TQM implementation issues: review and case study

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Abstract TQM is a philosophy mainly dominated by large companies. Small businesses are lagging behind larger ones when it comes to introducing and adopting new managerial philosophies and advanced technology. Many small companies have stopped at quality system certification, such as ISO 9000, in their quality journey rather than pursuing further continuous improvement efforts through TQM. Small businesses must understand the need to go beyond the quality system stage and work towards a total approach for quality. Only through this total approach will their quality effort be a success. Discusses the various issues confronting small businesses when embarking on TQM. First, reviews the subject of TQM and the quality initiatives undertaken by small businesses (which are treated as small- to medium-sized enterprises (SMEs)) such as ISO 9000 and TQM. The small business characteristics are also examined. Second, presents a case study conducted in a small manufacturing company. Culminates with conclusions and discussions drawn from both the review and the case study with suggestions for future research directions.

Introduction
Many of the companies that have implemented TQM are large multinational corporations (MNCs) such as IBM, British Airways, Hewlett-Packard, Motorola, etc. Except for the very few, in small businesses many are still lagging behind when it comes to implementing new management techniques such as TQM.

This paper looks at the various TQM implementation issues particularly in small and medium enterprises (SMEs). The background section reviews the concepts of TQM, and some of the quality initiatives undertaken by small businesses. Most of the studies found relate to quality assurance and the implementation of BS EN ISO 9000; very few focused on the application of the wider concept of total quality. A short description of small business characteristics is also given to provide an understanding of their problems. The case study part of the paper presents a detailed report of a study conducted in one SME involved in manufacturing. Various issues for effective implementation such as management practices, process of implementation, results and outcomes were investigated. The final section presents the conclusions based on both the review and the case study and suggests future research directions.

Background
Different authors have given various definitions of TQM. Kanji (1990) defined it as:
Berry (1991) defined the TQM process as a total corporate focus on meeting and exceeding customers’ expectations and significantly reducing costs resulting from poor quality by adopting a new management system and corporate culture. The principles of TQM have been described by many authors and encompass elements such as management leadership and commitment, employee involvement, supplier partnership, continuous improvement, etc. It is a way of managing an enterprise towards achieving business excellence (Dahlgaard et al., 1998).

Early studies on quality initiatives in small businesses have largely focused on achieving product quality and on the application of statistical techniques. Dale and Duncalf (1984) studied the quality assurance aspects of small manufacturing companies (less than 100 employees) and reported that they were less likely to have a coherent quality assurance policy, and a quality department than large companies. Very few had progressed from an inspection oriented function to the more advanced quality assurance concept. Nagpal and Twamley (1989) reported on a case study of SPC implementation in a small plastics manufacturer as a way of initiating a quality improvement culture. They described the process from initial training to the application of control charts on the shop floor. Both these studies have related quality to product quality assurance and the statistical techniques aspects of TQM.

The next stage of small business involvement witnessed the application of quality assurance through a quality system standard. BS 5750 (now known as BS EN ISO 9000), established in 1979, was perceived to be suitable for, and could be applied to, firms of any size. In 1985, the Task Force for Quality and Value recommended that companies consider adopting BS 5750 or its equivalent as the basis for their quality management system and make greater use of third party certification schemes (NEDO, 1985). This resulted in an upsurge of small businesses applying for certification. The BSI Chairman was reported to have said that:

BS 5750 is an undoubted UK success story. Over 28,000 organisations have been registered in the UK alone . . . we aim to make the benefits of BS 5750 accessible to all companies no matter what size. This service is the result of listening, learning, and acting on the needs of the smaller businesses (Vivian Thomas of BSI, quoted in Chittenden et al. (1996).

However, the BS EN ISO 9000 series of standards (or ISO 9000 as it will be referred to throughout this paper) is a generic quality assurance system and not a quality standard per se, where certification does not necessarily signify producing high quality products and services. The idea of having a common standard, as proof of an organisation’s product assurance system to its customers is noble, but should not be seen as an end in itself. A company
certified to the standard only has a documented product quality assurance system that complies to the prescribed requirements. Seddon (1997) argued that it lacks the continuous improvement element vital for quality sustenance.

Most of the studies on ISO 9000 implementation in small businesses have come to the conclusion that the impetus to attain certification comes not from a desire to improve, but from pressure by large companies (generally their customers) (Chittenden et al., 1996; McTeer and Dale, 1996; Rayner and Porter, 1991; Mo and Chan, 1997). Chittenden et al. (1996) found that small firms in the manufacturing, rather than the service, sector were more likely to use ISO 9000 for improving their quality procedures.

Rayner and Porter (1991) and Mo and Chan (1997) indicated that customer pressure, anticipation of certification request, additional requirements from potential customers, and the ambition to capture a larger market share were seen as the driving forces towards certification. The fear of losing contracts prompted most small businesses to “get quality” into their system rather than actually understanding the purpose of ISO 9000 as one of the tools of TQM. Registration was seen as being synonymous with quality improvement, where obtaining certification was viewed as the pinnacle of their quality aspirations (McTeer and Dale, 1996). Companies do not have to attain ISO 9000 certification if they fully understand the true nature of a good quality assurance system.

Even though there are disadvantages associated with ISO 9000 implementation, the benefits cannot be discounted. Chittenden et al. (1996) concluded that some of the accrued benefits were retained business which otherwise would have been lost, fewer customer complaints, breaking into new markets, increased sales turnover, and reduction of scrap and/or waste. McTeer and Dale (1996) also found some unsurprising benefits for small businesses implementing ISO 9000 such as providing the opportunity for making a detailed examination of a company’s procedures, helping to define the roles of people in the company, and having a greater understanding of how their business was conducted. The process of registration had made their employees much better trained, committed and responsible; it had also provided a better organisational structure and an improved understanding of the strengths and weaknesses of their business. A small business without any formal quality system in operation can greatly benefit when proper procedures are developed as prescribed in the standard. This goes some way in achieving a small part of the total system involved in TQM.

McTeer and Dale (1996) described two important drawbacks experienced by small businesses in their study of eight companies, namely the elapsed time and the amount of paperwork generated by installing the new system. Additional time will be required to process information, and record data, as specified by the standard. Since time can be considered an important resource and always in short supply in most small companies, this can adversely affect the efficiency of the new system. Coupled with time is the need for documentation which introduces bureaucracy and restricts flexibility in a small
business. Chittenden _et al._ (1996) found that ISO 9000 registration resulted in increased overhead costs, increased inspection/supervision, reduced flexibility and increased labour costs. This coincided with their findings as to the reasons why small businesses do not use ISO 9000. It was perceived that certification would increase their costs, add too much paperwork and was a time consuming process.

Small businesses must appreciate the pitfalls of implementing ISO 9000, the benefits that could be obtained, and the drawbacks in having such a system. Although a quality system is a vital element of TQM, it should not be implemented at the expense of losing flexibility which is a strength in small businesses. Small businesses must recognise that ISO 9000 is the product of large corporations imposing controls on to their suppliers to secure business. Implementing an ISO 9000 system solely because customers want it, is a mistake and a small company should aim for continuous improvement and the creation of a quality culture (DTI, 1995). The next steps, beyond certification, must be considered.

**TQM in the small business**

Studies of TQM implementation in smaller businesses are relatively scarce. There seems to be greater interest in the application of TQM in larger organisations, probably because they are seen as being more important than smaller ones. Much of the current published work is centred around the approaches that small companies have taken in their pursuit of TQM. Some of the literature relates to survey results regarding the motive for TQM implementation, measures adopted and the outcome of TQM implementation based on managers’ perceptions. A review conducted by Yusof and Aspinwall (2000a) revealed that those previously developed implementation frameworks were far from suitable and did not fit the SMEs context.

Moreno-Luzon (1993) concluded that small firms were lagging behind big ones in the application of TQM. Successful small firms were found to place more emphasis on product and process innovation, investing in new production equipment, and to have a highly motivated management team with better managing skills. They tended to have less qualified personnel than larger ones, and through TQM, were able to invest in the training of their staff which led to this improvement.

Ghobadian and Gallear (1996) reported on the case studies of four SMEs where they investigated the reasons for adopting TQM, the main steps involved in implementation, the impact and changes resulting from its adoption and the difficulties in implementation. They concluded that SMEs could apply TQM with considerable success and they pointed out the strengths inherent in SMEs which were beneficial for this.

Goh and Ridgway (1994) found that most of the companies, which they surveyed, viewed certification to ISO 9000 to be the end point in their quality drive. Similar findings were also reported by Zetie _et al._ (1994) and Meegan and Taylor (1997). Goh and Ridgway (1994) also advocated the need for a
Zetie et al. (1994) reported on a case study of a small company’s experience in implementing TQM. They utilised an improvement infrastructure that was very similar to the quality circles concept and gave examples of the kinds of projects conducted. All these took place after ISO 9000 certification.

**Reasons for adopting TQM**

Small firms have embarked on TQM for different reasons. Shea and Gobeli (1995) cited some of the motives reported by a group of small companies which they studied. They were:

1. promotion of growth – it is easier to convince the company’s bankers to invest in them if there is evidence that the organisation is well run;
2. management belief in the principle of customer satisfaction and employee empowerment which reflects the management style supporting TQM;
3. changing customer expectations even for organisations seen to be doing well (competitive issue);
4. making work more enjoyable; and
5. to improve poor company performance if the company is not doing well (survival issue).

Even though these reasons looked varied, they all point in the same direction to improvement. Increasing profits is an important issue especially for small businesses. They must understand and realise that improvements in their business and in other aspects such as the working environment are important for survival. Brown (1993) reported on a case study in a small company whose reason for adopting TQM was to develop a new culture as well as management’s desire to return the company to profitability. One of the companies studied by Ghobadian and Gallear (1996) cited trying to overcome internal problems such as poor delivery performance, quality related problems caused by a narrow functional approach and poor financial returns as the prime reasons for adopting TQM.

**Strengths and weaknesses in TQM implementation**

There are certain strengths that smaller companies possess relative to larger ones. Ghobadian and Gallear (1996) gave a list of the differences that exist between large and small and medium sized businesses on aspects such as structure, behaviour, processes, and people. Having analysed their proposed items, some modifications and improvements were made and this resulted in a comparison of the advantages and disadvantages of the major characteristics as shown in Table I. Certain characteristics facilitate TQM implementation in SMEs while others can hamper it.

In terms of structure, processes and people, a small business is in an advantageous position when it comes to adopting a new change initiative,
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td><strong>Structure</strong></td>
<td></td>
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<tr>
<td>Flat, with very few layers of management</td>
<td>Faster communication line</td>
<td>Low specialisation may result in lack of expertise in change initiatives</td>
</tr>
<tr>
<td>Top management highly visible and close to the point of delivery</td>
<td>Quick decision-making process</td>
<td>Need for outside assistance</td>
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<tr>
<td>Less delegation</td>
<td>Faster implementation</td>
<td>Owner controls everything and the lack of delegation can stifle growth</td>
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<tr>
<td>Division of activities is limited and unclear</td>
<td>Short decision-making chain</td>
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<tr>
<td>Low degree of specialisation</td>
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<tr>
<td>Flexible structure and information flows</td>
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<tr>
<td>Strategic process incremental and heuristic</td>
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<td><strong>Systems and procedures</strong></td>
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<tr>
<td>Activities and operations not governed by formal rules and procedures</td>
<td>Simple system allows flexibility and fast response to customer needs</td>
<td>Lack of proper system – difficulty in ensuring efficiency of work, and high variability in work outcome</td>
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<tr>
<td>Low degree of standardisation and formalisation</td>
<td></td>
<td>“Gut feeling” approach may result in wrong decisions</td>
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<tr>
<td>People-dominated</td>
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<tr>
<td>Simple planning and control system</td>
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<tr>
<td>Incidence of “gut feeling” decisions more prevalent</td>
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<tr>
<td>Informal evaluation, control, and reporting procedure</td>
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<tr>
<td>Flexible and adaptable processes</td>
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<tr>
<td><strong>Culture and behaviour</strong></td>
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<tr>
<td>Operations and behaviour of employees influenced by employer’s/manager’s ethos and outlook</td>
<td>Corporate mind-set is conducive for new change initiatives, i.e. company first</td>
<td>Uncommitted or dictatorial owner/manager ethos can damage new initiatives</td>
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<tr>
<td>Organic, not strong departmental/functional mind-set</td>
<td>Unified culture can be a good starting point for, say, TQM</td>
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<tr>
<td>Corporate mind-set</td>
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<tr>
<td>Unified culture</td>
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<tr>
<td>Result-orientated</td>
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(continued)
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<tr>
<th>Characteristics</th>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td><strong>Human resources</strong></td>
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<tr>
<td>Personal authority mainly high</td>
<td>High authority and responsibility can ensure job is done</td>
<td>Lack of financial support, e.g. no training budget</td>
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<tr>
<td>Few decision makers</td>
<td>Innovative environment will support improvement culture</td>
<td><em>Ad hoc</em> and small-scale approach can stifle improvement efforts</td>
</tr>
<tr>
<td>Dominated by pioneers and entrepreneurs</td>
<td>Early union involvement needed to ensure success</td>
<td>Improvement needs investment in human resources</td>
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<tr>
<td>Individual creativity encouraged and high incidence of innovativeness</td>
<td>Fewer employees, better relationship between them – almost everyone knows everyone else</td>
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<tr>
<td>Modest human capital, financial resources and know-how</td>
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<tr>
<td>Individuals normally can see the results of their endeavours</td>
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<tr>
<td>Low incidence of unionisation</td>
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<tr>
<td>Low degree of resistance to change</td>
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</tr>
<tr>
<td>More generalist – some staff may cover more than one department</td>
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<tr>
<td><strong>Markets and resources</strong></td>
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<tr>
<td>Span of activities narrow</td>
<td>Immediate feedback from customers allows quicker response</td>
<td>International marketing expensive</td>
</tr>
<tr>
<td>Limited external contracts</td>
<td>Customer needs better understood</td>
<td>After-sales support not as extensive as large businesses</td>
</tr>
<tr>
<td>Normally dependent on a small customer base</td>
<td></td>
<td>Easily suppressed/dictated to by larger multinationals (if they are customers), e.g. imposed ISO 9000, QS 9000, EMS, etc.</td>
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<tr>
<td>Close contact, easily accessible and many known personally</td>
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<tr>
<td>Mostly local market, limited national or international</td>
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provided that the owner/management has the commitment to, and leadership of, the change process, together with a sound knowledge of it. Lee and Oakes (1995) cited financial and technical resource constraints as being the main problems plaguing small businesses. This is supported by Haksever (1996) who gave two very serious problems faced by the small business manager when trying to implement TQM. They were the owner/manager's lack of business experience and knowledge, and the shortage of financial and human resources required. These two major problems can lead to others, such as reduced training budget, that further hinder the progress of TQM adoption.

Management leadership is probably the most important factor for TQM success. Shea and Gobeli (1995) suggested that it is easier to implement TQM in SMEs since the ultimate power for making decisions lies with the owner-managers. Gobadian and Gallear (1996) and Haksever (1996) highlighted an aspect favouring the smaller businesses in that they are closer to their customers, thus allowing faster information flow between customers and the company. However, small firms with no customer data collection system will face difficulties, as most of the information will be lost along the way, or will only remain in the minds of the owner-manager. This emphasises the need for a system for determining the types of data to be collected and the manner in which action should be taken. The degree of complexity of such a system must be considered whereby a simpler version than that in big businesses is preferred.

Training and education is one of the most important items on the agenda for small businesses in adopting TQM. Ideally, in a small organisation with fewer people, it will be very much easier to educate and train employees, and the amount of time needed to cascade training to lower levels is very much shorter than for large companies. However, small companies who recognise the need for training, do not have a clear vision of what is required and lack resources, knowledge, or facilities in carrying out an effective programme for the employees (Lee and Oakes, 1995). Small firms do not have the extra capacity to substitute people for periods of absence as compared to large firms, and this can hamper training programmes (Moreno-Luzon, 1993). Another problem is the inability of small firms to allocate sufficient funds for training. Without this, the road towards realising TQM could prove to be difficult.

Small businesses have a great potential for success in employee involvement and continuous improvement through participation, teamwork, and empowerment provided owners/managers truly believe in the value of employees as intelligent human beings (Haksever, 1996). Once a change is implemented, the result can be seen immediately because the feedback loop is very much shorter in smaller firms than in larger ones. This can further motivate employees.

Moreno-Luzon (1993) reported on the problems faced by small firms in their attempt to develop a quality culture. Some of the difficulties were:

- resistance to change;
- lack of experience in quality management;
lack of resources;
• the prevalent quality system based on detection (i.e. difficulty in moving to a prevention-based system);
• an emphasis on short-term objectives; and
• the lack of strategies and overall objectives.

Ghobadian and Gallear (1996) also reported on the difficulties in understanding requirements for change, a lack of internal specialist knowledge and technical expertise, and problems in locating and accessing relevant sources of information and knowledge as the main obstacles faced by SMEs. They also mentioned ineffective communication, employees’ lack of clear understanding, not emphasising the concept of prevention and the lack of time. It is only a better knowledge of the kind of problems faced that will enable the development of an effective implementation framework for small businesses.

Lessons from small business TQM implementation
Some writers have argued that a different approach for TQM adoption be used in SMEs due to their inherent characteristics and their organisational differences (Henricks, 1992; Asher, 1992). It is believed that a totally different methodology which fits the SMEs context must be formulated. Different authors (Ghobadian and Gallear, 1996; Bonvillian, 1996; Stuebing and Klaus, 1997; Henricks, 1992; Asher, 1992; Barrier, 1992) have a variety of views about TQM implementation in SMEs and the following discussion attempts to aggregate and synthesise the pertinent facts.

Small companies are advised not to implement TQM all at once (Henricks, 1992; Asher, 1992; Barrier, 1992). Certain fundamental processes necessary for TQM implementation exist but the rate at which an organisation carries them out depends very much on the level of resources available. This means that SMEs should adopt TQM in a much more staggered and progressive manner.

A short-term payoff can have long-term benefits (Henricks, 1992; Barrier, 1992). Smaller companies cannot afford massive investments such as a whole year on TQM education alone, or on visits to TQM companies to perform benchmarking. Small businesses should, on a small scale, consider improvement projects that can reduce costs, increase profits, reduce rejects, reduce failures, with a high degree of success, in the shortest possible time.

An over-emphasis on education is also something to be discouraged (Henricks, 1992). Small firms cannot afford expensive consultants to educate their employees on TQM principles and practices unlike big companies, who can afford large investments in education during the initial stage of implementation. They can for example enlist the help of an expert for a week or a month to help them start TQM. Education, as well as training, from universities, local colleges, or sharing of training resources from non-competitor small businesses through networking is a much cheaper option (Barrier, 1992). Networking in particular allows the sharing of ideas and experiences of problems encountered.
Struebing and Klaus (1997) pointed out two factors that could improve the probability of TQM success in small businesses. The first was having realistic expectations, although companies should be able to see immediate gains in the short term; greater benefits are achievable in the long term. They should not expect to solve all their problems in one go. As Barrier (1992) aptly pointed out, TQM will not solve every problem and in fact, it may create others. It is just one of the many philosophies that a company can adopt to achieve their business goals; it is not the panacea for all ills. For example, it may not be able to solve a particular financial crisis faced by a small company but it can help save money through quality improvements which can finally contribute to the overall financial performance if implemented correctly.

The second factor was to have a well-organised implementation plan up front where it should provide a structure for the successful implementation of TQM. It is not only a plan that they need, but an effective implementation framework that outlines the overall approach and methodology towards embracing TQM into the organisation. This is especially so for small businesses, since there is no room for waste, error, or rework in trying to implement such an important initiative. An effective implementation framework should be aimed at building business excellence in the company.

**Case study on TQM implementation in a small business**

*Introduction*

In an attempt to understand the reality of small business quality initiatives, a case study in one small manufacturing company was conducted through a structured interview approach. A questionnaire was developed (see Figure 1) and formatted in such a way as to elicit information and answer questions with regard to management perceptions and practices on TQM, the implementation of various quality initiatives, how the implementation was conducted, the benefits and outcomes, the problems encountered as well as the factors that contribute to the success of TQM. Besides interviews, observations were made from the documents supplied, and a short plant visit made to the company.
To gain maximum benefit from this study, it was decided that the company selected must have experience in implementing TQM. By choosing a “TQM company”, much of the lessons learned can be transferred to other companies, a comparison can be made with other companies on certain aspects which may be lacking and it can serve as a model to emulate for implementation purposes.

**Background of the case study – small TQM company**

The company studied was PT Ltd, located in Birmingham, UK (the name of the company is shortened to provide anonymity). It is one of the leading manufacturers of springs, including compression, tension, torsion, pressed, and wire shaped springs. Of the 112 employees working in the company, 15 are at staff/management level. Only six people are employed in the quality department which is about 5 per cent of the total workforce and is considered very lean (much of the quality inspection work has been empowered to the production operatives). The company’s organisational structure is still very much triangular in shape where the chairman/Chief executive heads the company, assisted by a technical sales director and a financial director. The second level of the structure comprises departmental managers including quality, production (which is divided into cells), maintenance, materials, and also an improvement department.

A series of awards, recognitions and certifications are testimonies of this company’s effort towards becoming a TQ company and being world class in their trade. They received the Ford’s Preferred Supplier Award in 1991, gained ISO 9002 certification in 1994, the Investors in People (IIP) certification in 1997 and QS 9000 in February 1998. They had previously submitted application to the Midlands Excellence Award for the SME sector.

**Perceptions and practices of TQM**

Top management believe in customer satisfaction through a continuous improvement culture. This perception has been translated into good management practices such as participating in improvement activities, improving communication, solving problems on the systems, taking care of the welfare and wellbeing of employees, teamworking at management level, having a clear mission regarding the business, and management as the key driver in continuous improvement. Various systems and procedures including quality assurance, training, human resource development and management information are already in place and key business processes such as production, delivery, and purchasing have been identified. Clearly, the quality practices in this company correspond to one that understands and values TQM.

Continuous improvement has been made possible through an improvement coordinating body at company level. In terms of the quality improvement structure, both cross-function and within-function teams exist. A training programme is in place to support quality improvement as evidenced by being an IIP certified company. One of the main programmes conducted in the compression spring cell is the Masters Improvement programme in
collaboration with the Society of Motor Manufacturers and Traders (SMMT) working on cycle time reduction, layout improvement, waste reduction, and “tact” (cycle) time determination and improvement. An improvement manager co-ordinates these activities and heads the SMMT project with members from the quality department and the compression spring cell leader.

Several measures have been taken to ensure that their customers are satisfied. The company has a customer liaison manager who gathers information from customers and acts as the central contact person. They have in place customer surveys, and a formal customer complaints process to take immediate action when necessary. They have set up a quick response concern monitoring (QRCM) room whereby all the problems and concerns raised from customers are immediately reported, analysed, and dealt with. Actions taken to temporarily or permanently resolve a problem will be recorded and the records maintained in this room. Having a QRCM room helps ensure faster response to any queries from customers.

Different types of measures are collected for quality performance monitoring and improvement. Examples include scrap percentage, number of reject parts per million and quality costs. Numerous quality tools and techniques are utilised for different processes. For example, FMEA and design of experiments are mainly used in the design and development process, while control charting and process capability studies are used in controlling production processes. However, the main emphasis seems to be related to the manufacturing processes since there was no evidence to indicate whether or not non-production related functions use some of the quality tools for improvement activities. It is believed that improvement has not permeated to these non-production areas. The reasons for this were not made known to the authors.

The involvement of suppliers is important in a company’s TQ process. PT has developed a Material Supplier development programme which started in 1997 involving 90 per cent of their suppliers. They are trying to build supplier partnerships similar to those that have been built with their customers by cascading quality improvement to their suppliers. A comprehensive supplier quality assurance programme is in place ranging from quality audits, supplier assistance, supplier evaluation, grading, and joint problem solving teams.

Having good management practices that promote human resource development differentiates between a TQ and a non-TQ company. Numerous healthy practices to promote job satisfaction and continuous improvement exist in this company. They include a system for job advancement, suggestion schemes, a reward system, education and training for employees (both skills and quality related) and job rotation through multi-skilling. Some of the communication methods established since implementing TQM include open door policy, newsletter, and monthly meetings. Off site meetings are held for the managers to discuss strategic issues. They also celebrate their achievements; one such example is their certification to QS 9000, but only involving managers and staff. They should consider including operatives in the future, which currently is not a practice.
Quality initiatives implementation

With regard to specific quality initiatives implemented to date by PT, the QC manager indicated almost all the items listed in the questionnaire. Some of these were developing a mission statement, setting up of a quality steering committee and the adoption of ISO 9000 and QS 9000. QS 9000 requirements are more stringent than their ISO counterpart and have specific clauses for continuous improvement activities (Lovitt, 1996; Hoyle, 1996). Other initiatives include SPC at critical processes, advanced quality planning tools, supplier development and partnership, a quality costs system, benchmarking and self-assessment. It was quite surprising that one of the items not answered in the affirmative was that of employees’ education on TQ concepts. However, having spoken with the cell manager, it was apparent that he had a good understanding of TQ. There are probably still some employees who have not been trained in TQ concepts but are actually involved in the improvement activities.

Process of implementation

The main reason for adopting a TQM strategy in this company was the realisation by top management that it was necessary for business survival; also their customers were demanding it. The QC manager also indicated that another motivating factor was the positive results that have emerged from carrying out continuous improvement such as reduction in scrap levels. Customer demand, as a motivational factor, is understandable, since they work with large businesses which want their suppliers to continuously improve quality. PT fully understand that continuous improvement will result in a higher quality of products and services, and in improved employee satisfaction ultimately satisfying their customers.

In general, the steps taken to implement TQM and continuous improvement were training and education, team development and support, improvement projects, quality coordinating body formation and developing business management systems. In addition, they have an annual operating plan which sets out the agenda for improvement to be achieved in the ensuing year. One example given, was the QS 9000 certification. They had set their target for certification by March 1998 but actually gained it one month earlier. By April 1998, they completed their first year of the Masters Improvement Programme in the compression spring cell. Some of the achievements to date have been in the area of waste reduction, “5S” activities, “3M” (muri, muda, mura), set-up time reduction and workplace layout improvement. The cell manager was satisfied with the team based improvement activities which have contributed towards high quality and productivity in his production cell.

Besides the certification route, the approach developed for implementing TQM in this company was basically a “do-it-yourself”, making reference to books and journals, and by attending seminars. Both the ISO 9000 and QS 9000 systems were developed internally without the help of consultants. The advantages in doing this were that a good learning and experience opportunity
(learning by doing) was provided and also the chances of the system becoming permanent was higher. This is because there is a champion in the company with the authority and responsibility to make it a success. With respect to a particular guru’s methodology, Deming’s philosophy influenced their approach.

An important issue appertaining to TQM implementation in small businesses, is the practical considerations when implementing these quality initiatives. Since resources were modest and limited, both financial and human, a scaled down approach was necessary. This was supported by the need to have staggered training rather than having a full-blown training programme as large companies would. They also indicated the selection of only important quality initiatives that met their purpose such as QS 9000 certification. It was apparent that their initiatives were focused in the manufacturing area and were very tangible in nature. Improvements such as a reduction in the number of defects, the amount of waste, set-up time, and downtime all demonstrate this. The advantage of concentrating on tangible aspects is that short-term gains can be achieved quickly and management and employees are convinced of the viability of the process. If an intangible concept, such as culture, were chosen as the improvement issue, a much slower progress would ensue.

Results and outcomes

An important aspect also investigated in this study was the results and outcomes from implementing TQM. The types of positive intangible outcomes ranged from employees realising the importance of quality improvement, to pride in work, quality improvement becoming a part of the culture and improved communication. In addition they mentioned improved teamwork, the feeling that everyone was important, and everyone was recognised for their contribution. During the plant visit, a quality inspector was asked how he liked working with the company, and he immediately replied that he was proud. In response to whether a quality culture should be developed prior to TQM implementation or whether it should be allowed to develop as TQM progresses, the QC manager agreed with the authors that it was an outcome of the whole process and not something to be changed upfront. Through the development of proper systems and measures that promote quality, as seen in this company, one would expect to see a change in the culture.

With regard to the tangible outcomes, this company has achieved numerous improvements ranging from improved product quality, increased sales, an increase in the number of employees involved in improvement activities, and improved customer and employee satisfaction. They have also experienced reductions in delivery times, costs of poor quality, employee turnover, absenteeism rate and inventory levels. It was not intended for this study to enquire about the actual magnitude of the improvements made. It was observed, however, from a number of graphical results displayed in the quality area, that drastic reductions in defect parts per million of most production cells in the manufacturing area had been achieved.
The company was able to secure and maintain improvements gained through committing themselves on a long-term basis to all those initiatives already implemented. The authors believed that through having an improvement manager, the company is able to focus on quality improvement on a continuous and consistent basis. The company has an annual plan for new improvement projects that could further spearhead their business performance and ensure that they do not rest on their laurels. One relevant example is embarking on a quality award project. A recent visit to the company indicated their commitment since they are now certified to the third edition of the QS 9000 standard.

Problems and obstacles
PT faced very few problems but those indicated by them are crucial in the context of small businesses. Their main ones were lack of human resources, lack of involvement from non-production functions and trying to achieve too much in a short time frame. This company’s quality department, with six employees, has the overall responsibility for quality assurance, product testing, ISO and QS 9000 compliance, dealing with customer feedback, etc. With the limited number of available personnel, it is vital that their human resources are properly planned and utilised especially when embarking on new quality initiatives.

Since this company’s core business is spring manufacture, it follows that the majority of the improvements would come from the manufacturing area. Non-production departments such as sales and marketing, purchasing and maintenance, probably comprise a small percentage of total employees, and do not justify being involved in improvement activities. Nevertheless, a company must understand that everyone does contribute directly or indirectly to the quality of its products and services. Therefore, it is important that improvement projects extend to these non-production departments so that TQM will encompass the whole organisation to ensure that it will be sustainable.

The last problem indicated by the company was in trying to achieve too much in a short time. A company like PT which is not always entirely satisfied with their current situation will continually try to find and adopt new ways to enhance their business. This can be perceived to be trying to do too much, but in actual fact, it may be a gradual continuous improvement process. During this journey, there are so many things to learn and do especially when little has actually been done in the past. One important reason for planning a few large projects is that it serves the purpose of ensuring momentum for improvement and helps sustain the motivation for TQM. It is worth stressing that PT has been able to sustain its performance and has not slid back to bad performance through this commitment of ongoing projects, and is always asking “what next?” This was evident from the numerous projects, including SMMT, which proved to be a worthwhile effort for them.
Success factors
The success factors particularly related to this company were a systematic approach, selective training, establishing a good communication system, having a continuous improvement system, a suitable measurement criteria, human resources development, an effective and simple implementation framework, and teamwork development.

The QC manager laid emphasis during the interviews on the process of TQM adoption being all about continuous improvement and teamwork. The tools and techniques are just the means whereby problems can be solved to achieve the goal of continuous improvement. Developing employees is vital so that they are continuously upgraded in terms of knowledge and skills to contribute towards improvement through training and education. It is believed that these success factors are relevant within the context of a small business and further studies would be needed to verify this and to investigate their suitability to other small businesses.

Discussion of case study
This exploratory study has provided an insight into the implementation of TQM in a small business. It is apparent that a small TQM company can have in place a wide range of quality initiatives but not necessarily to the same scale as in large businesses. A small company can be successful in implementing TQM because it understands the need to continuously improve in every aspect of its business as evidenced in PT. The key is understanding and having the knowledge of TQM. By providing the resources, such as for training purposes, a reward scheme, investing in supplier development, etc., management is seen to be committed towards quality improvement.

Although PT’s initiatives have centred around the certification route, they have actually succeeded in making continuous improvement their way of doing business. The company said that they first started implementing TQM in 1994, but the authors believe that it was probably much earlier than this, may be as early as 1990. This is evidenced from the first award obtained as being a Ford Preferred Supplier in 1991, taking into account a year of preparation and implementing any necessary changes. By being a preferred supplier, the company has to follow strict quality assurance requirements imposed by Ford. Their certifications, ISO 9000 and QS 9000, were mainly focused on a sound product quality assurance system. Together with all these systems/processes certification, the IIP certification helped them build a much stronger foundation for people development especially through training. And, finally, by adopting Deming’s continuous improvement philosophy, TQM becomes the way in which their business is run. The adoption of TQM has been in stages, as described earlier and especially for small businesses where resources are limited. The framework believed to be used for TQM adoption at PT is shown in Figure 2.

There are three main components, namely:
(1) the organisational elements which are affected by TQM implementation;
(2) the quality initiatives which when implemented will improve the organisational elements;
(3) the goal or aim of the whole process.

Adopting ISO 9000, for example, will ensure that the company’s products meet customer specifications and also improve job responsibilities through clear procedures. Having a quality assurance system may not be sufficient if there are no continuous improvement projects. The way that PT has brought about continuous improvement is through committing to a project, like the SMMT one, and also from constant customer feedback. Without continuous improvement, the company would probably have stopped their quality initiative at ISO 9000, as other SMEs have done (McTeer and Dale, 1996).

Some of the reasons that helped ensure a successful TQM adoption at PT were:

- high management commitment level;
- tangible improvement projects;
- continuous improvement strategy; and
- not being complacent at one level (e.g. moving on from ISO 9000 to QS 9000).

A comment made by this company was on the need to get people involved early in the process and to empower the operatives to make them part of the process. Another piece of advice given, was to give the workers the direction of the way forward, to make them understand the improvement process and the benefits to
be gained. The QC manager said “make them feel early in the journey/process that good things are going to happen”. Involvement is not enough, but the need to gain people’s support is crucial for success.

**Discussions and conclusions**

The arguments that have been presented by different authors so far, show that there are strengths and weaknesses associated with the adoption of TQM in small businesses. In addition there are also problems with implementation in this sector. Success stories, highlighted in the literature, may not reflect the actual realities faced by small businesses in adopting quality initiatives. In many cases, they have been shown the way forward mainly through consultants who have generally adopted large multinational approaches. Large companies tend to readily adopt any “new management” and “new technology” be it JIT, MRP, TPM, concurrent engineering, WCM, that comes their way. The small business owner’s or CEO’s understanding of TQM has come through what they have been told by consultants, academics, experts, who may not have a real understanding of the context in which small businesses operate and the true constraints they face.

What are the main problems faced? The review and the case study revealed that there are two major problems generally faced by most small businesses. The first is financial and the second is a more general resource constraint, which in a broad sense includes time, manpower, technical expertise and managerial expertise. A “full-blown” TQM approach will involve many improvement projects running concurrently, which in turn requires training of everyone in TQM concepts, tools, supervision, and teambuilding to name but a few. All these require a considerable investment. Can the small businesses afford it? When it comes to implementing improvement ideas which probably need new tools and technology, it will again require some kind of financial commitment. Obviously, the small business owner cannot afford this approach because of its adverse effect on their resource availability.

Small businesses must be presented with a TQM approach which is attractive to them in the sense that it must not promise to improve everything or to solve every problem but rather it must be seen to help them to be better in a short time span, say three to six months, with a view to long-term sustainability. Since profit is the main motive of all businesses, large and small, it is not at all wrong to ensure that the initiatives embarked upon have an impact on the bottom line, i.e. increase in profits, sales, and reduction in costs of production. But, at the same time educating the small business managers to have a long-term view of the whole process is needed. Short-term gains can be achieved through identifying waste generated in a system – waste in materials, time, money, methods, energy, etc. The way to make this happen is by adopting a continuous improvement system and an effective implementation framework designed especially for the needs of the small business. With this in mind, only then can further progress be achieved through a maturing process and a continuous learning of TQM.
Drawing from the discussions and ideas presented, the whole notion of TQM in small businesses can be redefined based upon the small business environment. Constraints that exist in a small company can stifle its progress of TQM adoption; they include managerial knowledge in total quality, financial and human resource constraints as well as technical ones. The concept of continuous improvement applies to firms of any size, but the unlimited resources assumption of TQM from the various definitions, concepts, and principles does not seem to apply to small businesses. It is therefore suggested that the frame of reference for TQM in this sector be defined to be more reflective of the context and circumstances in which they operate. This definition can serve as a foundation for the development of an effective and sound implementation framework to serve the small businesses characteristics. It is therefore proposed that TQM be defined as:

P1 Adopting a quality culture through the implementation of quality management initiatives in major aspects of the business wherever possible with full consideration towards building a continuous improvement culture based on realistic resources, financial and human, and in meeting customer needs according to priorities established for continued business success.

By having a TQM definition suitable for small businesses, it will make the tasks that follow, such as implementation, much easier and not result in blindly following the definitions used by their larger counterparts. In short, TQM as defined by large companies should not necessarily be the same for small businesses, but must fit the context in which it is to be used.

This paper has highlighted various issues that need to be addressed when implementing TQM in small businesses. The evidence obtained from the case study further strengthens the propositions provided in the definition for TQM in small businesses. A “full-blown” implementation approach is not suitable for a company which is faced with limited resources. Gradual adoption, for example, by starting with systems certification, then progressing from one programme/initiative to another, presents an attractive approach which is more applicable to small businesses. The PT’s implementation model could be further evaluated to investigate the applicability to other small companies within the manufacturing sector.

Those issues found in the review and the case study will form the basis for future study. There is a need for the formulation of an effective implementation framework that meets the small business context. A conceptual framework for TQM implementation has been proposed by Yusof and Aspinwall (2000b) and is shown in Figure 3.

The framework consists of three main dimensions:

1. quality initiatives/tools;
2. general methodology; and
3. the management coordinating committee.
These three elements are interactive and presented in a form suitable to SMEs. Characteristics which were considered in developing this framework include simplicity, avoiding jargon, implementable, and neither a tool nor a “steps approach”. The proposed framework will have to be validated by conducting case studies in various types of manufacturing companies. In order to ensure the generality of the developed framework (at least within the manufacturing sector), companies with different manufacturing processes will be selected. The proposed implementation framework will help to ensure that a selected quality initiative contributes towards continuous improvement throughout the organisation. The tasks for implementing TQM will be made easier by presenting the “overall implementation structure” rather than a series of “things to do” or “steps to follow” as previous frameworks have suggested. The authors believe that the proposed framework represents a comprehensive TQM approach for SMEs who are struggling to achieve quality excellence. Future work is already under way to validate this conceptual framework, and develop an effective implementation framework suitable for SMEs.

References


