Putting Systems Thinking to Use: A Case Study

by

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Systems thinking tools are particularly useful for diagnosing the problems for the situations with known history and insights are generated by structuring the assumptions to uncover causes of significant problems. An objective of this paper is to put systems thinking to use by showing how the problems faced by the case company were due to collective actions of several functional units of the organization. The focus here is to illustrate thorugh causal loop diagramming the consistently recurring themes during the case company's attempt to adopt quality management concepts. The paper concludes with generic insights equally applicable elsewhere.

Background, Method and Sources

The case company, SISU of USA fabricates some components and assembles logging machines on demand. It employs more than 150 people. Prior to 1992 due to unhealthy financial status the management decided to adopt the latest and notorious management philosophy of what is known as Total Quality Management which they named Total Valmet Quality (TVQ). Valmet Logging of America, Inc. was the name of the company prior to acquisition by SISU of Finland. However, the TVQ program was prematurely abandoned in 1993 and restarted under different name in 1994 using the ISO-9000 standards and guidelines as a framework. After learning what happened to the 1992-93 attempt, authors decided to thoroughly investigate the failed attempt by viewing through systems thinking lens to uncover any systemic problems which may potentially cause the problems for the 1994 attempt of adopting quality management concepts. The systems thinking tools were selected, because the tools offer a shared language to deal with complexity as well as a sense of control over the future one strives to influence. Furthermore, the critical insight the process of application leads to is the revelation how today's problems are created by our own past actions. Causal loop diagramming and archetypes [Brown and Tse, 1992; Kim, Daniel and Burchill, Gary, 1993] were the primary tools utilized.

The information for building a consistent story was collected by interviewing the employees directly involved in the TVQ program as members of the steering committee and by accessing the project file that included a complete set of minutes and other records related to the project plans and activities. Whenever necessary other employees were asked to illuminate their views on certain events during that period. All these interviews and data collection activities were aimed at constructing causal loop diagrams that would be based solely on facts.

The next section describes a causal loop showing a shared mental model of members of the management team at the time of the enrollment process into the TVQ initiative. The following section contains six specific stories, in the form of causal loops, happened during 1992 and 1993

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that led to abandonment of the TVQ. The stories were verified. Finally, the paper concludes with identification of forces which modulates everybody's interest in the quality management program. The generic insight about these forces is equally applicable elsewhere.

Management Mental Model Prior to TVQ Initiation

The TVQ program started from the suggestion and interest of one member of the management team. The managers recognized that quality thinking and improvement might be the crucial key to get the shop floor operations into better shape, to maintain and gain competitiveness in the market place and thus to improve financial bottom line. Management expectation about evolution of VQM are shown in the Figure 1.

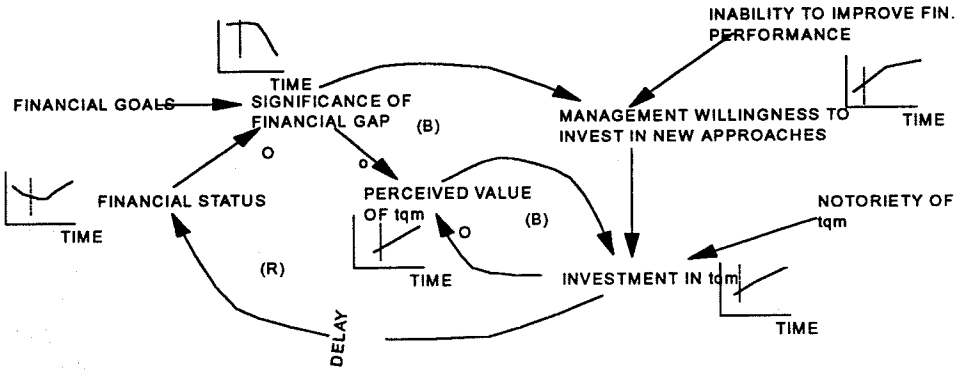

FIGURE 1: VELMET MANAGEMENT MENTAL MODEL OF TQM PROGRAM IN EARLY 1992

TVQ Implementation Stories

In early 1992, most of the managers did not have any substantial knowledge of quality management related issues. Consequently, the manager who initially suggested the program received a free hand to develop a customized approach. Rest of the managers accepted the arrangement, in spite of some concerns. The team began to self-educate in quality management concepts that first concentrated introducing indiscriminately the principles of team dynamics, problem solving techniques, customer focus, cost of good quality, process control, etc. Many meetings were devoted to generate suitable implementation strategies. Several companies engaged in quality programs were visited by the team members. Later an external consultant was brought in to train the management team and to help in putting together a TVQ manual that would be distributed to all key employees. Although most employees knew that a quality management program was being put together, they were in total dark as far as the details and its implications. Due to lack of planning and inconsistent communication with all employees, TVQ was not progressing as wished for. Gradually, management's conviction and patience with program bagman to diminish. Employee resistance and apathy toward the program was also evident. By the summer of 1993 the TVQ program had not achieved tangible results that would have been comparable to the invested resources. The only tangible result prior to its abandonment was a TVQ booklet.

The case company's experience with the failed TVQ program was subjected to examination to generate any insights that may be of value in the newly initiated ISO9000 driven quality management program. The personal interviews with key individuals and access to the project file that included a complete set of minutes and other records related to the project plans and activities, generated several stories which were amenable to be represented using systems tools. All six stories are presented in Figures 2 through 7. The details can be found in the thesis by the first author [Pirkka-Matti P. Alanne, 1995].

Conclusion

The Table 1 offers a list of forces influencing the employee interest in VQM. The insights from studying these forces are also applicable elsewhere.

Table 1: Employee Interest Influencing Forces

Interest Enhancing	Interest Diminishing		
	Planning Domain	Information Domain	Resources Domain
• Fear of losing / not gaining orders • Improving bottom- line • Buying time • Improving morale • Improving operations	• Lack of result orientation • Failure to recognize shortfalls in time and resources • Lack of consistency of purpose • Lack of appreciation of the need for training	• Lack of quality management knowledge • Inability to understand the requirements • Failure to maintain communication • Unavailability of advice • No prior quality documentation	• Lack of time • Conflicting demand on time • Mismatch between resource invested and the results • Insufficient knowledge resource • Insufficient workforce

References

Brown, Jim and Tse, Scott S. F., A System Dynamics Analysis of Total Quality Management Implementation False Starts, Massachusetts Institute of Technology, May 1992.

Kim, Daniel and Burchill, Gary, "System Archetypes as a Diagnostic Tool: A Filed Based Study of Total Quality Management Implementation, " D-4289 System Dynamics Group Work-paper, Massachusetts Institute of Technology, 1992.

Pirkka-Matti P. Alanne, A Clean Slate Approach to Designing an Infrastructure for Systemic Quality Evolution: A Case Study, an unpublished M.S. thesis, Michigan Technological University, 1995.

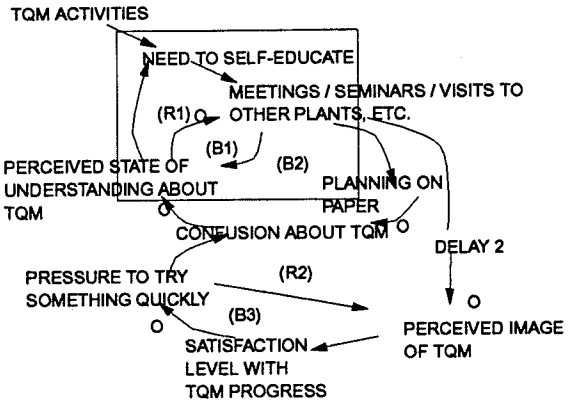

FIGURE 2: SLUGGISH WARM-UP

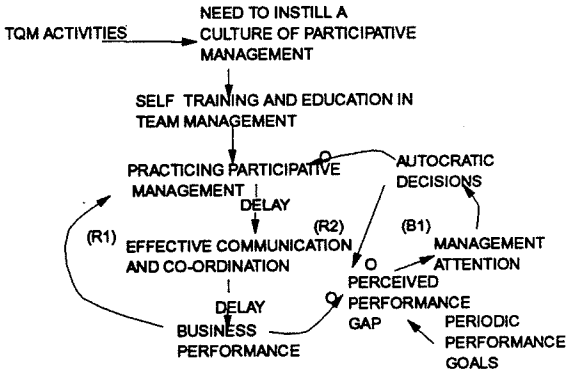

FIGURE 3:TENSION BETWEEN PARTICIPATIVE AND AUTOCRATIC DECISION MAKING

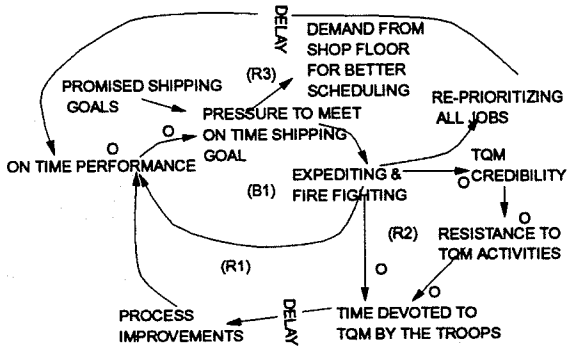

FIGURE 4: RESISTANCE TO CHANGE

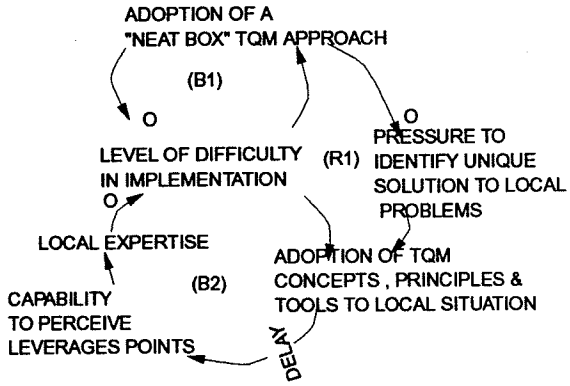

FIGURE 5: "HAPPY MEAL" SYNDROME

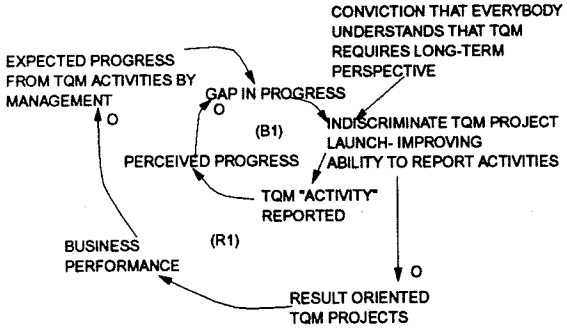

FIGURE 6: "ACTIVITY" VS "RESULT" ORIENTED PROJECTS

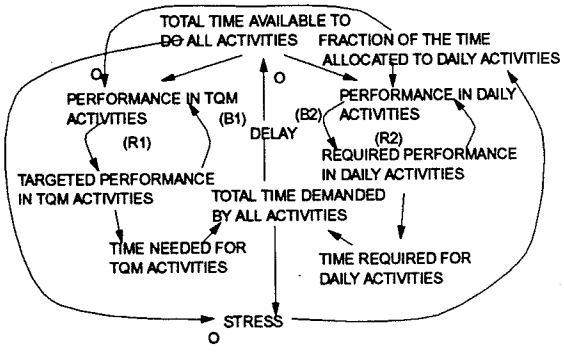

FIGURE 7: TRAGEDY OF COMMONS AT AN INDIVIDUAL LEVEL