CHAPTER 2

LITERATURE REVIEW

Today's organisations have to face a turbulent environment where change seems the only constant. To meet this challenge, organisations are forced to: accelerate and make effective all activities, be flexible in response to change in the external environment, improve quality, reduce cost and fully use their intellectual capital. Furthermore, as this system is becoming more and more complex, emphasis is given on the process orientation and cross-functional approaches. To succeed, the knowledge, skills, experience, and perspectives of a wide range of people must be integrated (Irani and Sharp, 1997).

In this era of tough global competition, numerous organisations are experiencing increasing customer demand for quality not only in products, but also in processes and services. This has compelled organisations and quality managers to make a great effort to implement fully fledged Total Quality Management (TQM) in their firms which offers a meaningful solution inducing a team spirit among their employees to foster a higher degree of quality in all aspects.

Nowadays, it is not an uncommon practice to find organisations and quality managers striving to induce a team spirit among the people in their firms by implementing Quality Control Circle (QCC) programmes. However, there is no definite opinion about the power of QCC programmes inducing team spirit, and thereby to achieve a greater degree of quality, and they are subject to controversies regarding their success and failure in manufacturing firms in various parts of the world other than Japan. Though some manufacturers report successful QCC programmes in their firms, a considerable number of manufacturers report otherwise (Aravindan et al., 1996).
2.1 QUALITY CONTROL CIRCLE (QCC)

The success of any business depends on how well its resources are managed. While managers have excelled in financial management they often have lacked the skills to manage their greatest resource, their workers. In recent years, more attention has been paid to different management techniques. A Quality Control Circle (QCC) is an approach that utilizes the workers' knowledge, abilities and potential problem-solving capabilities (Canel and Kadipasaoglu, 2002).

2.1.1 Background of QCC

The QCC was conceived by the late Kaoru Ishikawa of Japan in the early 1960s as a mechanism for groups employees in similar work areas to discuss, investigate, and find solution to problems with regards to their workplace, and come up with the recommended solutions (Shariff, 1999).

QCC were defined by Ishikawa (1985) as:

Small groups of workers, from the same work place, who meet together on a regular, voluntary basis to perform quality control activities and engage in self and mutual development.

The concept of QCC is rooted in human behavioural and motivational theories (Ouchi, 1981). This author popularised theory Z which, being a highly participative management philosophy, puts the onus on workers and managers to share the responsibility for decision making. Other authors have also indicated that the concept of QCC revolves around the principles of voluntary participation and collaborative decision making (e.g. Gray, 1993). In short, the QCC group has to function effectively as a multi-disciplinary team, focusing on improving selected work processes. The outcome is usually to aid continuous quality improvement.
Ishikawa (1985) states that QCC activity is when the different QC methods are effectively used in the workplace. There are at least seven diagrams that aid QCC. They can be used to help a process improvement leader and to help him/her communicate with other team members who are experts in their own portion of the process but do not know the QCC techniques.

1) The Pareto Chart

A Pareto Diagram is a bar graph. The length of the bars represents the frequency of occurrence. Therefore, the diagram virtually shows which situations are more significant using the Pareto principle of 80/20. What it means is that 80% of the problems comes from the 20% of the causes.

2) The Cause and Effect Diagram (also known as Fishbone)

The Cause and Effect Diagram relates the cause and effect. It can be used to structure a brainstorming session as it helps in sorting ideas into useful categories. This diagram broadens the team’s thinking. A traditional and widely used set of generic categories is the 5Ms – machines, manpower, materials, methods, and measurement.

3) Frequency Histogram

A Histogram is a bar graph that shows the distributions of data: how often the different values occur. It is useful for hypothesis testing – how does the distribution compare with what you would expect.

4) Scatter Diagram

The Scatter Diagram helps identify relationships between two variables. This chart shows the correlation between two variables, typically a
problem and a potential cause. It helps in examining interactions among several variables (with the use of multiple regression).

5) Control Charts

The Control Chart is a graph used to analyse variation in a process. The chart is used to see whether the process is stable or is being affected by special causes of variation. It is an effective tool for day-to-day monitoring and management of a process.

6) Process Flow Chart (also known as Process Map)

Useful for showing linkages among parts of a problem. It is also used to determine solutions.

A flowchart is a picture of the separate steps of a process in sequential order. The process described can be anything – an administrative or service process, a manufacturing process or a plan for a quality improvement process.

7) Run Charts

A run charts is a graph that shows a measurement (on the vertical axis) against time (on the horizontal axis) with a reference line to show the average set of data. It can be used to see whether the process is subject to change or behaves consistently over time. For example, if changes occur at meal times or when there are shift changes, one can then look at events that happen at those times but not as other times.
2.1.2 Implementation Issues of QCC

In terms of the type of content and papers published, Rafaeli (1985) has studied the relationship of employee participation in QCC to measures of job influence, satisfaction and design. Also, Marks et al. (1986) have measured the impact of QCC on the quality of work life, productivity and absenteeism in a manufacturing firm based in the USA. They have shown that QCC have a positive impact on productivity and quality. Similar impacts have also been observed in other industries such as health care (Canel and Kadipasaoglu, 2002), electronics (Gerry, 1995), and banking (Lampe and Sutton, 1992). However, most of these studies are focused primarily on UK (e.g. Dale and Lees, 1985) and North American operations. Also, these studies tend to emphasise the state of QCC development without revealing the evolution of QCC movement or the degree of QCC implementation (e.g. Gerry, 1995; Olberding, 1998). Little is mentioned about the cost-effectiveness and the achievement of the outcome criteria.

In fact, Gerry's account of a particular QCC implementation at Canadian electronics manufacturer reports that the QCC experience was not continuous, the results were mixed and the initiatives were generally short-lived. Some common reasons for the lack of success were weak management support and commitment, lack of interest and attitude, poor planning, little or no facilitation, and little or no training. The entire program had to be re-started three times before it could be launched effectively. Despite this shortcoming, the company was able to use the QC base to springboard to other programs like TQM, business process improvement teams and self-directed work teams.

QCC activities should be encouraged in all the areas of the corporation's activities, whether it is in the production workshop, in the office, or in other areas. Even inside the company, QCC activities should be implemented under the slogan of "The Next Processes are our Customer!" (Ishikawa, 1985). The concept seems simple, and it is, but the implementation and the effort needed to keep the circles functioning effectively require strong support from
management. Moreover, organisations adopting QCC have sometimes found that short-term benefits are difficult to quantify as the commitment to QCC is most effective on a long-term basis (Opfer, 1997).

Walker (1992) and Brennan (1992) have suggested reasons for the failure of QCC programmes:

- Not enough resources.
- Focus is only on production.
- Limited definition of improvement.
- QCC cannot be assimilated easily into existing power structure.
- Middle managers see QCC as a threat.

Walker (1992), Gray (1993) and Fabi (1992) have proposed the following requirements for successful QCC programmes:

- Focus on educating workers about the organization.
- Focus on formulating goals.
- Focus on participation.
- Talk must lead to action.
- Rewards integrated into organizational reward system.
- Top management support.
- Clear goals.
- Power shared.
- Organisational communication system.
- Members' commitment.
- Support of management.
- Training.
- Organisational stability (absence of financial difficulties).
- Briefing non-QC members about work of QCC.

Lee and Lam (1997) states four important issues in implementing the quality system:

- Staff Involvement
- Commitment
- Peak Workload
Briefing

Top management support

The quality improvement literature has tended to emphasize the need for senior management commitment and a corporate-wide change programme when embarking on a quality improvement intervention such as QCC. Without removing the need for senior management commitment, Bartunek and Moch (1991) suggest that successful intervention require multiple strategies appropriate to subcultures within the organization. It is not enough that senior managers are committed to "quality"; they must also understand their organizations and be flexible in the adoption of approaches to fit each subculture (Goulden, 1995). On the other hand, Lillrank and Kano (1989) reiterate that QCC cannot flourish without continuous management support to "push" forward the system. Such support is formally provided through a long hierarchical quality circles structure, favouring management interventions.

Attitudes of middle managers and supervisors

Hill (1991) remarked that "quality circles and middle managers do not mix well". Indeed, quality circles are authorized to discover deficiencies and to grapple with them. However, responsible managers tend to feel uneasy when details of these deficiencies are disclosed. In this sense, quality circles are considered as having potential to undermine managerial status. In order to fight against supervisors' resentment, Japanese companies have obliged middle managers to collaborate with quality circles by using their reward system; about 70 per cent of the middle managers of 21 firms believe that their attitudes towards and co-operation with quality circles are scrutinized when promotion is at stake (Lillrank and Kano, 1989). Separately, Mullins and Schmele (1993) suggest that managers must place value in QCC, have faith in their effectiveness, and appoint middle manager facilitators to increase the success of the group.
Employee involvement

Employee involvement should go beyond the mere request for suggestions on quality improvement. It should encourage employees to pursue their innovative ideas, work and learn with other team members to solve identified problems creatively, and to improve the work systems for efficiency and effectiveness' sake.

Besterfield (1994) suggests that QCC journey must entail a clear understanding of the role of the customer (internal and external), and the involvement and commitment of employees at all levels of an organisation. In addition, intense customer focus, a keen spirit of continuous improvement, strong process focus, co-ordinated teamwork and proactive employee participation are active ingredients for a QCC culture to take root. Teamwork includes the ongoing collaboration between managers and non-managers, between functions and between an organisation and its suppliers. In fact, a thorough implementation of a QCC movement should mobilise the expertise of the workforce for the benefit of everyone involved.

Selection of discussion topics

By definition, QCC tackle problems related to work, but “work” itself is a very broad issue. Many Western companies are eager to thrust QCC into specific ailing areas, so they provide them with lists of relevant problems. In Japan, however, 30 per cent of the responding QCC were found to choose topics having nothing to do with company policy and only 2 per cent reported that subjects were given directly by superiors (Lilrank and Kano, 1989). At an early stage it is considered necessary for QCC to deal with easy problems, and so that members do not become frustrated, a list of issues selected by management is indicated. Co-operation with management on the selection of projects may continue, since poor selection is reported as a major cause of
QCC programme failures (De Vries and Van de Water, 1992; Manson and Dale, 1989).

**Unions**

In Western firms, managers are often determined to keep the programme beyond the unions’ reach and many quality circles’ constitutions state explicitly that union issues should not be discussed during meetings. Unions are also alert to the need to prevent the formation of a parallel collective bargaining structure. Issues are occasionally removed from the quality circles’ context in order to enter the collective bargaining domain (Bradley and Hill, 1987).

**Leadership**

In Japanese firms, four different patterns are reported (Lillrank and Kano, 1989) according to which QCC leaders emerge, namely: through the principle of double approval (a consensus is made between members and supervisors); members appointed by managers; foremen themselves; and, finally, members who rotate at regular intervals. The last case, the most democratic one, is also the rarest. However, large companies tend more than do small ones to let workers elect their own leaders. For example, in the Nippon Steel Company QCC are led by workers who do not hold positions in the organisational hierarchy (Sasaki, 1984). In the Toyota Motor Company, too, senior foremen lead QCC at first, but later they are replaced by elected members’ representatives (Sasaki, 1984).
**Internal support**

Research studies to identify the causes of the unsatisfactory performance of QCC programmes indicate that it can be attributed to the improper, inefficient, insufficient and incomprehensive expertise of manufacturers and quality managers of manufacturing firms while implementing them (Ingle, 1982). Those who understand the real need for proper expertise during the different phases of QCC programmes implementation often invites experts to impart their knowledge through lectures and training programmes (Aravindan et al., 1996). This often leads to excessive expenditure and waste of time. Moreover, it is found in practice that a single human expert is not able to provide comprehensive expert advice to meet all the requirements for implementing healthier QCC programmes. At the same time, the past experiences of many manufacturers and quality managers indicate that employing a greater number of experts for a shorter period does not lead to efficient, long-range, sustainable QCC programmes. However, for most manufacturing firms it is highly impracticable in terms of money and time to employ either a few or a large number of experts for a long period to obtain continuous comprehensive expert knowledge.

**2.1.3 Pros and Cons of QCC**

As with most programs instituted in an organization, there are both advantages and disadvantages for employees and management personnel involved in QCC. The advantages include increased worker productivity, as they feel empowered and respected for their opinions. Advantages for the employees include the possibility of advancement in the organization, increased morale, and job satisfaction. Some of the disadvantages include an increase in time commitment, the initial start-up cost, and resistance to change (Canel and Kadi pasaoglu, 2002).

Enacting QCC requires dedication by management and workers. It is not a program to be taken on frivolously or hastily. QCC cannot simply be acquired, installed and left to run on its own (Main, 1984). An organisation that is
unwilling to devote time and energy to the program will be better without it. However, if given willing and enthusiastic members, compelling advantages can result.

The introduction of QCC leads to increased productivity as well as enhanced worker pride. Allowing subordinates to air their concerns about working conditions instills a spirit of democracy. Workers are no longer absent from decision-making but instead are finding a channel to management in which they can express ideas and feelings about their situation. The results are a mutual trust and respect, an atmosphere of cooperation and the attainment of a proud, productive, and profitable organization (Barra, 1983). Management reaps the benefits of QCC with the introduction of new management techniques. Additional input opens up a vast array of new possibilities for managers to use. The organization can only benefit from this large supply of untapped brainpower.

Although these advantages are inspiring, possible negative repercussions may occur. The initial investment in a program of this kind requires substantial capital. Expenses for training, supplies and printing are just three of the many initial costs. Time constraints also present obstacles to implementation. An essential element that contributes to the success of the QCC is the support of top management. While some members of management may favour the new technique, others will see it as an encroachment on their authority. Managers may not be willing to accept an unfamiliar idea and may attempt to circumvent it. Without complete support, increased productivity and better morale will be short-lived. Prior to implementation, companies must confront the advantages and the disadvantages; QCC are not appropriate for everyone. Weighing the pros and cons forces a company to consider how well QCC conform to a company's particular situation.
2.2 TOTAL QUALITY MANAGEMENT (TQM)

Total quality management (TQM) has gained wide acceptance as a means of gaining and sustaining a competitive edge in the global market. TQM is an integrated management philosophy and set of practices that emphasizes, among other things, continuous improvement, meeting customers' requirements, reducing rework, long-range thinking, increased employee involvement and teamwork, process redesign, competitive benchmarking, team-based problem-solving, constant measurement of results, and closer relationships with suppliers (Powell, 1995).

2.2.1 Background of TQM

The implementation of TQM can generate improved products and services, reduced costs, more satisfied customers and employees and improved bottom line financial performance (Chin and Pun, 2002). Although many adherents openly praise TQM, others have identified significant costs and implementation obstacles (Powell, 1995; Roger et al., 1994; Sitkin et al., 1994; Kekale and Kekale, 1995). Critics have suggested, for instance, that TQM entails excessive retraining costs, consumes inordinate amounts of management time, increases paperwork and formality, demands unrealistic employee commitment levels, emphasizes process over results, and fails to address the needs of small firms, service firms or non-profits. The failures of TQM have been attributed to the preexistence of factors that conflict with TQM philosophy and practice. These include lack of cooperation and excessive time and financial commitments. Shortcomings of TQM or the reasons for its failure can be attributed to implementation problems (Roger et al., 1994) or a disregard for contextual factors (Sitkin et al., 1994). Reasons for friction or failure to implement a quality program may include a mismatch of organizational culture (Kekale and Kekale, 1995), a lack of management leadership and inadequate training (Chin and Pun, 2002).
2.2.2 TQM Implementation Issues

The overwhelming volume of literature in TQM is primarily focused on techniques, prescriptions and procedures. However, less attention has been devoted to how TQM was introduced and implemented, the hurdles encountered by organizations, and how the principles of TQM have been adapted to existing cultures (Lindsay and Petrick, 1997).

Lewis and Smith (1994) suggested six common approaches that would be used to develop and/or implement TQM. They are:

(1) Guru approach
   The writings of Deming’s 14-point model, Crosby’s 14 steps and Juran’s trilogy are used for analysis and implementation.

(2) Japanese model approach
   This uses the writings of Japanese writers such as Ishikawa and the educational guidelines (e.g. Kaizen, 5S, etc.) of the Union of Japanese Scientists and Engineers.

(3) Total quality element approach
   This uses elements (e.g. quality circles, statistical process control and quality function deployment) of continuous improvement rather than full implementation.

(4) Hoshin planning approach
   This focuses on successful planning, deployment and execution and diagnosis of quality practices and performance measurement.

(5) Quality awards/business excellence criteria approach
   This includes such criteria as the Malcolm Baldrige National Award in the USA, the European Quality Award in Europe, and Australia Quality Award in Australia, to identify areas for improvement.
(6) Industrial company/leader model approach

This is where leaders from one organization visit an organization using TQM, identify its system and integrate this information with their own ideas to create a customized approach. Visiting and learning from the quality/excellence award winners is an example of this approach.

While all these approaches work, the most useful TQM implementation plan is an integrated blend of them (Lindsay and Petrick, 1997). The plan should meet a number of criteria to incorporate the organizational development and changes and be operational at the same time. If TQM is typical of other major change processes, it should be implemented using the principles that apply to any organizational change. In particular, each situation should be diagnosed periodically and organization change efforts redirected throughout the ongoing TQM implementation. There is a universal set of quality practices that, if implemented, will lead to high performance (Dale, 1999).

*Culture issues in TQM implementation*

Culture is something collective in a corporation and therefore not a characteristic of individuals within it. It is invisible and intangible software in a company, and distinguishes one organization from another. Sinclair and Collins (1994) regard culture as a tool in determining organizational performance. It provides companies with some measure of control over their business processes. It inculcates employees with a sense of the importance of distinct organizational ideologies to be inspired, and helps them face the desired outcome by providing ways of expressing and affirming their beliefs, values and norms.

The appropriateness of corporate culture would determine the effectiveness of TQM implementation. For instance, those organizations possessing flexibility-oriented values would emphasize decentralization and differentiation, whereas those possessing control-oriented values would advocate centralization and integration (Rodrigues, 1994). The former is likely to
encounter much less difficulty in implementing TQM practices than the latter. Individuals dominated by a large power distance and/or a strong uncertainty avoidance cultural dimension do not necessarily want the responsibilities that come with TQM programs. Similarly, people dominated by an individualistic cultural dimension may not fit well into the group-orientation aspects of management practices (Rodrigues, 1994). The alternation of beliefs, assumptions and values that define the behavioral norms and expectations that determine corporate culture, is both a difficult and long-term undertaking. It is necessary for the management to cultivate concern for employee participation and continuous improvement, and encourage organizational changes that are conducive to it.

*Type of employees*

The diversity of employees can present problems when implementing TQM. It is therefore recommended that representatives of each “type of employee” are involved in the development of the TQM implementation plan. This will ensure that training and TQM activities take into account their particular needs. If the needs of employees, as listed below, are considered, TQM can be effectively implemented.

*Skill level*

Highly skilled employees are likely to accept TQM more quickly than lower skilled employees. They are less likely to feel threatened by proposed changes and are more likely to understand its need. Organizations wishing to increase the autonomy of their workforce may need to improve the skill level of their employees.
**Level of education**

Employees with a high level of education are likely to accept TQM more quickly. A number of interviewees believed that individuals with a high level of education are more likely to judge TQM by its results rather than through its publicity. Whatever the level of education, it is important to note that publicity and posters may be viewed cynically and can create high expectations, which are difficult to meet.

**Length of employment**

Employees who have worked in an organization for a long time can be the hardest to convert to TQM. They are likely to have witnessed many new management approaches and initiatives. If these approaches were not as successful as expected, then these employees are likely to be sceptical towards the implementation of TQM. The most effective method of converting these employees to TQM is through their involvement in quality activities, which produce improvements.

With regard to job ownership, employees who have worked in a certain position for a number of years often do not want any increased responsibility. New responsibilities for some employees may cause distress. It is therefore important to consider each individual's needs before implementing changes, which affect them.

**Age distribution of employees**

An "old" workforce may not accept change as quickly as a "young" workforce. An old workforce may feel threatened at having to learn new responsibilities and use new work implementation and success of TQM methods. It is therefore important to have a comprehensive education and training programme tailored to their needs. A gradual approach to TQM, which gains their confidence, may be appropriate.
Method of manufacture

An organization's method of manufacture can hinder the application of quality activities. Traditional production methods and manufacturing layouts may encourage job specialization and menial repetitive work. In these circumstances it may be difficult for employees to become actively involved in the improvement of work processes. However, it is important that they are involved in the TQM effort, to prevent any feelings of alienation. Many organizations are surprised how employees, given the correct support (particularly resources) and encouragement, can make an active contribution to the organization and their working environment.

Employees' level of product contact

Employees in close contact with the product are more likely to accept TQM. This is because quality activities are typically associated with products rather than people or non-product processes. For this reason it is important in the planning of TQM to discuss how TQM will be implemented in low product contact areas (such as staff areas). A solution would be to develop specific training programmes for these areas providing practical applications of relevant quality activities. Quality activities concentrating on improving the service (product) between internal suppliers and customers may be appropriate.

Employee's attitude towards change

A positive attitude by employees towards change assists in the implementation of TQM. A negative attitude can be changed through education and training and the involvement of employees in quality activities, which result in improvements. After the implementation of an education and training programme, it is important that involvement shortly follows, otherwise employees may become disillusioned.
The setting up of a communication structure between management and employees can help to alleviate problem situations. The organization should aim to install a culture whereby employees recognize problems and solve them automatically (as part of their responsibility).

Business performance

The relationship between business performance and TQM acceptance is complex. Organizations with an excellent business performance may accept the need to change as a necessary prerequisite for success, or alternatively, employees may react against TQM as they fail to understand the need to change a successful system. Similarly, organizations in a “survival situation” may act positively to change as “it’s their last chance”, or negatively owing to previous poor experiences. The attitude of the employees, due to the organization’s business performance, should be considered when deciding the rate of implementation.

Organization’s age

TQM is likely to be more quickly accepted in a “new organization” or a “young organization” rather than in an established one. A new or young organization can introduce TQM as a natural element of its organization. An established organization may need to change its QCOCs, such as its shared values and management’s style, which have developed over many years.

Work methods

Employees used to traditional working methods such as “production make it and quality inspect it in” are likely to find it difficult to accept the TQM concepts. These employees have probably been educated and trained in the values of job specialization, delegation, inspection and control, and are likely
to react adversely to the same management advocating new values and methods. In contrast, employees using new technology are more likely to have experienced changing working methods. The experience of new working methods should encourage a more open attitude to concepts such as TQM.

**Understanding of quality improvement needs**

Employees who understand the need for quality improvement are more likely to accept TQM. For this reason, acceptance is likely to be high for organizations with a high level of quality development, which have witnessed the benefits of quality activities.

**Salary**

Employees with poor salaries are less likely to be enthusiastic for TQM. These employees are likely to feel undervalued by top management and will be suspicious of any new approaches. Organizations using a performance appraisal system will probably need to change the appraisal system to support the aims of TQM.

**Working conditions**

Employees working in poor working conditions are less likely to be enthusiastic for TQM. Similar to employees with low salaries, these employees are likely to feel undervalued by top management and will be suspicious of any new approaches.
Top management's attitude towards change

It is essential that, prior to TQM implementation, all members of the board support the proposed approach. If the managing director or board do not demonstrate their total commitment and total involvement in TQM then it is at risk. The top managers/directors need to be "champions of quality".

Middle management's attitude towards change

Middle management can be difficult to convert to TQM. Many managers may have been with the organization for a number of years and are used to a certain style of management. It may be difficult for them to give greater responsibilities to employees and change to a more participative style of management. In addition, they themselves may be controlled more by the incoming TQM structure.

To gain the middle management's commitment and confidence in TQM, an education and training programme must address their needs and a support structure needs to be developed to assist them through the change period. Without the total commitment of middle management, team building and employee involvement will be affected.

Junior management's attitude towards change

Junior managers can have the same problems as middle managers in accepting change. Those used Implementation and success to fire-fighting and delegating to employees may have difficulty in changing to a more participative style of management. As they are often the direct link between employees and management, it is important that they fully understand TQM. As the management style of junior managers is typically not as developed as middle managers, they are likely to accept TQM more quickly.
Leadership style

TQM aims to encourage a participative style of management throughout the organization. An organization with this style of management is likely to be more enthusiastic towards TQM and will have less need to change its systems and communication structure. Organizations with an authoritative style of management, whereby approach independently) or an integrated approach. Both approaches have advantages and disadvantages.
A fragmented approach encourages sites to pursue and tailor TQM to their own needs. With such an approach, TQM is likely to progress at different rates on each site and the corporate/divisional boards' control is likely to diminish.
An integrated approach, in contrast, provides a greater structure and control over each site for the corporate/divisional board. The advantage of this approach is that an imposed structure reduces the likelihood of poor implementations occurring by ensuring there is a similar level of management commitment at each site. The main difficulty of this approach is to develop a cohesive strategy, which considers the specific needs of each site while maintaining a similar rate of progress across all sites.

Stability of organizational structure

If the organizational structure is stable then TQM will be easier to implement. An unstable organizational structure can threaten the implementation of TQM. For example, the merging of two sites could adversely affect the structural elements of TQM already in place, like delegated teams. Also, the departure of committed TQM personnel, particularly members of the site board, can threaten the impetus and drive for TQM.
Geographically integrated

Organizations implementing TQM into sites geographically distanced from each other may find it more difficult to implement an integrated TQM approach. The physical distance between sites may hinder the transfer of information and weaken the effect the corporate board's leadership style and approach has on each site. In addition, sites geographically distanced are likely to have different QCOCs owing to the effect of the local environment on the organization's employees.

Number of employees

Generally, the smaller the number of employees, the easier it is to implement TQM. At smaller sites, the steerers of TQM (usually the management board) are more visible and have less employees to manage and involve in TQM. This may mean a less detailed and sophisticated implementation structure is required to ensure employee participation and to improve business performance.

Industrial relations

Organizations with poor industrial relations are likely to find it more difficult to implement TQM. Trade unions will be suspicious of TQM and the changes that may occur. This suspicion can be overcome by involving trade unions from the start either in the appraisal or planning of TQM. The involvement of trade unions will help in the acceptance of TQM by all employees.

Quality development

Organizations with a high level of quality development are likely to be enthusiastic towards TQM. These organizations will understand the need for
quality improvement and are therefore less likely to require as much training and education. They will be able to implement TQM more quickly. It is important that quality activities presently being used are integrated within the TQM approach. This will ensure they do not become isolated with regard to the allocation of resources, and that they can still operate successfully.

**Customer satisfaction**

Successful implementation of TQM requires the creation of a quality culture of achieving business excellence through customer satisfaction (Kanji and Wallace, 2000). The goal of satisfying the customer is fundamental to TQM and is expressed by the organization's attempt to design and deliver products and services that fulfill the customer needs. The rationale for this principle is the belief that customer satisfaction is the most important requirement for long-term organizational success and that it requires the entire organization to be focused on the customer's needs. In a study of Malaysian manufacturing companies, Agus and Abdullah (2000) offer empirical evidence of the contributing attribute of customer satisfaction resulting from TQM implementations towards financial performance. This is measured in terms of the number of repeat customers and customer complaints.
2.3 SIX SIGMA

Sigma is a Greek alphabet, which means deviation. It is measure of the variation in the output from the target or customer requirement. A higher Sigma level means less variation or inconsistency in the output; in other words, less quality problems.

2.3.1 Background of Six Sigma

Six Sigma has become a popular approach in many organisations today to drive out variability and reduce waste in process using powerful statistical tools and techniques (Banuelas and Antony, 2002). Six Sigma has been launched the entire world over and many companies testify to its pivotal role in their success.

In statistical terms, Six Sigma means 3.4 defects per million opportunities (DPMO), where sigma is a term used to represent the variation about the average of a process. In business terms, Six Sigma is defined as:

...a business improvement strategy used to improve business profitability, to drive out waste, to reduce costs of poor quality and to improve the effectiveness and efficiency of all operations so as to meet or even exceed customer's needs and expectations (Antony and Banuelas, 2001).

Six Sigma methodology measures the number of defects beyond the defect line. This defect line is given by the customer who receives the outputs of the process. The customer can either be internal or external.

Six Sigma makes use of the DMAIC methodology:

- First, the business problem is Defined to determine what needs to improve.
- The team then Measures the current state against the desired state.
- The team Analyzes the root causes of the business gap.
• The team then brainstorms, selects and implements the best *improvement* solutions.
• Last, the team *controls* the long-term sustainability of the improvements by establishing monitoring mechanisms, accountabilities and work tools.

2.3.2 Critical Success Factors and Implementation of Six Sigma

Many organisations have reported significant benefits today as a result of six sigma project implementation, though not all are yet success stories. These contrast result making six sigma implementation a complex and central process, where the critical success factors in the implementation of six sigma must be recognised through the existing literature on six sigma implementation by analysing the success and failure stories of a number of organisations (Banuelas and Antony, 2002).

*Management involvement and commitment*

Those who have implemented and practiced six sigma agree that the most important factor is continued top management support and enthusiasm (Henderson and Evans, 2000). People in the highest level of the organisation must drive six sigma. In six sigma success stories like Motorola, GE, and AlliedSignal, the CEOs are the ones who have made it possible. All of them support, participate, and are actively involved and dedicated in company-wide six sigma initiatives.

Any successful initiative like six sigma requires top management commitment and provision of appropriate resources and training (Halliday, 2001). Some managers will find it easy to commit to six sigma. However, being committed to a course of action is one thing, but in order to be successful in implementing six sigma, there must be management involvement. Managers must be involved in the creation and management of the process.
management system, and also participate in projects themselves (Eckes, 2000).
Six sigma should be part of everybody’s job, including top management and senior managers – (corporation, business unit, or even department managers). Without the top management commitment and support, the true importance of the initiatives will be in doubt and the energy behind it will be weakened (Pande et al., 2000).

Cultural change

Six sigma is considered a breakthrough management strategy, because it involves adjustments to the firm’s values and culture for its introduction. It also involves substantial change in the organisation structure and infrastructure. Usually when important change occurs, the people in the organisation are afraid of the unknown and they do not understand the need for change (Bauuelas and Antony, 2002).

Some organisation cultures are fear based. Mistakes are not allowed, and employees are used to hiding defects. Six sigma on the other hand flourish in an open and safe environment where defects are seen as improvement opportunities (Erwin, 2000). Organisation wide change often goes against the strong values held dear by members in the organisation, that is, the change may go against how members believe things should be done. This behaviour can be the result of different factors. Eckes (2000) identifies four different factors of resistance, which are:

1) Technical: frequently people find difficulties in understanding statistics to reduce this information. Education and involvement is needed.

2) Political: it is based on seeking on solution to be implemented as a loss, real or imagined. The strategy to avoid this is creating the need for change and then showing how change can be beneficial for them.

3) Individual: it consists of employees who are highly stressed as a result of personal problems, and not associated with the company. The strategy could be to try to reduce stress with less workload.
4) Organisational: this occurs when an entire organisation is committed to certain beliefs, which are usually instituted and communicated by the management. Reluctance to change can be diminished by communicating to the managers the benefits of the initiative.

Some companies that have succeeded in managing change have identified that the best way to tackle resistance to change is through increased and sustained communication, motivation and education. It is important as well to get as much practical feedback as possible from employees, plan the change through a detailed six sigma implementation milestone, delegate responsibilities when possible and empower people to make their own decisions.

Communication

A communication plan is important in order to involve the personnel with the six sigma initiative by showing them how it works, how it is related to their jobs and the benefit from it. By doing this, resistance can be reduced (Henderson and Evans, 2000). It is important to establish a communication programme that can describe what should be communicated by whom and how often. It would help organisations to propagate their business strategy, customer requirements and work team.

Training

Training is a crucial factor in the successful implementation of six sigma initiatives. It is critical to communicate the “why” and “how” of six sigma as early as possible, and provide the opportunity to people to improve the opportunity to people to improve their comfort level through training classes (Hendricks and Kelbaugh, 1998).
2.4 NEW WAYS OF WORKING IN MALAYSIA AIRLINES

The MAS Gemilang project, a programme designed to evolve a new work culture in Malaysia Airlines was lunched on 25 September 2001. The word "Gemilang" refers to a state of shining glory that comes with success upon success. Such success is built upon the excellent of Malaysia Airlines products, and the warmth and personal touch of Malaysia Airlines service.

MAS Gemilang with the tagline – 'Together We Can Make It', has three initiatives:

I. Change Acceleration Process (CAP) which addresses the human side of acceptance to change

II. Six Sigma which addresses the technical side of the change process

III. Quality Control Circle (QCC) to engage everyone in the organisation with continuous improvement at the work place.

In Malaysia Airlines, the QCC is divisionally driven. What it means is that each division will have their own facilitators and coordinating office to initiate and monitor the QCC activities within their division. QCC programme was introduced in Malaysia Airlines 20 years ago. In it early introduction, the QCC programme have achieved the desired results as many teams success and showed a high level of creativity and good teamwork. In year 2001, 18 staffs have been trained at QCC trainer workshop while in year 2002 61 staffs have been trained in three groups.