Integrating Knowledge Management and Total Quality: A Complementary Process

Dr Fang Zhao
Post Doctoral Research Fellow, The Centre for Management Quality Research, RMIT University, Melbourne, Australia
E-mail: fang.zhao@rmit.edu.au

Peter Bryar
PhD Student, The Centre for Management Quality Research, RMIT University, Melbourne, Australia
E-mail: peter.bryar@rmit.edu.au

ABSTRACT
The new century is dominated by knowledge-based enterprises operating within a knowledge-driven economy. Knowledge management (KM) has expanded the concept and application of organisational decision-making and now involves wider issues such as environmental scanning, environmental interpretation and enterprise learning. Foundation theories like Total Quality Management (TQM) need to be reviewed if they are to play a complementary role in the development of modern organisations. Any furtherance of TQM theory should address and integrate rather than differentiate newer theories like knowledge management – or is it the other way around?

Keywords: Knowledge Management, TQM,

1.0 Introduction
This paper aims to conceptually advance management research by exploring an integrated approach that incorporates knowledge management (KM) into the TQM process. The focus of this research is to:
• Examine the similarities and differences between TQM concepts and KM theories,
• Develop an inclusive approach to management by integrating KM into TQM, and
• Explore how this approach might be implemented by organisations.

This research draws on a comparative study of popular concepts of TQM and recent theoretical advances in knowledge management. The research is significant because:
• In today’s ambiguous and uncertain environment, the management of knowledge in businesses is an important and necessary factor for organisational survival, and
• To maintain competitive advantage, organizations need a TQM approach that views knowledge as a potential source of competitive advantage.

The paper starts with a brief literature review in the areas of KM and TQM. It continues with a comparative study of the fundamental concepts of both in terms of objectives, goals, strategies and focus. Based upon this study, an integrated approach to management that incorporates KM into the TQM process is developed. The paper concludes with a practical suggestion as to how the complementary approach may be implemented in organisations.
2.0 Knowledge Management & TQM: Similarities and Differences

Like TQM, KM has been defined in different ways and from different perspectives. Davenport et al. [1998] defined KM using a project-based approach:

Knowledge management is concerned with the exploitation and development of the knowledge assets of an organisation with a view to furthering the organisation’s objectives. The knowledge to be managed includes both explicit, documented knowledge, and tacit, subjective knowledge. Management entails all of those processes associated with the identification, sharing and creation of knowledge. This requires systems for the creation and maintenance of knowledge repositories, and to cultivate and facilitate the sharing of knowledge and organisational learning.

The authors of this paper explore KM from the perspective of operational processes, that is, the basic input-output transformation process (see Fig. 1). At the input end, we have a combination of knowledge of customer’s needs and expectations, knowledge of raw materials and resources to be used, knowledge of products and services to be delivered as well as data information or knowledge. The knowledge conversion process is actually a changing and/or improving process. It consists of preserving, embedding and enhancing knowledge of process, products and services. The knowledge conversion process can also be seen as one of knowledge creation, transferring and sharing, and a process of knowledge access improvement as well. Fostering a knowledge environment that is conducive to knowledge development, use and transfer is vital in the knowledge conversion process.

As we have entered into an information and technological age, knowledge embedded in products and services, intellectual capital and an improved knowledge and understanding of customer needs are among the most important outputs of the knowledge conversion process. The process clearly indicates that knowledge management takes information, knowledge and people as its basic inputs, and applied knowledge and intellectual capital as its desired outputs. KM emphasises knowledge creation, transfer and embedding to serve different organisational purposes. This may include the enrichment of knowledge of customers, the building of knowledge capital or developing enhanced access to knowledge [Armistead, 1999].

![Figure 1: The Knowledge Management Process](Adapted from Armistead, 1999)
Definitions and descriptions of TQM are often vague. It is therefore useful to provide a brief profile of TQM concepts by reviewing the vital principles:

- Customers include internal and external customers.
- Meeting and exceeding customer needs is a clearly stated aim.
- Leadership of TQM stems from the top management and enlists individual and team commitment throughout.
- The highest levels of integrity, honesty and trust and openness are essential ingredients of TQM.
- Mutual respect, mutual trust and mutual benefit of all stakeholders are important factors within the development of any Total Quality organisation.
- Total Quality offers each individual the opportunity to participate, contribute and develop a sense of ownership.
- TQM involves continuous and measurable improvement at all levels of an organisation.
- TQM requires consistent and precise performance to high standards in all areas of the organisation.
- An aim of TQM is to better use resources, to achieve effectiveness and efficiency [Hellard, 1995].

In terms of the input-output process, like KM, TQM is also a process of transformation of a set of inputs including plant equipment and raw materials, procedures and methods, information and knowledge, and people and their skills. The outputs of the transformation are products, services, information/paperwork and any results that meet customer needs and expectations (see Fig. 2).

The processes illustrated in Figures 1 and 2 above clearly show that both TQM and KM take information, knowledge and people as their basic inputs, and applied knowledge and intellectual capital (may be in the form of information and paperwork in the case of TQM) as their desired outputs. However, focuses and strategies of both are quite different. KM regards knowledge as the source of competitive advantage. TQM relies on quality processes to achieve customer satisfaction. Table 1, following, illustrates further the similarities and differences between KM and TQM in terms of objectives, goals, focuses and strategies [Miltra, 1998].

![Figure 2. A Framework of TQM Processes](Adapted from Oakland & Sohal [1996])
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<th>Similarities</th>
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<tr>
<td><strong>KM</strong></td>
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<tr>
<td>Continuous improvement and learning from others</td>
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<td>Valuing employees/intellectual capital</td>
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<td>People/competence development</td>
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<td>Empowerment/ involvement</td>
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<td>Teambuilding/collaboration</td>
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<td>Acquiring knowledge of competitors, customers, suppliers and partners</td>
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<td>Facilitating/improving access to knowledge</td>
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<td>Improving quality and efficiency of decision-making</td>
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<th>Differences (Focus/Strategies)</th>
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<tr>
<td><strong>KM</strong></td>
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<tr>
<td>Embedding knowledge in staff, customer, products, process, services</td>
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<td>Regarding knowledge as the source of competitive advantage</td>
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<td>Achieving greater productivity through the use of knowledge</td>
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<td>Creating/disseminating new knowledge and embedding it in new technologies and products</td>
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<td>Searching for new source of information</td>
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<td>Adapting knowledge to market needs</td>
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Table 1: Similarities and Differences: Knowledge Management (KM) and TQM

The authors propose that differences noted between KM and TQM are not mutually exclusive.

### 3.0 An Integrated Approach to Management

The above comparison of the TQM and KM processes indicates their strength and complementarity. On the basis of this, the authors developed a conceptual and theoretical framework of an integrated approach to management (see Fig. 3). The authors argue that the effectiveness of quality management process to achieve quality improvement and increased productivity will be enhanced if KM concepts are effectively integrated into the process. The framework (Fig. 3) shows that organisational excellence can be achieved through incorporating KM concepts into the TQM process whilst interacting with environmental changes. In today’s ambiguous and uncertain environment, organisations face critical issues of adaptation, survival and competence. It is through creating, acquiring, embedding and using knowledge that organisations can address the critical issues as well as obtain competitive advantage. Searching for and acquiring new sources of information and new technologies helps organisations to stand out in gaining market share in terms of their products and services. KM and TQM are complementary. A synergistic combination of KM and TQM forms a cycle of improvement and development, leading to organisational excellence. Knowledge of, and understanding, customer needs and requirements are the pre-requisite for customer satisfaction. Knowledge embedded quality products and services are vital to the achievement of customer satisfaction. Moreover, management by facts, a core value of Malcolm Baldrige National Quality Award, counts on organisational capability of obtaining, processing, disseminating and use of data and information. While TQM is result focused, which emphasises optimisation of resources and on greater productivity, better use of intellectual capital and knowledge assets hold the key to achieving the desired results. As elaborated above, to be successful, it is necessary to take an integrated approach to
management. In other words, TQM should address environmental changes and deal with them through improving knowledge management capacities and skills.

External Environment

Inputs
- Embedded and new knowledge in materials and customers
- Data / information
- Existing and new knowledge
- Procedures, Methods, People, Skills, Plant/Equipment

Outputs
- That meet customer requirements
- Knowledge embedded in customers and products / services
- Enhanced conversion knowledge
- Information / paperwork
- Intellectual capital
- Results

Organisational Excellence
vide
Total Management Process
(Total Quality Management, Knowledge Management & other Processes)

Inputs & New Learning

Reflection & Adaptation of New Learning

Although the proposed model can be described as a series of steps, it is intended to involve a series of spiral, self-reflective cycles commencing with:

- the knowledge and other inputs known at the time
- being fed into a holistic, total management process that
- produces the required output
- and stimulates individual and collective reflection
- that leads to new learning and adaptation of such into the inputs and total management process.

4.0 Implementing the Approach

To be successful in implementing this approach, the following concepts need to be considered:

- Build management understanding and commitment ensuring that it flows from top management through to all levels.
• Sufficient resources need to be allocated to ensure success.
• A knowledge of customer and other stakeholders needs and expectations must permeate the entire organisation.
• Intellectual capital must be harnessed and transformed into knowledge of products/services in a way that the entire workforce can be utilised.
• Existing knowledge and new learning must be accessible to all.
• Knowledge must contribute to organisational learning, thus creating a culture that is conducive to continuous improvement.
• Encourage individual and collective learning by supporting training and development and the sharing of experiences associated with new learning and application.
• When performance measures are established, organisations should ensure that they support a collaborative rather than competitive culture.

These concepts outline a sound way to run an organisation, however it is well known that implementation and benefits associated with TQM and KM will waver if any of the above concepts are allowed to fall into disrepair.

Although a number of authors [Besterfield et al, 1999; Levett and Guenov 2000] in the areas of TQM and KM propose stepped implementation models for their own disciplines, we have suggested that TQM and KM principles can be implemented synchronously and that there is an inherent synergy about them. KM will enhance the possibilities for achieving organisational excellence if there is a sound management foundation like TQM.

5.0 Conclusion

We are only just beginning to understand what KM means when it comes to managing operational processes. A knowledge based TQM approach will inform, guide and facilitate continuous improvement and learning, thereby assisting the organisation to better meet the changing needs and expectations of customers. It should facilitate the introduction of KM principles gradually engaging and turning them into a complementary management process.

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References
Miltra, A. [1998], Fundamentals of Quality Control and Improvement, Prentice Hall, New Jersey