

KNOWLEDGE AND KNOWLEDGE MANAGEMENT

(With special reference to the Deming's theory of management and Malcolm Baldrige criteria for organizational performance)

INTRODUCTION

Operations process of an organization accounts for more than 80 percent of the business success. Quality is a major concern in any process of production; either for a product or a service. Among many quality gurus and their well-known theories, this paper focusses on an impressive concept in two quality management theories: knowledge management in the Deming's theory of management and Malcolm Baldrige criteria for organizational performance. On one hand, in Deming's theory of management, knowledge and management of knowledge play a key role in all the domains. On the other hand, in Malcolm Baldrige criteria for organizational performance model knowledge management is a continuous function to do a change, guide the change and to deliver intended results.

Hence, in this knowledge era knowledge management is at-most important in any business to achieve success and the progress of success. How can an organization capitalize its knowledge? How an organization can improve its knowledge base to obtain competitive advantages, what measures organizations can apply to manage knowledge properly and pitfalls to be avoided when managing knowledge are the scope of this term paper respectively. Moreover, the paper

TODAY PEOPLE ARE
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ECONOMY. KNOWLEDGE
ECONOMIES ARE GOVERNED
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THEY CREATE, STORE
AND DISSEMINATES THE
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views on the theme and recommendations are given as per the description of the concept.

DEMING'S THEORY OF MANAGEMENT

The Deming's theory of management is a management philosophy based on four principles. Figure 01 exhibits the interconnection of those four principles.

- [1] **Knowledge of system**
- [2] **Knowledge of variations**
- [3] **Knowledge of psychology**
- [4] **Theory of knowledge**

However, knowledge depends on theory. As stated by Deming (1993) mere information is not knowledge. Experience explains nothing without theory. Practice makes a person or a process permanent, but not perfect. Copying examples does not lead to

the creation of knowledge (Deming, 1993).

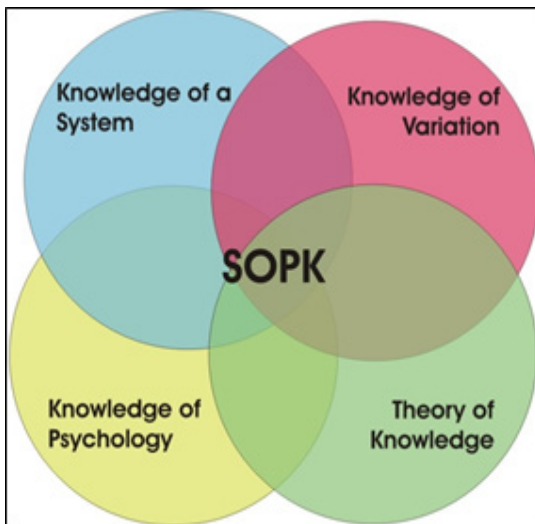


Figure 01: Four principles of Deming’s theory of management

Source: Deming, W. E. (1993). *The New Economics for Industry, Government & Education*. Cambridge: Massachusetts Institute of Technology Center for Advanced Engineering Study.

In order to promote cooperation, Deming (1993) espouses his Theory of Profound Knowledge. Profound knowledge involves expanded views and an understanding of the seemingly individual yet truly interdependent elements that compose the

larger system, the company. Deming believed that every worker has nearly unlimited potential if placed in an environment that adequately supports, educates, and nurtures senses of pride and responsibility; he stated that the majority 85 percent of a worker’s effectiveness is determined by his environment and only minimally by his own skill.

MALCOLM BALDRIGE CRITERIA FOR ORGANIZATIONAL PERFORMANCE

The Baldrige Criteria have empowered organizations, no matter their size, sector, or industry to reach their goals, improve results, and become more competitive. The Baldrige Criteria for performance excellence are a framework that any organization can use to improve overall performance. While the criteria characteristics, goals, and purposes remain constant, the Criteria have evolved significantly over time to help organizations in order to address current economic and marketplace challenges and opportunities. In both theories, knowledge management is a key function to be performed in achieving quality and productivity. Figure 02 displays --

the Baldrige model of business excellence.

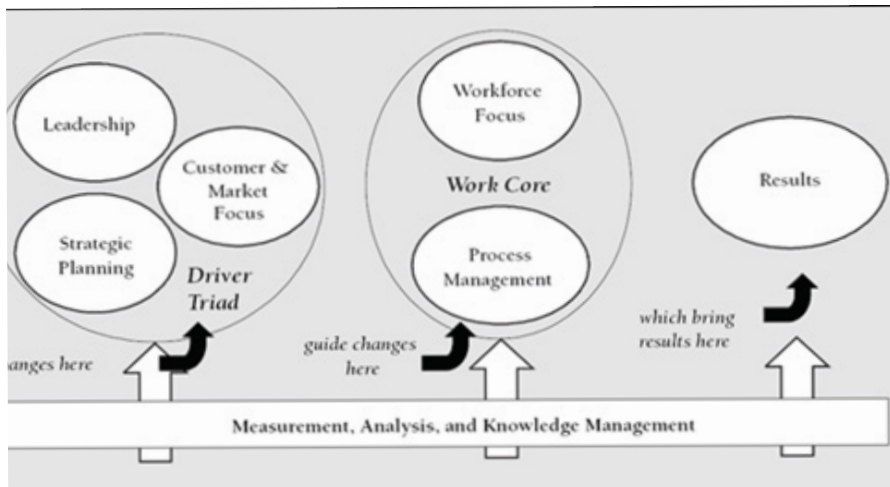


Figure 02: Malcolm Baldrige criteria for organizational performance
Source: Baldrige National Quality Program; retrieved from www.quality.nist.gov



ERA OF KNOWLEDGE ECONOMIES

Today people are living in a knowledge economy. Thus, traditional strategies are not match properly for organizations as they are in early decades like in industrial economies. These knowledge economies are governed by knowledge workers. They create knowledge. A knowledge worker can be any person within the organization who creates, stores and disseminates the knowledge. Today people are categorized in terms of knowledge. Not only people, organizations also learn. Hence, organizations are also categorized in terms of knowledge. Knowledge has been identified as the most important production factor and the main ingredient in the production process. What is knowledge? Knowledge is everything. Ultimately success of any organization depends on knowledge and the way it manages

its knowledge base.

Knowledge for development; published by the World Bank (2012) indicates the statistical measures of knowledge and the position of countries in this knowledge era. By preparing Knowledge Economy Index (KEI) it presents the aggregate average values for countries on knowledge and its management. There are four pillars used to prepare the Knowledge Economy Index (KEI). They are Economic Incentive Regime, Innovation, Education and ICT. Accordingly, Sri Lanka is at the 101st position obtaining 3.63 for KEI, 4.04 for economic incentive regime, 3.06 for Innovations and 4.61 for Education. The most important factor which is ICT and Sri Lanka obtained 2.80 points for ICT.

KNOWLEDGE MANAGEMENT

Knowledge and knowledge management are complex and complicated

concepts. Knowledge is a broad and abstract notion in the modern business world. There has been a growing interest in treating knowledge as a significant organizational resource in the past few years. Consistent with the interest in organizational knowledge and knowledge management, organizations have begun promoting a class of information systems, referred as knowledge management systems. The objective of knowledge management systems is to support creation, transfer, and application of knowledge in organizations.

Knowledge management could be considered as the most modern subject today. Hence, what is this activity called knowledge management, and why is it so important to each and every organization? Before attempting to address the question of knowledge management, it is important to develop some perspective regarding this stuff called knowledge, which there seems to be such a desire to manage.

Knowledge is the intellectual capital possessed by an individual or an organization. It is much more than data, as it includes the experience and expertise found within an organization. Technological developments have prompted an explosion in the scope and depth of knowledge which decision makers have access. There is increasing recognition of the benefits of using all employees' knowledge, by developing systems that allow information and expertise to flow to key points in the organization.

Traditional view of knowledge explains that it is the 'justified true belief' (Grant, 1999). As mentioned above employees within an organization are recognized as the most valuable asset. It means the information

and knowledge contained in the mind of the employee would double the value of human asset. Some of that knowledge can be made explicit while some will remain as tacit knowledge due to its personal quality. Many authors used the term 'intellectual capital' to indicate the individual and organizational knowledge. Hence, regardless of its source, knowledge considered as 'intellectual capital' due to its economically intangible nature. However, understanding that knowledge is valuable is essential, but quantifying its value is the challenge.

ORGANIZATIONAL LEARNING

Knowledge could be obtained through learning. Not only individuals but organizations also learn. Peddler et al. (1988) defined a learning organization as a social and economic entity which facilitates the learning of all its members and continuously transform itself. A learning organization has a climate in which individuals are encouraged to learn and develop further. Mumford (1994) argued that the learning organization depends on skills, approaches and commitment of individuals and their own learning than the mere accumulation of knowledge.

Moreover, Mumford (1994) identified knowledge is not just data and also it is not just information. Firstly, data converted in to information, then into knowledge. Wisdom is more than the body of knowledge. It includes innovative, creative and proper application of knowledge. Hence, the pragmatic usage of knowledge makes the value of it. Learning organizations are pragmatic enough to create, disseminate, store, update and apply new knowledge in the world of work.

TYPES OF KNOWLEDGE

Knowledge falls in to two categories:

- [1] **Explicit Knowledge**
- [2] **Tacit Knowledge**

Explicit knowledge can be codified while tacit knowledge exists in people’s mind. Explicit knowledge, such as copyright or information codified in hand books, systems or procedures can be protected through legal procedures. But tacit knowledge that is retained by individuals, include learning, experience, observation and informally acquired knowledge. The main challenge in knowledge management is how to turn tacit knowledge in to explicit knowledge. Tacit knowledge might be more important as it is difficult to comprehend by competitors and therefore, difficult for them to copy (Grant, 1999).

Nonaka (1991) identified tacit knowledge as knowledge that has not been codified outside the mind of the individuals who possess it. It is intangible and difficult to express and to communicate to other people by means of symbols. Tacit knowledge is more difficult to transmit than codified knowledge. It has a personal quality which makes it hard to formalize and communicate. Generally it is considered as tacit knowledge is more important than explicit knowledge in gaining competitive advantages.

Explicit knowledge can be codified and communicated through a formal and systematic language and it can be expressed in symbols. This is easy to copy by other competitive organizations, so that always organizations want to manage its existing explicit knowledge base properly without any obsolesce (Mumford, 1994).

Arguments, suggestions and models in extant literature relating to knowledge management could be grouped in to two basic approaches as **personal knowledge approach** and **organizational knowledge approach**. Following are the fundamental differences or assumptions of two approaches of identifying and managing knowledge.

The personal knowledge approach to knowledge management was created from the assumption that knowledge is essentially personal in nature and therefore it is very difficult to extract it from the mind of employees. Hence, here the management practice that focuses on managing people is to consider people as knowledge generators and carriers. Then it is essential to arrange appropriate interactions between knowledgeable individuals. These interactions are intended to encourage them to apply their knowledge constructively. Personal knowledge approach views that knowledge can be transferred by transferring people as knowledge carriers from one part to another in an organization.

Table 01: Personal and Organizational Knowledge Management Approaches
Source: Personal Knowledge versus Organizational Knowledge Approaches to Knowledge Management practices by D. Rooney, G. Hearn and A. Ninan.

Personal Approach
Knowledge is personal and very difficult to extract from people.
Knowledge should be transferred by moving people in the organization.
Learning can be encouraged by bringing the right people at the right time to the right place.

MERITS AND DEMERITS OF PERSONAL APPROACH OF KNOWLEDGE MANAGEMENT

This personal approach of knowledge management has its own advantages and disadvantages. Mainly it offers relatively simple steps to begin managing knowledge. Also it is easy to match individuals’ knowledge with the knowledge requirements of tasks and duties in the organization. This is the path to make a knowledge worker who governs the knowledge economy. At the same time this approach has many long term limitations. Here if knowledge remains as tacit in the minds individuals then the only way to move critical knowledge within the organization is to move people. But moving people is often costly and time consuming and some may refuse to move as it would corrupt their current work or the family life.

MERITS AND DEMERITS OF ORGANIZATIONAL APPROACH OF KNOWLEDGE

In contrast, the second approach; organizational knowledge approach explains knowledge as something that can be made explicit. It is said that knowledge of individuals

Organizational Approach
Knowledge can be codified to create organizational knowledge base.
Knowledge can be disseminated using information technology.
Learning can be designed to overcome knowledge deficiencies through well managed and scientific processes.

that is useful to an organization can be articulated and thereby made explicit and available to others. Knowledge is recognized as an asset which increases the earning capacity of the organization.

Based on the above fact here it is argued that new knowledge can be created through definable and manageable learning processes. Hence, it can be concluded that organizational knowledge approach typically focus on designing organizational processes for generating, articulating, categorizing and systematically leveraging organizational knowledge resource.

TOYOTA STORY OF SUCCESS

Spear and Bowen (1999) investigated the knowledge management practices applied in Toyota Company and they have identified two major practices; pre-training of employees and quality circles. As Spear and Bowen (1999) identified, these practices improved Toyota’s production system into one of the highest quality production processes in the world.

According to Spear and Bowen (1999), when Toyota builds a new factory and wants to transfer knowledge about its production system to the new employees in the factory, Toyota typically selects a group of two hundred to three hundred new employees and sends them for training and work on the assembly line in one of Toyota’s existing factories. After several months of studying the production system and working alongside experienced Toyota assembly line workers, these trained workers are sent back to their new factory to become the core of production teams formed with other new employees. When they

are returned, these trained workers are also accompanied by two hundred or more, highly experienced Toyota production workers, who then work alongside all the new employees in the new factory to assure that knowledge of how Toyota's production process works is fully transferred to all employees in the new factory.



Toyota's use of Quality Circles also illustrates a personal knowledge approach to creating new knowledge. At the end of each work week, groups of Toyota production workers spend one to two hours analyzing the performance in the production system to identify actual or potential problems in quality, productivity, safety, etc. Through their discussions, each group proposes countermeasures to correct identified problems, and discusses the results of countermeasures taken during the previous week to address problems identified in earlier quality circle discussions. Through such interactions, Toyota employees share their ideas for improvement, test new ideas, and assess the results of their tests. This knowledge management practice, which is repeated weekly as an integral part of the Toyota production system, progressively identifies, eliminates, and even prevents sources of process errors.

Toyota follows highly restricted

organizational knowledge management practices that record in detail the tasks that each team of workers and each individual worker are asked to perform on its assembly lines. These records provide a detailed description of the content, timing, sequence, and output of each task and how each task is to be performed, how long each task should take, the sequence of steps to be followed in performing each task, and the steps to be taken by each worker in checking his or her own work (Spear and Bowen 1999). When problems arise these records are used to make suggestions and solutions; especially by new workers.

STORY OF GE

Another example is coming from GE Fanuc Automation, one of the world's leading industrial automation firms. It develops detailed, company-specific design methodologies for the design of new kinds of components for their factory automation systems. Instead of letting each engineer to use his or her own personal knowledge to generate new component designs, GE Fanuc's engineers work collectively to identify standard design methodologies for each type of component that the firm uses. Many of these design methods are then programmed, so that the design of new component variations can be automated, and GE Fanuc's computers then automatically generate design solutions for new components.

STORY OF MOTOROLA

Motorola was the market leader in pagers market in 1990s. It provides another good example relating to organizational knowledge management. To maintain its



EXTRA ORGANIZATIONAL KNOWLEDGE

In addition to the above mentioned individual knowledge and the organizational knowledge, extra organizational knowledge also very important and must be taken in to account. It extends beyond organizational boundaries. The knowledge generated and exchange among similar organizations or different organizations constitutes extra organizational knowledge.

-market leader position, Motorola introduced new generations of pager designs by every 12-15 months. Each new pager invention was designed to offer more advanced features and options for customization than the preceding one. To produce its growing lines of pagers, Motorola designed and built a new factory with higher-speed, more flexible assembly lines for each new generation of pager. To sustain this high rate of product and process development, Motorola formed teams of product and factory designers to re develop each new generation of pager and the factory for production. At the beginning of each project, each new team of designers received a manual of development methods and techniques from the team that had developed the previous generation of pager and its factory. The new development team would then have following three deliverables at the end of their project. They are: an improved and more highly configurable next-generation pager design, the design of a more efficient and more flexible assembly line for the factory that would produce the new pager and an improved design manual that extended the development methods provided to the team in the manual it received by including improved development methods that the team had developed to meet the more demanding product and production goals for its project.

KNOWLEDGE MANAGEMENT AS A BUSINESS FUNCTION IN ACHIEVING QUALITY

As mentioned above knowledge management is any process of creating or capturing, sharing and using knowledge, wherever it resides, to enhance learning and performance in organizations. Hence, the knowledge management concerned with both stock of knowledge and the flow of knowledge.

The purpose of knowledge management is to transfer knowledge from those who have it to those who need it, in order to improve organizational effectiveness. It is concerned with storing and disseminating the knowledge accumulated in an organization about its processes, techniques and operations. It treats knowledge as a key resource. It is the key to competitive advantages.

Grant (1991) suggests that the source of competitive advantage lies within the firm; in its people and their knowledge. Knowledge effectively will become a major source of

competitive advantage for any organization. If the firm has more knowledge most probably it has more power. Successful organizations are knowledge creating organizations. Knowledge creation can be considered as the development and circulate new knowledge within the organization.

KNOWLEDGE MANAGEMENT STRATEGIES

Hansen et al. (1999) identified two strategies of knowledge management. The first one is the codification strategy. This says explicit knowledge is codified using a people-to-document approach. It is therefore document-driven. According to this approach, knowledge is carefully codified and stored in databases where it can be accessed and used easily by any in the organization.

The second approach is the personalized approach. According to this, knowledge is closely tied to the person who has developed it and is shared mainly through direct person to person contacts. This is termed as the person-to-person approach, which involves sharing tacit knowledge.

The creation of new knowledge in an organization can usefully start from an exploration of the existing knowledge base of the organization, especially how this is converted and communicated within the organization. Nonaka and Hirotaka (1995) presented that there are four ways that knowledge can be communicated and shared within the existing knowledge base in an organization.

First way is the socialization; from tacit knowledge to tacit knowledge. One way that

firms can share unwritten knowledge across the firm is to socialize, sharing unwritten experiences and information, perhaps in informal meetings or working together.

Next one is from tacit knowledge to explicit knowledge. It is recognized as externalization. Firms can also share unwritten knowledge by making them more formal. Third way is the combination; from explicit knowledge to explicit knowledge. Organizations can also use previously recorded knowledge and share it more widely within the firm. Last approach is the internalization; from explicit knowledge to tacit knowledge. Firms can take recorded knowledge and use it as a shared point for further shared experiences which are not necessarily written down.

AUTHORS' COMPREHENSIONS

In practice, several techniques for effective knowledge management can be seen. Undertaking a knowledge audit is a one technique. A knowledge audit is designed to search the breadth, depth and location of an organization's knowledge. The result of a knowledge audit allows an organization to use and develop its knowledge to support the strategy of the business. But here the challenge is to increase the knowledge base, which can be done in three ways. Knowledge can be bought, it may be rented by hiring consultants or knowledge can be developed through training and learning.

Next practice is maintaining knowledge in a proper way. Knowledge gaps may make the organization more vulnerable to the competition. For an example downsizing strategy that many firms have followed has

highlighted the danger of leaving employees with expertise and experience in the pursuit of short term cost savings. Thus, it is important to capture, codify and store people's expertise and tacit knowledge whenever needs it. Today information technology has the potential of doing that.

Another practice is protecting knowledge. Because knowledge is an important source of competitive advantage; it is essential to protect. In addition to that an efficient information management system should be coordinated to update the existing knowledge base.

Now it is clear that organizations seek to build competitive advantage in increasingly competitive markets. To do so they are turning to a previously untapped resource: employees' knowledge. But, it practices when implementing a knowledge management program many challenges or failures can be recognized among managers. Firstly failure to align knowledge management efforts with the organization's strategic objectives is a major challenge. Then failure to understand and connect knowledge management in to individual's daily work activities also a pitfall. An over emphasis on formal learning efforts as a mechanism for sharing knowledge also mentioned as a drawback. Focusing knowledge management efforts only within the organizational boundaries is another common weak point mostly done by organizations.

How does an organization assign value to its knowledge and quantify the knowledge asset? It is a challenge. Anyhow, how an organization selects to approach measuring the value of organizational knowledge might depend on the source of the knowledge or on how that knowledge help to meet current

organizational objectives.

An organization must include effective and efficient knowledge creators and knowledge consumers. Thus, it would be important to observe the impact of improved organizational knowledge and knowledge management practices to the value of an organization and its people. So that, today organizational knowledge management is a must for survival and growth of an organization.

CONCLUSION

In conclusion it could be seen, the value of knowledge management relates directly to the effectiveness with, which the managed knowledge enables the members of the organization to deal with today's situations and effectively envision and create their future. Without on-demand access to managed knowledge, every situation is addressed based on what the individual or group brings to the situation with them. With on-demand access to managed knowledge, every situation is addressed with the sum total of everything anyone in the organization has ever learned about a situation of a similar nature. So that, properly managed knowledge base could held organizations to obtain sustainable competitive advantages through several means.

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T. D. WEERASINGHE

T. J. R. THISERA

**Department Of Human Resource Management
Faculty Of Commerce And Management Studies
University Of Kelaniya, Sri Lanka**

