Why we trust in others what we need to do ourselves.

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Biography

Craig is the President of Australian Organisation for Quality Inc and sits on the Council Australian Organisation for Quality (SA) Inc. He has been employed in positions of quality management and business improvement where he worked with functional areas to assist them in the improvement of their systems and process. He enjoys working in strategy rollout and business planning. He uses knowledge management, Six Sigma and Lean methodologies as an effective method to improve the understanding of business improvement philosophy. More recently, Craig has entered the consultancy market and in thus role aims to improve businesses in various industries and sizes

Abstract

Whilst tacit knowledge appears on the surface to be simple subject and one which is well documented; it is one which is not widely understood and therefore has far reaching consequences in organisational management. Can lean[1] principles be applied to the process of tacit knowledge transfer and related knowledge flows within the organisation?

The majority of the research suggests that a lean strategy, principles, practices and tools enable the creation of precise customer value be it through its goods and services that meet tighter quality standards and display fewer defects. This enhanced value is achieved with less human effort, reduced capital, better utilisation of available space and in less time than the traditional systems often related to mass production. The application of lean principles improves flow.

A wide range of industries including government agencies, healthcare, non-profit organizations are finding ways to apply the principles of lean as a means of producing goods and delivering services that creates value for the customer with the minimum amount of waste and the maximum degree of quality. This paper attempts to discuss issues such as knowledge transfer with an emphasis on tacit knowledge due to its inherent difficulties and how these issues become problematic in institutionalising improvement in the knowledge flow of an organisation. Tacit knowledge (as opposed to formal or explicit knowledge) is knowledge that cannot be transferred to another person as a result of it being written down or verbalized. For example, stating to someone that Launceston is near Hobart is a piece of explicit knowledge that can be written down, transmitted, and understood by a recipient. However the ability to use algebra, speak a language, or design and use complex equipment requires all sorts of knowledge that is not always known explicitly, even by expert practitioners, and which cannot be explicitly transferred to users.

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[1] "**Lean**", is a production practice that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination. Working from the perspective of the customer who consumes a product or service, "value" is defined as any action or process that a customer would be willing to pay for.

Introduction

A 'Lean Enterprise' can be loosely defined as a business system for organizing and managing product development, operations, suppliers, and customer relations. It is also well documented that many key principles that we now refer to as 'Lean' were pioneered by Henry Ford, who was the first person to integrate an entire production system; he termed "flow production". Following World War II, the Toyota Motor Company adapted Ford's principles as a means of compensating for its challenge of limited human, financial, and material resources. The Toyota Production System (TPS), which evolved from this need, for work flow was one of the first managerial systems using lean principles throughout the enterprise to produce a wide variety of products at lower volumes and many fewer defects than competitors. It is this methodology of knowledge transfer that should be explored as an enabler for tacit knowledge management.

'Knowledge Management' is a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that will improve organizational performance.

Organisations will continually need to react to problems unless they specifically focus on the identification and management of critical knowledge. These same organisations must now develop an environment that uses lessons and knowledge gained to foresee and model problems prior to their occurrence and lead off with the initial 'first to market type' approach.

What often does not show up in a documented procedure or process map, yet has a tremendous potential impact on product quality, is the transfer of corporate knowledge. Specifications and procedures contain primarily information, not knowledge. Knowledge and ultimately wisdom requires an understanding of the context in which that information will be used.

Knowledge management has emerged from a variety of other disciplines. Its foundations lie in the management of explicit knowledge including information, documents and records as well as the management of tacit knowledge including networks, skills transfer and learning. Its strength lies in its power to combine the organisational elements of people, process, technology and content into a coherent approach to address gaps in organisational capability.

Utilisation of lean principles as a concept for creating maintaining and continually improving flow of knowledge throughout the organisation is a significant challenge and requires more than just an experienced lean consultant or practitioner. Before tacit knowledge can be communicated, it must be converted into words, models, or numbers that can be understood, hence lies the first difficulty to be addressed.

Personal knowledge embedded in individual experience and involves intangible factors, such as personal beliefs, perspective, and the value system. Tacit knowledge is especially hard to articulate with formal language, but not impossible. It contains subjective insights, intuitions, and hunches.

This paper has been written to raise the profile and problems of transference of tacit knowledge and the potential for loss of such knowledge due to the release of staff as a result of restructuring or downsizing and is aimed at developing future research opportunities in subject area.

As the costs of finding, training and retaining qualified employees continue to rise, managers are looking for improved ways of identifying and classifying the important attributes of high-quality employees. An area that has increasingly received attention is the value of tacit knowledge as a predictor of future success.

Quality Process Flow - tangibles

Figure 1 represents a high level view of the flow of some of the tangible items related to quality for the organisation. Requirements flow from customer to design (a), specifications flow from design to both purchasing (b) and production (c), component parts flow from suppliers (through purchasing) to production (d), and finished product flows from production to the customer (e).
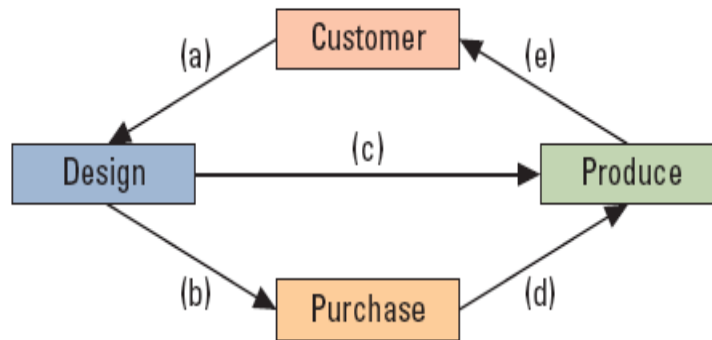
Figure 1: Flow of tangibles through the organisation

As defined by the Australian Standard on Knowledge Management (AS 5037-2005), Knowledge Management can be considered to consist of:
- people
- process
- technology
- content

According to Parsaye (1969), there are three major approaches to the capture of tacit knowledge from groups and individuals. They are:
- Interviewing experts.
- Learning by being told.
- Learning by observation.

Some other techniques for capturing tacit knowledge identified during this research include:
- Ad hoc sessions
- E-learning
- Action learning
- Learning history
- Road maps

All of these approaches should be recorded in order to transfer the tacit knowledge into reusable explicit knowledge.Interviewing experts can be done in the form of structured interviewing or by recording organisational stories. Structured interviewing of experts in a particular subject is the most commonly used technique to capture pertinent, explicit knowledge. An example of a

structured interview would be an exit interview. Learning by being told can be done by interviewing or by task analysis. Either way, an expert teaches the novice the processes of a task.

Task analysis is the process of determining the actual task or policy by breaking it down and analyzing what needs to be done to complete the task. Learning by observation can be done by presenting the expert with a sample problem, scenario, or case study and then observing the process used to solve the problem.

Polanyi's established a theory that informed guesses, hunches and imaginings are part of exploratory acts are motivated by what he described as 'passions' aimed at discovering 'truth'; however they are not necessarily in a form that can be stated in formal terms. Michael Polanyi (1967: 4) *'we can know more than we can tell'*. He termed this pre-logical phase of knowing as 'tacit knowledge'. Tacit knowledge comprises a range of conceptual and sensory information and images that can be combined in an attempt to make sense of something (see Hodgkin 1991). Many bits of tacit knowledge can be brought together to help form a new model or theory. This led him to explore connoisseurship and the process of discovery.

The tacit aspects of knowledge are those that cannot be codified, but can only be transmitted via training or gained through personal experience. Tacit knowledge has been described as "know-how" - as opposed to "know-what" (facts), "know-why" (science), or "know-who" (networking). It involves learning and skill but not in a way that can be written down.

So the question as to whether tacit knowledge (intangible) follows similar process flow pathways to product or even explicit knowledge (tangible) must be posed.
If the answer is yes, can lean principles be applied to improve flows and remove constraints in this transfer?
If the answer is no, can the flow of tacit knowledge be changed to allow the application of lean?

Individual and group tacit knowledge have been shown to improve organizational performance (Berman, Down, & Hill, 2002). However, despite the increasing interest in tacit knowledge, measuring it remains problematic.

Knowledge flows and constraints

Effective information management is dependent on standards. Such standards include thesauri, subject headings, information management schemes such as metadata, cataloguing rules and classification schemes. All these standards contribute to enable the description of resources/information in a consistent manner. It is through describing similar resources in a consistent manner that we achieve precision in search results. Therefore identification of important knowledge modes, their nature, sequence and relationships must be plotted to produce a trajectory.

- What constraints are placed on experimentation, investigation, diffusion and reception within the group, firm and industry?
- How do topics and discourses become sanctioned, constructed, regulated, supervised or subverted?
- What models, stories, company paradigms, perspectives and viewpoints dominate around here?
- Who exactly is *in* and what is *out*, who are the bad guys and what are the bogeymen?
- Is it easy and acceptable to question established processes, decisions and leaders?
- Can you experiment and 'play' with language or is the terminology (and meaning?) set and rigid?
- What type of knowledge is favoured explicit, well-documented, internally validated, marketable material or team spirit, second guessing, and informal stories?

Information management standards include things such as subject headings, taxonomies, and the protocols for their storage and retrieval. Information Management standards have probably been used ever since libraries were first established.

Mapping tacit knowledge is a contradiction of sorts; it requires immersion in the workplace, raising awareness, careful observation, team validation and attention to subtle investigator bias and subversion. Many knowledge management tools claim to map tacit knowledge but it seems this process is one task that will always require human skills, intuition and inventiveness. With this element foremost in the mind, utilisation of an external expert in lean or knowledge management will not ensure that success in developing lean knowledge flows will occur.
We must then argue can we trust in others what we need to do ourselves.

Knowledge mapping

Knowledge mapping is an ongoing quest to help discover the constraints, assumptions, location, ownership, value and use of organisational knowledge assets, artefacts, people and their expertise, uncover blocks to knowledge creation, and find opportunities to leverage existing knowledge. Knowledge mapping may involve developing and conducting social network analysis, executing a survey, engaging a group of people in sense making, action research.

The process of making the knowledge map is as important as the final product because it is impossible to create a single map which will meet the needs of every situation. Agreement is required by decision-makers regarding the purpose of the knowledge mapping exercise and a map or maps created to meet those objectives.

Knowledge mapping is data gathering, survey, exploring, discovery, conversation, disagreement, gap analysis, education and synthesis. It aims to track the loss and acquisition of information & knowledge, personal and group competencies and proficiencies, show knowledge flows, appreciate the influence on intellectual capital due to staff loss, assist with team selection and technology matching.

Knowledge management is not normally defined as a technology discipline; however technology may play a key role in delivering and supporting knowledge management services.
Organisations are being challenged like never before on how best they leverage their people and knowledge resources in an increasingly complex global business horizon.
Examples of such challenges are:

- future exposure to major structural change;
- reform and searching for new ways to adapt operationally and innovate;
- well-networked staff but hindered by low levels of knowledge sharing;
- looking to design the next generation submarine and faced with strong regional competition;
- highly knowledgeable staff that have shown signs of lacking trust between them;
- facing major demographic change and seeking to retain its corporate memory.

After considering the implementation of a knowledge sharing environment in any organisation, two major questions became clear.
These were:

- What is the best suited flow of knowledge for knowledge management for the organisation?
- What is the introduction and implementation process that would ensure adoption of knowledge management practice?

The value of knowledge management lies in the use employees are able to make of the managed knowledge. This includes an ability to deal with situations that arise so that the organisation can move forward and not repeat the mistakes of the past and foresee oncoming problems through analysis. This is what I term as the process flow of knowledge.

Without on-demand access to managed knowledge, every situation is addressed only by what each individual or group brings with them to that situation. With on-demand access to managed knowledge every situation is addressed with the sum total of everything anyone in the organisation has learnt about a similar situation.

Nonaka & Takeuchi (pp. 63-69) further discuss the four modes of knowledge creation or conversion that are derived from the two kinds of knowledge:

	To tacit knowledge	To explicit knowledge
From tacit knowledge	Socialization	Externalization
From explicit knowledge	Internalization	Combination

Figure 2: Four modes of knowledge creation

- **Socialization**: from tacit to tacit - Sharing experiences to create tacit knowledge, such as shared mental models and technical skills. This also includes observation, imitation, and practice. However, "experience" is the key, which is why the mere "transfer of information" often makes little sense to the receiver.

- **Internalization**: from explicit to tacit - Embodying explicit knowledge into tacit knowledge. Closely related to "learning by doing." Normally, knowledge is verbalized or diagrammed into documents or oral stories.

- **Externalization**: from tacit to explicit - The quintessential process of articulating tacit knowledge into explicit concepts through metaphors, analogies, concepts, hypothesis, or models. Note that when we conceptualize an image, we express its essence mostly in language.

- **Combination**: from explicit to explicit - A process of systemizing concepts into a knowledge system. Individuals exchange and combine knowledge through media, such as documents, meetings, and conversations. Information is reconfigured by such means as sorting, combining, and categorizing. Formal education and many training programs work this way.

To coin a phrase often used, 'data has no meaning on its own'. As my Six Sigma lecturer once said, "…generally the desire when faced with data is to attribute meaning to it and put it into a context albeit even if that context is a fabrication…". The implication here is that when there is no context for data, there is no knowledge or meaning which leads to wisdom.

Data collection and storage is not knowledge management

A collection of data is not information unless there is a relationship between the data that is understood by the observer. Information is therefore an understanding of the relationships between pieces of data, or between data and other information. This is what I believe forms the basis of an argument for understanding the flow of knowledge. Tacit knowledge is that element that is not easily written or transferred but ensures that the holder of knowledge can make this mental assimilation. These are the elements of process that are learned and stored and not captured for the next user.

As discussed, tacit knowledge is not easily shared. Tacit knowledge consists often of ***habits*** and ***culture*** that we do not recognize in ourselves. There appears a degree of difficulty to connect the dots, so to speak, as an outsider, applying explicit knowledge assets within organisation in which we enter. In the field of knowledge management, the concept of tacit knowledge refers to a knowledge which is only known by an individual and that is difficult to communicate to the rest of an organization. Knowledge that is easy to communicate is called explicit knowledge. The process of transforming tacit knowledge into explicit knowledge is known as codification or articulation.

While information entails an understanding of the relations between data, it generally does not provide a foundation for why the data is what it is, nor an indication as to how the data is likely to change over time.

Beyond relation there is pattern. Pattern embodies both a consistency and completeness of relations which, to an extent, creates its own context. Where a pattern relationship exists between the data and the information, the pattern has the potential to represent knowledge.

Patterns only become knowledge when the observer is able to understand the implications of the patterns. Patterns that represent knowledge tend to self contextualise. The pattern tends to create its own context rather than being context dependent to the same extent information is. A pattern which represents knowledge also provides, when the pattern is understood, a high level of reliability or predictability as to how the pattern will evolve over time, for patterns are seldom static. Patterns which represent knowledge have completeness to them that information simply does not contain.

Wisdom arises when the fundamental principles responsible for the patterns representing knowledge are understood. Wisdom, even more so than knowledge, tends to create its own context. Once wisdom is accomplished so the opportunity for innovation.

Conclusion

This paper is aimed at providing an introduction to the potential application of lean principles on the identification, capturing, handling, management and future use of tacit knowledge.

We understand that a lean approach in the process sense is used to reduce waste and coordinate flows to the betterment of the process. However it cannot be said that the same utilisation of process tools are used when discussing the issues surrounding knowledge and in particular tacit knowledge management.

To help generate and sustain a knowledge management system, there must be a clear strategy in place and enablers to ensure that the aspects of both tacit and explicit knowledge are not only captured and maintained, but are then used by the organisation in a positive way that ensures the creations of wisdom and ultimately creativity and innovation.

Information management is the organisation of information that should enable effective resource discovery. It is the development of this resource from tacit to explicit that requires process flows to be unrestrictive, supported and efficient. Similar to applying lean principles and philosophy to product flows requires these same elements.

Organisations that have fostered efficient knowledge networks and connections, which have explored processes and deployed people-centric technology, have started to manage the complexity and ambiguity that is a knowledge network. This system is characterised by Figure 1 earlier in this paper which shows the pathways and connections between people, process, technology and content, which then results in a rich web of relationships and interactions.

Interesting reading is *'Extreme Toyota: Radical Contradictions That Drive Success at the World's Best Manufacturer' ISBN 978-0-470-26762-2.*

Thankyou to
Robert Lloyd
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