A TQM Roadmap in an Oil-Based Economy:
A Case Study of the Libya Oil Industry

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Abstract

This paper describes the development of a Total Quality Management (TQM) roadmap based on empirical research and in the context of an oil-based economy, in this case the Libyan oil sector. The main aim of the paper is to identify Critical Quality Factors (CQF) as perceived in thirty large Libyan oil companies. The CQFs identified are used to develop a roadmap for the successful implementation of TQM in Libya. The roadmap is based on a progressive approach and is conveniently divided into three levels of activity namely engagement of top management in the journey to excellence, enhancement of organisational structures and associated systems, and the formulation of appropriate guidelines for implementing the identified Critical Quality Factors. It is argued that this roadmap can be readily used in many similar economies particularly in developing countries.

Keywords: *Total Quality Management (TQM), Libyan Oil sector, and critical success factors*

1. Introduction

Many organisations have found that the key to competitive success is about emphasising the product and service quality as a strategic issue when doing business (Belohav, 1993). The advent of value seeking, informed consumers, increased global competition and deregulation in a number of industries is driving companies to implementing Total Quality Management (TQM) as a solution to survive (Huarng, 1998). This new management philosophy based on TQM has generated significant interest in various economies across the World. Kanji (1990) has called this the second industrial revolution. The increased awareness of senior management, who have recognised that quality is an important strategic issue, is reflected as an important focus for all levels of the organisation (Oakland, 2000). To this extent, several authors have identified different sets of Critical Quality Factors (CQF) based on their experience (Blak, 1993; Blak and Porter, 1996). In Libya, empirical research is required to identify these CQFs in the context of a country who has just opened its economy to foreign investment after enduring tough international sanctions over an extended period of time.

2. Aim Of The Research

This is to develop a road map for TQM adoption in Libyan oil industries based on the identification of critical quality factors. Several authors (Ahire etal., 1996; Baidoun, 2003; Black,

1993; Blake and Porter, 1996; Thiagarajan, 1997; 2001) suggested that the development of a TQM road map is best informed by the experiences of organisations advanced in their use of TQM. Three different methods of data collection have been used in this research to capture the Libyan experience as follows:

1. Questionnaire involving 30 organisations with the aim of identifying Critical Quality Factors (CQF).
2. Semi-Structured Interviews with 10 case studies with the aim of investigating how the identified CQFs are implemented.
3. Open Interviews with 2 case studies with the aim of exploring the stages of implementation of the CQFs.

3. Research Findings

Analysis results indicated 18 quality factors stratified into three tiers of criticality based on statistical analysis (central tendency and dispersion) and further qualitative analysis as follows:

Tier I Critical Quality Factors
1. Top management commitment
2. Visible involvement of top management in quality and customer satisfaction
3. Clear mission statement
4. Quality planning
5. Staff development
6. Satisfying customer needs and expectations
7. Multi skill training on the job

Tier II Critical Quality Factors
8. Quality management system and manual
9. Problem solving and improvement processes
10. Effective communication between employees and management
11. Participation of operational staffs (in decision-making, where possible
12. Managers and supervisors as facilitators for continuous improvement
13. Supplier-customer chain
14. Proper organisation for quality management in place to facilitate the journey to excellence

Tier III Critical Quality Factors
15. Employee commitment and enthusiasm
16. Quality Teams
17. The use of Information Technology
18. Tracking of quality costs

4. Development Of The Proposed TQM Road Map

A model based on the findings of the empirical evidence is presented and includes essential top management actions, associated organisational activities and the guidelines for effective implementation in the context of Libyan oil industries. The three tiers of criticality identified are used to deploy the stages of implementation of the road map as follows:

1. Preliminary Stage: Full awareness and understanding of the 7 Tier I CQFs.
2. Adoption Stage: Implementation of Tiers I (7) and II (7) CQFs
3. Consolidation Stage Further enhancement of Tiers I (7), II (7) and III (4) CQFs.

5. Road map Constructs

Several authors (Leonard et al., 1982; Kanji, 2001a) have used normative constructs for developing TQM road maps. Normative constructs generally refer to those aspect or activities that a company aims to perform exceptionally well in adopting a TQM road map. The idea of finding a set of normative constructs and aligning them with practical options (Tier I CQFs, for instance) is to strategise thresholds that optimise efficiency when undergoing transformation for TQM.

Several methods have been used to identify these constructs. Black (1993), Ahire et al. (1996) and Zhang (2000) used factor analysis to do this. In this research, the approaches of Mann (1992) and Thiagarajan (1996), which are based on 'judgemental processes' are used because of the blend of quantitative and qualitative methods used in the analysis. Four constructs have been identified and represent collectively the Libyan experience in the oil sector. They are:

1. Leadership commitment
2. Employee involvement and participation
3. Customer-driven processes
4. Continuous improvement

6. Construct 1: Leadership Commitment

The literature has shown wide consensus that top management commitment is the internal driving force TQM (Ahire et al., 1996; Crosby, 1989 Black and Poreter, 1996; Deming, 1986; Garvin, 1983; Motwani, 2001; Zairi, 1999). As part of the quality policy of the company, top management needs to make a clear statement of vision and mission, quality goals, principal guidelines, strategies and plans. The policy needs to be communicated to all the levels of the company and implemented. Libyan respondents have indicated that leadership commitment is best realised using the following tasks:

1. *Implementing selected Tier I CQFs:* Senior executives are responsible for the company's policy on quality management and the commitment to improve performance in all aspects of the organisation. This commitment must be visible. The company mission statement should clearly relate to quality and associated measurable effects with proper resource deployment and review systems.

2. *Implementing selected Tier II CQFs:* Leadership should encourage participation of operational staff (shop floor) in decision-making, where possible.

3. *Monitoring:* Successful implementation of TQM requires careful planning. Performance indicators must be used to provide the means for identifying areas for improvement.

4. *Building teams:* Teamwork gives a collective momentum and energy to launch and

sustain TQM transformation and is founded on responsibility, trust and sustained problem solving.

5. *Securing top management support:* Managers should show their commitment through their active involvement, visible commitment, and active leadership and, above all, active encouragement of shop floor staff to commit themselves to quality. Two of the key components of leadership commitment are initiative and creativity. Resources for short and long-term commitments must be planned to sustain the continuous quality improvement process. Often, a change in company culture is necessary to facilitate the evolving demands of adopting TQM.

6. *Setting-Up a Quality Council:* This is required to provide vision and direction for the successful implementation of TQM. The quality council should aim to develop a strategic plan. Consensus reaching techniques for enlisting the wholehearted support of members must be used at all times.

7. *Appointing a TQM Manager*: The TQM manager must have a sound knowledge and enthusiasm for quality improvement, an impeccable capacity and disposition to work with different people and an ability to serve as trainer, coach and consultant. The TQM manager should make sure that quality teams are empowered and are aware of their responsibilities and duties in achieving the goals set by the quality council.

8. *Developing and deploying the TQM Policy:* This should include clear company values in the form of CQFs. Setting targets for these based on key performance indicators is essential. There is also a need for setting priorities, goals and targets at all levels of the organisation, as well as appropriate resources and training. All goals set must be feasible and measurable.

9. *Formulating and communicating the mission statement:* The formulation of the mission statement and definition of quality involves all cadres of staff, but should be led by top management. All available channels of communication must be explored to explain the mission statement to the employees at all levels of the organisation.

7. Construct 2: Employee Involvement and Participation

The impact of employee support in achieving quality goals has already been praised by many authors (Ahire et al., 1996; Black and Porter, 1996; Blackburn and Rosen, 1993; Clemmer, 1990; Creech, 1994; Evans and Lindsay, 2001; Kanji, 1995; Oakland, 2000; Sun, 2000; Thiagarajan and Zairi, 1997). Middle management and shop floor employees need to be involved in the organisational process as major internal stakeholders. They need to be motivated to rise up to the challenge of adopting TQM through appropriate training packages as well as work-based incentives. Motivation is essential to brew support for quality and employees should be empowered to work in teams - their efforts need to be rewarded. Libyan respondents have indicated that employee involvement and participation are best realised using the following tasks:

1. *Implementing selected Tier I CQFs:* Provide training at management levels in communication, effective meeting, and leadership skills; and at operations levels in problem identification and solving, quality improvement and other technical skills.

2. *Implementing selected Tier II CQFs:* Instigate effective inter-communication at and

between the various levels of the organisation.

3. *Implementing selected Tier III CQFs:* Encourage every employee to participate in the fulfilment of the company vision, values and quality policy.

4. *Disseminate information throughout company:* Ensure company-wide awareness of the potential benefits of TQM. In Libya, this is best achieved by arranging assemblies where employees see and hear top managers commit themselves to quality by providing appropriate resources and tools.

5. *Strengthen employee buy-in to TQM:* In Libya, face-to-face discussions with middle management and continuous communication with employees is possibly the only way to strengthen commitment to TQM.

6. *Communicate the policy and associated strategy:* The importance of communication – that is, all forms of communication – in generating awareness and mobilising creative energies for achieving the goals of TQM cannot be over-emphasised. In the Libyan oil sector, the top-down and bottom-up communication model (Richardson 1997) must be used. On the one hand, it allows employees know the minds, visions and strategies of top management; and on the other, it allows employees to let management know their views about key aspects of the implementation process. Open communications tackle suspicion and resolve barriers between employees and top management.

7. *Allay middle management/employee anxiety:* Fear and anxiety is a prominent problem at the early stage of adopting TQM. To allay this fear, it is the duty of top management to perform two tasks. Firstly, they need to engage middle managers and assure them of their strategic role in the process. Secondly, they need to make sure that fear among shop floor employees (such as possible downsizing and retrenchment) is assuaged.

8. *Develop middle managers to assume new roles:* This is crucial at all stages of TQM. To achieve this, middle managers need new knowledge, technologies, skills and know-how. They need to be well-trained and equipped to act as mentors for shop floor staff. Furthermore, appropriate recognition and rewards for middle management goes a long way to reinforce their enthusiasm and commitment.

9. *Seek continuous improvement of skills through training:* Trained staff are more likely to reduce potential risks, costs and defects in process control. Training middle management improves their skill of mentoring and facilitation, and helps pass information and decisions between the lower team levels, individuals and top management. Regular reviews of organisation and managerial procedures help identify appropriate quality-training programmes.

10. *Provide training in interactive skills:* These include group/team work, interpersonal and communication skills to enhance employees' ability to articulate issues and concerns.

11. *Increase company awareness of TQM:* there is a greater need for all participants to be brought in to the level of knowledge of theory and practice of TQM from formulation right through to implementation. Managers and employees alike must use the concepts and tools of TQM, and provide a rich source of information on company achievements, performances and developments vis-à-vis TQM.

8. Construct 3: Customer driven process

Managing by customer-driven processes for quality (Zairi, 1994) must be adopted in Libya to conduct business and implement quality goals by mobilising appropriate human and physical resources. Many argue that internal customer-suppler relationship is the basic principle behind this approach. Oakland (2000) referred to this as a series of internal supplier-customer chains contributing to the company-wide quality involvement in the company. Libyan respondents have indicated that a customer driven process is best realised using the following tasks:

1. *Implement selected Tier I CQFs:* Companies should identify customer needs and expectations, which match their business needs and expectations.

2. *Implement selected Tier II CQFs:* Companies should have in place procedures and work instructions, and every employee must understand their dual roles as internal and external customers and suppliers.

3. *Identify external and internal customer requirements:* The oft-repeated dictum is customers are the core of business and therefore quality. Several effective techniques help in identifying the requirements of the customers. Attending to the need of the customer is essential to customer satisfaction. Companies should use regular surveys, face-to-face meetings with customers and focus groups to capture their needs and expectations. Customer care is key to customer satisfaction and loyalty.

4. *Promote the concept of internal customer-supplier relationship:* Customer-supplier relationship needs to be promoted and sustained. The concept of customer-supplier relationship must be established in the quality process to identify, control and improve activities that add value to the customer satisfaction. This concept could be included in the quality awareness training planned for the early stages.

5. *Carry out systematic review and analysis of key process indicators*: Trained senior and middle managers are entrusted with the responsibility of mapping the process with key goals and indicators. In addition, individuals and teams also play a key role in supporting senior managers in evaluating processes and associated outputs.

6. *Deploy appropriate resources around major process:* Resources are always scarce and it is necessary to deploy them prudently. The requirements of various resources, including manpower, are decided based on a company's profile of income and expenditure. Thereafter, the resources are deployed according to the needs of each process.

7. *Develop a performance measurement system:* Developing a process of continuous improvement of an organisation helps in tracking the process performance using a performance measurement system developed for this purpose. Customer satisfaction and values are achieved through these processes, and are measured against internal and external benchmarks or standards. Based on the needs and wants of the customers, certain measures and targets are mutually agreed with supplier and customer for data collocation. Plans should be developed for handling non-conformance, and such plans should include establishing a target time scale for resolving them. A plan to maximise the sharing of experience should also be developed.

9. Construct 4: Continuous Improvement

Continuous improvement is necessary to achieve quality (Richardson, 1997). McNair and Leibfried (1992) posit that the basic philosophy that underlies continuous customer satisfaction is the continuous improvement of customer-driven activities and processes. Continuous improvement relies on putting certain early initiatives in place to deliver value to the customer.

Many scholars have stated that continuous improvement requires taking every decision based on facts (Kanji, 1995) and that bottom-up trust for quality improvement is promoted through teamwork (Hoevemeyer, 1993; Heath, 1989). Techniques and tools such as benchmarking, self-assessment, and cost of quality are introduced at a later stage, by which the continuous improvement efforts are initiated, guided and streamlined. Libyan respondents have indicated that continuous improvement is best realised using the following tasks:

1. *Implement selected Tier II CQFs:* Companies should promote the relationship existing between problem solving and continuous improvement based on regular review.

2. *Implement selected Tier III CQFs:* Companies should track quality costs including internal failure costs (waste, scrap, re-work and re-inspection) and external failure costs (repair, warranty claims, complaints and returns) for informing continuous improvement

3. *Encourage team effort:* A variety of team building must be encouraged including quality council, ad-hoc quality committee, departmental/unit teams, and line-based quality circles. Senior management support, as well as middle management's role as facilitator, should help involve employees in decision-making and activities.

4. *Seek continuous improvement and problem solving based on facts and systematic analysis:* Experts may be engaged wherever needed to assist teams and individuals to use tools and techniques Senior and middle management should nurture active and enthusiastic participation of employees, acknowledge their ideas and suggestions. Creative packaging of incentives/rewards and recognition will be useful in the Libyan context.

5. *Establish a system for measuring customer satisfaction:* Tools are needed to measure the level of customer satisfaction. Information solicited and collected from customers are essential in identifying tangible strategies for improvement.

10. Conclusions

The study identified the essential components for the successful implementation of TQM in Libyan oil industries. From these components, a road map was developed, presented and discussed. The roadmap itself was formulated based on key findings derived from quantitative and qualitative research data analyses. The roadmap represents the in-depth thinking of Libyan oil sector management experts in TQM theory and implementation. As such, it should prove highly relevant and useful for establishing TQM success in Libya. In essence, the roadmap can be readily applied to other industries in Libya.

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