Improving Supply Chain Performance Through Strategic Knowledge Management

a report by

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Introduction

In today's global knowledge economy, progressive companies must be equipped with a good balance of internal knowledge, both in scope and depth, and must adapt to the rapidly changing business environment. The ability of an organisation to manage knowledge as a corporate strategy is becoming a key competitive advantage.[1] The essence of building an organisation's strength or capability in strategic knowledge management is to deepen the understanding of exploitation and exploration of knowledge.[2]

The impact of strategic knowledge management on organisations embarking on such initiatives will be tremendous. This is particularly crucial when organisations are focusing their efforts on improving the performance of their supply chains. Several organisations implementing strategic knowledge management have yielded savings of millions or even billions of dollars. The Dow Chemical Company[3] and Chevron Texaco[4] are two examples.

The Dow Chemical Company capitalises on its intellectual assets and has heightened the value of its patents by more than 400% and saved in excess of US$50 million in related tax obligations and other costs over 10 years, as reported by Britton Manasco (1997). Dow started by exploring new ways to manage intellectual assets and created new processes of intellectual asset management (IAM) for the company. The IAM model covers six phases: strategy, competitive assessment, classification, valuation, investment and portfolio. During the valuation phase, working with consulting firm A.D. Little, Dow developed a tool known as the 'tech factor method' for comprehensive intellectual property/asset valuation. If Dow continues integrating the concept of intellectual capital management into its business decisions, it is likely to survive and thrive for a long time.

Chevron Texaco participated in the Knowledge Management World Summit in 1999. Implementing a knowledge management initiative was one key to reducing Chevron Texaco's operating costs by more than US$2 billion per year – from about US$9.4 billion to US$7.4 billion. The sharing of knowledge has become an issue of performance and reputation. It has a direct effect on every major company's ability to win new business and attract and retain top employees. The opportunity to apply new knowledge makes jobs more interesting and challenging. At Chevron Texaco, there is job fulfilment and reward throughout the organisation. Chevron Texaco has built a learning organisation through its knowledge management initiative.

Developing a Knowledge Management Strategy

The ability of an organisation to manage its collective and largely tacit knowledge can be critical to its competitive advantage in terms of maintaining and improving its performance based on the organisation's on-going experiences. A knowledge management strategy adopted by an organisation must align to the organisation's objectives and corporate strategy. The essence of such a strategy must therefore be to sustain and improve upon the organisation's core competencies.

The starting point for any such strategy is to undertake a company-wide knowledge audit and produce a 'P-Y chart'.[5] The chart, as shown in *Figure 1*, reveals an organisation's strength in sustaining its knowledge competencies and allows the organisation to develop appropriate strategies to bridge the knowledge gap.

1. *P Poh (2002),* Strategic Imperatives for e-Supply Chain Management, *Worldwide Business Research, Singapore.*
2. *M Zack, "Developing a Knowledge Strategy",* California Management Reviews, *41 (3) (1999), pp. 125–144.*
3. *http://webcom/quantera/Dow.html*
4. *Chevron Texaco (1999), "Managing Knowledge The Chevron Way", Chevron Speech Archives.*
5. *The P-Y chart, jointly developed by Poh and Yeo (2003), assesses the scope and depth of an organisation's knowledge readiness.*

There are several approaches to conducting a knowledge audit, with varying levels of coverage and detail. Generally, such audits will involve some or all of the following:

- identifying knowledge needs;
- drawing up a knowledge inventory;
- analysing knowledge flows; and
- creating a knowledge map.

The main approach to exercising a knowledge audit is collating information from all levels of the organisation through questionnaire-based surveys, interviews and facilitated group discussions, or a combination of these. Participants must be informed as to the purposes and objectives of the audit. Data and information provided by them will hold great value, with all input recognised and confidentiality respected.

One common method is to gather qualitative information using a company-wide survey through targeted interviews or focused group interviews. A simpler method of knowledge audit is one advocated by Leibowitz,[6] which proposed two steps: the first step is to identify what knowledge currently exists in a targeted area, and the second step is to identify what knowledge is missing in the target area.

Another method is that of systematic assessment suggested by Skyme,[7] using a knowledge initiative framework that considers three layers:

- top layer or enablers – covering an organisation's structure, culture and environment that encourages knowledge development and sharing;
- second layer or levers – covering processes, tacit and explicit knowledge, measures, hubs and centres and market leverage; and
- third layer or foundations – covering hard and soft infrastructure, tools and techniques.

The actual diagnostic on the three layers in the knowledge initiative framework involves a company-wide seeking of responses to several knowledge-related factors. *Table 1* shows the average ratings obtained on the knowledge-related factors in a sample organisation.

Knowledge Gap Analysis

Once the P-Y chart is plotted and the knowledge readiness of an organisation is assessed on its scope and depth of knowledge competencies, the next step is to analyse the gaps for improvements and then design the knowledge management initiatives and strategy. The strengths, weaknesses, opportunities and threats (SWOT) tabulation will be useful for gap analysis. The analysis will address the need to manage knowledge within the organisation for continuous improvement and competitive advantage. More importantly, the gap analysis on the selected factors of the knowledge initiative framework provides tangible evidence to which knowledge needs to be managed effectively.

The three levels of the knowledge initiative framework – enablers, levers and foundation – have to be co-ordinated and managed so as to give the organisation the desired competitive advantage and profitability. It is important to realise that knowledge management has strategic values and implications for the organisation.[8] The three elements, as suggested

Figure 1: P-Y Chart Developed from the Knowledge Initiative Framework

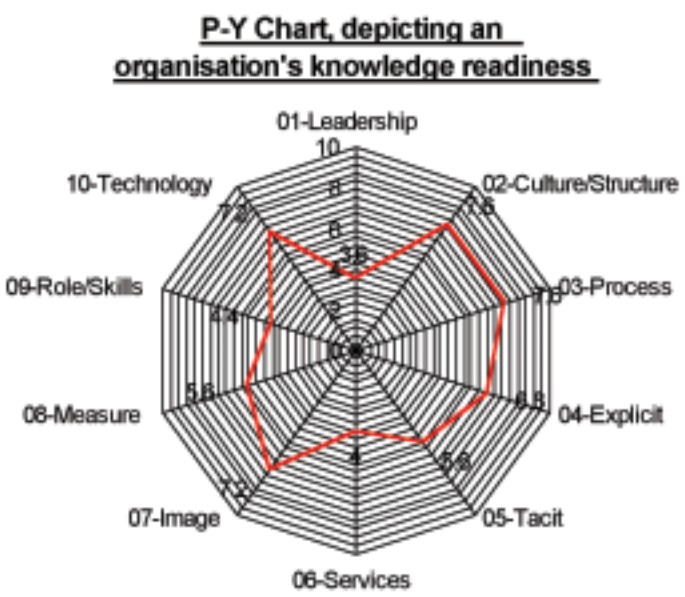

Table 1: Average Ratings on the Knowledge-related Factors in a Sample Organisation

	Knowledge Initiative Framework (Factors)	Average Ratings
01	Leadership (enabler)	3.6
02	Culture/structure (enabler)	7.6
03	Process perspective (lever)	7.6
04	Information resource management (lever)	6.8
05	Tacit knowledge (lever)	5.6
06	Knowledge hubs and centres (lever)	4.0
07	Market leverage (lever)	7.2
08	Assessing your measure (lever)	5.6
09	Assessing your 'soft' infrastructure (foundation)	4.4
10	Technology infrastructure (foundation)	7.2

6. *J Liebowitz (1999),* The Knowledge Management Handbook, *CRC Press, Boca Raton, FL.*
7. *D J Skyme (2002),* Knowledge Networking – Creating the Collaborative Enterprise, *Oxford Butterworth-Heinemann, pp. 177–211.*

by Nonaka[9] in the knowledge creating process, should be integrated using knowledge management so that the organisation can create knowledge continuously and dynamically.

Framework for Implementing Knowledge Management

A framework is essential to the knowledge management initiative and is sometimes referred to as the building-blocks for knowledge management. A knowledge management framework provides better understanding for developing and implementing knowledge management and can thus be used as an effective guide for the systematic implementation of an organisation's knowledge management. The framework also serves as a co-ordinated and comprehensive knowledge management practice. A typical framework can be very exhaustive and, for those new in such practices, it is easier to adapt or be selective with the elements or building-blocks used.

There are two typical frameworks: the 16 building-blocks advocated by Karl Wiig,[10] and the Standard Australia Knowledge Management Framework[11].

The 16 building-blocks to knowledge management are as follows:

1. obtain management buy-in;
2. survey and map the knowledge landscape;
3. plan the knowledge strategy;
4. create and define knowledge-related alternatives and potential initiatives;
5. portray benefit expectations for knowledge management initiatives;
6. set knowledge management priorities;
7. determine key knowledge requirements;
8. acquire key knowledge;
9. create integrated knowledge transfer programmes;
10. transform, distribute and apply knowledge assets;
11. establish and update knowledge management infrastructure;
12. manage knowledge assets;
13. construct incentive programmes;
14. co-ordinate knowledge management activities and functions enterprise-wide;
15. facilitate knowledge-focused management; and
16. monitor knowledge management.

The Standard Australia Knowledge Management Framework consists of five areas.

1. Strategy and outcomes – Organisational strategy provides direction of knowledge management initiatives and must be aligned with the organisational outcomes.

2. Organisational capability and culture – The organisational capability and culture have a profound impact on how the strategy and outcomes can be achieved.

3. Drivers – They are the strategic levers in the organisation and the forces through which the organisation delivers its desired outcomes. The drivers consist of operational excellence, stakeholder intimacy, service delivery, growth, sustainability and risk mitigation.

4. Elements – The four core elements consist of people, process, technology and content. The people element covers a diverse range of organisational, cultural and personnel issues and concepts, which include people in leadership and operational levels. They are a true asset of the organisation. The process element looks at how knowledge can be embedded in work processes. Knowledge processes help the organisation to share, acquire and create knowledge. Knowledge management is much more than technology, but enabling technologies are important tools and vehicles to facilitate knowledge management initiatives. Content element covers the characteristics of knowledge, its structure, its organisation and meaning. It applies to both explicit and tacit knowledge.

5. Enablers – Enablers are the arsenal of individual tools, techniques and approaches used to implement knowledge management initiatives in addressing the identified knowledge gap. They consist of supporting enablers, the nature of the organisation involved, interpersonal and individual factors, business disciplines, information disciplines, technology and systems.

A knowledge management initiative usually takes a long time to implement. Therefore, the 16 building-blocks can be simplified into a shorter framework so that the knowledge management programme can be implemented within months. The shortened programme can be implemented covering six major steps:

8. *I Nonaka, R Toyama and N Konno (2001), "SECI, ba and leadership: A unified model of dynamics knowledge creation",* Managing Industrial Knowledge: Creation, Transfer & Utilisation *(Eds Nonaka and Teece), London, pp. 13–43.*
9. *Ibid.*
10. *K Wiig (1999), "Introducing KM into enterprise",* Knowledge Management Handbook *(Ed. J Liebowitz), Boca Raton: CRC Press, pp. 3–1 to 3–41.*
11. *Interim Australia Standard (2003) AS 5037, Standard Australia.*

1. build management understanding and commitment to pursuing knowledge management;
2. map perspectives of the knowledge landscape;
3. plan the enterprise knowledge management priorities, focus and strategy;
4. identify desired knowledge management benefits;
5. adjust knowledge management priorities; and
6. create knowledge management-related incentive programmes.

Potential Risks, Challenges and Barriers

There are potential risks in knowledge management initiatives and they usually result in the eventual failure of knowledge management projects.

Some of the potential pitfalls can be summarised as follows:

- lack of budget or underbudgeted;
- lack of key resources;
- project manager and project team incompetence;
- different understanding of and plans for the knowledge management initiatives;
- ensuring continuous top management support;
- paradigm differences in knowledge management;
- ensuring the purpose and reason for knowledge sharing is clear and understood by everyone;
- understanding the interrelationship between knowledge sharing, knowledge creation and organisational change needs; and
- clarifying different expectations of knowledge sought at different levels.

There are bound to be barriers to any project implementation, as there are challenges. It is necessary to identify them early and incorporate probable solutions to overcome them. Some of these challenges and barriers include the following:

- lack of top management support;
- limited budget;
- resistance to change;
- organisation cultural change;
- lack of trust;
- unrealistic expectations;
- technologies and systems integration;
- lack of operational employees' support;
- individual barriers to knowledge creation; and
- organisational barriers, such as the need for a legitimate language, organisational stories, procedures or company paradigms.

Conclusions

The importance of managing knowledge in any organisation is crucial to the success of the organisation in the modern business environment. The push to embark on the knowledge management journey is no longer an option, but an absolute necessity. The knowledge management initiative provides opportunities for value creation and increasing the competitive advantages.

One key factor for the success of project implementation is project monitoring and an objective measurement to determine whether the progress is along the track to achieving the desired objectives. Some of the common ways to measure knowledge and the efficacy of an organisation's knowledge management system include benchmarking and balanced scorecards. Several global corporations have reaped substantial benefits and cost savings through appropriate benchmarking and appropriate measurements, for example Texas Instruments and Rank Xerox.

One possibility is to work with an international consulting firm such as Arthur Andersen, which has developed a toolkit called the Knowledge Management Assessment Tool (KMAT). However, the high cost can be inhibitive. Alternatively, there are other approaches, such as those used in the balanced scorecard method.[12]

Knowledge management is not a one-time execution, but a continuous process towards excellence. It is a long-term commitment with vast potential business implications in terms of improving profits and adding value to the organisation. Specifically, knowledge management seeks to improve the business and supply chain performance, improving the variable cost performance and optimising the services (products) and asset base. ■

12. *Kaplan and Norton (1996),* The Balanced Scorecard, *Harvard Business School Press.*