to light that were not recorded or identified until needed by the engineer or technician in a breakdown situation.

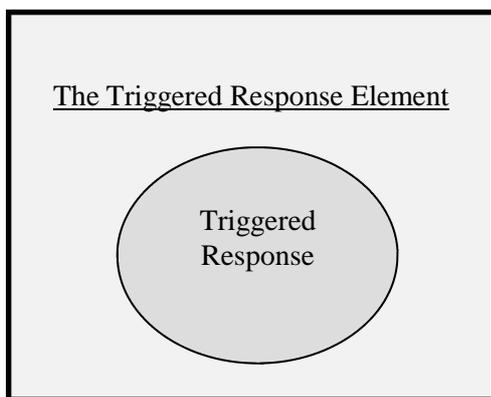


Figure 4. The Triggered Response Element

The trigger response seemed to be non exhaustive in the short term, which implied that more tacit knowledge was held by the individual that could not be recognised than that could be recognised and easily processed. Further research is needed to establish the time frame for transferring this element of tacit knowledge and the percentage of knowledge that can be triggered and transferred.

6. THE UNKNOWN TACIT ELEMENT

The fourth tacit element is all the remaining tacit knowledge, that can not be readily identified the Unknown Tacit Element (figure.5).

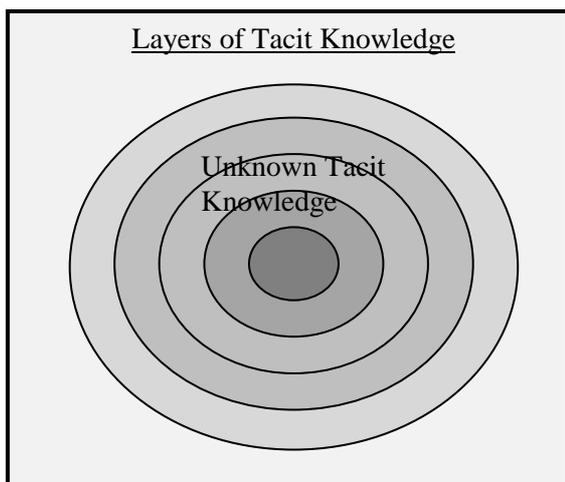


Figure 5. The Unknown Tacit Element

There is a very strong argument to suggest that tacit knowledge can be broken down into components that:

- Can be recognised by the individual.
- Not recognised by the individual.
- Not wanted to be shared by the individual.
- Communicated by the individual to peers.
- Understood and practiced by peers.

There are more components that can be added to this list...(Clarke et al. 2007.p.147)

The unknown tacit element is being represented as a set of ever decreasing rings, the smaller the ring the more difficult to recognise and extract the knowledge. It can be suggested that the inner rings are so personal to the individual that they may never be recognised or shared.

The case studies, demonstrates that over time, the outer rings can be recalled and transferred, but as the rings get smaller the time frame for recall extends, such that the unravelling of knowledge takes place over a period of months if not years.

When investigating the elements of tacit knowledge, it is difficult to come up with defined boundaries. There is a crossover between all the elements, and this has to be accounted for in the model. When considering the tacit to explicit element and the tacit to tacit element, this knowledge and how it is processes is dependent on the individual and their ability to communicate this information. In certain situations, it was found that the recalled knowledge could be made explicit, but was taught experientially (tacit to tacit) to reinforce learning. When evaluating the trigger response element of tacit knowledge, it was identified as having a tacit to tacit and a tacit to explicit element. There was no control over the recalled information and the form it was recalled in.

7. THE TACIT KNOWLEDGE SPECTRUM

In order to start constructing a tacit knowledge spectrum we have to go back to the early writings of Polanyi and his book *The Tacit Dimension* (1966). Here Polanyi out lined the concept of tacit and explicit knowledge in that “we can know more than we can tell”. Polanyi’s concept of knowledge was that tacit and explicit knowledge were not separate categories of knowledge, rather they are an integral part of all knowing.

Nonaka and Takeuchi (1995) in their book *The Knowledge Creating Company* take forwards the work of Polanyi and separate out tacit and explicit knowledge. Nonaka and Takeuchi through the assumption that knowledge is created through the interaction of tacit and explicit knowledge, postulate four different modes of knowledge conversion. Nonaka and Takeuchi propose a cyclic approach in which tacit knowledge is shared throughout the organisation as it moves through the four modes of knowledge conversion, becoming explicit and evolving into knowledge capital which becomes part of the company culture embedded into the workforce and working practices, again becoming tacit.

In order to start building a model of the tacit knowledge spectrum, this is the first fundamental question that needs to be addressed. From the analysis of the case studies, it can be seen that a component of tacit knowledge can be identified and isolated. If you apply the theory of Nonaka and Takeuchi you can successfully argue that tacit knowledge can be turned into explicit knowledge which with time evolves into knowledge capital and again becomes tacit.

The fundamental problem with Nonaka and Takeuchi theory is the identification of tacit knowledge. Throughout the cases studies, it could be observed that the identification of tacit knowledge by an individual is problematic, the first layers of tacit knowledge come away relatively easily through reflective practice, but then a trigger is required such as group discussions or a pressure situation before the tacit knowledge is identified. For this reason Nonaka and Takeuchi’s theory is too simplistic, tacit knowledge can not be treated as a single entity which can be transferred in its entirety into explicit knowledge, the components that make up tacit knowledge are far more complex and need to be treated accordingly.

The elements of tacit knowledge and their interrelationship have been analysed and represented in the form of the tacit knowledge spectrum. The graphical representation of the tacit knowledge spectrum gives an instant visual view of the interrelationship of the tacit elements and the complexity of

trying to retrieve the tacit knowledge by the individual (figure 6).

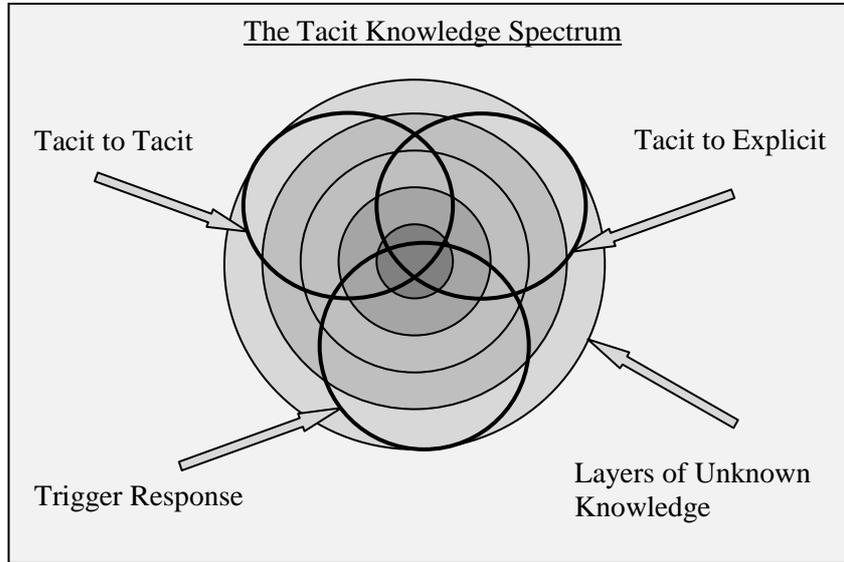


Figure 6. Elements of Tacit Knowledge

8. THE TRANSFERRING OF TACIT KNOWLEDGE

From the carrying out of the case studies, it could be observed that when asked to reflect on as process or procedure, a reflective cycle was carried out as suggested by Kolb, (1984). As the individual started to process their tacit knowledge, the reflective cycle came into play and further layers of knowledge rose to the surface. This process is represented in a feedback loop in figure 7.

Figure 7. The Reflective Process

Through further investigation and observations, it became apparent that a triggered response reflective cycle was also contributing to the recall of tacit knowledge. As the individual discussed the recalled tacit knowledge in a group or one to one environment, or in a pressure situation such as a breakdown in production, this triggered a further recall of tacit knowledge. This again on reflection could expose further layers of knowledge. This triggered response is represented as a second feedback loop, figure 8.

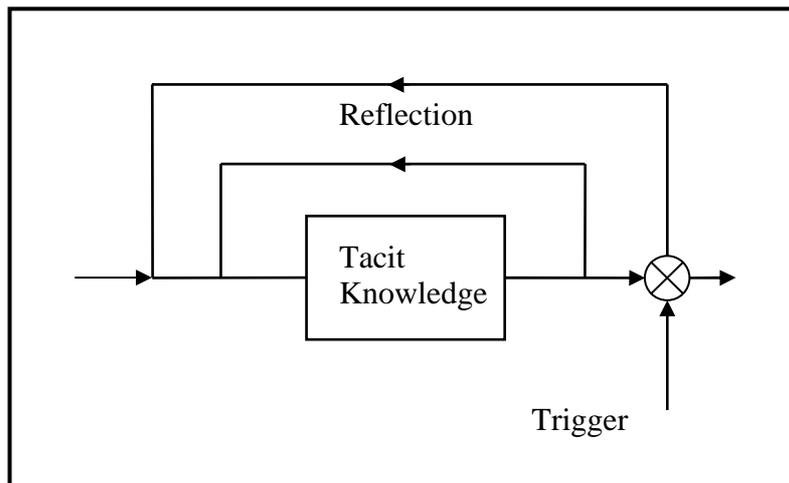
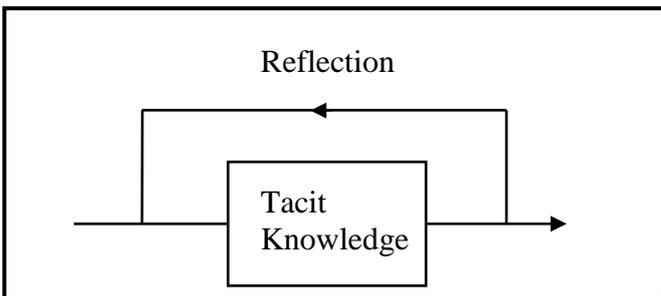


Figure 8. Triggered Response Loop

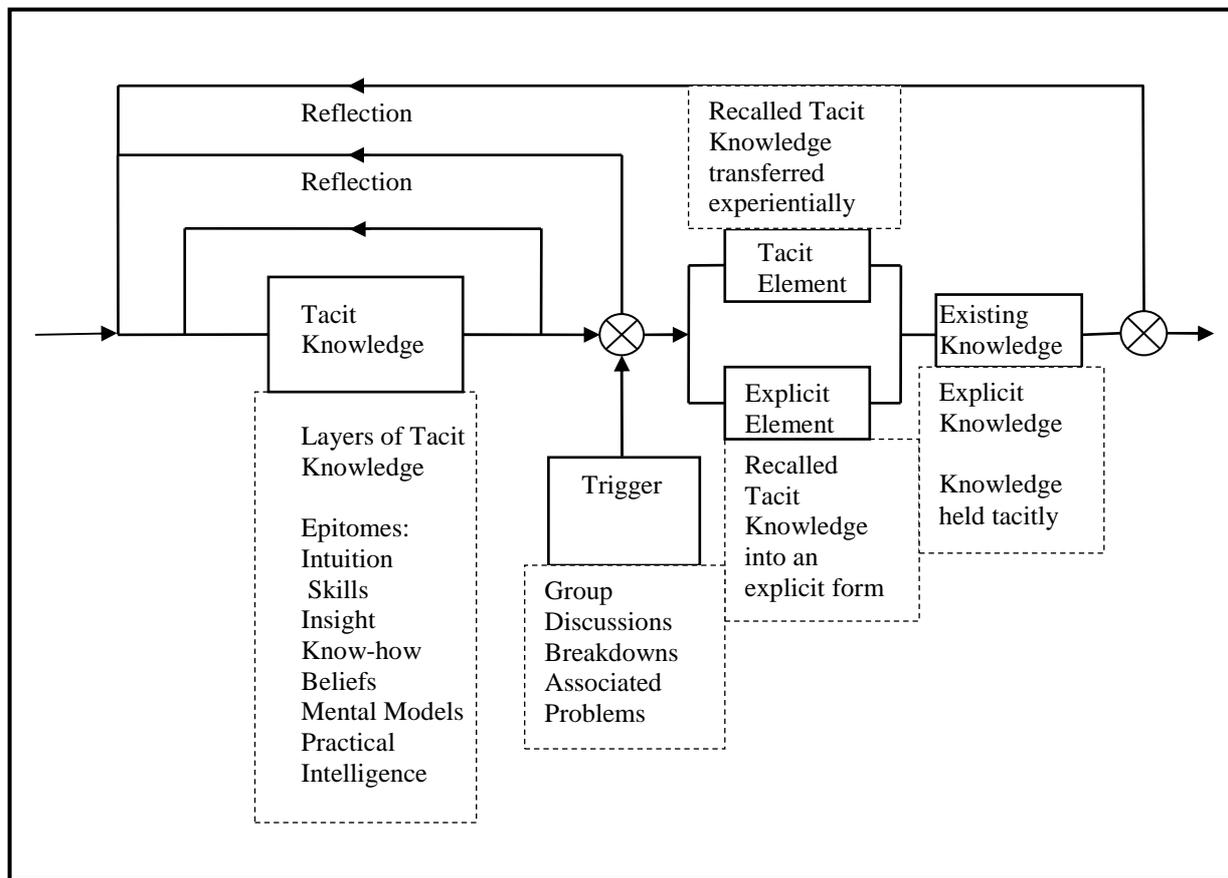


Figure 9. The Tacit Knowledge Spectrum Model

Through out the case studies, recalled tacit knowledge could be identified as two different elements, a tacit element that could be transfer directly to tacit knowledge through experiential learning due to its complexity and an explicit element that could be turned into explicit knowledge, this can be seen in figure 9, the Tacit Knowledge Transfer Model. As these two elements of tacit knowledge are integrated into existing knowledge, a third reflective cycle is carried out. As each reflective cycle is carried out, a deeper layer of tacit knowledge is revealed.

9. SUMMARY

With the near collapse of the apprenticeship system (a well tried and tested method of tacit knowledge transfer) and an ageing skilled work force especially within the engineering sector; the need for organisations to investigate tacit knowledge release is of high importance. The results of the case studies, point to tacit knowledge transfer taking place, but by no means was all the tacit knowledge available to the organisation transferred. This point was readably agreed upon by the academics, the organisation and the employees involved in the case studies.

The current literature on tacit knowledge and its transfer, treat tacit knowledge as a single entity, from analysis of the case studies, it was found that tacit knowledge can be recalled in different forms, tacit knowledge that could easily be turned into explicit knowledge, tacit knowledge that was easier transferred through experiential learning straight into tacit knowledge and tacit knowledge that only came to the for-front through the aid of a trigger and tacit knowledge that was personal to the individual but not identifiable.

The development of the Tacit Knowledge Spectrum Model represents the elements of tacit knowledge identified within the

case studies and there inter-relationships. The complexities of tacit knowledge are represented in a graphical format with the four identified elements clearly visible. The aim of the model is also to show that there are different levels of tacit knowledge, levels that can easily be recalled and transferred, through to levels that an individual can not identify and may take years to unravel and transfer. The model is not complete, as it is anticipated that through further research and cases studies, more elements will be identified that can be added to the model and the model expanded. By fully understanding the complexities of tacit knowledge and the inter-relationship of the elements of tacit knowledge, knowledge transfer and the management of tacit knowledge should become a more successful and a useful resource to organisations.

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