

From TQM to TSM

Dr. Li Sai Kwan examines a viable system modelling approach for translating Total Quality Management (TQM) principles into Total Safety Management (TSM) models.

Abstract

In the hope of a major leap forward in the field of safety management, some Safety management theorists have put forward TSM models, based on TQM principles. This article brings new light on TSM from a systems perspective and concludes with the formulation of a comprehensive TSM system within a viable system model structure. TSM characterizes itself with a leadership and learning style of safety management at all levels.

From TQM to TSM

Despite the popularity of TQM in the mid 90s, there is a lack of a consensual view on its theoretical base (Anderson et al, 1994). Hackman and Wageman (1995) have summarized the ideas of the TQM founders under four principles and five interventions. According to Waldman (1994), there are eight elements that make up TQM. However, Spencer (1994) has identified links between TQM and the mechanistic, organismic and cultural theories. Amid this theoretical m el ee, Petersen (1994) offers a direct translation of commonly quoted TQM elements for safety management. Table 1 below is the TSM model of Petersen and the corresponding TQM principles of Deming (1986).

The ten elements of TSM, when compared to Deming's 14 original principles (Deming, 1986), fail to cover all of the original TQM principles. Without commenting on the rationale of consolidating the original 14 principles into models with a lesser number of elements (Waldman, 1994), it might be possible that some of the original principles can be combined in respect of quality but bear a different meaning in regards safety.

For example, 'End the practice of awarding business on the basis of price tag alone' sounds very viable in safety management. It implies that a company should also consider the safety performance of service providers. It is clearly discernible that these points are relevant to safety management and should be included in the TSM programme. Therefore, a reinterpretation of Deming's TQM principles in safety terms may inspire managers when they come to refining their safety management systems.

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Table 1: TSM elements of Petersen (1994)

TSM elements	Corresponding TQM principles & reference of Deming
1) Concentrate on the long-range goal of developing a world-class system, not on short-term annual accident goals.	1) Constancy of purpose
2) Discard the philosophy of accepting accidents - they are not acceptable.	2) Adopt a new philosophy
3) Use statistical techniques to identify the two sources of accidents - the system and human error.	3) Cease dependence on mass inspection
4) Institute more thorough job skills training.	6) Institute training on the job
5) Eliminate dependence on accident investigation. Instead, use proactive approaches such as behavioral sampling, fishbone diagrams, flow charts, etc., to reveal system flaws and achieve continuous system improvement.	3) Cease dependence on mass inspection
6) Provide supervisors (and employees) with knowledge of statistical methods (sampling, control charts, etc.) and ensure that these tools are used to identify areas needing additional study.	3) Cease dependence on mass inspection
7) Reduce fear throughout the organization by encouraging all employees to report system defects and help find solutions.	8) Drive out fear
8) Reduce accidents by designing safety into the process. Train research and design personnel in safety concepts.	5) Improve constantly and forever every process for planning, production, and service
9) Eliminate the use of slogans, incentives, posters and gimmicks to encourage safety.	10) Eliminate slogans, exhortations, and targets for the work force
10) Examine work standards to remove accident traps.	5) Improve constantly and forever every process for planning, production, and service

Reinterpretation of TQM principles in safety terms

In order to give a structured model of TSM, the re-interpretation below will follow the structure of a Viable System Model ('VSM', Beer 1985). A VSM is consists of 6 management functions: policy, strategy, control, audit, co-ordination, and implementation. The reinterpretation is made based on systems and organizational behaviour theories:

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1. Create constancy of purpose toward improvement of product and service.
 - A safety policy of highly risk-avoiding, long term preference over short term success; and
 - A strategy of adapting to external changes such as new safety regulations and technologies.
2. Adopt the new philosophy.
 - A safety culture that drives the policy of rejecting long tolerated lapses and a new policy of continual improvement.
3. Cease dependence on mass inspection to achieve quality
 - A safety control system that does not rely on very frequent safety inspection; and
 - An effective safety inspection programme that can identify underlying safety problems.
4. End the practice of awarding business on the basis of price tag alone
 - Considering the safety capability of prospective suppliers (sub-contractors) instead of their price only; and
 - Using suppliers (sub-contractors) with good safety capability.
5. Improve constantly and forever every process for planning, production, and service
 - A leadership style that drives daily improvement to all processes at all levels, and
 - An effective communication that enables the free communication of improvement ideas.
6. Institute training on the job
 - The management in the safety requirements of various production processes; and
 - Workers on the safe way of executing works.
7. Adopt and institute leadership
 - A constructive safety leadership that resides in every functions and strives for the discrete safety policy instead of the targets of that function; and
 - A proactive safety leadership that interacts effectively with other functions.
8. Drive out fear
 - A culture of safety as value (Petersen, 1994; Geller, 1994, 2001) that is to be protected among other situational priorities;
 - A personnel policy that encourage peoples at all levels to participate in protecting and advancing safety; and
 - A positive leadership style that founds on coaching and help (Geller, 1994, 2001) but not fear.

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9. Break down barriers between staff areas
 - A truly systemic management system in which safety is taken seriously;
 - An effective safety coordination process; and
 - An effective safety auditing process.
10. Eliminate slogans, exhortations, and targets for the work force
 - A culture and leadership style of management by facts, not by empty exhortation; and
 - An operational practice of using positive symbols and signals to boost safety morale.
11. Eliminate numerical quotas for the work force and goals for management
 - Be free of unrealistic numerical targets; Be managed by facts and effective leadership (principle 7 above); and
 - Be driven by positive and constructive signals (principle 10 above).
12. Remove barriers that rob people of pride of workmanship
 - Non-performance based safety competition for the promotion of safety culture; and
 - An effective transformative leadership style that nurtures a safety culture and motivates workers to refine their safety behaviours.
13. Institute a vigorous program of education and self-improvement for everyone
 - A comprehensive safety training programme on both job related safety and safety management theories; and
 - A transformative leadership style that create a learning climate in constructing a learning organization.
14. Take action to accomplish the transformation
 - A detailed plan for accomplishing the transformation (Goetsch, 1998; Petersen, 2003); and
 - A positive transformative leadership that encourage workers to revert unsafe behaviours to safe practices.

A TSM model

With the re-interpretation postulated above, it is possible to construct a TSM model that uses the VSM structure. Below is the description of the functional content of such a TSM model.

The TSM policy should be one that is risk-avoiding, long-term focused, action biased and fact oriented. The policy nurtures constructive safety leadership that resides in every function and is targeted at safety values instead of focussing on the specific targets of that function.

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The TSM strategy drives the company to adapt to external changes such as new safety regulations and technologies. In doing business with suppliers, TSM strategy considers suppliers' safety capability instead of their price-only-selection.

TSM favours a safety control system that does not rely on frequent safety inspection. Instead, leadership and training are employed to render the system less dependent on control.

TSM requires effective safety inspection and auditing that can identify underlying safety problems and drive continual improvement. Statistical analysis on safety performance as obtained through inspections and audit, in terms of accident rate or frequency of observed unsafe behaviour, serves to reveal the root cause of an accident and aims at continual improvement. In no case should these figures be used to create fear in the workplace.

TSM is a truly systemic approach in which effective safety coordination is enabled, with an effective communication system that enables the free communication of ideas for improvement. There is proactive safety leadership that interacts effectively with other functions and a personnel policy that encourage personnel at all levels to participate in protecting and advancing safety

Implementation of TSM

Operational practice is to use positive symbols and signals to boost safety morale and non-performance based safety competition for the promotion of safety culture. Operations under TSM are free of unrealistic numerical targets and are managed by facts and effective leadership - a leadership style that drives daily improvement to all processes at all levels.

A normative TSM culture

Amid these functional characteristics, the interaction mediating among the functions is palpable; the interaction is manifested through leadership and training, both act to nurture a normative TSM culture as represented by the functional value system described above.

Leadership

A positive transformative leadership style that founds on coaching and help, not fear, is to be instilled at all levels. Through this transformative leadership, workers are guided to transform unsafe behaviour into safe practice.

Training

A comprehensive safety training programme on both job-related safety and safety management theories is to be implemented. It is crucial to train the management in the safety requirements of various production processes and workers on the safe way of executing works. Through transformative leadership, a learning climate is created for the pursuit of constructing a learning organization.

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Using these eight building blocks, a TSM model can now be envisaged:

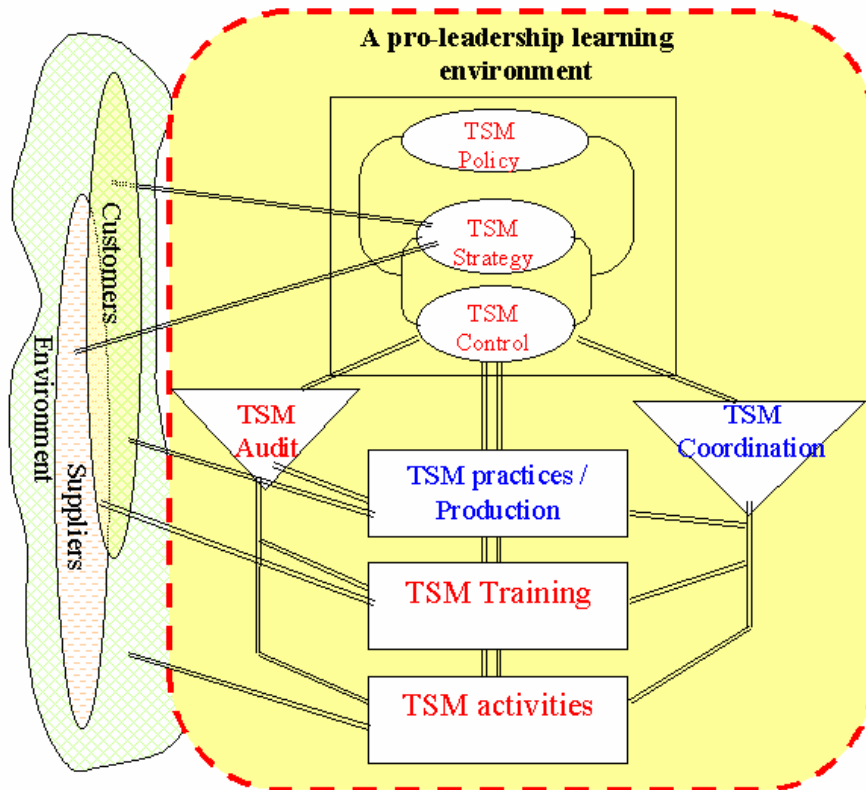


Fig. 1 A TSM model within a VSM structure

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